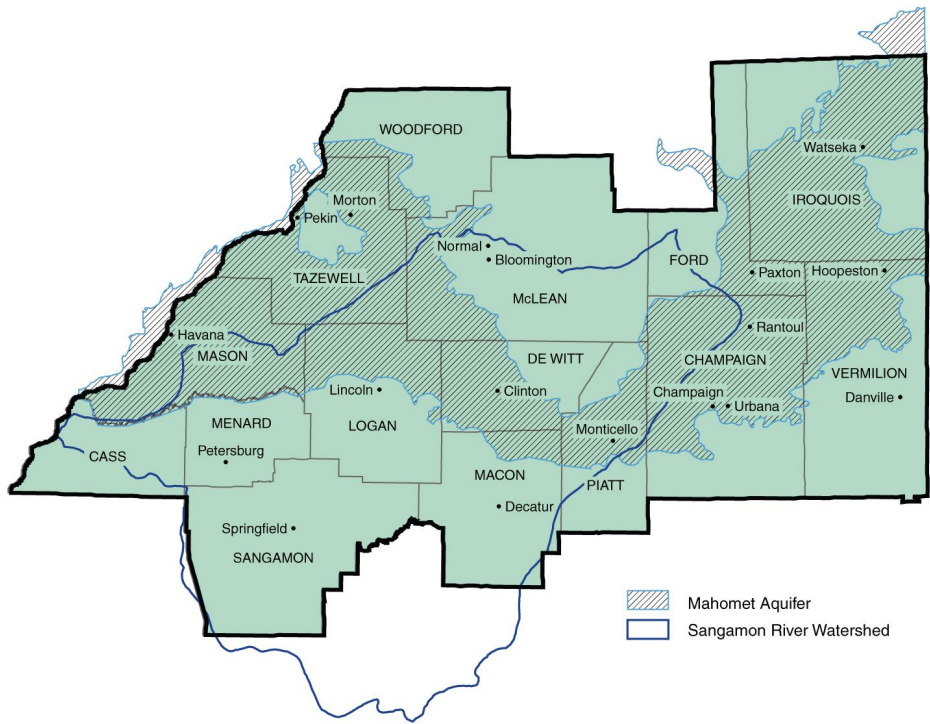


1 MAHOMET AQUIFER PROTECTION TASK
2 FORCE REPORT: FINDINGS AND
3 RECOMMENDATIONS ~~DRAFT~~



4
5 Source: Mahomet Aquifer Consortium website at <http://www.mahometaquiferconsortium.org/info-maps.html> **TABLE OF**
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Executive Summary

[Once a full draft is developed, then make an Executive Summary that can stand apart from the full report. No need to create yet until this report is final or it may not be consistent.]

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I. INTRODUCTION

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The Illinois Groundwater Protection Act (IGPA) defines “aquifer” as “saturated (with groundwater) 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.”

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For more than 70 years, the Mahomet Aquifer has been defined and described repeatedly in the contexts of scientific research, land-use planning, and public policy. -The vertical and horizontal extents of the aquifer generally follow the historic Mahomet Bedrock Valley. -Understanding of the specific characteristics of the aquifer continue to evolve as the science progresses.

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The Mahomet Aquifer is the primary source of drinking water for more than 500,000 people in 15 Illinois counties. The Mahomet Aquifer provides an estimated 220 million gallons of water per day to communities, industry, agriculture, and rural wells in Illinois. The western side of the aquifer is one of the most geologically susceptible areas in the State for potential groundwater contamination. -Pursuant 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 on the western end of the Mahomet Aquifer in 1991 and has been working to protect the groundwater quality over the past 27 years. -This committee and local stakeholders have developed many of the nationally recognized groundwater protection tools that can be used by local governments to protect groundwater (i.e. Tazewell County Groundwater Protection Ordinance, City of Pekin Overlay Wellhead Protection Ordinance, Pleasant Valley Public Water District Regulated Recharge Area). See Illinois EPA Groundwater Protection web-page: <https://www2.illinois.gov/epa/topics/water-quality/groundwater/Pages/default.aspx>.

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On March 11, 2015, USEPA designated a portion of the Mahomet Aquifer as a sole source aquifer. -Such a designation enables USEPA to review proposed projects that will: 1) be located within the review area; and 2) receive federal funding. -USEPA’s Sole Source Aquifer program is authorized by Section 1424(e) of the Safe Drinking Water Act of 1974. -Additionally, Illinois regulations impose additional requirements on siting a new landfill within 1,200 feet of a sole source aquifer.

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The Mahomet Aquifer Protection Task Force (Task Force) was created by Public Act 100-0403 and took effect on August 25, 2017. -The Task Force was created to address the issue of maintaining the clean drinking water of the Mahomet Aquifer, the principle aquifer in east-central Illinois.

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

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- *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 that was formed in 1998 by stakeholders concerned about the sustainability of the Mahomet Aquifer. In 2010, the consortium expanded their mission to include all water resources in the 15-county area. It is a wide array of members from individuals in local, state and federal government, water authority members, water company members, professional groups and the general public; and

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- 150 • *Action Plan for A Statewide Water Supply Planning and Management Program, January 5, 2015, Illinois*
 151 Department of Natural Resources, Office of Water Resources.

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

1	One member of the Senate, appointed by the President of the Senate	Senator Scott Bennett	52 nd District
2	One member of House of Representatives, appointed by the Speaker of the House of Representatives	Representative Carol Ammons	103 rd District
3	One member of the Senate, appointed by the Minority Leader of the Senate	Senator Chapin Rose	51 st District
4	One member of the House of Representatives, appointed by the Minority Leader of the House of Representatives	Representative Bill Mitchell	101 st District
5	One member representing the Illinois Environmental Protection Agency (Illinois EPA), appointed by the Director of the Illinois EPA	Director Alec Messina	Illinois Environmental Protection Agency
6	Two members representing a national waste and recycling organization, appointed by the Governor	Charles Hostetler (Chairman of Subcommittee A)	PDC Technical Service
		Eric Ballenger	Republic Services
7	One member representing a statewide environmental organization, appointed by the Governor	Andrew Rehn	Prairie Rivers Network
8	Three members representing a non-profit consortium dedicated to the sustainability of the Mahomet Aquifer, appointed by the Governor	Deborah Frank-Feinen (Task Force Chair)	Mayor of Champaign
		Diane Marlin	Mayor of Urbana
		Julie Moore-Wolfe	Mayor of Decatur
9	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
10	One member representing a statewide association representing the pipe trades, appointed by the Governor	Lynn Karner	Illinois Pipe Trades Association
11	One member representing the State's largest general farm organization, appointed by the Governor	Steve Turner	Illinois Farm Bureau
12	One member representing a statewide trade association presenting manufactures, appointed by the Governor	Donovan Griffith	Illinois Manufacturers Association
13	One member representing a community health organization located over the Mahomet Aquifer, appointed by the Governor	Claudia Lenhoff	Champaign County Healthcare Consumers
14	Seven members representing local government bodies located over the Mahomet Aquifer, appointed by the Governor	David Zimmerman	Tazewell County
		Larry Stoner (Chairman of Subcommittee B)	Mayor of Monticello
		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
15	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
16	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 shall conduct a study of the Mahomet Aquifer in furtherance of:

- (1) Developing a State plan to maintain the groundwater quality of the Mahomet Aquifer
- (2) Identifying potential and current contamination threats to the water quality of the Mahomet Aquifer
- (3) Identifying actions that might be taken to ensure the long-term protection of the Mahomet Aquifer
- (4) Making legislative recommendations for future protection of the Mahomet Aquifer

The Task Force established two subcommittees:

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

The Task Force and its subcommittees met a total of [23 times] between February and December 2018. All meetings were subject to the Open Meetings Act, and open to the public. For agendas, public notices, draft minutes and presentations, public comments and other materials, please refer to the Illinois Environmental Protection Agency's (Illinois EPA) website at: <http://epa.illinois.gov/topics/community-relations/sites/mahomet-aquifer-task-force/index>.

Appendix A lists the presentations and reference materials that were provided and made available to the Task Force and the public to assist in developing short-term and long-term measures to protect the quality and quantity of 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:

- (1) 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; and
- (2) 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.

Subcommittee A used the process above to build on identifying potential sources of groundwater contamination pursuant to IGPA. Appendices B and C detail the process. Subcommittee A identified the following potential routes, potential threats, and threats to the Mahomet Aquifer System:

- Potential route
 - Abandoned wells

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- 185 • Potential threat
186 o Legacy landfills
187 • Threat (i.e. ~~known~~ groundwater contamination)
188 o Arsenic (naturally occurring)
189 o Road Salt
190 o Source Water Susceptible to Contamination
191 o Household Hazardous Waste (HHW) and Pharmaceuticals and Personal Care Products (PCPP)
192 o Nitrate
193 o Peoples Gas Manlove Field
194 Subcommittee A then developed worksheets for each of the threats that were identified. These worksheets are
195 detailed for each threat in the ~~proceeding~~preceding list.

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196 **Aquifer Protection Worksheet: Abandoned Wells**

197 **Subcommittee A Classification:** Potential Route

198 **Issue:** Abandoned and poorly sealed wells can become a potential route for contaminants at the surface to reach
199 the Mahomet Aquifer by bypassing the naturally occurring clay layers that overlie and protect it. In rural areas,
200 abandoned water wells can be found on old home sites or existing homes where a new well was drilled with a higher
201 capacity or better water quality. In urban areas, water wells can often be found at abandoned industrial facilities or
202 at inactive self-supplied users, such as an old movie theater that used groundwater for air conditioning prior to the
203 advent of modern systems. The locations of many of the old abandoned wells are unknown. Reporting of new wells
204 to public health departments was not required until 1967 and reporting of well sealings did not occur until the
205 1990s. The Illinois State Water Survey (ISWS) and Illinois State Geologic Survey (ISGS) well records database (Figure
206 1A) has information on roughly 50 to 60% of the existing wells based on some field surveys. The Illinois Water Well
207 Construction Code requires the owner of a water well, boring or monitoring well to properly seal the well within 30
208 days of abandonment or when it is no longer used.

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

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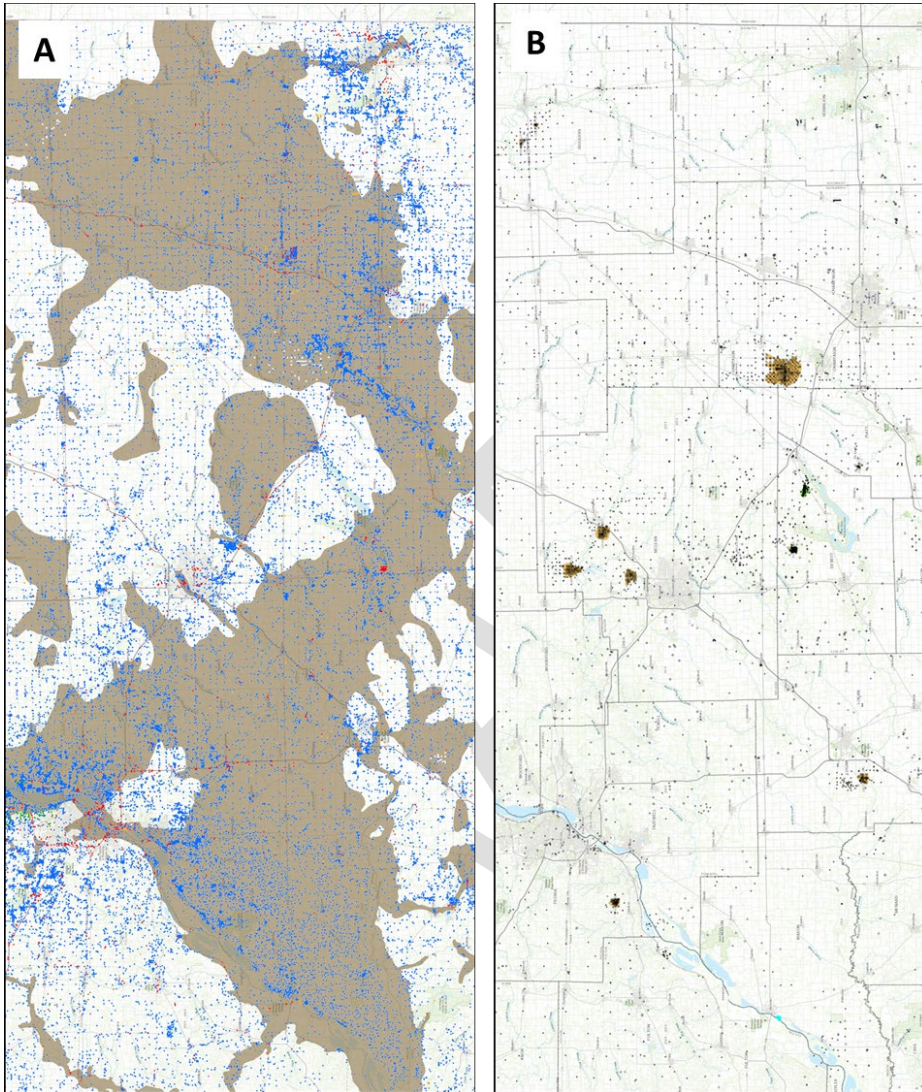


Figure 1. (A) Location of water well records (blue dots) over the Mahomet Aquifer in the ISGS ILWATER database and (B) location of oil and gas well records (black dots) from the ISGS ILOIL database.

220 **A. Aquifer Protection Worksheet: Legacy Landfills**

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221 **Subcommittee A Classification: Potential Threat**

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222 **Issue:** In 1970, the Illinois General Assembly passed the Illinois Environmental Protection Act which created the
223 Illinois EPA and the Illinois Pollution Control Board (Board). Illinois EPA was the first such agency in the United States
224 and was created prior to the United States Environmental Protection Agency (USEPA). In turn, the Board created
225 solid waste landfill regulations in the Illinois Administrative Code (known as the 35 Ill. Adm. Code 807 regulations).
226 Prior to this time, landfills were either not regulated, or regulated by local or State Public Health Departments.
227 Some of these pre-807 sites, and a limited number of 807 solid-waste landfills, did not have source controls (i.e.,
228 may have disposed of what is now hazardous waste before the promulgation of Resource Conservation and
229 Recovery Act (RCRA) in 1976), did not have groundwater monitoring programs, and did not have effective
230 engineering controls (e.g., liners, leachate removal systems, and landfill gas collection and control systems).

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231 To assist the Task Force due to their concern with legacy landfills, Illinois EPA staff prepared a list of 807 solid-waste
232 landfills that overlie the Mahomet Aquifer from their Solid-Waste Database of 25 Part 807 Landfills (5 Part 811
233 Landfills), as shown in Figure 2. These sites were overlain, using Illinois EPA's Geographic Information System (GIS),
234 on *Illinois Potential for Aquifer Recharge Map*. This map was developed by the ISGS pursuant to Section 17.2 of the
235 Act to specifically assist in regional groundwater protection planning.

236 Then the following, Part 807 landfills were identified in areas with a high to moderately high potential for aquifer
237 recharge (See Figure 2) by Illinois EPA:

- 238
- 239 • Map ID 5 - Paxton #2 (Ford County);
 - 240 • Map ID 14 - Tazewell RDF (Tazewell County);
 - 241 • Map ID 13 - Illinois Technical Systems (Tazewell County);
 - 242 • Map ID 10 - Rowe Construction Company (McLean County); and
 - Map ID 15 - Pekin Metro Landfill (Tazewell County).

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243 The next step of this assessment, conducted by Illinois EPA, involved input from each of the inspectors in our
244 regional field offices to further research these sites. All these landfills have covers and groundwater monitoring
245 systems. -Additionally, a detailed review of all the files for these sites including, inspection reports, groundwater
246 monitoring, corrective action, permit closure certification status, and enforcement actions were reviewed.

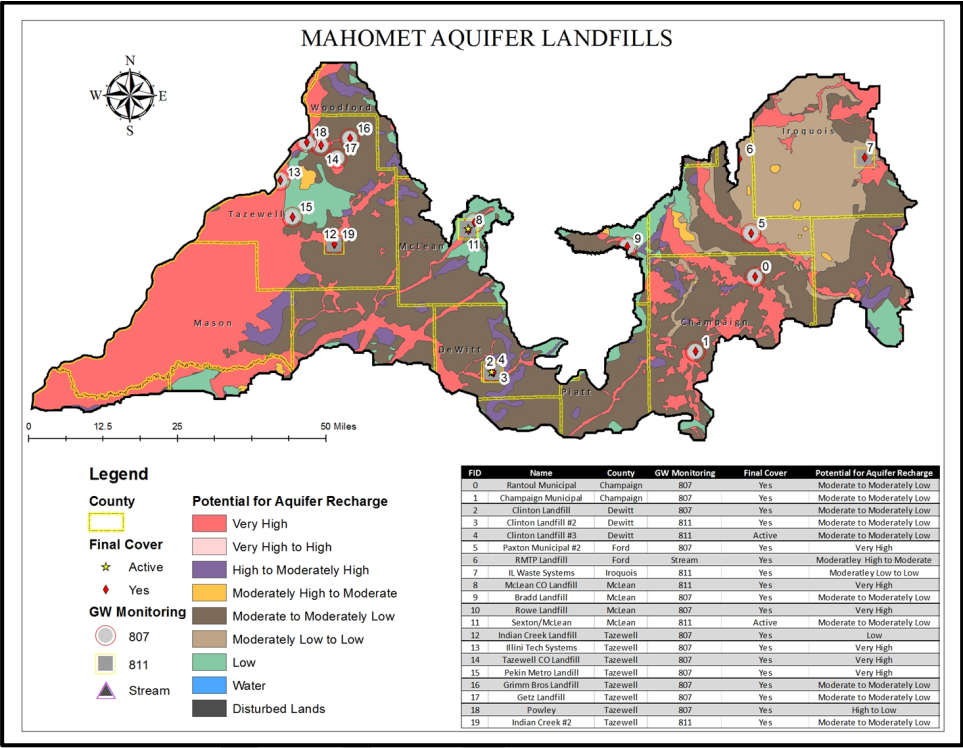


Figure 2. Part 807 and 811 Landfills Located Above the Mahomet Aquifer System Relative to Illinois Potential for Aquifer Recharge Map (Illinois EPA, 2018).

Further, summaries of each of these detailed reviews; 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 was developed for each landfill by Illinois EPA. 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 last 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 program.

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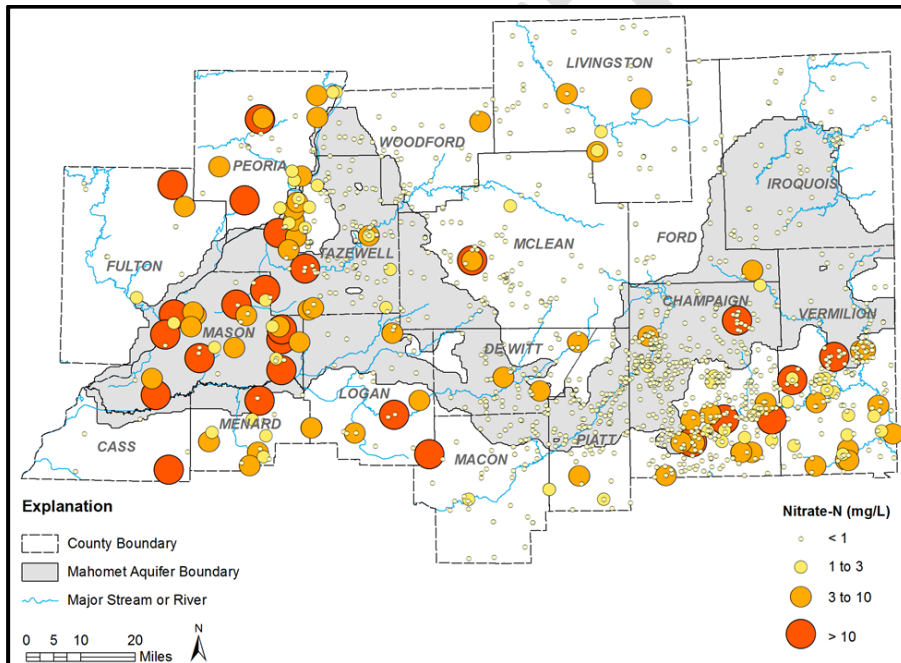
259 **Aquifer Protection Worksheet:** Nitrate

260 **Subcommittee A Classification:** Potential threat

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

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273 Figure 3. Nitrate-N concentrations in the Mahomet and shallower aquifers.

274
275 Figure 3 shows the distribution of nitrate concentrations in the Mahomet Aquifer region. The map includes 1,589
276 samples collected since 2000 from both the Mahomet and shallower sand and gravel aquifers found in the ISWS's
277 groundwater quality database. More than 90% of the samples have very low concentrations, less than 1 mg/L. Less
278 than 2% are above the drinking water standard, with a third of those from Mason County where the aquifer is
279 unconfined.

280 The Illinois Nutrient Loss Reduction Strategy (NLRS) was developed by Illinois EPA, the Illinois Department of
281 Agriculture (IDOA), and a multi-stakeholder Policy Working Group (PWG) that included federal and state agencies,
282 industry, agriculture, wastewater treatment agencies, and non-governmental organizations. The initial NLRS was

283 released in July 2015 and is a framework for leveraging existing programs to optimize nutrient loss reduction while
284 promoting collaboration, research, and innovation among the private sector, academia, non-profits, wastewater
285 treatment agencies, the agricultural sector, and state and local government. The primary strategy goals are to
286 reduce annual loading of nitrate and total phosphorus to the Mississippi River and address the impacts on local
287 water quality. The ultimate goal is to achieve 45 percent loss reductions in both nitrate and total phosphorus with
288 the interim loss reduction goals of 15 percent nitrate-nitrogen and 25 percent total phosphorus by 2025.

289 For more information on the NLRs, see [http://www.epa.illinois.gov/topics/water-quality/watershed-](http://www.epa.illinois.gov/topics/water-quality/watershed-management/excess-nutrients/nutrient-loss-reduction-strategy/index)
290 [management/excess-nutrients/nutrient-loss-reduction-strategy/index](http://www.epa.illinois.gov/topics/water-quality/watershed-management/excess-nutrients/nutrient-loss-reduction-strategy/index).

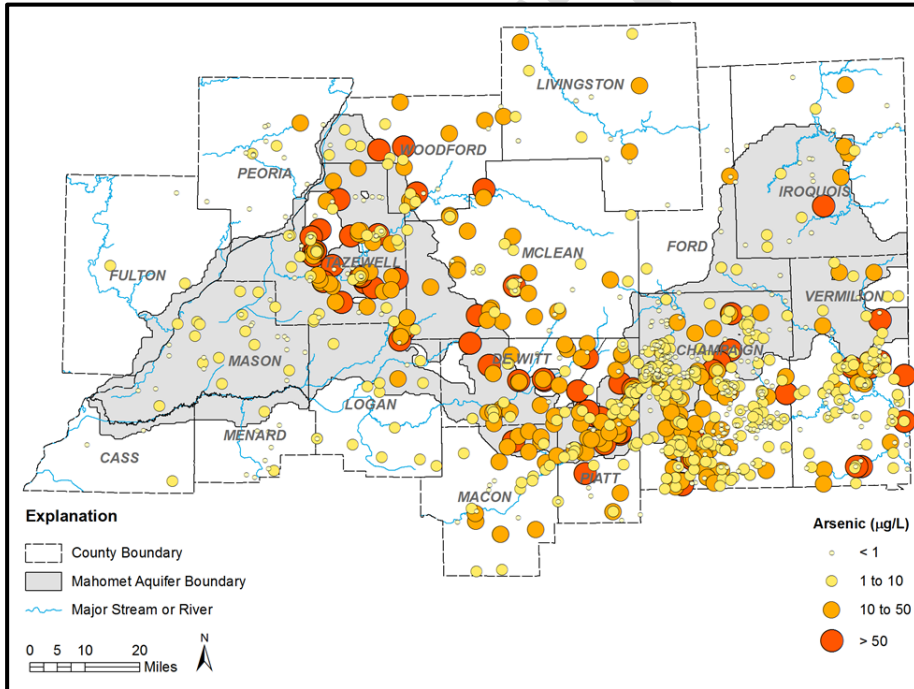
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291 **Aquifer Protection Worksheet: Arsenic**
292 **Subcommittee A Classification: Threat (Naturally Occurring)**

293 **Issue: Arsenic**

294 Arsenic is the most widespread natural contaminant of groundwater worldwide. Small amounts of arsenic are
295 common in many unconsolidated aquifer materials (sands and gravels) deposited by glaciers or rivers. Under certain
296 geochemical conditions, arsenic is released from the solid materials into the groundwater. There are several areas in
297 the Mahomet Aquifer system where arsenic is found above its drinking water standard (10 µg/L). The western
298 confined region is where elevated arsenic in the Mahomet Aquifer of the most concern, primarily in Tazewell
299 County. Central parts of the aquifer can also have elevated levels, especially along the aquifer valley walls. The
300 discontinuous overlying aquifers (Glasford, Pearl) can also have elevated concentrations of arsenic. In fact, the
301 highest concentrations in Illinois have been found in these shallower aquifers. There is a great deal of variability in
302 arsenic concentrations in the Mahomet Aquifer system, making it difficult to accurately predict where elevated
303 levels might be found. Domestic well owners with elevated arsenic levels commonly use reverse osmosis or other
304 point-of-use treatment systems to lower arsenic concentrations below the drinking water standard.

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305 Figure 4. Arsenic concentrations in the Mahomet and shallower aquifers.
306

307 Figure 4 shows the distribution of arsenic concentrations in the Mahomet Aquifer region. The map includes 1,069
308 samples collected since 2000 from both the Mahomet Aquifer and shallower sand and gravel aquifers found in the
309 ISWS's groundwater quality database. About 30% of the samples have concentrations greater than the drinking
310 water standard, while about 8% have concentrations greater than the old drinking water standard (50 µg/L), which
311 was superseded in 2006.

312

313 **Aquifer Protection Worksheet: Road Salt**

314 **Subcommittee A Classification: -Threat**

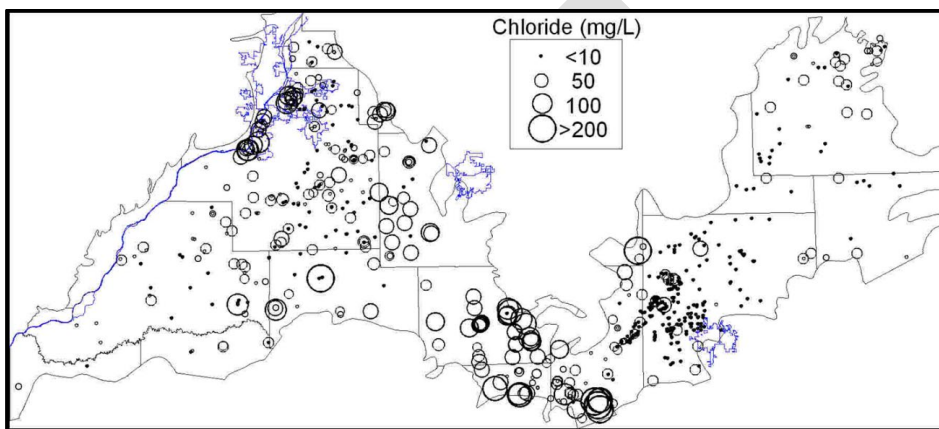
315 **Issue:** -Salt (sodium chloride) applied to roads as a deicing agent can runoff and infiltrate through the soil into the
316 groundwater. -Chloride is largely non-reactive in the subsurface and will accumulate in an aquifer over time. In
317 northeastern Illinois, over 55% of public water supply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

322 Some of the highest chloride concentrations in the Mahomet Aquifer (Figure 5) occur in western Tazewell County
323 where there is higher density of roadways and the aquifer is unconfined. -The high chloride values in Piatt and
324 DeWitt Counties are likely due to the influx of brine from the underlying bedrock.

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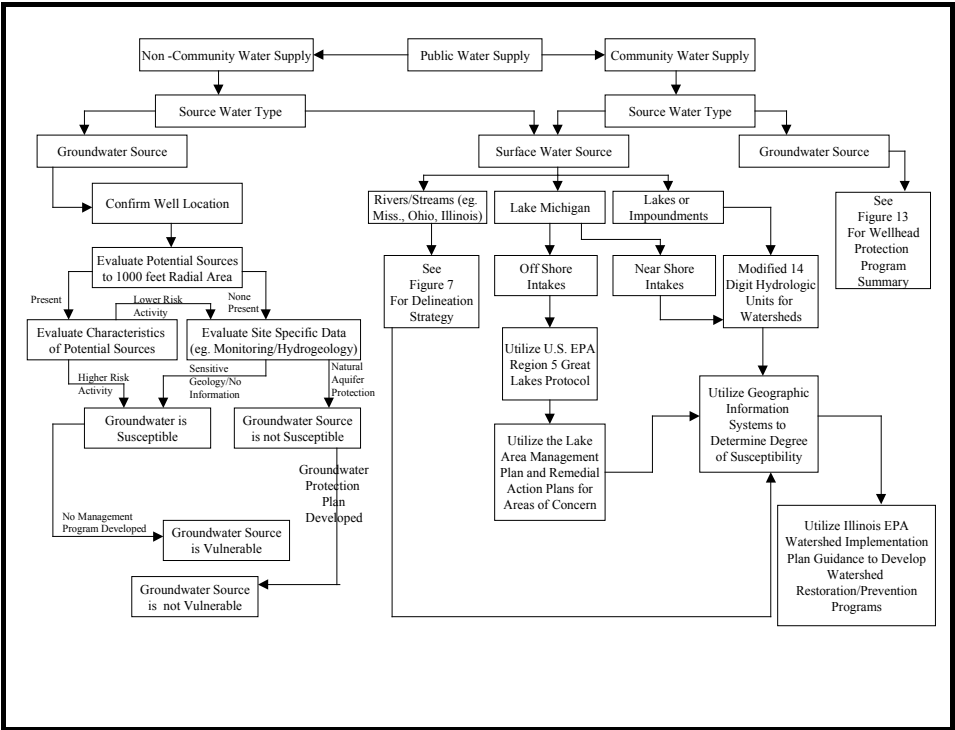


325
326 Figure 5. Chloride concentrations in the Mahomet Aquifer from the ISWS database

327

328 **Aquifer Protection Worksheet:** Source Water Susceptible to Contamination
329 **Subcommittee A Classification:** -Threat
330 **Issue:** -Susceptibility should continue to be used as a guide for development of appropriate wellhead protection
331 programs. -Figures 6 and 7 illustrate diagrammatic flow charts of Illinois' source water susceptibility and protection
332 program processes.

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333
334 Figure 6. Illinois Source Water Susceptibility and Protection Program Process

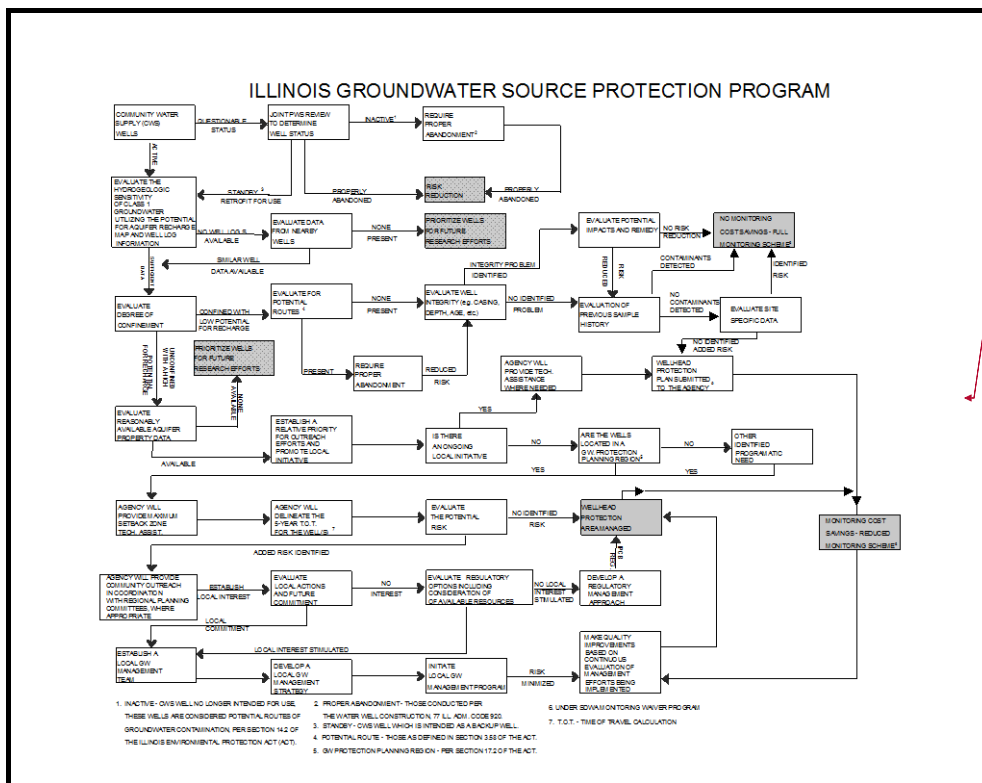


Figure 7. Illinois Groundwater Susceptibility and Protection Program Process

Source water assessments were conducted by the Illinois EPA using the process detailed in Figure 7 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 to the public at: <http://www.epa.illinois.gov/topics/water-quality/swap/index>. 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 web-site as a resource.

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344 **Aquifer Protection Worksheet:** Household Hazardous Waste (HHW) and
345 Pharmaceuticals and Personal Care Products (PCPP)
346 **Subcommittee A Classification:** Threat
347 **Issue:** Common household products can be highly toxic, flammable, explosive, or corrosive, the same as hazardous
348 waste that is highly regulated from commercial and industrial processes. PPCPs can easily enter the water system,
349 both before and after passing through a human system. Both HHWs and PPCPs can have adverse environmental
350 impacts, depending on their use and disposal method.

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

357 The problem of PPCPs is similarly one of scale. The amount of PPCP contamination generated by one person or a
358 small group is minimal, but the amount of PPCP contamination generated by many people in a relatively small area
359 can have considerable environmental impacts.¹

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

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

373

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375 **Aquifer Protection Worksheet:** Underground Natural Gas Storage

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376 **Subcommittee A Classification:** -Threat

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377 **Problem:** -Illinois has no significant sources of natural gas and must rely on other states to supply this fuel via
378 pipelines. To meet the volume and timing of the demand, Illinois has the largest amount of natural gas storage in
379 saline (i.e., deep geologic) formations in the nation, totaling 780 billion cubic feet. In Illinois, utilities have been
380 effectively storing natural gas in the subsurface for over 50 years, however, over the past several years, natural gas
381 leakage has occurred at multiple sites in Illinois likely as a result of aging infrastructure. In December 2016, a natural
382 gas leak was identified at the surface near a storage well in the Manlove Natural Gas Storage Field in northern
383 Champaign County and within the designated sole source aquifer boundary for the Mahomet aquifer (See Figure 8).
384 Well integrity of one natural gas storage well was identified as a cause. Natural gas is predominantly composed of
385 methane, CH₄. Groundwater sampling subsequently identified a specific type of methane, called thermogenic
386 methane, associated with stored natural gas in multiple adjacent private water wells. Mitigation activities occurred
387 in response to the leakage.

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388 There is currently not a water quality standard in Illinois for methane, nor is it known to be a health hazard when
389 ingested. -However, methane can be flammable and explosive when mixed with air, it can be an asphyxiant, and can
390 also cause problems with the operation of public and private water systems.

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

393 **Section 620.301 General Prohibition Against Use Impairment of Resource Groundwater**

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

399
400 Illinois EPA has referred Peoples Gas Light and Coke Company (PGL) to the Illinois Attorney General's Office (AGO)
401 pursuant to a violation of Section 12(a) of the Act and part 6201.301. -The Illinois Department of Natural Resources
402 has primary jurisdiction over the natural gas leak as the permitting Agency of the Manlove Field Facility. While
403 Illinois EPA does not regulate private wells that were found to be contaminated by the leak, the Agency opted to
404 conduct independent sampling to provide information on the extent of groundwater contamination resulting from
405 the natural gas leak, as the Agency does have legal authority over potential groundwater contamination. Following
406 the sampling, which began in October 2017, Illinois EPA issued a Violation Notice (VN) to PGL in December 2017.
407 The case was subsequently referred to the AGO on January 5, 2018. **Appendix E** contains a detailed timeline of
408 actions involving the Illinois EPA to develop a Groundwater Management Zone (GMZ) under a consent or court
409 order. The AGO leads the negotiations with PGL.

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410 In 2018, HB4746 was signed into law and requires prompt notification of any future leaks for storage sites within
411 sole source aquifer boundaries (e.g., the Mahomet aquifer boundary) and annual inspections of gas storage wells by
412 the Illinois Department of Natural Resources.

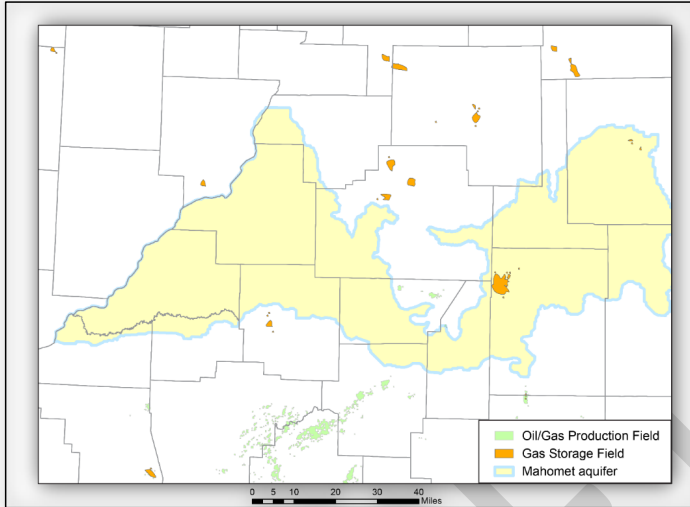


Figure 8. Natural gas storage fields and oil/gas production fields in relation to the Mahomet aquifer sole source aquifer boundary. (Image Source: Prairie Research Institute, 2018)

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III. ACTIONS THAT MIGHT BE TAKEN TO ENSURE THE LONG-TERM PROTECTION OF THE MAHOMET AQUIFER

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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 non-legislative recommendations generated by Subcommittee B for each of the threats identified.

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1. **Abandoned wells**
 - a. Promote well sealing demonstrations and communicate importance to homeowners.
 - b. Provide resources to better track and keep records of well sealings.
 - c. Develop on-line reporting tools for well permitting, drilling and sealing.
2. **Legacy Landfills**
 - a. 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.
 - b. Utilize the detailed terrain model templates to conduct an inspector training module for utilizing 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.
3. **Nitrate**
 - a. Continue to raise awareness of the NLRS and implementation efforts in existence to improve water quality and reduce nutrient loss into Illinois waterways.

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- b. 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.
 - c. Expand cost share opportunities to farmers to encourage adoption of BMPs that add expense and risk to farming operations.
 - d. Centralize the nitrate concentration data collected by the county public health departments.
 - e. Review nitrate data to determine the location, depth, and construction of wells vulnerable to nitrate contamination.
 - f. Develop recommendations to avoid high-nitrate zones when constructing new wells.
 - g. Discourage the use of shallow sand points.
 - h. Promote the public health guidelines to private well owners concerning setbacks for septic systems, feedlots, and other sources of nitrate.
4. **Arsenic**
- a. Encourage private well owners to test their water for arsenic.
 - b. Conduct scientific studies to better understand the distribution of arsenic in the aquifer.
 - c. Promote low-cost water treatment technology.
5. **Road Salt**
- a. Expand road salt education and training programs, like those organized by the Tazewell County Health Department, to all the counties over the aquifer.
 - b. Encourage municipalities and counties to calibrate their road salt spreaders.
 - c. Monitor chloride trends in public water supply wells
6. **Source Water Susceptible to Contamination**
- a. 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.
 - b. 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.
 - c. 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.
7. **HHW and PCPP**
- a. Consider implementing some of the measures included in the final report from the Illinois Task Force on the Advancement of Materials Recycling.
8. **Underground Natural Gas Storage**
- a. The General Assembly incorporate federal law and regulation for underground natural gas storage into state law and empower DNR to implement that law.

A-B. Generally Applicable Recommendations

The Task Force will need to vote and confirm this list in the November meeting

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 utilized published stakeholder recommendations on delineating and assessing the Mahomet Aquifer system to support its protection and restoration in certain instances that were compiled by the Prairie Research Institute (PRI) (See Appendix E). -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. The final tally and rankings are detailed in Appendix F.

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

489 Aquifer Characterization

490 A wide range of new technological methods are available that enable scientists to identify and map the details of
491 aquifers, and consequently, to determine and describe the availability of groundwater supplies. -One such
492 technology is helicopter-based time-domain electromagnetics (HTEM), which has been described as a “game
493 changer for hydrogeology.” -HTEM methods are used to measure the electrical properties of the subsurface
494 geological materials, which can be interpreted to map and characterize aquifer systems to depths of more than
495 1,500 feet. -HTEM technology gathers a much higher density of data than ground-based geophysics or invasive
496 research methods such as drilling, and the airborne method allows for rapid, continuous collection of data. -The
497 HTEM stem consists of a transmitter and a receiver suspended from a helicopter and flown over a mapping area.
498 HTEM data can be processed into a 3-D format to generate 3-D images and depth slices of the subsurface electrical
499 conductivity. -HTEM technology is crucial for geologic mapping because it fills in data gaps that are not observed by
500 typical land-based technologies such as geologic test hole drilling.

501 The Task Force recommends the General Assembly provide ~~\$19.8 million~~ to the Prairie Research Institute (PRI) to
502 ~~use~~ HTEM technology to characterize the aquifer to aid in identifying the connections with other aquifers and
503 surface waters. -Work can be done in phases to focus on the highest need areas first.

504 The State’s investment in HTEM technology will better define surface and groundwater conditions. -The Task Force
505 recommends that results be integrated into next-generation groundwater flow models.

506 [Insert most up to date cost estimates and map]

507 Communication

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

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

514 Water Quality and Protection

515 The Task Force recommends the General Assembly provide PRI adequate resources to improve the understanding of
516 ambient water quality to ultimately protect water quality. -See Appendix G for budget information.

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

519 Water Quantity and Sustainability

520 The Task Force recommends the General Assembly inventory the existing groups handling the process for regional
521 water supply planning and management of the Mahomet Aquifer, and consider empowering a group to provide
522 leadership, administrative structure, and processes for that work.

523 The Task Force recommends the General Assembly use the established water supply planning process to review and
524 update regional and local water supply plans at least every five years. The Department of Natural Resources (DNR)
525 Office of Water Resources (OW) is the lead Agency with respect to water supply planning. DNR’s authority, role, and
526 State Water Supply Action Plan are detailed at in Appendix B. [The Task Force should discuss DNR’s role here and
527 whether more is needed.

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

529 Underground Natural Gas Storage
530 The Task Force recommends the General Assembly incorporate federal law and regulation for underground natural
531 gas storage into state law and empower DNR to implement that law.

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

536 **IV. LEGISLATIVE RECOMMENDATIONS FOR THE FUTURE PROTECTION**
537 **OF THE MAHOMET AQUIFER**

538 Given the above described findings and recommendations, the Task Force recommends the following legislative
539 recommendations for the future protection of the Mahomet Aquifer:

540 First, the Task Force recommends the General Assembly provide \$19.8 million⁴⁴ to the Prairie Research Institute
541 (PRI) to use HTEM technology to characterize the aquifer to aid in identifying the connections with other aquifers
542 and surface waters.

543 Second, the Task Force recommends the General Assembly incorporate federal law and regulation for underground
544 natural gas storage into state law and empower DNR to implement that law.

545 **V. CONCLUSION**

546 The protection of the quality and quantity of the Mahomet Aquifer is the responsibility of everyone, from citizens to
547 cities to counties to state agencies. (See Appendix B).

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

550 To help support the Task Force in its effort to protect the Mahomet Aquifer System the Illinois EPA developed a Task
551 Force web-page: [https://www2.illinois.gov/epa/topics/community-relations/sites/mahomet-aquifer-task-](https://www2.illinois.gov/epa/topics/community-relations/sites/mahomet-aquifer-task-force/Pages/default.aspx)
552 [force/Pages/default.aspx](https://www2.illinois.gov/epa/topics/community-relations/sites/mahomet-aquifer-task-force/Pages/default.aspx). This web-page contains all the meeting agendas, minutes, and presentations.

553
554 Presentations

- 555 • Mahomet Aquifer Groundwater Protection Task Force – Groundwater Assessment and Protection Tools, Rick Cobb, Illinois EPA;
- 556 • Protection of the Mahomet Aquifer, George Roadcap, PRI;
- 557 • An Introduction to Natural Gas Storage in Illinois, Randy Locke, PRI;
- 558 • The Future of Science of the Mahomet Aquifer, Jason Thomason, PRI;
- 559 • Illinois EPA Investigation of the Thermogenic Natural Gas Release into the Mahomet Aquifer from the Manlove Natural Gas Storage Field, Rick Cobb, Illinois EPA
- 560 • Underground Natural Gas Storage Regulation in Illinois, Mike Mankowski, DNR
- 561 • Illinois Legacy Landfills, and Implications for Mahomet Aquifer Groundwater Resources, Chris Stohr, Applied Geo-Imaging Solutions
- 562 • Mahomet Aquifer Task Force, Bill Compton, Chair Groundwater Advisory Council
- 563 • Subcommittee B's Working List of Recommendations by Category and Priority, Jim Risley
- 564 • What is Considered a Threat to Groundwater, Rick Cobb, Illinois EPA
- 565 • 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

571 In addition, there are several references listed on the web-site for the Task Force for development of this report and
572 recommendations, but also to provide available tools for implementing these recommendations.
573

574 References
575

- 576 • Mahomet Groundwater Systems
- 577 • 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.
- 578 • 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
- 579 • Illinois EPA Source Water Assessment Protection Program GIS Tool
- 580 • "Meeting East-Central Illinois Water Needs to 2050: Potential Impacts on the Mahomet Aquifer and Surface Reservoirs"
- 581 • The Mahomet Aquifer Consortium: "A Plan to Improve the Planning and Management of Water Supplies in East-Central Illinois"
- 582 • Natural Gas Working group
- 583 • "Anomalous Groundwater Pressure Responses in the Mahomet Aquifer Near the Manlove Gas Storage Field" - George Roadcap, PhD, Illinois State Water Survey
- 584 • 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

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594 **Example Groundwater Protection Ordinances**

- 595 • The Central Region Groundwater Protection Committee's web page includes links to the Tazewell County
596 Groundwater Protection Ordinance and the City of Pekin's Overlay Wellhead Ordinance

597 **Videos**

- 598 • Video on 3-D mapping that includes 3D rendering of the Mahomet Aquifer; Barb Stiff - ISGS
599 • Video on Recharge Rates of the Mahomet Aquifer; George Roadcap - ISWS
600 B.
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602 Appendix B: Process and Responsibility for Protection of the Mahomet
603 Aquifer

604 DNR water supply planning authority should be added, as should the local siting process in 39.2 of the Act and the
605 definition of pollution control facility, as well as existing programs for disaster/spill responses.]

606 The protection of the quality of the Mahomet Aquifer is the responsibility of everyone, from citizens to cities to
607 counties to state agencies. Illinois EPA, Board, and the AGO have broad powers to protect groundwater under the
608 Illinois Groundwater Protection Act (IGPA) adopted in 1987 and the Illinois Environmental Protection Act (Act).
609 Section 12(a) and (d) of the Act adopted in 1970 and Part 620 (Groundwater Quality Standards Regulation) adopted
610 in 1991.

611

612 Illinois Environmental Protection Act

613

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

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*

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.

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

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644 concentrations brings the related activities within the purview of Section 12(a) depending on site-specific
645 circumstances. Bringing soil with the potential to pollute groundwater in concentrations greater than naturally
646 occurring concentrations to locations for deposit upon the land brings the related activities within the purview of
647 Section 12(d) depending on site-specific circumstances.

648 Illinois Groundwater Protection Act

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

655 Board Regulations

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

663 The effectiveness of Illinois
664 EPA to carry out its
665 responsibility depends on the
666 level of planning and
667 coordination with all the other
668 groups and on how those
669 other groups execute their
670 responsibilities. In addition to
671 the requirement described
672 previously to adopt water
673 quality standards, Section 4 of
674 the IGPA established the
675 Interagency Coordinating
676 Committee on Groundwater
677 (ICCG) and Section 5 of the
678 IGPA established the
679 Groundwater Advisory Council
680 (GAC) in 1987. Further, Section
681 17.2 of the Act establishes
682 regional groundwater
683 protection planning programs,
684 starting in 1991, in areas of the
685 State with the highest
686 potential for groundwater
687 contamination. The job of all
688 these different groups
689 depends on where they fall in
690 the six-stage process of aquifer
691 protection and restoration,

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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.

692 from planning to response, as outlined in the flow chart below. Two common themes throughout the process
 693 include the performance of data collection and scientific studies and the implementation of effective regulatory
 694 tools.

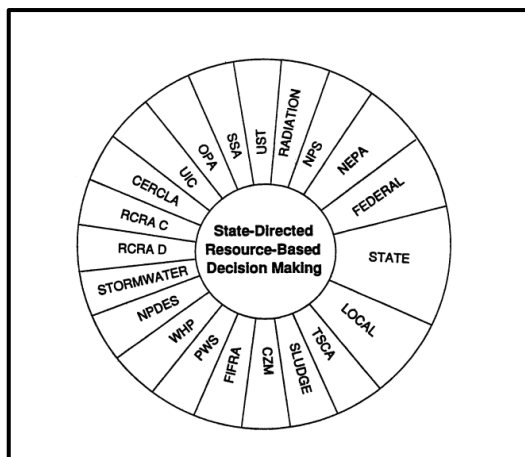


Figure 1. Myriad federal regulations that also protect groundwater

There is also a myriad of additional federal and state regulations ~~also that~~ help to protect and restore groundwater and surface water, as follows:

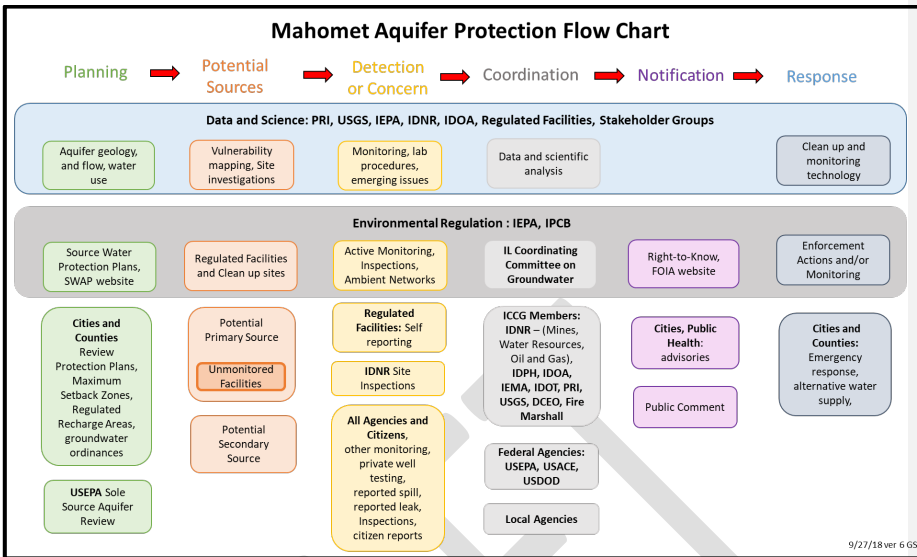
- Resource Conservation and Recovery Act (RCRA);
- Underground Storage Tanks (UST);
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund);
- Federal Insecticide Fungicide and Rodenticide Act (FIFRA);
- Toxic Release Inventory; Underground Injection Control (UIC);
- Safe Drinking Water Act (SDWA);

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- National Pollution Discharge Elimination System (NPDES);
- Wellhead Protection Program (WHPP);
- Section 319 Nonpoint Source Grants; and
- Emergency Planning and Community Right-to-Know Act (EPCRA).

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

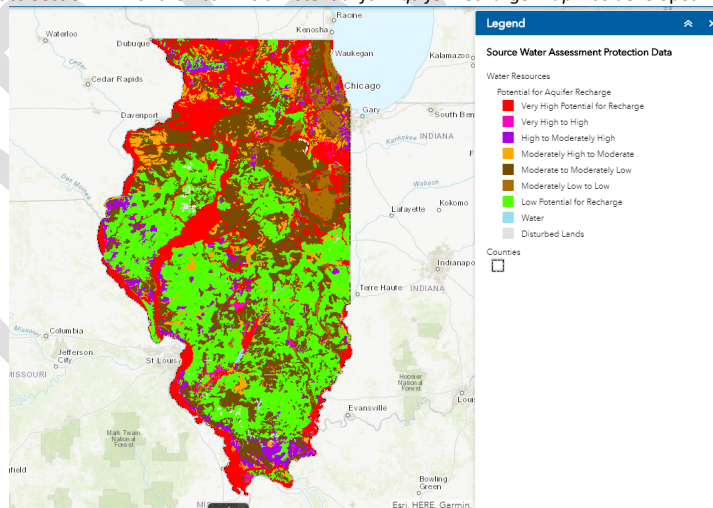
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Protection of Public Water Supplies

Step #1 - Planning: Pursuant to Section 17.2 of the Act Illinois' Potential for Aquifer Recharge Map was developed

by the ISWS and ISGS 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 flow chart above, well site survey reports were developed for every community water supply (CWS) and concurrently these systems were being sampled starting in 1984 for volatile organic compounds, 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.



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

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745 (1) Evaluation of the adequacy of protection afforded to resource groundwater by the minimum setback zone
746 and, if applicable, the maximum setback zone;

747 (2) Delineation, to the extent practicable, of the recharge area outside of any applicable setback zones but
748 contained within any area over which the county or municipality has jurisdiction or control;

749 (3) Identification and location of potential primary and potential secondary sources and potential routes
750 within, and if appropriate, in proximity to the delineated recharge area for each such well;

751 (4) Evaluation of the hazard associated with identified potential primary and potential secondary sources and
752 potential routes contained within the recharge area specified according to subparagraph (a)(2) of this
753 Section, considering the:

- 754 • characteristics of such potential sources and potential routes,
- 755 • the nature and efficacy of containment measures and devices in use,
- 756 • the attenuative qualities of site soils in relation to the substances involved,
- 757 • the proximity of potential sources and potential routes and the nature, rate of flow, direction of flow
758 and proximity of the uppermost geologic formation containing groundwater utilized by the well;

759 (5) Evaluation of the extent to which existing local controls provide, either directly or indirectly, some measure
760 of groundwater protection; and

761 (6) Identification of practicable
762 contingency measures, including
763 provision of alternative drinking
764 water supplies, which could be
765 implemented in the event of
766 contamination of the water supply.

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767 Illinois EPA conducted a pilot
768 groundwater protection needs
769 assessment for the City of Pekin
770 located in the Central
771 Groundwater Protection Planning
772 Region in the Mahomet Aquifer.
773 The Central Regional Committee
774 worked with local stakeholders to
775 develop a local groundwater
776 protection team. This team
777 developed the Pekin Wellhead
778 Protection Overlay Zoning
779 Ordinance.

780 Illinois EPA, ISWS, and ISGS
781 developed a Guidance Document
782 for Groundwater Protection Needs
783 Assessments in 1995 to help
784 provide technical assistance to
785 counties and municipalities in the
786 implementation of Section 17.1 of
787 the Act. Further, the Education
788 Subcommittee of the ICCG worked
789 Department of Urban and Regional

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 Department of Natural Resources (DNR), 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 DNR. 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 information relating to groundwater protection;
- Recommending to the regional protection planning committee.

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.

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790 Planning at the University of Illinois at Urbana-Champaign to develop Groundwater Protection by Local Government
791 in 1993, which is available on the Task Force website.

792 Step #2 - Identifying Potential Contamination Sources: -Identifying potential sources has been done in various
793 phases. Starting in 1984, the first state wide survey VOCs and pesticides in CWS lead to the *Plan for Protecting Illinois*
794 *Groundwater* in 1985 adoption of the IGPA in 1987 which formally codified statutory definitions for potential
795 primary and secondary source of groundwater contamination, and potential routes of groundwater contamination,
796 and led to the adoption of new technology controls (1991) for certain existing and new activities in setback zones
797 and regulated recharge areas.

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

800 Step #3 – Responding to New Threats and Concerns: Many of these potential sources of contamination inventoried
801 have led to expanded setback zones around CWS wells using Part 671. For example, the Pilot Groundwater
802 Protection Needs Assessment conducted for the Pleasant Valley Public Water District identified potential threats
803 that did not have preventive programs. This led to the development of the Pleasant Valley regulated recharge area
804 (Part 617) pursuant to Section 17.3 and 17.4 of the Act. Part 617 codified new potential source definitions based on
805 smaller thresholds of hazardous substances (i.e. potential tertiary source) and developed new prevention-based
806 requirements for the storage and handling of such substances within the delineated recharge area.

807 In addition, the ambient groundwater monitoring network designed to represent the population of CWS wells is
808 used for the outcome metric to measure of groundwater quality on an annual basis. Over the years this led to efforts
809 of evaluating groundwater for new and emerging contaminants, such as: Radon, Herbicide Transformation Products,
810 Chromium 6, and now Per- and Polyfluoroalkyl Substances (PFAS).

811 Step #4 - Coordination: The ICCG (chaired by Illinois EPA) ~~is comprised of~~ all the state agencies or departments that
812 have some authority to regulate groundwater:

- 813 • Illinois Department of Public Health (IDPH);
- 814 • Illinois State Fire Marshall;
- 815 • Office of Mines and Minerals;
- 816 • Office of Water Resources;
- 817 • Illinois Emergency Management Agency (Division of Nuclear Safety);
- 818 • Illinois Department of Transportation;
- 819 • Illinois Department of Agriculture;
- 820 • Illinois Department of Natural Resources (ISWS, ISGS); and
- 821 • Department of Commerce and Economic Opportunity.

822 The ICCG has generally met quarterly since 1988 to:

- 823 (1) Review and coordinate the State's policy on groundwater protection.
- 824 (2) Review and evaluate State laws, regulations and procedures that relate to groundwater protection.
- 825 (3) Review and evaluate the status of the State's efforts to improve the quality of the groundwater and of the
826 State enforcement efforts for protection of the groundwater and make recommendations on improving
827 the State efforts to protect the groundwater.
- 828 (4) Recommend procedures for better coordination among State groundwater programs and with local
829 programs related to groundwater protection.
- 830 (5) Review and recommend procedures to coordinate the State's response to specific incidents of groundwater
831 pollution and coordinate dissemination of information between agencies responsible for the State's
832 response.
- 833 (6) Make recommendations for and prioritize the State's groundwater research needs.
- 834 (7) Review, coordinate and evaluate groundwater data collection and analysis.
- 835 (8) Report biennially to the Governor and the General Assembly on groundwater quality, quantity, and the
836 State's enforcement efforts.

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837 Illinois EPA proposes a groundwater protection regulatory agenda (e.g., Part 611 Subpart C, Part 671, Part 670, Part
838 620 and subsequent amendments, Part 615/616, Part 617, Part 618, proposed Part 841, Part 1010, and proposed
839 Part 620 and new part 408) for consideration by the ICCG and the GAC. The principal purpose of the agenda is to
840 systematically consider the groundwater protection aspects of relevant federal and State regulatory programs and
841 to identify any areas where improvements may be warranted. To the extent feasible, the agenda also serves to
842 facilitate a more uniform and coordinated approach toward protection of groundwaters in Illinois. Upon adoption of
843 the final agenda by the ICCG, the Chairman of the ICCG assigns a lead agency (e.g., IDPH and the Illinois water Well
844 Construction Code, abandonment requirements, monitoring well design, etc.,) and any support agencies to prepare
845 a regulatory assessment report for each item on the agenda. Each regulatory assessment report shall specify the
846 nature of the groundwater protection provisions being implemented and shall evaluate the results achieved
847 therefrom. Special attention shall be given to any preventive measures being utilized for protection of
848 groundwaters. After review and consideration by the Committee, the reports shall become the basis for
849 recommending further legislative or regulatory action.

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

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

859 The GAC is tasked with the following:

- 860 (1) review, evaluate and make recommendations regarding State laws, regulations and procedures that
861 relate to groundwater protection;
862 (2) review, evaluate and make recommendations regarding the State's efforts to implement the IGPA and to
863 generally protect the groundwater of the State;
864 (3) make recommendations relating to the State's needs for groundwater research; and
865 (4) review, evaluate and make recommendations regarding groundwater data collection and analyses.
866

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

868 Step #5 - Notification: Public notification concerning threats of groundwater contamination has evolved over the
869 years like other environmental regulations.

- 870 • **Advisory of Groundwater Contamination Hazard** - A groundwater contamination hazard can be issued by
871 Illinois EPA to a county or municipality which has not prepared a groundwater protection needs assessment
872 where Illinois EPA has conducted a well site survey under Section 17.1(g) of the Act. Such advisories are
873 issued where the Illinois EPA determines that existing potential primary sources, potential secondary
874 sources or potential routes identified in the survey represent a significant hazard to the public health or the
875 environment. The Agency publishes a notice of such advisory in a newspaper of general circulation within
876 the county or municipality and shall furnish a copy of such advisory to any applicable regional planning
877 committee.
- 878 • **Well Centric Right-to-Know Notification (RTK)** – Notification is triggered by detection of volatile organic
879 compounds (VOCs) in a CWS well. An evaluation of the threat to potential nearby potable water supply
880 wells (i.e. private, semi-private wells) ins conducted, and a press release is drafted with IDPH encouraging
881 well owners to sample their wells for VOCs;
- 882 • **Site Centric RTK Notification** – An Illinois EPA Contaminant Evaluation Group (CEG) is convened by the
883 Illinois EPA RTK Coordinator to discuss sites that represent threat to off-site soil and groundwater.
884 Notification of off-site well users and community relations plans are implemented.

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885 • **Community Water Supply Consumers RTK Notification** – If there is a detection of a contaminant with a
886 Class I groundwater quality standard. Every consumer is notified within 5 business days.

887 •
888 **Step #6 - Response:** Responses to violations of the Act and Part 620 can be addressed via the voluntary cleanup
889 program under Part 740. Alternatively, if Illinois EPA issues a violation notice (VN) for exceedance of a groundwater
890 quality standard either we already have a hydrogeologic analysis that would assess causing, threatening, or allowing
891 off-site contamination or we would require such an assessment as part of a groundwater management zone (GMZ)
892 approval under Part 620.

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

896 Groundwater restoration and cleanup is also conducted via RCRA corrective action requirements, under the
897 voluntary site remediation program, Leaking Underground Storage Tank program, or under the federal Superfund
898 program. For further detail, see the Illinois EPA Bureau of Land's website:

899 <https://www2.illinois.gov/epa/topics/waste-management/Pages/default.aspx>.

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903 Emergency Response

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

911 OER responsibilities include:

- 912 • Oil and hazardous material spills in water or on land
- 913 • Releases of harmful quantities of toxic substances into the
- 914 air
- 915 • Emergencies involving wastewater treatment systems and
- 916 public water supplies
- 917 • Emergencies involving solid waste disposal sites
- 918 • Fish kills caused by pollutants
- 919 • Abandoned hazardous waste incidents posing immediate
- 920 hazards
- 921 • Illegal burning of waste

922 Where are EOU personnel?

923 Most of the Emergency Operations Unit personnel are located in the
924 Springfield ILLINOIS EPA Headquarters, but there are additional staff
925 in the Collinsville and DesPlaines Regional Offices.

926 Most EOU staff can be reached at the Agency headquarters in Springfield (217-782-3637). There are also full-time
927 response staff in the Des Plaines (800-759-7626) and Collinsville (618-346-5120) regional offices. During evenings,
928 weekends and holidays, a 24-hour Duty Officer may be reached at 217-782-7860.

In case of an emergency call:

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

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929 What assistance is available?

930 The Emergency Operations Unit provides many services to other Agencies and the public.

931 The Emergency Operation Unit may provide assistance in the form of:

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

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943 What assistance is not provided?

944 The Emergency Operations Unit generally does not lend assistance or assume a backup role in the following
945 situations:

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- 946 • Emergencies involving radioactive materials are handled by the Illinois Emergency Management Agency
- 947 • Emergencies involving disease-contaminated materials are handled by the Illinois Department of Public
- 948 Health
- 949 • Spills at crude oil storage sites are handled by the Division of Mines and Minerals (part of the Illinois Dept.
- 950 of Natural Resources), unless spills enter surface waters
- 951 • Citizens pollution complaints are typically handled by the Illinois EPA Regional Offices and may be placed
- 952 on-line.
- 953 • Workplace chemical exposure is handled by the Illinois Dept. of Labor or the Occupational Safety and
- 954 Health Agency

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955 Regional Water Supply Planning DNR OWR

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

- 958 1. Study and investigate ways and means by which the various water uses may be coordinated to the end
- 959 that the water resources of the State be put to their maximum beneficial use and, in connection therewith,
- 960 to request any department or agency of the State to make surveys, studies, investigations, prepare plans,
- 961 reports, and furnish such data and information as may be necessary.
- 962 2. Coordinate, determine and provide ways and means for the equitable reconciliation and adjustment of
- 963 the various conflicting claims and rights to water by users or uses.
- 964 3. Recommend legislation for the most feasible method or methods of conserving water resources and
- 965 putting them to the maximum possible use, taking into account the problems of navigation, flood control,
- 966 river flow control and stabilization, reclamation, drainage and recapture, and further their utilization of
- 967 water after use for any purpose, domestic and industrial use, irrigation of land, municipal use, development
- 968 of electric energy, public health, recreation, fish and game life, and other beneficial use.
- 969

970 Droughts and reoccurring concerns caused by growing water supply demand and conflicts across the state led to the
971 Illinois Governor's Office issuance of Executive Order 2006-01 which required that the following actions to be
972 executed: Consistent with the authority granted to the Department of Natural Resources under the Rivers, Lakes,
973 and Streams Act, 615 ILCS 5/5 et seq. and the Level of Lake Michigan Act, 615 ILCS 50/1 et seq., the authority of the

974 Department of Natural Resources' Office of Water Resources under 20 ILCS 801/5-5, the Office of Water Resources,
975 in coordination with the State Water Survey, shall:
976 1. Define a comprehensive program for state and regional water supply planning and management and
977 develop a strategic plan for its implementation consistent with existing laws, regulations and property
978 rights;
979 2. Provide for public review of the draft strategic plan for a water supply planning and management
980 program;
981 3. Establish a scientific basis and an administrative framework for implementing state and regional water
982 supply planning and management;
983 4. Develop a package of financial and technical support for, and encouragement of, locally based regional
984 water supply planning committees. These committees, whether existing or new entities, shall be organized
985 for participation in the development and approval of regional plans in the Priority Water Quantity Planning
986 Areas;
987 5. By December 31, 2006, ensure that Regional Water Quantity Plans are in process for at least two Priority
988 Water Quantity Planning Areas. Governor's Executive Order 2006-01: Executive Order for the Development
989 of State and Regional Water-Supply Plans. Issued by Governor's Office on January 9, 2006.

991 A Strategic Plan for Implementation of Statewide Water Supply Planning was developed in 2008 in response to
992 Illinois Executive Order 2006-01. The plan which followed Executive Order 2006-01 has been used to facilitate the
993 development of three regional water supply plans to-date. This document revises that Strategic Plan to create an
994 Action Plan for Statewide Water Supply Planning and was developed by the Department of Natural Resources in
995 consultation with the State Water Survey and affected water supply planners to further define the process for
996 creating a State of Illinois Water Supply Plan with all of the necessary components of regional and state-wide plans.
997 The following recommendations are a result of a review of the State's ongoing long-term program for water supply
998 planning and research; a review of previously prepared planning documents and task force reports listed in the
999 references, and an evaluation of the planning process undertaken in the three completed study areas

1000 <https://www.isws.illinois.edu/illinois-water-supply-planning>

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1002 Appendix C: Process of Identifying Potential Sources of Groundwater
 1003 Contamination and Developing a Regulatory Agenda for Protection with
 1004 the Interagency Coordination Committee on Groundwater and the
 1005 Groundwater Advisory Council

1006 The identification of contamination sources to any aquifer has been a developing scientific and regulatory process
 1007 that is commonly believed to have started in 1854 with the discovery of a cholera outbreak directly tied to a
 1008 contaminated public well in London.

1009 For Illinois, the Illinois EPA has developed a list of potential sources (Table 2) based on experiences of the staff
 1010 involved in cleaning up contamination sites and in the mapping and evaluation of protection zones around public
 1011 water supply wells and intakes and ambient monitoring. -New threats are constantly being evaluated and existing
 1012 potential sources are being reevaluated as technology improves. -The term "threat" is often used in Illinois law and
 1013 regulations when a potential source is an actual source of contamination that is threatening public health or the
 1014 environment.

1015 **Table 2. Most Prevalent Potential Sources of Ground Water Contamination¹ listed in the**
 1016 **Illinois Integrated Water Quality Report (Illinois EPA 2016).**

Contaminant Sources	Occurrence of Potential ²	Contaminants ³
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

¹ The basis for the analysis provided in Table A1 is a combination of existing monitoring data and potential source of groundwater contamination data from the completed CWS well site survey reports which Illinois EPA has conducted over the past 25 years.

² Occurrences are based solely on the Illinois EPA Groundwater Section's existing 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.

³ Contaminants: A. Inorganic pesticides; B. Organic pesticides; C. Halogenated solvents; D. Petroleum compounds; E. Nitrate; F. Fluoride; G. Salinity/brine; H. Metals; I. Radio-nuclides; J. Bacteria; K. Protozoa; L. Viruses; and M. Other.

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

1017
1018 The Illinois EPA divides the potential sources into five broad categories (Table A1) and has mapped them around
1019 community water supply (CWS) wells in Illinois. The most frequently occurring potential sources include storage
1020 tanks, septic systems, industrial facilities, repair facilities, chemical handling facilities, and urban runoff sites. -This list
1021 includes specific sites that are considered “point” potential sources, such as landfills, more wide-spread activities
1022 that are considered to be “non-point”, such as road salt or fertilizer application, and sources that may be one-time
1023 events, such as a highway spill or a pipeline break. -The type of contaminants associated with each potential source
1024 can vary from materials that are considered to be carcinogenic at very low, parts-per-billion concentrations to
1025 naturally-occurring compounds that are harmful in higher, parts-per-million concentrations. -Potential routes of
1026 aquifer contamination which can bypass any naturally-occurring protective layers are also listed in Table A1, such as
1027 drainage wells, abandoned wells, or quarries.

1028 The Act prioritizes potential sources of groundwater contamination as either primary or secondary and generally
1029 apply to facilities that landfill, store, or accumulate wastes or hazardous materials.

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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.”*

Information on most, if not all, of these facilities can be found on Illinois EPA’s website within the Source Water Protection page or the Freedom of Information Act page. Additional on-line information can also be found 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 already in place 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.

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.*

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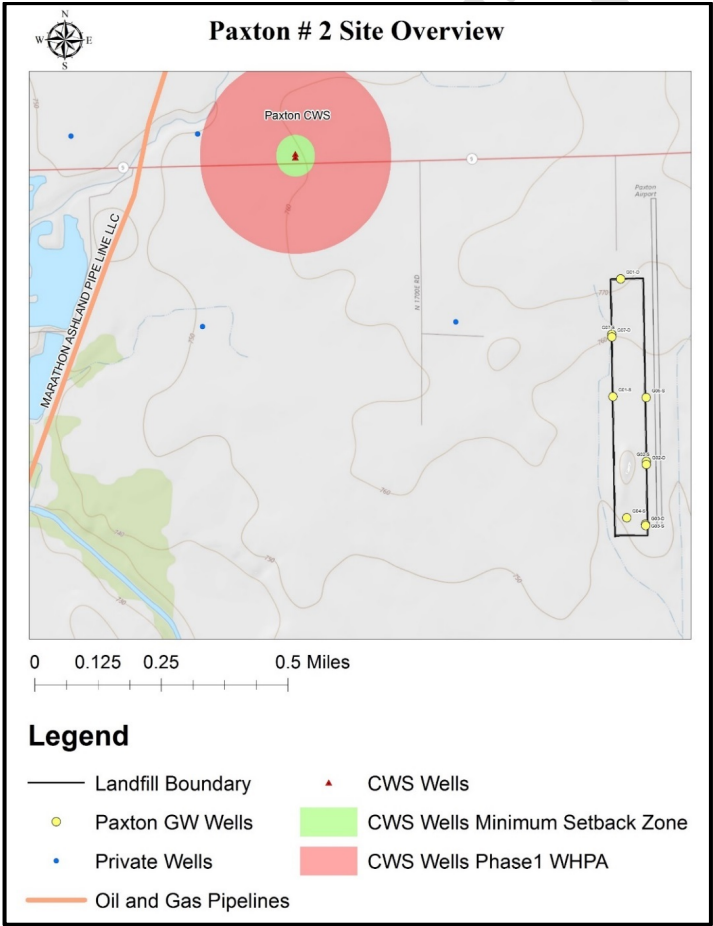
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Appendix D: Summary of 5 Part 807 Landfill Illinois EPA Reviews in Areas with Moderate to High Potential for Aquifer Recharge

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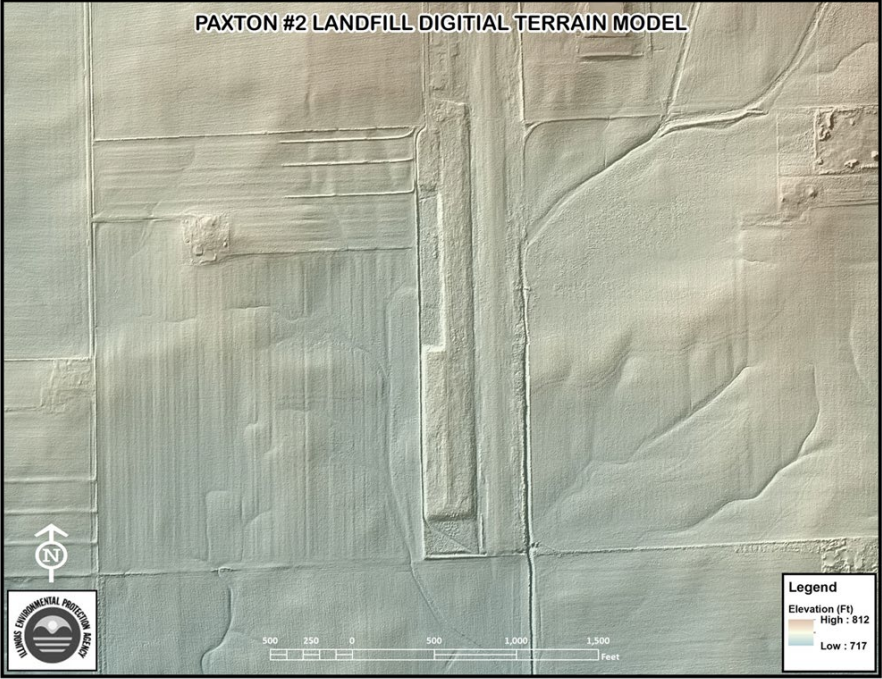
Paxton #2 (Ford County)

- 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 4 consecutive quarters needed to show the landfill is not causing GW contamination.
 3. Submission of new completion certification affidavit.



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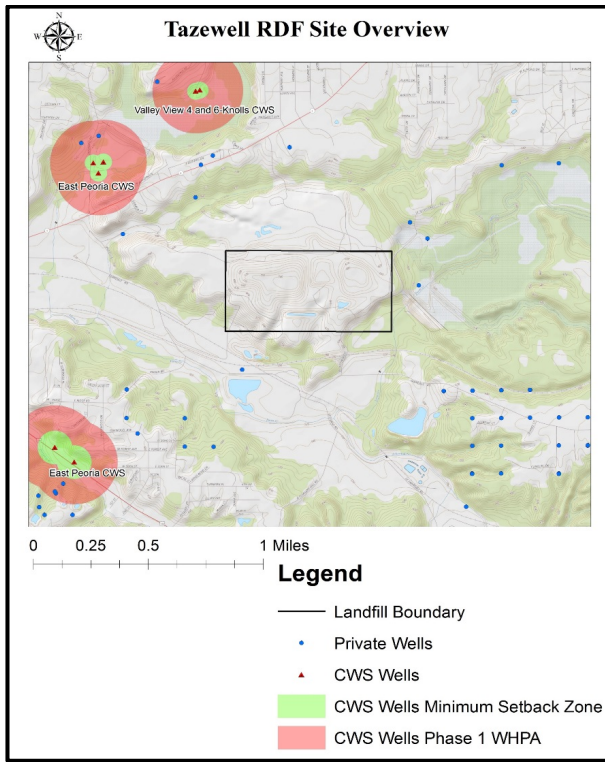
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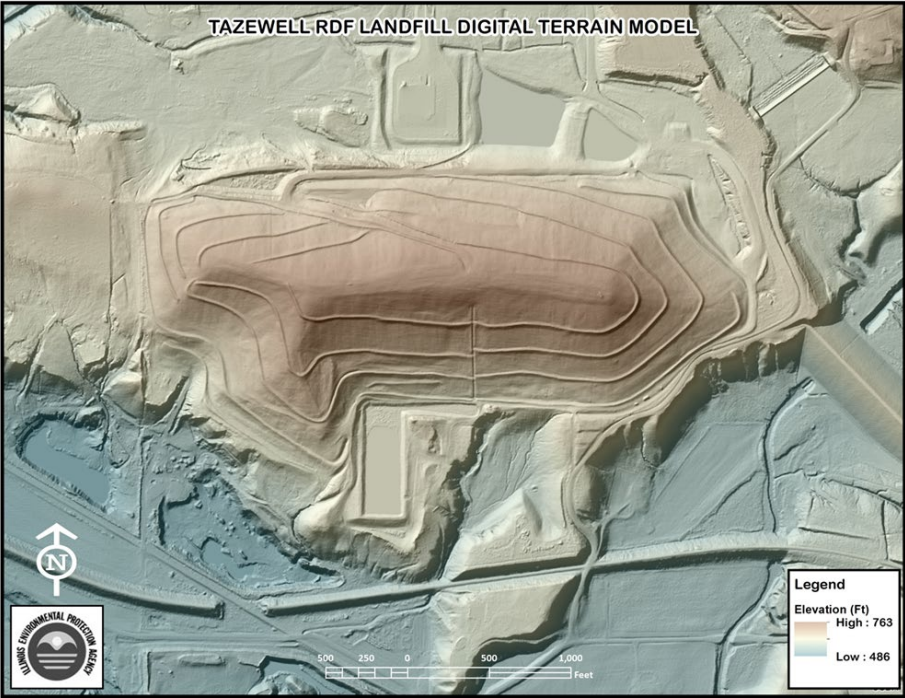
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Tazewell RDF (Tazewell County)

- 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.
- 1. Quarter of 2017 sample shows an observed increase of 3.8 µg/L
- 2. Class 1 GW standard: 5 µg/L
- 3. No drinking water Maximum Contaminant Level violations in Community Water Systems to report.



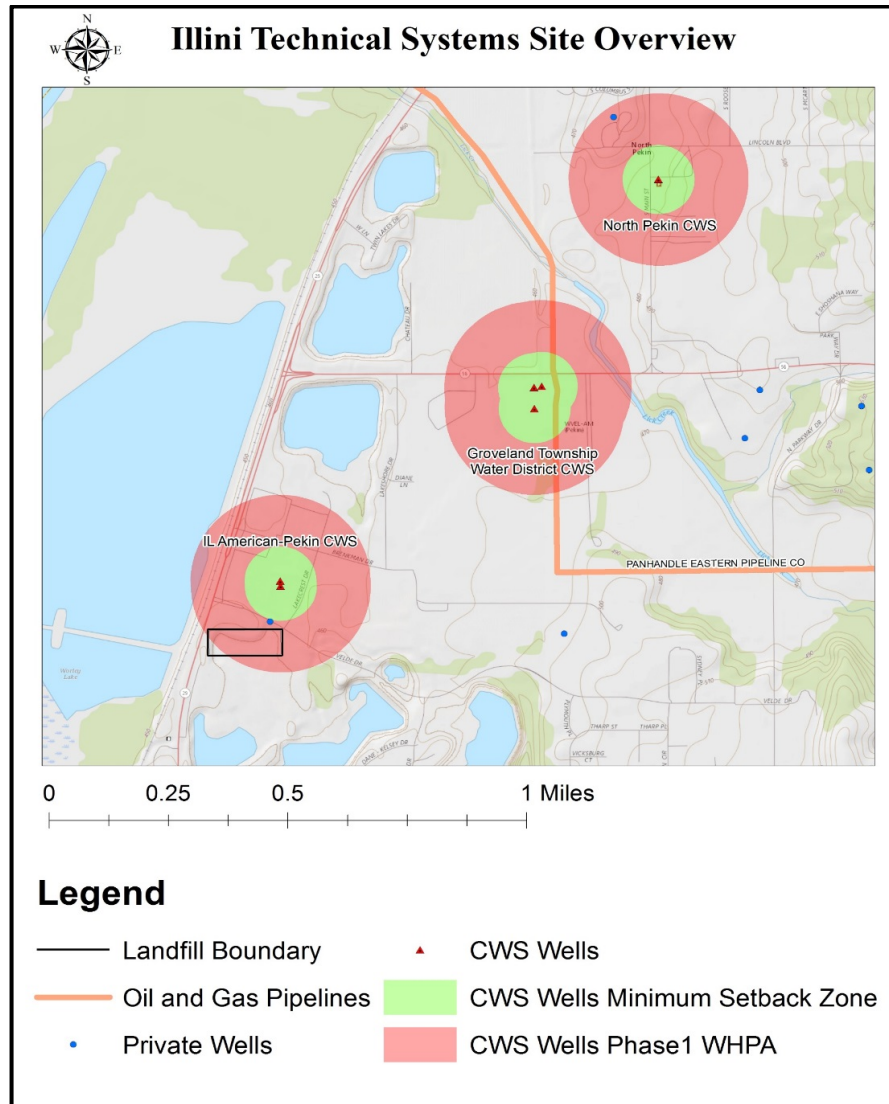
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Illinois Technical Systems (Tazewell County)

- 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.



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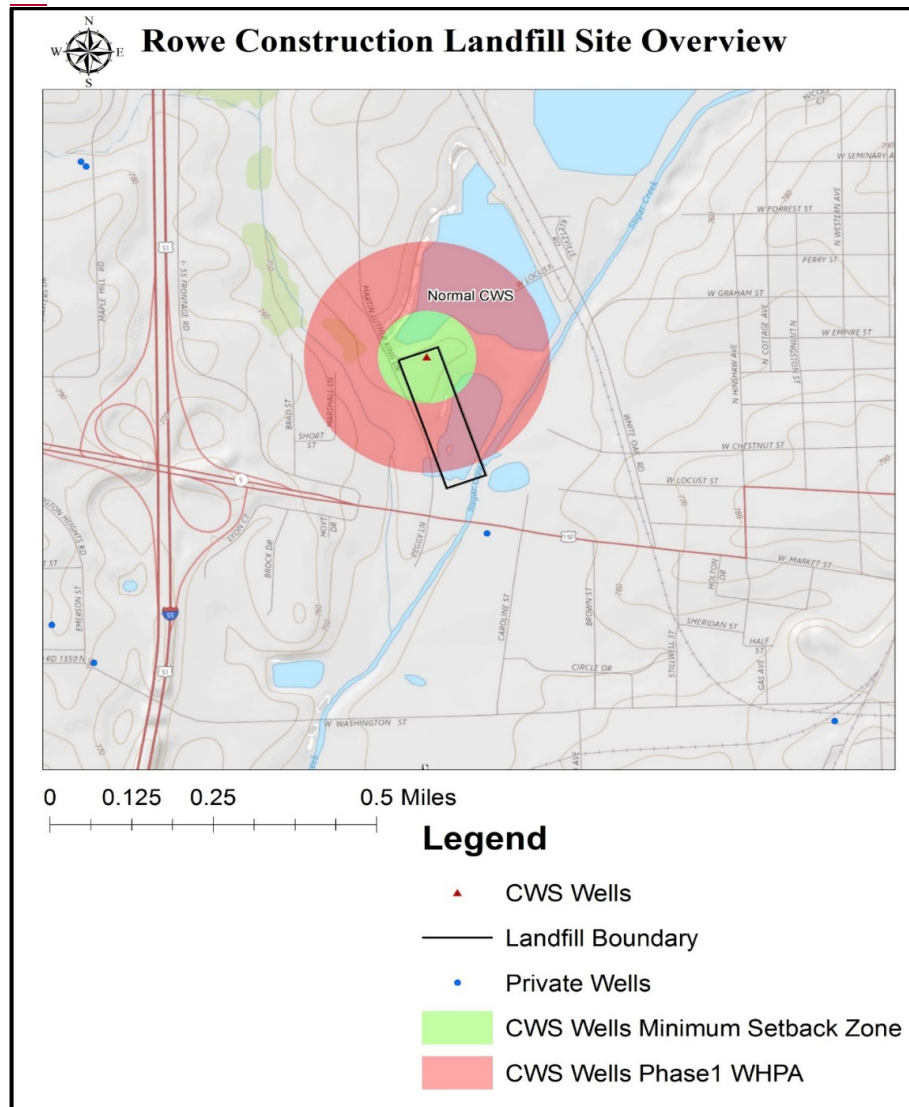


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Rowe Construction Company Landfill (McClean County)

- 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.



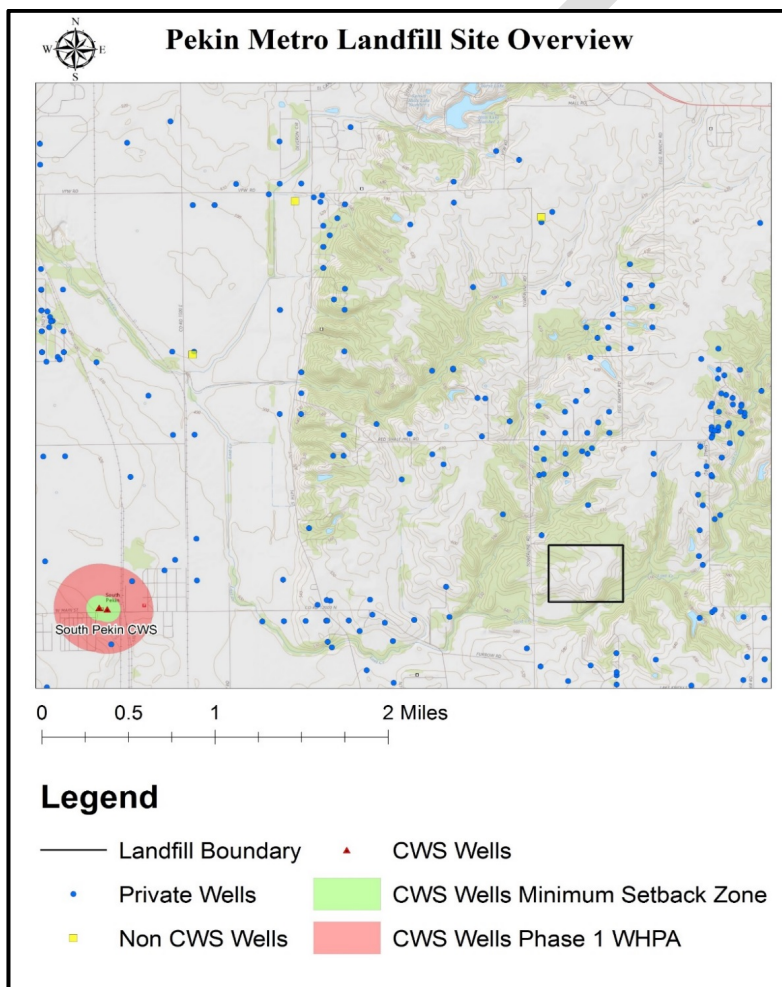
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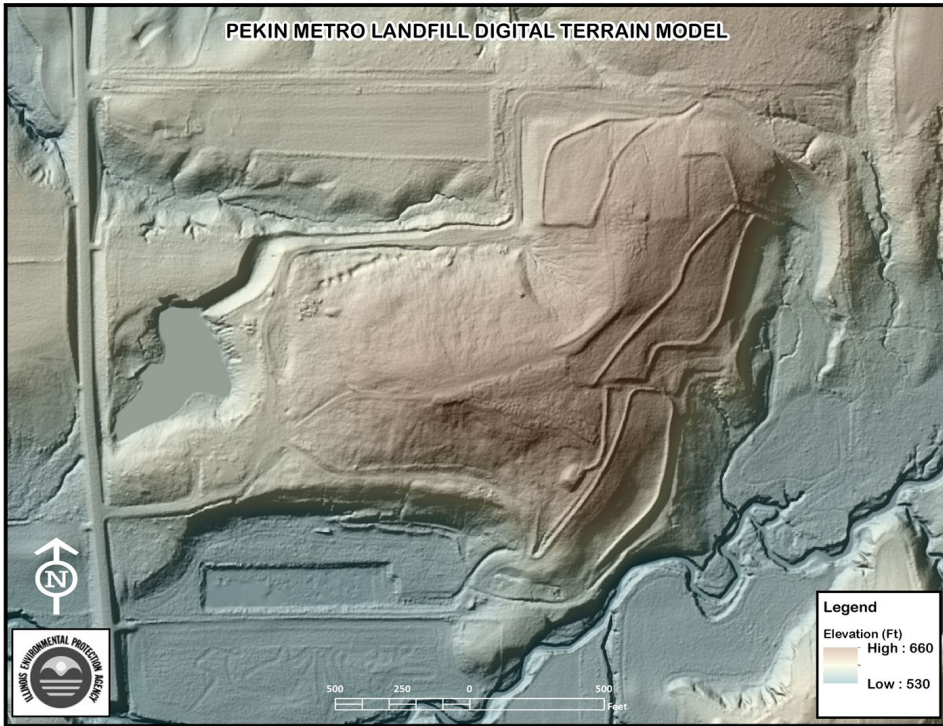
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Pekin Metro Landfill (Tazewell County)

- 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.





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

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Illinois EPA has referred PGL to the AGO. The AGO leads negotiations with defendants (PGL) on behalf of the State. The DNR 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 sampled. 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 January 5, 2018.

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Note: The purpose of detailed hydrogeologic investigation at this point, is to find the remaining free phase gas. The intent is to install relief wells in these areas to remove it from the aquifer. There has been extensive work to delineate the extent of the dissolved phase gas in existing potable water supply wells by Peoples Gas (i.e. 70 wells sampled) and Illinois EPA (29 wells sampled). It is the Agency's belief that the extent of contaminated private wells has been determined.

- December 19, 2016 – Illinois Emergency Management Agency (IEMA) contacted Illinois EPA with National Response Center (NRC) Report. Illinois EPA contacted DNR to ensure they were involved. The event appeared to be under DNR Jurisdiction and they were following up. DNR had an inspector on site.
- June 5, 2017 – Illinois EPA Water Pollution Control (WPC) Permits contacted (via phone) by PGL and Champaign regional Office, indicating the facility operates an underground natural gas storage station and a resident has issued a complaint regarding gas entering their drinking water well. Champaign regional staff indicated that DNR Office of Oil and Gas informed the facility that they would need to bring in a treatment system to separate the gas from the drinking water and burn the gas with a flare and discharge the wastewater to a nearby waterway. Illinois EPA WPC Permits informed PGL that the discharge would require an NPDES permit modification, potentially including an antidegradation assessment for the increased loading. Illinois EPA WPC Permits recommended they haul the pretreated wastewater to a Public Owned Treatment Works (POTW) so a permit could be issued quickly and a response action is not delayed. PGL did not know if the actions were being conducted under CERCLA or if the Illinois EPA Hydrogeology Unit or Bureau of Land had been contacted as the representative was not involved in meetings to determine a plan of action. Illinois EPA WPC Permits indicated they would contact Hydrogeology Unit to see what actions were recommended. Illinois EPA also asked if Illinois EPA should follow-up with another facility representative that was involved in the meetings to determine a plan of action. Contact information for the Plant Manager, John Horde, was provided to Illinois EPA.
- June 5, 2017 – WPC Permits staff emailed Groundwater (Hydrogeology Unit) staff discussing the need for a permit to discharge waste water to a nearby water way. (To permit an industrialized size water separator for potential natural gas relief wells).
- June 7, 2017 - Email from Illinois EPA Headquarters to Champaign regional staff requesting well location information.
- June 7, 2017 - PM Email from Champaign regional staff to Groundwater staff indicating she will contact PGL to get additional location information.
- June 8, 2017 - Email from IDPH FYI To Groundwater staff per Illinois EPA request.
- June 8, 2017 - Illinois EPA management had staff contact DNR. DNR was working with PGL. Sampling, well separators, discussion of relief wells to go along with Agency permit. Appears to be handled by DNR.
- September 08, 2017 - Email from Peoples Gas to Illinois EPA Permits Re: Peoples Gas & Light Manlove Water Separator Tanks - Construction and Operation Permit Application
- September 14, 2017 – Peoples Gas submitted Application for Construction & Operation Permit for Water Separator Well Tanks.
- October 10, 2017 – Illinois EPA WPC Permits issued permit for Construction & Operation of Water Separator Well Tanks.

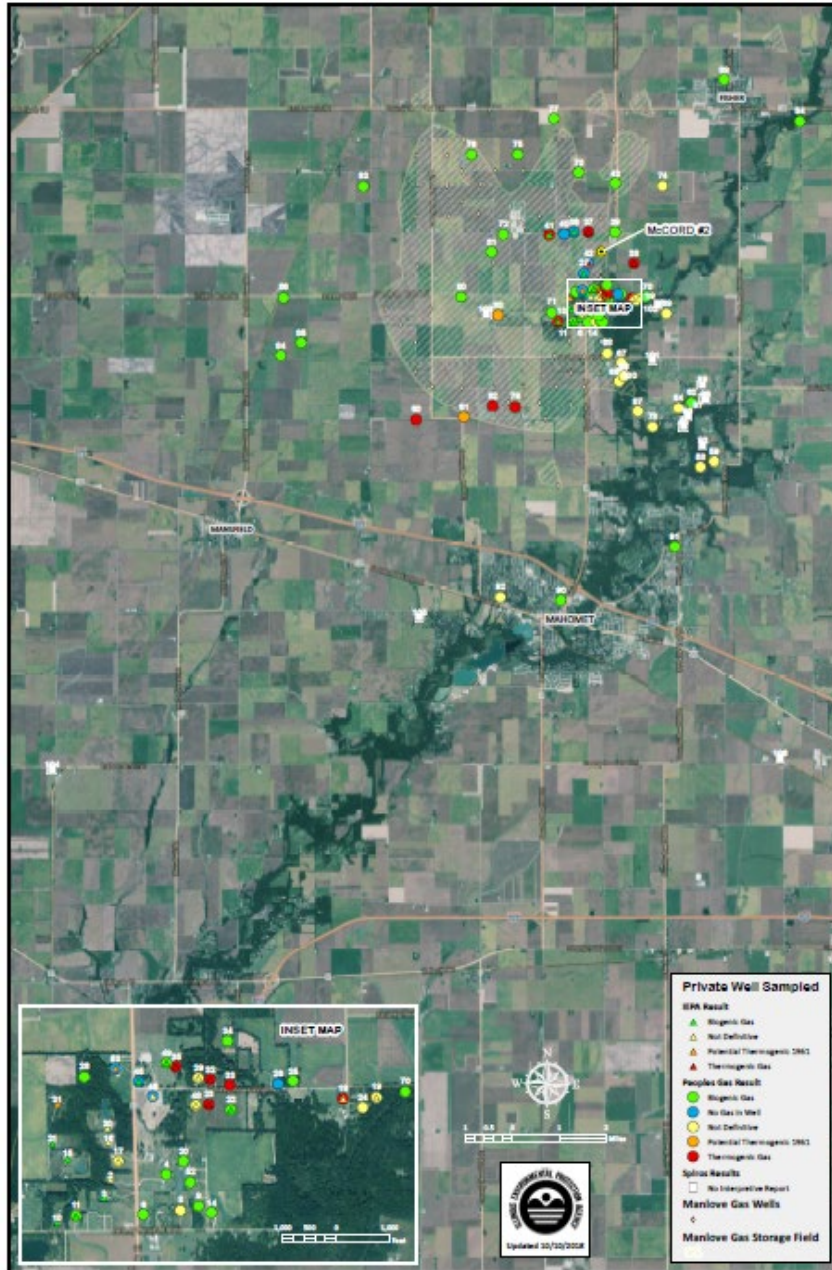
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- 1237 • October 11, 2017 – Illinois EPA Groundwater management asked to research the site for a call back to Senator
- 1238 Rose by end of the day.
- 1239 • October 12, 2017 – Illinois EPA spoke with DNR on the morning of the 12th. Then we had a conference call with
- 1240 Senator Rose at 3 PM that same day.
- 1241 • October 16, 2017 – Illinois EPA Conference call with the AGO.
- 1242 • October 16, 2017 - Started research on a lab that could do the dissolved gas analysis.
- 1243 • October 19, 2017 – Identified labs that could do the dissolved gas work.
- 1244 • October 20, 2017 - Developed a draft plan to independently sample the contaminated private wells with a
- 1245 budget.
- 1246 • October 20, 2017 - A conference call was held with the Director to discuss the preliminary plan and the budget.
- 1247 The plan and budget was approved by the Director.
- 1248 • October 23 – 26, 2017 – Working to get contact information from IDPH, Champaign IDPH, and Champaign
- 1249 County Health Departments for private well owners.
- 1250 • October 23, 2017 – Prepared a contract request form (CRF) for fiscal to justify the sampling and procurement.
- 1251 • October 24, 2017 - Fiscal started working with the lab on establishing a contract.
- 1252 • October 24, 2017 – Worked with Champaign County to obtain their GIS coverage for the County with digital tax
- 1253 parcels.
- 1254 • October 24 - November 2, 2017 – Worked on compiling geologic records, well depth, contact info, GIS maps.
- 1255 • October 26, 2017 - Press release issued on announcing canvassing and well sampling.
- 1256 • October 26, 2017 – Logistics of a Groundwater Section, Community Relations, Public Health and BOL FOS field
- 1257 effort.
- 1258 • October 26, 2017 – Developed door hangers and access agreements for well sampling.
- 1259 • October 30, 2017 – Started sampling.
- 1260 • November 1, 2017 -Continued sampling.
- 1261 • November 1, 2017 – Lab contract finalized.
- 1262 • November 2, 2017 – Continued sampling.
- 1263 • November 8, 2017 – Initial Awareness date for 5 contaminated wells.
- 1264 • November 17, 2017 – Final lab results received from Illinois EPA and Isotech labs.
- 1265 • November 17, 2017 to present – Working on 3-D Geologic Visualization Model.
- 1266 • November 21, 2017 – Checked on the status of Interpretive Results with Isotech (3rd week December).
- 1267 • November 21, 2017 – Memo basis for recommending VN.
- 1268 • November 21, 2017 – Reviewed Draft VN.
- 1269 • November 21, 2017 – Coordinated with IDPH and draft letters for the 5 contaminated wells had been developed
- 1270 and were being reviewed by IDPH.
- 1271 • November 23 and 24, 2017 State office closed for Thanksgiving Holiday.
- 1272 • November 29, 2017 – Coordination with IDPH on sending out letters to 5 homes with confirmed thermogenic
- 1273 gas on an expedited basis.
- 1274 • December 1, 2017 – Illinois EPA issued a Corrected Permit to correct a Special Condition for the Construction &
- 1275 Operation of Water Separator Well Tanks.
- 1276 • December 1, 2017 – Received copies of the Letters IDPH sent out to the 5 impacted private wells.
- 1277 • December 1, 2017 – Planned to send Peoples gas the VN on Tuesday, December 5.
- 1278 • December 4, 2017 - 5 interpretive reports for samples (Site-3, Site-10, Site-11, Site-15, and Site-45) associated
- 1279 with Jobs 36513, and 36514 = All microbial gas. Sent the data to IDPH.
- 1280 • December 5, 2017 – Signed VN for 5 wells impacted by thermogenic gas.
- 1281 • December 12, 2017 – Revised VN sent to correct one address.

- 1282 • December 13, 2017 – Conference call with PGL to discuss waiving the Section 31 process.
- 1283 • January 2, 2017 – Peoples Gas Waiver of Section 31.
- 1284 • January 5, 2018 – Illinois EPA Referred the case to the Illinois AGO.
- 1285 • January 13, 2018 – Conference call with PGLs.
- 1286 • February 14, 2018 – Received PGL Well Sampling data.
- 1287 • March 2, 2018 – Reviewed Peoples Gas private well sampling data, classification of results, maps created, and
- 1288 sent to AGO.
- 1289 • March 14, 2018 – Met with AGO.
- 1290 • April 1, 2018 – Provided reviewed PGL well sampling data to PRI.
- 1291 • April 4, 2018 – Provided AGO with groundwater remedy draft.
- 1292 • April 27, 2018 – Reviewed draft Groundwater Management Zone (GMZ) requirements and provided to the AGO.
- 1293 • May 1, 2018 – Received geologic interpretation from PRI for the McCord #2 Well for 3-D Model.
- 1294 • May 3, 2018 – Review of Spiro’s Law Firm well samples to AGO.
- 1295 • May 7, 2018 – Revising 3-D geologic model using new PRI data for the McCord #2 Well.
- 1296 • June 6, 2018 – Discussion about McCord well perforation with DNR and AGO
- 1297 • June 18, 2018 – Presentation of our investigation and the 3-D Model and Illinois EPA Investigation to the
- 1298 Mahomet Aquifer Task Force
- 1299 • June 28, 2018 – Conference Call with AGO to discuss the interpretation of the Barrowman results and the Spiro’s
- 1300 interpretation.
- 1301 • July 9 – Meeting with AGO and PGL to discuss the GMZ
- 1302 • August 16, 2018 Conference call with AGO and PGL
- 1303 • August 17, 2018 – Provided Comments on draft GMZ and Interim Agreed to Order to AGO
- 1304 • August 29, 2018 Provided comments on 1st Draft Amended Compliant to AGO
- 1305 • October 1, 2018 – Completed review of Spiro’s Results
- 1306 • October 11, 2018 – Completed a map per request of the AGO to include Illinois EPA, Peoples Gas and Spiro’s
- 1307 Results
- 1308 • October 31, 2018 – AGO, Illinois EPA, IDPH, Conference call with Senator Rose to discuss the Spiro’s results and
- 1309 Sangamon County Water Proposal
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McCORD #2 WITH RESULTS FROM PEOPLES GAS SAMPLING EVENTS TO DATE



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Appendix F: Published Stakeholder Recommendations Compiled by PRI

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Appendix G: —MAPTF Recommendation and Ranking

Table 1. Ranking by Subcommittee B of the existing recommendations compiled by the Prairie Research Institute.

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

E. —Appendix H — Draft Budget for Review of Water Quality Data from the Mahomet Aquifer

Task 1 — Review data from landfills and other regulated facilities	Budget
Salary	\$10,167
Fringe (41.98%)	\$4,268
Travel	\$0
Supplies	\$0
Analysis	\$0
Task Subtotal	\$14,435
Facilities & Administration (20%)	\$2,887
Task Total	\$17,322
Task 2 — Review WQ data from public supply, domestic, and observation wells	
Salary	\$10,167
Fringe (41.98%)	\$4,268

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Travel	\$413
Supplies	\$0
Analysis	\$0
Task Subtotal	\$14,847
Facilities & Administration (20%)	\$2,969
Task Total	\$17,817
Task 3.1 – Collection of new samples: Monitoring Wells	
Salary	\$13,125
Fringe (41.98%)	\$5,510
Travel	\$825
Supplies	\$1,800
Analysis	\$27,490
Task Subtotal	\$48,750
Facilities & Administration (20%)	\$9,750
Task Total	\$58,500
Task 3.2 – Collection of new samples: Recharge Zone	
Salary	\$13,125
Fringe (41.98%)	\$5,510
Travel	\$275
Supplies	\$950
Analysis	\$20,500
Task Subtotal	\$40,360
Facilities & Administration (20%)	\$8,072
Task Total	\$48,432
TOTAL ALL TASKS	\$142,069

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