JACKSON
Founded 1829

PLANNING COMMISSION

Wednesday, May 6, 2026 at 6:00 PM

City Hall, 10th Floor Conference Room

AGENDA

1. **CALL TO ORDER.**
2. **ROLL CALL.**
3. **ADOPTION OF AGENDA MAY 6, 2026**
4. **APPROVAL OF MINUTES.**
   A. Minutes of April 1, 2026
5. **PUBLIC COMMENTS AND COMMUNICATIONS (NON-AGENDA ITEMS)**
   (3-Minute Limit)
6. **UNFINISHED BUSINESS.**
   A. Master Plan Update
7. **NEW BUSINESS.**
8. **PLANNER'S COMMENTS.**
   A. AI and Data Centers
9. **COMMISSIONER COMMENTS.**
10. **NEXT MEETING REMINDER JUNE 3, 2026**
11. **ADJOURNMENT.**

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PLANNING COMMISSION
Wednesday, April 1, 2026 at 6:00 PM
City Hall, 2nd Floor Chambers
Minutes

1. Call to Order
    a. Vice Chair Chelsea Poole called the meeting to order at 6:08 PM

2. Roll Call:
    a. Members Present: Conner Wood (Councilmember), David Hammontree (Secretary), Daniel Mahoney (Mayor), Chelsea Poole (Vice Chair), and Clyde Mauldin (Zoning Board of Appeals)
    b. Members Excused: Johnathan Greene (City Manager), James Johnson (Chair)
    c. Staff Present: John O'Connor (Planning Director / Zoning Administrator)

3. Adoption of Agenda
    a. Commissioner Hammontree moved to approve the agenda as presented. Support by Commissioner Wood. Motion passed by voice vote (5–0).

4. Approval of Previous Minutes
    a. February 5, 2026, Planning Commission Meeting Minutes. Commissioner Wood moved to approve the February 5, 2026, meeting minutes as presented. Support by Commissioner Mahoney. Motion passed by voice vote (5–0).

5. Public Comment and Correspondence
    a. No public comment or correspondence was received.

6. Consideration of Application
    a. Request for Conditional Use (Home Occupation) at 1500 S. Jackson Street. Parcel No. 4-148300000. Applicant: Sharon Curry. Proposed Use: Cottage Food Business ("Beloved Sweets & Treats, LLC")
        i. Sharon Curry presented her request to operate a small, home-based cottage food business from her residence. She described the business as limited in scale, conducted using standard residential kitchen equipment, and compliant with Michigan Cottage Food Law requirements. She stated there would be no employees, no retail storefront, no signage, and no structural alterations to the home. Production would occur during daytime hours, with sales primarily occurring at farmers markets, craft events, and through online pre-orders, with limited and scheduled on-site pickup.

Ms. Curry confirmed she completed Michigan State University Extension cottage food training and emphasized her intent to operate responsibly and remain respectful of the surrounding residential neighborhood.

Commissioners asked clarifying questions regarding sales methods, pickup procedures, and recent changes to the Cottage Food Law, including expanded online sales allowances and increased annual sales thresholds.

ii. Staff Report: Planning Director O'Connor reviewed the staff report, noting that the request met all zoning and home occupation requirements. The applicant was well below allowed square footage limits, had sufficient off-street parking, and no additional conditions beyond those stated in the application were recommended. Staff recommended approval.
    1. Commissioner Wood moved to enter the staff report into the record.
       Support by Mauldin. The motion carried by voice vote. (5-0).

iii. Action: Commissioner Wood moved to approve the conditional use request as presented.
Support by Commissioner Mauldin.
    1. A roll call vote was conducted: Wood – Yes; Hammontree – Yes; Mahoney – Yes; Poole – Abstain; Mauldin – Yes. Motion approved (4-0-1).

iv. Director O'Connor noted that a conditional use permit letter would be issued to the applicant within approximately four to five business days.

7. Unfinished Business
    a. Comprehensive (Master) Plan Update
        i. Planning Director O'Connor provided a detailed update on the Master Plan process. He discussed:

- Ongoing recruitment for the steering committee, with underrepresentation noted in the 16–24 and 65+ age groups, as well as among residents with a high school education or equivalent.
- Outreach efforts through local schools, the Youth Council, senior groups, community organizations, and potential media engagement.
- Challenges posed by digital-only applications and discussion of potential strategies to reduce barriers while maintaining anonymity in the selection process.
- Coordination with the consultant, Planning Next, including branding development, demographic targets, and meeting logistics.
- Preliminary planning for site tours, department head engagement, and public participation sessions.

- The importance of producing a future master plan that is implementation-focused, measurable, and respectful in its characterization of neighborhoods.

ii. Commissioner discussion included accessibility concerns, meeting times, demographic representation, and long-term planning structure, with general support expressed for the direction of the process.

8. New Business
    a. No formal new business items were brought forward. Discussion occurred regarding pending state zoning legislation, accessory dwelling units, and implications for local zoning authority.

9. Planner's Comments
    a. Director O'Connor discussed planning and zoning training opportunities, including Citizen Planner and MAP (Michigan Association of Planners) zoning training, and the value of future training for Planning Commission and Zoning Board of Appeals members.

10. Commissioner Comments
    a. Commissioner comments included affirmation of the meeting discussion, clarification regarding abstentions earlier in the meeting due to late arrival, and appreciation for staff and vice chair facilitation.

11. Next Meeting Reminder
    a. Vice Chair Poole reminded members that the next regular Planning Commission meeting is scheduled for May 6, 2026.
12. Adjournment: Commissioner Wood moved to adjourn the meeting. Motion approved by voice vote. Vice Chair Poole adjourned the meeting at 7:00 PM.

Data Center Development Information

March 2026

This information is designed to assist Jackson County township officials in drafting zoning ordinances for large resource dependent industries such as a data center development, highlighting the pros, cons, and regulatory strategies.

"If the standards are connected to public health safety and welfare concerns, and also are tied to adopted goals in an up-to-date local master plan, and can be proven to be so, then the regulations are more likely to be deemed reasonable and can be enforced." -Harmony Fierke-Gmazel, MSE Extention Citizen Planner Training.

Data Centers in Southern Michigan: Overview

Data centers are specialized facilities housing computer systems for data storage and processing, driven by Artificial Intelligence (AI) demand. They require large amounts of land (often hundreds of acres), significant electricity, and water for cooling that may create adverse resource, health and living standard impacts in a region. *Michigan has 70 existing data centers of various sizes and many serve as accessory needs to business.*

Traditionally, data centers have been built as standalone industrial. As a result, both developers and communities have treated data centers like warehouses—routine projects that produce a surge in short-term construction jobs followed by a steady stream of tax revenue (unless reduced by state tax exemptions and/or local tax abatements) without offering many direct contributions to or interactions with the local economy. In that sense, an out-of-sight, out-of-mind approach has been the preferred state for data center management throughout the country.

Accordingly, the facilities have required major upfront infrastructure investments—including in large tracts of land, expensive server hardware, and reliable utility-scale power—while generating relatively few local benefits. *Some industries put profits over sustainable environment but a community's future is bound by clean water and air.*

AI-era scaling and competition for mega-sites/hyper-scale, grid access, and permits are giving regions new leverage. Early examples suggest that negotiated data center co-investments can anchor regional tech ecosystems. Regions should ask for this.

Townships that want these developments should treat data center negotiations not as isolated real estate transactions but as ecosystem-shaping moments that trade infrastructure access for commitments to advance local innovation, talent, and industry strengths.

Target Areas: Rural, undeveloped land with access to high-tension power lines (DTE/Consumers Energy) and fiber connectivity. *Example in Michigan: A "Stargate" project in Saline Township shows these can be massive ($7 billion, 575 acres).*

Potential Pros (Benefits)

- Significant Tax Revenue: Data centers are high-value properties that can contribute to school, county, and township budgets, potentially lowering the tax burden on residents through a community benefits agreement.
- Infrastructure Upgrades: Large projects often require developers to fund improvements to modernize the power grid, which may benefit surrounding areas.
- Construction Jobs: A single, large "hyperscale" project can generate roughly 1,200 construction jobs over a two-year period.
- No Burden on Schools: Unlike residential development, data centers do not increase demand on local schools, roads, or emergency services.

Potential Cons (Risks)

- Extensive Utility Load: A single data center can consume as much electricity as 2,000 homes. Cost of transmission upgrades may eventually be passed to ratepayers.
- Waste Heat Management: How will the facility manage or dissipate thermal heat *(typical 95 º to 122 º , containing slats, anti-corrosive chemicals, harming aquatic life*) output to prevent localized "heat island" effects. Discharges of heated wastewater into local streams and sewers systems is part of the cooling process.
- Water Consumption: Data centers use millions of gallons of water for cooling, which can compete with existing industries, and residential use, heavily straining local water tables *(can have 30' to 40' depletion*), wells, reducing groundwater recharge, and lowering aquifers. High-capacity (*100,000 or more gal./day*) groundwater withdrawals without recharge can pull contaminates towards wells, risk upward migration of saline water into fresh water zones, and permanently lower water tables in the Jackson County Saginaw Formation Aquifer (north of I-94), and Marshall Formations Aquifer (south of I-94). Hydrogeologic studies should assess cumulative impacts across the entire watershed. Reference: Groundwater over-withdrawals in Saginaw Formation Walther Farms, Lakeside Twp. Clio, and Marshall Formation in Ottawa County.
  See: Bridge Michigan 10-21-2013 article; Water, Water Everywhere But is it Enough.
- Noise (sound engineering study), and Air Quality: Cooling equipment runs 24/7, creating constant noise, hum, industrial buzz (*exceeding 90 decibels*), and vibration. Multiple backup diesel generators or gas turbines can produce dangerous pollution effecting health issues.

- Low Employment (Long-term): Data centers are automated and typically employ few people once operational (often <100).
- Visual Impact: Large, 100-foot-tall buildings can alter the rural character of a township.

Recommended Zoning Ordinance Strategies for Townships

Townships are advised to act proactively to manage development before it arrives.

Restrict to Specific Zones: Permit data centers only in specialized industrial, technology campus, or commercial (light industry) zones rather than agricultural or residential areas.
Prioritize “brownfield” locations that offer existing high-capacity power and fiber infrastructure, can accelerate deployment times, reusing developed land, limits urban sprawl, reduces construction waste, and offers Tax Increment Financing (TIF) that can offset costs.

Special Use, or Conditional Use Permits: Require a special use or conditional use permit for all data center projects to allow for specific scrutiny of site plans, environmental impacts, and infrastructure upgrades. Community Benefits Agreement should be considered.

Setbacks and Buffers: Require large setbacks (e.g., 300 feet is considered reasonable, a 1000 ft. setback may be considered exclusionary unless supported by data) from all non-participating residential properties, sensitive areas (e.g. parks, schools, churches, care homes), and riparian areas (e.g. wetlands, streams, headwaters (*located in Liberty & Somerset Townships*), lakes).

Environmental and Utility Studies: Mandate third party hydrogeologic, supply yield and feasibility studies where applicants provide impact assessments on water usage (specifically, reducing reliance on local wells). Aquifer Evaluations must determine if existing infrastructure can support new high-capacity users alongside agricultural irrigation needs without causing shortages.
Data Disclosure & Tracking: There is a critical need to track and publicly disclose water use by data centers to make informed planning decisions.
Regulatory Needs: Michigan is considering stricter regulations, including potential bans on high-volume, consumptive water use (water that is lost and not returned).

Sound limit studies: Facilities should require robust landscaping, sound proofing materials, and setback placement to reduce noise, hum, industrial buzz, and vibration mitigating impacts. (*Prince William County, Virginia increased setbacks to 700ft from homes*).

Electricity consumption and upgrading infrastructure should abate local rate hikes.
Growing concern of Shadow Grid (private off-grid systems & substations): Data centers, including those with heavy power infrastructure ("shadow grids" or backup systems), generate significant, continuous noise (55–85+ dB), often described as a low-frequency hum, drone, or

buzz from cooling systems. These 24/7 sounds are frequently deemed excessive by nearby residents, particularly in rural areas, leading to sleep disruption and stress. Some data centers are attempting to bypass the public grid entirely by building their own on-site power plants (often using "noisy" or unproven generators), raising concerns about safety, maintenance, and further localized pollution. *Example: Colossus-2 AI data center in Southaven, Mississippi has 27 gas turbines providing off-grid power and negative impacts.*

Emergency Response Plan: Coordination with local Fire and EMS departments regarding specialized training for electrical fires or chemical spills (refrigerants, lithium-ion battery electrolytes, diesel fuel, ethylenglycol, battery acid.

Aesthetic Controls: Require designs that blend with the rural character, such as screening, landscaping, and height limitations. Require energy saving construction design/materials. *(LEED quality)*

Exterior Lighting/Photometric Plan ensuring all exterior lighting (including security lighting) is shielded preventing glare, and downward focus, does not trespass (0 foot-candles) at the property-line, and LED low Kelvin temperatures to preserve dark skies friendly in rural areas.

Security fencing, security specification plan for fencing that does not interfere with wildlife corridors.

Decommissioning Plan: Mandate a bonding plan to remove the facility and restore the land if the operator abandons it. Plan for recycling E-waste and chemical pollutants.

Limit Size: Consider limiting total square footage (e.g., 750,000 sq ft) to prevent overly large campuses in rural or underserved areas, and manage financial risks if a single company departs.

Reference the Master Plan Economic Growth and Goals. Do Data Centers align with them? While Data Centers share some characteristics with industrial facilities (large sites, high power needs) their unique high-intensity impacts on infrastructure, immense, consistent & redundant power & cooling, low employment, and noise attenuation, makes them distinct from traditional industrial development.

Key Legal Considerations:

- No Absolute Bans: Michigan law prohibits "exclusionary zoning." A township cannot totally ban data centers, but it can place reasonable, rigorous conditions on their operation. Local government must balance a company's "need" to operate and "serious consequences" of that industry on the community. Attorneys advising townships on data center ordinances must balance the legal obligation to allow new technology development with the responsibility to protect local residents from high-intensity industrial impacts.

- State Tax Exemptions: While the state has passed tax incentives, they are not guaranteed. Local governments can negotiate for more favorable terms, though they are often preempted by state-level decisions. Avoid tax abatements. Strains of infrastructure may result in losses to local governments.
- Rate Payer Protection: The Michigan Public Service Commission ensures that data centers do not cause rate hikes for residential customers, though the "details" of these agreements are often debated.

Defendable Ordinances

A defendable data center ordinance in Michigan must balance the prevention of community disruption with the prohibition against exclusionary zoning, as outlined in the Michigan Zoning Enabling Act. To survive court challenges, the ordinance should not outright ban data centers but rather restrict them to appropriate zones through specific performance standards, such as rigorous noise limits, setbacks, and infrastructure impact assessments. Zoning is a legislative act, and decision are presumptively valid or reasonable.
Challengers must show that there is no reasonable government interest (public health, safety, & welfare) advanced by the zoning ordinance. Actkinson-Hoyt v. Superior Charter Township 4-8-2025 case # 369764.

Exclusionary Zoning & Demonstrating Local Need
Based on recent legal disputes and expert analyses (particularly in Michigan and Pennsylvania), here are the key strengths and weaknesses highlighted by legal counsel.
Strengths (Protective & Validating Measures)

A "strong" ordinance is one that is defensible in court while protecting community character.

- Specific Performance Standards: Rather than banning, a strong ordinance regulates noise, lighting, building height, traffic, and natural resource impacts, which can make a location unattractive to developers without triggering legal challenges.
- Environmental & Resource Controls: Regulations addressing water usage, cooling systems, and diesel generator exhaust are considered strong protections.
- Decommissioning Bonds: Including requirements for a bond to cover the cost of tearing down the facility and restoring the land if it is abandoned is a key strength.
- Proactive Zoning Updates: Updating the master plan and zoning code to specifically address data centers before a proposal arrives prevents "spot zoning" claims and ensures the municipality is prepared.

Clear Setbacks: Establishing significant buffer zones between data centers and residential areas, including using these for public green spaces, is a legally sound, protective measure.

Weaknesses (Legal Risks & Vulnerabilities)

Weaknesses often lead to litigation, particularly claims of "exclusionary zoning" or "spot zoning."

- "Blanket" Prohibition: Attorneys warn that outright banning data centers is unlikely to be upheld by a court, as state laws often prohibit excluding uses for which there is a demonstrated need.
- Vague or Missing Standards: A major weakness is having no specific regulations for data centers, leaving the township to rely on outdated, inapplicable industrial codes.
- Improper Procedure: Failure to follow proper public notice requirements, or not having the planning commission review the ordinance, can lead to the entire ordinance being declared void.
- Exclusionary Zoning: If a township fails to zone any land for industrial/research purposes, or makes regulations so burdensome that no data center can ever be built, the ordinance is vulnerable to legal challenges.
- Ignoring Infrastructure Impact: Failing to account for the massive energy and water needs of modern AI data centers can leave the community vulnerable.

Common Legal Challenges and Defenses

The "Spot Zoning" Risk: Rezoning a small parcel in a rural area for a massive data center can be challenged as invalid spot zoning.

- Evidence-Based Decisions: When denying a project, township boards must have a solid record of evidence (e.g., studies on noise or traffic). "Feelings" or mere opposition from residents are not sufficient for a defensible denial.
- Moratoriums as a Tool: While not a permanent solution, a temporary moratorium is often recommended to allow the town time to study the impact and draft a robust ordinance.
- In summary, attorneys advise that the best defense for a township is a well-researched, technically specific ordinance that regulates, rather than bans, the technology, ensuring it conforms to a comprehensive master plan.

Risks and Pitfalls that data center developers make:

- Relying solely on a zoning officer’s letter without proper vesting or notice, which creates appeal exposure.
- Assuming later phases are protected under an initial approval.
- Using low-cost zoning or land use reports that may be incomplete or inaccurate.
- Failing to maintain complete documentation of filings, postings, and agency correspondence to prove compliance, if challenged.

Attorney Opinions:

“Local government can set standards that protect public health, safety, and general welfare, while potentially making the community unappealing to developers e.g. noise limits, building height limit, glare from night light. But at the same time making sure they don’t cross into “exclusionary zoning”. Mika Meyers, municipal attorneys”

“It’s not clear whether data centers fall into that category of “demonstrated need”. Foster Swift Collins, municipal attorneys.”

Key Context: The “Local Need” Requirement:

Under many state laws, such as Michigan’s Zoning Enabling Act, if a township restricts a land use, the proponent must often demonstrate that the project fulfills a demonstrated need for the community or the surrounding area. If a developer cannot show that a project (like a large-scale warehouse) is actually needed locally, the municipality has a stronger legal basis for denying the site plan.

Demonstrated Need via Digital Demand: Developers often frame data centers as essential, modern, “critical infrastructure” needed for AI, cloud computing, ASIC crypto-mining, cloud gaming, gambling platforms, and economic development, arguing this demand exists locally.

Proving “Reasonable Use”: Developers may argue that their project is a reasonable use of land, especially when it is located in, or near industrial corridors, as seen in disputes where developers challenge zoning boards, claiming they are simply excluding the project for reasons other than safety or welfare.

Non-Disclosure Agreements (**NDA):**
Townships face significant legal and ethical trepidation when signing non-disclosure agreements (NDAs) with data centers. While NDAs are legally binding civil contracts used to protect proprietary information during negotiations, they may conflict with statutory duties regarding public access to records, zoning, and transparency, especially when public infrastructure or tax incentives are involved.

MODEL ORDINANCE OUTLINE

This model data center ordinance is designed for township, city, or village seeking to regulate the rapid influx of high-energy data center developments while adhering to state laws regarding non-exclusionary zoning. It incorporates standards based on recent Michigan, Georgia, and Pennsylvania regulations, focusing on environmental impact, noise, and community protection.
Data Center Special or Constitutional Land Use Ordinance

Section 1: **Intent and Purpose**

The purpose of this ordinance is to regulate the establishment of data centers to ensure they are compatible with surrounding land uses, protect natural resources, minimize noise and visual blight, and ensure that infrastructure demands do not disproportionately burden local taxpayers or the community environment.

Section 2: Definitions and Breakdown of the primary categories:

Enterprise Data Centers: Built and used by a single organization for its own specific needs, offering high control and security, often for sensitive data or compliance.
Colocation Data Centers: A third-party facility that rents out space, power, cooling, and connectivity to multiple companies (tenants) to house their own servers and IT gear.
Cloud/Hyperscale Data Centers: Extremely large facilities run by major providers (like Google, Amazon, Microsoft) that power public cloud services, offering massive scale and resources to many users.
Edge Data Centers: Smaller, strategically located data centers positioned closer to end-users to reduce latency for real-time applications like AI, AR, and content delivery.
Other Key Types:
Managed Services Data Centers: A hybrid where a third-party provider manages the infrastructure for a business, blending aspects of colocation and cloud.
Modular Data Centers: Self-contained, portable units designed for rapid deployment, temporary needs in remote areas.
Data Center: A facility utilized for the storage, management, and processing of data, typically comprising multiple large buildings (over 100,000 sq. ft.) with significant electrical, cooling, and water infrastructure needs. *Visualizing square footage: MACI 475,000 sq. ft. on 104 acres; TAC 249,000 sq. ft. on 181acres Technology Park; Gerdau 12,000 sq. ft. building & 117,000 sq. ft. processing on 625 acres; Jackson High School 425,000 sq. ft. on 24 acres.*

Section 3: **Zoning District Restrictions**

Data centers are permitted only as a Special Land Use, or Conditional Land Use in areas zoned Heavy Industrial/Industrial Revitalization Districts/ Commercial-3 light industry.

Data centers shall not be permitted on land zoned for agricultural or residential use, except upon rezoning and with strict adherence to performance standards.

Reference: All applicable Federal, State, and County required permits.

Section 4: Performance Standards & Requirements

Applicants must submit a detailed site plan demonstrating compliance with the following:

(a) Noise Mitigation: A noise study up to 2.5 miles radius (immediate zone of impact 3,000'), must be submitted showing that operational equipment (HVAC, backup generators) will not exceed 55 decibels and vibration (or 5 dBA and 5 dBC above the average baseline ambient sound and vibration) at the property line. Mitigation strategies such as acoustic walls, sound-dampening enclosures, site-specific (can be increased) (____) feet setbacks, and landscaping buffers are required. Buffers can be increased adjacent to residential districts, depending on site's natural features and topography.

(b) Water Usage and Protection:

Plans for cooling systems must maximize efficiency, prioritizing closed-loop systems.

A hydrogeological study shall be required to determine large withdrawal impacts on local aquifers (consideration of Saginaw Formation Aquifer and/or Marshall Formation Aquifer impacts), and neighboring wells within one-mile of site. A sustainable water use plan shall be required with annual monitoring reports, and private wells protection within (_____) feet of data center. Municipal water availability may be required and/or extended will upgrades at developer's expense, rather than burdening local ratepayers.

An ordinance aims to protect the township's water resources from high-capacity industrial water withdrawals including data centers through Special Use Permit or Conditional Use Permits, applicant-funded hydrogeological monitoring within a Zone of Influence (1-5 miles), and mandatory mitigation of Adverse Resource Impacts on residential wells, a detailed survey of all existing public and private wells within the proposed Zone of Influence supported by financial security and penalties. Key components include requiring a Water Impact Study and Management Plan, mandatory baseline and continuous independent monitoring, and operator liability for well failure mitigation, including temporary water supply and permanent well repair or replacement. Well logs (e.g., in Leoni Township, Jackson County) have identified the Saginaw Sandstone at varying depths.
Groundwater Levels: Studies have shown that historical pumping has caused significant drawdown in the Saginaw formation in surrounding areas, which the MODFLOW simulations aim to predict and manage. Source: USGS Publications Warehouse (.gov)

Prohibited activities include once-through cooling and untreated, high-temperature discharges.

Data center water usage differs from agriculture primarily in its high consumptive rate via evaporation, where roughly 80% or more of withdrawn water is released into the atmosphere as vapor rather than being returned directly to local aquifers or surface water sources. While agriculture also consumes water, data centers differ in that they often use high-quality potable water for cooling in areas of high-water stress, and the evaporated water does not immediately replenish the local watershed.

(c) Visual Impact and Landscaping:

Maximum building height must not exceed local industrial standards.

Significant, mature tree buffering or earth berms are required to obscure the building from residential or public viewing. *Reference Township Landscape Ordinance*.

Nighttime outdoor lighting must be strictly shielded and directed downward to prevent glare, zero foot-candles light trespass at property line, and no atmospheric light pollution. *Reference Township Outdoor Lighting Ordinance.*

(d) Energy and Grid Impact:

Applicants must demonstrate a plan for sustainable energy use.

Data centers are required to be contracted with an electric company provider for energy availability, and pay for their own grid upgrades, such as new substations or transmission lines, rather than burdening local ratepayers. The data center shall incorporate one or more renewable energy systems.

Off-Grid Systems (behind the meter generation units, and substations shall have an impact study to ensure that private on-site power generation, and sub-stations do not destabilize local utility grid. Efficiency metrics power usage effectiveness (PUE) to encourage sustainable low impact power usage.

(e) Emergency Systems: A, stringent backup generator test schedule must be provided to minimize noise and air quality impacts.

The data center shall have an emergency plan approved by the municipal fire department.

Section 5: Environmental and Safety Impact Study

A comprehensive study must be submitted evaluating:

1. Air quality impact from backup generator emissions must have filtration systems.
2. Soil disturbance and erosion control plans.

3. Hazardous material handling for backup battery storage systems (Bess) if applicable.

Inspections:

Township officials are authorized to conduct regular inspections of data centers, including exterior and interior areas, backup generators, fuel storage, and cooling systems, to ensure public safety and compliance with the Special Land Use Permit (SLUP) or Conditional Use Permit (CUP) and Site Plan.

Inspections may occur annually or more frequently, with 24 hours' notice typically provided, although exceptions exist for emergencies or suspected violations. Operators must also submit annual noise/vibration reports, monthly water usage reports if applicable, and maintain generator testing and emissions logs.

Failure to correct violations within a specified timeframe can result in fines, permit revocation, or legal action, with the operator responsible for associated inspection costs.

Section 6: Decommissioning Plan

A performance bond must be posted by the developer, payable to the municipality, to ensure that the facility is removed and the site remediated, preventing the creation of "brownfields" if the technology becomes obsolete.

This policy outlines regulations for the abandonment and decommissioning of data centers to ensure site restoration and financial accountability. A data center is considered abandoned if operations cease consistently for 12 consecutive months, requiring the owner to notify the Township via certified mail.

Key Decommissioning & Financial Requirements:

1. Timeline: Decommissioning must begin within six (6) months of abandonment and be fully completed, including site restoration (removing equipment/structures to 36 inches below ground following a waste removal recycling plan), within twelve (12) months.
2. Financial Assurance: A bond or letter of credit equaling 125% of the estimated decommissioning cost must be provided prior to obtaining building permits, with updates required every five years.

Ownership Transfer must have Township Approval: Transfers require 30 days' notice, with new owners assuming all responsibility for the existing plan and financial security. Transferring ownership of a data center does not nullify the decommissioning agreement, but it is subject to Township review to ensure ongoing compliance. The current owner must notify the Township at least 30 days before any transfer, and the new owner must formally agree to assume

responsibility for the existing decommissioning plan and bond. The Township may review the financial security to confirm its sufficiency before approving the transfer. Any new owner planning to change the facility's use must submit an updated reclamation plan.

Extensions: The Township may grant extensions if the owner provides evidence of intent to resume operations or valid reasons for delay.

Recommended Action Timeline:

1. Written notification within 30 days.
2. Decommissioning Start: Within 6 months of abandonment.
3. Completion: Within 12 months of initiation.

Section 7: Transportation and Construction Management

A traffic management plan with the local and/or state department of transportation, for construction vehicles must be approved to mitigate, at developer's cost, the impact on rural roads and traffic flow.

Disclaimer: This guide is for informational purposes and should not be considered legal advice. Township boards should work with legal counsel when drafting zoning ordinances.

Key Considerations for Adoption Suggestions

- **Act Proactively**: Given the surge in proposals, municipalities should pass amendments to their zoning ordinances to ensure they have legal, customized standards in place rather than relying on outdated industrial definitions.
- **Monitor State Legislation**: Be aware that state-level legislation could be pending to create statewide rules for water usage and tax incentives, which may affect local authority.
- **Common zoning standards** for noise, water usage, and setbacks are implemented to manage the environmental, social, and infrastructural impacts of development. These standards are typically based on studies regarding public health, environmental sustainability, and compatibility between land uses.

1. **Noise Zoning Standards:** Zoning ordinances establish maximum sound levels (measured in dBA and low frequency dBC) based on the "receiving" land use (e.g., residential areas have stricter limits than industrial zones). Michigan senate Bill 431 Sec. 205 restricts ground transmitted vibration at the property line.

Residential Standards: Commonly 55 dBA during the day and 50–55 dBA at night at the property line. And 50-60 dBC at night and 65-70 dBC day.

Commercial/Industrial Standards: Ranges from 60 dBA to 80 dBA depending on the time of day and adjacent zoning, with nighttime restrictions often being 5–10 dB lower. Vibration (low frequency) standards dBC should also be considered.

Data Center/Specific Industry Standards: Often require 60 dBA (day), 55 dBA (night) at the boundary, with specific regulations for generator testing (e.g., 10 am–4 pm). U.S. Noise Abatement Control Act of 1972 encourages use of certified low-noise emissions products. *Article: Noise Pollution Affects Birds, 3-2-2022 University of Michigan, study indicates decline in bird populations*.

Supporting Studies: EPA Guidelines: 55 dBA (outdoors) and 45 dBA (indoors) are standard goals for protecting against activity interference and annoyance.
EPA Clean Air Act- National Ambient Air Quality Standards for Nitrogen Dioxide, sulfur dioxide, particulate matter, carbon monoxide, lead & ozone.

HUD Standards (24 CFR Part 51): Defines "Normally Unacceptable" noise zones (65–75 dB) and requires noise attenuation for new construction.

OSHA: 85 dBA (8-hour time-weighted average) is the threshold for worker hearing protection.

2. **Water Usage and Quality Standards**: Zoning and municipal codes focus on efficiency, infrastructure capacity, and protecting water resources from pollution using hydrogeology testing within 1-5- mile radius. Large quantity water withdrawals must not surpass groundwater recharge levels.
Resources: EGLE oversees Groundwater Monitoring Program MOD FLOW Modeling often using USGS codes in the region; NREPA part 31, PA 451 of 1994 part 327; Safe Drinking Water Act PA 399 of 1976; City of Jackson Wellhead Protection.

Industrial/Commercial Usage: Mandates for closed-loop or recycled systems in high-use industries like data centers.
To avoid harming local ecosystems, prudent industry is shifting toward more sustainable cooling methods: Zero-Water Cooling: Major tech companies like Microsoft are piloting "zero-water" cooling systems that use air or closed-loop liquid systems, eliminating the need to withdraw fresh water or discharge wastewater.
Waste Heat Recovery: Rather than dumping heat into water, some data centers are recycling the excess heat to provide warmth for local buildings or city district heating networks.
Water-Free/Air Cooling: Moving towards dry cooling technologies that rely on air rather than water for heat rejection.
Water Positive Pledges: Companies are committing to replenishing more water than they consume by 2030.

Data Centers and Thermal Pollution: Discharging warm water into natural water bodies increases the temperature of the ecosystem.
Reduced Dissolved Oxygen: Warmer water holds less dissolved oxygen, which is critical for the survival of fish and other aquatic wildlife.
Increased Toxicity: Some contaminants become more toxic to aquatic life at higher temperatures.
Disruption of Local Ecosystems: The sudden, consistent discharge of warm water can disrupt the breeding and survival of native species.
While some data centers use treated wastewater or discharge within permitted limits, the environmental consensus strongly encourages moving toward technologies that do not return heated water to natural water bodies. USGS (.gov)

Water Quality/Runoff: Requirements for on-site retention and treatment of runoff, particularly in industrial zones. Prohibit untreated thermal wastewater discharges to streams, lakes, and wetlands.

Supporting Studies: EPA Water Sense & Best Management Practices (BMPs): Provides guidelines for reducing water usage in commercial buildings and landscaping.

National Pollutant Discharge Elimination System Permits: Technology-based and water-quality-based limits on wastewater discharge. Local Irrigation Studies: Guidelines on calculating water needs to prevent over-irrigation.

3. **Average Setbacks and Buffer Standards**: Setbacks define the minimum distance between a structure and the property line, aiming to ensure safety, privacy, and fire protection.

Residential Setbacks: Typically, 10–30 feet for front yards and 5–10 feet for side yards.
Setbacks Residential (Front)20-30 feet. Setbacks Industrial (from Res) 50-500+ feet. BuffersEnvironmental100-300 feet.

Industrial/Commercial Buffers: General Industrial: 50–100 feet from property lines, especially if adjacent to residential areas.

Specialized Uses (e.g., Data Centers): Often require larger buffers depending on topography, such as 200 feet from all lot lines and 500 feet from residential districts.

Environmental Buffers: Wetlands often require a 300-foot buffer, while lakes/reservoirs require a 100-foot buffer to protect water quality. Environmental Impact Assessments (EIAs): Studies that determine necessary buffers to protect habitat, wetlands, and water quality.

Supporting Studies: Fire Marshal Studies: Determine minimum distances required for fire-fighting, apparatus access, and reducing fire spread. Battery Energy Storage Systems will need additional approvals.

Summary Table of Common Standards Category Standard/Type Typical Measure NoiseResidential50-55 dBA (night)NoiseIndustrial65-75+ dBA

Jackson Water Withdrawal Studies:

Jackson County, Michigan, acts as a critical headwater region for several major watersheds, including the Grand River, the River Raisin, and the Kalamazoo River (both North and South Branches). The headwaters are often the most sensitive areas to environmental changes, and high-volume industrial water withdrawals (potentially in the million-gallons-per-day, or MGD, range) pose significant risks to these ecosystems.

Key Findings for Jackson County Area

Well Data: Well logs (e.g., in Leoni Township, Jackson County) have identified the Saginaw Sandstone at varying depths. Wells depth can varies from 30 feet to 400 feet throughout the County.

Groundwater Levels: Studies have shown that historical pumping has caused significant drawdown in the Saginaw formation in surrounding areas, which the MODFLOW simulations aim to predict and manage.

Source: USGS Publications Warehouse (.gov)

While the Saginaw Formation is a key water source, water quality can vary, with saline water or brine found deeper within the formation, particularly toward the center of the basin. The Saginaw aquifer can be productive, but its hydraulic properties are highly variable depending on the presence of fractured sandstone versus shale.

The Marshall Formation is a major freshwater producer, with wells sometimes producing 300 to 1,000 gallons per minute, although it is vulnerable to contamination.
MODFLOW Modeling: Groundwater modeling (often using USGS codes like MODFLOW) in this region, including Jackson and nearby Calhoun/Washtenaw counties, is used to simulate aquifer drawdown, delineate contributing areas, and manage groundwater resources. The models often show the interaction between the Marshall sandstone and overlying glacial deposits.

Impacts of projected MGD Industrial Withdrawals in Headwater Areas:

Aquatic Ecosystem Degradation: The headwaters often contain high-quality, coldwater streams that are particularly sensitive to flow reductions. Reduced streamflow,

or baseflow reduction, can cause significant drops in water levels and increases in water temperature, making them uninhabitable for trout and other coldwater species.

Reduced Groundwater Levels: In Jackson County, where the rivers start, extensive groundwater pumping can lower the water table, affecting the wetlands and baseflow that supply the rivers.

Reduced Streamflow: Research in Michigan indicates that large, concentrated water withdrawals (e.g., >1 MGD) can lead to excessive flow reduction in streams and potentially cause an Adverse Resource Impact (ARI) on fish communities.

Contaminant Concentration: Lower water levels and reduced flow diminish the ability of the rivers to dilute contaminants, which could be particularly problematic given the agricultural and urban runoff already present in the area.

Water Quality Degradation: The loss of water can exacerbate issues with existing dam infrastructure and increase water temperatures, harming downstream water quality.

Regulatory Context and Protections in Michigan:

Withdrawal Assessment Tool (WWAT): Michigan requires that any new or increased large quantity withdrawal (defined generally as more than 100,000 gallons per day, but with stricter rules for larger amounts may be evaluated using the WWAT, which checks for potential ARIs, particularly in sensitive coldwater streams.

Protection Standards: The law aims to preserve 75% to 95% of the summer low-flow of streams to protect aquatic health.

Groundwater Rules: The 2008 legislation requires that wells, particularly those that are high-capacity, be evaluated for their impact on nearby surface water, as many aquifers are connected to rivers. Studies need to assess cumulative impacts across the entire watershed.

Note: The information regarding headwaters and watershed locations is based on the Jackson County Master Plan, while the impacts of high-volume withdrawals are based on Michigan's general water withdrawal regulations and studies on similar aquatic environments.

The Saginaw Formation is a primary Pennsylvanian-aged sandstone bedrock aquifer in the Michigan Basin, crucial for municipal water supplies in Jackson County and the surrounding region. As part of regional aquifer studies, it is often analyzed alongside the Marshall Sandstone, with key concerns involving high demand, severe drawdown near pumping centers (like Lansing), and potential salinity migration.

Key Findings on the Saginaw & Marshall Formation Aquifer:

Demand and Drawdown: Increased regional demand has caused significant drawdown in the Saginaw aquifer in certain areas, with cones of depression extending over 100 square miles. Significant saltwater intrusions have occurred in areas of the Marshall aquifer resulting in susceptibility to contamination, and mineralized water into freshwater zones.

Water Quality: Saline water exists at indeterminate depths in the deeper parts of the aquifer, and increased pumping can lead to the migration of this saline water into freshwater zones. Intensive groundwater use can trigger water quality emergencies.
Article: Michigan State University 2-1-2018 "Southern Michigan's Hidden Treasure…

Hydraulic Characteristics: The aquifer is highly productive where sandstone-to-shale ratios are high.

Jackson County Regional Context:

Groundwater is a major source for municipalities in this region. Evaluation must determine if existing infrastructure can support additional extreme impacts.

The aquifer is situated beneath glacial drift, often with "red beds" or shale layers serving as confining units.

For detailed, actionable data, specific USGS Open-File Reports from the 1980s-2000s, such as the Simulation of Ground-Water Flow in the Glaciofluvial, Saginaw, and Marshall Aquifers, provide the most detailed analysis.

A regional water demand study for proposed Multi-million Gallon per Day (MGD) industrial withdrawals in Michigan involves rigorous, mandatory, and site-specific modeling to evaluate impacts on local water resources, complying with Michigan's Water Use Program and the Great Lakes Compact. Key steps include:

Registration and Modeling: Applicants must use the online Water Withdrawal Assessment Tool (WWAT) to estimate potential Adverse Resource Impacts (ARIs) on nearby stream flows, geology, and hydrology.

Site-Specific Review (SSR): For withdrawals exceeding 2 MGD or those that do not pass the initial WWAT, a mandatory SSR by the Department of Environment, Great Lakes, and Energy (EGLE) is required.

Professional Hydrogeological Analysis: A qualified expert must conduct an in-depth, alternative analysis of the proposed, high-capacity withdrawal.

Impact Evaluation: The study must assess the withdrawal's impact on surface water (streams, rivers) and its potential for "causing an adverse resource impact".

Long-Term Planning: Studies must incorporate long-term demand forecasts, sustainable water use strategies, and potential impacts on local water tables, including for, but not limited to, industrial, mining, and power generation uses.

If the proposed withdrawal cannot be authorized by the WWAT, the applicant must provide a site-specific review, which is a key part of the process for large, multi-MGD withdrawals. The state also requires the establishment of water user committees if adverse impacts are likely.

Geological Evaluation: Contractors may use methods like sonic drilling or borehole imaging to assess subsurface conditions, ensuring the withdrawal will not violate Michigan's legal reasonable use standards.

Mitigation Planning: The study must demonstrate that the withdrawal is sustainable and includes necessary water conservation measures to minimize impacts on the surrounding watershed. If the screening passes, the withdrawal can be registered, but if it fails, the user must seek a site-specific review or adjust their proposal to comply with state regulations.

Potential Impacts: Excessive industrial pumping can cause a drop in the water table, resulting in, or exacerbating, impacts to shallow residential wells, according to Bob Graham Center for Public Service. Any new, significant industrial proposal requires a customized hydrogeological study approved by state, and sometimes local, officials to ensure that no adverse impacts occur to existing residential, agricultural, or municipal supplies.

Current Industrial & Public Use

Jackson's Municipal Draw: The City of Jackson currently draws approximately 1.5 MGD from 16 wells that are over 400 feet deep.

Statewide Industrial Context: For comparison, Michigan industries withdraw roughly 64 to 85.8 MGD from on-site wells statewide.

To find out if a specific property in Jackson County can support a high-capacity industrial well, you can use the EGLE Water Well Viewer to map nearby residential wells and aquifer depths.

Article summaries:

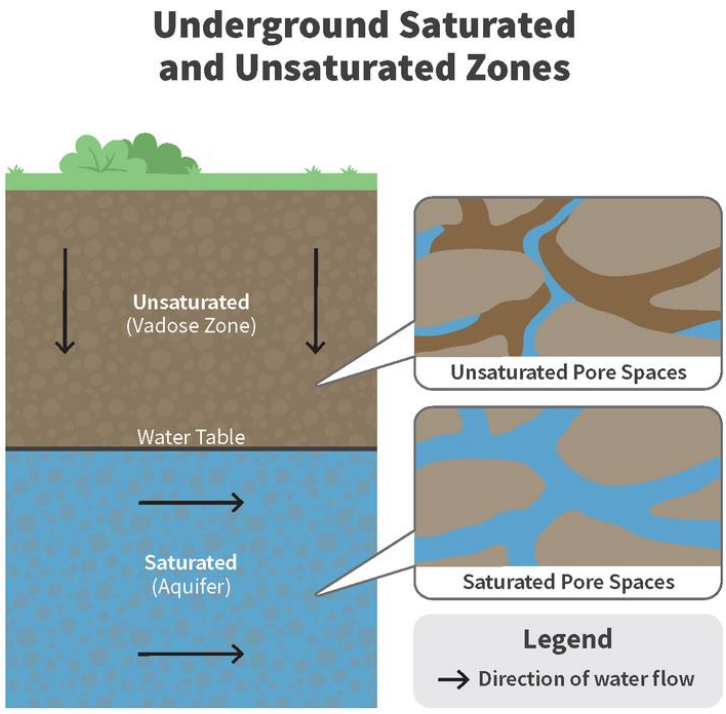
Groundwater Quality Data Ingham County by Shabaz Radfar -summary- The northern part of Jackson County is in the same aquifer.
The Ingham County Groundwater Survey project (2015–2020) aimed to re-sample 1980s-era

wells across 16 townships, revealing that while drinking water is generally safe, levels of arsenic, nitrate, boron, and fluoride occasionally exceeded standards. A 2021 report detailed these findings, indicating vulnerability to contamination.
Key Findings on Ingham County Groundwater:
Contaminants: Surveys identified arsenic, nitrate, boron, and fluoride above recommended drinking water standards.
Vulnerability: Groundwater is susceptible to pollution, specifically from leaking underground storage tanks.
-Project Scope: The project, a partnership often referenced with Tri-County Regional Planning Commission, completed sampling in all 16 townships by summer 2020 to track changes from 1980s data.
-Related Studies: Separate USGS studies in the area (e.g., near Mt. Hope Cemetery) have highlighted high levels of arsenic, manganese, and iron in glacial drift aquifers.
-The studies generally highlight that although the water quality is monitored, continued vigilance is necessary for private and municipal wells in Ingham County.
Tri-County Regional Planning Commission

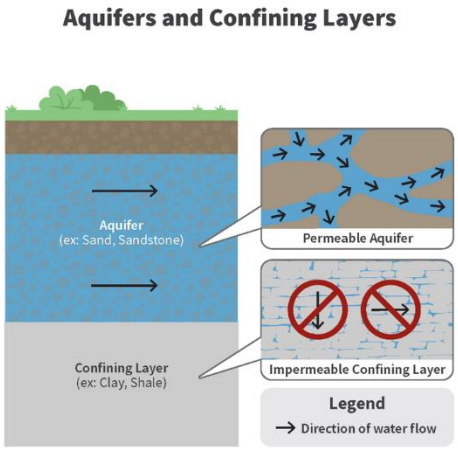
Aquifer 5-30-2024 downtown magazine summary:
In a May 2024 article by Stacy Gittleman highlights the vital role of Michigan's "nested bowl" aquifers in supplying drinking water, agriculture, and ecological health. The piece, referencing a 2024 report by FLOW, warns that these critical, often overlooked, underground resources face sustainability threats from overuse and climate change. Read the full article at Downtown Newsmagazine.

Groundwater Primer" by EGLE's Andrew Gelderloos with illustrations -summary- introduces the "hidden" water cycle, explaining that groundwater is stored in aquifers and recharged by precipitation. The article highlights that because groundwater and surface water are interconnected, protecting the subsurface is essential for maintaining Michigan's environmental health. For more details, visit Michigan Lakes and Streams Association.

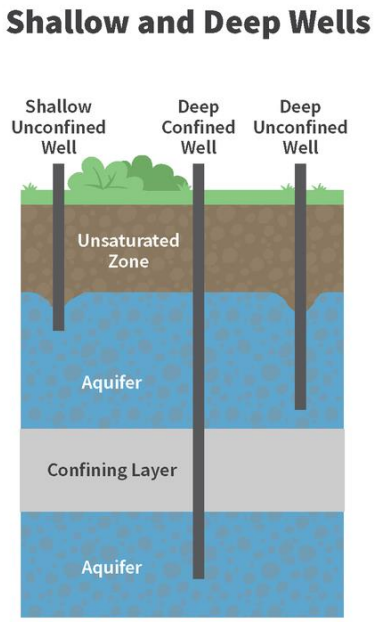
Groundwater makes hidden connections throughout the state. Take a moment this month to reflect on how influential groundwater is to us, the lakes and streams in Michigan, our economies, and our ecosystems.



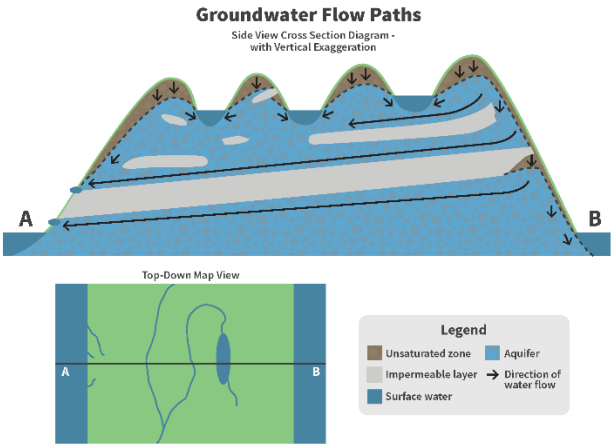
In the first diagram, Underground Saturated and Unsaturated Zones, water at the ground surface can enter the underground unsaturated zone. In the unsaturated zone, the pore space between sediments is filled with air and water. Water infiltrates downward through the unsaturated zone and makes its way down to the water table. The depth of the water table varies. It could be a couple of inches in one place and more than a hundred feet in another place. And it changes over time due to factors such as rainfall and vegetation. At and below the water table, in the saturated zone, all pore space is filled with water; this area is known as an aquifer. Groundwater moves primarily horizontally within an aquifer but can flow in any direction as it slowly moves from locations with a higher water table to locations with a lower water table.



In the second diagram, Aquifers and Confining Layers, groundwater moves through the pore spaces within an aquifer. The individual particles of some sediments, such as sand, are large enough that when they are packed together, the pore spaces are still connected. However, the individual particles of some sediments, such as clay, are so small that, when they are packed together, the pore spaces have only limited connections. In a confining layer, connections between pore spaces are so limited that groundwater cannot move through the layer.



In the third diagram, Shallow and Deep Wells, the groundwater pumped out of the shallower well may have only travelled a short distance during days or weeks since it infiltrated from the surface. It is possible that the water pumped from the shallow well may have even infiltrated from the ground surface adjacent to the well. The groundwater pumped out of the deeper well may have travelled many miles during the many years since it was last at the ground surface. Water drawn from the well drilled under the confining layer has traveled horizontally from a location not depicted in this diagram, where there is no confining layer between the aquifer and the ground surface.



When we start putting the pieces together, groundwater flow can become complex very quickly – often due to varying amounts of connectivity. For the final hypothetical diagram, Groundwater Flow Paths, consider:

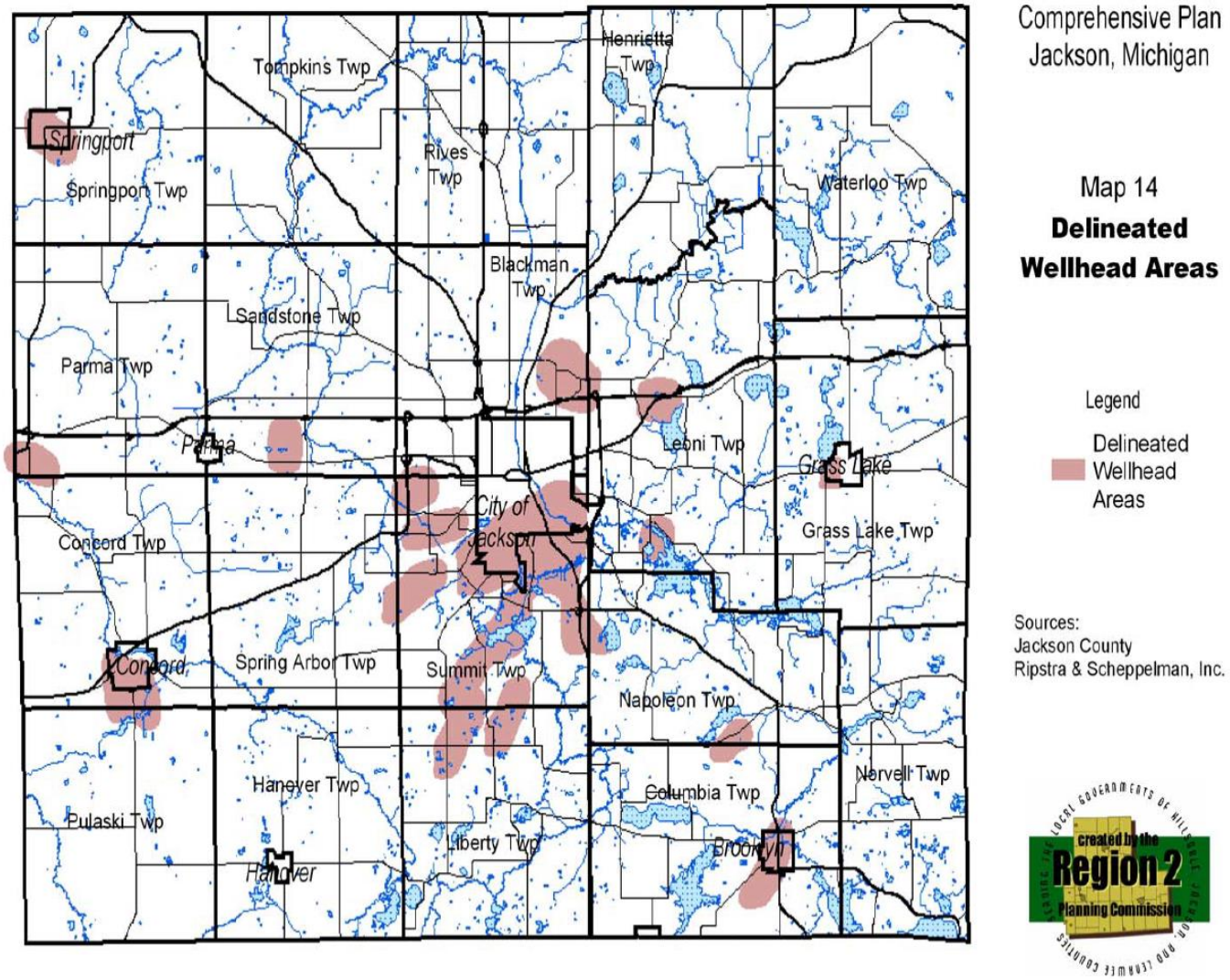
- How might the groundwater have gotten to any point on the diagram? Where did it originally infiltrate from the ground surface?
- Where do confining layers separate aquifers? How many aquifers might a well driller encounter from any given point on the ground surface?
- This diagram only illustrates one “slice of the cake”. What might another slice look like? What if we sliced through in a different direction? What if we zoom out further or deeper?

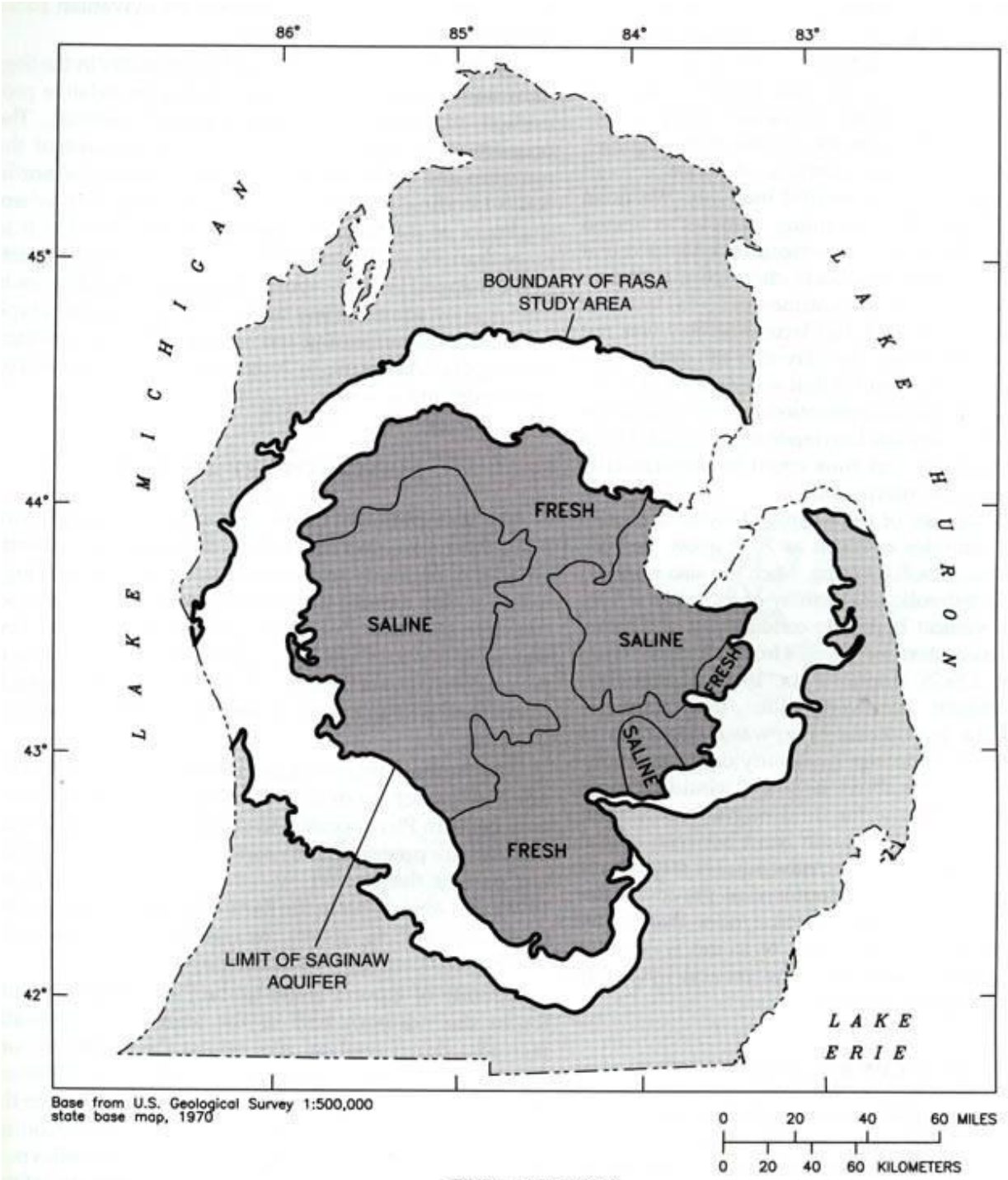
Groundwater Withdrawal Incidents:

2001, an agricultural operation in Saginaw County, Michigan, Walther Farms, owned by The Church of Jesus Christ of Latter-day Saints (often referred to as the LDS Church or Mormon Church), was involved in a water dispute regarding its irrigation practices. The farm, located in Lakefield Township and managed by Walther Farms, was accused of causing local residential wells to go dry due to heavy pumping from the underlying aquifer.

Incident Marshall Formation

In Ottawa County, groundwater for irrigation is primarily sourced from a deep, confined aquifer system, often identified as the Marshall Formation, which is facing significant depletion due to over-extraction, with water levels dropping up to 45 feet in some areas. A thick clay layer restricts recharge, leading to increased salinity and reduced water quality in agricultural wells.



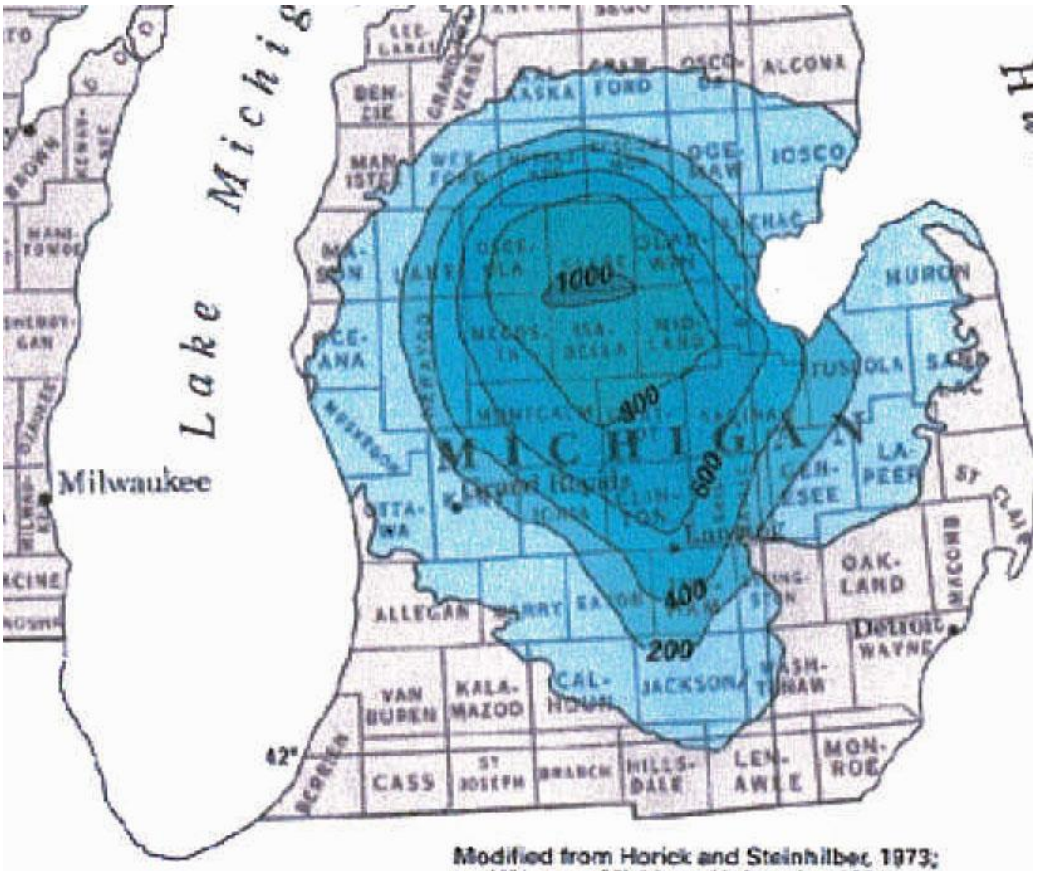


EXPLANATION

FRESH FRESH WATER—1,000 mg/L (milligrams per liter) or less dissolved solids

SALINE SALINE WATER—Greater than 1,000 and less than 10,000 mg/L dissolved solids

FIGURE 26.—Distribution of freshwater and saline water in the Saginaw aquifer, central Lower Peninsula of Michigan.



Modified from Horick and Steinhilber, 1973; and Western Michigan University, 1981

EXPLANATION

Thickness of Mississippian aquifer, in feet

200

400

600

800

1000