

# Meeting Agenda

## Ottawa County Groundwater Board

Fillmore Complex – Conference Room E

October 17, 2024 - 9:00 AM



1. Call to Order
2. Approval of the Agenda
3. Old Business
  - A. Approval of the June 20, 2024 [Meeting Minutes](#)
  - B. Shallow Wells Work Group
  - C. Composition of Board Membership
    - i. 2<sup>nd</sup> Well Driller seat posted per discussion last meeting
    - ii. Add County Parks Director as a non-voting member
    - iii. **Motion:** [to amend the Bylaws and Rules of the Groundwater Board as proposed](#)
4. Discussion Items
  - A. State Water Withdrawal Assessment Program
    - i. [Ottawa County Status Maps from EGLE](#)
    - ii. Adam Wygant - *Director, Geologic Resources Management Division, EGLE*
  - B. Water Use Advisory Council Updates
  - C. Pertinent updates from Board members (2 minutes per member)
5. Pertinent Project Updates
  - A. Well Drilling
  - B. Surface Water Monitoring
  - C. Outreach
  - D. Landscape Signage RFP
6. Public Comment
7. Other Business
  - A. Next Meeting: Thursday, December 19, 2024 at 9:00 AM
8. Adjournment

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## OTTAWA COUNTY GROUNDWATER BOARD

DATE: August 15, 2024

PLACE: Ottawa County Fillmore Complex, Conference Room E

PRESENT: Roger Belknap, Joe Bush, Jerry Geertman, Frank Johnson, David Kraker, Lee Machiela, Carrie Rivette, Patrick Staskiewicz (Joe Wallace), Alex Svoboda, John Yellich (Remote), Henry Werksma

ABSENT: Mark Baker, Dale Buist, Adam Elenbaas, Sylvia Rhodea, John Truscott, Dale Zahn

STAFF: Matthew Chappuies, Paul Sachs,

PUBLIC: David Barnosky, Steve Hecksel

CALL TO ORDER

Chair Belknap, called the meeting to order at 9:00 a.m.

A roll call was conducted, confirming the presence of a quorum.

APPROVAL OF AGENDA

GWB 24 - 11 Carrie Rivette moved to approve the August 15, 2024 Agenda. The motion passed.  
UNANIMOUS

OLD BUSINESS

GWB 24 - 12 Carrie Rivette moved to approve the June 20, 2024 Minutes. The motion passed.  
UNANIMOUS

PERTINENT PROJECT UPDATESA. Well Drilling

Matthew Chappuies discussed the ongoing well drilling projects. Drilling began at Allendale High School and then shifted to Polkton Township Hall, near Steve Hecksel's property. Plans to drill at the middle school are delayed due to a site change, with work expected to start the next week. The team reached 200 feet at Polkton before pausing and aims to continue today. Future drilling is planned at several sites, targeting an additional 10 wells by year-end.

Matthew highlighted a new sample collection method recommended by the Michigan Geologic Survey (MGS), which uses clear containers to collect well cuttings. This method not only aids in research but also improves visual understanding. The wells are being clustered within half-mile to one-mile radii to support future pump tests and data collection, specifically targeting the Marshall aquifer. These efforts will contribute to 3D modeling and improve the accuracy of data regarding groundwater impacts.

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The discussion moved toward alternative sampling techniques. Core sampling, as used earlier in the year when MGS was working with Illinois Geological Survey to collect cores, was mentioned as a superior method for developing geological frameworks though it is significantly more expensive. It was noted that while core drilling provides comprehensive soil profiles, the current approach of using well cuttings is a practical alternative.

John Yellich advises a gamma log will be performed on the drill holes to help identify the boundaries between clay and sand zones. The gamma log rig will be deployed in the upcoming weeks to log newly drilled holes, and this data will be compared to existing well records to improve the understanding of subsurface conditions. Although core drilling costs between \$60 and \$90 per foot, the well cuttings and gamma logging methods currently in use provide sufficient data for ongoing research and analysis.

John concluded by emphasizing that while core drilling offers the most detailed samples, the current techniques offer a viable and cost-effective approach to gathering necessary geological information.

Lastly, a brochure is being drafted to help communicate the drilling process and project details to the potential well site landowners. The board discussed drilling procedures, potential incentives such as future personal use, and the lifespan of the wells.

**B. Surface Water Monitoring**

Chappuies discussed ongoing efforts to implement surface water monitors alongside well sites, in collaboration with the Conservation District and other county teams. The monitors are intended to improve understanding of the relationship between surface water and groundwater, which could provide valuable data for future initiatives, such as developing a county-wide water budget. Specific site locations have been identified for the initial phase, with plans to install two or three monitors this year.

These monitors will help build a larger network over time and will eventually be integrated with the groundwater monitoring system. This would allow all surface and groundwater data to be displayed in a unified dashboard for comprehensive analysis. The data collected will focus primarily on the stream height, but some monitors may also include weather stations and cameras to provide real-time monitoring, especially in areas prone to blockages or debris build-up.

Joe Bush, Water Resources Commissioner, added that the goal is to gather data on stream behavior during rainfall events, helping the county understand how much water leaves the area and how much could potentially be stored upstream, aiding in regional water detention planning.

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C. Outreach

Chappuies provided an update on recent community outreach events and marketing efforts. Team members participated in the Conservation District's "Conservation on Tap" series at Trail Point Brewing, which focused on native landscaping. Although the event was small, it facilitated productive discussions with residents from Allendale and across the county, yielding positive feedback.

Additionally, the DSI participated in the Macatawa Water Festival at Windmill Island Park in Holland, which attracted over 1,500 attendees. The staff hosted a booth featuring a demonstration kit from the Michigan Geologic Survey, which illustrated concepts like porosity and permeability. This hands-on experience received great engagement from both adults and children, and the event was considered a big success. Staff looks forward to participating again next year.

The marketing campaign, which included targeted billboard ads, gas station TV spots, and social media, has concluded. According to King Media (the contracted marketing firm), the campaign was highly effective. Gas station TV ads were viewed over 350,000 times across 37 locations in the county, digital billboards reached an estimated around 600,000 views at 20 locations, and social media posts generated roughly 200,000 clicks. Altogether, the campaign resulted in over 1 million impressions, driving more than 4,000 unique visits to the groundwater website. Public awareness has increased, with many community members recognizing the ads, and plans are underway to launch a similar campaign in the future, focusing on the watering and growing seasons.

D. Native Landscape Signage Request for Proposal (RFP)

Staff discussed the progress of the native landscaping signage project, first introduced at the previous meeting. Mock-ups of signs were created to explain the native landscaping projects on the grounds, emphasizing that the landscaping is intentional and educates the public on how to implement similar practices.

The plan includes approximately 10 high-quality garden signs and 1 or 2 larger main signs. Based on the quotes received, the estimated cost for the project is around \$50,000 to \$55,000. These signs will be durable, long-lasting, and capable of withstanding the local climate.

To fund the project, staff plans to reallocate \$55,000 from existing budget categories: \$35,000 from *Project Reports*, \$10,000 from *Site Selection Services*, and \$10,000 from the *Temporary Position* fund.

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These funds were deemed available because the need for project reports, site selection services, and temporary staffing was either diminished or no longer necessary.

The board discussed the overall cost for the signage package, expressing concern over the price, but acknowledged that thorough due diligence had been done, including evaluating multiple quotes and touring facilities to assess the quality of the signs. Cheaper alternatives were considered, but they would likely degrade quickly and not maintain the aesthetic or quality required for the project.

Staff requested a motion to approve the reallocation of \$55,000 into the Outreach-Educational budget category for the native landscape signage at the Fillmore Complex.

GWB 24 -13 Carrie Rivette moved to approve the reallocation of funds, with Frank Johnson seconding the motion. The motion passed. UNANIMOUS

The board continued discussing the importance of high-quality signage, drawing comparisons to signage used in other departments. Members shared anecdotes about the positive impact that well-designed signage can have, noting that it leaves a lasting impression, while poor signage can reflect a lack of care or investment in a project. Given that these signs will likely be seen by a broad audience, including tourists, schools, businesses, and the general public, the board emphasized the importance of quality for this project. They also discussed incorporating additional elements, such as using recycled materials and adding a digital tour component to enhance the experience of the walking gardens. The board agreed that these aspects are crucial to the project's success.

E. Shallow Wells Work Group

Paul Sachs, Director of Strategic Impact, provided an update on the recent work group meetings. He noted that while it has been challenging to reengage the group during the summer, the staff is working to synthesize the discussions and organize the information on paper. This will help outline current thinking and identify opportunities moving forward, particularly regarding shallow wells. Once the information is consolidated, the group will reconvene for a more focused and intentional discussion to determine the next steps.

F. Farmland Conservation Easement

Paul Sachs provided a quick update on the Farmland Conservation Easement program, highlighting several ongoing strategies related to groundwater issues. He emphasized that in addition to the work being done by the land use planning Staff, the Farmland Preservation Board is playing a key role in the conservation process. Recently, the board has been working to secure agricultural property in Blendon Township for permanent conservation easements, utilizing grant dollars, landowner donations, and philanthropic funds—without any county dollars involved.

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Sachs also mentioned that the County Board of Commissioners committed \$1 million of ARPA funds to farmland preservation, especially in areas with known groundwater challenges. The Blendon Township site will be the first to leverage these funds, ensuring the preservation of critical farmland that might otherwise be converted to residential development. This site aligns with conservation goals, given that there are no plans for infrastructure in the area.

Board member Alex Sobota added details about the conservation planning for this property, which is part of the Regional Conservation Partnership Program (RCPP). The plan includes conservation practices to protect water quality, such as erosion control measures. Sobota noted that the project may take up to a year to complete, with multiple sources of federal funding potentially supplementing the county's efforts.

The program is voluntary for landowners, and they have some flexibility in preserving portions of their property while protecting all tillable areas from development. Local involvement, particularly Township approval and alignment with master planning, is essential to the process.

No board action was required, and updates will be provided as the project progresses.

#### DISCUSSION ITEMS

##### A. Adding Dedicated Board Seats for Members of the Well Drilling Industry

Paul Sachs discussed the need for better representation from the well drilling industry on the board, given their critical on-the-ground expertise. Currently, one seat is designated for well drillers, but Sachs proposed revising the bylaws to add a second seat, starting January 1. With several at-large positions expiring, one could be converted into this additional well driller seat. The Talent and Recruitment Committee would then seek candidates to fill the role. Other board members supported the idea, noting that well drillers' input on water levels and monitoring wells adds credibility to the board, and a motion was made to move forward.

GWB 24 -14 David Kraker moved for DSI staff to revise the Groundwater Board bylaws regarding sector membership, with the revisions to be presented at the next meeting. Lee Machiela seconded the motion. The motion passes.

UNANIMOUS

##### B. State Water Withdrawal Assessment Program

Paul Sachs talked about some issues with the State Water Withdrawal Assessment Program, concerns were raised about the state's current tool because it only considers a single aquifer system. This was deemed inadequate for Ottawa County, which deals with a dual aquifer system. Carrie Rivette noted that

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the state had released an RFP for a new tool, but it still focused solely on unconfined aquifers. John Yellich explained that the tool, developed in the early 2000s, does not account for Michigan's complex geology. It was suggested that the board draft a letter to the state highlighting the need to address the dual aquifer system in their assessments.

Sachs goes on to mention that Pat Staskiewicz had shared a performance audit report on the State Water Withdrawal Assessment Tool, completed by the Auditor General of the Water Withdrawal Assessment Program in May 2024. The report highlighted numerous challenges and included recommendations for improving the program. Though Pat couldn't attend the meeting, it was noted that he is still reviewing the report. At the next meeting, Pat may provide more details on the findings and discuss how they plan to address the issues raised. The report will be shared with the group for review.

C. Pertinent Updates from Board members

- a. Frank Johnson, Robinson Township Supervisor, shared that the Township is moving forward with plans to implement alternative irrigation sources for residential areas, focusing on reducing reliance on potable water for home irrigation. They are advancing these efforts through master planning and local zoning changes and are committed to the initiative as part of their long-term development strategy. The township is proactively pursuing these solutions to improve water sustainability.
- b. Lee Machiela mentioned an ongoing issue with lowering a well near the intersection of 64th Ave and Bingham St. This problem persists and has now surfaced in a new location.
- c. Alex Svoboda shared that the Conservation District staff are working to implement a large surface water monitoring infrastructure with funds from the County. There are plans to inventory streams with funds from EGLE to monitor best management practices with agricultural producers. Updates will be provided as they become available.

Lastly, the RCPP recently completed its first irrigation project focusing on efficient water usage. There are other similar projects still in progress, however, the funding for RCPP has ended so this is the last year of the program. Agriculture producers are still urged to contact the conservation district for future support.

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PUBLIC COMMENT

David Barnoski, from Port Sheldon Township, offered suggestions about using the groundwater promotional videos during down times of Board of Commissioner meetings. He also suggested to directly contact leaders at the State level concerning legislation.

OTHER BUSINESS

**Next Meeting: Thursday, October 17, 2024 at 9:00 AM**

ADJOURMENT

GWB 24 - 15 Chair Belknap adjourned the meeting at 10:57am.



# BYLAWS AND RULES OF THE OTTAWA COUNTY GROUNDWATER BOARD

## SECTION I

### PURPOSE

The Ottawa County Groundwater Board was created by the Ottawa County Board of Commissioners. The provisions of the "Resolution Establishing the Ottawa County Groundwater Board" and any amendments thereto are incorporated herein by reference. That resolution authorizes the Groundwater Board to establish rules and bylaws to govern its operations. These Bylaws and Rules are to be read in a manner consistent with that resolution, as well as state law, and any provision herein deemed inconsistent with the resolution or state law shall be struck and the remainder of the Bylaws and Rules shall remain in full force and effect.

## SECTION II

### ORGANIZATION

2.1 MEMBERSHIP. The Groundwater Board shall total no more than seventeen (17) members, including two (2) members from the Ottawa County Board of Commissioners, all of whom shall be voting members. The Groundwater Board shall also include the County's Water Resources Commissioner ~~and County Park's Director~~ as ~~a~~ non-voting members, who shall be in addition to the seventeen (17) or fewer voting members. At least two Board members shall be from municipalities with groundwater challenges specific to the Bedrock Aquifer, and two Board members shall represent the well drilling industry. Additionally, the County shall make every reasonable effort to ensure that the membership of the County Groundwater Board includes representation from the following sectors: scientific community; ~~well drilling~~; agricultural; conservation; local business; environmental education; K-12 education; real estate/development; public utilities/engineering. Members at-large will also be permitted.

Groundwater Board members will serve three (3) year terms, with the exception of select inaugural members identified in the adopting resolution, who will serve a two (2) year term. There will be no limit on the number of terms a person may serve as a Groundwater Board member, either successively or in total.

In the event that a Groundwater Board member is no longer able or willing to serve on the Board, the Ottawa Board of Commissioners will fill any vacancy.

2.2 FIDUCIARY DUTIES. While the Groundwater Board Members are representative of different constituencies within the County, they shall endeavor to promote the general public good rather than special interests. All members should respect the confidentiality of materials presented.

2.3 ATTENDANCE. If a member is unable to attend a Groundwater Board or committee meeting, he or she should contact the Ottawa County Department of Strategic Impact or Chairperson by 5 p.m. of the day preceding the meeting and advise them of the reason for the absence. As stated in the Board of Commissioners' Administrative Policy regarding appointments to boards and commissions, all appointees are expected to maintain at least a seventy-five (75)%

attendance record at meetings, and to not miss more than three (3) consecutive meetings without acceptable reasons. An appointee may be removed by the Board of Commissioners for failure to meet this expectation.

### SECTION III

#### OPERATIONS

3.1 SESSION. The Groundwater Board shall operate on an annual session coterminous with the calendar year.

3.2 MEETINGS. The Groundwater Board will attempt to hold at least four (4) meetings per session, which includes an organizational meeting. The organizational meeting shall be the first meeting that occurs after January 1 of each year. At the organizational meeting, the Groundwater Board shall select a Chairperson and a Vice-Chairperson.

At the organizational meeting, a schedule of regular meetings for the year shall be established, including the organizational meeting for the following year. This schedule shall include the date, time and meeting location. Notwithstanding the above regular meetings may be adjourned and rescheduled by the Chairperson for cause.

Special meetings to discuss particular topics may be called by the Chairperson or by a written request signed by three (3) Groundwater Board members and filed with the Secretary. Special meetings of the Board will require seven (7) calendar days written notice to all Board members and include the meeting date, time, location and topic.

Each Groundwater Board member shall be responsible for keeping the Secretary (defined in Section 3.3 below) apprised of his or her current address, email address, and telephone number and if such information is utilized, no defect in notice will be recognized.

#### 3.3 TELECONFERENCING.

1. Any Board member wishing to attend physically shall be permitted to participate physically.
2. Any Board member wishing to attend remotely must call into the Board Secretary with significant time in advance of the meeting to participate in a joint telephonic or videoconferencing hookup into the meeting room.
3. The joint telephonic or videoconferencing hookup should include two-way communications so that all Board members can hear and record the discussion.
4. The Chairperson of the meeting and the Board Secretary recording the minutes, if possible, should be located in the physical location, although if no Board member who is physically present is appointed Chair *pro tem* of the meeting by the Board, the Chairperson or Vice-Chairperson respectively, shall chair the meeting.
5. Any Board member attending remotely is allowed to vote.
6. All votes will be by roll call vote.
7. All other Board rules will apply.

3.4 VOTE OF THE BOARD. No Groundwater Board action shall be official unless it is done through a proper vote (as defined below) at a properly convened meeting (as defined below) or unless it is ratified by a proper vote at a subsequent, properly convened meeting.

“Properly convened meeting” refers to a Groundwater Board meeting where a majority of the appointed members are present, and which was the subject of seven (7) calendar days prior written notice to each member.

“Proper vote” refers to a polling of the members of the Groundwater Board at a properly convened meeting which results, unless otherwise specified in these bylaws, in a majority of those members who are present, physically or remotely, voting in support of a motion or resolution.

3.5 OFFICERS. The officers of the Groundwater Board shall consist of the Chairperson, Vice-Chairperson, and shall be elected for a one-year term by a proper vote at the organizational meeting. The Groundwater Board will also appoint an auxiliary non-member to serve the role of Secretary on an annual basis.

Officers shall exercise functions including but not limited to those described below:

**Chairperson** – shall preside at the meetings of the Groundwater Board, serve as its spokesperson and signatory and coordinate its activities.

**Vice Chairperson** – shall exercise the powers of the Chairperson when the Chairperson is unavailable.

**Secretary** – shall be responsible for arranging meetings and recording and distribution of the minutes of each meeting, and for carrying on the normal administrative duties necessary to the Groundwater Board’s functions.

The role of the Secretary of the Board will be carried out by the Director of the County Department of Strategic Impact, or, upon a vote of the Groundwater Board, a Departmental staff person. The Secretary will not be considered a member of the Groundwater Board.

3.6 COMMITTEES. The Groundwater Board may establish such standing committees, special committees and task forces as it deems necessary.

Standing committee members must be members of the Groundwater Board. Members of special committees or task forces need not be members of the Groundwater Board. Any special committee or task force established may be asked to file a written report of its activities upon the completion of its assigned task. Special committees or task forces shall be dissolved upon presentation of a final report at the discretion of the Board.. The Groundwater Board may dissolve any special committee or task force it establishes, at any time. The Chairperson shall make committee and task force appointments subject to the approval of the Groundwater Board upon a proper vote. Each committee or task force shall elect a chairperson from its membership.

3.7 RULES OF ORDER. Except as otherwise provided herein, Roberts Rules of Order shall be used in all Groundwater Board meetings, including those of its committees and task forces. Members shall have the following rights and duties:

A. When a Board member wishes to speak, he or she shall be recognized and address themselves to the Chairperson.

B. When two (2) or more Board members wish to speak at the same time, then the Chairperson shall decide who is to speak first.

C. When a Board member is speaking on any question before the Groundwater Board, he or she shall not be interrupted except to be called to order.

D. When a Board member is called to order, he or she shall immediately suspend his or her address except to register an appeal. The entire Groundwater Board in attendance, if appealed to, shall decide the question upon a proper vote. If there is no appeal, the ruling of the Chairperson shall be final.

E. The Chairperson shall vote on all questions decided by ye and nay except on an appeal from his or her own decision. When a ye and nay vote is taken, every Board member present, physically or remotely, shall vote or note their abstention.

3.8 PUBLIC PARTICIPATION. Groundwater Board meetings are not subject to the Open Meetings Act; however, it is fully within the discretion of the Chairperson of the Groundwater Board to allow the public to attend and to address the Board at meetings, both of which are subject to reversal by a proper vote of the Groundwater Board. Each person giving public comment must state his or her name, and city/township of residence, and speak to the Chairperson in an orderly fashion. The Chairperson may set reasonable limits upon public participation, but any such limits are subject to reversal by a proper vote of the Groundwater Board. Public comment is limited to agenda items only.

3.9 MINUTES. The Secretary shall record, prepare in writing, and maintain minutes of each Groundwater Board regular meeting and special meeting, noting attendance and all Groundwater Board actions.

## SECTION IV

### DUTIES

4.1 ADVISORY FUNCTION. The Groundwater Board's function will be to make policy recommendations and develop recommended regulatory standards for various groundwater initiatives.

The Board will also support efforts for the creation of new state enabling legislation as necessary to allow for greater ability to manage groundwater resources at the local/regional level.

## SECTION V

ADOPTION AND AMENDMENTS

These Bylaws and Rules shall be adopted and become operative when approved by two-thirds of the Groundwater Board members appointed and serving. These Bylaws and Rules may be amended at any time provided the Groundwater Board members have been provided with a copy of the proposed amendments at least seven (7) days prior to a meeting at which the amendment will be considered. Adoption of any amendment will require approval of two-thirds of the Groundwater Board members appointed and serving.

ATTESTATION

We, the Chairperson and Secretary of the Ottawa County Groundwater Board hereby certify that on ~~November 8, 2023~~October 17, 2024, the Groundwater Board duly approved these Bylaws and Rules.

\_\_\_\_\_  
Chairperson

\_\_\_\_\_  
Secretary

**Water Withdrawal Assessment Tool Watershed Status Map for Ottawa County as of April 6, 2023**

The map displays the following watershed status distribution:

- Green (Good):** Watersheds 111701, 12279, 11810, 6514, 12690, 11068, 12820, 22226, 15520, 21758, 20779, 21034, 22050, 21098, 21548, 16029, 21317, 16029, 16108, 21165, 21159, 16212, 20937, 21446, 10085, 10688, 10688, 10193, 10688, 11884, 10099, 13126, 10438, 10131, 12673, 12452, 4156, 4135, 11107, 15079, 12188, 15073, 15367, 15183, 21206, 990163, 16184, 9861, 4136, 13155, 10168, 11366, 9986, 10085, 16106, 21132, 21540, 20951, 21290, 21372, 20918, 21810, 22224, 22107, 21198, 15954, 15903, 21865, 23179, 21785, 14938, 15089, 9907, 7564, 7596, 7588, 6526, 10494, 6527, 11178, 11538, 20943, 11538, 12820, 22226, 15520, 21758, 20779, 21034, 22050, 21098, 21548, 16029, 21317, 16029, 16108, 21165, 21159, 16212, 20937, 21446, 10085, 10688, 10688, 10193, 10688, 11884, 10099, 13126, 10438, 10131, 12673, 12452, 4156, 4135, 11107, 15079, 12188, 15073, 15367, 15183, 21206, 990163, 16184, 9861, 4136, 13155, 10168, 11366, 9986, 10085, 16106, 21132, 21540, 20951, 21290, 21372, 20918, 21810, 22224, 22107, 21198, 15954, 15903, 21865, 23179, 21785, 14938, 15089, 9907, 7564, 7596, 7588, 6526, 10494, 6527, 11178, 11538, 20943, 11538, 12820, 22226, 15520, 21758, 20779, 21034, 22050, 21098, 21548, 16029, 21317, 16029, 16108, 21165, 21159, 16212, 20937, 21446, 10085, 10688, 10688, 10193, 10688, 11884, 10099, 13126, 10438, 10131, 12673, 12452, 4156, 4135, 11107, 15079, 12188, 15073, 15367, 15183, 21206, 990163, 16184, 9861, 4136, 13155, 10168, 11366, 9986, 10085, 16106, 21132, 21540, 20951, 21290, 21372, 20918, 21810, 22224, 22107, 21198, 15954, 15903, 21865, 23179, 21785, 14938, 15089, 9907, 7564, 7596, 7588, 6526, 10494, 6527, 11178, 11538, 20943, 11538, 12820, 22226, 15520, 21758, 20779, 21034, 22050, 21098, 21548, 16029, 21317, 16029, 16108, 21165, 21159, 16212, 20937, 21446, 10085, 10688, 10688, 10193, 10688, 11884, 10099, 13126, 10438, 10131, 12673, 12452, 4156, 4135, 11107, 15079, 12188, 15073, 15367, 15183, 21206, 990163, 16184, 9861, 4136, 13155, 10168, 11366, 9986, 10085, 16106, 21132, 21540, 20951, 21290, 21372, 20918, 21810, 22224, 22107, 21198, 15954, 15903, 21865, 23179, 21785, 14938, 15089, 9907, 7564, 7596, 7588, 6526, 10494, 6527, 11178, 11538, 20943, 11538, 12820, 22226, 15520, 21758, 20779, 21034, 22050, 21098, 21548, 16029, 21317, 16029, 16108, 21165, 21159, 16212, 20937, 21446, 10085, 10688, 10688, 10193, 10688, 11884, 10099, 13126, 10438, 10131, 12673, 12452, 4156, 4135, 11107, 15079, 12188, 15073, 15367, 15183, 21206, 990163, 16184, 9861, 4136, 13155, 10168, 11366, 9986, 10085, 16106, 21132, 21540, 20951, 21290, 21372, 20918, 21810, 22224, 22107, 21198, 15954, 15903, 21865, 23179, 21785, 14938, 15089, 9907, 7564, 7596, 7588, 6526, 10494, 6527, 11178, 11538, 20943, 11538, 12820, 22226, 15520, 21758, 20779, 21034, 22050, 21098, 21548, 16029, 21317, 16029, 16108, 21165, 21159, 16212, 20937, 21446, 10085, 10688, 10688, 10193, 10688, 11884, 10099, 13126, 10438, 10131, 12673, 12452, 4156, 4135, 11107, 15079, 12188, 15073, 15367, 15183, 21206, 990163, 16184, 9861, 4136, 13155, 10168, 11366, 9986, 10085, 16106, 21132, 21540, 20951, 21290, 21372, 20918, 21810, 22224, 22107, 21198, 15954, 15903, 21865, 23179, 21785, 14938, 15089, 9907, 7564, 7596, 7588, 6526, 10494, 6527, 11178, 11538, 20943, 11538, 12820, 22226, 15520, 21758, 20779, 21034, 22050, 21098, 21548, 16029, 21317, 16029, 16108, 21165, 21159, 16212, 20937, 21446, 10085, 10688, 10688, 10193, 10688, 11884, 10099, 13126, 10438, 10131, 12673, 12452, 4156, 4135, 11107, 15079, 12188, 15073, 15367, 15183, 21206, 990163, 16184, 9861, 4136, 13155, 10168, 11366, 9986, 10085, 16106, 21132, 21540, 20951, 21290, 21372, 20918, 21810, 22224, 22107, 21198, 15954, 15903, 21865, 23179, 21785, 14938, 15089, 9907, 7564, 7596, 7588, 6526, 10494, 6527, 11178, 11538, 20943, 11538, 12820, 22226, 15520, 21758, 20779, 21034, 22050, 21098, 21548, 16029, 21317, 16029, 16108, 21165, 21159, 16212, 20937, 21446, 10085, 10688, 10688, 10193, 10688, 11884, 10099, 13126, 10438, 10131, 12673, 12452, 4156, 4135, 111

WMA Number	WMA Name	Stream Type	Index flow (cfs)	Index flow (gpm)	Total Available (gpm)	Currently Available (gpm)
10438	South Branch Macatawa River	Warm stream	1.5	673	162	16
4102		Coastline	0	0	1440	1440
4135	Macatawa River	Warm small river	12	5386	916	30
4136		Warm stream	1.3	584	71	71
9861		Cool stream	1.5	673	168	168
9907		Coastline	0	0	1440	1440
<b>9986</b>		<b>Warm stream</b>	<b>1.7</b>	<b>763</b>	<b>183</b>	<b>-497</b>
10085	Black Creek	Warm stream	2.6	1167	280	125
10099	Black Creek	Cool stream	7	3142	785	326
10131	North Branch Macatawa River	Warm stream	2.5	1122	269	129
10168		Warm stream	0.7	314	75	22
10193	Little Rabbit River	Cool stream	17	7631	1907	76
11107	Pine Creek	Warm stream	5.2	2334	560	6
11366	Macatawa River	Warm small river	21.7	9740	1656	822
12188	Little Pigeon Creek	Warm stream	25	11222	2693	706
12293		Cold stream	5.97	2680	536	230
12452		Coastline	0	0	1440	1440
12673	Kelly Lake Drain	Cool stream	3.2	1436	359	142
13126		Warm stream	0.9	404	97	1
13155	Macatawa River	Cool stream	2	898	224	129
14938	Little Black Creek	Cold transitional stream	3	1347	54	48
15073		Coastline	0	0	1440	1425
15079		Coastline	0	0	1440	1440
15183	Pigeon River	Warm stream	7.7	3456	829	0
15367	Pigeon River	Cold transitional stream	19	8528	341	215
15879	Norris Creek	Cold transitional stream	15	6733	269	214
15954		Cold transitional stream	17.2	7720	309	155
16073	Ottawa Creek	Cold transitional stream	1	449	18	-10
16106		Cold transitional stream	0.3	135	5	5
16108		Cold stream	1.3	584	117	55
16184	Rush Creek	Cool stream	7.8	3501	875	847
20918	Grand River	Warm large river	1780	798971	175750	175230
20937	Rush Creek	Cold transitional stream	22	9875	395	386
20943	Crockery Creek	Cold stream	14.4	6464	1293	387
20951	Deer Creek	Warm stream	4	1795	431	419
21034	North Branch Crockery Creek	Cold transitional stream	8.34	3743	150	0
21098		Cool stream	2.2	987	247	95
21132	Sand Creek	Cold transitional stream	20	8977	359	329
21165	Grand River	Warm large river	1600	718176	157978	157222
21198		Cold transitional stream	8.3	3726	149	2
21206	Bass Creek	Warm stream	5.7	2559	614	211
21290	Beaver Creek	Warm stream	0.6	269	65	10
21317		Warm stream	2.3	1032	248	109
21372	Crockery Creek	Cool small river	35.7	16024	4006	1822
21446	East Branch Rush Creek	Warm stream	2.3	1032	248	122
21527	Little Bass Creek	Warm stream	2.4	1077	259	36
21540	Little Deer Creek	Warm stream	1.5	673	162	79
21548	Mill Creek	Warm stream	2.3	1032	248	78
21785	Norris Creek	Cold transitional stream	8.5	3815	153	76
<b>21810</b>		<b>Cold transitional stream</b>	<b>2</b>	<b>898</b>	<b>36</b>	<b>38</b>
21865	Black Creek	Cool stream	3.5	1571	393	99
22050		Cold transitional stream	1.8	808	32	18
22105	Sand Creek	Cool stream	7.4	3322	830	685
22107		Cold transitional stream	1.8	808	32	13
22224		Cold transitional stream	2	898	36	3
<b>22726</b>	<b>Bass River</b>	<b>Warm stream</b>	<b>8.8</b>	<b>3950</b>	<b>948</b>	<b>-80</b>
<b>23080</b>	<b>Rio Grande Creek</b>	<b>Cold transitional stream</b>	<b>4.6</b>	<b>2065</b>	<b>83</b>	<b>-13</b>
23179	Crockery Creek	Cool small river	35	15710	3927	2744
990163		Cool stream	2.9	1302	325	111
21159		Cool stream	1.4	0	77	77
15903		Cool stream	1.5	0	82	82

WMAs highlighted have not had an index flow review completed (these are triggered by the first Site-Specific Review in the WMA)

**WMAs in bold text have pending Site-Specific Reviews debiting them**

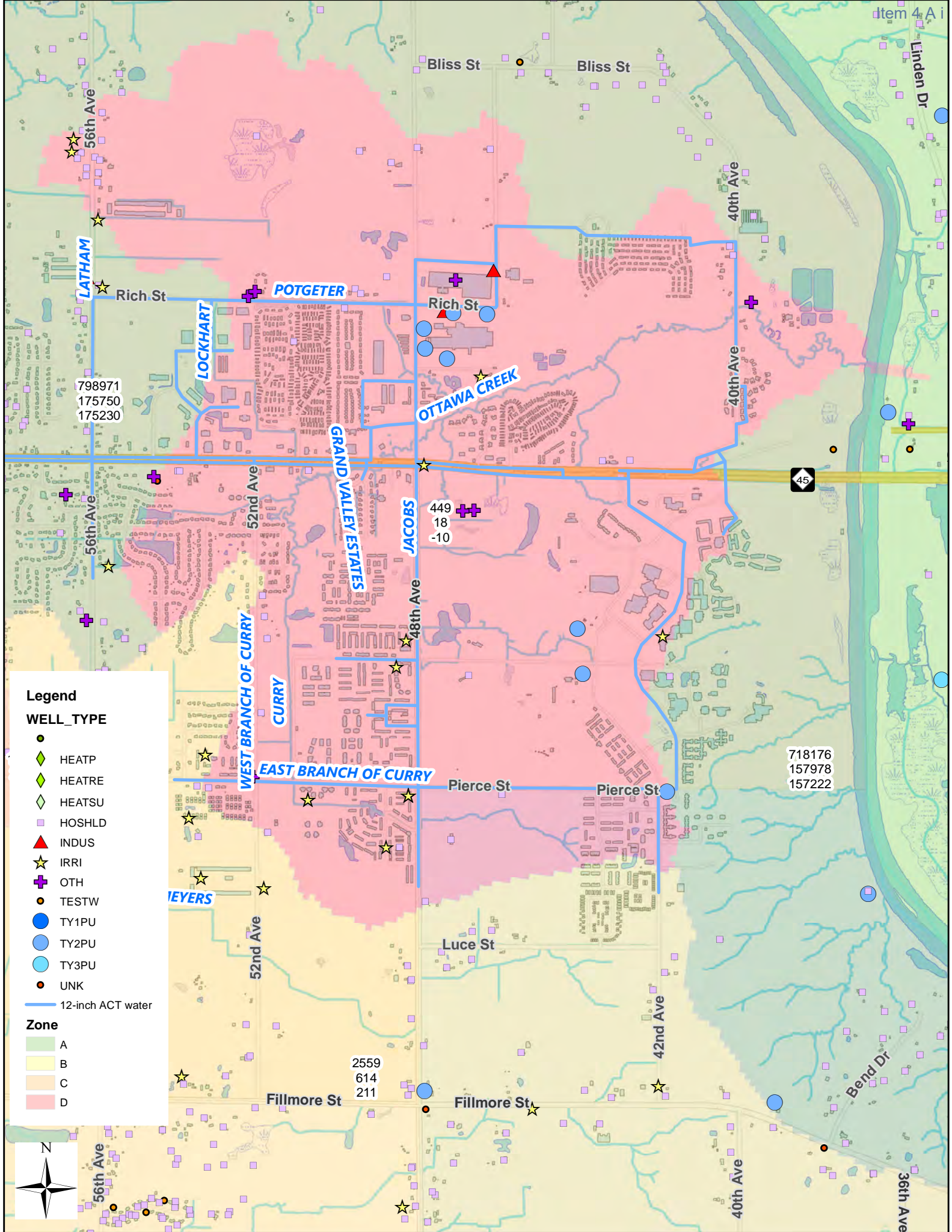


#### Item 4 Aoi



Index Flow (gpm)  
Total Available (gpm)  
Current Available (gpm)





**Legend**

**WELL\_TYPE**

- 
- ◆ HEATP
- ◆ HEATRE
- ◆ HEATSU
- HOSHL
- ▲ INDUS
- ★ IRRI
- ✚ OTH
- TESTW
- TY1PU
- TY2PU
- TY3PU
- UNK

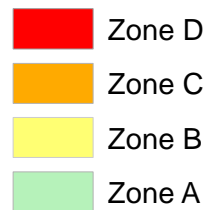
**Zone**

- A
- B
- C
- D

12-inch ACT water



# Water Withdrawal Assessment Tool Watershed Status Map for Ottawa County as of October 11, 2024



WMA Number	WMA Name	Stream Type	Index flow (cfs)	Index flow (gpm)	Total Available (gpm)	Currently Available (gpm)
10438	South Branch Macatawa River	Warm stream	1.5	673	162	20
4102		Coastline	0	0	1,440	1,440
4135	Macatawa River	Warm small river	12	5,386	916	25
4136		Warm stream	1.3	584	71	71
9861		Cool stream	1.5	673	168	168
9907		Coastline	0	0	1,440	1,440
9986		Warm stream	1.7	763	183	140
10085	Black Creek	Warm stream	2.6	1,167	280	79
10099	Black Creek	Cool stream	7	3,142	785	326
10131	North Branch Macatawa River	Warm stream	2.5	1,122	269	129
10168		Warm stream	0.7	314	75	49
10193	Little Rabbit River	Cool stream	17	7,631	1,907	46
11107	Pine Creek	Warm stream	5.2	2,334	560	6
11366	Macatawa River	Warm small river	21.7	9,740	1,656	675
12188		Warm stream	25	11,222	2,693	1,331
12293	Little Pigeon Creek	Cold stream	5.97	2,680	536	225
12452		Coastline	0	0	1,440	1,440
12673	Kelly Lake Drain	Cool stream	3.2	1,436	359	142
13126		Warm stream	0.9	404	97	1
13155	Macatawa River	Cool stream	2	898	224	104
14938	Little Black Creek	Cold transitional stream	3	1,347	54	49
15073		Coastline	0	0	1,440	1,425
15079		Coastline	0	0	1,440	1,440
15183	Pigeon River	Warm stream	7.7	3,456	829	0
15367	Pigeon River	Cold transitional stream	19	8,528	341	208
15879	Norris Creek	Cold transitional stream	15	6,733	269	149
15954		Cold transitional stream	17.2	7,720	309	155
16073	Ottawa Creek	Cold transitional stream	1	449	18	8
16106		Cold transitional stream	0.3	135	5	5
16108		Cold stream	1.3	584	117	55
16184	Rush Creek	Cool stream	7.8	3,501	875	477
20918	Grand River	Warm large river	1,780	798,971	175,750	175,322
20937	Rush Creek	Cold transitional stream	22	9,875	395	386
20943	Crockery Creek	Cold stream	14.4	6,464	1,293	573
20951	Deer Creek	Warm stream	4	1,795	431	419
21034	North Branch Crockery Creek	Cold transitional stream	8.34	3,743	150	150
21098	Nash Creek	Cool stream	2.2	987	247	9
21132	Sand Creek	Cold transitional stream	20	8,977	359	329
21165	Grand River	Warm large river	1,600	718,176	157,978	157,821
21198		Cold transitional stream	8.3	3,726	149	12
21206	Bass Creek	Warm stream	5.7	2,559	614	50
21290	Beaver Creek	Warm stream	0.6	269	65	10
21317		Warm stream	2.3	1,032	248	121
21372	Crockery Creek	Cool small river	35.7	16,024	4,006	1,822
21446	East Branch Rush Creek	Warm stream	4.2	1,885	452	347
21527	Little Bass Creek	Warm stream	2.4	1,077	259	29
21540	Little Deer Creek	Warm stream	1.5	673	162	41
21548	Mill Creek	Warm stream	2.3	1,032	248	87
21785	Norris Creek	Cold transitional stream	8.5	3,815	153	57
21810		Cold transitional stream	2	898	36	37
21865	Black Creek	Cool stream	3.5	1,571	393	69
22050		Cold transitional stream	1.8	808	32	21
22105	Sand Creek	Cool stream	7.4	3,322	830	381
22107		Cold transitional stream	1.8	808	32	1
22224		Cold transitional stream	2	898	36	3
22726	Bass River	Warm stream	8.8	3,950	948	158
23080	Rio Grande Creek	Cold transitional stream	4.6	2,065	83	1
23179	Crockery Creek	Cool small river	35	15,710	3,927	2,607
990163		Cool stream	2.9	1,302	325	146

WMAs highlighted have not had an index flow review completed (these are triggered by the first Site-Specific Review in the WMA)



# Ottawa County Water Management Areas

