

MEETING: REGULAR MEETING OF THE VILLAGE BOARD
DATE & TIME: Monday, August 19, 2024 at 7:00 PM
LOCATION: Germantown Village Hall Board Room
N112 W17001 Mequon Road

Any member of the body and/or citizen may attend the meeting virtually through the WebEx platform, Meeting #:2551 746 8900 Password: RGfHMePh684 which can be accessed by phone at 408-418-9388 or by clicking the link below:
<https://villageofgermantown.my.webex.com/villageofgermantown.my/j.php?MTID=mbac09c1bf900c82b3d4fd86d044402dc>

Citizens not wishing to attend the meeting personally or virtually may submit any public comments by sending an email to comments@germantownwi.gov by 4 p.m. on the day of the meeting so that it can be provided to the members of the body for their consideration. Previously recorded VillageBoard Meeting Videos can be viewed at:
https://www.youtube.com/channel/UCOYp0EgELzTCa9X_iCohyhQ

AGENDA

- I. **CALL TO ORDER:** *This meeting has been given public notice in accordance with Section 19.83 and 19.84, Wis. Stats, in such form that will apprise the general public and news media of subject matter that is intended for consideration and action.*
- II. **ROLL CALL:**
- III. **PLEDGE OF ALLEGIANCE:**
- IV. **PRESIDENT'S REPORT:**
- V. **ANNOUNCEMENTS OF FORTHCOMING EVENTS OF PUBLIC INTEREST**
COMMITTEE AND DEPARTMENT REPORTS:
 - A. Presentation of Commendation for Sgt. Brock Majkowski, Officer Jared Spreiter, Officer Jeremy Peterson and Officer Steven Hilleman
- VI. **CITIZEN INPUT:** *(Please be advised per 19.84(2) that information and comment will be received from the public. It is the policy of this municipality that public input be limited to a three (3) minute period per person with a time extension granted at the discretion of the Chairperson. Be advised that there may be limited discussion of the information received but no action will be taken under public comments.)*
- VII. **CONSENT AGENDA:**
 - A. Minutes: August 5, 2024
 - B. Resolution adopting the Comprehensive Tree Plan as required per municipal code 17.60.
 - C. Award of Kinderberg splash pad repairs to Carrico Aquatics for an amount not to exceed \$57,800 from accounts 91591000-592100 and 10591000-1000.
 - D. Award of library copula roof leak repair to Noffke Roofing in amount not to exceed \$23,500.00 from capital account 40564000-592300.
 - E. Award of Fireman's Park standing seam roof project to JK Contractors in an amount not to exceed \$19,060.00 from capital account 40564000-592300.
 - F. Fire Department Lieutenant Positions
 - G. GPD Purchase of Firearms and Related Equipment

- H. GPD Flock Safety Invoice

VIII. UNFINISHED BUSINESS

IX. PUBLIC HEARINGS:

X. NEW BUSINESS:

- A. Village of Germantown- Community Development Department - Proposed Text Amendments to Zoning Code Section 17.40 (Wellhead Protection) of the Village of Germantown Municipal Code.
- B. Well 12 Investigation: Findings and Next Steps Presentation by Water Quality Investigations
- C. Award of a contract to Water Quality Investigations for design and inspection services for liner installation in Well 12 for an amount not to exceed \$24,500 from account 45408460-543100.

XI. ADJOURNMENT:

UPON REASONABLE NOTICE, efforts will be made to accommodate the needs of disabled individuals through appropriate aids and services. For additional information or to request this service, please contact the Village Clerk at (262)250-4745 at least 2 days prior to the meeting.

MEETING:	REGULAR MEETING OF THE VILLAGE BOARD
DATE AND TIME:	Monday, August 5, 2024 7:00 PM
LOCATION:	Germantown Village Hall Board Room N112 W17001 Mequon Road

MINUTES

- I. **CALL TO ORDER:** *This meeting has been given public notice in accordance with Section 19.83 and 19.84, Wis. Stats, in such form that will apprise the general public and news media of subject matter that is intended for consideration and action.*

Village President Dean Wolter called the Village Board meeting to order at 7:04 PM.

II. **ROLL CALL:**

Present: Trustee David Baum, Trustee Robert Warren, Trustee Jan Miller, Trustee Phil Hudson, President Dean Wolter, Trustee Meg Cutts

Present via WebEx: Trustee Jolene Pieper

Absent:

Excused: Trustee Terri Kaminski, Trustee Rick Miller

Also Present: Village Administrator Steve Kreklow, Village Attorney Brian Sajdak, Village Clerk Donna Ott, Public Works Director Matthew Mortwedt, Finance Director Matthew Uselding

III. **PLEDGE OF ALLEGIANCE:**

IV. **PRESIDENT'S REPORT:**

President Wolter provided updates on upcoming election and polling location change, as well as upcoming Village events: budget sessions, Neighbors Against Crime National Night Out, Music at the Pavilion, and Movies in the Park.

V. **ANNOUNCEMENTS OF FORTHCOMING EVENTS OF PUBLIC INTEREST
COMMITTEE AND DEPARTMENT REPORTS:**

Trustees announced upcoming meeting dates and times, and events occurring in the Village.

- VI. **CITIZEN INPUT:** *(Please be advised per 19.84(2) that information and comment will be received from the public. It is the policy of this municipality that public input be limited to a three (3) minute period per person with a time extension granted at the*

discretion of the Chairperson. Be advised that there may be limited discussion of the information received but no action will be taken under public comments.)

Lynne Bednarz (W156N10121 Pawnee Ct) spoke regarding the budget.

Sarah Larson (W159N9737 Butternut Rd) spoke regarding Public Works, open records, legal services, and noise levels.

Scott Hefle (W159N10514 Old Farm Rd) spoke regarding the budget and TIDs.

Melanie Smythe (N140W17938 Cedar Ln) spoke regarding the proposed sound ordinance, audit, TID 9, and budget.

VII. CONSENT AGENDA:

A. Minutes: July 15, 2024

Motion: Approve as presented

Motioned By: Trustee Baum

Seconded By: Trustee Warren

Yes: Trustee Baum, Trustee Warren, Trustee Jan Miller, Trustee Hudson, President Wolter, Trustee Cutts, Trustee Pieper

No: None

Abstain: None

Motion Carried by Voice Vote (Yes 7, No 0, Abstained 0)

VIII. UNFINISHED BUSINESS

A. 5-Year Capital Improvement Plan

Public Works Director Mortwedt presented a proposed 5-Year Capital Improvement Plan.

Motion 1: Adopt 5-Year Capital Improvement Plan as a List of Potential Needs

Motioned By: Trustee Baum

Seconded By: Trustee Warren

Motion 2: Amend Motion 1 to Re-title "5-Year Capital Improvement Plan as a List of Potential Needs" to "5-Year Capital Improvement Considerations Goal"

Motioned By: Trustee Jan Miller

Seconded By: Trustee Cutts

Motion 2:

Yes: Trustee Jan Miller

No: Trustee Baum, Trustee Warren, Trustee Hudson, President Wolter, Trustee Cutts,

Trustee Pieper
Abstain: None

Motion 2 Failed by Voice Vote (Yes 1, No 6, Abstained 0)

Motion 3: Amend Motion 1 to Re-title "5-Year Capital Improvement Plan as a List of Potential Needs" to "Summary of CIP Expenditures"

Motioned By: Trustee Baum

Seconded By: Trustee Warren

Motion 3:

Yes: Trustee Baum, Trustee Warren, President Wolter, Trustee Cutts, Trustee Pieper

No: Trustee Hudson, Trustee Jan Miller

Abstain: None

Motion 3 Carried by Voice Vote (Yes 5, No 2, Abstained 0)

Motion 1 as Amended - "Adopt Summary of CIP Expenditures":

Yes: Trustee Baum, Trustee Warren, President Wolter, Trustee Cutts, Trustee Pieper

No: Trustee Hudson, Trustee Jan Miller

Abstain: None

Motion 1 as Amended Carried by Voice Vote (Yes 5, No 2, Abstained 0)

IX. PUBLIC HEARINGS:

No public hearings took place.

X. NEW BUSINESS:

- A. Pinno Construction, Agent for Stephen and Daniel Grunewald, Property Owners W124N13423 Wasaukee Road. Conditional Use Permit for a Mother-In-Law Suite.

Motion: Approve Conditional Use Permit as presented

Motioned By: Trustee Baum

Seconded By: Trustee Hudson

Yes: Trustee Baum, Trustee Warren, Trustee Jan Miller, Trustee Hudson, President Wolter, Trustee Cutts, Trustee Pieper

No: None

Abstain: None

Motion Carried by Voice Vote (Yes 7, No 0, Abstained 0)

- B. 2023 Audit Results

Finance Director Uselding and Leah Gaffney with Baker Tilly presented the 2023 Audit Results.

C. 2025 Budget Preview

Finance Director Uselding presented a 2025 Budget Preview.

D. Resolution Authorizing the Opening of an Ambulance Fee Loxbox

Motion: Approve Resolution as presented

Motioned By: Trustee Baum

Seconded By: Trustee Cutts

Yes: Trustee Baum, Trustee Warren, Trustee Jan Miller, Trustee Hudson, President Wolter, Trustee Cutts, Trustee Pieper

No: None

Abstain: None

Motion Carried by Roll Call Vote (Yes 7, No 0, Abstained 0)

E. Impact of Tax Increment Districts on Residential Property Tax Bills

Village Administrator Kreklow provided information regarding the Impact of Tax Increment Districts on Residential Property Tax Bills.

F. Discussion on how to shorten Village Board meetings

Trustees discussed ideas on how to shorten Village Board meetings. This item will be referred to the next General Government & Finance Committee meeting on August 19, 2024, for further discussion.

G. Propose new meeting date for Village Board due to Labor Day falling on Monday, September 2nd.

Motion: Move Monday, September 2nd, Village Board meeting to Tuesday, September 3rd

Motioned By: Trustee Hudson

Seconded By: Trustee Baum

Yes: Trustee Baum, Trustee Hudson, President Wolter, Trustee Cutts

No: Trustee Jan Miller, Trustee Warren, Trustee Pieper

Abstain: None

Motion Carried by Voice Vote (Yes 4, No 3, Abstained 0)

XI. ADJOURNMENT:

Village President Wolter adjourned the Village Board meeting at 10:15 PM.

DRAFT

BUSINESS OF THE VILLAGE BOARD

MEETING DATE: August 19, 2024

PLACEMENT: Resolution

ITEM TITLE: Resolution adopting the Comprehensive Tree Plan as required per municipal code 17.60.

SUBMITTED BY: Matthew Mortwedt, Public Works Director

SUMMARY EXPLANATION:

The attached draft of the Comprehensive Tree Plan (attachment 1) proposed by staff is intended to satisfy the requirement for such a plan outlined in municipal code section 17.60. That section of the code describes the Comprehensive Tree Plan as a plan that covers the "...care, preservation, pruning, planting, replanting, removal or disposition of trees ...along streets, and in other public places." The plan is intended to serve as a guide of staff on proper care of public trees, proper techniques for performing work, and proper communication with residents. The plan also serves as a guide for residents of Germantown regarding expectations of the Department of Public Works when it comes to caring for public trees.

Should the plan be adopted by resolution, additional changes to the code will be required to avoid conflicts and for consistency. Those changes are outlined in attachment 2 to this agenda item. Changes in the code will be considered at a PWHC meeting in the near future.

The draft plan was reviewed by the Public Works and Highway Committee in July 2024 and was available for public comment through July 31, 2024. Though no public comments were received, some revisions to the plan were made based on additional staff review.

Highlights of the plan include:

- Creation of a Tree Board (also required by 17.60), including a citizen member.
- Creation of a permit process, managed by DPW, for work on public trees, including provisions for HOA's to become a permittee
- Creation of communication standards with residents based on the type of tree maintenance activity being performed.
- Standards for new subdivisions and developers
- A new list of approved trees based on size, as required by code.

ATTACHMENT:

1. Comprehensive Tree Plan Resolution
2. Attachment 1 - Comprehensive Tree Plan - Final Draft

3. Attachment 2 - Code Change Log - Comprehensive Tree Plan

STAFF RECOMMENDATION:

Recommendation for adoption by resolution of the Comprehensive Tree Plan to the Village Board for approval.

ACTION BY Committee:

Approved 4-0.

RESOLUTION NO. 2024-____

RESOLUTION ADOPTING THE COMPREHENSIVE TREE PLAN

WHEREAS, the Germantown Village Board adopted the tree ordinance, which was intended to encourage the preservation, expansion, protection, and proper maintenance of the village urban forest; and

WHEREAS, the Germantown Village Board recognizes that benefits of a well maintained urban forest include increased biodiversity, improved public health and well-being, infrastructure protection, community engagement, and equitable access the benefits of trees; and

WHEREAS, the creation of a long term management plan for Germantown's urban forest is consistent with the Germantown tree ordinance; and

WHEREAS, the tree ordinance requires the adoption of a Comprehensive Tree Plan that includes a written plan for the care, preservation, pruning, planting, replanting, removal or disposition of public trees.

NOW, THEREFORE, BE IT RESOLVED, by the Village Board of the Village of Germantown, as follows:

That the Village of Germantown Village Board adopts the Comprehensive Tree Plan attached hereto as Exhibit A effective the date of this Resolution.

Passed by the Village Board this ____ day of September, 2024.

Dean Wolter, Village President

Donna Ott, Village Clerk

**The Village of Germantown
Comprehensive Tree Plan
Adopted: TBD
Revised: N/A**



Matt Mortwedt, Director of Public Works

Scott Anderson, Superintendent of Highways, Parks Buildings & Grounds

Nathan Schuettpelz, Village Forester

The Village of Germantown Comprehensive Tree Plan

In the heart of the Village of Germantown lies a natural treasure—a vibrant urban forest that not only enhances the beauty of our community but also serves as a vital asset for our environment, economy, and quality of life. Recognizing the invaluable benefits that trees provide, from purifying our air and water to mitigating climate change and enhancing biodiversity, the Village is committed to fostering the sustainable management and stewardship of our urban forest for generations to come.

This comprehensive tree plan represents a collaborative effort between municipal leaders, community stakeholders, and environmental experts to establish a strategic framework for the preservation, enhancement, and responsible utilization of our tree resources. Grounded in sound science, best practices, and community engagement, this plan seeks to address the diverse needs and priorities of our residents while ensuring the long-term health, resilience, and sustainability of our urban forest ecosystem.

Through this plan, we aspire to achieve the following key objectives:

1. *Promote Biodiversity and Resilience:* By prioritizing the planting of native tree species and fostering a diverse urban forest canopy, we aim to enhance ecological resilience, support local wildlife habitat, and minimize the risk of pest outbreaks and disease epidemics.
2. *Enhance Public Health and Well-being:* Trees play a crucial role in improving air quality, reducing urban heat island effects, and providing opportunities for recreation and relaxation. By strategically planting and maintaining trees in our neighborhoods, parks, and public spaces, we can promote physical and mental well-being for all residents.
3. *Ensure Safety and Infrastructure Protection:* Proper tree management, including pruning, removal, and maintenance, is essential for mitigating potential hazards such as falling limbs, root damage to infrastructure, and obstruction of utility lines. Through proactive risk assessment and management strategies, we aim to safeguard public safety and protect valuable assets.
4. *Foster Community Engagement and Education:* Engaging residents, businesses, schools, and community organizations in tree planting, care, and advocacy efforts is critical for building a culture of environmental stewardship and resilience. By providing educational resources, volunteer opportunities, and outreach initiatives, we seek to empower individuals and groups to take an active role in caring for our urban forest.
5. *Ensure Equitable Access and Distribution:* Every neighborhood in the Village of Germantown deserves equitable access to the benefits of trees, regardless of socio-economic status or geographic location. Through strategic planning and resource allocation, we will prioritize tree planting and maintenance efforts in underserved areas to promote social equity and environmental justice.

As we embark on this journey to cultivate a greener, healthier, and more sustainable future for the Village of Germantown, we invite all residents, businesses, and stakeholders to join us in this collective endeavor. Together, we can harness the power of trees to enrich our community, strengthen our resilience to environmental challenges, and leave a lasting legacy for future generations to enjoy.

The Comprehensive Tree Plan and the Village of Germantown Code of Ordinances. This Comprehensive Tree Plan was developed to meet the requirements set forth in the Village of Germantown code of ordinances, section 17.60. The plan is intended to supplement provisions

17.60 and meet the requirements outlined therein. This plan serves as a guide for Department of Public Works staff and residents. The plan sets expectations for how Village owned trees are managed.

Appendices:

Appendix A – Tree Planting Standards Checklist

Appendix B – Tree Pruning Standards Checklist

Appendix C – Tree Removal Standards Checklist

Appendix D - Required Forestry Budget

Appendix E – Non-Residential Development Street Tree Requirements

Appendix F - Permit

Urban and Rural Trees in the Right of Way. The Department of Public Works (DPW) maintains all trees within the right of way (ROW), also referred to as street trees. The right of way is a type of easement granted or reserved over the land for transportation purposes, such as roads, paths, transmission lines, pipelines, etc. Within the Village of Germantown, the right-of-way is most typically denoted for the purpose of roadway construction or maintenance. The land itself is owned directly by the Village and is not part of the adjacent property. DPW staff will maintain rural trees in the ROW and contract for tree maintenance in the ROW in more urban areas.



Image 1 – Right of way

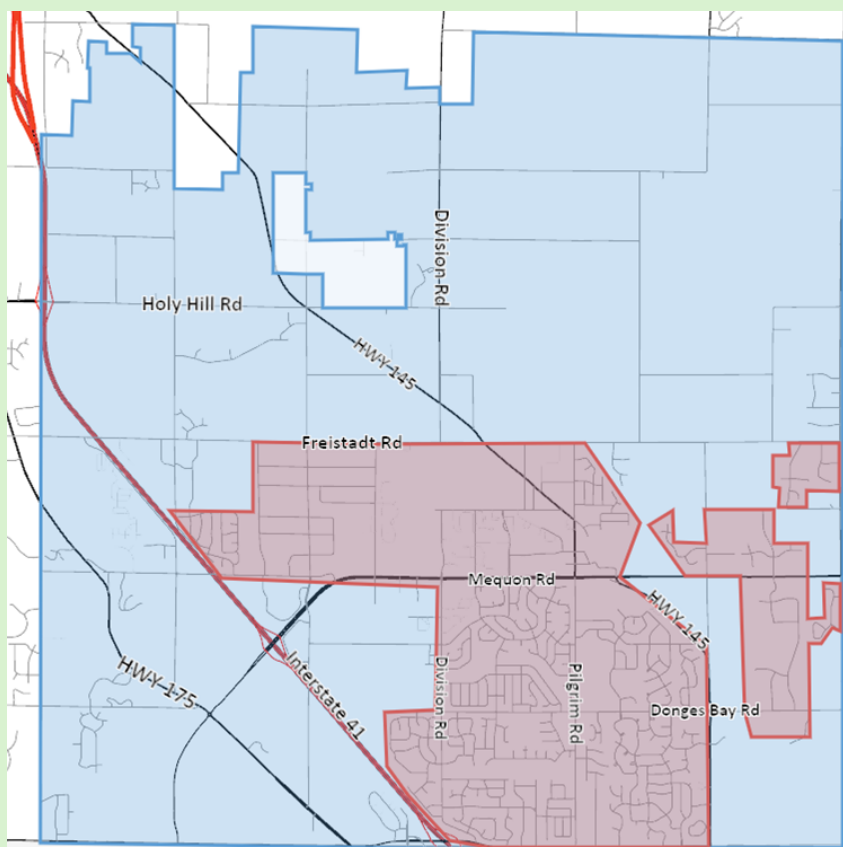


Image 2 – Urban (red) and Rural (blue) areas

Trees in Parks and on Village Owned Property. In addition to ROW trees, the DPW maintains all Village of Germantown Park trees, and trees on other property owned by the Village, such as properties with Village facilities. Park tree maintenance is conducted in a manner consistent with urban trees, discussed later in this plan.

Private Trees. The Village of Germantown does not plant or maintain trees on private property. Private trees are only subject to being maintained by DPW when the private tree affects the lives, health, safety and welfare of the public, public property or property owned or controlled by the Village.

1. The tree is determined to be a public nuisance in accordance with municipal code 17.60(5)a.
2. The tree is determined to be hazardous in accordance with municipal code 17.60(5)c.

Only when these provisions have been met will the Village of Germantown act upon, or compel action, upon private trees. Absent these criteria, private trees are considered a private matter. Issues between residents regarding private trees are also private.

The Village of Germantown is responsible for maintenance of right-of-way trees (street trees).

Tree Planting and Tree Replacement

Planting and Replacement Program Goals. The Village of Germantown seeks to grow the urban forest through a planting and replacement initiative. The goals of the planting program are to increase canopy cover, diversify tree species, enhance the public health and well-being, mitigate urban heat island effect, improve air quality, improve water quality, improve stormwater management, and provide greater biodiversity and habitat.

Planting Season. The time of year a tree is planted can greatly affect the tree's establishment because newly planted trees require water to survive and grow. Planting during the spring and fall will help ensure tree establishment and survival.

The planting season in Germantown extends from April 1 – June 15 in the spring and September 15 – October 31 in the fall. Planting during this timeframe is recommended.

If a planting permit is issued outside of the ideal planting season, the Superintendent of Highway, Buildings and Grounds may defer planting until the next planting season to promote survivability. The Superintendent will also factor in the species and location when deciding on exceptions to the planting season.

Planting Cycle. The Village plans to fill vacant planting sites over a five-year period.

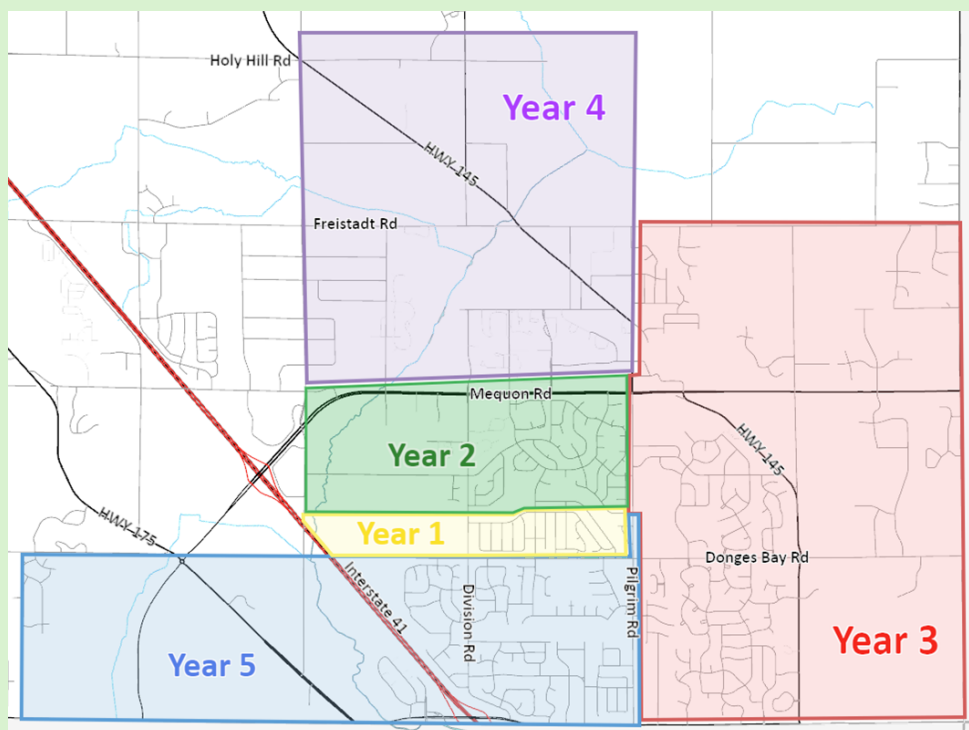


Image 3 - Five Year Vacant Planting Map

Species Diversity. Lessons learned from the Emerald Ash Borer (EAB) epidemic have resulted in a more tempered approach to urban tree species selection. In the past the “30-20-10” planting rule was used which stated you wouldn’t plant more than thirty percent from one family, no more than twenty percent from one genus and no more than 10 percent from one species. Municipalities that followed this rule, or perhaps maintained even less tree diversity, may have lost as many as one in five trees because of EAB.

The Village of Germantown now adopts a “20-10-5” rule. This means that no more than twenty percent of trees will be planted from one family, no more than ten percent from one genus and no more than five percent from one species. This rule will be evaluated in future years as current research seems to indicate that even more species diversity may be required to ensure the most resilient urban forest.

It is also worth noting that diversity should address age, size and location and those factors should play a role in decisions that are made regarding new planting.

Geographic Information System (GIS). The Germantown GIS must be updated with the location, species and year planted for all trees. Similarly, if an identified tree plot is left vacant the GIS must be updated.

Condition Assessment: Over a 5-year cycle, the Village will conduct a condition assessment of all urban trees identified in GIS. The condition rating will be added as an attribute to the tree asset in GIS.

Approved Tree List. The following trees are approved for planting in the ROW and parks:

SMALL TREES

Scientific Name	Common Name	Cultivars
<i>Amelanchier arborea</i>	Downy Serviceberry	
<i>Amelanchier x grandiflora</i>	Apple Serviceberry	‘Autumn Brilliance’, ‘Robin Hill’
<i>Amelanchier laevis</i>	Allegheny Serviceberry	‘Cumulus’, ‘Lustre’
<i>Carpinus caroliniana</i>	American Hornbeam	‘Firespire’
<i>Cercis canadensis</i>	Eastern Redbud	
<i>Crataegus crusgalli inermis</i>	Thornless Cockspur Hawthorn	
<i>Crataegus phaenopyrum</i>	Washington Hawthorn	
<i>Crataegus viridis</i>	Winter King Hawthorn	‘Winter King’
<i>Maackia amurensis</i>	Amur Maackia	‘Starburst’, ‘Summertime’, ‘JFS-Schichtel1’
<i>Malus spp.</i>	Flowering Crabapple	‘Adirondack’, ‘Jewelcole’, ‘Bob White’, ‘Harvest Gold’, ‘Jackii’, ‘Prairiefire’, ‘Professor Sprenger’, ‘Red Bud’, ‘Royal Raindrops’, ‘Sugar Tyme’, ‘Lanzam’, ‘Hargozam’
<i>Ostrya virginiana</i>	Ironwood	
<i>Syringa pekinensis</i>	Peking Lilac	‘China Snow’
<i>Syringa reticulata</i>	Japanese Tree Lilac	‘Ivory Silk’, ‘Summer Snow’, ‘Snowcap’, ‘Ivory Pillar’, ‘Snowdance’

<i>Cornus mas</i>	Cornelian Cherry Dogwood	‘Golden Glory’
<i>Prunus sargentii</i>	Sargent Cherry	‘JFS-KW58’

MEDIUM TREES

Scientific Name	Common Name	Cultivars
<i>Aesculus glabra</i>	Ohio Buckeye	‘Sunset’
<i>Cladrastis kentuckea</i>	American Yellowwood	
<i>Carpinus betulus</i>	Hornbeam	‘JFS-KW1CB’; ‘Fastigiata’
<i>Phellodendron amurense</i>	Amur Cork tree	
<i>Nyssa sylvatica</i>	Black Tupelo	
<i>Tilia spp.</i>	Linden	‘Crimean’; ‘Harvest Gold’; ‘Sterling’; PNI 6051’

LARGE TREES

Scientific Name	Common Name	Cultivars
<i>Aesculus flava</i>	Yellow Buckeye	
<i>Carya cordiformis</i>	Bitternut Hickory	
<i>Celtis occidentalis</i>	Hackberry	‘Prairie Pride’, ‘Chicagoland’, ‘Windy Village’, ‘JFS-KSU1’
<i>Cercidiphyllum japonicum</i>	Katsuratree	
<i>Corylus colurna</i>	Turkish Filbert	Autumn Gold'
<i>Eucommia ulmoides</i>	Hardy Rubber Tree	
<i>Ginkgo biloba</i>	Ginkgo (male only)	Autumn Gold', 'Magyar', 'Princeton Sentry'
<i>Gleditsia triacanthos inermis</i>	Thornless Honeylocust	Imperial', 'Shademaster', 'Skyline/Skycole', 'Sunburst', 'Street Keeper/Draves'
<i>Gymnocladus dioicus</i>	Kentucky Coffeetree	‘Espresso’, ‘Prairie Titan’, ‘Decaf’
<i>Liriodendron tulipifera</i>	Tuliptree	
<i>Platanus x acerifolia</i>	London Planetree	‘Exclamation’
<i>Quercus bicolor</i>	Swamp White Oak	
<i>Quercus x</i> ‘Crimschmidt’	Crimson Spire Oak	

<i>Quercus macrocarpa</i>	Bur Oak	
<i>Quercus robur</i>	English Oak	'Skymaster', 'Regal Prince', 'JFS-KW1QX'
<i>Quercus rubra</i>	Red Oak	
<i>Quercus x macdanielii</i> 'Clemons'	Heritage Oak	
<i>Quercus muehlenbergii</i>	Chinkapin Oak	
<i>Quercus x schuettei</i>	Swamp x Bur Oak	
<i>Ulmus x</i>	Hybrid Elm	'Accolade', 'New Horizon', 'Regal', 'Triumph', 'Discovery', 'Frontier', 'Pioneer', 'Cathedral'
<i>Ulmus parvifolia</i>	Lacebark Elm	

EVERGREENS TREES

Do not plant on streets, evergreens obstruct visibility making them hazardous on street locations.
Acceptable trees for parks and non-street tree locations.

Scientific Name	Common Name	Cultivars
<i>Abies concolor</i>	White Fir	
<i>Xanthocyparis nootkatensis</i>	Nootka Cypress	
<i>Juniperus chinensis</i>	Chinese Juniper	Iowa', 'Mounntbatten'
<i>Juniperus x</i>	Star Power Juniper	JN Select Blue'
<i>Picea glauca var. densata</i>	Black Hills Spruce	
<i>Picea omorika</i>	Serbian Spruce	
<i>Pinus bungeana</i>	Lacebark Pine	
<i>Pinus flexilis</i>	Limber Pine	Vanderwolf's Pyramid'
<i>Pinus strobus</i>	Eastern White Pine	Fastigiata'
<i>Pinus sylvestris</i>	Scotch Pine	
<i>Pseudotsuga menziesii</i>	Douglasfir	
<i>Thuja occidentalis</i>	Arborvitae	Smaragd', 'Hetz Wintergreen', 'Sunkist', 'Techny'
<i>Thuja plicata</i>	Western White Cedar	
<i>Tsuga canadensis</i>	Canadian Hemlock	

<i>Metasequoia glyptostroboides</i> *	Dawn Redwood*	‘Gold Rush’
<i>Taxodium distichum</i> *	Baldcypress*	‘Shawnee Brave’

The approved tree list is comprehensive, but subject to annual review with the update of this plan. The list provides the species of tree and its projected crown height when fully mature. Trees are placed in three categories:

Small (mature crown height under 30 feet)

Medium (mature crown height between 30 and 45 feet)

Large (mature crown height over 45 feet)

New Planting Locations. Street trees are a vital part of public infrastructure, reducing stormwater runoff, reducing heat, enhancing property values, and providing wildlife habitat. However, street trees share space with other public infrastructure, requiring careful selection of tree planting locations in the right-of-way. Because of this the following should take place:

Utility marking: The applicant shall call Diggers Hotline to identify the locations of underground utilities before identifying a new location or conducting any ground-disturbing activities.

Utility and Infrastructure Spacing: An appropriate amount of space must be allocated between a new tree planting location and existing infrastructure.

Spacing requirements: Mature tree size and planting site size define the minimum tree spacing requirements. Alternative designs may be approved by the Village Forester.

Large planting sites:

Improved sites greater than or equal to 6.0 feet wide without overhead high-voltage wires

Unimproved sites without overhead high-voltage wires

Medium planting sites:

Improved sites greater than or equal to 4.0 feet wide but less than 6.0 feet wide with or without overhead high-voltage wires

Improved sites greater than or equal to 6.0 feet wide with overhead high-voltage wires

Unimproved sites with overhead high-voltage wires

Small planting sites:

Improved sites greater than or equal to 3 feet wide but less than 4 feet wide with or without overhead high-voltage wires

Vacant Locations. As trees are removed there are various reasons that a planting site is left vacant. When identifying planting locations for a given year, priority will be given to currently vacant locations. An up-to-date record of vacant locations will be maintained in GIS.

Vacant locations may also evolve into ‘no plant’ locations. In that case, the location should be identified as “no plant” in GIS. Village staff will identify a replacement location for any location that has become unplantable.

New Planting Stock. *New public tree plantings will be from nursery grown bare root, containerized, or balled and burlapped tree stock.*

New Subdivisions and Developments. The standards developed in this plan pertain to new developments and subdivisions. This section supplements requirements in municipal code 17.43(5).

Trees should have appropriate spacing between other infrastructure in the right-of-way. The following table provides guidelines for developers:

Infrastructure	Feet
Water meter / vaults	10
Catch basins	10
Gas meters	10
Driveway aprons and crosswalks	10
Fire hydrants	10
Street lights	20
Electrical poles	20
Intersections / corners	45
Railroad tracks	100
Other trees	25-40 feet

Spacing between other trees in the right-of-way is variable depending on the mature height and width based on the species of the nearest tree(s). The desirable distance between trees is 30 feet. At a minimum, a residential lot in a new subdivision should have two right-of-way street trees.

Tree plantings for commercial and industrial development will be required per approved landscape plan, according to municipal code 17.43(5).

Non-Residential Developments. Non-residential developments must have an approved landscaping plan that meets tree standards for parking lots and street trees.

Planting Standards. Appendix A provides standards for planting a new tree, along with a checklist for staff to follow.

Watering. Watering is recommended for a 10-week period following planting. Village contracts will specify 3 supplemental waterings during the growing season spaced 4 weeks apart. The Village of Germantown requests that adjacent property owners supplement the watering. Where there are no adjacent property owners, watering is solely the responsibility of the Village.

Safety. DPW will follow all necessary procedures related to tree maintenance and working in the ROW to ensure the safety of staff, pedestrians, and motorists. Protection measures that will be utilized during forestry operations, include, but are not limited to, signage, traffic control, and barricades.

Work areas will be inspected for hazards like uneven terrain, overhead wires, or nearby structures. Appropriate precautions will be taken to mitigate risks.

If a safety concern is observed, work must stop, and a crew leader or supervisor must be contacted to resolve the issue before continuing.

Tree Pruning and Maintenance of Urban Trees

Pruning Technique. Maintenance of urban trees will be conducted by contracted staff and under the supervision of a certified arborist.

Tree pruning and maintenance of urban street trees is conducted according to ANSI A300 - Standard for Tree Maintenance. The ANSI A300 standard document is a proprietary document that is available in the Department of Public Works and has been incorporated into contract documents.

Pruning Standards and Checklist. Appendix B provides standards for pruning along with a checklist for staff to follow.

Cycle and Budget. There are 3,153 deciduous urban trees identified in the Germantown Geographic Information System (GIS). According to experts, the Ideal pruning cycle for urban municipal trees is somewhere between 5-8 years. A regular maintenance cycle helps to prevent disease, potential damage, allows for proper shaping and thinning, and addresses encroachment in the ROW. Approximately 400-630 trees need to be pruned each year within the Village at a cost of \$80,000 - \$126,000 to meet the recommended maintenance cycle. This plan proposes an initial 9-year cycle to balance budgetary demands of a new program and the need for systematic maintenance. A 9-year pruning cycle would demand a consistent pruning budget of \$70,000. Future planning periods should consider shortening the pruning cycle to fall within the recommended range. As the urban forest grows the commitment to pruning will also grow.

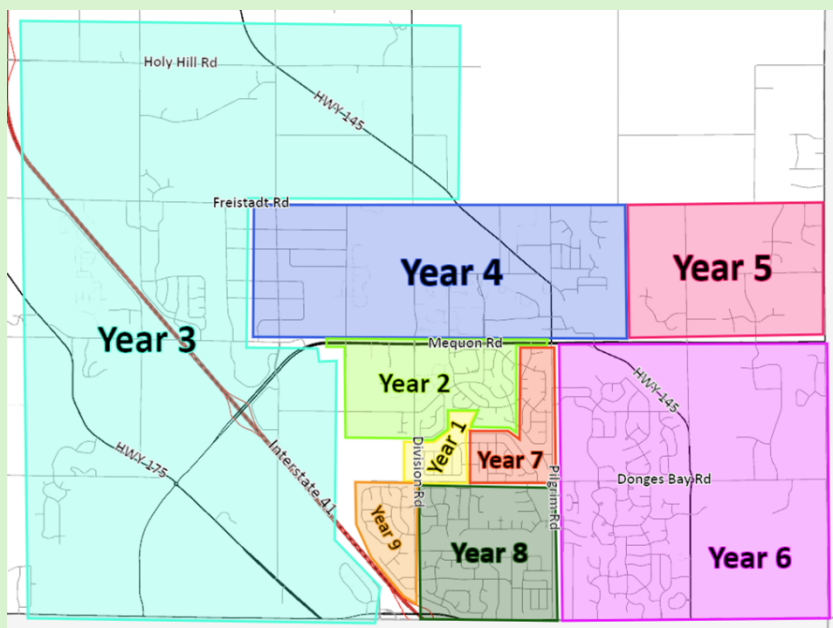


Image 4 - 9-year Cycle: 2024-2033

Treatment: Disease and Insect Control

Assessment and Monitoring. DPW and the Village Forester will complete a comprehensive inventory of all urban municipal trees in a 5-year cycle. The assessment of the tree will factor in all conditions including signs of disease or insect infestation. The condition assessment will flag trees that need an additional treatment feasibility analysis.

Treatment Feasibility Assessment and Integrated Pest Management (IPM). A tree flagged for a treatment feasibility analysis will be reviewed by the Superintendent of Highways, Buildings and Grounds and the Village Forester. Factors in the IPM strategies will include:

- Treatment options available (biological, mechanical, chemical controls)
- Thresholds for treatment based on severity
- The likelihood of successful treatment
- The cost of treatment over time
- The available budget for treatment
- The cost of removal and replacement

Using this multi-factored approach, DPW will determine how to properly care for the tree.

Enhanced Monitoring. When a tree has become diseased or infested and a treatment measure was applied, it will be placed on an enhanced annual monitoring cycle. The effectiveness of treatment will be noted with a new condition assessment. The effectiveness of the treatment will be evaluated, using the same criteria, for continued treatment (if applicable).

Documentation. Documentation of the tree's condition, disease condition, and treatments applied will be updated in GIS.

Tree Pruning and Maintenance of Rural Trees

Maintaining trees in rural areas is essential for safety, aesthetics, and ecosystem health. DPW will follow these guidelines when addressing maintenance of rural trees.

Rural Tree Inventory and Assessment. While a comprehensive inventory and assessment of all rural trees in the ROW is not practical, staff will identify problem trees and problem areas that need to be addressed. Initial assessment will include contributing factors such as the health of

the tree, structural integrity, risk to those in the ROW and on private property, the volume of traffic in a hazard area, and proximity to infrastructure.

Maintenance Plan. Based on the assessment, develop a long-term maintenance plan outlining pruning schedules, tree inspections, and other necessary actions. Maintenance tasks will be prioritized based on urgency, budget constraints, and community needs, considering factors such as tree health, age, species, potential impact to the ROW or private property, and the volume of traffic near the problem area.

Maintenance of rural ROW trees will be conducted primarily by DPW staff, unless specialized equipment or personnel are needed based on complexity of the job, safety, or other factors.

Pruning Guidelines. Follow industry best practices and ANSI A300 standards for tree pruning to ensure safety, tree health, and aesthetic appeal.

Prune trees to remove dead, diseased, or damaged branches, improve structure and form, and reduce hazards such as low-hanging limbs or overhanging branches near roads and utilities.

Avoid excessive pruning, especially topping or lion-tailing, which can weaken trees and promote decay.

Pruning Standards and Checklist. Appendix B provides standards for pruning along with a checklist for staff to follow.

Qualified Personnel and Equipment. Ensure that pruning and maintenance activities are carried out by trained and/or certified arborists, or qualified tree care professionals. All pruning and maintenance activities shall be supervised by an ISA Certified Arborist.

Provide personnel with appropriate safety gear, tools, and equipment, including pruning saws, pole pruners, and safety harnesses.

Where appropriate, for urban trees, ROW tree maintenance will be outsourced to a contractor and supervised by an ISA Certified Arborist.

Timing of Pruning. Schedule pruning activities during the dormant season (late fall to early spring) to minimize stress and promote rapid wound closure.

Avoid pruning during periods of active growth or flowering, as it can increase the risk of disease transmission and excessive wounding.

Planned Tree Removal

Assessment and Evaluation. Prior to initiating tree removal, DPW will conduct a thorough assessment to determine the need for removal. Consideration will be made for factors such as tree health, structural stability, location, proximity to buildings, utilities, roads, cost, and potential risks to public safety. During the process we will evaluate alternatives to removal, such as pruning, treatment, cabling, or other mitigation measures, whenever feasible. The Village Forester will be consulted.

Complexity. Based on the complexity of removal, specifically the size of the tree, the proximity to infrastructure, the public, utilities, etc., DPW may choose to contract out for tree removal.

Safety Measures. DPW will prioritize the safety of personnel, property, and the public throughout the removal process. Staff, assisted by crew leaders, will establish a safe work zone with clear boundaries and signage to alert pedestrians and vehicles to potential hazards. Both DPW staff and/or contracted crews will use appropriate personal protective equipment (PPE), including helmets, gloves, eye protection, chainsaw chaps, and high-visibility clothing.

Removal Plan. Before the tree is removed an assessment of the personnel, equipment and coordination necessary for removal will be conducted. Once the plan has been established a briefing will be conducted at the shop to go over the removal plan and discuss safety. If, for any reason, safety issues cannot be resolved the operation cannot continue until all concerns are addressed. Crew leaders may involve management up to and including the Director of Public Works.

Mobilization. Once the removal plan has been briefed and no issues remain mobilization to the site is able to occur. Crews should ensure that equipment and tools used for tree removal are properly maintained, inspected, and operated by trained personnel. A pre-operation inspection is required for all equipment.

Tree Removal. The removal standards identified in Appendix C will always be followed. Complex removals will be conducted under the supervision of an ISA Certified Arborist.

Communication. DPW will keep residents informed through communications in person, on social media, the Village of Germantown website and, if warranted, local media. Communication with residents will precede the tree removal to the greatest degree possible. The communication to citizens will include the scope of the work and the anticipated schedule. The extent of the Village's communication regarding the removal will be tied to the scope of the tree removal work.

Example 1: Removal of a single ROW tree would result in direct communication with the adjacent property owner only.

Example 2: Removal of five diseased trees in a subdivision will result in direct communication with the adjacent property owner but may also include social media postings.

Example 3: A large-scale removal of trees may involve a variety of communication methods.

Documentation. Documentation of the removal will be captured in work orders (staff time, contractor cost, equipment time) and in GIS. Affected assets in GIS will be updated to reflect the new condition. If the asset was removed, then GIS should be updated to reflect a vacant site or no replant site.

Emergency Tree/Branch Removal

DPW will provide emergency response to deal with damaged trees in the ROW. The emergency response will be timely and ensure the safe removal of branches or trees within the right-of-way in the Village of Germantown to prevent hazards to residents, property, and infrastructure.

Initial Assessment. Upon receiving a report of a fallen tree or damaged and hazardous branches within the village right-of-way, DPW will assess the situation promptly. If during working hours the Superintendent of Highway, Parks, Buildings and Grounds, or his staff, will be notified of the hazard condition. After hours, the call may be taken by Germantown Police Department or the Germantown answering service and DPW will be contacted through normal after-hours emergency procedures. After assessing the situation, using information from the

caller, a determination will be made about the immediacy of the need for the hazard to be mitigated.

Safety Measures. Of primary importance in the initial evaluation is determining the potential impact on safety. Priority remediation efforts will be given to issues that affect resident safety, traffic safety, or the safety of first responders. If any of these conditions exist DPW will treat the remediation efforts as an emergency response which will require a site investigation. If the traveling roadway is affected coordination with Germantown Police Department will also be initiated.

Site Investigation / Evaluation of Hazards.

The evaluation will determine the level of safety precautions that need to be in place, the personnel and equipment needed to address the hazard.

1. Establish a safe perimeter around the affected area to prevent access by pedestrians or vehicles. If necessary, coordinate with local law enforcement to divert traffic away from the area.
2. Assess the size and location of the fallen tree or branches.
3. Determine potential risks to nearby buildings, roads, utilities, and pedestrians.
4. Deploy trained personnel equipped with appropriate tools for tree removal (e.g., chainsaws, safety gear).
5. Coordinate with relevant departments, external contractors and utilities for additional support, if needed.

Tree/Branch Removal. The focus of an emergency response will be to mitigate priority hazards. Depending on the time of day, resources available and extent of the damage, the emergency response from DPW may just address specific hazard and future work at the same site may be scheduled later. Pruning standards identified in this plan will apply to the greatest extent possible.

Communication. DPW will keep residents informed through communications in person, on social media, the Village of Germantown website and, if warranted, local media. With that said, safety is the overriding factor and if time does not allow for communication, outreach will be conducted following the emergency operation.

Documentation. Documentation of the emergency response will be captured in work orders (staff time, contractor cost, equipment time) and in GIS. Affected assets in GIS will be updated to reflect the new condition. If the asset was removed, then GIS should be updated to reflect a vacant site or no replant site.

Permits Required

Any planting, pruning, or other tree maintenance of a tree in the ROW must be permitted, as per Germantown Code 17.60(4). Permits may be obtained at the Germantown Village Hall in the Department of Public Works. Permits will be reviewed by the Superintendent of Highway, Buildings, and Grounds prior to approval. All standards identified in this plan and in the municipal code will be enforced through the permit. Permitted trees planted in the ROW are considered donations to the Village of Germantown and all future maintenance is the responsibility of the Village of Germantown, unless otherwise permitted. Receipt of an approved permit serves as acknowledgement of a permittee's understanding of all applicable standards and acts as an agreement to conduct their permitted work according to those standards.

Upon completion of permitted tree work the permittee will contact the Superintendent of Highway Buildings and Grounds. An inspection of permitted work by the Superintendent of Highway, Building and Grounds will ensure work was completed to standards. The Superintendent of Highway, Building and Grounds may require the permittee to perform additional work to properly conform to standards.

Permits are available at no fee. Non-compliance with a permit or failure to remedy unsatisfactory work will result in a penalty per municipal code 17.60(12).

Determinations made by staff related to permit denials may be reviewed by the Tree Board.

Adjacent Landowners Responsibility. No person shall remove, trim, cut roots, or disturb any ROW tree, park tree or other public tree without a permit.

Homeowners Associations (HOA). HOA's may annually apply for permits for pruning, planting, or other tree maintenance, in the ROW on behalf of their members who have properties adjacent to ROW trees. The Village of Germantown will not approve permit requests from an HOA that do not address ROW trees in the HOA holistically. Permitted work will be performed according to these standards, and subject to inspection, corrective action and penalties as described above under "Permits". The permitted work will be conducted at the cost of the HOA. Planted trees in the ROW become the property of the Village of Germantown. The permitted work of HOA's must be coordinated with the Superintendent of Highway, Buildings and Grounds.

The Tree Board

The tree board will be established and act in accordance with municipal code 17.60.

Members. The Tree Board will consist of three members:

- A Village Trustee
- The Village Forester, and
- A citizen from the Village of Germantown

Terms. The Village Trustee and citizen members will serve two-year staggered terms. Upon plan adoption the citizen member will serve an initial two-year term. The Village Trustee will serve an initial one-year term. Subsequent term(s) of the Village Trustee will be two-year terms.

Appointment. The Village President will nominate the Trustee member and the citizen member to serve two-year terms. The appointments will be confirmed by the Village Board.

The Village Forester will remain on the Tree Board to coincide with his/her ongoing appointment to the Village Forester position.

Advisory Role. Except as noted below, the Tree Board serves in an advisory capacity to the Public Works and Highway Committee. Contracts for tree maintenance and planting are ultimately approved by the Public Works and Highway Committee and/or the Village Board, depending on the value of the contract.

Scope of the Tree Board

Annual Operations and Maintenance Plan Review - The Department of Public Works will make an annual presentation to the Tree Board which will consist of the plan for the current year operation, the communication plan, and the 5-year plan. The Tree Board will make a recommendation to the Public Works and Highway Committee regarding the approval of the annual operations plan and 5-year plan.

Comprehensive Tree Plan Review – As the Comprehensive Tree plan is revised time-to-time, it will be brought to the Tree Board for review.

Appeals of Determinations and Orders - The Tree Board may convene, as required by municipal code 17.60 (9), to review an appeal of a determination or order made by staff. At such hearing the Tree Board may reverse, affirm, or modify the order of the determination appeal. The grounds for its decision shall be stated in writing. The Tree Board shall by letter notify the party appealing the order or determination of its decision within 10 days after the hearing has been concluded and file its written decision with the Village Clerk. The decision of the tree board is final and not subject to additional appeal.

Plan Review and Community Outreach

Comprehensive Tree Plan Review. This plan will be reviewed annually.

Community Outreach. Community outreach regarding the annual operations for tree planting and maintenance will be conducted in numerous ways.

1. Letters will be sent to property owners with adjacent ROW trees outlining the type of tree maintenance they can expect and the anticipated timing of the work. Outreach letters will precede any tree work by a minimum of three weeks.
2. Village of Germantown social media will announce all work.
3. The Village of Germantown website will announce all work as an alert and post the annual operations plan, the 5-year plan and the Comprehensive Tree Plan.

Continuous Monitoring and Feedback. DPW will Monitor the health and condition of pruned trees over time, observing growth patterns, pest infestations, and response to pruning

treatments. The annual operations plan and the 5-year plan may need to be adjusted based on new conditions.

Feedback from residents will be tracked by DPW. Solicit feedback from residents and stakeholders regarding the effectiveness of maintenance efforts, responsiveness to concerns, and overall satisfaction with the rural tree management program.

Comprehensive Tree Plan – Appendix A

Tree Planting Standards Checklist

- ☐ Notify affected residents, property owners, and stakeholders in advance of planned tree planting activities.
- ☐ Provide clear and transparent communication about the reasons for planting, proposed timelines, and any mitigation measures or alternatives considered.
- ☐ Prepare planting holes of appropriate size and depth, typically two to three times the width of the root ball.
- ☐ Handle trees with care to avoid damage to roots, branches, or trunk.
- ☐ Remove packaging materials and gently loosen or remove any circling roots before planting.
- ☐ Position the tree in the center of the planting hole, ensuring that the root collar is level with or slightly above the surrounding soil surface.
- ☐ Backfill the hole with native soil, avoiding the use of excessive amendments or fertilizers.

- ☐ Create a shallow watering basin around the base of the tree to facilitate irrigation.
- ☐ Water newly planted trees thoroughly immediately after planting to settle the soil and promote root establishment.
- ☐ Provide regular watering during the first growing season, especially during periods of drought or high temperatures. Watering should be weekly in the initial 3 months of the planting.
- ☐ Apply a layer of organic mulch (e.g., wood chips, bark) around the base of the tree, leaving space around the trunk to prevent moisture buildup and potential decay.
- ☐ Mulch should be spread evenly to a depth of 2-4 inches to conserve soil moisture, regulate soil temperature, and suppress weed growth.
- ☐ Clean up the planting location so it is clear of excess materials, packaging, equipment, etc.
- ☐ Evaluate the need for staking based on the size, species, and site conditions of the newly planted tree.
- ☐ Use flexible, non-abrasive materials for staking to minimize damage to the trunk and branches.
- ☐ Install stakes at a slight angle away from the tree, securing them firmly but not tightly to allow for natural movement.
- ☐ Monitor the tree regularly and remove stakes and support systems once the tree has established sufficient root anchorage.
- ☐ Record the tree species, planting dates and condition assessment in GIS.
- ☐ Establish a monitoring schedule to track the growth and health of newly planted trees over time.
- ☐ Use collected data to evaluate the success of tree planting initiatives and inform future planning and management decisions.

Comprehensive Tree Plan – Appendix B

Tree Pruning Standards Checklist

- ☐ Notify affected residents, property owners, and stakeholders in advance of planned tree pruning activities.
- ☐ Provide clear and transparent communication about the reasons for pruning, proposed timelines, and any mitigation measures or alternatives considered.
- ☐ Use properly maintained and sanitized pruning tools to minimize the spread of disease pathogens.
- ☐ Inspect equipment before pruning activities are initiated.
- ☐ Ensure that pruning tools are sharp and properly adjusted to make clean, precise cuts.
- ☐ Assess potential hazards such as falling limbs, overhead wires, or pedestrian traffic before initiating pruning activities.
- ☐ Use appropriate personal protective equipment (PPE), including helmets, gloves, eye protection, and high-visibility clothing.

- ☐ Secure work areas with warning signs, cones, or barriers to alert pedestrians and vehicles to the presence of pruning crews.
- ☐ Conduct routine pruning during the dormant season (late fall to early spring) to minimize stress and promote rapid wound closure.
- ☐ Address immediate safety hazards or emergency situations promptly, regardless of the season.
- ☐ Use proper pruning techniques to minimize damage and promote healing. Follow the ANSI A300 Standard at all times.
- ☐ Make clean, smooth cuts just outside the branch collar to facilitate compartmentalization and minimize the risk of decay.
- ☐ Avoid leaving stubs or making flush cuts, as they can impair wound closure and lead to long-term health issues.
- ☐ Prioritize the removal of dead, diseased, or broken branches.
- ☐ Identify and correct structural defects such as co-dominant leaders, included bark, and narrow crotch angles.
- ☐ Maintain a balanced canopy by selectively thinning overcrowded or crossing branches.
- ☐ Avoid excessive pruning of healthy green foliage, as it can stress the tree and compromise its ability to photosynthesize.
- ☐ Clean-up after pruning as is appropriate for the location of the pruned tree. Urban street tree clean-up may be more extensive than rural street tree clean-up activities.
- ☐ Maintain records of pruning activities, including the date, location, reasons for pruning, and specific pruning cuts made in GIS associated with that asset.
- ☐ Document any observed signs of pest infestations, diseases, or other tree health issues through an updated condition assessment in GIS.

Comprehensive Tree Plan – Appendix C

Tree Removal Standards Checklist

- ☐ Notify affected residents, property owners, and stakeholders in advance of planned tree removal activities per plan requirements. In emergency situations prioritize safety with secondary notifications, if advance notification is not possible.
- ☐ Provide clear and transparent communication about the reasons for removal, proposed timelines, and any mitigation measures or alternatives considered.
- ☐ Conduct a thorough assessment of the tree to determine the need for removal.
- ☐ Consider factors such as tree health, structural stability, location, and potential risks to nearby structures, utilities, and pedestrians.
- ☐ Evaluate alternatives to removal, such as pruning, cabling, or other mitigation measures, whenever feasible.
- ☐ Establish a safe work zone with clear boundaries and signage to alert pedestrians and vehicles to potential hazards.
- ☐ Use appropriate personal protective equipment (PPE), including helmets, gloves, eye protection, chainsaw chaps, and high-visibility clothing.

- ☐ Ensure that equipment and tools used for tree removal are properly maintained, inspected, and operated by trained personnel. Conduct a pre-operation check of all tools and equipment.
- ☐ Use specialized equipment such as chainsaws, ropes, and rigging gear as needed to safely remove trees in confined spaces or near structures.
- ☐ Employ safe and efficient tree removal techniques based on the size, species, and condition of the tree.
- ☐ Consider the use of directional felling, piecemeal dismantling, or crane-assisted removal methods to minimize risks and damage to surrounding property.
- ☐ Minimize impacts to the surrounding environment, including nearby vegetation, wildlife habitat, and soil integrity.
- ☐ Implement erosion control measures as needed to prevent soil erosion and sedimentation during removal activities.
- ☐ Dispose of tree debris and wood waste as appropriate, according to the location. Clean-up in urban areas may be more extensive than clean up in rural areas.
- ☐ Consider opportunities for composting, chipping, or repurposing tree materials to minimize waste and support sustainable resource management practices.
- ☐ Remove all debris, logs, and branches from the removal site promptly after completion of the work.
- ☐ Restore disturbed areas to their original condition or implement revegetation measures as needed to prevent soil erosion and promote site stabilization.
- ☐ Maintain accurate records of tree removal activities, including the date, location, reasons for removal, and methods used. The location should be updated in GIS to reflect the vacancy.
- ☐ Document any observed signs of pest infestations, diseases, or other tree health issues that may have contributed to the need for removal.⁴

Comprehensive Tree Plan – Appendix D - Budget

Required Forestry Annual Budget

Historical Forestry Budget

Forestry Consultant	\$15,000
Emerald Ash Borer Treatment	\$10,000
Tree Planting	\$35,000
Contracted forestry work / contracted pruning	\$40,000
Total	\$100,000

Necessary Budget* per Comprehensive Plan

Forestry Consultant	\$20,000
Emerald Ash Borer Treatment	\$10,000
Tree Planting	\$35,000
Tree Pruning	\$70,000
Contracted forestry work	\$20,000
Total	\$155,000

*This budget is presented in 2024 dollars and will need annual adjustments for inflation

Comprehensive Tree Plan – Appendix E

Non-Residential Development Street Tree Requirements

Quantity of Trees. Determining the quantity of street trees required adjacent to a development depends on the species size, the width of the right-of-way (ROW), and the length of ROW. The developers plan shall utilize the approve species listed in the Comprehensive Tree Plan and the spacing outlined below:

<u>Tree Size</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>
Spacing	25-30'	30-40'	50'
Minimum ROW Width	5'	5-8'	8+'

Additional spacing requirements are addressed below and may affect the quantity of trees adjacent to a development. The plan will be reviewed and approved by the Village Forester.

Geographic Information Systems. The Village requires all new street trees to be recorded in the Village geographical information system (GIS). Newly added street trees will be added to the Village GIS at a cost to the developer where the Village will bill for actual costs to update the system.

Variety. Developers are encouraged to present plans that include a variety of approved species. The variety of species is subject to approval of the Village Forester.

Specification for Planting Street Trees

- All plant material shall be true to name and type, and first-class representatives of their species or variety. They shall have normal, well-developed branches, be healthy, vigorous plants free from defects, plant disease, and all forms of infestation or objectionable disfigurements. Either bare root, containerized, or balled and bulapped trees are acceptable. All plant material shall conform to American Standard for Nursery Stock (**ANSI Z60.1 - 2004**).
- The street trees shall be centered between the back of the curb and the street side of the existing or future sidewalks (if no walk is planned, it will be centered in the right-of-way). Spacing of trees from various infrastructure and features of the right-of-way are addressed in the Comprehensive Tree Plan (above).
- If there is not sufficient space to plant street trees in the right of way developer may plant an equal number of trees on private property. This will be accounted for in the developer's landscape plan. Any trees planted on private property will be maintained by the developer or owner.
- All street trees planted shall be of minimum size of 2" in caliper for containerized and balled and burlapped trees and 1 ¾" for bare root trees.
- The size for the tree installation hole shall be a minimum of 36" in diameter. Trees shall be planted with the root collar exposed at or slightly above the surface level. For balled trees, the hole shall be at least 18" larger than the largest diameter of the ball and no deeper than the ball. Remove twine, clip and fold back wire basket and trim burlap.
- Soil for backfilling around roots and/or root balls shall be the existing soil from the excavation. Where existing soil is rocky and poor quality, the local brown topsoil may be used. Soil shall be pulverized and screened. All material dug from the plant holes and not used shall be removed from the site and disposed of. Immediately after planting, soil around roots and balls shall be thoroughly watered.
- At the time of planting, trees shall be pruned only to remove dead, broken, or diseased branches or cross branches that rub. As much of the crown as possible shall be maintained to create food for the tree. Trees shall appear symmetrical in shape and appearance.
- Persons installing street trees shall take all necessary precautions to minimize the damage to existing lawns. Any damage to existing lawns shall be repaired by placing topsoil and seed in the damaged area. The final determination to be made by the Village Forester.

- Upon completion of planting, individual planting holes shall be outlined with a shoulder of soil, placed outside of the planting hole rim to form a saucer. Wood mulch material shall be placed to cover disturbed areas to a minimum depth of three (3) inches, but there will be an air gap 1" wide around the base of the trunk with no mulch to keep the root flare exposed.
- Street trees do not need to be staked, unless required by the Village Forester due to size or species. If staking is required, a minimum of two wood posts that have a minimum diameter of 2½" shall be used. The minimum length of the posts shall be the depth of the bore plus one-half the height of the tree. The posts shall be installed at least one foot outside the diameter of the tree planting hole. The tree shall be connected to the posts with a 2" x 1/16" strap of such design so as not to damage the tree. The straps shall be located midway between the base of the trunk and the point where branching occurs. The tree shall be planted as plumb as possible and the contractor shall maintain tree plumbness throughout the guarantee period. All stakes shall be removed within one year of planting.
- Street trees planted between June 15 and September 15 should be avoided. If it cannot be avoided trees shall be balled and burlapped. These trees shall also be on a maintenance watering schedule, if natural rainfall is not sufficient during this time period.
- All installations must be inspected by the Village Forester, or a representative. If, in the sole opinion of the Village Forester, additional remedies are needed to assure the stocking and maintenance of healthy tree specimens, additional remedies may be required.
- Street trees installed by a developer shall be guaranteed for one (1) year. Replacement trees after one shall be the responsibility of the Village.
- The Village Forester may add to or delete from the list of approved trees. This may include trees that have come under attack from insects or disease that should not be planted. This information may come from DNR Forest Health or UW Extension staff or alerts.

Note: Refer to the DNR guidelines for current planting specifications.

[Urban Tree Planting Resources](#) | [Wisconsin DNR](#)

Comprehensive Tree Plan – Appendix F – Permit Application

Application for Permit to Prune, Remove, Plant or Treat Tree(s) on Public Property within the Village of Germantown.

Property Owner/Homeowners Association:

Date: _____

Address: _____

Phone: _____

Permit is requested to _____ (prune / treat / remove / plant) a tree or trees.

Location of tree(s)

Type and approximate trunk diameter of tree(s):

If the permit is for pruning or removal, please state the reason for action. If the permit is to plant a tree, please identify the type and size of tree to be planted. If the permit is to spray, please state the chemical to be used and follow directions on the label.

Who will do the work? _____

(If someone other than the property owner, then a License must also be obtained) It is understood and agreed that if this application is granted, then the property owner will have the work done in a workmanlike manner, comply with any special instructions stated in the Comprehensive Tree Plan, remove from the street all debris and dirt and replace the paving and lawn and leave them compatible with the surrounding landscape. It is further agreed that the applicant will save the Village its officers, employees, and agents free and harmless from all damage to life, limb and property arising from the proposed work and as well as damage to nearby and abutting property. It is further agreed that the applicant will comply with all provisions of the ordinances of the Village of Germantown and with the laws of the State of Wisconsin.

Applicant's signature (if an individual):

Authorized agents signature and title (if an HOA):

- - - - - Staff Notes:

Permit is approved _____ Permit is denied _____ Permit No:

DPW Staff Signature:

Comprehensive Tree Plan

Log of Suggested Municipal Code Changes

Needed to prevent conflict in code/plan:

Change 1: Section 1.215 (4) refers to a Master Street Tree Plan. Section 17.60(3) refers to a Comprehensive Tree Plan. Section 1.215(4) should be updated to replace “Master Street Tree Plan” with “Comprehensive Tree Plan”.

Change 2: Subchapter II – Boards and Commissions

A section on the Tree Board needs to be created consistent with the draft Comprehensive Tree Plan.

Change 3: Section 1.214 (2) change the supervision of the Village Forester to the Director of Public Works.

Change 4: Section 17.6(4)(b) should be modified to indicate that applications may be obtained from the Village website and from the Department of Public Works.

Change 5: Section 17.60(4)(d) should be modified to the appropriate fee amount.

Change 6: Section 17.43 (5)(c)(1) should be modified so the caliper matches the Comprehensive Tree Plan.

Other Recommendations:

- Officially appoint a Village Forester
- Section 17.60(6)(a) more appropriately belongs in Section 17.60(5).
- Section 17.60 more appropriately belongs in Chapter 8 – Public Works

BUSINESS OF THE VILLAGE BOARD

MEETING DATE: August 19, 2024

PLACEMENT: Action Item

ITEM TITLE: Award of Kinderberg splash pad repairs to Carrico Aquatics for an amount not to exceed \$57,800 from accounts 91591000-592100 and 10591000-1000.

SUBMITTED BY: Gil Standridge, Park & Rec Director

SUMMARY EXPLANATION:

I am requesting the Public Works and Highway Committee allow me to contract Carrico Aquatics to replace Kinderberg Park splash pad mechanical room equipment, out of account 91591000-592100, for \$57,800 for which \$55,000 was approved through the ARPA budget. The additional \$2,800 would come out of the Recreation & Maintenance expense for spray pad account, 10591000-1000. Please note the three proposals included in this packet for a breakdown of mechanical equipment needed.

This committee should be made aware that these improvements for the mechanics of the splash pad do not include media blasting (\$16,292.00) or surface painting (\$11,466) based on 2024 pricing. These figures will have to be requested in the 2025 budget. My recommendation to the Parks and Recreation Commission will be to sandblast the current paint down to the concrete surface and leave without repainting. Many Villages/Cities throughout are leaving the surface of the splash pad with bare concrete, which meets industry standards, but at a large savings to the Village.

ATTACHMENT:

1. Carrico Aquatics Proposal
2. Letter to Public Works Highway Committee- Splashpad

STAFF RECOMMENDATION:

Award of Kinderberg splash pad repairs to Carrico Aquatics for an amount not to exceed \$57,800 from accounts 91591000-592100 (\$55,000) and 10591000-1000 (\$2,800).

ACTION BY Committee:

Approved 4-0.



Providing Safe Clean Sparkling Blue Water

720 N. Parkway • Jefferson, WI 53549

Office: 920-541-3600

Fax: 920-541-3602

www.carricoaquatics.com

July 31, 2024

Guilford Standridge
Village of Germantown
N122W17177 Fond Du Lac Avenue
Germantown, Wisconsin 53023

RE: Mechanical Room Equipment

Dear Guilford,

Thank you for allowing Carrico Aquatic Resources, Inc. the opportunity to work with the Village of Germantown and provide a proposal for mechanical room equipment for the splash pad.

Splash Pad Mechanical Room Equipment:

- (1) Pentair Triton 100 Filter with multiport valve and AFM filter media
- (1) 1HP, 1PH 115/230V Circulation pump with spare basket
- (1) 10HP, 1PH, 230V Main feature pump with spare basket
- (1) 1HP, 1PH 115/230V Small feature pump with spare basket
- (1) ChlorKing UV disinfection system with EZ Clean strainer
- (1) BECSys5 Chemical controller
- (1) BECSys Autofill system with 1" ASCO solenoid
- (2) 2" FloVis flow meters
- (1) Pulsar Precision 30 chlorine feeder
- (1) Stenner peristaltic pump for acid feed
- Demolition and disposal of all existing equipment
- Installation, start-up, programming and operator training
- All required state engineered plans, permits and inspections
- Shipping

Your total investment for the above listed is fifty-seven thousand eight hundred and no/100 dollars (\$57,800.00).

The Village is responsible for installation of the autofill solenoid in the domestic water line as well as all necessary electrical and data connections. Any local permits, if needed, are the responsibility of the Village.

Terms for this sale are:

- Prices are firm for 30 days from date of this proposal.
- Terms of payment requested is 30 days from the date of our invoice after delivery.
- Past due accounts will be charged a late fee of 1.5% per month.
- This price does not include taxes.

If you have any questions, please feel free to contact our office toll free at 800-832-7147. If you find this proposal acceptable, please indicate below and email a copy **cory@carricoaquatics.com**.

Thank you,

Cory Hintze
Account Manager
Carrico Aquatic Resources, Inc.

ACCEPTANCE OF PROPOSAL

Accepted by: _____ Date: _____ P.O.# _____



Germantown Park and Recreation Department

N112W17001 Mequon Rd

P.O. Box 337

Germantown, Wisconsin 53022-0337

(262)250-4710 Fax (262)255-2920

Information Line (262)250-4711

Meeting Date: August 14, 2024
To: Public Works & Highway Committee
From: Gil Standridge, Park and Recreation Director
RE: Approval to Contract Carrico Aquatics for Splashpad improvements

I am requesting the Public Works and Highway Committee allow me to contract Carrico Aquatics to replace splash pad mechanical room equipment, out of account 91591000-592100, for \$57,800 for which \$55,000 was approved through the ARPA budget. The additional \$2,800 would come out of the Recreation & Maintenance expense for spray pad account, 10591000-1000. Please note the three proposals included in this packet for a breakdown of mechanical equipment needed.

Public works has worked with Carrico in the past and trusts the quality of their parts and workmanship. Three companies were asked to provide a quote for the mechanical parts needed. CAS Commercial Aquatic Services Inc. submitted a quote for \$61,150.00. Spear Corporation provided a quote of \$72,250.00. That put Carrico at the lowest cost at \$57,800.00. With these mechanical room equipment improvements this should increase the life of the splashpad another ten years.

This Committee should also be made aware that these improvements for the mechanics of the splashpad do not include media blasting (\$16,292.00) or surface painting (\$11,466) based on 2024 pricing. These figures will have to be requested in the 2025 budget. My recommendation to the Parks and Recreation Commission will be to sandblast the current paint down to the concrete surface and leave without repainting. Many villages/cities throughout are leaving the surface of the splashpad bare concrete which meets safety standards, and a huge savings.

Carrico can order the parts and start to replace the mechanical room equipment during September after the Splashpad is closed for the season. Therefore there will be no interruption of service to the public.

Thanks in advance for your consideration on this matter.

Regards,

Gil Standridge
Parks and Recreation Director
Village of Germantown

BUSINESS OF THE VILLAGE BOARD

MEETING DATE: August 19, 2024

PLACEMENT: Action Item

ITEM TITLE: Award of library copula roof leak repair to Noffke Roofing in amount not to exceed \$23,500.00 from capital account 40564000-592300.

SUBMITTED BY: Scott Anderson, Superintendent

SUMMARY EXPLANATION:

The library roof was replaced in the fall of 2021. Since that time and during periods of significant temperature change accompanied by precipitation, a leak forms in the community room. While this leak isn't a common occurrence, when it occurs, it can cause disruption, especially if library programming is underway. If not addressed, staff is concerned about damage to insulation, drywall and even mold on the interior of the building.

On several occasions, staff has worked closely with the roofing contractor who completed the project in 2021. Testing the area with water has not identified deficiencies within the shingled area, which would have been included in the original project scope. The original contractor has worked to help identify the leak, at no additional cost to the village.

Around 2012, staff had identified a significant leak near the library's main entrance, which was eventually determined to be a oversight during the original construction of the building. At that time, staff had worked closely with Noffke Roofing, who specializes in the repair of troublesome issues. Recently, staff met with Noffke regarding the situation over the community room. A plan has been formulated to remove all of the shingles around the perimeter of the copula. This will allow for inspection of roof deck and flashings on the copula wall, where it's suspected the leak may originate. The project will inspect the top of the copula and replace deficient shingles as needed. The project will also include a new and larger finial near the lightning rod.

While this project is specifically unbudgeted, there are funds remaining from a project that was significantly scaled back at Haupt Strass Park. Staff recommends using these remaining park funds to cover the cost of this project.

ATTACHMENT:

STAFF RECOMMENDATION:

Staff recommends contracting with Noffke Roofing to complete the repairs associated with the leak on the library in an amount not to exceed \$23,500.00 and to forward this request onto the Village Board with a positive recommendation. If approved, funds shall be allocated from the Parks borrowed capital account: 40564000-592300.

ACTION BY Committee:

Approved 4-0.

BUSINESS OF THE VILLAGE BOARD

MEETING DATE: August 19, 2024

PLACEMENT: Action Item

ITEM TITLE: Award of Fireman's Park standing seam roof project to JK Contractors in an amount not to exceed \$19,060.00 from capital account 40564000-592300.

SUBMITTED BY: Scott Anderson, Superintendent

SUMMARY EXPLANATION:

As reflected in the 2024 Parks non-borrowed capital budget, funds were allocated in the amount of \$22,000.00 to replace the asphalt shingled roof on the Firemen's Park seasonal restroom shelter. The roof will be replaced with a standing seam metal roof, similar to the roof of the new shelter and band shell. Included in the project scope is the addition of gutters and downspouts to move water away from the building. This project is being completed in conjunction with the tuckpointing and resealing of the exterior split-faced block, and an exterior / interior painting project. Staff has solicited pricing from area contractors and the results are listed below.

JK Contractors: \$19,060.00

Murphy's Exterior Construction: \$23,632.76

ATTACHMENT:

STAFF RECOMMENDATION:

Staff recommends contracting with JK Contractors to complete the roof replacement project for an amount not to exceed \$19,060.00 and to forward this request to the Village Board with a positive recommendation. If approved, funds shall be allocated from the Buildings & Grounds non-borrowed capital account: 40564000-592300.

ACTION BY Committee:

Approved 4-0.

BUSINESS OF THE PUBLIC SAFETY COMMITTEE

MEETING DATE: August 5, 2024

PLACEMENT: Action Item

ITEM TITLE: GFD Position Requests

SUBMITTED BY: John Delain, Fire Chief

SUMMARY EXPLANATION:

With the addition of new personnel next year, the Germantown Fire Department will need to add more supervisors to its ranks. We currently have provisions in our CBA that specify a 5% pay increase for people who are promoted to a Lieutenant. At this time we are requesting to allow up to four employees to be promoted to the position of Lieutenant.

ATTACHMENT:

STAFF RECOMMENDATION:

ACTION BY Committee:



Germantown Fire Department

N115W18752 Edison Drive
Germantown, WI 53022
Phone: (262) 502-4701
Fax: (262) 502-4744

GFD Position Requests

08/05/2024 Public Safety Committee

New Business Item A

Background

As the department transitioned from Paid-on-Call to a career department a strategic decision was made to reduce the number of officers within the department temporarily, in part to reduce expenses where feasible. This was never intended to be a long-term solution. As a result of this decision, our organization structure is flat.

A flat organizational is described as a model with few or no levels of middle management between the executives (Chiefs) and front-line employees (Firefighter/Medics). This model allows for little to no progression opportunities for front line employees, and places significantly higher workloads on the executives who have more direct subordinates. A flat organization also does not provide a clear chain of command which can lead to conflict and confusion among members of the same rank requiring a manager to intervene where normally that would not be needed.

This model has taken away much needed time and resources for other executive level functions, such as mandatory state and federal reporting, supplemental reporting, grant applications, budget preparation, training assignments, and many more.

Provided below are the organization structures of 2 neighboring departments, the Germantown Fire Departments organization structure for the majority of the last 3 decades, as well as the Germantown Fire Departments current organization structure.

Menomonee Falls Fire Department Organization Structure – Current

1x Chief
3x Deputy Chiefs
5x Battalion Chiefs
7x Lieutenants
12x Motor Pump Operator (MPO, Driver/Operator)
9x Inspector
Firefighter / EMT / Paramedics



Germantown Fire Department

N115W18752 Edison Drive
Germantown, WI 53022
Phone: (262) 502-4701
Fax: (262) 502-4744

Jackson Fire Department Organization Structure – Current

1x Chief
1x Assistant Chief
3x Battalion Chiefs
3x Captain
3x Lieutenants (1 currently vacant)
6x Motor Pump Operator (MPO, Driver/Operator)
Firefighter / EMT / Paramedics
Interns

Germantown Fire Department Organization Structure 2000-2017

Note: There were times when levels fluctuated temporarily, this is the general structure for this timeframe.

1x Chief
2x Deputy Chiefs
3x Captains
6x Lieutenants
2x Inspector
Firefighter / EMT / Paramedics

Germantown Fire Department Organization Structure – Current

1x Chief
3x Battalion Chief
1x Lieutenant (Health and Safety Officer required by State Statute)
Firefighter / EMT / Paramedics



Germantown Fire Department

N115W18752 Edison Drive
Germantown, WI 53022
Phone: (262) 502-4701
Fax: (262) 502-4744

Germantown Fire Department Organization Structure – Proposed

1x Chief

3x Battalion Chief

5x Lieutenants

Firefighter / EMT / Paramedics

Need

We chose the Lieutenant level at this time as it is the most cost effective and fills the area with the most immediate need.

NFPA 1710 5.2 Fire Suppression Services specifically requires “Each company shall be led by an officer who shall be considered part of the company.” This role is only fillable with officers who remain with the company or crew for the incident operational period, such as a Lieutenant or Captain. A Battalion Chief cannot fill this role in addition to their other responsibilities on a fireground.

There will continue to be further analysis of the fire department structure and shifting of responsibilities as we continue to increase in requests for service, potentially expand to a second station, and as the diversity of fire department mitigation responsibilities increase with new and emerging technologies and hazards.

Request

The request is to hire/promote up to 4 positions to the level of Lieutenant and is not creating additional FTE positions. The cost increase for a Lieutenant is 5% above the members base pay level. Under the current collective bargaining agreement this would cost between \$2,866.86 and \$4,127.76 annually per position or a total cost of between \$11,467.44 and \$16,511.04 annually.

Staff Recommendation

Approve the request to hire/promote up to 4 positions to the level of Lieutenant.

BUSINESS OF THE PUBLIC SAFETY COMMITTEE

MEETING DATE: August 5, 2024

PLACEMENT: Action Item

ITEM TITLE: Purchase of Firearms and Related Equipment

SUBMITTED BY: Mike Snow, Police Chief

SUMMARY EXPLANATION:

The service weapons used by the Germantown Police Department are approaching eight years old. We are also looking to take advantage of upgrades in LED sights. An upgrade to new firearms and sights would require the replacement of existing holsters. We are requesting you to purchase the following:

Smith & Wesson M&P 9mm M2.0 LE (50) @ \$529.95	\$26,497.50
Trijicon RMR-HD Red Dot (50) @ \$559.75	\$30,786.25
Safariland 6360RDS Duty Holster (50) @ \$159.95	\$8,797.25
TOTAL	\$66,081

This purchase could be supported by available ARPA funds.

ATTACHMENT:

1. Germantown WI Police Pistol Optic Holster Quote July 2024

STAFF RECOMMENDATION:

ACTION BY Committee:

SIoux SALES COMPANY

The Police Store

P.O. Box 3276

714 Jackson Street

Sioux City, Iowa 51102

Phone: 712 255-1969 Fax: 712 255-7431

Toll Free 800 772-1772 Iowa Only 800 225-6677

www.siouxsales.com

QUOTATION

July 18, 2024

Germantown Police Department
Captain Patrick J Merten
N112 W16877 Mequon Rd
Germantown, WI 53022
pmerten@germantownpolicewi.gov

Dear Captain Merten:

In response to your request for a budgetary quotation we are pleased to offer the following:

- 50 – Smith & Wesson M&P9 M2.0 LE Optic Ready Pistols w/ Optic Height Night Sights, SKU # 13614 and 3 – 17 round magazines.
@ \$ 529.95 each = \$26,497.50.
- 55 – Trijicon RMR-HD, RMHD2-C-3200002, 50 MOA Adjustable LED Reticle w/ 3.25 MOA Red Dot @ \$ 559.75 each = \$ 30,786.25
- 55 – Safariland 6360RDS-2222-4XX Duty Holster, Level III, Plain or Basketweave Finish With Optic Hood and Light
@ \$ 159.95 each = \$ 8,797.25

Trade In:

45 – Smith & Wesson M&P9 M2.0 Pistols @ (\$ 200.00 each = \$ 9,000.00).

Please contact me with any questions. Thank you.

Sincerely,
Sioux Sales Company

By *Kurt Bornholtz*

BUSINESS OF THE PUBLIC SAFETY COMMITTEE

MEETING DATE: August 5, 2024

PLACEMENT: Action Item

ITEM TITLE: Flock Safety Invoice

SUBMITTED BY:

SUMMARY EXPLANATION:

We have attached the annual invoice for 5 of our Flock Safety cameras. These are funded in part by donations and by funds from our software account; 10541000.

The invoice is \$13,000..

ATTACHMENT:

1. flock_invoice

STAFF RECOMMENDATION:

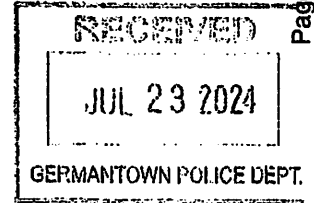
ACTION BY Committee:

flock safety

Flock Group Inc dba Flock Safety
www.flocksafety.com

INVOICE

Invoice Number INV-44186
Invoice Date: 7/23/2024
Due Date: 8/22/2024
Payment Terms: Net 30
PO#:



Page 42 of 43

Bill To: WI - Germantown PD
N112w16877 Mequon Rd
Germantown, Wisconsin, 53022

Ship To: WI - Germantown PD
N112W16877 Mequon Rd
Germantown, Wisconsin 53022

Billing Company Name: WI - Germantown PD
Billing Contact Name:
Billing Email Address: jbarth@germantownpolicewi.gov

Payment Terms: Net 30
Contracted Billing Structure: Annual

Notes: Renewal Opportunity: Year 2 of 24 Month Term, 2024 - 2025

ITEMS	QTY	UNIT PRICE	SALES TAX	TOTAL
Flock Safety Falcon ®	4	\$2,500.00	\$0.00	\$10,000.00
Flock Safety Falcon ® Flex	1	\$3,000.00	\$0.00	\$3,000.00

Unless otherwise noted on the Order Form, the Term shall commence upon first installation and validation of Flock Hardware.
Link to Location of Services:

Subtotal: \$13,000.00
Sales Tax: \$0.00
Credit: \$0.00
Payments: \$0.00
Balance Due: \$13,000.00

ORDER # 100352
INVT # 10541000-531000
C. S. _____
APPROVAL _____

If you have questions about your invoice or need to update your billing contact information, please email billing@flocksafety.com or call 866-901-1781, option 3.



INVOICE

Flock Group Inc dba Flock Safety
www.flocksafety.com

Invoice Number: INV-44186
 Invoice Date: 7/23/2024
 Due Date: 8/22/2024
 Payment Terms: Net 30
 PO#:

Payment Remittance Information	
Pay by Check: Payable to: Flock Group Inc Memo: INV-44186 Mail to: PO Box 121923 Dallas, TX 75312-1923 <i>If paying by check, please include the remittance slip below.</i>	Pay by ACH: Account Legal Name: Flock Group Inc. Account Number: 3302113966 Account Type: Checking Routing / SWIFT Code: 121140399 / SVBKUS6S <i>If paying by ACH, please include your invoice number in the memo section of the ACH transfer request.</i>

By paying this invoice, I, the customer, agree to the terms and conditions listed at
<https://www.flocksafety.com/terms-and-conditions>

Please be aware that failure to pay the invoice by the due date may result in an interest penalty or disconnection of service, as specified in your contract.

.....
 Detach and Return with Payment

Make Checks Payable to: Flock Group Inc

If sending via Flock Group Inc
 USPS: PO Box 121923
 Dallas, TX 75312-1923

Or

If sending via Flock Group Inc
 UPS, FedEx or 891923
 USPS: 1501 North Plano Rd. ste 100
 Richardson, TX 75081

Account: WI - Germantown PD

Invoice # INV-44186

Amount Due: \$13,000.00

Amount Enclosed: \$ _____

BUSINESS OF THE VILLAGE BOARD

MEETING DATE: August 19, 2024

PLACEMENT:

ITEM TITLE: Village of Germantown- Community Development Department - Proposed Text Amendments to Zoning Code Section 17.40 (Wellhead Protection) of the Village of Germantown Municipal Code.

SUBMITTED BY: Jeff Retzlaff, Community Dev. Director

SUMMARY EXPLANATION:

Staff is proposing amendments to various subsections under 17.40 (Wellhead Protection) in the Village Zoning Code as detailed in the attached draft ordinance.

ATTACHMENT:

1. STAFF REPORT_Zoning Code Amendments-Wellhead Protection-REVISED
2. ZONING CODE TEXT AMENDMENTS-WELLHEAD PROTECTION-REVISED
3. 17.40 Wellhead Protection
4. FIG 1_Wellhead Protection District Map-Well 2 through 5 & 7
5. FIG 2_Wellhead Protection District Map-Well 12

STAFF RECOMMENDATION:

At their meeting on August 12, 2024, the Plan Commission discussed and acted to recommend that the Village Board **APPROVE** the proposed text amendments to Section 17.40 as draft by Village staff.

ACTION BY Committee:

ZONING CODE TEXT AMENDMENTS

8/12/24 Plan Commission Meeting

Germantown Community Development Department

Village Staff Report & Recommendation

Germantown, Wisconsin

Summary

The Community Development Department (Planning & Zoning Services) is proposing a series of text amendments to Section 17.40 (Wellhead Protection) in the Zoning Code.

Staff is proposing amendments to various subsections under 17.40 (Wellhead Protection) in the Village Zoning Code as detailed in the attached draft ordinance and summarized below:

Amendment #1 (see Section 1)

The proposed amendment to Section 17.40.04 is intended to clarify the responsibilities of the Groundwater Technical Review Committee. Specifically, language is added to indicate that the Committee's responsibilities include interpreting the provisions of 17.40 with respect to administration and enforcement and advising the Board of Zoning Appeals and Zoning Administrator.

Amendment #2 (see Section 2)

This amendment is intended to address the inequity that exists between how new businesses or land uses that want to locate within a wellhead protection district are treated differently than pre-existing businesses or land uses already operating from property within that protection district. Specifically, how certain "new" businesses are either prohibited or required to obtain a conditional use permit while pre-existing businesses that are the same or similar are allowed to rebuild and expand.

This inequity was brought to light while reviewing the recent Kwik Trip proposal to move the existing Maple Road convenience store and gasoline filling station to a new parcel across just down the road. Current restrictions in Section 17.40 WOULD NOT allow Kwik Trip to relocate the existing gasoline filling station to the new site that is located within the same Groundwater Protection District for Well #5 & #7 (see Figure 1 attached) despite the fact that the new filling station would be developed and operate using state-of-the-art groundwater protection equipment and spill containment methods but WOULD allow the existing 30+ year-old filling station where Kwik Trip is now located to be rebuilt or expanded.

Staff's opinion is that groundwater the Village's groundwater resources would be better protected by allowing the relocation and re-construction of a restricted business or use within a Groundwater Protection District with state-of-the-art equipment and containment facilities vs. prohibiting such business from doing so and, as a result, perpetuating the continued use of older equipment, outdated facilities, and less-effective groundwater protection methods.

While the Kwik Trip situation may seem unique to Germantown, the facts are that the entire Germantown Industrial Park is located within the Well #5 & #7 Groundwater Protection District (see Figure 1), and, that several successful businesses in the Industrial Park have moved from one property to another within the Industrial Park to accommodate their growth. The proposed text amendments may allow other businesses to move and grow within the Industrial Park vs. forcing them to move elsewhere and possibly outside the Village of Germantown.

The proposed text amendment includes language that would allow a pre-existing business or land use that otherwise would be prohibited (or require a CUP), to not only expand but to also relocate to another site provided certain criteria can be met, including, but not necessarily limited to the following provisions that would be required to be included as conditions of approval for any business or use relocating:

1. to the extent feasible, all site, building and other improvements shall be constructed using current best management practices, designs and state-of-the-art technologies that diminish the potential for groundwater contamination; and
2. to the extent feasible, equipment and machinery and the installation thereof shall be state-of-the-art to diminish the potential for groundwater contamination; and
3. The pre-existing use or facility is relocated within the same Groundwater Protection Overlay District; and
4. The new location meets all applicable separation distance requirements set forth under subsection 17.40.09; and
5. The use or facility can obtain all applicable Federal, State and Local approvals and permits; and
6. The owner of the property or current site from which the pre-existing use or facility is relocating from records a deed restriction against the property that prohibits future uses and/or facilities that require a conditional use permit under subsection 17.40.11 or are listed as a prohibited use in subsection 17.40.11; and
7. The owner of the property or operator of the pre-existing use or facility being relocated causes the property and all structures, equipment, and systems located thereon to be altered and/or restored to a physical condition that can be reasonably expect to not cause groundwater contamination, including but not limited to the removal of storage tanks, pipes, and systems that previously contained or utilized hazardous, flammable, or other liquids or materials that had the potential to contaminate the Village's groundwater resources. Where/when applicable, said alteration and restoration shall meet all Federal, State, and Local agency requirements (e.g. Wisconsin's Cleanup Rules and Laws)

In addition to these conditions of approval, the application for a relocating a business or use will need to include the following items required under 17.40.11(3) through (5):

-
- (3) All requests for a conditional use permit shall be submitted in writing to the Germantown Village Planning and Zoning Department, and shall include all the following:
- (a) A site plan map with all building and structure footprints, driveways, sidewalks, parking lots, stormwater management structures, groundwater monitoring wells, and 2-foot ground elevation contours.
 - (b) A business plan and/or other documentation which describes in detail the use, activities, and structures proposed.
 - (c) An environmental assessment report prepared by a licensed environmental engineer which details the risk to, and potential impact of, the proposed use, activities, and structures on groundwater quality. In the event of a substitution or relocation of a pre-existing use under this section, the report shall address the ways that the substituted or relocated use will reduce the risk to groundwater compared to the pre-existing use.
 - (d) An operational safety plan, which details the operational procedures for material processes and containment, best management practices, stormwater runoff management, and groundwater monitoring.
 - (e) A contingency plan which addresses in detail the actions that will be taken should a contamination event caused by the proposed use, activities, or structures occur.
- (4) All applicants submitting a request for a conditional use permit shall reimburse the Village for all consultant fees and expenses and technical review committee expenses associated with this review, plus administrative costs and processing fees.
- (5) All conditional use permits granted shall be subject to conditions that will include environmental, and safety monitoring determined necessary to afford adequate protection of the public water supply. These conditions shall include all the following:
- (a) Provide current copies of all federal, state and local facility operation approval or certificates and on-going environmental monitoring results to the Village.
 - (b) Establish environmental or safety structures/monitoring to include an operational safety plan, material processes and containment, operations monitoring, best management practices, stormwater runoff management, and groundwater monitoring.
 - (c) Replace equipment or expand in a manner that improves the environmental and safety technologies in existence.
 - (d) Prepare, file and maintain a current contingency plan which details the response to any emergency which occurs at the facility, including notifying municipal, county and state officials. Provide a current copy to the Village.

Amendment #3 (see Section 3)

This amendment adds an additional conditional use permit application requirement for a business or land use that is trying to relocate within a Groundwater Protection Overlay District or replace a pre-existing use by way of substituting a use with less potential for groundwater contamination. This amendment requires that the required environmental assessment report include an assessment or documentation of the ways in which the new substituted or relocated business or use would reduce the risk for groundwater contamination vs. the pre-existing business or use.

Amendment #4 (see Section 4)

This section simply adopts the latest Groundwater Protection Overlay District boundary map for Well #12 located on Rockfield Road @ Gateway Crossing in the Germantown Gateway Corporate Park (see Figure 2 attached; Figure #1 is also attached for reference).

A recommendation from the Plan Commission is necessary to move the proposed code amendments to the Village Board for consideration and action. The Staff recommendation is to **APPROVE** the proposed text amendments to Section 17.40 as presented in the draft ordinance (copy attached) and summarized herein.

**AN ORDINANCE AMENDING SECTION 17.40 (WELLHEAD PROTECTION) OF
THE ZONING CODE IN THE VILLAGE OF GERMANTOWN MUNICIPAL CODE**

THE VILLAGE BOARD OF THE VILLAGE OF GERMANTOWN, WASHINGTON COUNTY,
WISCONSIN, ORDAINS AS FOLLOWS:

SECTION 1. That Section 17.40.04 is revised as follows where words that are ~~stricken~~ are deleted
and words that are underlined are to be added:

17.40.04 GROUNDWATER TECHNICAL REVIEW COMMITTEE.

- (1) The Germantown Groundwater Technical Review Committee shall consist of all the following:
 - (a) The Village Planner/Zoning Administrator
 - (b) The Village Public Works Director
 - (c) The Village Engineer
 - (d) The Fire Chief
 - (e) The Superintendent of the Water Utility
- (2) The purpose for and responsibilities of the Germantown Groundwater Technical Review Committee are is to:
 - (a) provide objective and scientific technical review of requests for conditional use permits and make recommendations to the Plan Commission and ultimately to the Village Board to grant or deny conditional use permits based upon the facts discovered in that review;
 - (b) to make recommendations on any and all conditions placed on a conditional use permit;
 - (c) to interpret the provisions of Section 17.40 (Wellhead Protection) and to provide guidance to the Village Planner/Zoning Administrator regarding potential amendments to and the administration and enforcement of the provisions under Section 17.40; and
 - (d) to give advice on matters concerning the protection of Germantown's groundwater resources.
- (3) Professional Services. The Village may retain the services of professional consultants (including engineer, environmental specialist, hydrologist, and other experts) to assist the Village in the Village's review of a proposal or submittal coming before the Germantown Water Technical Review Committee. The submittal of a proposal by a petitioner shall be construed as an agreement to pay for such professional review services applicable to the proposal. The Village may apply the charges for these services to the petitioner along with an administrative fee. Review fees which are applied to the petitioner, but which are not paid, may be assigned by the Village as a special assessment to the subject property.

**AN ORDINANCE AMENDING SECTION 17.40 (WELLHEAD PROTECTION) OF
THE ZONING CODE IN THE VILLAGE OF GERMANTOWN MUNICIPAL CODE**

SECTION 2. That Section 17.40.12 is revised as follows where words that are ~~stricken~~ are deleted and words that are underlined are to be added:

17.40.12 PROVISIONS AND REQUIREMENTS FOR PRE-EXISTING USES OR FACILITIES
 REQUIRING A CONDITIONAL USE PERMIT OR LISTED AS A PROHIBITED USE.

Pre-existing uses or facilities within a the Groundwater Protection Overlay District at the time of enactment of such district which require a conditional use permit under subsection 17.40.11 or are listed as a prohibited use in subsection 17.40.11 or under subsection 17.40.10 all of which are incorporated herein as if fully set forth shall meet the following as may be applicable.

- (1) Current Federal, State, and Local Approvals and Permits. The owners or operators of uses or facilities as above which existed within a Groundwater Protection Overlay District the district at the time said District was of enacted ment shall, within 45 days of enactment, provide copies of all current, and within 30 days of receipt, revised or new Federal, State and local facility operation approvals, permits or certificates; operational safety plan and on-going environmental monitoring results to the Village.
- (2) Contingency Plans. The owners or operators of such uses or facilities as above which existed within the district at the time of enactment of a district shall have the responsibility of devising, filing and maintaining, with the Village, a current contingency plan which details how they intend to respond to any emergency which may cause or threaten to cause environmental pollution that occurs at their facility, including notifying municipal, county and state officials.
- (3) Repair, Rebuild, Expand, Relocation, and Substitution of Pre-Existing Uses or Facilities. In the event any of the following circumstance arise, of casualty loss causing damage or destruction to building improvements exceeding 50% of the assessed valuation thereof, or the desire to expand or enlarge building improvements, the cost of which will reasonably be anticipated to exceed 50% of the assessed valuation thereof, the owners or operators of such pre-existing uses and facilities shall be granted a conditional use permit, in accordance with this Code and subsection 17.40.11(3) through (6) above, to repair, rebuild, ~~or expand~~ , relocate, or allow the substitution of such pre-existing uses or facilities, provided that the conditions imposed shall include the requirements generally require that listed under subsection 17.40.12(4) below:
 - (a) A casualty loss causing damage or destruction to the site, building or other improvements exceeding 50% of the existing assessed valuation thereof; or
 - (b) the owner or operator desires to repair, rebuild, or expand the site, building or make other improvements where the cost of which will reasonably be anticipated to exceed 50% of the existing assessed valuation thereof; or
 - (c) the owner or operator desires to relocate the pre-existing use or facility within a Groundwater Protection Overlay District; or
 - (d) the owner or operator desires to substitute or replace a pre-existing use or facility that requires a conditional use permit or is listed as a prohibited use with a different use or facility that requires a conditional use permit or is listed as a prohibited use.

**AN ORDINANCE AMENDING SECTION 17.40 (WELLHEAD PROTECTION) OF
THE ZONING CODE IN THE VILLAGE OF GERMANTOWN MUNICIPAL CODE**

- (4) Conditional Use Permit Requirements. At a minimum, conditional use permits granted by the Village pursuant to subsection 17.40.12(3) above shall include conditions that require the following:
- (a) to the extent feasible, based upon scientific, engineering and economic factors, ~~the~~ all site, building and other improvements shall be repaired, restored or rebuilt, expanded, relocated, or substituted using employing best management practices, designs and technologies which are state of the art, such that they diminish the potential for wellhead contamination; and
 - (b) to the extent feasible, based upon scientific, engineering, and economic factors, the replacement, substitution, or augmentation of equipment and machinery and the installation thereof shall utilize state of the art equipment and machinery which diminishes potential for wellhead contamination; and ~~This section does not apply to normal maintenance or minor repairs.~~
 - (c) The relocation of pre-existing uses or facilities is allowed provided all the following are met:
 - (i) The pre-existing use or facility is relocated within the same Groundwater Protection Overlay District;
 - (ii) The new location meets all applicable separation distance requirements set forth under subsection 17.40.09;
 - (iii) The use or facility can obtain all applicable Federal, State and Local approvals and permits;
 - (iv) The owner of the property or current site from which the pre-existing use or facility is relocating from records a deed restriction against the property that prohibits future uses and/or facilities that require a conditional use permit under subsection 17.40.11 or are listed as a prohibited use in subsection 17.40.11; and
 - (v) The owner of the property or operator of the pre-existing use or facility being relocated causes the property and all structures, equipment, and systems located thereon to be altered and/or restored to a physical condition that can be reasonably expect to not cause groundwater contamination, including but not limited to the removal of storage tanks, pipes, and systems that previously contained or utilized hazardous, flammable, or other liquids or materials that had the potential to contaminate the Village's groundwater resources. Such alteration and restoration shall meet all applicable Federal, State, and Local agency requirements (e.g. Wisconsin's Cleanup Rules and Laws)

**AN ORDINANCE AMENDING SECTION 17.40 (WELLHEAD PROTECTION) OF
THE ZONING CODE IN THE VILLAGE OF GERMANTOWN MUNICIPAL CODE**

SECTION 3. That Section 17.40.11(3)(c) is revised as follows where words that are ~~stricken~~ are deleted and words that are underlined are to be added:

- (c) An environmental assessment report prepared by a licensed environmental engineer which details the risk to, and potential impact of, the proposed use, activities, and structures on groundwater quality. In the event of a substitution or relocation of a pre-existing use under this section, the report shall address the ways that the substituted or relocated use will reduce the risk to groundwater compared to the pre-existing use.

SECTION 4. Figure 2 titled “Groundwater Flow and Recharge Area” attached hereto as Exhibit 1 is hereby adopted as the Groundwater Protection Overlay District (i.e. depicted as the “recharge area” shown in Figure 2) and made part of the collection of Village of Germantown Wellhead Protection Maps incorporated by reference into Section 17.40.07.

SECTION 5. This ordinance shall take effect and be in full force the day after its passage and publication, as provided by law.

Introduced by Trustee: _____
Adopted: _____, 2024

Vote: Ayes: _____
Nays: _____

Dean Wolter, Village President

ATTEST:

Donna Ott, Village Clerk

APPROVED AS TO FORM:

Brian Sajdak, Attorney

Published:

VILLAGE OF GERMANTOWN

ORDINANCE NO. _____

CREATING SECTION 17.40 OF THE GERMANTOWN CODE OF ORDINANCES
REGULATING WELLHEAD PROTECTION

THE VILLAGE BOARD OF THE VILLAGE OF GERMANTOWN, WASHINGTON COUNTY,
STATE OF WISCONSIN, DOES ORDAIN AS FOLLOWS:

SECTION I:

Section 17.40 of the Germantown Code of Ordinances is hereby created in the form annexed hereto and incorporated herein, having been placed on file and open to public inspection in the office of the Clerk of the Village of Germantown at the Germantown Village Hall, N112 W17001 Mequon Road, Germantown, Wisconsin, since March 3, 2010, in accordance with the procedures provided in §66.0103, Wis. Stats., and is hereby adopted as such Section 17.40 of the Code of Ordinances in and for the Village of Germantown, Washington County, Wisconsin.

SECTION II:

All ordinances or parts of ordinances contravening the terms of this ordinance are hereby to that extent repealed.

SECTION III:

This ordinance shall take effect and be in full force upon its passage and the day after publication.

Introduced by Trustee: _____

Adopted: _____

Vote: Ayes: _____ Nays: _____

Dean Wolter, Village President

Approved as to legality:

ATTEST:

John L. DeStefanis Village Attorney

Elizabeth Knaack, Village Clerk

Published: _____, 20____.

SECTION 17.40, GERMANTOWN CODE

WELLHEAD PROTECTION ORDINANCE

17.40.01 PURPOSE AND AUTHORITY.

(1) **PURPOSE.** The residents of the Village of Germantown depend exclusively on groundwater for a safe drinking water supply. Certain land use practices and activities can seriously threaten or degrade groundwater quality. The purpose of this Wellhead Protection Ordinance is to institute land use regulations and restrictions protecting the municipal water supply of the Village of Germantown and promote the public health, safety and general welfare of the residents.

(2) **AUTHORITY.** Statutory authority of the Village to enact these regulations was established by the Wisconsin Legislature in ss. 62.23(7)(a) and (c), Wis. Stats. Under these statutes, the Village has the authority to enact this ordinance to encourage the protection of groundwater resources.

17.40.02 APPLICATION OF REGULATIONS. The regulations specified in this Wellhead Protection Ordinance shall apply to those areas of the Village of Germantown that lie within the recharge areas for municipal water supply wells as defined in section 17.40.05, and are in addition to the requirements in the underlying zoning district, if any. If there is a conflict between this ordinance and the zoning ordinance, the more restrictive provision shall apply.

17.40.03 DEFINITIONS.

- (1) **AQUIFER.** A saturated, permeable geologic formation that contains and will yield significant quantities of water.
- (2) **CONE OF DEPRESSION.** The area around a well, in which the water level has been lowered at least one-tenth of a foot by pumping of the well.
- (3) **FACILITIES.** A general term referring to land uses, business operations, activities, developed property, or material stored.
- (4) **FIVE-YEAR TIME OF TRAVEL.** The recharge area upgradient of the cone of depression, the outer boundary of which it is determined or estimated that groundwater will take five years to reach a pumping well.
- (5) **MUNICIPAL WATER SUPPLY.** The municipal water supply of the Village of Germantown.
- (6) **PERSON.** An individual, partnership, association, corporation, municipality or state agency, or other legal entity.
- (7) **RECHARGE AREA.** The area which encompasses all areas or features that, by surface infiltration of water that reaches the zone of saturation of an aquifer, supplies groundwater to a well.
- (8) **THIRTY-DAY TIME OF TRAVEL.** The recharge area upgradient of a well, or its cone of depression, the outer boundary of which it is determined or estimated that groundwater will take thirty days to reach a pumping well.
- (9) **WELL FIELD.** A piece of land used primarily for the purpose of locating wells to supply a municipal water system.
- (10) **WELL.** A boring into the earth for the purpose of extracting groundwater for supply to the municipal water supply.
- (11) **ZONE OF SATURATION.** The area of unconsolidated, fractured or porous material that is saturated with water and constitutes groundwater.

17.40.04 GROUNDWATER TECHNICAL REVIEW COMMITTEE.

- (1) The Germantown Groundwater Technical Review Committee shall consist of all of the following:

 - (a) The Village Planner/Zoning Administrator.
 - (b) The Village Public Works Director.
 - (c) The Village Engineer
 - (d) The Fire Chief.
 - (e) The Superintendent of the Water Utility
- (2) The purpose of the Germantown Groundwater Technical Review Committee is to provide objective and scientific technical review of requests for conditional use permits and make recommendations to the Plan Commission and ultimately to the Village Board to grant or deny conditional use permits based upon the facts discovered in that review, to make recommendations on any and all conditions placed on a conditional use permit, and to give advice on matters concerning groundwater.
- (3) Professional services. The Village may retain the services of professional consultants (including engineer, environmental specialist, hydrologist, and other experts) to assist the Village in the Village's review of a proposal or submittal coming before the Germantown Water Technical Review Committee. The submittal of a proposal by a petitioner shall be construed as an agreement to pay for such professional review services applicable to the proposal. The Village may apply the charges for these services to the petitioner along with an administrative fee. Review fees which are applied to the petitioner, but which are not paid, may be assigned by the Village as a special assessment to the subject property.

17.40.05 GROUNDWATER PROTECTION OVERLAY DISTRICT. A Groundwater Protection Overlay District may be created to institute land use regulations and restrictions within a defined area which contributes water directly to a municipal water supply and thus promotes public health, safety, and welfare. The district is intended to protect the groundwater recharge area for the existing or future municipal water supply from contamination.

17.40.06 SUPREMACY OF THIS DISTRICT. The regulations of an overlay district will apply in addition to all other regulations which occupy the same geographic area. The provisions of any zoning districts that underlay this overlay district will apply except when provisions of the Groundwater Protection Overlay District are more stringent.

17.40.07 GROUNDWATER PROTECTION OVERLAY DISTRICTS BOUNDARIES.

The boundaries of the Groundwater Protection Overlay Districts are referenced as being part of the Germantown zoning map being an overlay district to the zoning map. The locations and boundaries of the zoning districts established by this ordinance are set forth on the Village of Germantown Municipal Wellhead Protection Areas Map which is incorporated herein and hereby made a part of this ordinance. Said map, together with everything shown thereon and all amendments thereto, shall be as much a part of this ordinance as though fully set forth and described herein.

17.40.08 PERMITTED USES.

- (1) Subject to the conditions for existing uses listed in section 17.40.12 the following are the only permitted uses within the groundwater protection overlay district.
- (a) Public and private parks, and playgrounds provided there are no on-site wastewater disposal systems or holding tanks.
 - (b) Wildlife and natural and woodland areas.
 - (c) Biking, hiking, skiing, nature, equestrian and fitness trails.
 - (d) Residential which is municipally sewered and free of flammable and combustible liquid underground storage tanks.
 - (e) Agricultural uses in accordance with the county soil conservation department's best management practices guidelines.
 - (f) Single-family residences on a minimum lot of 20,000 square feet with a private on-site sewage treatment system receiving less than 8,000 gallons per day, which meets the County and State health standards for the effluent, and Free of flammable or combustible liquid underground storage tanks.
 - (g) Commercial, Institutional, Industrial or Office establishments which are municipally sewered Subject to the prohibited and conditional uses listed in 17.40.10 and 17.40.11.



17.40.09 SEPARATION DISTANCE REQUIREMENTS.

- (1) The following separation distances as specified in s. NR 811.16, Wis. Adm. Code, shall be maintained. Measurements shall be from the well head to the specified structure, facility, edge of land fill or storage area as described in items (a) through (f) below.
- (a) Fifty feet between a public water supply well and a stormwater sewer main or any sanitary sewer main constructed of water main materials and joints which is pressure tested in place to meet current AWWA 600 specifications. NOTE: Current AWWA 600 specifications are available for inspection at the office of the Wisconsin Department of Natural Resources, the Secretary of State's office and the office of the Revisor of Statutes.
 - (b) Two hundred feet between a public water supply well and any sanitary sewer main not meeting the above specifications, any sanitary sewer lift station or single-family residential fuel oil tank.
 - (c) Four hundred feet between a public water supply well and a septic system receiving less than 8,000 gallons per day, or a stormwater detention, retention, infiltration or drainage basin.
 - (d) Six hundred feet between a well and any gasoline or fuel oil storage tank installation that has received written approval from the Wisconsin Department of Commerce (hereafter Commerce) or its designated agent under Comm 10.10, Wis. Adm. Code.

- (e) One thousand feet between a well and land application of municipal, commercial or industrial waste; industrial, commercial or municipal waste water lagoons or storage structures; manure stacks or storage structures; and septic tanks or soil adsorption units receiving 8,000 gallons per day or more.
- (f) Twelve hundred feet between a well and any solid waste storage, transportation, transfer, incineration, air curtain destructor, processing, wood burning, one time disposal or small demolition facility; sanitary landfill; coal storage area; salt or deicing material storage area; gasoline or fuel oil storage tanks that have not received written approval from Commerce or its designated agent under s. Comm 10.10, Wis. Adm. Code; bulk fuel storage facilities; and pesticide or fertilizer handling or storage facilities.

17.40.10 PROHIBITED USES.

(1) The following uses are prohibited:

- (a) Buried hydrocarbon, petroleum or hazardous chemical storage tanks. (Hazardous chemicals are identified by OSHA criteria under 40CFR Part 370.)
- (b) Radioactive waste facilities.
- (c) Coal storage.
- (d) Industrial lagoons, pits or natural or man made containment structures, primarily of earthen materials used for storage or treatment of wastewater, fermentation leachates or sludge.
- (e) Landfills and any other solid waste facility, except post-consumer recycling.
- (f) Manure and animal waste storage except animal waste storage facilities regulated by the County.
- (g) Pesticide and fertilizer dealer.
- (h) Railroad yards and maintenance stations.
- (i) Rendering plants and slaughterhouses.
- (k) Salt or deicing material storage for the purpose of distribution
- (l) Septage or sludge  ading
- (m) Septage, wastewater, or sewage lagoons.
- (n) Motor vehicular filling stations.
- (o) Wood preserving operations.

17.40.11 CONDITIONAL USES.

(1) Any person may request a conditional use permit for certain uses, activities and structures within the Groundwater Protection Overlay District not prohibited in section 17.40.10.

(2) The uses, activities, and structures that may be conditionally allowed are:

- (a) Jewelry plating and metal plating.
- (b) Machine or metal working shops as the principal business.
- (c) Commercial, Institutional, or Office establishments utilizing a private on-site wastewater treatment system .
- (d) Cemeteries.
- (e) Chemical manufacturers (Standard Industrial Classification Major Group 28).
- (f) Dry cleaners.
- (g) Nonmetallic earthen materials extraction or sand and gravel pits.
- (h) Salvage or junk yards.
- (i) Stockyards and feedlots.

- (j) Research labs, universities and hospitals.
 - (k) Exposed hydrocarbon, petroleum or hazardous chemical storage tanks. (Hazardous chemicals are identified by OSHA criteria under 40 CFR Part 370.) This shall not apply to residential LP gas tanks which are permitted under section 17.40.08(1)(i).
 - (l) Storage or processing of extremely hazardous substances, radioactive materials or substances listed in Table 1, ch. NR 140, Wis. Adm. Code (Extremely hazardous substances are identified by SARA/EPCRA criteria under 40 CFR Parts 302 and 355.)
 - (m) Septage or sludge storage or treatment
 - (n) Motor vehicular service stations, repair, renovation and body working.
- (3) All requests for a conditional use permit shall be submitted in writing to the Germantown Village Planning and Zoning Department, and shall include all of the following:
- (a) A site plan map with all building and structure footprints, driveways, sidewalks, parking lots, stormwater management structures, groundwater monitoring wells, and 2-foot ground elevation contours.
 - (b) A business plan and/or other documentation which describes in detail the use, activities, and structures proposed.
 - (c) An environmental assessment report prepared by a licensed environmental engineer which details the risk to, and potential impact of, the proposed use, activities, and structures on groundwater quality.
 - (d) An operational safety plan, which details the operational procedures for material processes and containment, best management practices, stormwater runoff management, and groundwater monitoring.
 - (e) A contingency plan which addresses in detail the actions that will be taken should a contamination event caused by the proposed use, activities, or structures occur.
- (4) All applicants submitting a request for a conditional use permit shall reimburse the Village for all consultant fees and expenses and technical review committee expenses associated with this review, plus administrative costs and processing fees.
- (5) All conditional use permits granted shall be subject to conditions that will include environmental and safety monitoring determined necessary to afford adequate protection of the public water supply. These conditions shall include all of the following:
- (a) Provide current copies of all federal, state and local facility operation approval or certificates and on-going environmental monitoring results to the Village.
 - (b) Establish environmental or safety structures/monitoring to include an operational safety plan, material processes and containment, operations monitoring, best management practices, stormwater runoff management, and groundwater monitoring.
 - (c) Replace equipment or expand in a manner that improves the environmental and safety technologies in existence.
 - (d) Prepare, file and maintain a current contingency plan which details the response to any emergency which occurs at the facility, including notifying municipal, county and state officials. Provide a current copy to the Village.
- (6) The Germantown Village Board shall decide upon a request for a conditional use permit only after full consideration of the recommendations made by the Germantown Groundwater Technical Review Committee. Any conditions above and beyond those specified in Conditional Uses, subsections (5) herein that are recommended by the Germantown Groundwater Technical Review Committee may be applied to the granting of the conditional use permit.



17.40.12 REQUIREMENTS FOR EXISTING FACILITIES REQUIRING A CONDITIONAL USE OR LISTED AS A PROHIBITED USE

Existing facilities within the Groundwater Protection Overlay District at the time of enactment of such district which require a conditional use or are listed as a prohibited use in section 17.40.11 or section 17.40.10 all of which are incorporated herein as if fully set forth.

- (a) The owners or operators of such facilities as above which exist within the district at the time of enactment shall, within 45 days of enactment, provide copies of all current, and within 30 days of receipt, revised or new federal, state and local facility operation approvals, permits or certificates; operational safety plan and on-going environmental monitoring results to the Village.
- (b) The owners or operators of such facilities as above which exist within the district at the time of enactment of a district shall have the responsibility of devising, filing and maintaining, with the Village, a current contingency plan which details how they intend to respond to any emergency which may cause or threaten to cause environmental pollution that occurs at their facility, including notifying municipal, county and state officials.
- (c) In the event of casualty loss causing damage or destruction to building improvements exceeding 50 percent of the assessed valuation thereof, or the desire to expand or enlarge building improvements, the cost of which will reasonably be anticipated to exceed 50 percent of the assessed valuation thereof, the owners or operators of such facilities shall be granted a conditional use permit, in accordance with this Code, and Section 17.40.11 above, to repair, rebuild, or expand such facilities, provided that the conditions imposed shall generally require that:
 - (1) To the extent feasible, based upon scientific, engineering and economic factors, the building improvements shall be repaired, restored or rebuilt employing designs and technologies which are state of the art, such that they diminish the potential for wellhead contamination, and
 - (2) To the extent feasible, based upon scientific, engineering, and economic factors, the replacement or augmentation of equipment and machinery and the installation thereof, which diminishes potential for wellhead contamination. This section does not apply to normal maintenance or minor repairs.

17.40.13 CHANGING TECHNOLOGY.

- (1) The uses prohibited by this district are prohibited based upon the combined pollution experience of many individual uses, and the technology generally employed by a particular use considered to be of a high risk for pollution to the groundwater resource. As the technology of other uses change to low or non-risk materials or methods, upon petition from such use, after conferring with the Groundwater Technical Review Committee or other expert opinion, and after appropriate public notice and hearing, the Village through appropriate procedures and actions to change these provisions of the Germantown Municipal Code may remove from the designated prohibited uses such uses as are demonstrated convincingly that they no longer pose a groundwater pollution hazard.

- (2) In dealing with uses which attempt to become permissible, under the terms of this district, by continuing to utilize pollutant materials but altering their processing, storage and handling, it is not the intention to accept alternate or reduced hazards as the basis for making a use permissible. It is the intention to continue a prohibition on such uses until the technology of the use removes reliance upon the pollutant materials or processes deemed to be a groundwater hazard.

17.40.14 ENFORCEMENT AND PENALTY.

- (1) **PENALTY.** Any person who violates, neglects or refuses to comply with any of the provisions of this ordinance shall be subject to a penalty as provided in Chapter 17.40 of this Municipal Code.
- (2) **INJUNCTION.** The Village of Germantown may, in addition to any other remedy, seek injunction or restraining order against the party alleged to have violated the provisions herein, the cost of which shall be charged to the defendant in such action.
- (3) **CLEANUP COSTS.** As a substitute for, and in addition to any other action, the Village of Germantown may commence legal action against both the person who releases the contaminants and the owner of the facility whereupon the contaminants were released to recover the costs, together with the costs of prosecution. Any person who causes the release of any contaminants which may endanger or contaminate the municipal water supply system associated with a Groundwater Protection Overlay District shall immediately cease such discharge and immediately initiate clean up satisfactory to the Village of Germantown and the other state and federal regulatory agencies.

The person who releases such contaminants and the person who owns the facility whereon the contaminants have been released shall be jointly and severally responsible for the cost of cleanup, consultant, or other contractor fees, including all administrative costs for oversight, review and documentation, including the Village employees, equipment, and mileage.

17.40.15 CONFLICT, INTERPRETATION AND SEVERABILITY.

- (1) **CONFLICT AND INTERPRETATION OF PROVISIONS.** If the provisions of the different chapters of this Code conflict with or contravene each other, the provisions of each chapter shall prevail as to all matters and questions arising out of the subject matter of such chapter. In their interpretation and application, the provisions of this ordinance shall be held to be the minimum and are not deemed a limitation or repeal of any other power granted by Wisconsin Statutes. Where any terms or requirements of this ordinance may be inconsistent or conflicting, the most restrictive requirements or interpretations shall apply.
- (2) **SEVERABILITY OF CODE PROVISIONS.** If any section, subsection, sentence, clause or phrase of the Code is for any reason held to be invalid or unconstitutional by reason of any decision of any court of competent jurisdiction, such decision shall not affect the validity of any other section, subsection, sentence, clause or phrase or portion thereof. The Village Council hereby declares that they would have passed this Code and each section, subsection, sentence, clause, phrase or portion thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses, phrases or portions may be declared invalid or unconstitutional.

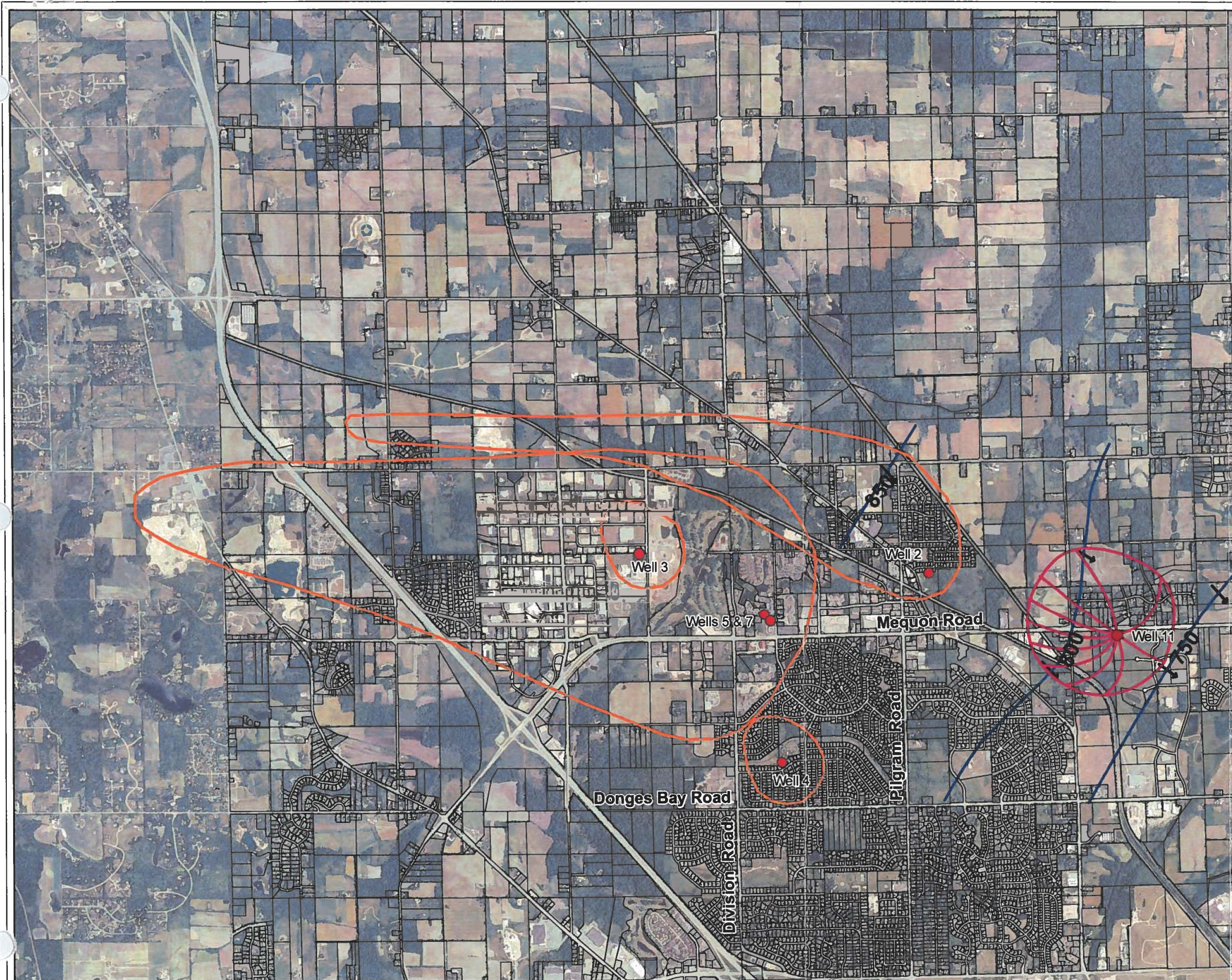


Figure 1

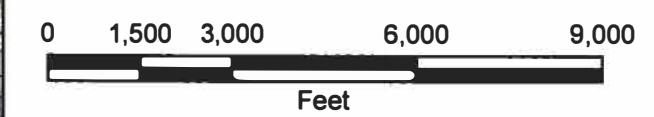
**Wellhead Protection Areas for
Germantown Well No. 11***

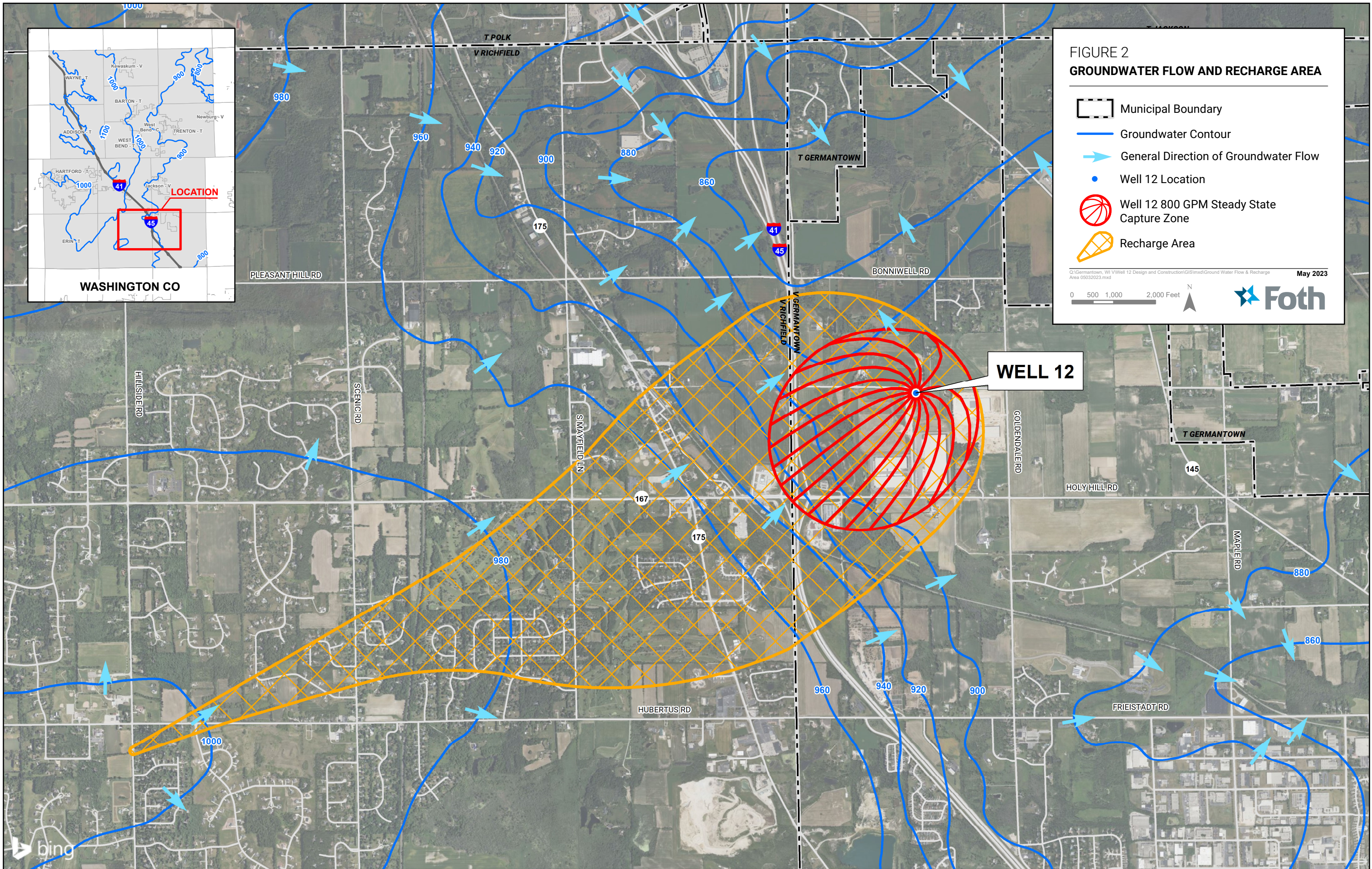
**Village of Germantown
Washington County, Wisconsin**

*WHPA for Well 11 delineated by
Ruekert-Mielke, 2010 in Amendment
No. 1 to Wellhead Protection Plan for
Municipal Well Nos. 2, 3, 3, 5, & 7
delineated by Graef, 2008

Legend

- Village Well Sites
- Direction of Groundwater Flow
- 800 Potentiometric Surface Elevation of Sandstone Aquifer (Static Condition)
- Wellhead Protection Area Well 11 (Based on 5-Year TOT)
- Graef Wellhead Protection Areas Wells 2-5 & 7 (Based on 5-Year TOT)





BUSINESS OF THE VILLAGE BOARD

MEETING DATE: August 19, 2024

PLACEMENT: Presentation

ITEM TITLE: Well 12 Investigation: Findings and Next Steps Presentation by
Water Quality Investigations

SUBMITTED BY: Matthew Mortwedt, Public Works Director

SUMMARY EXPLANATION:

When PFAF's testing was required for Well 12 (a new regulatory requirement), it required that the well be pumped to get the sample. Though PFAF's were not identified, it was noticed that the well did not perform as well as it did when it was constructed in 2021 - the draw-down was more significant and a biofilm had developed in parts of the well. This led to a series of cleaning efforts and tests to identify exactly what had happened and what the best steps were for Germantown moving forward.

During that time, Water Quality Investigations' (WQI) Andy Jacque led the effort. Mr. Jacque has worked as a consultant with the Germantown Water Utility for over 5 years. He is the chief scientist at WQI, a PhD and a professional engineer.

Attached to this agenda item is the final report prepared by WQI as well as the presentation Mr. Jacque will give.

What is proposed will lead into the next agenda item for additional consulting fees to properly scope the proposed solution.

ATTACHMENT:

1. 2024-07-03 Germantown Village of - Well 12 Summary Report
2. Germantown Well 12 Discussion

STAFF RECOMMENDATION:

N/A

ACTION BY Committee:

N/A

Water Quality Investigations Summary Report

Project: Germantown, Village of - Well 12

Prepared on 07/24/2024

Project Purpose: Assess water quality and well capacity for the lower aquifer at Well 12. Testing was performed with a packer installed and inflated at a depth of about 260 feet with water collected from the well borehole located below the packer.

Report Date: 07/24/2024

Project: Germantown, Village of - Well 12

Sample Date: Varies

Sample Name	Sample Description
24 Hrs Pumping - Packer	Sample was collected after indicated time of pumping. Sample represents average quality of untreated water from the lower aquifer connected to the well (below packer - fracture at about 350 feet).
Surge - Packer	Sample was collected about 3.5 minutes after restarting the pump after resting the well for five minutes after the 24-hour pump test. Sample represents average quality of untreated water from the lower aquifer connected to the well (below packer - fracture at about 350 feet).
24 Hrs Pumping - Packer + 4 mg/L Cl	Indicated sample was treated with chlorine to assess chlorine demand and reactivity.
Surge - Packer + 4 mg/L Cl	Indicated sample was treated with chlorine to assess chlorine demand and reactivity.
Dynamic #2: 270 ft (previous)	Sample was collected at the indicated depth at the end of a 24-hour pump test. Sample represents quality of untreated water from below the 270' region of the well (lower aquifer).
Dynamic #2: 270ft + 4 mg/L Cl (previous)	Indicated sample was treated with chlorine to assess chlorine demand and reactivity.
Dynamic #2: Combined discharge (previous)	Sample was collected at the indicated depth at the end of a 24-hour pump test. Sample represents quality of untreated water from the entire well (all aquifers).
W5 2 Hours Aquifer (previous)	Sample was collected after indicated time of pumping. Sample represents average quality of untreated water from the aquifer(s) connected to Well 5. This sample from a previous sampling time is included for comparison purposes.
Surge, Start of Dynamic #2 Pumping (previous)	Sample was collected about ten minutes after changing the pumping rate from 460 gpm to 810 gpm (start of Dynamic #2). Water clarity was starting to improve at this point.

Project: Germantown, Village of - Well 12

OVERALL ASSESSMENT AND RECOMMENDATIONS

1. Overall data patterns for 24-hour packer sample are generally consistent with patterns seen for the lower aquifer in previous testing.
2. Attributes of the lower aquifer generally include the following:
 - a. Low iron, elevated ammonia, moderate to elevated organic carbon, and no nitrate.
 - b. Moderate alkalinity, magnesium, and zinc, which indicate potential corrosion of mineralogy.
 - c. Contains elevated biofilm signatures and elevated protein, which are indicators of biofilm starvation conditions and the potential for biofilm formation and corrosion in the well and downstream water system.
 - d. Contains a chlorine demand of about 1.9 mg/L (caused by ammonia) and the presence of reactive proteins that cause the formation of combined chlorine. A chlorine dose of about 3.5 mg/L may be needed for adequate control and residual in the water system.
 - e. Water from the lower aquifer is very similar to water obtained from Well 5, except that the ammonia, arsenic, cobalt, iron, magnesium, phosphorous and zinc are higher, and nitrate is lower in Well 12. These results may change when downward movement in the well is eliminated with installation of a liner and previously recharged water from the upper aquifer is cleared out.
3. The packer surge sample contained elevated iron and excessive arsenic, both of which were in a particulate form. **Arsenic in the packer surge sample exceeds the Public Health Standard (10 ug/L).** These metals are associated with discolored water that started at about 2.5 minutes after initiating a surge and lasted for about 6 minutes. The sample was collected about 3.5 minutes after the start of the surge. The timing of the discolored water indicates that the particulate material came from the fracture located at about 350 feet (top of the Maquoketa shale layer), which is the lower aquifer in the well. Iron and arsenic appear to be oxidized metals adhered to biofilm that is present in the fracture. Overdevelopment of the well by pumping at 2,000 gpm with rawhiding after installation of the liner will remove/minimize this material.
4. Field data indicate the following for the pump test:
 - a. Static water level:
 - i. Above packer ~ 15 feet below top of casing
 - ii. Below packer ~ 63 feet below top of casing
 - iii. There is about 48 feet of hydraulic head difference between the upper and lower aquifers. This clearly shows the hydraulic gradient that caused downward movement in the well under static conditions.
 - b. 24-hour pumping water level at 800 gpm (pumping of lower aquifer):
 - i. Above packer = 42.3 feet (~0.5 feet drawdown or fluctuation)
 - ii. Below packer = 111.3 feet (~29 feet drawdown)
 - iii. 24-hour specific capacity at 800 gpm = 27.8 gpm/ft. Specific capacity may decline if pumping rate is increased caused by restrictions associated with fracture flow.
 - iv. Data indicate there is limited connectivity between the upper aquifers and the lower aquifer at Well 12. The limited connectivity could be caused by minor leakage through flow paths around the packer, which would be sealed off with installation of a fully grouted liner.

Project: Germantown, Village of - Well 12

- c. WellIntel Data for nearby wells:
 - i. WellIntel data for nearby logs showed no impact of the 7/1/2024 packer test on the nearby wells. This is in contrast to the 7.6 foot of drop in the Matt Stephan well and the 7.1 foot of drop in the Joann Stephan well observed during the step test performed from 4/28 thru 4/30.
 - ii. WellIntel data suggest that the aquifer has rebounded about one foot in the Matt Stephan and Joann Stephan wells with the packer inflated since 6/28/2024 (as of 7/24/2024).
 - d. There is direct connectivity of the lower aquifer at Well 12 with other wells in the community, which likely include Well 2, Well 5 and Well 7. Operation of the Village's current wells caused a drawdown of about 1.0 feet in Well 12 during the pump test and during the rest and recovery periods.
 - e. There is limited connectivity between the upper aquifers at Well 12 with other wells in the community. Operation of the Village's current wells caused a drawdown of 0.25 to 0.5 feet in the upper aquifer in Well 12 during the pump test and during the rest and recovery periods.
 - f. Results indicate that installation of a liner would result in minimal impact of Well 12 on the nearby wells and may in fact allow the upper aquifer to rebound and further minimize local impact because downward movement in the well under static conditions would be eliminated.
5. Recommendations:
- a. A liner should be installed to a depth of 260 feet to 1) eliminate the pumping of poorer quality water from the upper and middle aquifer, 2) to minimize the potential for excessive biofilm growth in the well and 3) the pumping of turbid water caused by biofilm growth (seen in previous videos). Installation of the liner would subject the nearby wells to conditions that existed prior to the construction of Well 12 and would allow the local aquifer to rebound and thus correct the impact that Well 12 has had on nearby wells.
 - b. The well should be partially abandoned below a depth of 360 feet to eliminate the non-productive zone at the bottom of the well that is open to the Maquoketa Shale.
 - c. After installation of the liner and partial abandonment, a temporary 2,000 gpm pump should be installed to overdevelop and clean the lower aquifer, and to remove any debris that entered this part of the well during the liner installation process.
 - d. If the liner is not installed now, a packer should remain in the well until liner installation to isolate the upper and middle aquifer from the lower aquifer.
 - e. It appears that Well 12 can easily produce 1,000 gpm or more, maximizing water production at the site without the need for a deep well and blending, or the need for additional water treatment.

See attached report for the data trends that informed the above conclusions and recommendations.

BIT DATA SUMMARY

Project: Germantown, Village of - Well 12

Sample	ME/mL	MBP EEM (FI)	DP EEM (FI)	TP EEM (FI)	BCI	ORP (mV)	p.H. (s.u.)	Specific Conductance (uS/cm)	AOC_S (mg/L)	Nitrate (mg/L as N)	WQI Protein Assay (mg/L)	Spike Recovery	BSA Equivalence (mg/L)	Dis. Cu Est (µg/L)	Filter Color	Total Chlorine (mg/L)	Free Chlorine (mg/L)	Ammonia, Total (mg/L)	Nitrite as N (mg/L)	Phosphate as PO4 (mg/L)	Heterotroph (organic carbon bacteria)	Nitrification (ammonia bacteria)	Est. Life of 1" copper pipe (years)	Net Copper Corrosion Potential (ug/L)	Net Lead Corrosion Potential (ug/L)	Total Copper Corrosion Potential (ug/L)	Total Lead Corrosion Potential (ug/L)
24 Hrs Pumping - Packer	560	150,498	478,873	629,371	2.0	290	7.99	987	0.21	0.00	0.97	170%	0.51	25	0	NT	NT	0.16	0.000	0.030	32%	68%	68	195.0	55	1,926.0	472.0
Surge - Packer	5,080	151,632	491,691	643,323	2.0	271	7.98	976	0.20	0.00	0.88	159%	0.48	26	5	NT	NT	0.17	0.002	0.030	32%	68%	67	249.0	54	1,964.0	476.0
24 Hrs Pumping - Packer + 4 mg/L Cl	NT	80,230	138,850	219,080	1.3	735	8.21	918	0.16	0.00	NT	NT	NT	70	NT	2.6	2.4	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Surge - Packer + 4 mg/L Cl	NT	78,527	127,999	206,526	1.3	756	8.19	916	0.14	0.00	NT	NT	NT	61	NT	2.5	2.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Dynamic #2: 270 ft	2,100	140,347	472,107	612,454	1.8	404	7.93	979	0.22	0.00	0.86	233%	0.36	33	0	NT	NT	NT	0.000	0.030	78%	22%	66	170.0	59	1,981.0	483.0
Dynamic #2: Combined discharge	2,324	138,640	477,435	616,075	1.8	395	8.00	986	0.21	0.00	0.77	195%	0.38	7	1	NT	NT	NT	0.000	0.020	54%	46%	71	176.0	66	1,865.0	476.0
W5 2 Hours Aquifer	626	220,859	439,579	660,438	3.3	355	7.94	1,008	0.44	0.00	0.75	320%	0.16	1	0	NT	NT	NT	0.004	NT	75%	25%	58	195.0	22	2,267.0	473.0
Surge, Start of Dynamic #2 Pumping	20,662	152,508	481,545	634,053	2.0	392	8.07	981	0.20	0.00	0.93	239%	0.38	42	5	NT	NT	NT	NT	NT	39%	61%	61	265.0	62	2,150.0	496.0

Note: For a set of samples from a given system, water quality would not change by more than 5%



BAT DATA SUMMARY

Project: Germantown, Village of - Well 12

	Decay Severity SI									Metabolism Severity SI								
Sample	DSI: PO4	DSI: Sulfur	DSI: Complex OA	DSI: Simple OA	DSI: Protein Degrade	DSI: Simple Sugar	DSI: Ammonia and/or Protein	DSI: Biofilm Degrade	DSI: Iron/Metal Deficit	MSI: PO4	MSI: Sulfur	MSI: Complex OA	MSI: Simple OA	MSI: Protein Degrade	MSI: Simple Sugar	MSI: Ammonia and/or Protein	MSI: Biofilm Degrade	
24 Hrs Pumping - Packer	6.1	6.1	1.1	1.0	3.3	2.4	5.1	1.8	4.2	0.2	6.1	2.8	2.8	3.4	0.0	3.3	0.1	
Surge - Packer	6.4	6.1	1.1	0.8	2.7	5.6	6.5	5.8	4.2	0.0	6.3	3.0	2.6	3.0	0.0	4.4	0.0	
Dynamic #2: 270 ft	6.5	6.7	1.6	1.0	4.5	2.7	6.4	0.0	1.8	0.0	7.7	5.2	3.6	5.7	0.0	2.5	4.5	
Dynamic #2: Combined discharge	6.0	6.0	1.1	0.9	3.4	6.9	6.1	6.3	4.3	0.7	7.7	3.2	2.8	4.3	0.2	2.9	1.4	
W5 2 Hours Aquifer	6.1	2.1	1.3	1.3	4.7	1.9	4.6	2.1	2.1	3.1	2.6	3.5	4.8	6.1	0.6	2.6	0.8	
Surge, Start of Dynamic #2 Pumping	5.3	5.8	1.4	1.1	5.4	0.0	6.6	0.0	3.2	0.0	4.8	3.9	3.3	5.4	0.0	2.3	1.2	

Note: For a set of samples from a given system, water quality would not change by more than 5% unless biofilm were present.

CHEMICAL WATER QUALITY DATA

Client/Project: Germantown, Village of - Well 12

Metals, Inorganics, and Nutrients

Parameter	24 Hrs Pumping - Packer	Surge - Packer	Dynamic #2: 270 ft	Dynamic #2: Combined Discharge	W5 2 Hours Aquifer	Surge, Start of Dynamic #2 Pumping	Units	LOD
Alkalinity, tot. as CaCO ₃	350	350	340	330	410	350	mg/L	1
Aluminum, dis.	BDL	BDL	NT	NT	NT	NT	mg/L	0.0090
Aluminum, tot.	BDL	0.28	0.038	0.061	BDL	5.7	mg/L	0.0090
Antimony, dis.	BDL	BDL	NT	NT	NT	NT	ug/L	0.32
Antimony, tot.	BDL	BDL	BDL	BDL	BDL	BDL	ug/L	0.32
Arsenic, dis.	1.2	BDL	NT	NT	NT	NT	ug/L	1.1
Arsenic, tot.	1.4	22	1.3	1.6	BDL	57	ug/L	1.1
Barium, dis.	99	98	NT	NT	NT	NT	ug/L	0.20
Barium, tot.	110	150	120	130	110	410	ug/L	0.20
Cadmium, dis.	BDL	BDL	NT	NT	NT	NT	ug/L	0.12
Cadmium, tot.	BDL	BDL	BDL	BDL	BDL	BDL	ug/L	0.12
Calcium, dis.	110	110	NT	NT	NT	NT	mg/L	0.13
Calcium, tot.	100	98	110	110	NT	300	mg/L	0.13
Chloride, tot.	75	74	74	75	86	76	mg/L	1.6
Chromium, dis.	BDL	BDL	NT	NT	NT	NT	ug/L	1.2
Chromium, tot.	BDL	BDL	BDL	BDL	BDL	11	ug/L	1.2
Cobalt, dis.	0.23	0.23	NT	NT	NT	NT	ug/L	0.030
Cobalt, tot.	0.31	0.50	0.24	0.28	0.26	2.7	ug/L	0.030
Copper, dis.	1.7	0.84	NT	NT	NT	NT	ug/L	0.69
Copper, tot.	2.2	3.1	0.78	0.80	3.1	14	ug/L	0.69
Hardness, tot. as CaCO ₃	470	430	460	480	NT	1300	mg/L	0.28
Iron, dis.	BDL	BDL	NT	NT	NT	NT	mg/L	0.044
Iron, tot.	0.16	12	0.23	0.43	BDL	42	mg/L	0.044
Lead, dis.	BDL	BDL	NT	NT	NT	NT	ug/L	0.25
Lead, tot.	BDL	1.0	BDL	BDL	BDL	7.3	ug/L	0.25
Magnesium, dis.	62	61	NT	NT	NT	NT	mg/L	0.069
Magnesium, tot.	53	44	47	50	43	140	mg/L	0.069
Manganese, dis.	9.7	9.7	NT	NT	NT	NT	ug/L	0.50
Manganese, tot.	10	17	12	15	10	190	ug/L	0.50
Molybdenum, dis.	0.74	0.78	NT	NT	NT	NT	ug/L	0.57
Molybdenum, tot.	1.5	0.85	0.90	0.91	0.84	0.97	ug/L	0.57

Parameter	24 Hrs Pumping - Packer	Surge - Packer	Dynamic #2: 270 ft	Dynamic #2: Combined Discharge	W5 2 Hours Aquifer	Surge, Start of Dynamic #2 Pumping	Units	LOD
Nickel, dis.	2.4	2.4	NT	NT	NT	NT	ug/L	1.0
Nickel, tot.	1.9	3.4	1.8	1.7	2.4	10	ug/L	1.0
Nitrogen, Ammonia as N, tot.	0.38	0.30	0.12	0.12	BDL	0.21	mg/L	0.039
Nitrogen, NO2 and NO3 as N, tot.	BDL	BDL	BDL	BDL	0.12	0.078	mg/L	0.052
Phosphorus, tot.	0.043	0.33	0.048	0.052	BDL	2.0	mg/L	0.037
Potassium, dis.	2.9	2.8	NT	NT	NT	NT	mg/L	0.060
Potassium, tot.	2.7	2.3	2.6	2.5	3.5	4.8	mg/L	0.060
Silicon, dis.	9900	9800	NT	NT	NT	NT	ug/L	18
Silicon, tot.	9600	9400	8500	9100	NT	24000	ug/L	18
Sodium, dis	40	40	NT	NT	NT	NT	mg/L	0.14
Sodium, tot.	34	27	31	32	37	30	mg/L	0.14
Strontium, dis.	940	910	NT	NT	NT	NT	ug/L	0.23
Strontium, tot.	970	930	1200	1000	1200	1700	ug/L	0.23
Sulfate, as SO4	50	50	61	58	74	59	mg/L	3.0
Tin, dis.	BDL	BDL	NT	NT	NT	NT	ug/L	1.5
Tin, tot.	BDL	BDL	BDL	BDL	BDL	BDL	ug/L	1.5
Total Organic Carbon (TOC)	0.67	0.78	1.0	0.71	0.98	0.97	mg/L	0.27
Turbidity	BDL	3.2	2.2	2.0	NT	410	NTU	0.50
Zinc, dis.	8.3	5.6	NT	NT	NT	NT	ug/L	1.8
Zinc, tot.	11	18	4.3	5.5	8.5	50	ug/L	1.8

NT = Not Tested; BDL = Below Detection Limit

Project: Germantown, Village of - Well 12
 Water System: WELL
 Sample Disinfection: NONE
 Corrosion Control: NONE
 Stag/Flow Condition: FLOW
 Sample Lab ID: **2024-07-03_A-01**
 Analysis Date: 7/3/2024
 Collection Date: 7/3/2024
 Sample Name: **24 Hrs Pumping - Packer**



Yellow shading: preventative actions recommended

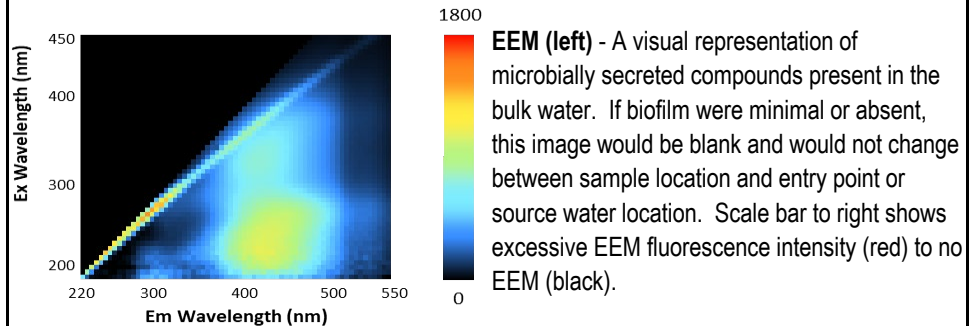
Red shading: corrective actions required

Overall Biofilm Assessment and Microbiologically Influenced Corrosion (MIC) Assessment

Parameter	Result	Comment/Description
Heterotroph (carbon bacteria)	32%	percentage of organic carbon consuming bacteria expected in system
Nitrification (ammonia bacteria)	68%	percentage of organic nitrogen consuming bacteria expected in system
Bacteria/biofilm growth potential	10.0	excessive biofilm growth potential - nutrient control required
Opportunistic pathogen potential	10.0	excessive potential for opportunistic pathogens - biofilm control required
Biostability	4.2	moderate biofilm instability - stability control recommended
DBP potential if chlorinated	4.9	moderate potential for TTHM and/or HAA5 formation if chlorinated
Copper MIC Potential	1.5	low MIC potential
Lead MIC Potential	10.0	excessive MIC potential - nutrient control and biofilm control required
Steel or SS MIC Potential	NT	not tested
Main Cause of MIC	Metals starvation/limitation	
Other Cause of MIC	The presence of thick biofilm that is active	
Other Cause of MIC	Protein degradation of decaying organic matter	



Filter Picture (above)



BIOFILM INDICATION TEST® (BIT) Results Summary

Parameter	Result	Description
ME/mL	560	low measure of sloughed biofilm or bacteria
ORP (mV)	290	ORP is acceptable
pH (su)	7.99	pH is acceptable
Specific Conductance (µS)	987	excessive measure of ions in the water, may be corrosive
AOC_S (mg/L)	0.2	low est. of organic matter and acids
TP EEM (FI)	629,371	moderate TP EEM (biofilm starvation and stress), biofilm control recommended
MBP EEM (FI)	150,498	moderate MBP EEM (biofilm activity), biofilm control recommended
DP EEM (FI)	478,873	moderate Decay Products EEM (biofilm decay and thickness), biofilm control recommended
Est. Dis. Copper (µg/L)	25	low estimate of dissolved copper caused by corrosion
Nitrate-N (mg/L)	0.00	low estimate of nitrate
Protein Assay (mg/L)	0.97	excessive indicator of biofilm starvation/stress, biofilm control required
Filter Color SI	0	low estimate of sloughed biofilm in sample
BCI (Corrosivity Scale)	1.98	low general estimate of biofilm corrosivity
Total Chlorine (mg/L)	NT	
Free Chlorine (mg/L)	NT	
Combined Chlorine (mg/L)		Not Applicable
Nitrite (mg/L)	0.000	low estimate of nitrate
Orthophosphate (mg/L)	0.030	low presence of orthophosphate (corrosion control and nutrient)
Ammonia as N, tot. (mg/L)	0.16	excessive ammonia, biofilm or nutrient control required
Manganese, tot. (ug/L)	NT	Not Tested
Iron, tot. (mg/L)	0.11	moderate iron, corrosion, control, biofilm control or treatment recommended

Sample Lab ID: **2024-07-03_A-01**
 Analysis Date: 7/3/2024
 Collection Date: 7/3/2024
 Sample Name: **24 Hrs Pumping - Packer**

Yellow shading: preventative actions recommended
 Red shading: corrective actions required

BIOFILM ACTIVITY TEST® (BAT) Results Summary. DSI = Decay Severity Index. MSI = Metabolism Severity Index

Parameter	Result	Description
DSI: PO ₄ Starvation	6.1	excessive organic phosphate use, biofilm thickness control required
DSI: Sulfur Utilization	6.1	excessive organic sulfate use, biofilm thickness control required
DSI: Complex Organic Acid	1.1	low complex organic acids use
DSI: Simple Organic Acid	1.0	low simple organic acids use
DSI: Protein Degrade	3.3	moderate degrading proteins, biofilm thickness control recommended
DSI: Simple Sugar	2.4	low complex sugar acid use
DSI: Ammonia and/or Protein	5.1	moderate protein degradation, biofilm thickness control recommended
DSI: Biofilm Degrade	1.8	low complex organic matter use
Iron or Metal Deficit	4.2	moderate biofilm actively looking for metals, biofilm thickness control recommended
MSI: PO ₄ Starvation	0.2	low organic phosphate use
MSI: Sulfur Utilization	6.1	excessive organic sulfate use, biofilm activity/nutrient control required
MSI: Complex Organic Acid	2.8	low complex organic acids use
MSI: Simple Organic Acid	2.8	low simple organic acids use
MSI: Protein Degrade	3.4	moderate degrading proteins, biofilm activity/nutrient control recommended
MSI: Simple Sugar	0.0	low complex sugar acid use
MSI: Ammonia and/or Protein	3.3	moderate protein degradation, biofilm activity/nutrient control recommended
MSI: Biofilm Degrade	0.1	low complex organic matter use

Chemical and Nutrient Analysis Results Summary

Parameter	Result	Comment
Alkalinity, tot. as CaCO ₃ (mg/L)	350	moderate result, control or treatment recommended
Aluminum, dis. (mg/L)	BDL	
Aluminum, tot. (mg/L)	BDL	
Antimony, dis. (ug/L)	BDL	
Antimony, tot. (ug/L)	BDL	
Arsenic, dis. (ug/L)	1.2	
Arsenic, tot. (ug/L)	1.4	
Barium, dis. (ug/L)	99	
Barium, tot. (ug/L)	110	
Cadmium, dis. (ug/L)	BDL	
Cadmium, tot. (ug/L)	BDL	
Calcium, dis. (mg/L)	110	elevated result, control or treatment required
Calcium, tot. (mg/L)	100	elevated result, control or treatment required
Chloride, tot. (mg/L)	75	moderate result, control or treatment recommended
Chromium, dis. (ug/L)	BDL	
Chromium, tot. (ug/L)	BDL	
Cobalt, dis. (ug/L)	0.23	
Cobalt, tot. (ug/L)	0.31	
Copper, dis. (ug/L)	1.7	
Copper, tot. (ug/L)	2.2	
Hardness, tot. as CaCO ₃ (mg/L)	470	elevated result, control or treatment required
Iron, dis. (mg/L)	BDL	
Iron, tot. (mg/L)	0.16	moderate result, control or treatment recommended
Lead, dis. (ug/L)	BDL	
Lead, tot. (ug/L)	BDL	
Magnesium, dis. (mg/L)	62	elevated result, control or treatment required
Magnesium, tot. (mg/L)	53	elevated result, control or treatment required
Manganese, dis. (ug/L)	9.7	
Manganese, tot. (ug/L)	10	
Molybdenum, dis. (ug/L)	0.74	
Molybdenum, tot. (ug/L)	1.5	
Nickel, dis. (ug/L)	2.4	
Nickel, tot. (ug/L)	1.9	
Ammonia as N, tot. (mg/L)	0.38	elevated result, control or treatment required
NO ₂ and NO ₃ as N, tot. (mg/L)	BDL	

Sample Lab ID: **2024-07-03_A-01**
 Analysis Date: 7/3/2024
 Collection Date: 7/3/2024
 Sample Name: **24 Hrs Pumping - Packer**

Yellow shading: preventative actions recommended

Red shading: corrective actions required

Parameter	Result	Comment
Phosphorus, tot. (mg/L)	0.043	
Potassium, dis. (mg/L)	2.9	
Potassium, tot. (mg/L)	2.7	
Silicon, dis. (ug/L)	9900	moderate result, control or treatment recommended
Silicon, tot. (ug/L)	9600	moderate result, control or treatment recommended
Sodium, dis (mg/L)	40	
Sodium, tot. (mg/L)	34	
Strontium, dis. (ug/L)	940	
Strontium, tot. (ug/L)	970	
Sulfate, as SO4 (mg/L)	50	
Tin, dis. (ug/L)	BDL	
Tin, tot. (ug/L)	BDL	
Total Organic Carbon (TOC) (mg/L)	0.67	moderate result, control or treatment recommended
Turbidity (NTU)	BDL	
Zinc, dis. (ug/L)	8.3	
Zinc, tot. (ug/L)	11	

Project: Germantown, Village of - Well 12
 Water System: WELL
 Sample Disinfection: NONE
 Corrosion Control: NONE
 Stag/Flow Condition: FLOW
 Sample Lab ID: **2024-07-03_A-02**
 Analysis Date: 7/3/2024
 Collection Date: 7/3/2024
 Sample Name: **Surge - Packer**



Yellow shading: preventative actions recommended

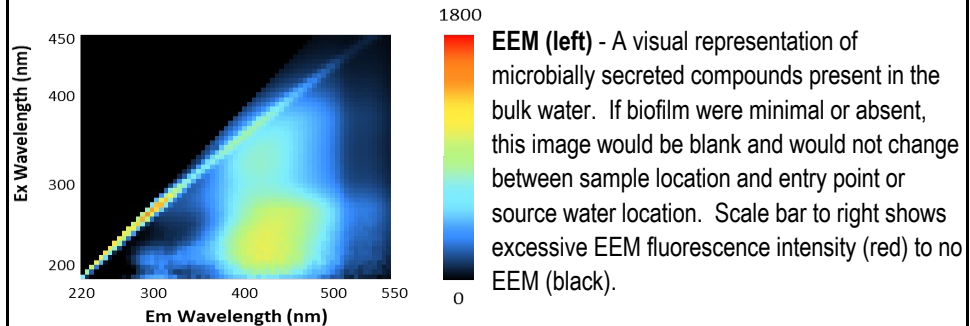
Red shading: corrective actions required

Overall Biofilm Assessment and Microbiologically Influenced Corrosion (MIC) Assessment

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Opportunistic pathogen potential	10.0	excessive potential for opportunistic pathogens - biofilm control required
Biostability	10.0	excessive biofilm instability - nutrient control and stability control required
DBP potential if chlorinated	4.4	moderate potential for TTHM and/or HAA5 formation if chlorinated
Copper MIC Potential	1.9	low MIC potential
Lead MIC Potential	10.0	excessive MIC potential - nutrient control and biofilm control required
Steel or SS MIC Potential	NT	not tested
Main Cause of MIC	Metals starvation/limitation	
Other Cause of MIC	The presence of thick biofilm that is active	
Other Cause of MIC	Protein degradation of decaying organic matter	



Filter Picture (above)



BIOFILM INDICATION TEST® (BIT) Results Summary

Parameter	Result	Description
ME/mL	5,080	excessive measure of sloughed biofilm or bacteria, biofilm control required
ORP (mV)	271	ORP is acceptable
pH (su)	7.98	pH is acceptable
Specific Conductance (µS)	976	excessive measure of ions in the water, may be corrosive
AOC_S (mg/L)	0.2	low est. of organic matter and acids
TP EEM (FI)	643,323	moderate TP EEM (biofilm starvation and stress), biofilm control recommended
MBP EEM (FI)	151,632	moderate MBP EEM (biofilm activity), biofilm control recommended
DP EEM (FI)	491,691	moderate Decay Products EEM (biofilm decay and thickness), biofilm control recommended
Est. Dis. Copper (µg/L)	26	low estimate of dissolved copper caused by corrosion
Nitrate-N (mg/L)	0.00	low estimate of nitrate
Protein Assay (mg/L)	0.88	excessive indicator of biofilm starvation/stress, biofilm control required
Filter Color SI	10	excessive estimate of sloughed biofilm in sample, biofilm control required
BCI (Corrosivity Scale)	1.98	low general estimate of biofilm corrosivity
Total Chlorine (mg/L)	NT	
Free Chlorine (mg/L)	NT	
Combined Chlorine (mg/L)		Not Applicable
Nitrite (mg/L)	0.002	low estimate of nitrate
Orthophosphate (mg/L)	0.030	low presence of orthophosphate (corrosion control and nutrient)
Ammonia as N, tot. (mg/L)	0.17	excessive ammonia, biofilm or nutrient control required
Manganese, tot. (ug/L)	NT	Not Tested
Iron, tot. (mg/L)	10.80	excessive iron, corrosion, control, biofilm control or treatment required

Sample Lab ID: 2024-07-03_A-02

Analysis Date: 7/3/2024

Collection Date: 7/3/2024

Sample Name: Surge - Packer

Yellow shading: preventative actions recommended

Red shading: corrective actions required

BIOFILM ACTIVITY TEST® (BAT) Results Summary. DSI = Decay Severity Index. MSI = Metabolism Severity Index

Parameter	Result	Description
DSI: PO ₄ Starvation	6.4	excessive organic phosphate use, biofilm thickness control required
DSI: Sulfur Utilization	6.1	excessive organic sulfate use, biofilm thickness control required
DSI: Complex Organic Acid	1.1	low complex organic acids use
DSI: Simple Organic Acid	0.8	low simple organic acids use
DSI: Protein Degrade	2.7	low degrading proteins
DSI: Simple Sugar	5.6	moderate complex sugar acid use, biofilm thickness control recommended
DSI: Ammonia and/or Protein	6.5	excessive protein degradation, biofilm thickness control required
DSI: Biofilm Degrade	5.8	moderate complex organic matter use, biofilm thickness control recommended
Iron or Metal Deficit	4.2	moderate biofilm actively looking for metals, biofilm thickness control recommended
MSI: PO ₄ Starvation	0.0	low organic phosphate use
MSI: Sulfur Utilization	6.3	excessive organic sulfate use, biofilm activity/nutrient control required
MSI: Complex Organic Acid	3.0	low complex organic acids use
MSI: Simple Organic Acid	2.6	low simple organic acids use
MSI: Protein Degrade	3.0	low degrading proteins
MSI: Simple Sugar	0.0	low complex sugar acid use
MSI: Ammonia and/or Protein	4.4	moderate protein degradation, biofilm activity/nutrient control recommended
MSI: Biofilm Degrade	0.0	low complex organic matter use

Chemical and Nutrient Analysis Results Summary

Parameter	Result	Comment
Alkalinity, tot. as CaCO ₃ (mg/L)	350	moderate result, control or treatment recommended
Aluminum, dis. (mg/L)	BDL	
Aluminum, tot. (mg/L)	0.28	elevated result, control or treatment required
Antimony, dis. (ug/L)	BDL	
Antimony, tot. (ug/L)	BDL	
Arsenic, dis. (ug/L)	BDL	
Arsenic, tot. (ug/L)	22	elevated result, control or treatment required
Barium, dis. (ug/L)	98	
Barium, tot. (ug/L)	150	
Cadmium, dis. (ug/L)	BDL	
Cadmium, tot. (ug/L)	BDL	
Calcium, dis. (mg/L)	110	elevated result, control or treatment required
Calcium, tot. (mg/L)	98	elevated result, control or treatment required
Chloride, tot. (mg/L)	74	
Chromium, dis. (ug/L)	BDL	
Chromium, tot. (ug/L)	BDL	
Cobalt, dis. (ug/L)	0.23	
Cobalt, tot. (ug/L)	0.5	
Copper, dis. (ug/L)	0.84	
Copper, tot. (ug/L)	3.1	
Hardness, tot. as CaCO ₃ (mg/L)	430	elevated result, control or treatment required
Iron, dis. (mg/L)	BDL	
Iron, tot. (mg/L)	12	elevated result, control or treatment required
Lead, dis. (ug/L)	BDL	
Lead, tot. (ug/L)	1	
Magnesium, dis. (mg/L)	61	elevated result, control or treatment required
Magnesium, tot. (mg/L)	44	elevated result, control or treatment required
Manganese, dis. (ug/L)	9.7	
Manganese, tot. (ug/L)	17	
Molybdenum, dis. (ug/L)	0.78	
Molybdenum, tot. (ug/L)	0.85	
Nickel, dis. (ug/L)	2.4	
Nickel, tot. (ug/L)	3.4	
Ammonia as N, tot. (mg/L)	0.3	elevated result, control or treatment required
NO ₂ and NO ₃ as N, tot. (mg/L)	BDL	

Sample Lab ID: **2024-07-03_A-02**
 Analysis Date: 7/3/2024
 Collection Date: 7/3/2024
 Sample Name: **Surge - Packer**

Yellow shading: preventative actions recommended
 Red shading: corrective actions required

Parameter	Result	Comment
Phosphorus, tot. (mg/L)	0.33	
Potassium, dis. (mg/L)	2.8	
Potassium, tot. (mg/L)	2.3	
Silicon, dis. (ug/L)	9800	moderate result, control or treatment recommended
Silicon, tot. (ug/L)	9400	moderate result, control or treatment recommended
Sodium, dis (mg/L)	40	
Sodium, tot. (mg/L)	27	
Strontium, dis. (ug/L)	910	
Strontium, tot. (ug/L)	930	
Sulfate, as SO4 (mg/L)	50	
Tin, dis. (ug/L)	BDL	
Tin, tot. (ug/L)	BDL	
Total Organic Carbon (TOC) (mg/L)	0.78	moderate result, control or treatment recommended
Turbidity (NTU)	3.2	moderate result, control or treatment recommended
Zinc, dis. (ug/L)	5.6	
Zinc, tot. (ug/L)	18	

Project: Germantown, Village of - Well 12
 Water System: WELL
 Sample Disinfection: NONE
 Corrosion Control: NONE
 Stag/Flow Condition: FLOW



Sample Lab ID: **2024-07-03_A-03**

Analysis Date: 7/3/2024

Collection Date: 7/3/2024

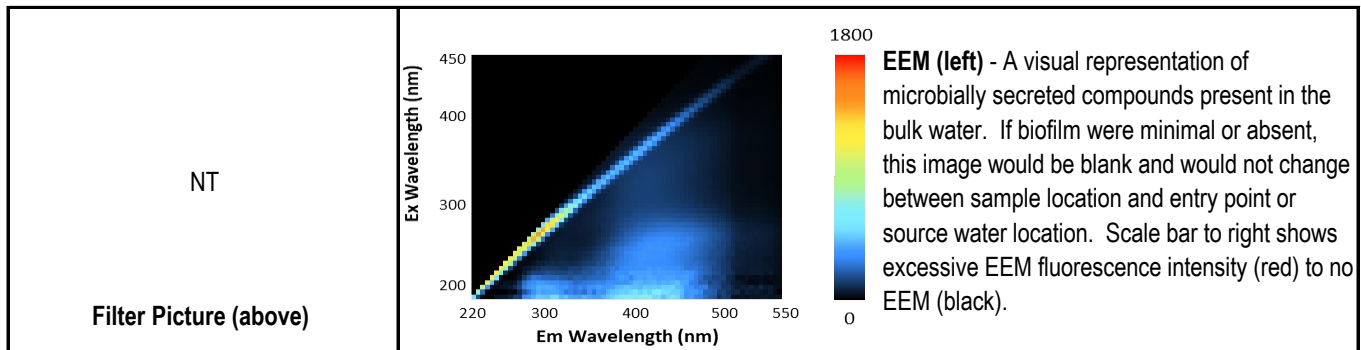
Sample Name: **24 Hrs Pumping - Packer + 4 mg/L Cl**

Yellow shading: preventative actions recommended

Red shading: corrective actions required

Overall Biofilm Assessment and Microbiologically Influenced Corrosion (MIC) Assessment

Parameter	Result	Comment/Description
Heterotroph (carbon bacteria)	NT	percentage of organic carbon consuming bacteria expected in system
Nitrification (ammonia bacteria)	NT	percentage of organic nitrogen consuming bacteria expected in system
Bacteria/biofilm growth potential	NT	excessive biofilm growth potential - nutrient control required
Opportunistic pathogen potential	NT	not tested
Biostability	1.5	low biofilm instability
DBP potential if chlorinated	NT	not tested
Copper MIC Potential	NT	not tested
Lead MIC Potential	NT	not tested
Steel or SS MIC Potential	NT	not tested
Main Cause of MIC	not tested	
Other Cause of MIC	not tested	
Other Cause of MIC	not tested	



BIOFILM INDICATION TEST® (BIT) Results Summary

Parameter	Result	Description
ME/mL	NT	Not Tested
ORP (mV)	735	ORP is too high
pH (su)	8.21	pH is high
Specific Conductance (µS)	918	excessive measure of ions in the water, may be corrosive
AOC_S (mg/L)	0.2	low est. of organic matter and acids
TP EEM (FI)	219,080	low TP EEM (biofilm starvation and stress)
MBP EEM (FI)	80,230	low MBP EEM (biofilm activity)
DP EEM (FI)	138,850	low Decay Products EEM (biofilm decay and thickness)
Est. Dis. Copper (µg/L)	70	low estimate of dissolved copper caused by corrosion
Nitrate-N (mg/L)	0.00	low estimate of nitrate
Protein Assay (mg/L)	NT	Not Tested
Filter Color SI	NA	excessive estimate of sloughed biofilm in sample, biofilm control required
BCI (Corrosivity Scale)	1.27	low general estimate of biofilm corrosivity
Total Chlorine (mg/L)	2.61	adequate total chlorine disinfection
Free Chlorine (mg/L)	2.43	adequate free chlorine disinfection
Combined Chlorine (mg/L)	0.18	acceptable combined chlorine
Nitrite (mg/L)	NT	Not Tested
Orthophosphate (mg/L)	NT	Not Tested
Ammonia as N, tot. (mg/L)	NT	Not Tested
Manganese, tot. (ug/L)	NT	Not Tested
Iron, tot. (mg/L)	NT	Not Tested

Project: Germantown, Village of - Well 12
 Water System: WELL
 Sample Disinfection: NONE
 Corrosion Control: NONE
 Stag/Flow Condition: FLOW
 Sample Lab ID: **2024-07-03_A-04**
 Analysis Date: 7/3/2024
 Collection Date: 7/3/2024
 Sample Name: **Surge - Packer + 4 mg/L Cl**

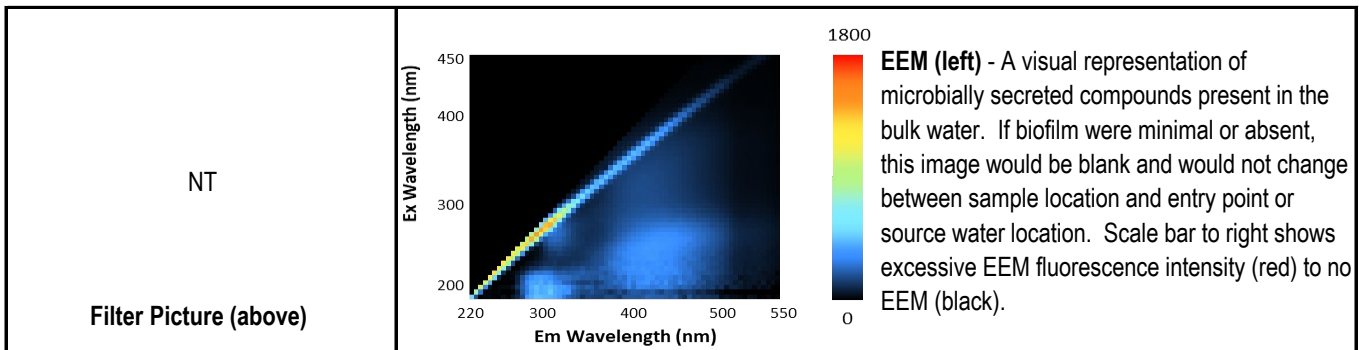


Yellow shading: preventative actions recommended

Red shading: corrective actions required

Overall Biofilm Assessment and Microbiologically Influenced Corrosion (MIC) Assessment

Parameter	Result	Comment/Description
Heterotroph (carbon bacteria)	NT	percentage of organic carbon consuming bacteria expected in system
Nitrification (ammonia bacteria)	NT	percentage of organic nitrogen consuming bacteria expected in system
Bacteria/biofilm growth potential	NT	excessive biofilm growth potential - nutrient control required
Opportunistic pathogen potential	NT	not tested
Biostability	1.4	low biofilm instability
DBP potential if chlorinated	NT	not tested
Copper MIC Potential	NT	not tested
Lead MIC Potential	NT	not tested
Steel or SS MIC Potential	NT	not tested
Main Cause of MIC	not tested	
Other Cause of MIC	not tested	
Other Cause of MIC	not tested	



BIOFILM INDICATION TEST® (BIT) Results Summary

Parameter	Result	Description
ME/mL	NT	Not Tested
ORP (mV)	756	ORP is too high
pH (su)	8.19	pH is high
Specific Conductance (µS)	916	excessive measure of ions in the water, may be corrosive
AOC_S (mg/L)	0.1	low est. of organic matter and acids
TP EEM (FI)	206,526	low TP EEM (biofilm starvation and stress)
MBP EEM (FI)	78,527	low MBP EEM (biofilm activity)
DP EEM (FI)	127,999	low Decay Products EEM (biofilm decay and thickness)
Est. Dis. Copper (µg/L)	61	low estimate of dissolved copper caused by corrosion
Nitrate-N (mg/L)	0.00	low estimate of nitrate
Protein Assay (mg/L)	NT	Not Tested
Filter Color SI	NA	excessive estimate of sloughed biofilm in sample, biofilm control required
BCI (Corrosivity Scale)	1.27	low general estimate of biofilm corrosivity
Total Chlorine (mg/L)	2.45	adequate total chlorine disinfection
Free Chlorine (mg/L)	2.23	adequate free chlorine disinfection
Combined Chlorine (mg/L)	0.22	acceptable combined chlorine
Nitrite (mg/L)	NT	Not Tested
Orthophosphate (mg/L)	NT	Not Tested
Ammonia as N, tot. (mg/L)	NT	Not Tested
Manganese, tot. (ug/L)	NT	Not Tested
Iron, tot. (mg/L)	NT	Not Tested

Project: Germantown, Village of - Well 12
Water System: WELL
Sample Disinfection: NONE
Corrosion Control: NONE
Stag/Flow Condition: FLOW
Sample Lab ID: **2024-05-01_A-12**
Analysis Date: 5/1/2024
Collection Date: 5/1/2024
Sample Name: **Dynamic #2: 270 ft**



Yellow shading: preventative actions recommended

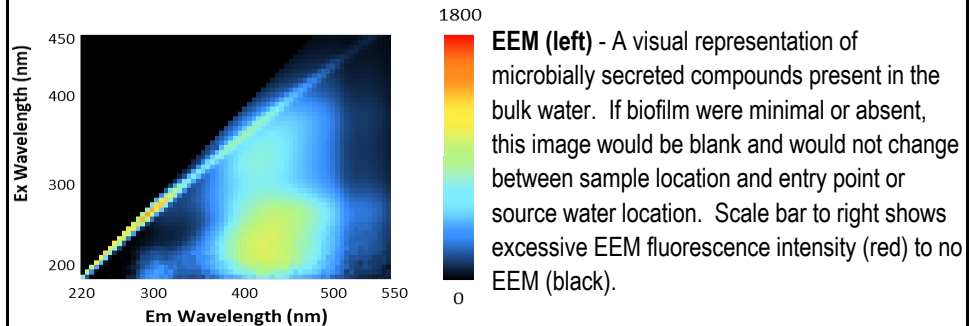
Red shading: corrective actions required

Overall Biofilm Assessment and Microbiologically Influenced Corrosion (MIC) Assessment

Parameter	Result	Comment/Description
Heterotroph (carbon bacteria)	78%	percentage of organic carbon consuming bacteria expected in system
Nitrification (ammonia bacteria)	22%	percentage of organic nitrogen consuming bacteria expected in system
Bacteria/biofilm growth potential	NT	excessive biofilm growth potential - nutrient control required
Opportunistic pathogen potential	NT	not tested
Biostability	4.1	moderate biofilm instability - stability control recommended
DBP potential if chlorinated	4.3	moderate potential for TTHM and/or HAA5 formation if chlorinated
Copper MIC Potential	1.3	low MIC potential
Lead MIC Potential	10.0	excessive MIC potential - nutrient control and biofilm control required
Steel or SS MIC Potential	NT	not tested
Main Cause of MIC	Metals starvation/limitation	
Other Cause of MIC	The presence of thick biofilm that is active	
Other Cause of MIC	Protein degradation of decaying organic matter	



Filter Picture (above)



BIOFILM INDICATION TEST® (BIT) Results Summary

Parameter	Result	Description
ME/mL	2,100	moderate measure of sloughed biofilm or bacteria, biofilm control recommended
ORP (mV)	404	ORP is acceptable
pH (su)	7.93	pH is acceptable
Specific Conductance (µS)	979	excessive measure of ions in the water, may be corrosive
AOC_S (mg/L)	0.2	low est. of organic matter and acids
TP EEM (FI)	612,454	moderate TP EEM (biofilm starvation and stress), biofilm control recommended
MBP EEM (FI)	140,347	moderate MBP EEM (biofilm activity), biofilm control recommended
DP EEM (FI)	472,107	moderate Decay Products EEM (biofilm decay and thickness), biofilm control recommended
Est. Dis. Copper (µg/L)	33	low estimate of dissolved copper caused by corrosion
Nitrate-N (mg/L)	0.00	low estimate of nitrate
Protein Assay (mg/L)	0.86	excessive indicator of biofilm starvation/stress, biofilm control required
Filter Color SI	0	low estimate of sloughed biofilm in sample
BCI (Corrosivity Scale)	1.82	low general estimate of biofilm corrosivity
Total Chlorine (mg/L)	NT	
Free Chlorine (mg/L)	NT	
Combined Chlorine (mg/L)		Not Applicable
Nitrite (mg/L)	0.000	low estimate of nitrate
Orthophosphate (mg/L)	0.030	low presence of orthophosphate (corrosion control and nutrient)
Ammonia as N, tot. (mg/L)	NT	Not Tested
Manganese, tot. (ug/L)	NT	Not Tested
Iron, tot. (mg/L)	NT	Not Tested

Sample Lab ID: **2024-05-01_A-12**
 Analysis Date: 5/1/2024
 Collection Date: 5/1/2024
 Sample Name: **Dynamic #2: 270 ft**

Yellow shading: preventative actions recommended
 Red shading: corrective actions required

BIOFILM ACTIVITY TEST® (BAT) Results Summary. DSI = Decay Severity Index. MSI = Metabolism Severity Index		
Parameter	Result	Description
DSI: PO ₄ Starvation	6.5	excessive organic phosphate use, biofilm thickness control required
DSI: Sulfur Utilization	6.7	excessive organic sulfate use, biofilm thickness control required
DSI: Complex Organic Acid	1.6	low complex organic acids use
DSI: Simple Organic Acid	1.0	low simple organic acids use
DSI: Protein Degrade	4.5	moderate degrading proteins, biofilm thickness control recommended
DSI: Simple Sugar	2.7	low complex sugar acid use
DSI: Ammonia and/or Protein	6.4	excessive protein degradation, biofilm thickness control required
DSI: Biofilm Degrade	0.0	low complex organic matter use
Iron or Metal Deficit	1.8	low biofilm actively looking for metals
MSI: PO ₄ Starvation	0.0	low organic phosphate use
MSI: Sulfur Utilization	7.7	excessive organic sulfate use, biofilm activity/nutrient control required
MSI: Complex Organic Acid	5.2	moderate complex organic acids use, biofilm activity/nutrient control recommended
MSI: Simple Organic Acid	3.6	moderate simple organic acids use, biofilm activity/nutrient control recommended
MSI: Protein Degrade	5.7	moderate degrading proteins, biofilm activity/nutrient control recommended
MSI: Simple Sugar	0.0	low complex sugar acid use
MSI: Ammonia and/or Protein	2.5	low protein degradation
MSI: Biofilm Degrade	4.5	moderate complex organic matter use, biofilm activity/nutrient control recommended

Chemical and Nutrient Analysis Results Summary		
Parameter	Result	Comment
Alkalinity, tot. as CaCO ₃ (mg/L)	340	moderate result, control or treatment recommended
Aluminum, dis. (mg/L)	NT	
Aluminum, tot. (mg/L)	0.038	moderate result, control or treatment recommended
Antimony, dis. (ug/L)	NT	
Antimony, tot. (ug/L)	BDL	
Arsenic, dis. (ug/L)	NT	
Arsenic, tot. (ug/L)	1.3	
Barium, dis. (ug/L)	NT	
Barium, tot. (ug/L)	120	
Cadmium, dis. (ug/L)	NT	
Cadmium, tot. (ug/L)	BDL	
Calcium, dis. (mg/L)	NT	
Calcium, tot. (mg/L)	110	elevated result, control or treatment required
Chloride, tot. (mg/L)	74	
Chromium, dis. (ug/L)	NT	
Chromium, tot. (ug/L)	BDL	
Cobalt, dis. (ug/L)	NT	
Cobalt, tot. (ug/L)	0.24	
Copper, dis. (ug/L)	NT	
Copper, tot. (ug/L)	0.78	
Hardness, tot. as CaCO ₃ (mg/L)	460	elevated result, control or treatment required
Iron, dis. (mg/L)	NT	
Iron, tot. (mg/L)	0.23	moderate result, control or treatment recommended
Lead, dis. (ug/L)	NT	
Lead, tot. (ug/L)	BDL	
Magnesium, dis. (mg/L)	NT	
Magnesium, tot. (mg/L)	47	elevated result, control or treatment required
Manganese, dis. (ug/L)	NT	
Manganese, tot. (ug/L)	12	
Molybdenum, dis. (ug/L)	NT	
Molybdenum, tot. (ug/L)	0.9	
Nickel, dis. (ug/L)	NT	
Nickel, tot. (ug/L)	1.8	
Ammonia as N, tot. (mg/L)	0.12	moderate result, control or treatment recommended
NO ₂ and NO ₃ as N, tot. (mg/L)	BDL	

Sample Lab ID: **2024-05-01_A-12**
 Analysis Date: 5/1/2024
 Collection Date: 5/1/2024
 Sample Name: **Dynamic #2: 270 ft**

Yellow shading: preventative actions recommended

Red shading: corrective actions required

Parameter	Result	Comment
Phosphorus, tot. (mg/L)	0.048	
Potassium, dis. (mg/L)	NT	
Potassium, tot. (mg/L)	2.6	
Silicon, dis. (ug/L)	NT	
Silicon, tot. (ug/L)	8500	moderate result, control or treatment recommended
Sodium, dis (mg/L)	NT	
Sodium, tot. (mg/L)	31	
Strontium, dis. (ug/L)	NT	
Strontium, tot. (ug/L)	1200	moderate result, control or treatment recommended
Sulfate, as SO4 (mg/L)	61	
Tin, dis. (ug/L)	NT	
Tin, tot. (ug/L)	BDL	
Total Organic Carbon (TOC) (mg/L)	1	elevated result, control or treatment required
Turbidity (NTU)	2.2	moderate result, control or treatment recommended
Zinc, dis. (ug/L)	NT	
Zinc, tot. (ug/L)	4.3	

Project: Germantown, Village of - Well 5
 Water System: WELL
 Sample Disinfection: NONE
 Corrosion Control: NONE
 Stag/Flow Condition: FLOW
 Sample Lab ID: **2023-03-29_A-02**
 Analysis Date: 3/29/2023
 Collection Date: 3/28/2023
 Sample Name: **W5 2 Hours Aquifer**



Yellow shading: preventative actions recommended

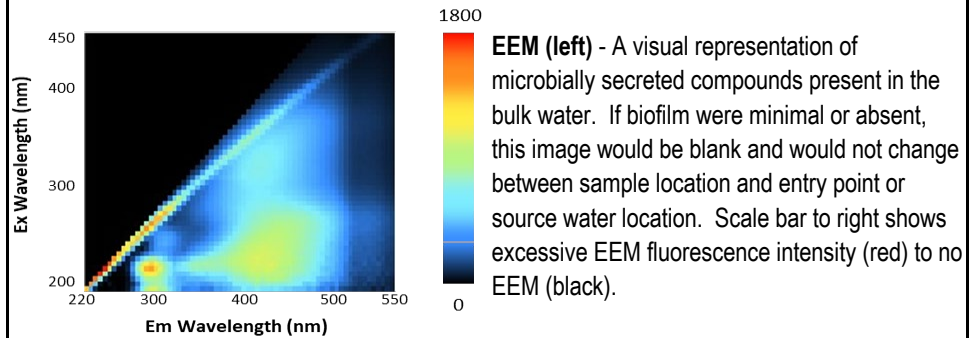
Red shading: corrective actions required

Overall Biofilm Assessment and Microbiologically Influenced Corrosion (MIC) Assessment

Parameter	Result	Comment/Description
Heterotroph (carbon bacteria)	75%	percentage of organic carbon consuming bacteria expected in system
Nitrification (ammonia bacteria)	25%	percentage of organic nitrogen consuming bacteria expected in system
Bacteria/biofilm growth potential	NT	excessive biofilm growth potential - nutrient control required
Opportunistic pathogen potential	NT	not tested
Biostability	4.4	moderate biofilm instability - stability control recommended
DBP potential if chlorinated	3.8	moderate potential for TTHM and/or HAA5 formation if chlorinated
Copper MIC Potential	1.5	low MIC potential
Lead MIC Potential	10.0	excessive MIC potential - nutrient control and biofilm control required
Steel or SS MIC Potential	NT	not tested
Main Cause of MIC	Metals starvation/limitation	
Other Cause of MIC	The presence of thick biofilm that is active	
Other Cause of MIC	Protein degradation of decaying organic matter	



Filter Picture (above)



BIOFILM INDICATION TEST® (BIT) Results Summary

Parameter	Result	Description
ME/mL	626	low measure of sloughed biofilm or bacteria
ORP (mV)	355	ORP is acceptable
pH (su)	7.94	pH is acceptable
Specific Conductance (µS)	1,008	excessive measure of ions in the water, may be corrosive
AOC_S (mg/L)	0.4	moderate est. of organic matter and acids, nutrient control recommended
TP EEM (FI)	660,438	moderate TP EEM (biofilm starvation and stress), biofilm control recommended
MBP EEM (FI)	220,859	moderate MBP EEM (biofilm activity), biofilm control recommended
DP EEM (FI)	439,579	moderate Decay Products EEM (biofilm decay and thickness), biofilm control recommended
Est. Dis. Copper (µg/L)	1	low estimate of dissolved copper caused by corrosion
Nitrate-N (mg/L)	0.00	low estimate of nitrate
Protein Assay (mg/L)	0.75	moderate indicator of biofilm starvation/stress, biofilm control recommended
Filter Color SI	0	low estimate of sloughed biofilm in sample
BCI (Corrosivity Scale)	3.32	moderate general estimate of biofilm corrosivity, biofilm control recommended
Total Chlorine (mg/L)	NT	
Free Chlorine (mg/L)	NT	
Combined Chlorine (mg/L)		Not Applicable
Nitrite (mg/L)	0.004	low estimate of nitrate
Orthophosphate (mg/L)	NT	Not Tested
Ammonia as N, tot. (mg/L)	NT	Not Tested
Manganese, tot. (ug/L)	NT	Not Tested
Iron, tot. (mg/L)	NT	Not Tested

Sample Lab ID: **2023-03-29_A-02**
 Analysis Date: 3/29/2023
 Collection Date: 3/28/2023
 Sample Name: **W5 2 Hours Aquifer**

Yellow shading: preventative actions recommended
 Red shading: corrective actions required

BIOFILM ACTIVITY TEST® (BAT) Results Summary. DSI = Decay Severity Index. MSI = Metabolism Severity Index		
Parameter	Result	Description
DSI: PO ₄ Starvation	6.1	excessive organic phosphate use, biofilm thickness control required
DSI: Sulfur Utilization	2.1	low organic sulfate use
DSI: Complex Organic Acid	1.3	low complex organic acids use
DSI: Simple Organic Acid	1.3	low simple organic acids use
DSI: Protein Degrade	4.7	moderate degrading proteins, biofilm thickness control recommended
DSI: Simple Sugar	1.9	low complex sugar acid use
DSI: Ammonia and/or Protein	4.6	moderate protein degradation, biofilm thickness control recommended
DSI: Biofilm Degrade	2.1	low complex organic matter use
Iron or Metal Deficit	2.1	low biofilm actively looking for metals
MSI: PO ₄ Starvation	3.1	moderate organic phosphate use, biofilm activity/nutrient control recommended
MSI: Sulfur Utilization	2.6	low organic sulfate use
MSI: Complex Organic Acid	3.5	moderate complex organic acids use, biofilm activity/nutrient control recommended
MSI: Simple Organic Acid	4.8	moderate simple organic acids use, biofilm activity/nutrient control recommended
MSI: Protein Degrade	6.1	excessive degrading proteins, biofilm activity/nutrient control required
MSI: Simple Sugar	0.6	low complex sugar acid use
MSI: Ammonia and/or Protein	2.6	low protein degradation
MSI: Biofilm Degrade	0.8	low complex organic matter use

Chemical and Nutrient Analysis Results Summary		
Parameter	Result	Comment
Alkalinity, tot. as CaCO ₃ (mg/L)	410	elevated result, control or treatment required
Aluminum, dis. (mg/L)	NT	
Aluminum, tot. (mg/L)	BDL	
Antimony, dis. (ug/L)	NT	
Antimony, tot. (ug/L)	BDL	
Arsenic, dis. (ug/L)	NT	
Arsenic, tot. (ug/L)	BDL	
Barium, dis. (ug/L)	NT	
Barium, tot. (ug/L)	110	
Cadmium, dis. (ug/L)	NT	
Cadmium, tot. (ug/L)	BDL	
Calcium, dis. (mg/L)	NT	
Calcium, tot. (mg/L)	NT	
Chloride, tot. (mg/L)	86	moderate result, control or treatment recommended
Chromium, dis. (ug/L)	NT	
Chromium, tot. (ug/L)	BDL	
Cobalt, dis. (ug/L)	NT	
Cobalt, tot. (ug/L)	0.26	
Copper, dis. (ug/L)	NT	
Copper, tot. (ug/L)	3.1	
Hardness, tot. as CaCO ₃ (mg/L)	NT	
Iron, dis. (mg/L)	NT	
Iron, tot. (mg/L)	BDL	
Lead, dis. (ug/L)	NT	
Lead, tot. (ug/L)	BDL	
Magnesium, dis. (mg/L)	NT	
Magnesium, tot. (mg/L)	43	elevated result, control or treatment required
Manganese, dis. (ug/L)	NT	
Manganese, tot. (ug/L)	10	
Molybdenum, dis. (ug/L)	NT	
Molybdenum, tot. (ug/L)	0.84	
Nickel, dis. (ug/L)	NT	
Nickel, tot. (ug/L)	2.4	
Ammonia as N, tot. (mg/L)	BDL	
NO ₂ and NO ₃ as N, tot. (mg/L)	0.12	

Sample Lab ID: **2023-03-29_A-02**
 Analysis Date: 3/29/2023
 Collection Date: 3/28/2023
 Sample Name: **W5 2 Hours Aquifer**

Yellow shading: preventative actions recommended

Red shading: corrective actions required

Parameter	Result	Comment
Phosphorus, tot. (mg/L)	BDL	
Potassium, dis. (mg/L)	NT	
Potassium, tot. (mg/L)	3.5	
Silicon, dis. (ug/L)	NT	
Silicon, tot. (ug/L)	NT	
Sodium, dis (mg/L)	NT	
Sodium, tot. (mg/L)	37	
Strontium, dis. (ug/L)	NT	
Strontium, tot. (ug/L)	1200	moderate result, control or treatment recommended
Sulfate, as SO4 (mg/L)	74	
Tin, dis. (ug/L)	NT	
Tin, tot. (ug/L)	BDL	
Total Organic Carbon (TOC) (mg/L)	0.98	elevated result, control or treatment required
Turbidity (NTU)	NT	
Zinc, dis. (ug/L)	NT	
Zinc, tot. (ug/L)	8.5	

Project: Germantown, Village of - Well 12
 Water System: WELL
 Sample Disinfection: NONE
 Corrosion Control: NONE
 Stag/Flow Condition: FLOW
 Sample Lab ID: **2024-05-01_A-19**
 Analysis Date: 5/1/2024
 Collection Date: 5/1/2024
 Sample Name: **Surge, Start of Dynamic #2 Pumping**



Yellow shading: preventative actions recommended

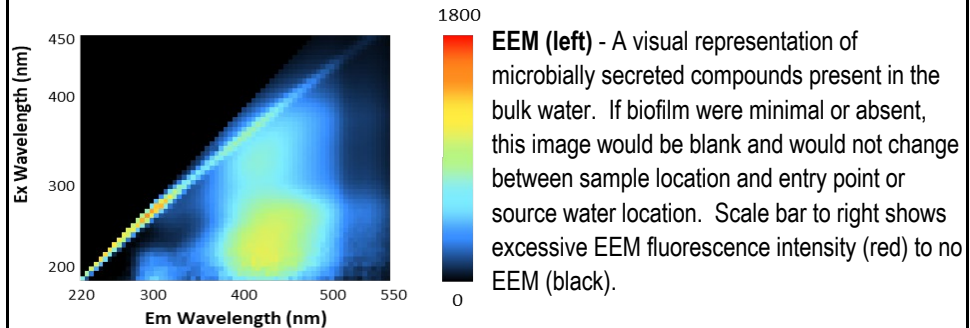
Red shading: corrective actions required

Overall Biofilm Assessment and Microbiologically Influenced Corrosion (MIC) Assessment

Parameter	Result	Comment/Description
Heterotroph (carbon bacteria)	39%	percentage of organic carbon consuming bacteria expected in system
Nitrification (ammonia bacteria)	61%	percentage of organic nitrogen consuming bacteria expected in system
Bacteria/biofilm growth potential	NT	excessive biofilm growth potential - nutrient control required
Opportunistic pathogen potential	NT	not tested
Biostability	10.0	excessive biofilm instability - nutrient control and stability control required
DBP potential if chlorinated	4.7	moderate potential for TTHM and/or HAA5 formation if chlorinated
Copper MIC Potential	2.0	low MIC potential
Lead MIC Potential	10.0	excessive MIC potential - nutrient control and biofilm control required
Steel or SS MIC Potential	NT	not tested
Main Cause of MIC	Metals starvation/limitation	
Other Cause of MIC	The presence of thick biofilm that is active	
Other Cause of MIC	Protein degradation of decaying organic matter	



Filter Picture (above)



BIOFILM INDICATION TEST® (BIT) Results Summary

Parameter	Result	Description
ME/mL	20,662	excessive measure of sloughed biofilm or bacteria, biofilm control required
ORP (mV)	392	ORP is acceptable
pH (su)	8.07	pH is high
Specific Conductance (µS)	981	excessive measure of ions in the water, may be corrosive
AOC_S (mg/L)	0.2	low est. of organic matter and acids
TP EEM (FI)	634,053	moderate TP EEM (biofilm starvation and stress), biofilm control recommended
MBP EEM (FI)	152,508	moderate MBP EEM (biofilm activity), biofilm control recommended
DP EEM (FI)	481,545	moderate Decay Products EEM (biofilm decay and thickness), biofilm control recommended
Est. Dis. Copper (µg/L)	42	low estimate of dissolved copper caused by corrosion
Nitrate-N (mg/L)	0.00	low estimate of nitrate
Protein Assay (mg/L)	0.93	excessive indicator of biofilm starvation/stress, biofilm control required
Filter Color SI	10	excessive estimate of sloughed biofilm in sample, biofilm control required
BCI (Corrosivity Scale)	2.01	low general estimate of biofilm corrosivity
Total Chlorine (mg/L)	NT	
Free Chlorine (mg/L)	NT	
Combined Chlorine (mg/L)		Not Applicable
Nitrite (mg/L)	NT	Not Tested
Orthophosphate (mg/L)	NT	Not Tested
Ammonia as N, tot. (mg/L)	NT	Not Tested
Manganese, tot. (ug/L)	NT	Not Tested
Iron, tot. (mg/L)	NT	Not Tested

Sample Lab ID: **2024-05-01_A-19**

Analysis Date: 5/1/2024

Collection Date: 5/1/2024

Sample Name: **Surge, Start of Dynamic #2 Pumping**

Yellow shading: preventative actions recommended

Red shading: corrective actions required

BIOFILM ACTIVITY TEST® (BAT) Results Summary. DSI = Decay Severity Index. MSI = Metabolism Severity Index

Parameter	Result	Description
DSI: PO ₄ Starvation	5.3	moderate organic phosphate use, biofilm thickness control recommended
DSI: Sulfur Utilization	5.8	moderate organic sulfate use, biofilm thickness control recommended
DSI: Complex Organic Acid	1.4	low complex organic acids use
DSI: Simple Organic Acid	1.1	low simple organic acids use
DSI: Protein Degrade	5.4	moderate degrading proteins, biofilm thickness control recommended
DSI: Simple Sugar	0.0	low complex sugar acid use
DSI: Ammonia and/or Protein	6.6	excessive protein degradation, biofilm thickness control required
DSI: Biofilm Degrade	0.0	low complex organic matter use
Iron or Metal Deficit	3.2	moderate biofilm actively looking for metals, biofilm thickness control recommended
MSI: PO ₄ Starvation	0.0	low organic phosphate use
MSI: Sulfur Utilization	4.8	moderate organic sulfate use, biofilm activity/nutrient control recommended
MSI: Complex Organic Acid	3.9	moderate complex organic acids use, biofilm activity/nutrient control recommended
MSI: Simple Organic Acid	3.3	moderate simple organic acids use, biofilm activity/nutrient control recommended
MSI: Protein Degrade	5.4	moderate degrading proteins, biofilm activity/nutrient control recommended
MSI: Simple Sugar	0.0	low complex sugar acid use
MSI: Ammonia and/or Protein	2.3	low protein degradation
MSI: Biofilm Degrade	1.2	low complex organic matter use

Chemical and Nutrient Analysis Results Summary

Parameter	Result	Comment
Alkalinity, tot. as CaCO ₃ (mg/L)	350	moderate result, control or treatment recommended
Aluminum, dis. (mg/L)	NT	
Aluminum, tot. (mg/L)	5.7	elevated result, control or treatment required
Antimony, dis. (ug/L)	NT	
Antimony, tot. (ug/L)	BDL	
Arsenic, dis. (ug/L)	NT	
Arsenic, tot. (ug/L)	57	elevated result, control or treatment required
Barium, dis. (ug/L)	NT	
Barium, tot. (ug/L)	410	
Cadmium, dis. (ug/L)	NT	
Cadmium, tot. (ug/L)	BDL	
Calcium, dis. (mg/L)	NT	
Calcium, tot. (mg/L)	300	elevated result, control or treatment required
Chloride, tot. (mg/L)	76	moderate result, control or treatment recommended
Chromium, dis. (ug/L)	NT	
Chromium, tot. (ug/L)	11	
Cobalt, dis. (ug/L)	NT	
Cobalt, tot. (ug/L)	2.7	
Copper, dis. (ug/L)	NT	
Copper, tot. (ug/L)	14	
Hardness, tot. as CaCO ₃ (mg/L)	1300	elevated result, control or treatment required
Iron, dis. (mg/L)	NT	
Iron, tot. (mg/L)	42	elevated result, control or treatment required
Lead, dis. (ug/L)	NT	
Lead, tot. (ug/L)	7.3	moderate result, control or treatment recommended
Magnesium, dis. (mg/L)	NT	
Magnesium, tot. (mg/L)	140	elevated result, control or treatment required
Manganese, dis. (ug/L)	NT	
Manganese, tot. (ug/L)	190	moderate result, control or treatment recommended
Molybdenum, dis. (ug/L)	NT	
Molybdenum, tot. (ug/L)	0.97	
Nickel, dis. (ug/L)	NT	
Nickel, tot. (ug/L)	10	moderate result, control or treatment recommended
Ammonia as N, tot. (mg/L)	0.21	elevated result, control or treatment required
NO ₂ and NO ₃ as N, tot. (mg/L)	0.078	

Sample Lab ID: **2024-05-01_A-19**

Analysis Date: 5/1/2024

Collection Date: 5/1/2024

Sample Name: **Surge, Start of Dynamic #2 Pumping**

Yellow shading: preventative actions recommended

Red shading: corrective actions required

Parameter	Result	Comment
Phosphorus, tot. (mg/L)	2	elevated result, control or treatment required
Potassium, dis. (mg/L)	NT	
Potassium, tot. (mg/L)	4.8	
Silicon, dis. (ug/L)	NT	
Silicon, tot. (ug/L)	24000	elevated result, control or treatment required
Sodium, dis (mg/L)	NT	
Sodium, tot. (mg/L)	30	
Strontium, dis. (ug/L)	NT	
Strontium, tot. (ug/L)	1700	moderate result, control or treatment recommended
Sulfate, as SO4 (mg/L)	59	
Tin, dis. (ug/L)	NT	
Tin, tot. (ug/L)	BDL	
Total Organic Carbon (TOC) (mg/L)	0.97	elevated result, control or treatment required
Turbidity (NTU)	410	elevated result, control or treatment required
Zinc, dis. (ug/L)	NT	
Zinc, tot. (ug/L)	50	

Project: Germantown, Village of - Well 12
 Water System: WELL
 Sample Disinfection: NONE
 Corrosion Control: NONE
 Stag/Flow Condition: FLOW
 Sample Lab ID: **2024-05-01_A-10**
 Analysis Date: 5/1/2024
 Collection Date: 5/1/2024
 Sample Name: **Dynamic #2: Combined discharge**



Yellow shading: preventative actions recommended

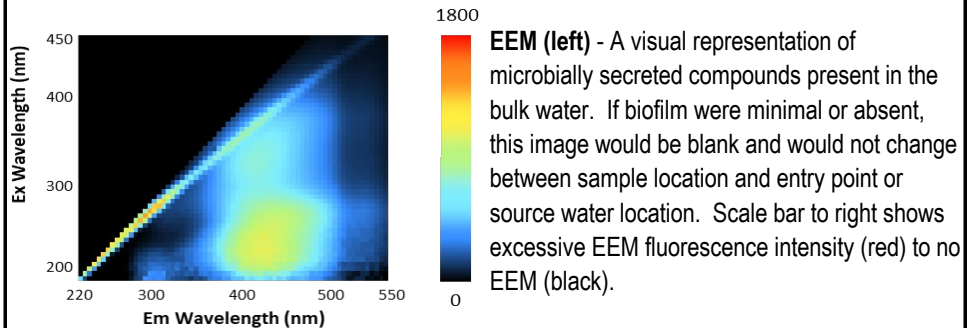
Red shading: corrective actions required

Overall Biofilm Assessment and Microbiologically Influenced Corrosion (MIC) Assessment

Parameter	Result	Comment/Description
Heterotroph (carbon bacteria)	54%	percentage of organic carbon consuming bacteria expected in system
Nitrification (ammonia bacteria)	46%	percentage of organic nitrogen consuming bacteria expected in system
Bacteria/biofilm growth potential	NT	excessive biofilm growth potential - nutrient control required
Opportunistic pathogen potential	NT	not tested
Biostability	8.2	excessive biofilm instability - nutrient control and stability control required
DBP potential if chlorinated	NT	not tested
Copper MIC Potential	1.4	low MIC potential
Lead MIC Potential	10.0	excessive MIC potential - nutrient control and biofilm control required
Steel or SS MIC Potential	NT	not tested
Main Cause of MIC	not tested	
Other Cause of MIC	not tested	
Other Cause of MIC	not tested	



Filter Picture (above)



BIOFILM INDICATION TEST® (BIT) Results Summary

Parameter	Result	Description
ME/mL	2,324	moderate measure of sloughed biofilm or bacteria, biofilm control recommended
ORP (mV)	395	ORP is acceptable
pH (su)	8.00	pH is high
Specific Conductance (µS)	986	excessive measure of ions in the water, may be corrosive
AOC_S (mg/L)	0.2	low est. of organic matter and acids
TP EEM (FI)	616,075	moderate TP EEM (biofilm starvation and stress), biofilm control recommended
MBP EEM (FI)	138,640	moderate MBP EEM (biofilm activity), biofilm control recommended
DP EEM (FI)	477,435	moderate Decay Products EEM (biofilm decay and thickness), biofilm control recommended
Est. Dis. Copper (µg/L)	7	low estimate of dissolved copper caused by corrosion
Nitrate-N (mg/L)	0.00	low estimate of nitrate
Protein Assay (mg/L)	0.77	moderate indicator of biofilm starvation/stress, biofilm control recommended
Filter Color SI	2	low estimate of sloughed biofilm in sample
BCI (Corrosivity Scale)	1.79	low general estimate of biofilm corrosivity
Total Chlorine (mg/L)	NT	
Free Chlorine (mg/L)	NT	
Combined Chlorine (mg/L)		Not Applicable
Nitrite (mg/L)	0.000	low estimate of nitrate
Orthophosphate (mg/L)	0.020	low presence of orthophosphate (corrosion control and nutrient)
Ammonia as N, tot. (mg/L)	NT	Not Tested
Manganese, tot. (ug/L)	NT	Not Tested
Iron, tot. (mg/L)	NT	Not Tested

Sample Lab ID: 2024-05-01_A-10

Analysis Date: 5/1/2024

Collection Date: 5/1/2024

Sample Name: Dynamic #2: Combined discharge

Yellow shading: preventative actions recommended

Red shading: corrective actions required

BIOFILM ACTIVITY TEST® (BAT) Results Summary. DSI = Decay Severity Index. MSI = Metabolism Severity Index

Parameter	Result	Description
DSI: PO ₄ Starvation	6.0	excessive organic phosphate use, biofilm thickness control required
DSI: Sulfur Utilization	6.0	excessive organic sulfate use, biofilm thickness control required
DSI: Complex Organic Acid	1.1	low complex organic acids use
DSI: Simple Organic Acid	0.9	low simple organic acids use
DSI: Protein Degrade	3.4	moderate degrading proteins, biofilm thickness control recommended
DSI: Simple Sugar	6.9	excessive complex sugar acid use, biofilm thickness control required
DSI: Ammonia and/or Protein	6.1	excessive protein degradation, biofilm thickness control required
DSI: Biofilm Degrade	6.3	excessive complex organic matter use, biofilm thickness control required
Iron or Metal Deficit	4.3	moderate biofilm actively looking for metals, biofilm thickness control recommended
MSI: PO ₄ Starvation	0.7	low organic phosphate use
MSI: Sulfur Utilization	7.7	excessive organic sulfate use, biofilm activity/nutrient control required
MSI: Complex Organic Acid	3.2	moderate complex organic acids use, biofilm activity/nutrient control recommended
MSI: Simple Organic Acid	2.8	low simple organic acids use
MSI: Protein Degrade	4.3	moderate degrading proteins, biofilm activity/nutrient control recommended
MSI: Simple Sugar	0.2	low complex sugar acid use
MSI: Ammonia and/or Protein	2.9	low protein degradation
MSI: Biofilm Degrade	1.4	low complex organic matter use

Chemical and Nutrient Analysis Results Summary

Parameter	Result	Comment
Alkalinity, tot. as CaCO ₃ (mg/L)	330	elevated result, control or treatment required
Aluminum, dis. (mg/L)	NT	
Aluminum, tot. (mg/L)	0.061	elevated result, control or treatment required
Antimony, dis. (ug/L)	NT	
Antimony, tot. (ug/L)	BDL	
Arsenic, dis. (ug/L)	NT	
Arsenic, tot. (ug/L)	1.6	elevated result, control or treatment required
Barium, dis. (ug/L)	NT	
Barium, tot. (ug/L)	130	elevated result, control or treatment required
Cadmium, dis. (ug/L)	NT	
Cadmium, tot. (ug/L)	BDL	
Calcium, dis. (mg/L)	NT	
Calcium, tot. (mg/L)	110	elevated result, control or treatment required
Chloride, tot. (mg/L)	75	elevated result, control or treatment required
Chromium, dis. (ug/L)	NT	
Chromium, tot. (ug/L)	BDL	
Cobalt, dis. (ug/L)	NT	
Cobalt, tot. (ug/L)	0.28	elevated result, control or treatment required
Copper, dis. (ug/L)	NT	
Copper, tot. (ug/L)	0.80	elevated result, control or treatment required
Hardness, tot. as CaCO ₃ (mg/L)	480	elevated result, control or treatment required
Iron, dis. (mg/L)	NT	
Iron, tot. (mg/L)	0.43	elevated result, control or treatment required
Lead, dis. (ug/L)	NT	
Lead, tot. (ug/L)	BDL	
Magnesium, dis. (mg/L)	NT	
Magnesium, tot. (mg/L)	50	elevated result, control or treatment required
Manganese, dis. (ug/L)	NT	
Manganese, tot. (ug/L)	15	elevated result, control or treatment required
Molybdenum, dis. (ug/L)	NT	
Molybdenum, tot. (ug/L)	0.91	elevated result, control or treatment required
Nickel, dis. (ug/L)	NT	
Nickel, tot. (ug/L)	1.7	elevated result, control or treatment required
Ammonia as N, tot. (mg/L)	0.12	elevated result, control or treatment required
NO ₂ and NO ₃ as N, tot. (mg/L)	BDL	

Sample Lab ID: **2024-05-01_A-10**

Analysis Date: 5/1/2024

Collection Date: 5/1/2024

Sample Name: **Dynamic #2: Combined discharge**

Yellow shading: preventative actions recommended

Red shading: corrective actions required

Parameter	Result	Comment
Phosphorus, tot. (mg/L)	0.052	elevated result, control or treatment required
Potassium, dis. (mg/L)	NT	
Potassium, tot. (mg/L)	2.5	elevated result, control or treatment required
Silicon, dis. (ug/L)	NT	
Silicon, tot. (ug/L)	9100	elevated result, control or treatment required
Sodium, dis (mg/L)	NT	
Sodium, tot. (mg/L)	32	elevated result, control or treatment required
Strontium, dis. (ug/L)	NT	
Strontium, tot. (ug/L)	1000	elevated result, control or treatment required
Sulfate, as SO4 (mg/L)	58	elevated result, control or treatment required
Tin, dis. (ug/L)	NT	
Tin, tot. (ug/L)	BDL	
Total Organic Carbon (TOC) (mg/L)	0.71	elevated result, control or treatment required
Turbidity (NTU)	2.0	elevated result, control or treatment required
Zinc, dis. (ug/L)	NT	
Zinc, tot. (ug/L)	5.5	elevated result, control or treatment required



Biofilm Indication Test® Report Explanation Page

- BIT™ = Biofilm Indication Test®
- BAT™ = Biofilm Activity Test®
- SI = Severity Index on a scale of 0 (good) to 10 (poor)
- Biofilm: A layer of diverse bacteria on a surface that have grown to form a colony. Biofilm attaches to a surface with a slime layer that protects the bacteria/colony from stress, including disinfection. Biofilm naturally grows inside of water distribution system mains, water treatment systems, plumbing, hot water heaters, softeners, process piping, fountains, groundwater wells, and more. Bacteria found in biofilms are typically harmless (but not always). Biofilm in a water system becomes a problem when conditions allow it to grow so thick that the bacteria can change the quality of the water or cause microbial induced corrosion. Thick biofilm can corrode plumbing fixture to increase metals in the water (such as lead and copper), cause an increase in disinfection demand and the formation of disinfection byproducts, and/or cause taste and odor complaints. Thick biofilms can also harbor opportunistic pathogens such as Legionella.
- ME = Microbial Equivalents: Estimate of total microbial occurrence in sample volume based on measurement of ATP present. Does not estimate ME in biofilm only ME in bulk water. Samples from a drinking water system with greater than 500 ME/mL have elevated microbial occurrence and are likely to be affected by microbial biofilms. In certain waters, low ME indicate the presence of an excessively thick biofilm because of stressful conditions.
- ORP = Oxidation Reduction Potential: A relative measure of the concentration of dissolved energy-bearing nutrients in the water, and/or is an indicator of an adequate disinfectant residual or disinfection conditions.
- pH = measure of acidity: pH of a sample is highly dependent on geology, aquifer/sediment/mineral chemistry, water source, the type of chemical/disinfectant used, and the type of microbial activity present. Change in pH can be caused by acid producing biofilm and certain bacterial metabolisms.
- Specific conductance: Estimate of the concentration of dissolved ions present in the water.
- AOC_S: A surrogate estimate of dissolved assimilable organic carbon present in the water, which is a subset of total organic carbon. Can be used to assess the presence of biofilm and biofilm-produced organic molecules.
- EEM = Excitation Emission Matrix: Provides information on the type of fluorescing organic carbons present in water (food for microbial growth and/or microbial created products) and/or exposure of water to biofilm. In general, the greater the EEM, the greater the starved biofilm presence was in the system sampled, with the proportion of each type of EEM indicating the underlying cause of biofilm.
- MBP = Microbial ByProducts EEM: Metabolic by products excreted by actively respiring microorganisms in water and biofilm. High levels create the potential for microbial induced corrosion. Units = FI (fluorescence intensity)
- DP = Decay Products EEM: Products caused by the decay of organic matter and/or biofilm. High levels indicate the presence of decaying organic matter and/or biofilm attempting to cause decay. Units = FI (fluorescence intensity)
- TP = Total Products EEM: Total of microbial produced compounds and fluorescing organic matter in water. Units = FI (fluorescence intensity)
- BCI = Biofilm Corrosivity Index: Assessment of biofilm's ability to cause corrosion of aquifer, equipment and/or plumbing materials. As BCI increases, the potential for microbial induced corrosion increases. A biofilm sloughing event could cause a spike in ME and BCI.
- BDL = Below Detection Limit.
- Filter Color: Color of filters used to process the samples is used to gauge the presence of biofilm and/or sloughed material in the water samples. All filters begin as white.
- Iron/Metal Limitation: Assesses the presence of bacterial molecules searching for needed metals for activation of metabolism related processes.
- Protein Assessment: Biofilms that are stressed often secrete proteins to alleviate stressful conditions. Stressors include a nutrient imbalance, disinfection and/or a change in nutrient conditions. Biofilm with excessive protein production can harbor Legionella.

Germantown Well 12 Discussion

Andrew Jacque, PhD, PE
Water Quality Investigations, LLC
August 19, 2024

Well 12 Timeline

- Drilled and tested in 2021
- Capped in 2021 awaiting wellhouse design and construction
- Sampled in fall of 2023 for PFAS – found turbid water and changed conditions
- Investigated in Spring and Summer of 2024

Investigation Results – June Pump Test

- Three water producing zone in the well:
 - Upper, Middle and Lower
 - Middle aquifer causes upward and downward flow in the well under non-use conditions (unusual)
- Test pumping with sampling and televising:
 - Upper and middle aquifer produce turbid water – source of issue in PFAS testing
 - Increasing pumping from 400 gpm to 800 gpm:
 - Caused increased turbidity and iron
 - Caused 7 feet of drop in nearby wells
 - If upper and middle aquifer used: an iron filter is needed & capacity is limited to 600 gpm

Investigation Results – July Pump Test of Lower Aquifer

- Pump with packer installed to only pump from the lower aquifer
- Testing pumping at 800 to 900 gpm:
 - Little iron at pump startup
 - No iron after 5-minute stabilization
 - No impact on nearby wells
 - Well capacity = 1,000 to 1,200 gpm

Recommendation

- Install liner to 260 feet:
 - Isolates middle and upper aquifer from the well
 - Minimizes impact on local wells
 - Increases capacity of facility: 1,200 versus 600 gpm
- Develop well further to reduce silt introduced to the lower aquifer
- Eliminate the non-productive bottom
- Still allows future expansion at the site:
 - Blending of deep well with Well 12 to get 2,400 gpm

BUSINESS OF THE VILLAGE BOARD

MEETING DATE: August 19, 2024

PLACEMENT: Action Item

ITEM TITLE: Award of a contract to Water Quality Investigations for design and inspection services for liner installation in Well 12 for an amount not to exceed \$24,500 from account 45408460-543100.

SUBMITTED BY: Matthew Mortwedt, Public Works Director

SUMMARY EXPLANATION:

The Water Utility is requesting to award design and installation inspection services for the installation of a liner to the existing well #12 borehole to Water Quality Investigations (WQI). The liner installation cost will be sent out to bid and brought under the Hassinger contract as a change order. This liner will seal off the upper and middle fractures of the borehole with the lowest fracture being the water producing zone. Installing this liner will provide the best water quality and help protect the private wells from our pumping operations.

ATTACHMENT:

1. WQI Germantown Well 12 Liner Proposal

STAFF RECOMMENDATION:

Award of a contract to Water Quality Investigations for design and inspection services for liner installation in Well 12 for an amount not to exceed \$24,500 from account 45408460-543100.

ACTION BY Committee:

August 14, 2024

Village of Germantown

SUBJECT: Design and Construction Services for Well 12 Liner Installation

Background

Extensive investigation of Well 12 resulted in the recommendation that a liner be installed in the well. Installation of the liner to a depth of 260 feet will remove the upper and middle aquifer from the well, which will achieve the following:

1. Minimize the potential for impacting capacity of nearby private wells that could be caused by pumping of Well 12.
2. Minimize the potential for lowering the nearby aquifer and thus impacting the capacity of the nearby well, which would be caused by downward movement in Well 12.
3. Reduce the potential for natural biofilm growth in the well caused by ammonia that is present in the middle aquifer, which would be isolated with the liner installation.

Company Background

WQI is a combined laboratory and consulting business that specializes in investigating and solving water quality, water treatment and corrosion issues (water-related concerns) in water-based systems. We have performed numerous investigations for the following types of systems:

1. Municipal, industrial, commercial, agriculture and residential groundwater wells (small to large).
2. Surface water drinking water treatment plants (various treatment technologies including conventional sand filtration, granular activated carbon, ozone, micro and ultra membrane filtration and reverse osmosis, large to small).
3. Groundwater treatment systems (various treatment technologies, large to small).
4. Water distribution systems from source to tap (groundwater and surface water systems, small to large).
5. Industrial water systems including irrigation, fire protection, non-contact cooling, aquaculture, agriculture, pharmaceutical and process water systems.
6. Wastewater treatment and conveyance systems (treatment performance and corrosion).
7. Hot and cold-water commercial premise plumbing systems, including those found in hospitals, prisons, university buildings, dormitories, condominiums, office parks, food manufacturing, and agriculture.
8. Premise plumbing water treatment systems, including ion exchange (softening), anion exchange (nitrate removal), iron filtration, ozone/UV treatment and reverse osmosis.

Solutions to water-related concerns are developed based on resolving/minimizing the underlying cause of a concern or by mitigating the concern if the underlying cause is difficult to resolve. In many groundwater well investigations, well rehabilitation is used to resolve a concern.

Proposal

We offer the following proposal to perform design and construction services to rehabilitate Well 12. The proposal generally includes the following work:

1. Attend one Village Board meeting to discuss the Well 12 investigation results and the recommendation for installation of the liner.
2. Prepare a specification for installation of the liner, partial abandonment of the bottom of the well, over pumping of the well to further develop the lower aquifer, and sampling of the well. The specification will be used by Foth to obtain pricing for the work through the Well 12 contractor.
3. Obtain DNR approval for the well rehabilitation work.
4. Perform onsite inspection for a total of five days. Three days will be for liner welding and installation and two days will be for grouting. Submit reports to the Village and Foth that document the liner installation process.

Cost for the above would not exceed \$24,500. Work would be billed on a time and material basis. WQI would invoice for work performed on a monthly basis with payment due within 30 days of invoice.

We appreciate the opportunity to submit this proposal and look forward to working with you. If this proposal is agreeable, please sign below, and return it to us.

If you have any questions or concerns, please contact me at your earliest convenience.

Respectfully submitted,



Andrew D. Jacque, Ph.D., P.E.
Chief Scientist, Founder

Please sign below to show acceptance of this proposal.

Signed:

Date:
