



Inver Grove Heights City Council
Monday, October 14, 2024 at 6:00 PM
8150 Barbara Ave, Inver Grove Heights, MN 55077

AGENDA

NOTICE TO RESIDENTS: Individuals may submit written public comments in advance of the meeting by emailing comments to Rebecca Kiernan (rkiernan@ighmn.gov). Comments received prior to **12:00 p.m.** on Monday, October 14, 2024, will be provided to the Council at or before the October 14, 2024 meeting.

1. **Call to Order**
2. **Roll Call**
3. **Approval of Agenda**
4. **Presentations**
5. **Consent Agenda**

All items on the consent agenda are considered routine and have been made available to the City Council at least two days prior to the meeting; the items will be enacted in one motion. There will be no separate discussion of these items unless a Councilmember or citizen so requests, in which event the item will be removed from this agenda and considered in normal sequence.

- A. Approval of Minutes of the September 9, 2024, City Council Meeting
- B. Approval of Minutes of the September 23, 2024, City Council Meeting
- C. Approval of Disbursements
- D. Personnel Actions
- E. Resolution Amending Position Classification Plan
- F. Summary of Conclusions Regarding City Administrator's Performance Evaluation
- G. Resolution Accepting Federal COPS Hiring Grant
- H. Resolution Authorizing DWI Officer Grant Agreement with Minnesota Department of Public Safety
- I. Approval of Exempt Gambling Permit for Inver Grove Heights Hockey Association
- J. Resolution Appointing Additional Election Judges for the 2024 General Election
- K. Resolution Declaring Surplus Property and Authorizing Disposal or Donation
- L. Appointment of Auditors for Years Ending December 31, 2024, 2025 and 2026
- M. Resolution Renewing a Joint Powers Agreement for Technical Services with the Dakota County Soil & Water Conservation District

- N. Change Order No. 1 for City Project No. 2020-03 - ADA Pedestrian Ramp Improvements
- O. Approval of Amended Open Space Plan for Plat of Archer Trail

6. Public Hearing

- A. Assessment Hearings and Resolutions Adopting Final Assessment Rolls for 2024 Pavement Management Projects 2024-09D, 2024-09F, 2024-09G, 2024-09H, and 2024-09I
- B. Certification of Delinquent Utility Balances
- C. Adoption of Assessment Roll for the 2024 Public Nuisance & Diseased Tree Abatement Program

7. Regular Business

- A. Approval of Rental Housing Licenses
- B. Consider Response to Citizen Petition Requesting the City Require an Environmental Assessment Worksheet for a Proposed Development in the Northwest Area

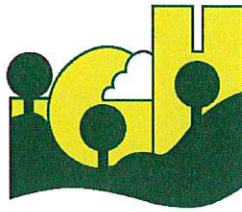
8. Public Comment

Public comment provides an opportunity for the public to address the Council on items that are not on the agenda. Comments will be limited to three (3) minutes per person.

9. Mayor and Council Comments

10. Adjourn

This document is available upon a three (3) business day request in alternate formats such as braille, large print, audio recording, etc. Please contact Rebecca Kiernan, City Clerk, at 651.450.2513 or rkiernan@ighmn.gov.



WELCOME TO THE INVER GROVE HEIGHTS CITY COUNCIL MEETING

In order to maintain an accurate record of those who speak during the meeting, we ask that you sign in below.

Monday, October 14th, 2024

6:00 p.m. City Council Meeting

Sign in if you wish to speak – 3-minute time limit

-Please Print-

NAME	STREET ADDRESS	AGENDA ITEM
Brook Williams	3515 78 th St. E.	EQB
Karen Van Delle	6565 Arlene	EQB
Tom LaSalle	2001 Killebrew Dr.	7 B
John MacHARGO	2422 ENTERPRISE DR.	7 B
Bill Griffith	8300 Norman Center Bloom.	7 B
Ruben Crescini	2298-96 th St. E.	
Greg & Virginia Artman	2293 96 th St. E	
Ken Johnson	3894 Upper 73 rd	8
Tracie Killon	4660 Bucan Ave	Public Comment
Derek Lind		Public Comment
Erik Van Mechelen		Public Comment
Michael Blazek	7837 Corey Path	SG area 7
Tessa Bright	9589 Baker Ct.	8
LARS RUNQUIST	9580 BAKER CT.	522 ACS
Glen Ruiz	2462 53 rd St E	
Willie + Nicole Abbott	2220 96 th St E	

INVER GROVE HEIGHTS CITY COUNCIL MEETING
MONDAY, September 9, 2024 - 6:00 P.M. - 8150 BARBARA AVENUE

1. CALL TO ORDER:

The City Council of Inver Grove Heights met in regular session on Monday, September 9, 2024. Mayor Dietrich called the meeting to order at 6:00 p.m. The Pledge of Allegiance was recited.

2. ROLL CALL:

Present In-Person: Mayor Dietrich; Council Members: Murphy, T’Kach, Gliva and Scales; City Administrator Wilson, City Clerk Kiernan, Police Chief Chiodo, Parks & Recreation Director Lares, Public Works Director Connolly, City Engineer Merchlewicz, City Attorney Nason, Community Development Director Ziemer, Assistant City Planner Botten, Finance Director Hove, Commander Otis, Parks Superintendent Swoboda, and Code Enforcement Coordinator Tyson Rainey.

3. APPROVAL OF AGENDA:

Motion to approve agenda as published by Gliva, second by Scales.

Ayes: 5

Nays: 0 Motion carried.

4. PRESENTATIONS

5. CONSENT AGENDA:

- A.** Approval of Minutes of the August 12, 2024, City Council Meeting
- B.** Approval of Minutes of the August 26, 2024, City Council Meeting
- C.** Approval of Disbursements, **Resolution 2024-180**
- D.** Personnel Actions
- E.** Resolution Amending Position Classification Plan, **Resolution 2024-181**
- F.** Resolution Approving Local Road Improvement Program Grant Funding Assistance for City Project No. 2016-17 - 117th Street Reconstruction, **Resolution 2024-182**
- G.** First Amendment to the Final Design Contract for City Project No. 2016-17 - 117th Street Reconstruction, **Resolution 2024-183**
- H.** Declare Costs to be Assessed, Order Preparation of Proposed Assessments, and Call for Assessment Hearings for Pavement Management Projects 2024-09 D, F, G, H and I, **Resolutions 2024-184, 185, 186, 187, 188, 189, 190, 191, 192, & 193**
- I.** Resolution Setting Budget and Closing City Project No. 2019-09D - 64th Street Area Improvements, **Resolution 2024-194**
- J.** Resolution Setting Budget and Closing City Project No. 2019-09D - Bryant Lane Area Improvements, **Resolution 2024-195**
- K.** Resolution Setting Budget and Closing City Project No. 2021-01 - NWA Trunk Utility Improvements, **Resolution 2024-196**

- L.** Resolution Awarding Contract and Approving Budget for City Project No. 2024-09L – 2024 Ultra-Thin Bonded Wear Course (UTBWC), **Resolution 2024-197 & 2024-198**
- M.** Approval of Massage Therapist License
- N.** Authorization to Submit CVB Grant Application for 2025 Recovery Grant from Explore MN
- O.** Resolution Authorizing Easement Acquisitions for City Project No. 2023-08 – Babcock Trail Multi-Use Trail, **Resolution 2024-199**
- P.** Pipeline Crossing Agreements with UP Railroad for City Project No. 2016-17 – 117th Street Reconstruction
- Q.** Resolution Approving a Setback Variance for 10037 Barnes Trail, **Resolution 2024-200**
- R.** Resolution Accepting \$4,000 in Donations for Fire & Police Departments, **Resolution 2024-201**

Motion to approve consent agenda items 4A – R by Murphy, second by T’Kach.

Ayes: 5

Nays: 0 Motion carried.

6. PUBLIC HEARING:

- A.** Consider a Variance from the Subdivision Ordinance to Allow Placement of a Shed in a City Drainage and Utility Easement at 7260 Bancroft Way

Assistant Planner Botten presented this item. The property is located along Bancroft Way, east of Babcock Trail and is zoned R1-C, single-family residential. There is a multi-family development behind the property owned by an association.

The request is for a variance from the Subdivision Ordinance to allow a shed in a city drainage and utility easement. To be approved by Council, an unusual hardship must be identified. This request complies with the setback requirements for R1C zoning, but the request is for the shed to be in the easement.

Site:

- 20’ drainage and utility easement along rear property
- 20’ easement used for a flow path for stormwater
- 30-inch storm sewer located in easement
- Shed is 8’ x 8’ (64 square feet)

The shed was originally behind the garage area, but the homeowners moved it back to create a garden space.

Staff recommends a denial of the request.

- City Code restricts placement of structures in D&U easements
- Creates potential obstruction of drainage in area
- Inhibits access to storm sewer pipe if maintenance is required
- Lack of demonstrated hardship

Assistant Planner Botten said they received comments from two neighboring property owners, and they are included in the packet.

Applicant Randy Markun - 7260 Bancroft Way - said the easement is the only flat area on the property and water can easily drain beneath the shed. The shed was very difficult to use where it was previously because of the incline.

Mayor Dietrich asked when the shed was moved.

Markun said they moved the shed in the spring of 2024.

Council Member Murphy asked if the water in the pictures was after a rainfall.

Markun said the water was from a slip and slide/pool.

Council Member Gliva asked if the shed could go anywhere else on the property.

Markun said everywhere else on the property is on an incline.

Public Comment:

Michael Bates - 7256 Bancroft Way - Presented support. Bates said there is drainage there, but it does not affect the property.

Ed Iago - 7152 Ballard Trail - said he represents the Lafayette Ridge homeowner's association. They oppose the shed because it would set a precedent and contaminate the pond.

Motion to close public hearing by T'Kach, second by Gliva.

Ayes: 5

Nays: 0 Motion carried.

Council Member Scales said he does not see a hardship and does not want to approve the request because it would set a precedent in the city for all of the other easements.

Council Member Gliva said she agrees with Council Member Scales and does not think it is a good idea to put anything on an easement.

Council Member T'Kach said she agreed with Scales and Gliva and asked if the owner could put the shed on stilts to level it and not require a permit.

Planner Botten said she would recommend asking the Building Inspections department.

Motion to Approve Denial Resolution #2024-202 for a Variance to allow placement of a shed within the rear yard drainage and utility easement of the property located at 7260 Bancroft Way by Scales, second by Gliva.

Ayes: 5

Nays: 0 Motion carried.

7. REGULAR BUSINESS:

- A.** Police Department UAS (Unmanned Aerial Systems) Policy and Related Budget Amendment

Chief Chiodo and Investigator Malcolm presented this item. Chief Chiodo said state statute requires the police department to provide an opportunity for public comment before it purchases or uses an Unmanned Ariel System (UAS). At a minimum, they must accept public comments submitted electronically or by mail. They presented the UAS request at the City Council Work Session in August to decide how to receive public comment. They put the plan on the city website, social media, and the police department website. They had 28 comments received and have submitted them to the City Clerk.

Chief Chiodo said there has been a lot of thought and care in the process. Chief Chiodo has been in law enforcement for 28 years and with Inver Grove Heights Police department for six years. Throughout the 28 years she has worked in every area except S.W.A.T. Chief Chiodo said she chose Investigator Malcolm to be the drone coordinator for Inver Grove Heights. Investigator Malcolm will give history about his work experience with the Fourth Amendment and other areas that residents are concerned about. Chief Chiodo will review questions from the residents after the presentation.

Investigator Malcolm said he has been a police officer with Inver Grove Heights since 2017 where he has served as a patrol officer, a member of the crime scene team, an Explorer Advisor, a field training officer for new officers and most recently as an investigator. He is a general investigator and investigates everything from homicides to theft. Investigator Malcolm has a bachelor's degree in criminal justice from Metropolitan State University and a master's degree in criminal justice leadership from Concordia University. Investigator Malcolm said he understands the concerns of residents regarding their 4th Amendment Right against unreasonable searches and seizures and takes it very seriously.

What UASs will be used for:

- Search and rescue
- Disaster relief
- Locating fleeing suspects
- Crime scene documentation
- Officer and public safety concerns

Investigator Malcolm said the UAS will help them capture a large outdoor scene and be able to present it to a jury. The UAS will also help when they are searching a building where there is a potential armed assailant. The option currently is to put an officer or the canine at risk.

What UASs will not be used for:

- Spying on citizens
- Conduction searches of private areas of property or residences without emergency circumstances, or a search warrant issued by a judge
- Equipped with weapons or munitions

The plan includes using two different types of UASs. The larger is about the size of the podium. The smaller UAS fits in the palm of your hand and is intended to be used for training and indoor deployments.

Proposed Policy:

- Purpose and Scope: The purpose of this policy is to establish guidelines for use of an unmanned aerial system (UAS) and for the storage, retrieval, and dissemination of images and data captured by the UAS (Minn. Stat. § 626.19).
- Definitions: Definitions related to this policy include:
 - Unmanned aerial system (UAS) - An unmanned aircraft of any type that is capable of sustaining directed flight, whether preprogrammed or remotely controlled without the possibility of direct human intervention from within or on the aircraft (commonly referred to as an unmanned aerial vehicle (UAV), and all of the supporting or attached systems designed for gathering information through imaging, recording, or any other means (Minn. Stat. § 626.19).
- Policy: A UAS may be utilized to enhance the Department's mission of protecting lives and property when other means and resources are not available or are less effective. Any use of a UAS will be in strict accordance with constitutional and privacy rights and Federal Aviation Administration (FM) regulations.

Investigator Malcolm said in addition to training from the FAA as program coordinator, he will ensure any member of the police department selected for the UAS team has a strong understanding of the 4th Amendment and reasonable methods to avoid unintentional recording of private properties.

- Privacy: The use of the UAS potentially involves privacy considerations. Absent a warrant or exigent circumstances, operators and observers shall adhere to FM altitude regulations and shall not intentionally record or transmit images of any location where a person would have a reasonable expectation of privacy (e.g., residence, yard, enclosure). Operators and observers should take reasonable precautions to avoid inadvertently recording or transmitting images of areas where there is a reasonable expectation of privacy. Reasonable precautions can include, for example deactivating or turning imaging devices away from such areas or persons during UAS operations.\
- Program Coordinator: The Chief of Police will appoint a program coordinator who will be responsible for the management of the UAS program. The program coordinator will ensure that policies and procedures conform to current laws, regulations, and best practices and have the following additional responsibilities:
 - Coordinating the FM Certificate of Waiver or Authorization (COA) application process and ensuring that the COA is current, and/or coordinating compliance with FM Part 107 Remote Pilot Certificate, as appropriate for department operations.
 - Ensuring that all authorized operators and required observers have completed all required FM and department-approved training in the operation, applicable laws, policies, and procedures regarding use of the UAS.
 - Developing protocols for conducting criminal investigations involving a UAS, including documentation of time spent monitoring a subject.
 - Developing protocols to ensure that all data intended to be used as evidence are accessed, maintained, stored, and retrieved in a manner that ensures its integrity as evidence, including strict adherence to chain of custody requirements.

Electronic trails, including encryption, authenticity certificates, and date and time stamping shall be used as appropriate to preserve individual rights and to ensure the authenticity and maintenance of a secure evidentiary chain of custody.

- Developing protocols that ensure retention and purge periods are maintained in accordance with established records retention schedules.
- Ensuring that established protocols are followed by monitoring and providing periodic reports on the program to the Chief of Police.
- Preparing and submitting the required annual report to the Commissioner of Public Safety (Minn. Stat. § 626.19).
- Reviewing the program and UAS use for compliance with Minn. Stat. § 626.19.
- Facilitating law enforcement access to images and data captured by the UAS.
- Developing protocols for reviewing and approving requests for use of the Department UAS by government entities (Minn. Stat. § 626.19).
- Recommending program enhancements, particularly regarding safety and information security.
- Maintaining familiarity with FAA regulatory standards, state laws and regulations, and local ordinances regarding the operations of a UAS.
- Posting the Department policies and procedures regarding the use of a UAV on the department website, as applicable (Minn. Stat. § 626.19).

Mayor Dietrich asked for an example a situation where they may make policy better and run up the chain of command.

Investigator Malcolm said he does not have a great example because they have the program set up to the best of their ability. It would be something that they would recognize as a shortcoming such as having too many pilots or not enough pilots or a potential change to the platform.

Use of UAS:

- Only authorized operators who have completed the required training shall be permitted to operate the UAS.
- Use of vision enhancement technology (e.g., thermal, and other imaging equipment not generally available to the public) is permissible in viewing areas only where there is no protectable privacy interest, when in compliance with a search warrant or court order, or when there is an applicable exemption to the warrant requirement. In all other instances, legal counsel should be consulted.
- UAS operations should only be conducted consistent with FM regulations.
- Shall not be used without a search warrant, except:
 - During or in the aftermath of an emergency situation or disaster that involves the risk of death or bodily harm to a person.
 - Over a public event where there is a heightened risk to the safety of participants or bystanders.
 - To counter the risk of a terrorist attack by a specific individual or organization if the agency determines that credible intelligence indicates a risk.

- To prevent loss of life or property in natural or man-made disasters and to facilitate operation planning, rescue, and recovery operations.
- To conduct a threat assessment in anticipation of a specific event.
- To collect information from a public area if there is a reasonable suspicion of criminal activity.
- To collect information for crash reconstruction purposes after a serious or deadly collision occurring on a public road.
- Over a public area for officer training or public relations purposes.
- For purposes unrelated to law enforcement at the request of a government entity, provided the request is in writing and specifies the reason for the request and the proposed period of use.

Investigator Malcolm said this summer law enforcement had knowledge of town festivals becoming violent due to a specific group of juveniles starting fights and assaulting people. This is an instance a UAV that could be utilized over a public event. A peaceful demonstration would not fall under this provision.

Each pilot is required to have a monthly flight to maintain efficiency. An example of a request from a government entity would be the Public Works department requesting assistance to survey the water tower for damage or a promotional video for another department.

Prohibited Use:

- The UAS video surveillance equipment shall not be used:
 - To conduct random surveillance activities.
 - To target a person based solely on actual or perceived characteristics such as race, ethnicity, national origin, religion, sex, sexual orientation, gender identity or expression, economic status, age, cultural group, or disability.
 - To harass, intimidate, or discriminate against any individual or group.
 - To conduct personal business of any type.
- The UAS shall not be weaponized (Minn. Stat. § 626.19).

Additional Prohibitions:

- Unless authorized by a warrant, a UAS shall not be deployed with facial recognition or biometric matching technology (Minn. Stat. § 626.19).
 - IGH Police Department does not currently use facial recognition or biometric matching technology.
- Unless authorized by a warrant or for purposes of permitted use outlined in this policy, a UAS shall not be used to collect data on public protests or demonstrations (Minn. Stat. § 626.19).

Retention of UAS Data:

- The Office of the Support Services Supervisor, shall ensure that data collected by the UAS is disclosed or deleted as required by Minn. Stat. § 626.19, including the deletion of collected data as soon as possible, and in no event later than seven days after collection, unless the data is part of an active criminal investigation (Minn. Stat. § 626.19).

Investigator Malcolm said if the data is part of an ongoing investigation it will fall under the retention period based on the type of investigation, either seven years or permanent. One question residents have is how they will know if the UAS has been used against them or if they are the subject of a UAS. The public is notified within 90 days of the data being captured or in cases where there is a search warrant to conduct pre-surveillance in anticipation of a search warrant, they would be notified with the search warrant is executed, whichever is sooner.

Chief Chiodo said most of the questions from the community fit into nine questions.

1. Why do we need a drone?
2. What is the cost to implement (including purchasing and training)?
3. Will the drone operator be licensed and qualified by the FAA?
4. Will there be notification to property owners for use on their property?
5. Will a search warrant be used when flying on private property?
6. Will this technology replace officers?
7. What are "other" government entities?
8. What if the drone is misused?
9. Why can't you use Dakota County Sheriffs UAS program?

Chief Chiodo said Burnsville does not have a UAS system right now. If they had one in February when their officers and fire fighter were shot, they could have sent used the UAS instead of sending a people. They also have lost children situations, and a particular concern are small children that live with autism and are attracted to water. They now have to call another city or the county to ask to use their UAS. If they have a drone in the department and a drone operator present, it would be 60 seconds to have the drone up in the air.

Drone operators will be licensed and qualified by the FAA.

When they patrol the Inver Grove Heights parade, they want to ensure that there is an officer at every intersections so traffic cannot come through. Right now, they are sending one person to every single corner to visually check. With a drone, they could have it in the air to check that they have individuals at each intersection for protection.

The police department has used the Dakota County Sheriffs UAS but using their UAS works best for planned events. In emergency situations they would prefer to use their own tools instead of rely on another agency.

Chief Chiodo said people said they do not want the UAS to replace officers. This will not replace officers; they will have their officers in place. This is to help to see situations from the air. They have homicides and car accidents that can stretch over a number of blocks and an aerial view can help.

The UAS can be utilized by other departments in the Inver Grove Heights government. This will not be used for requests from ICE, Homeland Security, the FBI, etc. The UAS is for their internal city use.

Mayor Dietrich asked how quickly a drone could be deployed.

Chief Chiodo said they are planning for six drone operators, one for each of their four teams, one for the investigation's unit during the day and one with their SRG team that is there in the evening. It would be 60 seconds from the time the drone operator arrives on the scene.

Agencies Using Drones:

- DCSO Program has 5 drones, 15 operators for 10 years
- Inver Grove Heights Fire Department
- Eagan Police Department
- MN State Patrol
- MN Bureau of Criminal Apprehension
- 99+ LE Agencies in Minnesota and growing

Chief Chiodo said the DSCO used their drones over the Inver Grove Heights parade this year. The fire department has different restrictions that law enforcement has when it comes to drones. They are not able to cross utilize a UAS.

Required Documentation:

- Documentation: Each use of a UAS should be properly documented by providing the following (Minn. Stat. § 626.19):
 - A unique case number
 - A factual basis for the use of a UAS
 - The applicable exception, unless a warrant was obtained

Chief Chiodo said they have to fill out a report every year for the BCA. They have to include each date it was used and the reason for an exception if there was no warrant. The report is put out in June of every year and is available to the public. The cost for Dakota County Sheriff's Department to maintain their UAS in 2023 was \$18,000 and they used their drone 74 times without a search warrant. The report breaks down the uses by exception. The Police Department's policies for UAS are already published on their website and the report will be published there also.

The top four uses for using a drone without a search warrant have remained the same since the information started being gathered in 2019.

2023 State Drone Use Report:

- 4,236 - LE usage without a search warrant
- Code 8 (1,986) - were used for training or public relations
 - Most were training events
- Code 1 (1,031) - emergency situations that involved risk of death or bodily harm, searching for missing people and documenting crime scenes
- Code 7 (603) - To collect information for crash reconstruction purposes after serious or deadly collisions occurring on public roads
- Code 6 (398) - Collect information from a public area where there is a reasonable suspicions of criminal activity

Requesting Use:

- Developing uniform protocols for submission and evaluation requests made during ongoing or emerging incidents. Deployment of UAS shall require written authorization of the Chief of Police or authorized designee, depending on the type of mission.
- Coordinating the completion of the FAA Emergency Operation Request Form in emergency situations, as applicable (e.g., natural disasters, search and rescue, emergency situations to safeguard human life).

Notification/Protocols:

- Developing operations protocols governing the deployment and operation of a UAS including but not limited to safety oversight, use of visual observers, establishment of lost link procedures, and secure communication with air traffic control facilities.
- Developing a protocol for fully documenting all missions.
- Developing a UAS inspection, maintenance, and record-keeping protocol to ensure continuing airworthiness of a UAS, up to and including its overhaul or life limits.
- Implementing a system for public notification of UAS deployment.

Officer Accountability:

IGH P/P 320 Code of Conduct

- Misuse of police powers; search warrants. Administrative subpoenas, credit checks etc.
 - Baseline Discipline = Termination
- Garrity violations; perjury; falsify official documents or reports
 - Baseline Discipline = Termination
- Minnesota Statute 360.75 (Misdemeanor)
 - Operating any aircraft in such a manner to indicate either a willful or wanton disregard for the safety of persons or property.
- IGH P/P 100.4 Constitutional Requirements
 - All members shall observe and comply with every person's clearly established rights under the United States and Minnesota Constitutions.
- IGH P/P 102.1 Oath of Office
 - Officers of this department are sworn to uphold the federal and state constitutions and to enforce federal, state, and local laws.
- IGH P/P 311.2 Search and Seizure
 - It is the policy of the Inver Grove Heights Police Department to respect the fundamental privacy rights of individuals.
 - Members of this department will conduct searches in strict observance of the constitutional rights of persons being searched.
 - All seizures by this department will comply with relevant federal and state law governing the seizure of persons and property.
- IGH P/P 311.6 Search Warrants
 - Search warrants are obtained by application to the court.
 - (a) Any officer may make application to the court for a search warrant.
 - (b) Application shall be prepared and presented to a judge for review and signing pursuant to all applicable laws and procedures.

- (c) Officers preparing a search warrant shall take all reasonable steps to confirm and corroborate probable cause contained in the search warrant application.

Program Costs:

- Team of 6 Operators
- Operators/Pilots receive no extra compensation
- Training is free for operators
- Initial License Exam \$175, free re-licensure ever 2 years after
- Initial Drone Purchase, Data Storage/License Fees
 - \$15,000, use of one-time public safety dollars
- Yearly cost moving forward for Storage/User Licenses
 - \$3,400

Community Suggestions:

- Conduct a trial period/evaluation period
- Share use statistics/information with the community
- Use the County UAS program

Chief Chiodo said they evaluate any new tool that they implement. The police department will likely look at a 60-day, 90-day and 1-year review to see where they can improve. They will work with the communications department and IT to have the statistics and information published on their website. The public can look up crime in neighborhoods throughout Inver Grove Heights at any time on their website. Using the County's UAS system is not practical in an emergency situation.

Recap of Events:

- Council work Session on August 5th
- Publicized on City Website and Police Social Media
- Q&A September 5th at Inver Glen Library
- State statute 626.19 requires the police department to accept public comment electronically, or by mail or in person
- To date 28 electronic responses
- The police department is asking for Council to approve a budget amendment of \$15,000 from Fund 102 to the Police Machinery and Equipment Fund

Mayor Dietrich thanked Chief Chiodo for being proactive with community outreach.

Council Member Murphy asked if the seven day deletion requirement applied to unintentional video and how do they verify it was deleted.

Investigator Malcolm said unintentional recordings do need to be deleted within seven days. He is working with two of the commanders that oversee the evidence storage platform on a system that will code it a certain way for auto deletion. As Program Coordinator it will be Investigator Malcolm and a support services supervisor's job to ensure that the video has been deleted.

Chief Chiodo said it is similar to what they do with their body camera footage.

Council Member Murphy asked if there are any neighboring cities that are using UAS.

Chief Chiodo said Burnsville is looking at it but waiting to see what happens in Inver Grove Heights.

Investigator Malcolm said Inver Grove Heights will be the third law enforcement department in the county to use UAS. Dakota County Sheriff's office and the Eagan Police Department are the other agencies currently using UAS.

Chief Chiodo said someone included articles in the comment they sent. There was some factual information but also some incorrect information. The articles said Burnsville had zero uses of their UAS, but Burnsville does not have drones.

Council Member Murphy said the article says a city used a drone a certain amount of times without a warrant. The wording seemed misleading because the instances the city used them without a warrant were all included in the nine exceptions.

Chief Chiodo said she looked it up because she was curious about it. The article said Plymouth used their UAS 231 times without a warrant but 189 of the times were for training.

Council Member T'Kach said a lot of people are concerned about the 4th Amendment rights and asked if the UAS program could be discontinued by Council if people were not comfortable with it.

Chief Chiodo said they are not asking approval from the Council to have the program. State statute requires them to accept public comment.

Administrator Wilson said state statute gives the chief of a law enforcement agency the ability to put a program in place as long as they have met the requirements of having a written policy and allowing an opportunity for public comment. Council could give direction but there is not a formal vote of the Council.

Council Member T'Kach asked if they needed a search warrant for public events where there may be a heightened risk and how do they determine what a heightened risk is.

Chief Chiodo said a heightened risk to safety at a public event is on the list of items that they do not need to obtain a search warrant for. Every day they use their professional experience to determine if something is an emergency. There is not a list of select criteria because it varies from city to city and event to event. It is reasonable to use their professional experience and knowledge to make the decisions. It does not have to be a terroristic threat but if there is a public safety need, they could use the UAS. They also receive intelligence from groups that work from the state that monitor chatter.

Council Member T'Kach said she wants to support this but also wants to make sure that people in the community are comfortable and said there were two or three drones at the fireworks.

Chief Chiodo said the drones were not the police department since they are not authorized to use them until after they have received public comment. They may have belonged to the police department or Dakota County Sheriffs.

Council Member T'Kach asked if people can have drones in the city and if there would be confusion between a privately owned drones and the police department drones.

Chief Chiodo said people can own drones and they will put the police department's drone usage on the website. If their drone is being used in someone's backyard as part of a criminal investigation they will be notified within 90 days.

Investigator Malcolm said he participated in a vehicle pursuit where the vehicle crashed, and the driver fled. They tracked the driver using a canine through people's yards and realized he had entered a resident's garage. They entered the garage to apprehend the suspect. They are not typically going into someone's house with the drone. The community has the trust in the police department to go into people's houses to apprehend a suspect and he asks that the community have the trust in them to not abuse their powers with the UAS.

Council Member T'Kach asked how long the UAS would last without having to be replaced.

Investigator Malcolm said five to seven years. It is technology based so it will also depend on if the company continues to update the technology on older models as new models are introduced.

Council Member T'Kach asked if they would be willing to do another community meeting if there was a request from the community.

Chief Chiodo said the policy will be posted on the website. Residents could come to the police station and talk to her or the person running the program.

Mayor Dietrich said it would be a great addition to the police citizens' academy.

Council Member T'Kach asked if there would be opportunity for the public to contact the police department if they had additional questions.

Chief Chiodo said yes, they could contact them by email, phone or stop by the police department with any questions.

Council Member Scales said drones are being used everywhere and many other departments and cities have them. The difference is the police department has more rules for when they can use them that others do not. This is just informing Council and the public what they will be using it for.

Chief Chiodo said that was correct.

Council Member Gliva asked if the community would be notified if the police department was going to use the drone at a public event.

Chief Chiodo said they can notify the community for pre-planned events that are not criminal in nature.

Mayor Dietrich said the UAS is a great tool to keep the community safe and she supports the police department's discretion when making decisions.

Public Comment:

Rachel Tallarini - 2430 96th St. E - asked for clarification on what other government entities may petition to use the UAS.

Investigator Malcolm said the requests would be from organizations within the city such as the Public Works department. There would not be requests from federal organizations.

Council Member T'Kach asked if it would be allowed to let a neighboring city use their drones.

Investigator Malcolm said yes, it would be under their mutual aid agreement. If they had an operator and the available resources, they would assist.

Council Member Scales said it is a necessary tool, but it is new and scary. It is a resident and officer safety issue. He would like to see the use statistics on the website if possible.

Motion to accept Comments into record by Gliva, second by Scales.

Ayes: 5

Nays: 0 Motion carried.

Motion to Approve Resolution 2024-203 approving budget amendment of \$15,000 for the public safety small equipment fund by Murphy, second by Scales.

Ayes: 5

Nays: 0 Motion carried.

B. Adoption of Preliminary 2025 Budgets & Tax Levies for Taxes Payable 2025

Finance Director Hove presented this item. The first draft of the General Fund Budgets and Tax Levy discussion was at the July 15 Work Session. During the August 5 Work Session, they discussed the Debt Service Levies and budgets, the Economic Development Authority Budget, the Host Community Fund Budget, The Pavement Management Fund Budgets, and the Internal Service Fund Budget. At the August 26 Council Meeting, City Administrator Wilson provided recommendations and a review of the General Fund Budget and Tax Levy.

Council Actions Needed:

- Adopt Citywide Preliminary Tax Levy
 - Council is required to pass a preliminary levy by September 30 each year; when the final levy is adopted in December, it may be lower but cannot be higher than the preliminary levy. Proposed tax notices mailed to residents in November will be based on the approved preliminary levy.
- Adopt Special Taxing District Preliminary Levies
- Adopt Preliminary General Fund Budget

- Set the date, time, and place for statutorily required public meeting on the City's proposed budget and levy
 - Scheduled for the December Work Session

2025 Budget Recap - Base Assumptions - with adjustments:

- 3% Wage Increase, plus steps increases for all full-time staff as negotiated with various employee unions
- 6.2% average increase in the City's costs for employee insurance (across the City's 3 plans)
 - Originally budgeted at 10%
- 5% increase to Pavement Management levy funding
- 5% increase to Parks Capital Replacement levy funding
- 5% increase to EDA levy funding

Adjustments from the first draft:

- Implement a smaller increase to the Fire Department's Central Equipment allocation than originally shown.

2024	2025 - 1 st Draft	2025 - Modified
\$856,200	\$1,482,800	\$1,382,800

- Based on updated inflationary recommendations from equipment vendors
 - Allows for better phase-in of increases for future capital costs
- Assume a 50% decrease (\$50,000) to Town Square cable franchise revenue to all for future consideration of an adjusted 2025 revenue share plan.
 - Originally budgeted for \$100,000 in revenue

Use of Fund Balance:

- General Fund - 2025 is the first year to start spending down the previous year's savings from Fire SAFER Savings Plans (\$525,000)
- From one-time Public Safety Aid
 - \$11,250 for Police Department badge updates and new honor guard uniforms
 - \$331,600 to cover phase-in of 3 new police officers
- Debt Funds - continue to utilize Closed Bond Funds in lieu of levy for 2020A Refunding Bonds (\$177,250)
- City Facilities
 - Use fund balance for ongoing capital needs (\$188,500)
 - Plus: use \$45,000 for Police Department building updates (2025 = Year 2)
- Technology Fund - utilize \$75,000 for Fire Station \$2 AV updates

Expenditure Budgets by Function

	2024 Approved Budget	2025 Proposed Budget	\$ Difference	% Change

General Government	\$ 3,359,700	\$ 3,456,511	\$ 96,811	2.88%
Police	11,846,756	12,679,169	832,413	7.03%
Fire	6,464,364	6,777,629	313,265	4.85%
Public Works	4,956,955	5,035,595	78,640	1.59%
Parks & Recreation	3,566,235	3,647,160	80,925	2.27%
Community Dev.	2,259,475	2,302,500	43,025	1.90%
Transfers Out	484,515	771,240	286,725	59.18%
Subtotal	\$32,938,000	\$34,669,804	\$1,731,804	
Tax Abatement	182,880	183,300	420	
Total	\$33,120,880	\$34,853,104	\$1,732,224	

Director Hove said one of the resolutions is for Council to approve the preliminary General Fund budget amount of \$34,853,104.

New Staff Positions Included in Preliminary Levy and Budget (4FTE's)

- Police Department – 3 additional police officers
 - 5-year phased approach like SAFER savings plan, using Police's share of one-time public safety dollars
 - 2025 levy impact of \$82,900
- Fire Department – 1 additional FT firefighter
 - 2025 levy impact of \$132,300
 - Additional firefighters could be considered if the City is awarded a new SAFER grant
 - Otherwise, future years would consider adding 1 FT firefighter/year in years 2026 & 2027
- Additional \$30,000 spread across all departments for additional hours, position reclasses, intern

Fire Department	Police Department
4 new staff in 2019 (3 FT Captains + 1 Inspector)	Minus 2 staff in 2019 (1 officer, 1 support staff)
0 new staff in 2020	1 new staff in 2020 (1 officer)
0 new staff in 2021	1 new staff in 2021 (1 officer)
9 new staff in 2022 (3FT Lts. + 6 FT FF - grant funded)	4 new staff in 2022 (2 officers, 1 Sgt., 1 support staff)
0 new staff in 2023	2 new staff in 2023 (2 officers)
1 new staff in 2024 (Assistant Chief - Operations)	0 new staff in 24
14 new FT staff positions over 6 years	Net gain of 6 new staff over 6 years

Proposed Use of One-Time Public Safety Aid

	2025	2026	2027	2028	2029	Total
Cost of 3 Officers	\$414,500	\$435,225	\$456,986	\$479,836	\$503,827	\$2,290,374

Levy	\$82,900	\$174,090	\$274,192	\$383,868	\$503,827	\$1,418,878
State Aid	\$331,600	\$261,135	\$182,795	\$95,967	\$0	\$871,497
	20%/80%	40%/60%	60%/40%	80%/20%	100%/0%	

Director Hove said the cost of the three officers would be 100% levy supported in 2029.

What is Funded in the General Fund?

What's Included	What's Not Included
Administration & Mayor/Council	Community Center Funds*
City Clerk & Elections	Debt Service Funds*
Communications	Host Community Fund
Finance	
Community Development	Golf Course
Planning	Utilities (Water, Sewer, Storm)
Inspections	Convention & Visitor's Bureau
Police	
Fire	* these are not part of the General Fund, but they are levy-supported Funds
Engineering	
Streets & Street Lighting	
Parks & Recreation	
Transfers - to EDA & Parks Capital	

Expenditure Budgets by Function

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Total	\$33,120,880	\$34,853,104	\$1,732,224	

Transfers Out - procedural change to reporting for Parks Capital Replacement

	2024 Approved Budget	2025 Proposed Budget	\$ Difference
EDA	\$ 169,515	\$ 177,990	\$ 8,475
Parks Capital Replacement	\$ 315,000	\$ 593,250	\$ 278,250
Total Transfers Out	\$ 484,515	\$ 771,240	\$ 286,725

Director Hove said in prior years the city also made a transfer from the Pavement Management fund for paved surfaces within parks. For 2025, staff is recommending combining these into one transfer for improved simplicity and transparency.

Council Member T’Kach asked if the EDA funding is for consultants and studies and not land purchase.

Director Hove said the EDA fund is more of an operating fund. It will pay for consultants or studies and there is funding for a full time staff member. This funding allows the EDA have flexibility to either hire a full time staff person or continue with a consultant. It does not give enough to buy property.

Council Member T’Kach asked if the EDA has levy authority.

Director Hove said EDAs have levy authority, but the Inver Grove Heights has not set it up. Council can decide they would like the EDA to have levy authority and there are legal steps that they have to follow.

Council Member T’Kach asked how long the process would take.

Administrator Wilson said it would take most of a year and if Council would like to add an EDA levy for 2026, they should give staff direction within the next few months. The EDA levy comes from the same taxpayers as the city’s levy but would be identified as an EDA levy on taxpayers’ tax statements.

Council Member T’Kach asked if Host Community Funds could be moved into the EDA fund.

Administrator Wilson said Host Community funds can be used as Council directs.

Citywide Tax Levy Calculation

	2024 Approved Budget	2025 Proposed Budget	\$ Difference	% Change
General Fund Subtotal	\$ 32,938,000	\$ 34,669,804	\$ 1,731,804	2.88%
Minus Other Revenues	-5,966,897	-6,120,729	-153,832	2.58%
Amount Levied for General Fund Activities	\$ 26,971,103	\$ 28,549,075	\$ 1,577,962	5.85%
General Fund-Tax Abatement	182,880	183,300	420	0.23%
Debt Levy	2,542,411	2,547,632	5,221	0.21%
Pavement Management Levy	3,045,000	2,934,750	(110,250)	-3.62%
Total Levy	\$32,741,394	\$34,214,757	\$1,473,363	4.50%

Tax Abatement Tax Levy

Annual abatement is based on the new value added to the city’s tax base under The Crossings project. City taxes related to that new value are “abated” or paid back to the developer.

- 2023 was the first year of this abatement (\$33,000 estimate) – due to fact that only a portion of the new project’s market value was “online”
- 2024 estimated at \$182,880 – after 2024, these payments should stabilize as the only “new value” will be due to any appreciation of the existing property
- 2025 estimated at \$183,300
- Abatement runs for ten years or less
- Maximum abatement is \$1.6 million
- Abatement is considered a separate “levy” each year

Debt Tax Levies

Bond Issuance	2022 Budget	2023 Budget	2024 Budget	2025 Budget
Street-Related Debt				
2015A G.O. Bonds	635,669	637,301	633,210	634,055
2016A G.O. Bonds	695,874	718,134	718,292	723,227
2017B G.O. Bonds	263,211	263,125	262,882	267,731
2020A G.O. Bonds*	177,250	177,250	177,250	177,250
Use of Closed Bond Fund	-177,250	-177,250	-177,250	-177,250
Fire station Debt				
2018A G.O. Bonds	737,977	739,289	739,552	733,514
2019A G.O. Bonds	176,585	187,635	188,475	189,105
Total	\$2,519,316	\$2,545,484	\$2,542,411	\$2,547,632

Pavement Management Tax Levy

	2024 Adopted	2025 Proposed	% Change
Tax Levy	\$ 3,045,750	\$ 2,934,750	
Transfer out for Parks Pavement	-250,000	0	
Levy without Parks Capital Transfer	\$ 2,795,750	\$ 2,934,750	+5%

Citywide Tax Levy Calculation

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General Fund Subtotal	\$ 32,938,000	\$ 34,669,804	\$ 1,731,804	2.88%
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Pavement Management Levy	3,045,000	2,934,750	(110,250)	-3.62%
Total Levy	\$32,741,394	\$34,214,757	\$1,473,363	4.50%

Director Hove said the General Fund Levy, Tax Abatement Levy, Debt Levy and Pavement Management Levy equals a levy amount of \$32,214,747 and is a 4.50% increase over 2024.

Impact of 4.50% Citywide Tax Levy Increase on Median Valued Residential Property (\$349,500)

Proposed Citywide 2025 Tax Levy	\$ 34,214,757
Levy Increase (%)	4.50%
Tax Rate	50.932
Change in Tax Rate	1.60%
2025 Median Valued Property*	\$ 349,500
Annual change in City Taxes (for \$349,500 median property)	\$68,77

*In 2024, the median valued property was \$341,950

Director Hove said the tax rate does change over the years depending on citywide market values and fiscal disparities but typically stays in the 48 to 52 range. The tax rate is subject to change until the county finalizes the numbers in the spring.

Comparison - Dakota County Cities

City	Preliminary Rate (estimated)
Apple Valley	13.76%
Burnsville	7.06%
Eagan	8.20%
Farmington	7.54%
Hastings	7.50%
Inver Grove Heights	4.50%
Lakeville	12.05%
Rosemount	10.90%
South St. Paul	9.06%
West St. Paul	7.22%
Average	8.77%

Eagan's tax rate includes 3% related to the Parks/Facilities Bond and Rosemount has gradual increase between 2024 and 2027 for debt service on new building and the tax rate was 6.90% prior to the increase.

Director Hove said these are preliminary numbers, but Inver Grove Heights has the lowest tax rate compared to the other Dakota County cities.

Council Member T'Kach asked if they are anticipating a significant increase in the tax rate next year because they are significantly lower than the other cities and if staff thinks they have the savings needed for future projects and needs.

Director Hove said staff has not presented the utility budgets yet but those are not funded by a tax levy. There will be future building needs for the central maintenance facility and would

likely involve some debt. This is a unique year and staff feel they can continue to provide the services needed and even increase some staffing with this rate.

Administrator Wilson said the biggest need coming will be to figure out a properly sized central maintenance facility for the community. The Fire Station on Upper 55th Street is also a significant challenge. They do not have enough planning done to make a recommendation on a budget. The challenges they have are not imminent and require additional development and research.

Council Member T'Kach said she thinks 4.5% is great but does not want residents to be shocked with a 12 - 15% increase because they forgot something.

Director Hove said everything is included in the budget.

Council Member Scales said 12 - 15% is a scary number and is not based on anything.

Director Hove said cities are setting a maximum right now and she expects some of the rates will lower as they are finalized.

Approval Needed:

- Adopt Citywide Preliminary Tax Levy
 - Council is required to pass a preliminary levy by September 30 each year; when the final levy is adopted in December, it may be lower but cannot be higher than the preliminary levy
- Special Taxing District Preliminary Levies - Storm Water Special Taxing District Levy
 - Established under MN Statute 444
 - Used to fund trunk storm sewer improvements installed in conjunction with the 70th Street East Reconstruction Project from Cahill Avenue to Concord Boulevard (City Project 2001-02)
 - Babcock trail
 - South Grove
 - 70th Street
 - Contains approximately 3,000 parcels)
 - 10-Year Term (2018-2019)
 - Annual levy of \$79,394
- Adopt Preliminary General Fund Budget
- Set the date, time, and place for statutorily required public meeting on the City's proposed budget and levy
 - Monday, December 2, 2024 at 6 p.m.
 - Council Chambers - 8150 Barbara Avenue, Inver Grove Heights

Director Hove said the resolutions can be approved in one motion or Council can do separate motions.

Motion to approve Resolution 2024-204 adopting proposed citywide tax levies for payable 2025, approve Resolution 2024-205 adopting proposed storm water special taxing district tax levies payable for 2025, approve Resolution 2024-206 adopting the

preliminary general fund 2025 budget, approve Resolution 2024-207 setting the date, time, and location for the public budget discussion by T’Kach, second by Gliva.

Ayes: 5

Nays: 0 Motion carried.

C. Interim Use Permit to Allow a Park-and-Ride Facility at 6588 / 660 Cahill Avenue

Assistant Planner Botten presented this item. The property is located on the east side of Cahill Avenue and is in the B-4 zoning district for shopping centers. The site is developed and includes three buildings and a lot of parking area.

The applicant is requesting an Interim Use Permit (IUP) for a park, sleep, and fly facility at 6588/6600 Cahill Avenue.

Interim Use Permits (IUP):

- Does not fit strict application of Zoning Code
- Uses have merit for an intermediary period of time.
- Temporary use of a property until a specific date, occurrence of a particular event, or until change of zoning regulations.

Background - Existing IUP:

Inver Grove Hospitality/AmericInn

- Location: AMC Movie Theater, 5861 Blaine Avenue
- Term: First issued May 2018 for five-years; and a one-time 1.5 year extension
- Facility: 250 parking spaces
- Expiration: January 10, 2025
- Other:
 - Proposed location is a multi-tenant site.
 - Parking minimums are met within the front or side of existing businesses.
 - Property is not proposed to be fenced, but would include security cameras.

Assistant Planner Botten said the applicant is requesting a five-year IUP. The Dollar Tree, Aldi, the Post Office, and other smaller stores are located on the site. There is no proposed fence but as a condition of approval they are required to have a guard post with 24 hour in-person surveillance starting by April of 2025. The security footage has to be kept for at least two weeks, and they have to be in communication with the police department. The police department will need a contact with the people working directly at the site in case there are any issues.

The Planning Commission recommended approval of the IUP for five years with the conditions presented in the Resolution. Staff supports the recommendation from the Planning Commission but added additional language to the wording of the expiration of the IUP. The language permits the five-year but includes additional language that states if the park-and-ride would terminate for three months or more, the IUP would expire. If there is a

change in ownership of the property, change in zoning regulations or if the property were subdivided, the IUP would become void.

The request requires a 4/5th vote from Council and staff has not heard from any of the surrounding property owners.

Council Member Scales asked if the reason there is would be no fence was for emergency services to have access.

Assistant Planner Botten said yes, they will not have a fence so emergency services can access the area if needed and the owners of the property have said that they do not want a fence.

Council Member Scales asked if it would be a problem if someone was visiting a business on the property and parked in the space.

Assistant Planner Botten said the city would not be monitoring it and the applicant may be able to provide more information.

Council Member Murphy asked if staff has any history of how long temporary use permits historically last. If this is approved, it would be 12 years from the first IUP.

Assistant Planner Botten said all of the IUPs approved in the past have been for different types of use and different periods of time. There is no consistent timeframe there have been IUPs with longer timeframes. Each request is looked at differently.

Council Member Murphy asked if they would look to change the code to include a temporary use in the code.

Assistant Planner Botten said Council could consider updating the code. In this case, the area has redevelopment potential so Council may not want to change the code to include a park-and-fly.

Council Member Gliva asked what would happen to the IUP if the zoning of the property changed.

Assistant Planner Botten said the current property is a commercial shopping center and is likely not to be rezoned. If it were rezoned the IUP would become void.

Council Member Gliva asked if there would be a situation where they would not want to have an IUP.

Assistant Planner Botten said the code is written that it is an allowed interim use in the B-3 or B-4 districts. If the zoning were to change the comprehensive plan would need to be changed to match the zoning.

Mayor Dietrich asked if Council had discretion on the timeframe.

Assistant Planner Botten said yes, the Council can determine the timeframe.

Council Member T'Kach asked if there is a minimum timeframe an IUP holder would have to move their property if the zoning were changed.

Assistant Planner Botten said they would be eligible for a one-time extension to allow them time to find a new site.

Council Member T'Kach asked to confirm if the property sold in three years, the IUP would be expired but the applicant could request a one-time extension.

Assistant Planner Botten said yes, if the property sold prior to the IUP expiring, the IUP would be void upon the sale of the property and the applicant could request a one-time extension.

Administrator Wilson said the difference between an Interim Use Permit (IUP) and a Conditional Use Permit (CUP) is a CUP runs with the land indefinitely and survives a change of ownership. CUPs are also grandfathered in if there is a zoning change. An IUP can end after a certain timeframe, a sale of a property and it is not grandfathered in if a future Council does a rezoning. Council sees CUPs more commonly than IUP.

Owner Ali Hasan said they do not operate a traditional park-and-fly. They operate as a park, sleep, and fly and all of their guests stay at their hotel. There were concerns about security at their current property and there are concerns about the new property. They have had a handful of security issues since they have been there. There were two more serious incidents. One of the incidents was a stolen car, but it was a domestic situation. The other incident was a car was damaged from a gunshot, but the gunshot was not on their property.

They originally suggested a fence, but the owner of the lot did not agree. They are currently planning to have security cameras and 24/7 security. The new property is behind a line of trees and a building so it would not be as much of an eyesore as the current location. There was a concern of commercial vehicles parking in the area, but they were not guests of the hotel. They were truckers who had parked there to sleep. They have a sizeable business and support from the Conventions Visitor Bureau CVB and the hotel's General Manager Evelyn Sanchez is part of the CVB.

General Manager Evelyn Sanchez said the business supports 12 jobs, seven full-time positions and five part-time positions. The director of CVB Lily Miller wrote a letter on their behalf.

Hasan said the other businesses in the area support the park, sleep, and fly because it brings more people into the community. They currently have three full-time and three part-time drivers and one full-time and one part-time security guard. The new property will add an additional four security guards. They had a request to have their vehicles only use the back road to get to the parking lot and they have agreed to that.

Sanchez said when a guest comes in, they fill out a form with car, make, model, plate number and owner's phone number. Each guest is assigned a number and security checks the numbers. If they have an unauthorized vehicle in the lot, they will contact the police department.

Hasan said they do not move cars to the lot until late in the evening. If other cars are parked in the area late into the evening, they are not concerned. They are concerned if there are unregistered vehicles there at 2 a.m. because the local businesses would be closed at that time.

Council Member T'Kach asked if there would be signage for the area they will be using.

Hasan said the Planning Commission requested signage. They will also have security cameras and there will be signage saying "this area is monitored by surveillance" but he does not think they would need signage saying it was only for AmericInn use. It would not be an issue if someone parked there overnight. They had one guest of Holiday Inn that used their current lot. They caught it but did not do anything and he got his car.

Council Member T'Kach said she wanted to make sure that people were not getting towed because they accidentally parked in their lot.

Hasan said they only tow they had to do was because of a broken down vehicle.

Hasan said they do not own the lot and there is a condition that ends the IUP if there is an ownership change. He asked if the change of ownership was referring to them as the business owners or change of ownership of the property.

Attorney Nason said as it is structured now, a change to ownership of the property that would terminate the IUP.

Hasan asked if it could be changed as sale of the property would be outside of their control.

Attorney Nason said it would be the Council's decision if they want to consider an approval with the original conditions or an approval with some or all of the additional conditions.

Mayor Dietrich said it is the City's intent to encourage economic growth and this area could be redeveloped for retail.

Hasan said they have had discussions with the property owner, Gator, and they said they had it for sale but have since removed it and put up for lease signs. Gator told them that they had the spoken with a developer two years prior about a potential apartment building.

Hasan said there are some items they have to add items to the property to make it usable and if the IUP is approved for a shorter period of time it may not be worth it for them. Their lease with Gator is for five years.

Council Member T'Kach asked if the applicant sold the business would the IUP be voided.

Attorney Nason said as it is written the IUP would be voided if the property owner sold the property. Council could amend the verbiage to say if the business were sold the IUP would be terminated.

Council Member Gliva asked if anyone has talked to the businesses where the park-and-fly is located.

Hasan said they have discussed this with the business owners. Their original map had 220 spaces and the only business to have an issue with it was Aldi because they have some larger trucks that need to be able to get in the area. They amended their map to 192 parking spaces.

Council Member Gliva asked if there were any concerns with a large parking lot in general.

Hasan said all of the conversations have been through Gator. Gator seemed happy with the idea because the added presence of a security guard would do more good than harm.

Council Member Gliva said she is concerned that there is no fence and there is a school nearby where kids would be going back and forth. There may be some current issues with people loitering. She is concerned that the guard station would not be active until April.

Hasan said engaging with Gator took much longer than expected. The original plan was to have the guard station up when the contract started but due to time constraints, they will not be able to have it built in time. They have a vehicle marked as security with a siren on top and they will use that until they get the guard station built.

Council Member Gliva said economic development is on Council's short list and is concerned with having a large parking lot in the middle of the city.

Hasan said the shuttle will lead the cars to the parking lot at the top of the hour between 6 and 10 p.m. and when guests are returning, the shuttle will take them to their car, and they will exit. There will be no massive amounts of people going in and out. Most guests prefer to keep their car until the evening to visit restaurants in the area. The only two lots that were large enough, zoned correctly and close enough to the property are Aldi's lot and the AMC movie theater's lot. The lot next door needs significant development and is not a viable option by January. The CVB supports this and the lot itself maintains 12 jobs.

Mayor Dietrich asked what the difference was between a park-and-fly and a park, sleep, and fly.

Hasan said this has always been a park, sleep, and fly. It is only for guests that stay at the hotel. The majority of the time guests will check into the hotel for a night and have an early flight in the morning. The guests' cars will remain in the lot until they return from their trip. All of the people using the lot stay at the hotel for one or two nights.

Assistant Planner Botten said there could be some confusion because the language in the code for the IUP listed approvals in the B-3, B-4 and P districts for park and ride facilities such as short-term parking and park and fly lots. If they had the operation on the AmericInn property they would not need the IUP. Since it is not on their property, they need an IUP. The correct term is a park and ride facility, but it could also mean a park, sleep and fly, a park-and-ride or short-term parking.

Mayor Dietrich asked if a park-and-fly would be permitted.

Assistant Planner Botten said yes, they use a park and ride facility as a general term.

Hasan said they have never allowed a regular park-and-fly because it does not benefit them. The cost of taking someone to the airport is not worth allowing just parking.

Council Member Murphy said he is concerned with there not being a fence and asked how many rooms there are in the hotel.

Hasan said they have 82 rooms.

Council Member Murphy asked if they were requesting 192 spaces because they are doubling up on the rooms until somebody comes back.

Hasan says a guest will come and stay at the hotel and typically leave their car there for about a week. They would not have enough spaces in their parking lot to have guests staying at the hotel and their guests that have left for their trip.

Council Member Murphy asked how it would work if a guest showed up at the parking lot late and has to get on the shuttle to the airport.

Hasan said the guest has to check in at the front desk. The guard in the guard shack will only be doing security, they will not be checking guests in and out. Guests stay at the hotel before their trip 80% of the time. They will have use of their car until the evening when the shuttle leads them to the parking lot at a specific time. The shuttle will return them to the hotel to sleep for the evening and take them to the airport the next morning. They do have 5-10% of guests that stay at their hotel at the end of their trip. They will park at the hotel property and the shuttle will take them to the airport. Their car would remain on the hotel property for the duration of their trip since it is a minor occurrence.

Council Member Murphy asked how many parking spaces they have at the hotel.

Hasan said they share a parking lot with Applebee's, but it is 75-80. Applebee's has never had an issue with their guests using a few parking spaces of theirs and they also have no issue with Applebee's guests using their parking spaces.

Council Member Murphy asked if the five-year term would be a deal-breaker.

Hasan said it is not, but the park, sleep and fly is very important to their business. The amount of traffic in Inver Grove Heights is not sustainable without this. Their agreement with AMC was for 220 spaces. Most of the winter the lot is full, but it quiets down in the summer. The winter months help the business be sustainable. It also brings more business for the neighboring hotels who operate smaller park, sleep, and fly programs. An IUP for two or three years would be worth it but the end of the IUP would put the viability of the business in jeopardy. The park, sleep and fly option generate about one third of their revenue.

Sanchez said one of the reasons the CVB approves of this program is that it brings in people from neighboring states and even Canada that would not normally come to Inver Grove Heights. They stay at their hotel and visit the local businesses.

Hasan said he was aware there were issues with the previous owner that they were unaware of at the last meeting. He tried to address as many concerns from that meeting as he could. The program supports 12 jobs on its own and it is bringing business to the area.

Council Member Scales asked if the police department provided any information on the area.

Assistant Planner Botten said they sent a drawing of the request and the additional conditions that were included in the resolution. They commented on what was presented but not if there are any security issues on the property currently.

Council Member Murphy asked how a five-year term of an IUP does not prevent them from approving redevelopment on the property.

Community Development Director Ziemer said an IUP is associated with the owner of the property and not the land. There is some risk to the user of the property making investments to the property knowing that at some point in time they may not be able to continue that use into the future. If the owner of the property decides to sell the IUP is terminated. The new owner could apply for an IUP but if Council decides they would want a different long-term use in the area, the IUP application can be denied. There is a five-year timeframe given but there are other aspects such as ceasing the operation of the park and ride, or the lease expires the IUP is void. It preserves the City's ability to look at its use as a temporary use. Council can continue to entertain development, but it would ultimately be up to the property owner to sell the land.

Mayor Dietrich said the police department recommended having at least two weeks of memory storage for security footage because there is a potential for increased public safety calls. She would want the staffed guard building would be operable by January 11, 2025. Mayor Dietrich has concerns with the length of the contract because she does not know how it will affect the area in terms of crime.

Mayor Dietrich asked if a condition could be added requiring the business to be current on taxes and fees.

Attorney Nason said they can change the dates and the start. They typically see language in licensing stating that they must be current on taxes. If they want to require taxes and fees be current it would apply to the property owner Gator.

Mayor Dietrich said she would like to hear from the current tenants and the police department before moving a Resolution forward.

Council Member T'Kach said she was supportive of the application and did not realize park, sleep and fly was an available product. She researched and saw a lot of hotels offer this type of product and thinks they are protected with the conditions. She does not know if having a security building constructed by January is feasible. If there were redevelopment going on in the area it does take some time. They were asked to move from their original area because there had been some proposals for retail, and nothing has happened yet.

Council Member Scales said redevelopment is important, but the area used to be an enclosed mall, and the back lot was never used. There are current calls to the police department for activity happening there now and he thinks this will help decrease that. It is a temporary use and he does not have an issue with the five year term. At AMC they gave a shorter term because development was coming, and they do not currently have any development plans. He would not want it as permanent, but it is ok as temporary. There are more positives than negatives.

Council Member T'Kach said she reviewed the community crime map and there are no reported crimes in the area, but she is not sure what the date range is.

Motion to approve Resolution 2024-208 approving an interim use permit to allow a park-and-ride facility to be operated at 6600/6588 Cahill Ave by T’Kach, second by Scales.

Ayes: 2

Nays: 3 (Dietrich, Gliva, and Murphy) Motion failed.

Mayor Dietrich said the reason for her denial is if they cannot make money because they cannot obtain an additional parking lot they may need to change the scope of their business. Mayor Dietrich would also want to have further input from the police chief.

Council Member Gliva said she was not comfortable putting the business without a fence, near a school and without hearing from the other businesses could create a safety issue.

Council Member Murphy said he was uncomfortable with the length of the IUP and the ability to request another year. He is also uncomfortable that there is no fence planned.

Attorney Nason asked the Council Members that voted against approval if they had any additional reasons related to health, safety, or welfare that they would like on the record. Attorney Nason will prepare a written Resolution that includes the reasons for denial and articulates the facts from the Council and it will be brought back before the Council during the next meeting.

Mayor Dietrich said she wanted to clarify that the business needs to have at least enough parking spaces for the rooms they have to sell.

Council Member T’Kach asked when the applicant could return with a new application.

Assistant Planner Botten said the applicant could request a reconsideration of the application at the next meeting.

Attorney Nason said there was no language in the IUP section that would inhibit reapplication.

D. 3rd Reading of Ordinance Amending City Code Related to the Sale of Tobacco and Nicotine Products

Commander Otis presented this item.

Background:

- Prior to 2024, Dakota County previously issued licenses for the sale of tobacco and nicotine products and delivery devices and conducted compliance checks.
- In 2023, the City adopted an ordinance and took over the licensing of tobacco products in 2024.
- The 2024 compliance checks were completed, and the police department has requested clarifying revisions to existing code language.

City Code Revisions:

#1. License Denial, Suspension, or Revocation

- Knowing there is no suspension, or revocation is contemplated for first violation.
- Existing language in 4-12-5: Basis for Denial, Suspension or Revocation of License and 4-12-10: Administrative Penalties for Violations have some discrepancies.
- Proposed language change clarifies that there is no mandatory suspension or revocation of a license upon a violation, although Council always has discretion to impose greater penalties for any violation.

4-12-5: Basis for Denial, Suspension, or Revocation of License:

- A. The following ~~shall~~ may be grounds for denying the issuance or renewal of a license or suspending or revoking any license issued under this chapter:
- B. Except as may otherwise be provided by law, the existence of any particular ground for denial, revocation or suspension does not mean that the City must deny revoke, or suspend the license. If a license is mistakenly issued or renewed it shall be revoked upon the discovery that the person was ineligible for the license under this Chapter.

#2. Administrative Penalties for Violations

For this section, there are seven revision areas.

1. Clarifies that in addition to financial penalties or license suspension or revocation, the City Council may add reasonable conditions to a license as a result of violation
 - No one under 21 allowed to sell licensed products
 - Additional training requirements
2. Further clarifies that each violation of a license is a separate violation of the terms of the license
 - They cannot move from a first violation to a second violation without a previous violation within 36 months of that ordinance
3. Requires that all license holders implement seller training upon a license violation
 - Similar to alcohol server training requirements
4. Clarifies that the City Council will be holding hearings related to license violations
5. Removes non-criminal penalty section
 - Police issuing a petty misdemeanor citation to sellers over 21 years of age.
 - Administrative penalty process for the business.
 - Consistent with other compliance checks outlined in ordinances.
6. Language updates for consistence
 - Changed business to licensed retail establishment
 - Changed server to seller
7. The addition of recently passed statutory language that requires the imposition of additional penalties for license violations in certain circumstances.

Commander Otis said there was a typo in the ordinance:

Notwithstanding the foregoing, pursuant to Minnesota Statutes, Section 461.12 subd. 1a.2a. a licensee's authority to sell licensed products must be suspended for not less than seven (7) days and may be revoked if the licensee:

Commander Otis said Council is requested to approve the third reading of the ordinance with the typo correction and approve the summary publication resolution.

Council Member T'Kach asked if there are some places that sell tobacco that are not licensed retail establishments.

Attorney Nason said the terminology in the beginning of the ordinance refers to a licensed retail establishment. They changed business to licensed retail establishment for consistency. If a business is not a licensed retail establishment, it is illegal to sell the tobacco products.

There were no additional comments received for this item.

Motion to approve third and final reading of an Ordinance 1483 Amending City Code Related to the Sale of Tobacco and Nicotine Products and approve Resolution 2024-209 Summary Publication by Murphy, second by Gliva.

Ayes: 5

Nays: 0 Motion carried.

E. 2nd Reading of Ordinance Amending City Code Related to Abatement of Nuisance (Hazardous and Diseased) Trees

Attorney Nason presented this item and Parks Superintendent Swoboda and Code Enforcement Coordinator Rainey were present to answer questions.

Background:

- City Code currently declares certain diseased trees to constitute a public nuisance and authorizes their abatement
- Unlike the general public nuisance abatement section (Title 5, Chapter 9), the diseased tree abatement section (Title 5, Chapter 8) does not provide for the appeal of an abatement order
- Staff are requesting the Council consider amending the City Code related to diseased and hazardous trees to clarify certain definitions as well as the abatement procedures for diseased and hazardous trees

Attorney Nason said the revision of this code started because a compliance order was issued to a property owner and the property owner wanted to appeal the order.

Objectives of the Ordinance:

1. Clarify that diseased and hazardous trees and wood constitute a public nuisance under the City's general public nuisance section (Title 5, Chapter 9)
2. Define hazardous trees to include hazardous trees as a public nuisance
3. Provide that abatement of diseased trees and hazardous wood and trees is to follow the process provided in Title 5, Chapter 9

#1. Clarify that Dead, Diseased, and Hazardous Trees that Constitute a Public Nuisance under Chapter 8 Also Constitute a Public Nuisance Under Chapter 9

Section One. Amendment. Title 5, Chapter 9, Section 2 of the Inver Grove Heights City Code is hereby amended to include the following language:

- T. Diseased trees, hazardous trees, or hazardous wood which constitute a public nuisance under section 5-8-4 of this code.

#2. Define a Hazardous Tree and Declare Them to be a Public Nuisance Under Chapter 8

Section Two. Amendment. Title 5, Chapter 8, Section 4 of the Inver Grove Heights City Code is hereby amended as follows. The new language is show underlined:

5-8-4: Nuisances Declared and Prohibited

- A. Nuisances Declared: The following items are hereby declared to be public nuisances, ~~when found within the control zones between April 1 and September 15:~~
1. Any hazardous tree. A hazardous tree is defined as a tree which has structural defects in the roots, stem, and/or branches that are likely to cause the tree or tree part to fall, and such fall could cause property damage or personal injury.
 - Ordinance clarifies the definition of a diseased tree
 2. Any diseased tree. A diseased tree shall mean any of the following when found with the control zones between April 1 and September 15:

Attorney Nason said staff has only been able to find one Resolution establishing a control zone from 2019 and it declares the entire city to be the control zone. To answer the question from the last meeting, for Emerald ash borer purposes, the entire city is a control zone.

- Ordinance clarifies the definition of a hazardous wood

Hazardous wood is the wood from one of these trees in the control zone.

#3: Clarify Language in Section 5-8-6 Related to Abatement

- Add a reference to "diseased or hazardous trees" to Section 5-8-6, along with hazardous wood
- Amended the section related to abatement of trees to clarify that the abatement process found in Section 5-9-6 shall be followed.

Additional Information:

- Diseased trees are only subject to abatement if they are:
 1. Located in a control zone; and
 2. Between April 1 and September 15
- Hazardous wood is only subject to abatement if it is:
 1. Located in a control zone; and
 2. Between April 1 and September 15
- Hazardous trees are subject to abatement at any time
- Per resolution 19-75, the entire city is a control zone for EAB purposes

Council Member Murphy asked if this applied to city-owned land.

Attorney Nason said yes, it does not reference privately owned land.

Council Member Scales said they have residents that own a lot of acres with ash trees in the middle of the acreage and if the tree falls it will not hurt anything. He asked if this would require those residents to remove those trees and if it could potentially be 100 trees. He does not want to force residents to pay a large amount of money to remove trees that will not hurt anything if they fall.

Attorney Nason said if the tree is not likely to cause harm to a person or property, it is not considered a hazardous tree. As the code is written, if the tree is diseased, it is subject to abatement.

Council Member Murphy asked if changing the definition of a control zone would address Council Member Scales concerns.

Attorney Nason said yes, it would.

Administrator Wilson said nothing about this ordinance changes the control zone. This ordinance gives residents a way to appeal an abatement notice where they do not have that option now. This amendment is taking a step in the right direction by allowing an appeal.

Council Member Scales asked if code enforcement intended to go into the large properties.

Superintendent Swoboda said they are not looking for hundreds of trees in private backyards. They are mostly taking phone calls from residents are for hazardous trees that have the potential to harm people or property. They should be looking at the entire urban forestry to help control emerald ash borer, but they do not have the resources.

Council Member Scales said he appreciates that they are not going into these large lots and asked if taking down a tree with emerald ash borer is necessary or has the spread of it already stopped.

Superintendent Swoboda said a tree can get emerald ash borer one year, but it takes three to five years to kill the tree. There are treatments for emerald ash borer, but it has to be caught early. The City also has thousands of trees that they are trying to deal with.

Council Member T'Kach asked they could start a program where they have a list of contractors that the City works with that would help with tree removal and if it could be charged on a per hour basis. She also asked if the abatements could be added to the property taxes.

Code Enforcement Coordinator Rainey said if the abatement is not paid, it will be added to the property taxes. There are no grants to help pay for tree removal.

Superintendent Swoboda said he often provides lists of tree removal companies that the City uses. Many of the private trees are in backyards and take much more work to be removed, increasing the cost.

Council Member T'Kach asked if there was a way to set a standard pricing with contractors.

Superintendent Swoboda said every tree is different depending on how big it is and how dead it is. A lot of these trees are getting to the point where contractors do not want to touch them.

Mayor Dietrich asked if Superintendent Swoboda or Coordinator Rainey had any opinion on the updates to the ordinance.

Both Swoboda and Rainey said they were ok with the updates.

Council Member T'Kach asked how long someone has to remove a tree.

Coordinator Rainey said the code allows for 14 days to remove a diseased tree. It is not a long time to get a service to come and remove the tree. Residents can contact them to let them know they are working on finding a contractor, they will work with residents.

Council Member T'Kach asked if there was a preference between burning, chipping, or removing the wood.

Superintendent Swoboda said any option would be ok.

Council Member T'Kach said she was concerned about the wind if they were trying to burn an entire tree.

Chief Swoboda said depending on the size of the fire they would need to acquire a burning permit.

Coordinator Rainey said the ordinance does not clarify a timeframe for diseased trees, so he has been staying consistent with hazardous trees and advising 14 days.

Council Member Scales said diseased and hazardous trees should be taken care of. He does not want to be heavy handed and go into properties with hundreds of trees and he is happy with adding the appeal process.

Motion to approve second reading of an Ordinance amending IGH City Code Title 5, Chapters 8 & 9 related to abatement of diseased and hazardous trees by Scales, second by Murphy.

Ayes: 4

Nays: 1 (T'Kach) Motion carried.

8. PUBLIC COMMENT:

9. MAYOR AND COUNCIL COMMENTS:

Mayor Dietrich thanked everyone for a fantastic week of Inver Grove Heights days.

Council Member Murphy said it was a great event with a lot of residents attending.

Council Member Scales said he agreed and said there were more people and more excitement this year than the last. He thanked emergency services for assisting a family

member in need. Lieutenant Wegner, firefighter Bryant and recruit firefighter Foss went above and beyond with communications and even put away some groceries.

10.ADJOURN:

Motion to Adjourn at 9:40 p.m. by Scales, second by Gliva.

Ayes: 5

Nays: 0 Motion carried.

Minutes prepared by Recording Secretary Sara Lyons

INVER GROVE HEIGHTS CITY COUNCIL MEETING

MONDAY, September 23, 2024 - 6:00 P.M. - 8150 BARBARA AVENUE

1. CALL TO ORDER:

The City Council of Inver Grove Heights met in regular session on Monday, September 23, 2024. Mayor Dietrich called the meeting to order at 6:00 p.m. The Pledge of Allegiance was recited.

2. ROLL CALL:

Present In-Person: Mayor Dietrich; Council Members: Murphy, T'Kach, Gliva and Scales; City Administrator Wilson, City Clerk Kiernan, Community Development Director Ziemer, Parks & Recreation Director Lares, City Engineer Merchlewicz, City Attorney Nason, Assistant City Planner Botten, Finance Director Hove, Commander Otis, Parks Superintendent Swoboda, Human Resources Manager Shefchik and Code Enforcement Coordinator Rainey.

3. APPROVAL OF AGENDA:

Council Member Gliva said she would like to move Public Comment after Regular Business item 7D.

Motion to move Public comment after item 7D prior to Closed sessions by Gliva, second by Scales.

Ayes: 5

Nays: 0 Motion carried.

4. PRESENTATIONS:

5. CONSENT AGENDA:

- A.** Approval of the Minutes of the September 9, 2024, City Council Meeting
- B.** Approval of Disbursements **Resolution 2024-210**
- C.** Personnel Actions
- D.** Resolution Approving Joint Powers Agreement for Final Design of City Project No. 2023-09E - Argenta Trail Reconstruction **Resolution 2024-211**
- E.** Resolution Approving Joint Powers Agreement for Preliminary Design of City Project Nos. 2023-13 and 2024-14 - 70th Street Reconstruction and Lane Reduction **Resolution 2024-212**
- F.** Resolution Approving Amendment to Final Design Contract for City Project No. 2023-08 - Babcock Trail Multi-Use Path Construction **Resolution 2024-213**
- G.** Resolutions Granting Conditional Use Permit and Approving PUD Development Plan Amendment, Improvement Agreement, and Related Documents for Daycare Facility Located at 7761 Amana Trail **Resolution 2024-214, 215, 216, & 217**
- H.** Approval of Final Plat for the Plat of Archer Trail and Related Development Documents **Resolution 2024-218 & 219**

- I.** Resolution Adopting Written Reasons for Denial of Interim Use Permit (IUP) Application
Resolution 2024-220
- J.** Resolutions Approving a Conditional Use Permit and Granting Variances for an Essential Service Use at 4682 Babcock Trail **Resolution 2024-221, 222, & 223**
- K.** Exempt Gambling Permit for Ducks Unlimited
- L.** Approval of Contract with Invoice Cloud for Payment Processing Services
- M.** Resolution Approving Agreement with Legal Notification Services Inc. for 180-day Pilot Program of iSubpoena **Resolution 2024-224**
- N.** Authorization to Enter into Contract with Total Construction & Equipment, Inc. for Lighting Improvements at City Hall, and Police Station
- O.** Approval of 2025 Group Medical, Dental and Vision Insurance Plans and City Contribution Amounts
- P.** Approval of Contract with Wellness That Fits for Fire Department Mental Wellness Services **Resolution 2024-225**
- Q.** Acceptance of Survey Proposals and Scope of Work from Alliant Engineering for City/EDA Owned Properties
- R.** Memorandum of Understanding Modifying Allocation of Cable Franchise Fee Revenues

Council Member T’Kach asked to remove 5A and 5J from the consent agenda to be discussed by Council.

Ali Hasan – 5861 Blaine Avenue – requested to remove 5I from the consent agenda to be discussed by Council.

Motion to approve Item A – R except for Items A, I & J by Gliva, second by Scales.

Ayes: 5

Nays: 0 Motion carried.

Council Member T’Kach asked to correct the minutes of the September 9th City Council Meeting on page 21 to add “in the future” because that was the context of the conversation.

“Council Member T’Kach said she thinks 4.5% is great but does not want residents to be shocked with a 12 – 15% increase in the future because they forgot something.”

Attorney Nason said the motion can be approved with the correction if the Council believes that the minutes do not accurately reflect what the statement was. If the Council believes the minutes accurately reflect what was said, the motion can be denied. Staff can review the minutes and the video and provide more information at the next regular meeting.

Motion to table Item A – Minutes of the September 9 CC Meeting minutes for staff to further review recording and bring back to next regular meeting for approval by T’Kach, second by Gliva.

Ayes: 5

Nays: 0 Motion Carried

Council Member T’Kach said she wants to reconsider if a 10-foot fence makes sense in the residential area. The Planning Commission approved the variance request, but the area is mostly residential. Having a 10 foot fence is not going to keep somebody out if they have a bolt cutter and she does not see why they would want a 10-foot fence in that area.

Council Member Scales said he thinks the 10-foot fence is a federal requirement for utilities to harden their sites.

Council Member T’Kach said her understanding was the 10-foot fence is a preference.

Associate Planner Botten said she would refer to the applicant because there are differences between an electrical substation requirements and an essential service with gas connection requirements.

Bryan Sullivan from Xcel Energy said there are differences in the regulations for the electrical and gas sides of business. For electrical equipment, the Federal Electrical Regulatory Commission sets guidelines and regulations for securing facilities and have a 10-foot chain link fence requirement. They have adopted the 10-foot chain link fence guideline for their gas facilities because it is an essential service. The fence is the primary defense against people entering in the facilities. A 10-foot fence with a one inch grid is very difficult to climb. This will keep out adventure seekers but if someone wants to get in, they will get in. The one inch grid is too small for a bolt cutter to get through. It would require a power tool of some kind to cut through the fence.

Council Member T’Kach asked if all of the equipment at this site will be in the new building if the new building is approved.

Sullivan said yes, it will be in the new building.

Council Member T’Kach said she understands the reasoning but thinks 10-feet is unreasonable for the area. She asked if they have had issues with people vandalizing their property.

Sullivan said they have not at this site as far as he is aware but have had issues at other places in the past.

Council Member Scales said he appreciates the clarification but does not have an issue with the 10-foot fence.

Motion to approve (Item J) Resolution 2024-221 approve a major site plan review for essential service structure, 2024-222 approve a variance to allow a fence 10 feet in heights whereas seven feet is maximum allowed in code, and resolution 2024-222 a variance to allow a structure to encroach into the required setback by Scales, second by Gliva.

Ayes: 4

Nays: 1 (T’Kach) Motion carried.

Applicants Ali Hasan - 5861 Blaine Avenue and Evelyn Sanchez - 2790 47th Street E were present.

Hasan said during the last meeting Council had many concerns. One of the concerns was regarding security. They plan to have security at the location starting on the first day but may not be able to have the guard building completed by January 1st. They would be willing to have the Interim Use Permit start later than January 1st if Council wants the guard building there prior to any use. There was a concern about the business in the area. The applicants have submitted an email with signatures from the local businesses.

Mayor Dietrich said they received the email.

Hasan said they spoke to the businesses and there were concerns that they would be leaving cars in the lot with no security. They explained the security plan to the businesses and said after they heard the plan, they were supportive and even enthusiastic about having additional security. Council Member Murphy had concerns about the timeframe of the permit. Hasan asked if Council would be open to a longer permit if they chose a different site that did not require an IUP.

Mayor Dietrich asked if they had a secondary site in mind.

Hasan said there are other properties that are for sale, but they are not zoned correctly. There is a site across the street from their property that would fit their needs better, but it is currently zoned for a medical building that does not allow for an IUP for parking. It would require a zoning change and wanted to know if Council would consider a zoning change.

Council Member Murphy said he does not have enough information to comment on a zoning change. His objection to the IUP was they should not be continually approving them for the same reason, and they should look at changing the zoning to add the specific type of business to the zoning if Council wants it to be permitted. He would need to see more information on a different location.

Hasan asked if Council had any thoughts on the additional information provided about security concerns and the opinions of the businesses.

Mayor Dietrich said in the past ten days there have been some incidents in the area that were brought to her attention and brought to code compliance. There was an RV parked in the lot for a week with people living in it and they have had issues before in the area because it is not zoned for residential. It was taken up with the police department. While that situation was being investigated, another RV was pulling into camp there. That causes concerns for safety. There was also a jalopy that was jacked up off of the ground and missing both rear tires. There were trash bins outside of the business entrances that were overflowing for weeks after Inver Grove Heights Days. A boat was listed for sale in the lot also.

Mayor Dietrich said there are viable concerns in the area and if Council had any other comments or if Attorney Nason could advise on the next steps.

Attorney Nason said the action item on the agenda is approval of the resolution adopting written reasons for the denial of the interim use permit. If there is no further discussion or

other type of motion, they would make a motion to approve the resolution, adopting the reasons for denial.

Mayor Dietrich asked Administrator Wilson if there were any options they could offer the applicants that would allow them to do their business.

Administrator Wilson said there are certain zoning districts that allow a park-and-ride or park-and-fly as an interim use. Staff has spoken with the applicant about what zoning districts permit the IUP and where some of the locations are in Inver Grove Heights. The applicants could review the list and consider some of the other parcels. They could submit a rezoning of a parcel that they think would be a good fit in one of the categories that allow an interim use for a park-and-ride.

Council Member T'Kach said the current security and safety concerns are out of the applicant's control and wonders if having them in the space would help reduce that activity because there would be lighting and security. It might be a benefit to the area. T'Kach originally supported the proposal and hearing the security issues thinks it provides more of a reason to have activity in the area, so they do not have people causing problems.

Council Member Scales said he believes it is a good interim use in the space for a couple of reasons. They talk about development in the city and both the spot that they are currently in and the spot they are proposing has no plans for development that they have seen. If there is a proposal for development, they can review it at that time because it is an interim use and not a permanent use for the site. They are moving because a year and a half ago it was decided that they were going to develop the area by the movie theater, so they only gave them a two year IUP instead of a five year IUP. There are no plans for development at their original site and they could have continued their business at the current location without affecting anything. The new site has been empty and been a crime issue for many years. This would help minimize the crime issue temporarily with security. Leaving the site as it is now is not working and there is still crime, RVs and cars being worked on. That does not go away if they say no. Scales supports it as an interim use and does not see an issue with a five-year term. If the owner of the property decides it would be beneficial to develop the site, it is likely there is something in the lease that would allow the owner to do so. This does not stop anything from being developed. It is a great business in the community, and he supports it.

Council Member T'Kach asked if approving 5I would prevent them from reconsidering the issue.

Attorney Nason said it would not prevent them from reconsidering. There is no waiting period for an interim use permit.

Council Member T'Kach asked if there could be a reconsideration of the last vote that was taken.

Attorney Nason said the Council's decision at the last meeting can be reconsidered at this meeting. Council has approved the agenda and the motion for reconsideration is not a business item on this meeting's agenda. There would need to be a motion made to amend the agenda to add reconsideration of the prior action on this item to tonight's agenda for

business purposes. That motion could be made by any member of Council but does require a unanimous vote of Council since Council has previously approved the agenda. If the motion to amend the agenda is approved, one of the three members who voted against the original motion to approve the IUP would have to make the actual motion to reconsider. Any member can second the motion and it would require a simple majority vote and that would put the original approval before Council at this meeting.

Administrator Wilson said the action to reconsider has to be taken at this meeting because this is the next subsequent meeting after the action.

Mayor Dietrich asked if the applicant could work with community development on other locations if a motion to reconsider was not approved.

Administrator Wilson said they could look at other locations or they could reapply for the same location if they thought some factual basis had changed. It would be a fresh case file and agenda item before the Council.

Council Member T'Kach asked if the applicants would have to repay the \$500 fee for the application if it was a fresh case file.

Administrator Wilson said yes, they would have to pay the application fee again.

Motion to reconsider and amend the agenda to add an item to the agenda for the IUP by T'Kach, second by Scales.

Ayes: 2

Nays: 3 (Dietrich, Gliva & Murphy) Motion failed.

Motion to approve (Item I) Resolution 2024-220 Memorializing and adopting written findings of fact and reasons for denial of the application for an interim use permit to allow a park-and-ride facility to be operated at 6600/6588 Cahill Ave by Murphy, second by Gliva.

Ayes: 5

Nays: 0 Motion carried.

6. PUBLIC HEARING:

7. REGULAR BUSINESS:

A. Third and final Reading of Ordinance Amending City Code Related to Abatement of Nuisance (Hazardous and Diseased Trees)

Attorney Nason presented this item.

Background:

- City Code currently declares certain diseased trees to constitute a public nuisance and authorizes their abatement

- Unlike the general public nuisance abatement section (Title 5, Chapter 9), the diseased tree abatement section (Title 5, Chapter 8) does not provide for the appeal of an abatement order
- Staff are requesting the Council consider amending the City Code related to diseased and hazardous trees to clarify certain definitions as well as the abatement procedures for diseased and hazardous trees

Three Objectives of Ordinance

1. Clarify that diseased and hazardous trees and wood constitute a public nuisance under the City's general public nuisance section (Title 5, Chapter 9)
2. Define hazardous trees and include hazardous trees as a public nuisance
3. Provide that abatement of diseased trees and hazardous wood and trees is to follow the process provided in Title 5, Chapter 9

Attorney Nason said the Ordinance does not change the currently established control zones and does not expand the ability to abate diseased trees to areas outside of the control zones. The entire city is a control zone.

City Code Revisions:

#1. Clarify that Dead, Diseased, and Hazardous Trees that Constitute a Public Nuisance under Chapter 8 Also Constitute a Public Nuisance Under Chapter 9

Section One. Amendment. Title 5, Chapter 9, Section 2 of the Inver Grove Heights City Code is hereby amended to include the following language:

- T. Diseased trees, hazardous trees, or hazardous wood which constitute a public nuisance under section 5-8-4 of this code.

#2. Define a Hazardous Tree and Declare Them to be a Public Nuisance Under Chapter 8

Section Two. Amendment. Title 5, Chapter 8, Section 4 of the Inver Grove Heights City Code is hereby amended as follows. The new language is show underlined:

5-8-4: Nuisances Declared and Prohibited

- A. Nuisances Declared: The following items are hereby declared to be public nuisances, ~~when found within the control zones between April 1 and September 15:~~
1. Any hazardous tree. A hazardous tree is defined as a tree which has structural defects in the roots, stem, and/or branches that are likely to cause the tree or tree part to fall, and such fall could cause property damage or personal injury.
 - Ordinance clarifies the definition of a diseased tree
 2. Any diseased tree. A diseased tree shall mean any of the following when found with the control zones between April 1 and September 15:
 - Ordinance clarifies the definition of a hazardous wood

Hazardous wood is the wood from one of these trees in the control zone.

#3. Clarify Language in Section 5-8-6 Related to Abatement

- Add a reference to "diseased or hazardous trees" to Section 5-8-6, along with hazardous wood
- Amended the section related to abatement of trees to clarify that the abatement process found in Section 5-9-6 shall be followed.
- Further clarifies that the forester and/or any other authorized enforcement officer may abate the public nuisance

Additional Information:

- Diseased trees are only subject to abatement if they are:
 1. Located in a control zone; and
 2. Between April 1 and September 15
- Hazardous wood is only subject to abatement if it is:
 1. Located in a control zone; and
 2. Between April 1 and September 15
- Hazardous trees are subject to abatement at any time

Requested Council Action:

1. Consider a third and final reading of the ordinance included in tonight's council packet.
2. If the third reading of the ordinance is approved, consider approval of the summary publication resolution included in the council packet.

Council Member T'Kach asked if staff has tried to research a payment system or program to help property owners with the costs of tree removal.

Administrator Wilson said they have not received direction from Council that they were interested in providing that kind of program. Council Member T'Kach made them aware that there is another city in the metro area has a program. If Council would like to move forward, they can discuss a program and how it might be funded. Staff does not have anything to propose.

Public Comment:

Kelly Kayser - 1953 59th Ct E - said ash trees can be treated for a fraction of the cost of abatement.

Motion to approve Third reading of Ordinance 1484 amending IGH City Code Title 5, Chapters 8 & 9 related to abatement of diseased and hazardous trees and Resolution 2024-226 Summary publication by Gliva, second by Scales.

Ayes: 5

Nays: 0 Motion carried.

B. Consideration of Personnel Action

Administrator Wilson said Council has received a confidential memo with a personnel recommendation. The employee that is the subject of the memo has a right to be heard before Council and has indicated that he wished to do so.

John Verdeja - 748 Ottawa Ave, St. Paul - said the League of Minnesota's insurance company is denying his benefits and has submitted a statement to Council and requested Patti Jo Verdeja to read the statement on his behalf.

Patti Jo Verdeja 7264 Brittany Lane said John Verdeja was a member of the building department for nearly a decade and dedicated himself to serving the community and providing quality service to residents. He assisted the City of Inver Grove Heights with the public election in November 2020 during the peak of Covid-19. There were no vacations available and very little was known about the transmission and safety precautions for this deadly disease. Verdeja and ten of his coworkers contracted Covid-19 as the result of their long term exposure on Election Day. One of his coworkers passed away due to the virus.

Verdeja faced a severe battle with Covid-19, spending many months in the hospital and enduring several near-death experiences. He spent three months in a medically induced coma and his mother passed away during that time. After awakening from the coma, he spent the next two months relearning basic skills like sitting, walking, talking, and feeding himself. In total he was away from his wife and four young children for five months. The impact on his mental and physical well-being has been and continues to be profound. He uses oxygen nearly 24/7.

Verdeja does not blame anyone for contracting Covid-19 because, so little was known about the disease then and there were not adequate resources to protect them. He asks that his insurance claim be paid as all of his coworker's claims have been paid and, in some cases, continue to be paid. He is asking council to reconsider the disparate treatment he has received and has learned that the League of Minnesota Cities trust board has the power to review his case. He requests that they consider his family's situation and his request for a fair outcome for his sacrifice.

Mayor Dietrich asked staff for information regarding the League of Minnesota and their insurance situation.

Administrator Wilson said they do receive a number of insurance products through the League of Minnesota Cities insurance trust including, liability, property, auto and workers compensation insurance. When an employee files a first report of injury it is sent to the insurance company to be considered and open a claim. They also send a supervisor's report that provides additional information about the circumstances surrounding contracting an illness or experiencing an injury. The claim is then in the insurance carrier's hands. They do not process the details further. They receive information from the insurance company if they have approved benefits or if they will be providing wage replacement. They do not get involved in the medical bills or what is to be or not to be paid. There are privacy and HIPAA restrictions so as the employer, they do not see the medical bills or any treatment plans. They provide information when asked but beyond that, it is handled by a neutral third party. This ensures that workers compensation is not based on preferences or personalities but leaves them not directly involved in the settlement process.

Mayor Dietrich asked if the action before them is for non-disciplinary dismissal of the employee because they need to fill the position.

Administrator Wilson said yes, it is a non-disciplinary dismissal because the position needs to be filled.

Mayor Dietrich said she understands they need to resolve the issue of his employment status with the City to allow for a building inspector to be hired and will ask for a motion and a second to adopt the resolution. Dietrich asks that the City Administrator and HR Manager stay in active contact with the insurance company and provide updates to Council at a high level to avoid getting into any private data.

Motion to approve Resolution 2024-228 Authorizing termination of employment for John J. Verdeja, effective September 23, 2024 by T’Kach, second by Murphy.

Ayes: 5

Nays: 0 Motion carried.

Council Member T’Kach said she is moving the motion because the City has an obligation to continue with its work. It is a very difficult situation and is empathetic to the situation but wants to continue moving things forward in the city without losing sight of the situation at hand.

Council Member Murphy agreed with Council Member T’Kach in the reasoning for his second.

C. Allocation of Remaining American Rescue Plan Act (ARPA) Dollars

Finance Director Hove presented this item.

Background:

- Distinct from CARES Act funding received earlier in the pandemic
- City’s ARPA Funds total \$3.9 million - half received in May of 2021 and half in May of 2022
- Accepted under the category of “revenue replacement”
- May be spent on any “governmental purpose”
- Must be obligated by Dec. 31, 2024 and fully spent by Dec. 31, 2026
- May be divided up and spent on multiple things

Council Discussions:

- June 7, 2021 Work Session - introduction to ARPA and presentation of eligible uses
- December 13, 2021 Council Meeting - City Council accepts City’s share of ARPA funds
- February 26, 2022 Council/Staff Retreat - discussion of guiding principles and priorities for use of funds
 - Heritage Village Park - continued build out
 - 117th Street
 - PW Facility
 - Advanced Metering Infrastructure (water meters)
- February 28, 2022 Council Meeting - Council adopts the standard allowance under the revenue loss provision
- June 5, 2023 Work Session - Discuss potential use of funds

- Water Infrastructure (Water Treatment Plant)
 - Acquisition of park land specifically in the NWA of the City
 - Movement of historic buildings
- May 13, 2024 Council Meeting – Council approves use of \$2.5 million for Water Treatment Plant Project
- August 5, 2024 Work Session – Discussion on remaining dollars
 - \$1 million earmarked for Parks
 - \$400,000 available for another use

Upcoming Deadline: Dec. 31, 2024:

- December 31, 2024 is the deadline to legally obligate the City's remaining ARPA dollars
- US Treasury defines obligation as an order placed for property and services and entry into contracts, subawards, and similar transactions that require payment
 - Approving a budget does not obligate funds
 - Passing a spending plan does not obligate funds

Staff Recommendation:

- Staff recommendation is to allocate the remaining ARPA dollars (\$1,397,440.98) to the Police Dept. 2024 full-time wages
- Police Department has largest payroll with a 2024 budget of just over \$5.8 million in full-time wages
- Tis allocation/transfer to the General Fund would allow the General Fund's balance to grow by \$1,397,440.98 which would allow that original funding for Police payroll (tax levy) to be used elsewhere

General Fund & Budget Carryovers:

- At the beginning of each year staff present the Council with a list of potential carryovers to consider based on ending General Fund balances
- 2024 Carryovers to 2025 Budget
 - Anticipate General Fund requests would include the normal list of carryover items PLUS
 - Staff would prepare a recommendation for a budget carryover and/or transfer of any savings generated by using ARPA on police payroll to another Council-designated purpose
 - Allows staff to continue with park land negotiations without those negotiations tied to ARPA deadline
 - Allows Council to provide additional feedback without hindrance of ARPA deadline

Director Hove said if they do not legally obligate the funds by December 31, 2024 they are returned to the federal government.

Mayor Dietrich asked if allocating the funding to the Police Department is for bookkeeping and Council will still be able to use the funds for the best purpose for the City.

Director Hove said yes, the police department's budget will not change. It is changing what funds they have earmarked as a city to pay for their expenses. Most General Fund departments need tax dollars to supplement their spending because they are not revenue generating departments. Staff recommends using the \$1.4 million ARPA dollars to fund part of their payroll and \$1.4 million from the tax levy can be spent elsewhere.

Mayor Dietrich said that they are one of the few cities that still have ARPA dollars to spend, and she applauds staff, policymakers, and input from residents for making the best decisions for the city.

Council Member Murphy said he understands the deadline but is uncomfortable with the funds being in the General Fund. He asked what the process would be if the funds are in the General Fund and Council wanted to use them to purchase much needed park land in the NWA.

Director Hove said anytime they want to purchase a park or make improvements they would first look at the fund balance in the Park Acquisition and Development fund. If the money is still in the General Fund and they have met their fund balance policy, they can transfer the funds at any time to the Park fund.

Council Member Murphy asked why they chose the police department budget as opposed to any other department.

Director Hove said they looked for the largest area of spending in the General Fund to minimize the accounting. It could have been applied across multiple departments, but they had a large amount of spending on the police payroll, and it was the most streamlined way to report it.

Council Member Murphy asked if the \$1.4 million could get lost in the budget or if it was a separate line item.

Director Hove said at the end of the year they will have an extra transfer of \$1.4 million into the General Fund. Staff will ask Council if they want to keep it in the general fund or transfer to another fund when they present budget carryovers. Council could transfer the funds at any time.

Council Member Scales said this was an allocation they had set for parks, and he does not like the idea of it being in the General Fund and possibly being used for another use. He is disappointed they have not moved the historic buildings. Scales said he would like to see the funds transferred into the parks fund on January 1, 2025 so they can accomplish the things they have wanted to do like a park in the NWA and possibly move the historic buildings to Heritage Village.

Council Member Gliva asked if Council should have the discussion and allocate the funds before the year ends. They would not have to worry about the next year and the funds being lost.

Mayor Dietrich said they have \$25 million in deficit for the utilities in the ground that are not currently funded and does not believe there is a clear consensus of where the money should

go. Dietrich asked if they could move the current item as recommended and Council could have a meeting prior to yearend to discuss how the money should be spent.

Administrator Wilson said yes, they could have a discussion at December's Work Session where staff can present ideas and bring a resolution in the following meeting to carry out the decision Council makes during the Work Session.

Mayor Dietrich said the NWA needs a park and they will be receiving money into the fund from upcoming developments that are already signed.

Council Member Gliva said she was not alluding to where the dollars should go at this time, but it would be helpful if they could decide prior to December 31, 2024.

Public Comment:

Ben Johnston - 4735 Babcock Trail - said he did not want the funds to stay in the General Fund where they could be lost and wants to see it done by the end of the year.

Sandy Honerbrink - 2318 75th Street E - said the money needs to be put where it belongs otherwise it will get lost.

Mayor Dietrich asked if the motion needs to include Council having a discussion about moving the funds before December 31st.

Administrator Wilson said staff understands the direction and they can move to adopt the resolution in the packet.

Motion to approve Resolution 2024-229 Allocating the City's remaining American Rescue Plan Act (ARPA) dollars by T'Kach, second by Gliva.

Ayes: 5

Nays: 0 Motion carried.

D. Comment Letter to the Metropolitan Council Regarding the Draft 2025 Comprehensive Plan System Statements

Community Development Director Ziemer presented this item. Director Ziemer said they are in the very early stages of the 2050 comprehensive plan for the city. The Metropolitan Council puts out system statements where their staff meets with constituents and the public to get an idea of what people's perceptions are of the Twin Cities metropolitan area today and in the future. They published the system statements on August 12th and there is an opportunity for local governments in the area to review the statements and provide comment on things they like and do not like. Staff has prepared a letter that is included in the packet and at this meeting they would like to receive comments.

Image 2050 Comprehensive Planning Process:

- Policy System Statements (Regional)
 - Policy Areas: Land Use, Housing, Parks & Trails, Water & Transportation
 - Purpose: Snapshot of current & projected critical issues facing region

- Goal: Tool allowing local governments to plan for growth, change
- System Statements Review
 - Drafts complete; public comment period until October 7
 - Final documents release expected September 2025
- Current & Future Steps
 - City's reaction to system statements (September 23)
 - Receive final system statements; review & develop direction
 - Determine process for updating comprehensive plan

Timeline:

- 2025 - Receive System Statements
- 2026 - Review: Determine Process
- 2027 - Hire Consultant & Commence Work
- 2028 - Draft Document & Public Review
- 2029 - Approve & Implement 2050 Plan

Community Forecasts:

- Inver Grove Heights still growing but at a slower projected rate
- 2020 US Census: 35,801 (population) & 14,723 (households)

Thrive 2040	Population	Households	Employment
2020	33,730	15,400	11,400
2030	42,000	17,600	12,400
2040	47,700	19,800	14,000

Imagine 2050	Population	Households	Employment
2020	33,730	15,400	11,400
2030	42,000	17,600	12,400
2040	47,700	19,800	14,000
2050	42,513	18,010	15,670

Director Ziemer said the entire metro area is expected to continue to grow but at a slower rate than in the past.

- Absorption of affordable housing (units)
- Dakota County CEDA housing study under way

	Thrive 2040	Imagine 2050
≤ 30% AMI	274	256
31% TO 50% AMI	157	210
51% to 80% AMI	160	62
Total Units	591	528

Director Ziemer said every city is expected to absorb a certain number of affordable housing units and the number of units Inver Grove Heights is expected to provide has decreased from 591 units in the Thrive 2040 plan to 528 units in the Imagine 2050 plan.

The large components that cities spend the most time on are land use aspects and the housing policy statements.

Draft Image 2050 Summary:

- Continued growth of the Region & IGH but at a slower pace
- Enough land supply & sewer capacity to meet projected growth
 - No expansion of MUSA necessary
- Current developed density is greater than planned density; projected to continue
- Housing demands continue to evolve; continued need for more attainable housing
 - Renewed emphasis on naturally occurring affordable housing (NOAH) preservation; not just new construction
 - Across all ages, notably younger & older generations
- Reduce costs; remove barriers to enhance community choice
 - Leverage existing assets & available capacity (utilities & transportation)
- Balanced development approach to enhance community resiliency
 - Control costs, preserve land, protect natural resources, reduce climate impacts
- Shared regional responsibility

Draft Image 2050 Proposals & Response:

- Increase average minimum net density from 3.0 u/na to 4.0 u/na
 - Proposed density is only intended for areas identified for (re)development
 - Response:
 - Region & cities are unique; one-size-fits-all policy approach does not work
 - Market, housing demand & developer interest not equitable across region
 - Physical landscape does not always allow for more dense development

Director Ziemer said this is not a citywide density, it refers to areas of the city that are to be developed like the NWA.

- Expectation of compact development design
 - Response:
 - Physical landscape does not always allow for more dense development
 - Threatens developer creativity; conflicts localized housing demand
- All “new connections” must meet minimum density requirements
 - Response:
 - Clarification relationship of individual developments in planned areas meeting minimum density

Director Ziemer said it is not clear if the document is it mentions new connections and they do not know if this refers to new connections in the MUSA area or not in the MUSA area, or every new development with new residential connections that connect to the existing utilities. They are requesting clarification for the relationship between developments in a planned

MUSA areas that meet minimum density versus areas that are not currently serviced by utilities or outside of the MUSA areas.

- Meeting future affordable housing need
 - Response:
 - Clarify if cities need land use designation starting at 10 u/na

Director Ziemer said they currently do not have a land use designation that meets the 10 units per net acre (u/na) and is requesting to clarify if they can adjust on of their current designations or if they have to add an additional land use designation.

- Requiring cities to use certain financial incentives
 - Response:
 - Typical cities identify as tools; remove perceived obligations to use
- Decade-by-decade housing density progress reporting
 - Response:
 - Cities currently report development progress via plat monitoring
 - Remove policy statement until can clarify policy, process, implementation & implications

Director Ziemer said they are currently reporting density yearly to the MET Council through plat monitoring reporting.

- Regional water supply planning
 - Response:
 - City already follows permitting requirements & rules for water supply, consumption via MnDNR

Director Ziemer said staff is recommending Council direct the Mayor and City Administrator to sign the letter and send it to the Metropolitan Council.

Mayor Dietrich asked if there is collaboration with other cities in response to the Policy System Statements.

Director Ziemer said he thought there would be a lot of comments from cities similar to Inver Grove Heights in regard to the density changing from 3 u/na to 4 u/na but Inver Grove Heights is the first city to provide comments. He also spoke to the executive director of the Association of Minnesota Cities, and they have not heard many comments but expect some cities to provide comments by the October 7th deadline. It is not uncommon for some cities to provide no comments.

Mayor Dietrich asked if they wanted to provide additional comments that are not in the letter, would they have another chance to do so.

Director Ziemer said it is an ongoing dialog with MET Council. There is a deadline of October 7th but there is a portal where comments can be submitted if any Council Members or anyone from the public would like to. Ziemer highly recommends anyone with comments to submit them. They do like to hear public comment. Sending the letter does not obligate them to anything. If they identify something after the October 7th deadline, they could still

provide comments and if the document finished, there is still potential for the comments to be heard. MET Council is not obligated to adjust the document based on comments they receive but they will review them.

Council Member Murphy said the document reminds him of House File 4009 from the last legislative session which would have hurt Inver Grove Heights, and he supports and appreciates the clarity of the response and that it was focused on the residents. Murphy asked why there were no comments of parks and said his experience with those that want to develop the community is that parks are on the bottom of their list. Green space for families is very important.

Director Ziemer said the section on parks and trails in the document is very small and focuses on the regional component as opposed to the local component. The system statements typically say their goal is to make sure they are providing recreational opportunities for all residents and allows local governments to determine park areas.

Council Member Gliva thanked Director Ziemer for the good comments and said she asked about the move from 3 u/na to 4 u/na because it is a 33% increase. Gliva agreed with Council Member Murphy that Imagine 2050 reminds her of House File 4009. There is constant infringement on local control and makes elected officials make decisions that they do not have control over. She is not in agreement with how it is written. The MET Council is not an elected body whereas Council is an elected body, and they have residents to be accountable to. She is in favor of the comments and hopes other communities will respond in a similar way.

Council Member Scales agreed with the other Council Members.

Council Member T'Kach asked if the motion was to send the letter to MET Council.

Mayor Dietrich said yes, the request is to approve the letter.

Council Member T'Kach said there is a lot of detail in the summary statement and staff did a great job to break it down. She would like to offer solutions for what Inver Grove Heights would like to see instead and how they can make do their part for the region instead of just submitting their concerns. She understands it is important to submit some comments to the MET Council but has not had a chance to read the document in its entirety and is not positive she agrees with all of the comments.

Council Member Scales said he understands Council Member T'Kach's comments but any direction they take right now may not be what the city wants in the future. The goal is to maintain as much local control as they can. The letter says they understand what their goals are, but each city is different, and the city needs to be able to determine what is right for it now and in the future.

Mayor Dietrich said she agreed with maintaining local control.

Director Ziemer said when Council was developing the 2040 Comprehensive Plan there was robust community engagement. Once MET Council provides the final system statements Council can determine how they want to engage citizens for feedback to determine what is

wanted for the community. This is a draft to what they initially put forward and he does understand Council Member T’Kach’s want for community engagement.

Public Comment:

Jeff Peltier - 7146 Claude Avenue - said there was a statement made in the report that the density occurring was more than was planned. It was followed by a plan to increase density. He supports local control.

Patty Mikulski - 3379 67th Street E - said every city is different and wants control with local elected officials.

Rachel Brewer - 6925 Athena Way - said she would like to know the type of surveys the MET Council did to determine the density and encouraged Council to listen to the residents.

Craig Hillegas - 6755 Arlene Ave - said residents want to make sure they keep the units per acre down and opposes the increase in density, especially in the NWA and wants to keep local control.

Motion to Recommendation by city council to direct mayor and city administrator to sign the letter and send to Metropolitan Council by Murphy, second by Gliva.

Ayes: 4

Nays: 1 (T’Kach) Motion carried.

8. PUBLIC COMMENT:

Tracie Killion - 4660 Bacon Ave - said she serves on the Environmental Commission and is a part of the Grassroots Election Integrity Team. Many residents have expressed concerns about upcoming elections. Killion proposes a post-election review audit to help restore faith in the elections. There are currently six cities in Anoka County and Big Lake in Sherburne County that are doing some type of post-election review audit. Inver Grove Heights has twelve precincts, and the Grassroots Election Integrity team would like a random audit of a minimum of two precincts. The county will do a post-election review audit ten days after Election Day. In 2022 the county audited around four precincts out of 142 precincts and only the top races are audited. A post-election review audit would help confirm the results and alleviate questions citizens may have.

Killion said a post-election review audit requires cities to send election judges to the county and the cost is approximately \$1,000 for a full ballot audit of all of the races. Per state statutes they can no longer get cast vote records with images or do a parallel ballot counting. This is a way the city can still have authority of the elections. Killion is willing to come back to another meeting on the agenda or Council can discuss with her at a later time.

Mayor Dietrich thanked Killion for her commission service and asked her to leave her information with the City Clerk.

Kevin Sethre - 3650 73rd Street E - said the MET Council meets every other Monday in St. Paul and encourages people to go to the meeting.

Nathan Herschbach - 115 Salem Church Road, Sunfish Lake - said he is running for House Representative for 53A which encompasses the majority of Inver Grove Heights. He agrees with keeping local control of the ballots and supports a post-election audit.

7E. CLOSED SESSION: Attorney-Client Privilege

Motion pursuant to Minnesota Statute Section 13D.05, subdivision 3(b) to move into closed session pursuant to the attorney-client privilege regarding a contract dispute between the City and Weber, Inc. by Gliva, second by Scales.

Ayes: 5

Nays: 0 Motion carried.

Motion to move to reconvene in open session by T'Kach, second by Gliva.

Ayes: 5

Nays: 0 Motion carried.

7F. Consider Approval of Settlement Agreement with Weber, Inc.

Motion to approve settlement Agreement with Weber Inc. by Gliva, second by Murphy.

Ayes: 5

Nays: 0 Motion carried.

7G. CLOSED SESSION: City Administrator Performance Evaluation

Motion to move into closed session pursuant to Minnesota Statute Chapter 13D.05, subd. 3, to conduct a performance review of the City Administrator, Kris Wilson, by Scales, second by T'Kach.

Ayes: 5

Nays: 0 Motion carried.

9. MAYOR AND COUNCIL COMMENTS:

10. ADJOURN:

Motion to Adjourn at 9:30 p.m. by Gliva, second by Scales.

Ayes: 5

Nays: 0 Motion carried.

Minutes prepared by Recording Secretary Sara Lyons



Request for Council Action

SUBJECT: **Approval of Disbursements**

MEETING DATE: October 14, 2024

ITEM TYPE: Consent Agenda

CONTACT: Amy Hove, Finance Director, 651.450.2521

ACTION REQUESTED

The Council is asked to adopt the attached Resolution, approving disbursements for the period of September 18 – October 8, 2024.

BACKGROUND

The following chart represents a summary by fund type of the disbursements processed during the period of September 18 – October 8, 2024. Disbursement details are attached to this memo.

Fund Type	Amount
General Fund	\$1,033,495.96
Special Revenue	67,792.16
Debt Service	-
Capital Projects	2,195,522.41
Enterprise	82,123.34
Internal Service	119,000.22
Escrows	38,681.49
Total - All Funds	\$3,536,615.58

FISCAL IMPACT

The disbursements are within adopted budgets for the associated funds or have otherwise been approved by the Council.

RECOMMENDATION

Staff recommends approval of the disbursements as presented.

ATTACHMENTS

1. Resolution 10.14.2024
2. Disbursements Listing (9.18.2024 - 10.8.2024)

**CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA**

RESOLUTION NO. 2024-229

**RESOLUTION APPROVING DISBURSEMENTS FOR THE PERIOD OF
September 18, 2024 - October 8, 2024.**

WHEREAS, a detailed listing of disbursements for the period of September 18, 2024 - October 8, 2024 was presented to council for approval.

NOW, THEREFORE BE IT RESOLVED, BY THE CITY OF INVER GROVE HEIGHTS:
Payment of the disbursements for the following fund types are approved:

Fund Type	Amount
General Fund	\$1,033,495.96
Special Revenue	67,792.16
Debt Service	-
Capital Projects	2,195,522.41
Enterprise	82,123.34
Internal Service	119,000.22
Escrows	38,681.49
Total - All Funds	\$3,536,615.58

Approved by the City of Inver Grove Heights, Minnesota this 14th day of October 2024.

Brenda Dietrich, Mayor

ATTEST:

Rebecca Kiernan, City Clerk



Payment Dates 9/18/2024 - 10/8/2024

Vendor Name	Payable Number	Post Date	Description (Item)	Account Number	Amount
Fund: 101 - GENERAL FUND					
TYLER TECHNOLOGIES, INC	025-479356	09/19/2024	UB Training-LH 8.13.2024	101.1800.000.5340	275.00
ST. PAUL PIONEER PRESS	0824572521	09/19/2024	NoPH - Mississippi Pub	101.1140.000.5330	19.24
ST. PAUL PIONEER PRESS	0824572521	09/19/2024	Ord 1482 Sum Pub - MF Upda...	101.5100.000.5310	54.60
VMC, LLC.	1329	09/19/2024	Antenna Lease Review Invoice...	101.3100.000.5310	9,000.00
FIRST IMPRESSION GROUP	160457	09/19/2024	#10 Regular Envelopes (10%)	101.1200.000.5105	89.00
FIRST IMPRESSION GROUP	160457	09/19/2024	#10 Regular Envelopes (70%)	101.3100.000.5105	623.00
FIRST IMPRESSION GROUP	160457	09/19/2024	#10 Regular Envelopes (20%)	101.5000.000.5105	178.00
MADISON NATIONAL LIFE INS...	1646526	09/19/2024	10.2024 Premium	101.0000.000.2026	4,333.64
DANNER LANDSCAPING	19508	09/19/2024	black dirt	101.4200.000.5125	768.00
GOPHER LAWN AND SNOW S...	3657	09/19/2024	Lawn Care Service @ 6339 Ap...	101.5000.000.5310	85.00
GOPHER LAWN AND SNOW S...	3658	09/19/2024	Lawn Care Services @ 6535 D...	101.5000.000.5310	85.00
GOPHER LAWN AND SNOW S...	3659	09/19/2024	Lawn Care Services @ 5373 B...	101.5000.000.5310	340.00
TOTAL CONSTRUCTION & EQU...	40384	09/19/2024	repairs to Oakwood & Skyview...	101.4200.000.5400	216.38
LEAGUE OF MN CITIES	411125	09/19/2024	Membership Dues 9.2024 - 12...	101.1000.000.5335	9,646.00
MN BOARD OF WATER AND S...	9/17/2024	09/19/2024	2024 MWPCP Training	101.3100.000.5340	475.00
INNOVATIVE OFFICE SOLUTIO...	IN4638859	09/19/2024	Hard cover planner and envel...	101.1140.000.5105	112.59
NEOPOST USA INC	9/20/2024	09/20/2024	Refill postage	101.0000.000.1405	8,000.00
ICMA RETIREMENT TRUST - 4...	INV0201344	09/20/2024	457 -AGE <49	101.0000.000.2038	4,160.38
ICMA RETIREMENT TRUST - 4...	INV0201345	09/20/2024	457 -AGE <49 %	101.0000.000.2038	10,198.84
ICMA RETIREMENT TRUST - 4...	INV0201346	09/20/2024	457 -AGE 50+	101.0000.000.2038	1,200.29
ICMA RETIREMENT TRUST - 4...	INV0201347	09/20/2024	457 PLAN -AGE 50+ %	101.0000.000.2038	1,051.08
ICMA RETIREMENT TRUST - 4...	INV0201348	09/20/2024	457 - ROTH AGE <50	101.0000.000.2038	550.00
ICMA RETIREMENT TRUST - 4...	INV0201349	09/20/2024	457 - ROTH AGE <50 %	101.0000.000.2038	1,500.26
ICMA RETIREMENT TRUST - 4...	INV0201350	09/20/2024	457 - ROTH AGE 50+	101.0000.000.2038	20.00
AFSCME COUNCIL 5	INV0201351	09/20/2024	UNION DUES (AFSCME FULL S...	101.0000.000.2041	884.70
AFSCME COUNCIL 5	INV0201352	09/20/2024	UNION DUES (AFSCME FULL S...	101.0000.000.2041	44.24
MINNESOTA DEPARTMENT OF...	INV0201353	09/20/2024	CASE #001570640001	101.0000.000.2220	342.87
TEXAS STATE DISBURSEMENT...	INV0201354	09/20/2024	CASE #0012022247	101.0000.000.2220	230.77
MINNESOTA DEPARTMENT OF...	INV0201355	09/20/2024	CASE #001490481201	101.0000.000.2220	357.72
MINNESOTA DEPARTMENT OF...	INV0201356	09/20/2024	CASE #001563363401	101.0000.000.2220	426.85
WI SCTF (WI SUPPORT COLLEC...	INV0201357	09/20/2024	PARTICIPANT ID#0004986316	101.0000.000.2220	433.06
IGH FIRE RELIEF ASSN	INV0201358	09/20/2024	MEMBERSHIP DUES - FIRE REL...	101.0000.000.2041	408.00
IGH FIRE RELIEF ASSN	INV0201359	09/20/2024	MEMBERSHIP DUES - FIRE REL...	101.0000.000.2041	77.25
MEDSURETY ACH ONLY	INV0201360	09/20/2024	HSA ELECTION-FAMILY	101.0000.000.2031	4,599.87
MEDSURETY ACH ONLY	INV0201361	09/20/2024	HSA ELECTION-SINGLE	101.0000.000.2031	6,844.07
IGH PROFESSIONAL FIREFIGHT...	INV0201362	09/20/2024	UNION DUES (IAFF)	101.0000.000.2041	504.01
MN STATE RETIREMENT SYST...	INV0201363	09/20/2024	MINNESOTA DEFERRED COM...	101.0000.000.2038	1,235.00
MN STATE RETIREMENT SYST...	INV0201364	09/20/2024	MINNESOTA DEFERRED COM...	101.0000.000.2038	848.36
MN STATE RETIREMENT SYST...	INV0201365	09/20/2024	457 ROTH IRA (AGE 49 & UND...	101.0000.000.2038	1,420.00
PERA	INV0201366	09/20/2024	PERA COORDINATED PLAN	101.0000.000.2225	54,577.64
PERA	INV0201367	09/20/2024	EMPLOYER SHARE (EXTRA PE...	101.0000.000.2225	4,198.27
PERA	INV0201368	09/20/2024	PERA DEFINED PLAN	101.0000.000.2225	15.77
PERA	INV0201369	09/20/2024	EMPLOYER SHARE (PERA DEFI...	101.0000.000.2225	15.77
PERA	INV0201370	09/20/2024	PERA POLICE & FIRE PLAN	101.0000.000.2225	34,721.09
PERA	INV0201371	09/20/2024	EMPLOYER SHARE (POLICE & F...	101.0000.000.2225	52,081.63
ICMA RETIREMENT TRUST - 4...	INV0201372	09/20/2024	ROTH IRA (AGE 49 & UNDER)	101.0000.000.2039	3,447.57
ICMA RETIREMENT TRUST - 4...	INV0201373	09/20/2024	ROTH-AGE <49 %	101.0000.000.2039	119.85
ICMA RETIREMENT TRUST - 4...	INV0201374	09/20/2024	ROTH IRA (AGE 50 & OVER)	101.0000.000.2039	638.46
EFTPS	INV0201375	09/20/2024	FEDERAL WITHHOLDING	101.0000.000.2213	79,769.67
MN DEPT OF REVENUE (PAYR...	INV0201376	09/20/2024	STATE WITHHOLDING	101.0000.000.2215	34,158.47
EFTPS	INV0201377	09/20/2024	MEDICARE WITHHOLDING	101.0000.000.2211	22,361.52
EFTPS	INV0201378	09/20/2024	SOCIAL SECURITY WITHHOLDI...	101.0000.000.2210	58,681.54
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Eric Bergu...	09/21/2024	Tape, nozzle, antifreeze, clean...	101.1200.000.5190	54.74

Expense Approval Report

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Vendor Name	Payable Number	Post Date	Description (Item)	Account Number	Amount
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Eric Bergu...	09/21/2024	Spray paint & flex seal	101.2200.000.5190	47.97
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Joe Hawkin...	09/21/2024	rodent killer & duct tape	101.4200.000.5125	53.96
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Joe Hawkin...	09/21/2024	shop towels and tie down stra...	101.4200.000.5125	6.49
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Joe Hawkin...	09/21/2024	shop towels and tie down stra...	101.4200.000.5125	21.49
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Joe Hawkin...	09/21/2024	paint supplies & pipe insulators	101.4200.000.5125	27.96
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Joe Hawkin...	09/21/2024	signs, grill supplies for So Vall...	101.4200.000.5190	32.53
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Joe Sander...	09/21/2024	hammer bits and concrete cra...	101.4200.000.5125	14.99
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Joe Sander...	09/21/2024	hammer bits and concrete cra...	101.4200.000.5125	14.99
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Kyle Ravn ...	09/21/2024	garbage & contractor bags	101.4200.000.5125	57.97
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Kyle Ravn ...	09/21/2024	duct tape & PVC pipe	101.4200.000.5125	31.98
WELLS FARGO CREDIT CARD A...	Amazon Mark R44iw8b71 Tara...	09/21/2024	mouse pads and name plate p...	101.2000.000.5105	35.92
WELLS FARGO CREDIT CARD A...	Amazon Mark R44iw8b71 Tara...	09/21/2024	Return 2 mouse pads	101.2000.000.5105	-15.98
WELLS FARGO CREDIT CARD A...	Amazon Mark R48fi15z1 Stev...	09/21/2024	flashlights, headlamps	101.5200.000.5160	182.88
WELLS FARGO CREDIT CARD A...	Amazon Mark R48fi15z1 Stev...	09/21/2024	Safety vests	101.5200.000.5175	82.45
WELLS FARGO CREDIT CARD A...	Amazon Mark Ru1594sw1 Teri...	09/21/2024	fire extinguisher location sign...	101.4200.000.5190	16.48
WELLS FARGO CREDIT CARD A...	Amazon Mktp R44v11o02 Ac...	09/21/2024	Check stock	101.1800.000.5105	49.44
WELLS FARGO CREDIT CARD A...	Amazon Mktp R465j4hx0 Teri...	09/21/2024	portable eye wash station	101.4200.000.5160	122.21
WELLS FARGO CREDIT CARD A...	Amazon Mktp R46u974w2 Ter...	09/21/2024	portable eye wash station	101.4200.000.5160	149.00
WELLS FARGO CREDIT CARD A...	Amazon Mktp Rf6ks20s1 Mon...	09/21/2024	pens and notebooks	101.2200.000.5105	39.94
WELLS FARGO CREDIT CARD A...	Amazon Mktp Rf9ay84e2 Teri...	09/21/2024	replacement edger blades	101.4200.000.5160	19.97
WELLS FARGO CREDIT CARD A...	Amazon Mktp Ru0vo2aq0 M...	09/21/2024	shoe polish for firefighters' bo...	101.2200.000.5190	40.11
WELLS FARGO CREDIT CARD A...	Amazon Mktp Ru27h8h91 Ter...	09/21/2024	safety wear	101.4200.000.5175	28.98
WELLS FARGO CREDIT CARD A...	Amazon Mktp Rv83o2ue0 Teri...	09/21/2024	umbrellas & stands for South ...	101.4200.000.5190	1,010.90
WELLS FARGO CREDIT CARD A...	Amazon.Com Rm8lc9xi0 Moni...	09/21/2024	toilet bowl cleaner	101.2200.000.5190	14.92
WELLS FARGO CREDIT CARD A...	American Heart Shopcpr Danie...	09/21/2024	training CPR video with digital ...	101.2200.000.5179	62.00
WELLS FARGO CREDIT CARD A...	Amzn Mktp US R45jp0jl1 Stev...	09/21/2024	Hard hats	101.5200.000.5160	37.64
WELLS FARGO CREDIT CARD A...	Amzn Mktp US Rk1073vk2 Tar...	09/21/2024	new mouse pad	101.2000.000.5105	21.91
WELLS FARGO CREDIT CARD A...	Amzn Mktp US Rm8o38wl0 Ac...	09/21/2024	Foldable sign holders	101.1300.000.5190	101.48
WELLS FARGO CREDIT CARD A...	Amzn Mktp US Ru09v4t31 Mo...	09/21/2024	heavy duty extension cords	101.2200.000.5190	153.98
WELLS FARGO CREDIT CARD A...	Amzn Mktp US Ru4zb5912 Ac...	09/21/2024	Stand up sign holders	101.1300.000.5190	202.96
WELLS FARGO CREDIT CARD A...	Apa Accounts P WF 08/24	09/21/2024	Yearly APA membership	101.5100.000.5335	415.00
WELLS FARGO CREDIT CARD A...	Apa Mn Chapter Accounts P ...	09/21/2024	Conference registration for H...	101.5100.000.5340	467.00
WELLS FARGO CREDIT CARD A...	Batteries+bulbs #026 Monica ...	09/21/2024	batteries for speakers used for...	101.2200.000.5190	86.48
WELLS FARGO CREDIT CARD A...	Batteries+bulbs #026 Monica ...	09/21/2024	batteries for speakers used for...	101.2200.000.5190	43.24
WELLS FARGO CREDIT CARD A...	Cafe Zupas Katrina Le WF 08/...	09/21/2024	Lunch for Interview Panel	101.2000.000.5190	72.31
WELLS FARGO CREDIT CARD A...	Cba Cyberlink Daniel Ber WF 0...	09/21/2024	annual plan for video and pho...	101.2200.000.5335	162.18
WELLS FARGO CREDIT CARD A...	Crown Rental Rosemount Dan...	09/21/2024	table, chairs, projector, and sc...	101.2200.424.5430	867.12
WELLS FARGO CREDIT CARD A...	Cub Foods #1639 Daniel Ber ...	09/21/2024	food for NDTA testing	101.2200.424.5190	50.61
WELLS FARGO CREDIT CARD A...	Cub Foods #1639 Scott Oswa...	09/21/2024	cakes and food for NDTA grad...	101.2200.424.5190	132.74
WELLS FARGO CREDIT CARD A...	Delta 00622583165455 Scott ...	09/21/2024	plane tickets for FM Oswald fo...	101.2200.000.5340	281.95
WELLS FARGO CREDIT CARD A...	Delta 00622649161201 Scott ...	09/21/2024	change in air fare (by NFA) for...	101.2200.000.5340	226.00
WELLS FARGO CREDIT CARD A...	Dollartree Rachel Mik WF 08/...	09/21/2024	Photobooth supplies for 5th ...	101.4300.453.5190	16.25
WELLS FARGO CREDIT CARD A...	Dominos 1975 Rachel Mik WF...	09/21/2024	Pizza for all staff for South Val...	101.4300.459.5190	114.13
WELLS FARGO CREDIT CARD A...	Eig Constantcontact.Co Amy L...	09/21/2024	email marketing	101.1300.000.5335	20.00
WELLS FARGO CREDIT CARD A...	Fun Jumps Entertainmen Rach...	09/21/2024	2nd charge for Bounce house ...	101.4300.453.5190	577.57
WELLS FARGO CREDIT CARD A...	Gdp National Police Ca Ryan R...	09/21/2024	K9 Certifications	101.2000.000.5180	80.00
WELLS FARGO CREDIT CARD A...	Holiday Stations 0471 Melissa...	09/21/2024	Fuel Purchase	101.2000.000.5340	52.60
WELLS FARGO CREDIT CARD A...	Jimmy Johns 1436 Katrina Le ...	09/21/2024	Lunch for Interview Panel	101.2000.000.5190	45.96
WELLS FARGO CREDIT CARD A...	Jimmy Johns 1436 Rebecca Ki...	09/21/2024	Election staff lunch	101.1200.000.5190	49.39
WELLS FARGO CREDIT CARD A...	Kap Ed/Awards By Hammo Da...	09/21/2024	awards for NDTA graduation c...	101.2200.424.5190	25.50
WELLS FARGO CREDIT CARD A...	Kwik Trip #1168 Melissa Ch W...	09/21/2024	Fuel Purchase	101.2000.000.5340	50.64
WELLS FARGO CREDIT CARD A...	Kwik Trip #152 Melissa Ch WF...	09/21/2024	Fuel Purchase	101.2000.000.5340	51.89
WELLS FARGO CREDIT CARD A...	Menards West St Paul M Mike...	09/21/2024	painting supplies	101.4200.000.5125	41.07
WELLS FARGO CREDIT CARD A...	Menards West St Paul M Mike...	09/21/2024	Hand soap	101.4200.000.5125	12.40
WELLS FARGO CREDIT CARD A...	Menards West St Paul M Mike...	09/21/2024	23' ladder	101.4200.000.5160	239.00
WELLS FARGO CREDIT CARD A...	Menards West St Paul M Mike...	09/21/2024	tie down straps w/ J hook	101.4200.000.5160	80.80
WELLS FARGO CREDIT CARD A...	Minnesota State Colleg Monic...	09/21/2024	Fire Inspector training in Eaga...	101.2200.000.5340	575.00
WELLS FARGO CREDIT CARD A...	Minnesota State Colleg Rebec...	09/21/2024	Katie to attend MCFOA Advan...	101.1140.000.5340	325.00
WELLS FARGO CREDIT CARD A...	Oreilly 1767 Cory Rosen WF 0...	09/21/2024	wax and tire shine for trucks f...	101.2200.000.5410	97.90
WELLS FARGO CREDIT CARD A...	Paypal Minnesotaau Monica ...	09/21/2024	MNAFAA training meeting for ...	101.2200.000.5340	20.00

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WELLS FARGO CREDIT CARD A...	Pepperball Ben Madsen WF 0...	09/21/2024	Pepperball Training	101.2000.000.5340	549.00
WELLS FARGO CREDIT CARD A...	Piada Eagan Katrina Le WF 08...	09/21/2024	Lunch for Interview Panel	101.2000.000.5190	52.89
WELLS FARGO CREDIT CARD A...	Pioneer Press Circ Amy Looze...	09/21/2024	newspaper subscription	101.1300.000.5335	14.00
WELLS FARGO CREDIT CARD A...	Psi Services Llc Johnny Dan WF..	09/21/2024	Drone Training - Malcolm	101.2000.000.5340	175.00
WELLS FARGO CREDIT CARD A...	River Heights Chamber Accou...	09/21/2024	Trade show registration	101.1100.000.5340	100.00
WELLS FARGO CREDIT CARD A...	Sams Club #4736 Adam Lares...	09/21/2024	Sam's Club Membership	101.4300.459.5335	45.00
WELLS FARGO CREDIT CARD A...	Sams Club #4736 Adam Lares...	09/21/2024	Sam's Club Membership	101.4300.459.5335	110.00
WELLS FARGO CREDIT CARD A...	Sams Club #4738 Eric Bergu ...	09/21/2024	food for NDTA graduation	101.2200.424.5190	750.12
WELLS FARGO CREDIT CARD A...	Samsclub #4738 Adam Lares ...	09/21/2024	South Valley Grand Opening F...	101.4300.459.5190	364.50
WELLS FARGO CREDIT CARD A...	Samsclub #4738 Eric Bergu WF..	09/21/2024	membership dues for Sam's Cl...	101.2200.000.5335	140.00
WELLS FARGO CREDIT CARD A...	Samsclub.Com Amy Crary WF ...	09/21/2024	IGH Days Parade Candy	101.4300.453.5190	436.39
WELLS FARGO CREDIT CARD A...	Spi Centurylink/Lumen Monica..	09/21/2024	phone line for elevator at Stat...	101.2200.000.5310	2,837.98
WELLS FARGO CREDIT CARD A...	Suncntry Gyk6xa Haugland D...	09/21/2024	Flight for IACP	101.2000.000.5340	423.58
WELLS FARGO CREDIT CARD A...	The Corner Store Cory Rosen...	09/21/2024	fuel for lawn mowers	101.2200.000.5405	34.10
WELLS FARGO CREDIT CARD A...	The Corner Store Jacob Kreu ...	09/21/2024	block ice to set stone benches	101.4200.000.5190	27.96
WELLS FARGO CREDIT CARD A...	The Corner Store Joe Hawkin...	09/21/2024	gas for small equipment	101.4200.000.5125	81.57
WELLS FARGO CREDIT CARD A...	The Corner Store Joe Hawkin...	09/21/2024	gas for small equipment	101.4200.000.5125	128.92
WELLS FARGO CREDIT CARD A...	The Corner Store Joe Hawkin...	09/21/2024	gas for small equipment	101.4200.000.5125	96.34
WELLS FARGO CREDIT CARD A...	The Corner Store Joe Hawkin...	09/21/2024	gas for small equipment	101.4200.000.5125	137.96
WELLS FARGO CREDIT CARD A...	The Corner Store Joe Hawkin...	09/21/2024	gas for small equipment	101.4200.000.5125	139.30
WELLS FARGO CREDIT CARD A...	The Corner Store Joe Hawkin...	09/21/2024	gas for small equipment	101.4200.000.5125	39.95
WELLS FARGO CREDIT CARD A...	The Corner Store Kyle Ravn W...	09/21/2024	gas for small equipment	101.4200.000.5125	160.91
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Cory ...	09/21/2024	Cleaners, brushes, drain clean...	101.2200.000.5190	178.75
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Jacob...	09/21/2024	cleaners & supplies to clean w...	101.4200.000.5125	29.82
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Joe H...	09/21/2024	hand soap, paint, towels	101.4200.000.5125	62.14
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Joe H...	09/21/2024	Dish soap and window cleaners	101.4200.000.5125	26.17
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Joe H...	09/21/2024	wasp spray & paper towels	101.4200.000.5125	59.83
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Kyle ...	09/21/2024	painting supplies	101.4200.000.5125	28.43
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Kyle ...	09/21/2024	electrical supplies for repairs	101.4200.000.5400	67.98
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Mike ...	09/21/2024	squeegee	101.4200.000.5125	17.67
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Mike ...	09/21/2024	caulking gun and caulk/nitrile ...	101.4200.000.5125	67.40
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Mike ...	09/21/2024	caulking gun and caulk/nitrile ...	101.4200.000.5125	10.98
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Mike ...	09/21/2024	hole dozer saw kit	101.4200.000.5160	64.97
WELLS FARGO CREDIT CARD A...	Tractor-Supply-Co #019 Eric B...	09/21/2024	5 Gal jug and gas line antifree...	101.2200.000.5190	30.97
WELLS FARGO CREDIT CARD A...	Tractor-Supply-Co #019 Eric B...	09/21/2024	water jugs needed at Station 2	101.2200.000.5190	24.99
WELLS FARGO CREDIT CARD A...	Tst Turittos Pizza - Rachel Mik...	09/21/2024	Pizza for all staff on last day of...	101.4300.459.5190	83.33
WELLS FARGO CREDIT CARD A...	U Of M Contlearning Ol Tara Al...	09/21/2024	TZD Conference Eid and Weld...	101.2000.000.5340	300.00
WELLS FARGO CREDIT CARD A...	Usps Po 2688010540 Tara All...	09/21/2024	Postage stamps for DWI kits a...	101.2000.000.5325	146.00
WELLS FARGO CREDIT CARD A...	Wal-Mart #5089 Adam Wiede...	09/21/2024	Popsicles for Cadets to hand o...	101.2000.000.5182	2.98
WELLS FARGO CREDIT CARD A...	Wal-Mart #5089 Al Vandeho ...	09/21/2024	Volunteer coach folders	101.4300.454.5190	3.62
WELLS FARGO CREDIT CARD A...	Wal-Mart #5089 Rachel Mik ...	09/21/2024	Supplies for community garde...	101.4300.456.5190	44.59
WELLS FARGO CREDIT CARD A...	Wal-Mart #5089 Scott Oswa ...	09/21/2024	food for NDTA graduation	101.2200.424.5190	52.74
WELLS FARGO CREDIT CARD A...	White Cap #127 Joel Jacks WF...	09/21/2024	Tape, earplugs, repair kit and ...	101.3200.000.5190	256.06
WELLS FARGO CREDIT CARD A...	Wm Supercenter #2421 Jamie...	09/21/2024	South Valley Grand Opening S...	101.4300.459.5190	93.67
WELLS FARGO CREDIT CARD A...	Zoom.Us 888-799-9666 Katrin...	09/21/2024	Zoom Subscription Lee	101.2000.000.5395	12.79
WELLS FARGO CREDIT CARD A...	Zoom.Us 888-799-9666 Melis...	09/21/2024	Monthly Subscription Chiodo	101.2000.000.5395	15.99
GALLS LLC	028851076	09/26/2024	Cargo Pants - Decker	101.2000.000.5175	222.22
GALLS LLC	028862676	09/26/2024	Shirt - Decker	101.2000.000.5175	79.36
YEGO, JACLYN	07132024	09/26/2024	Face Painter for Movie in the ...	101.4300.453.5310	200.00
HOLIDAY COMPANIES	080901092400	09/26/2024	Squad car washes 8.2024	101.2000.000.5410	255.00
LANGUAGE LINE SERVICES	11390415	09/26/2024	Interpreter Services 8.2024	101.2000.000.5310	687.26
UNIFIRST CORPORATION	1410086389	09/26/2024	Uniforms-Streets 9.9.2024	101.3200.000.5175	52.21
UNIFIRST CORPORATION	1410086389	09/26/2024	Uniforms-Parks 9.9.2024	101.4200.000.5175	22.00
UNIFIRST CORPORATION	1410087625	09/26/2024	Uniforms-Streets 9.16.2024	101.3200.000.5175	52.21
UNIFIRST CORPORATION	1410087625	09/26/2024	Uniforms-Parks 9.16.2024	101.4200.000.5175	22.00
UNIFIRST CORPORATION	1410089173	09/26/2024	Street Uniforms 9.23.2024	101.3200.000.5175	52.21
UNIFIRST CORPORATION	1410089173	09/26/2024	Parks Uniforms 9.23.2024	101.4200.000.5175	22.00
BITUMINOUS ROADWAYS, INC.	18854	09/26/2024	fence repairs at Skyview & Gr...	101.4200.000.5400	1,500.00
DAKOTA CTY DISTRICT COURT	19WSCR2365511	09/26/2024	Bail for Juquan Spears Warran...	101.0000.000.2208	500.00
BLACKTOP PROS, LLC	23-0376	09/26/2024	Clark road paving	101.3200.000.5415	9,500.00

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Vendor Name	Payable Number	Post Date	Description (Item)	Account Number	Amount
BLACKTOP PROS, LLC	23-081	09/26/2024	Clark road - mill & clean road	101.3200.000.5415	5,900.00
TAHO SPORTSWEAR	24TS4448	09/26/2024	Bike the Bridges Shirts	101.4300.453.5190	599.05
SOLBERG AGGREGATE CO	29573	09/26/2024	Stones for maintenance	101.3200.000.5125	783.04
ASPEN MILLS	338827	09/26/2024	Uniform Allowance for New R...	101.2000.000.5175	418.67
ASPEN MILLS	339141	09/26/2024	Initial Uniform Purchase - Offi...	101.2000.000.5175	1,658.07
VALLEY IMAGES PHOTOGRAP...	3392	09/26/2024	Photo Session for New Hire A...	101.2000.000.5310	50.00
BUREAU OF CRIMINAL APPRE...	36996	09/26/2024	BCA Crime Reporting Training ...	101.2000.000.5340	50.00
BUREAU OF CRIMINAL APPRE...	37014	09/26/2024	BCA Operator Training Brewer	101.2000.000.5340	50.00
BUREAU OF CRIMINAL APPRE...	37052	09/26/2024	DMT Recertification- Pung	101.2000.000.5340	75.00
DIATECH INC	72367	09/26/2024	Evidence Supplies - Mixing & ...	101.2000.000.5190	94.97
SOCCER SHOTS	8/28/2024	09/26/2024	Preschool Contracted sports J...	101.4300.454.5310	6,165.00
CAMPBELL KNUTSON, P.A.	8/31/2024	09/26/2024	Prosecution Fees 8.2024	101.2000.000.5306	21,360.28
LIVINE RIERA	9/10/2024	09/26/2024	Refund permit #RHTH202402...	101.2000.000.4339	25.00
BONFE'S PLUMBING	9/17/2024	09/26/2024	Refund plumbing permit #PRP...	101.0000.000.2207	0.80
BONFE'S PLUMBING	9/17/2024	09/26/2024	Refund plumbing permit #PRP...	101.5200.000.4186	62.20
STARS & STRIPES LAWN & LA...	9/18/2024	09/26/2024	repairs & work on Vista Pines ...	101.4200.000.5310	660.00
OFFICE OF THE SECRETARY OF...	9/4/2024	09/26/2024	Notary Commission - Brewer	101.2000.000.5335	120.00
METROPOLITAN COUNCIL	9/6/2024	09/26/2024	SAC prompt payment discount...	101.0000.000.4300	-124.25
INVER HILLS COMMUNITY BA...	9/9/2024	09/26/2024	City's donation to IHCC concer...	101.4200.000.5490	1,000.00
INVER GROVE HEIGHTS ANIM...	913313	09/26/2024	Vet services for PD K9 Chase	101.2000.000.5180	557.28
GRAINGER	9255233398	09/26/2024	Rivet nut	101.4200.000.5125	11.95
RCM SPECIALTIES, INC.	9622	09/26/2024	tack oil	101.3200.000.5125	1,011.15
ENTERPRISE FM TRUST	FBN5134344	09/26/2024	Vehicle leases 9.2024	101.2000.000.5430	16,199.73
STREICHER'S	I1717534	09/26/2024	Hat, Face Masks, Pants & Pou...	101.2000.000.5175	176.00
DAKOTA 911	IG2024-10	09/26/2024	Dakota 911 fee 10.2024	101.2000.000.5313	66,849.30
DAKOTA 911	IG2024-10	09/26/2024	Dakota 911 fee general fund 1...	101.2200.000.5313	7,427.70
BRITTANY MISKOWIEC	IGHPD-09052024	09/26/2024	Dept Covered Therapy Sessions	101.2000.000.5310	790.63
PRECISE MRM	IN200-2000164	09/26/2024	GPS Data	101.3200.000.5310	110.00
GEOTAB USA, INC.	IN397474	09/26/2024	ProPlus Software	101.2000.000.5395	283.43
INNOVATIVE OFFICE SOLUTIO...	IN4615161	09/26/2024	pens	101.3200.000.5190	50.46
INNOVATIVE OFFICE SOLUTIO...	IN4615161	09/26/2024	trash can liners	101.4200.000.5125	74.16
CITY OF SAINT PAUL	IN58954	09/26/2024	Asphalt purchase	101.3200.000.5125	5,513.20
CITY OF SAINT PAUL	IN59708	09/26/2024	Asphalt Patching and Paving ...	101.3200.000.5125	5,739.67
HARRIS COMPUTER SYSTEMS	MUNMN0002173	09/26/2024	CityView Bluebeam License	101.5200.000.5395	1,740.00
WSB & ASSOCIATES, INC.	R-026197-000-2	09/26/2024	8.2024 Groveland Park ballfiel...	101.4200.000.5310	2,660.75
BERTELSON BROTHERS	WO-1313006	09/26/2024	Pens, memo pads and sticky n...	101.2000.000.5105	45.14
MEDSURETY, LLC	9/27/2024	09/27/2024	FLEX COMP SPEND DED PAY (...)	101.0000.000.2036	740.39
DAKOTA ELECTRIC ASSN	200001093947 9/30/2024	09/30/2024	Electric	101.3400.000.5355	1,450.78
DAKOTA ELECTRIC ASSN	200002468379 9/30/2024	09/30/2024	Electric	101.4200.000.5355	1,638.42
DAKOTA ELECTRIC ASSN	200002501658 9/30/2024	09/30/2024	Electric	101.4200.000.5355	577.74
DAKOTA ELECTRIC ASSN	200003935632 9/30/2024	09/30/2024	Electric	101.4200.000.5355	442.97
DAKOTA ELECTRIC ASSN	200004267134 9/30/2024	09/30/2024	Electric	101.3400.000.5355	55.30
DAKOTA ELECTRIC ASSN	200004430542 9/30/2024	09/30/2024	Electric	101.4200.000.5355	18.57
DAKOTA ELECTRIC ASSN	200010036635 9/30/2024	09/30/2024	Electric	101.2200.000.5355	3,017.17
XCEL ENERGY	893447787	09/30/2024	PD electric	101.2000.000.5355	45.38
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	101.1100.000.5058	7.50
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	101.1120.000.5058	9.00
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	101.1140.000.5058	12.25
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	101.1300.000.5058	9.00
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	101.1800.000.5058	41.32
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	101.2000.000.5058	252.00
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	101.2200.000.5058	82.25
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	101.3100.000.5058	33.02
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	101.3200.000.5058	44.12
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	101.4200.000.5058	47.93
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	101.4300.459.5058	17.95
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	101.5000.000.5058	13.43
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	101.5100.000.5058	9.00
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	101.5200.000.5058	41.25
EFTPS	INV0202574	09/30/2024	FEDERAL WITHHOLDING	101.0000.000.2213	68.36

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Vendor Name	Payable Number	Post Date	Description (Item)	Account Number	Amount
MN DEPT OF REVENUE (PAYR...	INV0202575	09/30/2024	STATE WITHHOLDING	101.0000.000.2215	19.67
EFTPS	INV0202576	09/30/2024	MEDICARE WITHHOLDING	101.0000.000.2211	5.04
EFTPS	INV0202577	09/30/2024	SOCIAL SECURITY WITHHOLDI...	101.0000.000.2210	21.50
BJORKLUND COMPENSATION ...	00004669	10/03/2024	UB supervisor job evaluation	101.1120.000.5310	150.00
MINNEAPOLIS OXYGEN CO.	00131141	10/03/2024	oxygen cylinder rental	101.2200.000.5310	218.68
CITY OF MENDOTA HTS	00243202	10/03/2024	Cascade Bay field trip entrance..	101.4300.452.5343	103.30
JOSEPH BEZOTTE - CORE SECU...	1045	10/03/2024	Range rental for training	101.2000.000.5179	1,440.00
RIVER HEIGHTS MARINA	11641	10/03/2024	Electrical service for boat 2	101.2200.000.5405	10.05
RIVER HEIGHTS MARINA	11653	10/03/2024	Fuel for boat 2	101.2200.000.5405	611.06
ANCOM COMMUNICATIONS, ...	123871	10/03/2024	Fix solar panels at Rich Valley	101.2000.000.5405	6,903.00
UNIFIRST CORPORATION	1410090510	10/03/2024	Street Uniforms	101.3200.000.5175	52.21
UNIFIRST CORPORATION	1410090510	10/03/2024	Park Uniforms	101.4200.000.5175	22.00
CITY OF SOUTH ST PAUL	14759	10/03/2024	Skyzone entrance fee for yout...	101.4300.452.5343	330.75
CULLIGAN	157984591006x093024	10/03/2024	bottled water service at fire st...	101.2200.000.5190	68.93
CULLIGAN	157984591188X093024	10/03/2024	bottled water service St 3	101.2200.000.5190	95.95
CULLIGAN	157986034674X093024	10/03/2024	bottled water service fire stati...	101.2200.000.5190	174.94
FIRST IMPRESSION GROUP	160879	10/03/2024	2 IGH Days parade banners for...	101.4300.453.5190	210.00
FIRST IMPRESSION GROUP	161147	10/03/2024	Business Cards - Adamski	101.2000.000.5105	55.00
BITUMINOUS ROADWAYS, INC.	18863	10/03/2024	Rich Valley trail removal & rep...	101.4200.000.5415	69,500.00
FIRE PROTECTION SERVICES, I...	1938	10/03/2024	plan review for FM	101.2200.000.5310	209.63
CITY OF WEST ST. PAUL	2024-00000110	10/03/2024	Reimbursement for field trip ...	101.4300.452.5343	103.95
NEWPORT, CITY OF	2024-8	10/03/2024	NDTA instructor payment rei...	101.2200.424.5310	8,521.45
BLACKTOP PROS, LLC	23-0378	10/03/2024	Asphalt maintenance	101.3200.000.5415	9,500.00
TREE TRUST	240765	10/03/2024	Set up archery range at South...	101.4200.000.5310	15,556.30
THE APPAREL LAB, LLC.	248572	10/03/2024	Polo Shirt - Adamski	101.2000.000.5175	45.00
THE APPAREL LAB, LLC.	248576	10/03/2024	Polo Shirts - Prail	101.2000.000.5182	314.02
FAST SIGNS	255-101648	10/03/2024	new court rules for Skyview c...	101.4200.000.5190	600.04
PEARSON EDUCATION	26583860	10/03/2024	EMR books for NDTA	101.2200.424.5179	3,461.02
DAKOTA AWARDS & ENGRAV...	28459	10/03/2024	Name tag replacement	101.1140.000.5105	12.00
VERIFIED HOLDINGS, LLC	356991	10/03/2024	Pre-employment background ...	101.1120.000.5310	657.50
HANCE UTILITY SERVICES INC	37450	10/03/2024	Utility locate at Rich Valley	101.4200.000.5310	446.75
TOTAL CONSTRUCTION & EQU...	40416	10/03/2024	Rich Valley pond pump repairs	101.4200.000.5405	549.22
TOTAL CONSTRUCTION & EQU...	40417	10/03/2024	Street Light Repairs	101.3400.000.5405	1,478.57
STREAMLINE DESIGN INC	43286	10/03/2024	Uniform shirts for Citizen's ac...	101.2200.000.5190	520.12
STREAMLINE DESIGN INC	43291	10/03/2024	pink cancer T-shirts	101.2200.000.5175	2,618.55
STREAMLINE DESIGN INC	43292	10/03/2024	pink cancer t-shirts	101.2200.000.5175	103.56
STREAMLINE DESIGN INC	43295	10/03/2024	uniform t-shirts	101.2200.000.5175	842.76
MESSERLI & KRAMER, P.A.	469605	10/03/2024	2024 Q4 Legislative Represent...	101.1000.000.5310	11,125.00
DAKOTA CTY FINANCIAL SVCS	5502436	10/03/2024	PD MHZ Subscriber Fee 8.2024	101.2000.000.5310	1,959.72
DAKOTA CTY FINANCIAL SVCS	5502436	10/03/2024	FD MHZ Subscriber Fee 8.2024	101.2200.000.5310	1,773.08
DAKOTA CTY FINANCIAL SVCS	5502436	10/03/2024	PW MHZ Subscriber Fee 8.2024	101.3200.000.5310	46.66
HOLMES DESIGN, INC.	5567	10/03/2024	Recreation flyer design service...	101.4300.459.5310	1,080.00
EMC	64441	10/03/2024	annual maintenance of rescue...	101.2200.000.5405	2,333.00
CENTRAL TURF & IRRIGATION ...	65000245-00	10/03/2024	hand pump & marking flags	101.4200.000.5190	118.78
RT RESIDENTIAL INC.	7/1/2024B	10/03/2024	Water meter tax refund	101.0000.000.2205	13.71
RT RESIDENTIAL INC.	7/1/2024B	10/03/2024	Surcharge refund	101.0000.000.2207	117.70
RT RESIDENTIAL INC.	7/1/2024B	10/03/2024	Refund building permit PRBD...	101.5200.000.4184	1,872.75
COMCAST	8772105910359526X090524	10/03/2024	Cable for Station 1	101.2200.000.5310	10.92
MIRACLE RECREATION EQUIP...	880669	10/03/2024	Tire w/chains for playground	101.4200.000.5160	857.00
NEW PRAGUE ARCHERY CLUB	9/16/2024	10/03/2024	Youth archery instructor train...	101.4300.454.5310	90.00
CENTURY LINK	9/19/2024	10/03/2024	Phone line at station 1	101.2200.000.5320	51.28
FAIRVIEW HEALTH SERVICES	9/20/2024	10/03/2024	Blood draw for DWI Stensrud,...	101.2000.000.5310	92.82
KENISON, TERRI	9/30/2024	10/03/2024	cleaning stations 1,2 & 3	101.2200.000.5310	1,600.00
CINTAS CORPORATION	9290083739	10/03/2024	9.30.24 AED agreement	101.4200.000.5310	134.42
MUNICIPAL EMERGENCY SERV...	IN2110549	10/03/2024	uniform pants for firefighters	101.2200.000.5175	86.50
MUNICIPAL EMERGENCY SERV...	IN2117765	10/03/2024	uniform pants for firefighters	101.2200.000.5175	86.55
INNOVATIVE OFFICE SOLUTIO...	IN4652029	10/03/2024	Election Supplies - Rubberban...	101.1200.000.5105	24.39
INNOVATIVE OFFICE SOLUTIO...	IN4655932	10/03/2024	Highlighters & Notepads	101.2200.000.5105	74.83
ST PAUL STAMP WORKS INC	IV00563806	10/03/2024	name badges for uniforms	101.2200.000.5175	151.10
ST PAUL STAMP WORKS INC	IV00563807	10/03/2024	Engineer badges	101.2200.000.5175	323.60

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ST PAUL STAMP WORKS INC	IV00563808	10/03/2024	Fire Marshal badges	101.2200.000.5175	125.10
ST PAUL STAMP WORKS INC	IV00563809	10/03/2024	bugles for uniforms	101.2200.000.5175	282.50
ST PAUL STAMP WORKS INC	IV00563810	10/03/2024	name bars for uniforms	101.2200.000.5175	127.45
ST PAUL STAMP WORKS INC	IV00563811	10/03/2024	serving since badges	101.2200.000.5175	200.10
ST PAUL STAMP WORKS INC	IV00563812	10/03/2024	Assistant Chief badges	101.2200.000.5175	356.60
ST PAUL STAMP WORKS INC	IV00563813	10/03/2024	Deputy Chief badges	101.2200.000.5175	473.40
ST PAUL STAMP WORKS INC	IV00563814	10/03/2024	serving since badges	101.2200.000.5175	263.20
ICMA RETIREMENT TRUST - 4...	INV0202579	10/04/2024	457 -AGE <49	101.0000.000.2038	4,306.38
ICMA RETIREMENT TRUST - 4...	INV0202580	10/04/2024	457 -AGE <49 %	101.0000.000.2038	9,703.08
ICMA RETIREMENT TRUST - 4...	INV0202581	10/04/2024	457 -AGE 50+	101.0000.000.2038	1,400.29
ICMA RETIREMENT TRUST - 4...	INV0202582	10/04/2024	457 PLAN -AGE 50+ %	101.0000.000.2038	1,051.08
ICMA RETIREMENT TRUST - 4...	INV0202583	10/04/2024	457 - ROTH AGE <50	101.0000.000.2038	1,011.00
ICMA RETIREMENT TRUST - 4...	INV0202584	10/04/2024	457 - ROTH AGE <50 %	101.0000.000.2038	1,686.40
ICMA RETIREMENT TRUST - 4...	INV0202585	10/04/2024	457 - ROTH AGE 50+	101.0000.000.2038	20.00
MINNESOTA DEPARTMENT OF...	INV0202588	10/04/2024	CASE #001570640001	101.0000.000.2220	342.87
TEXAS STATE DISBURSEMENT...	INV0202589	10/04/2024	CASE #0012022247	101.0000.000.2220	230.77
MINNESOTA DEPARTMENT OF...	INV0202590	10/04/2024	CASE #001490481201	101.0000.000.2220	357.72
MINNESOTA DEPARTMENT OF...	INV0202591	10/04/2024	CASE #001563363401	101.0000.000.2220	426.85
WI SCTF (WI SUPPORT COLLEC...	INV0202592	10/04/2024	PARTICIPANT ID#0004986316	101.0000.000.2220	433.06
IGH PROFESSIONAL FIREFIGHT...	INV0202596	10/04/2024	UNION DUES (IAFF)	101.0000.000.2041	504.01
MN DEPT OF REVENUE (PAYR...	INV0202601	10/04/2024	LEVY - LETTER ID:L1198636128	101.0000.000.2045	750.57
MN STATE RETIREMENT SYST...	INV0202602	10/04/2024	MINNESOTA DEFERRED COM...	101.0000.000.2038	1,735.00
MN STATE RETIREMENT SYST...	INV0202603	10/04/2024	MINNESOTA DEFERRED COM...	101.0000.000.2038	848.36
MN STATE RETIREMENT SYST...	INV0202604	10/04/2024	457 ROTH IRA (AGE 49 & UND...	101.0000.000.2038	1,420.00
ING DIRECT	INV0202605	10/04/2024	MSRS-HCSP	101.0000.000.2035	36,143.83
EFTPS	INV0202616	10/04/2024	FEDERAL WITHHOLDING	101.0000.000.2213	82,453.12
MN DEPT OF REVENUE (PAYR...	INV0202617	10/04/2024	STATE WITHHOLDING	101.0000.000.2215	34,944.99
EFTPS	INV0202618	10/04/2024	MEDICARE WITHHOLDING	101.0000.000.2211	22,264.36
EFTPS	INV0202619	10/04/2024	SOCIAL SECURITY WITHHOLDI...	101.0000.000.2210	57,655.38
MN LIFE INSURANCE CO	94339751-00	10/31/2024	10.2024 Premium	101.0000.000.2022	4,375.48
MN LIFE INSURANCE CO	94339751-00	10/31/2024	8.2024 Retro Premium Adjus...	101.0000.000.2022	-7.92
Fund 101 - GENERAL FUND Total:					1,018,425.96

Fund: 102 - PUBLIC SAFETY SMALL EQUIPMENT FUND

VERTEX UNMANNED SOLUTI...	3501	09/26/2024	Drone, License and Extra Batte..	102.2000.000.5615	15,070.00
Fund 102 - PUBLIC SAFETY SMALL EQUIPMENT FUND Total:					15,070.00

Fund: 201 - C.V.B. FUND

MINNESOTA ASSOCIATION OF...	1168	09/19/2024	MACVB Annual Meeting Regis...	201.5600.000.5340	220.00
LILLYANNA ELAINE SMITH	8/22/2024	09/19/2024	Ink, sticky notes, pens, pencils...	201.5600.000.5105	111.49
LILLYANNA ELAINE SMITH	8/22/2024	09/19/2024	Canopy Tent	201.5600.000.5190	151.14
LILLYANNA ELAINE SMITH	8/22/2024	09/19/2024	Food for board meeting	201.5600.000.5190	29.97
CATHERINE PIEPER	8939	09/19/2024	Google Ad Campaign	201.5600.000.5330	297.00
RIVER HEIGHTS CHAMBER OF ...	103825	09/26/2024	2024 Annual Business Awards...	201.5600.000.5340	50.00
LILLYANNA ELAINE SMITH	9/12/2024	09/26/2024	Facebook ad for IGH days give...	201.5600.000.5330	20.00
LILLYANNA ELAINE SMITH	9/12/2024	09/26/2024	Hotel stay for CVB conference	201.5600.000.5340	382.22
LILLYANNA ELAINE SMITH	9/9/2024	09/26/2024	Mileage reimbursements	201.5600.000.5340	93.01
CATHERINE PIEPER	9008	09/26/2024	Google & Facebook Ad Campa...	201.5600.000.5330	840.50
Fund 201 - C.V.B. FUND Total:					2,195.33

Fund: 205 - COMMUNITY CENTER-OPERATING FUND

DANIEL BAUER - TRUE MECH...	1606	09/19/2024	8.2024 boiler operation checks	205.4420.000.5400	405.00
FIRST SUPPLY LLC	3647204-00	09/19/2024	parts for VMCC water softener	205.4420.000.5400	50.28
FIRST SUPPLY LLC	3647204-00	09/19/2024	parts for VMCC water softener	205.4440.000.5400	50.28
KULLY SUPPLY, INC.	654986	09/19/2024	flush assembly for toilets	205.4420.000.5400	97.92
KULLY SUPPLY, INC.	654986	09/19/2024	flush assembly for toilets	205.4430.000.5400	65.28
HAWKINS, INC.	6856755	09/19/2024	pool chemicals	205.4420.000.5135	4,071.37
GRAINGER	9237308193	09/19/2024	chemical metering pump	205.4420.000.5160	859.26
GRAINGER	9242192590	09/19/2024	floor drain grates	205.4420.000.5150	383.52
GRAINGER	9242192590	09/19/2024	floor drain grates	205.4430.000.5150	255.68
GRAINGER	9243713873	09/19/2024	weatherproof outlet covers	205.4420.000.5150	47.22
SHERWIN-WILLIAMS CO.	9612-0	09/19/2024	paint supplies for general repa...	205.4420.000.5125	35.38

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SHERWIN-WILLIAMS CO.	9612-0	09/19/2024	paint supplies for general repa...	205.4440.000.5125	35.37
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Jeremy Gil...	09/21/2024	washing machine cleaner	205.4440.000.5125	15.96
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Rick Roach...	09/21/2024	O rings for diving boards	205.4420.000.5125	13.86
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Rick Roach...	09/21/2024	Nozzles for pool area	205.4420.000.5160	29.98
WELLS FARGO CREDIT CARD A...	Amazon MktpL Rf5lt1901 Aaro...	09/21/2024	Pressure washers for the pool	205.4420.000.5160	581.69
WELLS FARGO CREDIT CARD A...	Amazon MktpL Rf9s71ie1 Aar...	09/21/2024	Pressure washer w/ 2 extensi...	205.4420.000.5160	244.38
WELLS FARGO CREDIT CARD A...	Amazon MktpL Rk18v5ff2 Aar...	09/21/2024	Pool vacuum	205.4420.000.5160	406.97
WELLS FARGO CREDIT CARD A...	City Of Apple Valley R Rachel ...	09/21/2024	Kids Rock field trip to Apple Va..	205.4450.483.5343	800.00
WELLS FARGO CREDIT CARD A...	Fsp Sugar Lake Lodge Patrick ...	09/21/2024	MIAMIA 2024 HR training hote...	205.4440.000.5340	852.98
WELLS FARGO CREDIT CARD A...	Hobby-Lobby #742 Suzie Seab...	09/21/2024	Return of T Shirts for LG Comp	205.4420.000.5190	-31.45
WELLS FARGO CREDIT CARD A...	Menards West St Paul M Jere...	09/21/2024	Hoses	205.4420.000.5160	149.97
WELLS FARGO CREDIT CARD A...	Sams Club #4738 Rachel Mik ...	09/21/2024	Snacks for Kids Rock	205.4450.483.5190	187.28
WELLS FARGO CREDIT CARD A...	Samsclub #4738 Jamie Musc ...	09/21/2024	Cups, Plates, Napkins, Towels	205.4410.470.5190	142.38
WELLS FARGO CREDIT CARD A...	Samsclub #4738 Jamie Musc ...	09/21/2024	Cups, Plates, Napkins, Towels	205.4410.470.5190	27.98
WELLS FARGO CREDIT CARD A...	Samsclub #4738 Jamie Musc ...	09/21/2024	Sam's Club Membership	205.4410.470.5335	45.00
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Jerem...	09/21/2024	ConcreteSeal, Batteries and ta...	205.4420.000.5125	108.40
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Jerem...	09/21/2024	Kneeling pad, brushes, scraper...	205.4420.000.5125	88.06
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Patric...	09/21/2024	new power strip for VMCC poo...	205.4420.000.5190	27.86
WELLS FARGO CREDIT CARD A...	The Lifeguard Store, I Suzie Se...	09/21/2024	Hip packs for the lifeguards	205.4420.000.5190	160.00
WELLS FARGO CREDIT CARD A...	The Lifeguard Store, I Suzie Se...	09/21/2024	Whistles	205.4420.000.5190	150.00
WELLS FARGO CREDIT CARD A...	Tst Turittos Pizza - Rachel Mik...	09/21/2024	Pizza for all staff on last day of...	205.4450.483.5190	83.33
WELLS FARGO CREDIT CARD A...	Vsi City Of Eagan Pr Rachel Mi...	09/21/2024	Kids Rock Field Trip to Cascade...	205.4450.483.5343	310.00
WELLS FARGO CREDIT CARD A...	Wal-Mart #5089 Suzie Seab W...	09/21/2024	Batteries for the AED's	205.4420.000.5190	17.54
TWIN SOURCE SUPPLY	00512819	09/26/2024	cleaning supplies - soaps, towe...	205.4420.000.5125	516.64
TWIN SOURCE SUPPLY	00512819	09/26/2024	cleaning supplies - soaps, towe...	205.4430.000.5125	344.43
TWIN SOURCE SUPPLY	00512819	09/26/2024	cleaning supplies - soaps, towe...	205.4440.000.5125	645.80
TWIN SOURCE SUPPLY	00512819	09/26/2024	cleaning supplies - soaps, towe...	205.4450.481.5125	215.27
R & R SPECIALTIES OF WI, INC.	0082992-IN	09/26/2024	East Rink paint & ice painting ...	205.4440.000.5400	2,455.50
TAHO SPORTSWEAR	24TS4242	09/26/2024	VMCC apparel for Aaron	205.4420.000.5175	30.15
TAHO SPORTSWEAR	24TS4242	09/26/2024	VMCC apparel for Aaron	205.4430.000.5175	20.10
TAHO SPORTSWEAR	24TS4242	09/26/2024	VMCC apparel for Aaron	205.4440.000.5175	37.69
TAHO SPORTSWEAR	24TS4242	09/26/2024	VMCC apparel for Aaron	205.4450.481.5175	12.56
FIRST SUPPLY LLC	3650426-00	09/26/2024	insulation for VMCC water sof...	205.4420.000.5125	6.78
FIRST SUPPLY LLC	3653840-00	09/26/2024	pipe insulation - VMCC water ...	205.4420.000.5125	13.56
ALL FLAGS, LLC	435604	09/26/2024	USA, POW & MN flags for VM...	205.4420.000.5125	75.75
ALL FLAGS, LLC	435604	09/26/2024	USA, POW & MN flags for VM...	205.4430.000.5125	50.50
ALL FLAGS, LLC	435604	09/26/2024	USA, POW & MN flags for VM...	205.4440.000.5125	169.99
ALL FLAGS, LLC	435604	09/26/2024	USA, POW & MN flags for VM...	205.4450.481.5125	31.56
CINTAS CORPORATION	5229359266	09/26/2024	First Aid supplies	205.4410.470.5190	85.56
KULLY SUPPLY, INC.	655985	09/26/2024	solenoid for water fountain re...	205.4430.000.5400	122.80
GRAINGER	9252713517	09/26/2024	socket covers	205.4420.000.5150	63.26
GRAINGER	9252713517	09/26/2024	socket covers	205.4430.000.5150	42.17
GRAINGER	9252713517	09/26/2024	socket covers	205.4440.000.5150	79.07
GRAINGER	9252713517	09/26/2024	socket covers	205.4450.481.5150	26.36
MN DEPT OF LABOR & INDUS...	ABR0333473X	09/26/2024	annual boiler & pressure vesse...	205.4420.000.5335	60.00
XCEL ENERGY	891261506	09/30/2024	Aquatic center electric charges	205.4420.000.5355	17,045.28
XCEL ENERGY	891261506	09/30/2024	Aquatic center electric charges	205.4430.000.5355	11,363.52
XCEL ENERGY	894021939	09/30/2024	Ice arena load profile natural ...	205.4440.000.5355	1,803.74
XCEL ENERGY	894021939	09/30/2024	Ice arena load profile electric	205.4450.481.5355	601.25
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	205.4410.470.5058	26.20
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	205.4420.000.5058	12.63
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	205.4420.000.5058	5.25
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	205.4430.000.5058	3.75
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	205.4440.000.5058	12.69
TWIN SOURCE SUPPLY	00512964	10/03/2024	cleaning supply & can liners	205.4420.000.5125	184.63
TWIN SOURCE SUPPLY	00512964	10/03/2024	cleaning supply & can liners	205.4430.000.5125	123.08
TWIN SOURCE SUPPLY	00512964	10/03/2024	cleaning supply & can liners	205.4440.000.5125	230.78
TWIN SOURCE SUPPLY	00512964	10/03/2024	cleaning supply & can liners	205.4450.481.5125	76.93
NIHCA	107494	10/03/2024	annual health club membersh...	205.4410.471.5335	449.00
APEC	125836	10/03/2024	HVAC filters	205.4420.000.5125	138.47

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APEC	125836	10/03/2024	HVAC filters	205.4430.000.5125	92.31
APEC	125836	10/03/2024	HVAC filters	205.4440.000.5125	173.08
APEC	125836	10/03/2024	HVAC filters	205.4450.481.5125	57.69
LVC COMPANIES, INC.	151724	10/03/2024	replaced duct detector in pool...	205.4420.000.5400	876.00
HUEBSCH SERVICES	20350858	10/03/2024	lobby mats	205.4420.000.5430	171.98
HUEBSCH SERVICES	20350858	10/03/2024	lobby mats	205.4430.000.5430	114.65
HUEBSCH SERVICES	20350858	10/03/2024	lobby mats	205.4440.000.5430	92.14
HUEBSCH SERVICES	20350858	10/03/2024	lobby mats	205.4450.481.5430	30.71
PERFECTION PLUS, INC	315634	10/03/2024	10.2024 cleaning svcs	205.4420.000.5310	6,912.70
PUSH PEDAL PULL	389612	10/03/2024	Repairs to climbmill machine	205.4430.000.5405	180.96
HOLMES DESIGN, INC.	5567	10/03/2024	Recreation flyer design service...	205.4410.472.5310	1,620.00
CINTAS CORPORATION	9290084143	10/03/2024	9.30.24 VMCC AED agreement	205.4410.470.5310	537.68
KENDELL DOORS & HARDWARE	IN103525	10/03/2024	keys cut for VMCC	205.4420.000.5190	44.25
KENDELL DOORS & HARDWARE	IN103525	10/03/2024	keys cut for VMCC	205.4440.000.5190	44.25
HORIZON COMMERCIAL POOL...	INV86608	10/03/2024	pool lift control box repairs	205.4420.000.5405	914.73
Fund 205 - COMMUNITY CENTER-OPERATING FUND Total:					59,814.56
Fund: 270 - HOST COMMUNITY FUND					
GREENE ESPEL PLLP	91038	09/26/2024	Legal advice & representation...	270.5900.000.5305	5,617.20
JR'S APPLIANCE DISPOSAL	114062	10/03/2024	Recycling of electronics	270.5900.000.5389	165.00
Fund 270 - HOST COMMUNITY FUND Total:					5,782.20
Fund: 290 - EDA-OPERATING FUND					
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	290.5800.000.5058	0.07
Fund 290 - EDA-OPERATING FUND Total:					0.07
Fund: 401 - PARK CAPITAL REPLACEMENT					
HOISINGTON KOEGLER GROUP..	024-09.01	09/19/2024	Prevailing wage review for Sou..	401.4210.000.5310	13,822.00
BITUMINOUS ROADWAYS, INC.	2322114	09/19/2024	Pay Voucher #2, Project 2024-...	401.4210.000.5610	22,118.26
BITUMINOUS ROADWAYS, INC.	2322114-B	09/19/2024	Pay Voucher #3, Project 2024-...	401.4210.000.5610	7,155.06
SHORT ELLIOTT HENDRICKSON..	473786	09/19/2024	8.2024 Swing Bridge lighting s...	401.4210.000.5310	1,543.20
BITUMINOUS ROADWAYS, INC.	8/30/2024	09/19/2024	Pay Voucher #2, Project 2024-...	401.4210.000.5610	29,982.00
FLAGSHIP RECREATION LLC	F23033	09/19/2024	Bench for South Valley park	401.4210.000.5610	1,165.00
Fund 401 - PARK CAPITAL REPLACEMENT Total:					75,785.52
Fund: 402 - PARK ACQUISITION & DEVELOPMENT FUND					
WEBER, INC.	04/04/2024	09/19/2024	Pay Voucher #11, Project 202...	402.4210.000.5610	11,867.23
WEBER, INC.	04/25/2024	09/19/2024	Pay Voucher #12, Project #20...	402.4210.000.5610	242,537.75
LOCAL GOVERNMENT INFOR...	68036	09/19/2024	HVP Phase IV cable splicing	402.4210.000.5615	5,645.00
WEBER, INC.	9/11/2024	09/19/2024	Pay Voucher #13, Project 2021..	402.4210.000.5610	114,994.29
Fund 402 - PARK ACQUISITION & DEVELOPMENT FUND Total:					375,044.27
Fund: 436 - 117TH STREET RECONSTRUCTION					
SRF CONSULTING GROUP, INC	16424.00-15	09/19/2024	117th St. Reconstruction Final...	436.3210.000.5310	3,255.00
UNION PACIFIC RAILROAD	90127378	09/19/2024	117th Street - UP Rail Crossing...	436.3210.000.5310	867.50
UNION PACIFIC RAILROAD	90130572	09/19/2024	117th Street - UP Rail Crossing...	436.3210.000.5310	712.00
UNION PACIFIC RAILROAD	90130942	09/19/2024	117th Street - UP Rail Crossing...	436.3210.000.5310	548.00
Fund 436 - 117TH STREET RECONSTRUCTION Total:					5,382.50
Fund: 440 - PAVEMENT MGMT-LOCAL STREETS					
BOLTON & MENK, INC.	0343765	09/19/2024	Dawn Way Construction Servi...	440.3210.000.5310	882.00
EHLERS AND ASSOCIATES, INC.	98976	09/19/2024	PMP Financial Model Updates...	440.3210.000.5310	1,211.25
SHORT ELLIOTT HENDRICKSON..	473775	09/26/2024	Babcock Trail Multi-Use Trail F...	440.3210.000.5310	28,550.59
WSB & ASSOCIATES, INC.	R-024055-000-6	09/26/2024	2025 PMI Final Design	440.3210.000.5310	36,680.00
WSB & ASSOCIATES, INC.	R-024055-000-6	09/26/2024	2025 PMI Final Design	440.3210.000.5310	10,155.25
WSB & ASSOCIATES, INC.	R-024055-000-6	09/26/2024	2025 PMI Feasibility	440.3210.000.5310	12,599.25
FIRST IMPRESSION GROUP	160722	10/03/2024	PMI North and PMI South Mail...	440.3210.000.5325	620.39
KIMLEY-HORN & ASSOCIATES, ...	29122747	10/03/2024	2024 PMI Construction Support	440.3210.000.5310	24,916.25
SHORT ELLIOTT HENDRICKSON..	473704	10/03/2024	2026 PMI South Feasibility	440.3210.000.5310	2,255.72
SHORT ELLIOTT HENDRICKSON..	473705	10/03/2024	2026 PMI North Report	440.3210.000.5310	2,255.72
MCNAMARA CONTRACTING I...	8/31/2024	10/03/2024	Pay Voucher #4, Project 2024-...	440.3210.000.5610	197,051.66
MCNAMARA CONTRACTING I...	8/31/2024	10/03/2024	Pay Voucher #4, Project 2024-...	440.3210.000.5610	558,629.67
MCNAMARA CONTRACTING I...	8/31/2024	10/03/2024	Pay Voucher #4, Project 2024-...	440.3210.000.5610	597,396.87
MCNAMARA CONTRACTING I...	8/31/2024	10/03/2024	Pay Voucher #4, Project 2024-...	440.3210.000.5610	1,551.35

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MCNAMARA CONTRACTING I...	8/31/2024	10/03/2024	Pay Voucher #4, Project 2024-...	440.3210.000.5610	89,966.42
MEYER CONTRACTING, INC.	9/16/2024	10/03/2024	Contractor Invoice No 6	440.3210.000.5610	45,417.48
FAHRNER ASPHALT SEALERS L...	9/25/2024	10/03/2024	Final Pay Voucher #1, Project ...	440.3210.000.5415	67,448.95
WSB & ASSOCIATES, INC.	R-024055-000-7	10/03/2024	2025 PMI Final Design	440.3210.000.5310	39,555.25
WSB & ASSOCIATES, INC.	R-024055-000-7	10/03/2024	2025 PMI Final Design	440.3210.000.5310	17,439.50
WSB & ASSOCIATES, INC.	R-024458-000-7	10/03/2024	Feasibility Report	440.3210.000.5310	2,308.50
WSB & ASSOCIATES, INC.	R-024941-000-4	10/03/2024	Construction Surveying	440.3210.000.5310	1,000.00
WSB & ASSOCIATES, INC.	R-026038-000-3	10/03/2024	Construction Materials Testing	440.3210.000.5310	217.75
Fund 440 - PAVEMENT MGMT-LOCAL STREETS Total:					1,738,109.82
Fund: 443 - TREE REPLACEMENT FUND					
EXPERT TREE SERVICE AND SC...	11894	09/19/2024	city-wide stump grinding	443.4210.000.5310	1,062.50
Fund 443 - TREE REPLACEMENT FUND Total:					1,062.50
Fund: 453 - SE QUADRANT TIF DIST 4-1					
ST. PAUL PIONEER PRESS	0824572521	09/19/2024	TIF Annual Disclosure	453.0000.000.5330	137.80
Fund 453 - SE QUADRANT TIF DIST 4-1 Total:					137.80
Fund: 500 - NW AREA CAPITAL PROJECTS					
KIMLEY-HORN & ASSOCIATES, ...	29122745	10/03/2024	CSAH 26/63 Construction Pha...	500.0000.000.5310	571.08
Fund 500 - NW AREA CAPITAL PROJECTS Total:					571.08
Fund: 510 - WATER-OPERATING FUND					
WATER CONSERVATION SERV...	14287	09/19/2024	Leak Detection	510.7100.000.5415	341.14
CITY OF BLOOMINGTON	24004	09/19/2024	Bacteria Samples 8.2024	510.7100.000.5310	560.00
HAWKINS, INC.	6862694	09/19/2024	WTP Chemicals	510.7100.000.5135	10.00
LONE OAK COMPANIES	95435	09/19/2024	UT Delinquent Letter Processi...	510.7100.000.5310	163.28
USABBLUEBOOK	INV00477756	09/19/2024	Maintenance kit and tubing fo...	510.7100.000.5150	457.50
SAFE-FAST, INC.	INV295718	09/19/2024	Uniform calibration services	510.7100.000.5175	198.00
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Matt Johns...	09/21/2024	Buckets to supply clean water ...	510.7100.000.5190	41.94
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Matt ...	09/21/2024	Meter install tools	510.7100.000.5160	41.96
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	510.7100.000.5058	32.38
RT RESIDENTIAL INC.	7/1/2024B	10/03/2024	Water meter refund	510.7100.000.4725	192.50
Fund 510 - WATER-OPERATING FUND Total:					2,038.70
Fund: 511 - WATER-CAPITAL FUND					
RT RESIDENTIAL INC.	7/1/2024B	10/03/2024	Water connection refund	511.7110.000.4755	3,780.00
RT RESIDENTIAL INC.	7/1/2024B	10/03/2024	Water core NWA refund	511.7110.000.4760	2,000.00
RT RESIDENTIAL INC.	7/1/2024B	10/03/2024	Water treatment NWA refund	511.7110.000.4765	810.00
Fund 511 - WATER-CAPITAL FUND Total:					6,590.00
Fund: 520 - SEWER-OPERATING FUND					
LONE OAK COMPANIES	95435	09/19/2024	UT Delinquent Letter Processi...	520.7200.000.5310	163.27
WELLS FARGO CREDIT CARD A...	Py Advanced Sportswea Scott...	09/21/2024	luke jacobsen clothing embroi...	520.7200.000.5175	60.00
WELLS FARGO CREDIT CARD A...	Tractor-Supply-Co #019 Matt ...	09/21/2024	T-shirts, work pants and hood...	520.7200.000.5175	104.96
WELLS FARGO CREDIT CARD A...	Wal-Mart #5089 Matt Johns ...	09/21/2024	SD cards for camera van	520.7200.000.5405	71.64
FASTENAL COMPANY	MNTC1288005	09/26/2024	Supplies for water plant repairs	520.7200.000.5150	24.38
DAKOTA ELECTRIC ASSN	200010048618 9/30/2024	09/30/2024	Electric	520.7200.000.5355	159.62
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	520.7200.000.5058	14.01
Fund 520 - SEWER-OPERATING FUND Total:					597.88
Fund: 521 - SEWER-CAPITAL FUND					
METROPOLITAN COUNCIL	9/6/2024	09/26/2024	Monthly SAC fee 8.2024	521.0000.000.2207	7,455.00
RT RESIDENTIAL INC.	7/1/2024B	10/03/2024	SAC refund	521.0000.000.2207	2,485.00
RT RESIDENTIAL INC.	7/1/2024B	10/03/2024	Sewer connection NWA refund	521.7210.000.4755	6,750.00
RT RESIDENTIAL INC.	7/1/2024B	10/03/2024	Sewer core 4' NWA refund	521.7210.000.4760	670.00
Fund 521 - SEWER-CAPITAL FUND Total:					17,360.00
Fund: 530 - STORM WATER-OPERATING					
WELLS FARGO CREDIT CARD A...	Amazon Mktp Rm0sk2282 Ra...	09/21/2024	Hooks, holders, repellents, sp...	530.7300.000.5190	75.65
WELLS FARGO CREDIT CARD A...	Amazon Mktp Rm1ib2mr2 Ra...	09/21/2024	Tick repelling cuff wrap	530.7300.000.5190	75.00
WELLS FARGO CREDIT CARD A...	Amzn Mktp US Rm3x14fa1 Ray..	09/21/2024	Hand sanitizer	530.7300.000.5190	11.99
WELLS FARGO CREDIT CARD A...	Cherokee Manufacturing Joel ...	09/21/2024	Erosion control non-woven G...	530.7300.000.5190	550.00
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Ray R...	09/21/2024	Shovel and contractor bags	530.7300.000.5190	44.95
GERTENS	229459/12	09/26/2024	Grass for Storm Water Mainte...	530.7300.000.5420	62.09
M & J SERVICES, LLC	2984	09/26/2024	Storm sewer patch & repairs	530.7300.000.5420	4,030.00

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ESS BROTHERS & SONS INC	EE6864	09/26/2024	Storm Water Castings	530.7300.000.5420	14,809.00
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	530.7300.000.5058	7.23
M & J SERVICES, LLC	2996	10/03/2024	Storm sewer & curbside repairs	530.7300.000.5420	2,380.00
Fund 530 - STORM WATER-OPERATING Total:					22,045.91

Fund: 550 - INVER WOOD GOLF COURSE

COLLEGE CITY BEVERAGE	1064471	09/19/2024	alcohol for resale	550.7600.000.5199	281.85
COLLEGE CITY BEVERAGE	1067112	09/19/2024	alcohol for resale	550.7600.000.5199	302.15
BREAKTHRU BEVERAGE MINN...	117649780	09/19/2024	alcohol for resale	550.7600.000.5199	320.00
BREAKTHRU BEVERAGE MINN...	117759914	09/19/2024	alcohol for resale	550.7600.000.5199	434.50
UNIFIRST CORPORATION	1410064831	09/19/2024	lobby mats	550.7600.000.5310	45.34
UNIFIRST CORPORATION	1410081699	09/19/2024	uniforms and towels	550.7700.000.5175	38.39
SHAMROCK GROUP	3057019	09/19/2024	ice for beverage resale	550.7600.000.5197	175.31
SHAMROCK GROUP	3061351	09/19/2024	ice for beverage resale	550.7600.000.5197	170.68
SHAMROCK GROUP	3066133	09/19/2024	ice for beverage resale	550.7600.000.5197	64.19
SHAMROCK GROUP	3068404	09/19/2024	ice for beverage resale	550.7600.000.5197	91.97
SHAMROCK GROUP	3068900	09/19/2024	ice for beverage resale	550.7600.000.5197	105.86
DENNY'S 5TH AVENUE BAKERY	35245	09/19/2024	breads for food resale	550.7600.000.5197	110.21
DENNY'S 5TH AVENUE BAKERY	35436	09/19/2024	breads for food resale	550.7600.000.5197	127.09
DENNY'S 5TH AVENUE BAKERY	35531	09/19/2024	breads for food resale	550.7600.000.5197	118.65
DENNY'S 5TH AVENUE BAKERY	35623	09/19/2024	breads for food resale	550.7600.000.5197	147.01
ARTISAN BEER COMPANY	3710652	09/19/2024	alcohol for resale	550.7600.000.5199	341.60
ARTISAN BEER COMPANY	3712409	09/19/2024	alcohol for resale	550.7600.000.5199	281.60
M. AMUNDSON LLP	389442	09/19/2024	snacks for resale	550.7600.000.5197	340.25
NAPA OF INVER GROVE HEIG...	432548	09/19/2024	Oil filters (24) for equipment r...	550.7700.000.5405	321.70
COCA COLA BOTTLING COMP...	43263985011	09/19/2024	pop & water for resale	550.7600.000.5197	1,040.45
COCA COLA BOTTLING COMP...	43263985013	09/19/2024	CO2 tank return	550.7600.000.5197	-75.00
SUPERIOR TURF SERVICES INC	5743	09/19/2024	fertilizer range	550.7700.000.5135	363.29
PHILLIPS WINE & SPIRITS	6846496	09/19/2024	alcohol for resale	550.7600.000.5199	271.12
PERFORMANCE FOOD GROUP ...	73406613	09/19/2024	returned wrong trays for food ...	550.7600.000.5197	-38.05
PERFORMANCE FOOD GROUP ...	73422362	09/19/2024	food & beverage supplies for r...	550.7600.000.5197	756.43
PERFORMANCE FOOD GROUP ...	73454640	09/19/2024	returned wrong boxes for food..	550.7600.000.5197	-103.41
PLUNKETT'S PEST CONTROL	8772047	09/19/2024	pest control svcs 9.9.2024	550.7600.000.5310	80.66
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Leon Otnes...	09/21/2024	Wasp/hornet bee killer	550.7600.000.5125	10.79
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Leon Otnes...	09/21/2024	Water Softener Salt	550.7600.000.5190	34.56
WELLS FARGO CREDIT CARD A...	Ace Hardware 693 Matt Moyni...	09/21/2024	Amor all	550.7600.000.5190	69.16
WELLS FARGO CREDIT CARD A...	Cedar Small Engine Co Timoth...	09/21/2024	string trimmer string	550.7700.000.5125	67.65
WELLS FARGO CREDIT CARD A...	Cub Foods #1639 Matt Moyni...	09/21/2024	Lettuce	550.7600.000.5197	11.94
WELLS FARGO CREDIT CARD A...	Cub Foods #1639 Matt Moyni...	09/21/2024	Lettuce	550.7600.000.5197	21.13
WELLS FARGO CREDIT CARD A...	Cub Foods #1639 Matt Moyni...	09/21/2024	club soda and tonic water, clo...	550.7600.000.5197	27.79
WELLS FARGO CREDIT CARD A...	Cub Foods #1695 Matt Moyni...	09/21/2024	Tonic water	550.7600.000.5197	4.87
WELLS FARGO CREDIT CARD A...	Cub Foods #1695 Matt Moyni...	09/21/2024	Lettuce	550.7600.000.5197	11.94
WELLS FARGO CREDIT CARD A...	Cub Foods #1695 Matt Moyni...	09/21/2024	Club soda & Tonic water	550.7600.000.5197	13.88
WELLS FARGO CREDIT CARD A...	Golf Course Superinten Joel ...	09/21/2024	Aaron dues for GCSAA	550.7700.000.5335	240.00
WELLS FARGO CREDIT CARD A...	Harbor Freight Tools 6 Timoth...	09/21/2024	Tin snips, cutters, pliers and ti...	550.7700.000.5160	77.09
WELLS FARGO CREDIT CARD A...	Metro Cash Register, I Matt ...	09/21/2024	Thermal paper rolls	550.7600.000.5190	211.14
WELLS FARGO CREDIT CARD A...	Napa Store 3279003 Timothy ...	09/21/2024	Fuel line	550.7700.000.5405	21.44
WELLS FARGO CREDIT CARD A...	Napa Store 3279003 Timothy ...	09/21/2024	equipment battery	550.7700.000.5405	144.46
WELLS FARGO CREDIT CARD A...	Napa Store 3279003 Timothy ...	09/21/2024	battery	550.7700.000.5405	144.46
WELLS FARGO CREDIT CARD A...	Officemax/Depot 6384 Matt ...	09/21/2024	Adding machine tape	550.7600.000.5125	73.49
WELLS FARGO CREDIT CARD A...	Pos Portal Matt Moyni WF 08...	09/21/2024	New CC reader	550.7600.000.5160	580.68
WELLS FARGO CREDIT CARD A...	Sams Club #4738 Matt Moyni...	09/21/2024	Cups and Tomatoes	550.7600.000.5197	88.85
WELLS FARGO CREDIT CARD A...	Samsclub #4738 Matt Moyni ...	09/21/2024	coffee cup for fb	550.7600.000.5190	24.85
WELLS FARGO CREDIT CARD A...	Samsclub #4738 Matt Moyni ...	09/21/2024	Straws	550.7600.000.5190	12.85
WELLS FARGO CREDIT CARD A...	Samsclub #4738 Matt Moyni ...	09/21/2024	Breakfast sandwiches	550.7600.000.5197	27.96
WELLS FARGO CREDIT CARD A...	Samsclub #4738 Matt Moyni ...	09/21/2024	Tomatoes	550.7600.000.5197	9.52
WELLS FARGO CREDIT CARD A...	Samsclub #4738 Matt Moyni ...	09/21/2024	Breakfast sandwiches	550.7600.000.5197	27.96
WELLS FARGO CREDIT CARD A...	Target 00025197 Matt Moyni...	09/21/2024	Ziploc bags	550.7600.000.5125	6.48
WELLS FARGO CREDIT CARD A...	Target 00025197 Matt Moyni...	09/21/2024	Tonic water and Club soda	550.7600.000.5197	8.40
WELLS FARGO CREDIT CARD A...	The Home Depot #2845 Timot...	09/21/2024	Sealant, toilet flapper, hitch ba...	550.7700.000.5125	150.37
WELLS FARGO CREDIT CARD A...	The Home Depot #2845 Timot...	09/21/2024	Tape, mat, hose, braces and p...	550.7700.000.5125	274.54

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WELLS FARGO CREDIT CARD A...	The Home Depot #2845 Timot...	09/21/2024	Brass nipples	550.7700.000.5125	72.19
HERITAGE LANDSCAPE SUPPLY...	0017218968-001	09/26/2024	Chemicals for golf greens	550.7700.000.5135	45.61
HERITAGE LANDSCAPE SUPPLY...	0017709095-001	09/26/2024	Chemicals for golf course	550.7700.000.5135	161.58
YAMAHA GOLF & UTILITY, INC.	01-307550	09/26/2024	parts for golf carts	550.7600.000.5405	1,230.81
YAMAHA GOLF & UTILITY, INC.	01-307553	09/26/2024	part for golf cart	550.7600.000.5405	99.10
COLLEGE CITY BEVERAGE	1069442	09/26/2024	alcohol for resale	550.7600.000.5199	223.60
BREAKTHRU BEVERAGE MINN...	117863882	09/26/2024	Alcohol for resale	550.7600.000.5199	469.80
SIGNAL SYSTEMS INC	13099173	09/26/2024	time cards	550.7600.000.5105	66.86
UNIFIRST CORPORATION	1410087627	09/26/2024	uniforms and towels 9.16.2024	550.7700.000.5175	41.31
UNIFIRST CORPORATION	1410087628	09/26/2024	lobby mats/towels 9.16.2024	550.7600.000.5310	45.34
UNIFIRST CORPORATION	1410089175	09/26/2024	uniforms and towels 9.23.2024	550.7700.000.5175	41.31
MTI DISTRIBUTING CO	1439020-00	09/26/2024	Mobile service visit to repair e...	550.7700.000.5405	375.00
MTI DISTRIBUTING CO	1446113-00	09/26/2024	Misc parts for equipment repa...	550.7700.000.5405	225.39
MTI DISTRIBUTING CO	1447271-00	09/26/2024	Parts for mower repair	550.7700.000.5405	3,254.63
MTI DISTRIBUTING CO	1447366-00	09/26/2024	equipment repair credit for sh...	550.7700.000.5405	-165.36
MTI DISTRIBUTING CO	1449055-00	09/26/2024	Tires for future repairs	550.7700.000.5150	316.82
MSP CONTAINERS LLC	1469	09/26/2024	storage containers	550.7700.000.5160	7,785.00
SHAMROCK GROUP	3070575	09/26/2024	ice for beverage resale	550.7600.000.5197	129.01
SHAMROCK GROUP	3071032	09/26/2024	ice for beverage resale	550.7600.000.5197	73.45
DENNY'S 5TH AVENUE BAKERY	35803	09/26/2024	Breads for food resale	550.7600.000.5197	127.09
DENNY'S 5TH AVENUE BAKERY	35885	09/26/2024	Breads for resale	550.7600.000.5197	110.21
ARTISAN BEER COMPANY	3706965	09/26/2024	alcohol for resale	550.7600.000.5199	447.75
ARTISAN BEER COMPANY	3714114	09/26/2024	alcohol for resale	550.7600.000.5199	203.10
M. AMUNDSON LLP	390320	09/26/2024	snacks for food resale	550.7600.000.5197	275.83
HEGGIES PIZZA	483878	09/26/2024	Pizzas for resale	550.7600.000.5197	101.90
MOR GOLF & UTILITY, INC.	49682	09/26/2024	Cables, axle and bearings for c...	550.7600.000.5405	217.07
CINTAS CORPORATION	5231471607	09/26/2024	first aid supplies	550.7600.000.5190	146.95
PHILLIPS WINE & SPIRITS	6831614	09/26/2024	alcohol for resale	550.7600.000.5199	551.94
PHILLIPS WINE & SPIRITS	6850392	09/26/2024	alcohol for resale	550.7600.000.5199	235.24
PERFORMANCE FOOD GROUP ...	73555474	09/26/2024	returned wrong food trays	550.7600.000.5197	-38.07
PERFORMANCE FOOD GROUP ...	73567772	09/26/2024	dishwasher detergent	550.7600.000.5125	151.80
PERFORMANCE FOOD GROUP ...	73615378	09/26/2024	Gloves & Towels	550.7600.000.5125	101.56
PERFORMANCE FOOD GROUP ...	73615378	09/26/2024	Food for resale	550.7600.000.5197	744.99
TRI-STATE BOBCAT INC.	P23481	09/26/2024	Choke knob and oil for repairs	550.7700.000.5405	58.55
DAKOTA ELECTRIC ASSN	200002013605 9/30/2024	09/30/2024	Electric	550.7700.000.5355	174.22
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	550.7600.000.5058	17.24
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	550.7700.000.5058	13.00
ARAMARK REFRESHMENT SER...	06050248	10/03/2024	coffee for resale	550.7600.000.5197	99.06
UNIFIRST CORPORATION	1410090512	10/03/2024	uniforms and towels	550.7700.000.5175	41.31
UNIFIRST CORPORATION	1410090513	10/03/2024	lobby mats	550.7600.000.5310	45.34
COVERALL NORTH AMERICA I...	1590039505	10/03/2024	10.2024 Club House cleaning s...	550.7600.000.5310	1,459.69
GERTENS	229891/12	10/03/2024	Limestone gravel	550.7700.000.5125	333.20
SHAMROCK GROUP	3074638	10/03/2024	ice for beverage resale	550.7600.000.5197	96.00
DENNY'S 5TH AVENUE BAKERY	35981	10/03/2024	breads for resale	550.7600.000.5197	110.21
DENNY'S 5TH AVENUE BAKERY	36154	10/03/2024	breads for resale	550.7600.000.5197	135.53
DENNY'S 5TH AVENUE BAKERY	36309	10/03/2024	breads for resale	550.7600.000.5197	110.21
ARTISAN BEER COMPANY	3715839	10/03/2024	alcohol for resale	550.7600.000.5199	318.50
COCA COLA BOTTLING COMP...	43462803014	10/03/2024	pop & water for resale	550.7600.000.5197	1,323.76
COCA COLA BOTTLING COMP...	43462803016	10/03/2024	CO2 tank return	550.7600.000.5197	-75.00
PERFORMANCE FOOD GROUP ...	73713429	10/03/2024	supplies for club house & F&B	550.7600.000.5125	138.37
PERFORMANCE FOOD GROUP ...	73713429	10/03/2024	cups/lids for beverage resale	550.7600.000.5197	168.80
PERFORMANCE FOOD GROUP ...	73713429	10/03/2024	foods for resale	550.7600.000.5197	535.20
CINTAS CORPORATION	9290083223	10/03/2024	9.30.24 AED agreement	550.7600.000.5310	216.25
MANSFIELD SERVICE PARTNE...	IN-00102836	10/03/2024	fuel for golf carts	550.7600.000.5130	1,219.43
Fund 550 - INVER WOOD GOLF COURSE Total:					32,919.77
Fund: 602 - RISK MANAGEMENT					
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	602.8200.000.5058	0.71
LEAGUE OF MN CITIES INS TR...	22985	10/03/2024	W/C Deductible #00496797	602.8200.000.5474	115.63
LEAGUE OF MN CITIES INS TR...	22994	10/03/2024	W/C Deductible #00499684	602.8200.000.5474	103.78
LEAGUE OF MN CITIES INS TR...	23050	10/03/2024	W/C Deductible #00504423	602.8200.000.5474	393.07

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LEAGUE OF MN CITIES INS TR...	9/25/2024	10/03/2024	Add'l Coverage: Emergency Si...	602.8200.000.5470	611.00
Fund 602 - RISK MANAGEMENT Total:					1,224.19
Fund: 603 - CENTRAL EQUIPMENT					
FERRELLGAS	1127638529	09/19/2024	Motor fuel for patching truck	603.8300.000.5410	100.50
MN DEPT OF REVENUE	9/19/2024	09/19/2024	Petro license renewal	603.8300.000.5335	25.00
SNAP-ON INDUSTRIAL	ARV/62383369	09/19/2024	Solus plus	603.8300.000.5160	783.54
WELLS FARGO CREDIT CARD A... Amazon Mktp R49wb95t2 Bar...	09/21/2024		Magnifier lens for welding he...	603.8300.000.5160	28.47
WELLS FARGO CREDIT CARD A... Amazon Mktpplace Pmts Barry...	09/21/2024		Magnifier lens for welding he...	603.8300.000.5160	-28.47
WELLS FARGO CREDIT CARD A... Amazon.Com Rm2ie7zb2 Rick ...	09/21/2024		Seat covers for fire truck	603.8300.000.5410	210.88
WELLS FARGO CREDIT CARD A... Amazon.Com Ru61d4hn1 Barr...	09/21/2024		AA and AAA batteries for shop...	603.8300.000.5190	43.96
WELLS FARGO CREDIT CARD A... Amzn Mktp US Rm77z96i1 Joel..	09/21/2024		Receiver hitch	603.8300.000.5410	97.43
WELLS FARGO CREDIT CARD A... Menards West St Paul M Joel ...	09/21/2024		Transfer sump pump and hose...	603.8300.000.5160	70.98
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Break lube	603.8300.000.5150	22.49
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Copper plug	603.8300.000.5150	8.48
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		2" pop-in wheel	603.8300.000.5150	29.94
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Battery for generator	603.8300.000.5405	136.45
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Forklift battery	603.8300.000.5405	126.26
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Battery for roller	603.8300.000.5405	125.71
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Motor oil	603.8300.000.5405	14.98
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Connector for generator	603.8300.000.5405	11.04
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Motor oil	603.8300.000.5405	22.47
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Megacrimps and fittings for Sk...	603.8300.000.5405	97.61
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Tractor cabin filters	603.8300.000.5405	44.26
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Air filters	603.8300.000.5405	64.66
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Oil filters	603.8300.000.5410	15.87
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Brake fluid	603.8300.000.5410	9.99
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Seat covers for fire squad car	603.8300.000.5410	119.98
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Oil filters	603.8300.000.5410	71.84
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Oil filters	603.8300.000.5410	35.07
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Brake pads & rotors	603.8300.000.5410	339.98
WELLS FARGO CREDIT CARD A... Oreilly 1767 Rick Jacks WF 08/...	09/21/2024		Alternator	603.8300.000.5410	312.73
OXYGEN SERVICE COMPANY, ...	0003594792	09/26/2024	Oxygen tank for the shop	603.8300.000.5150	17.98
NORTH AMERICAN TRAILER S...	030004230638	09/26/2024	Dump truck tubing	603.8300.000.5410	46.39
FACTORY MOTOR PARTS COM...	1-10011068	09/26/2024	Stock filters	603.8300.000.5410	249.82
FACTORY MOTOR PARTS COM...	1-10033412	09/26/2024	Stock filters	603.8300.000.5410	197.65
BEAUDRY OIL & SERVICE INC	1117089	09/26/2024	Unleaded Fuel	603.8300.000.5130	12,485.37
BEAUDRY OIL & SERVICE INC	1117090	09/26/2024	Diesel fuel	603.8300.000.5130	7,529.89
BEAUDRY OIL & SERVICE INC	1117091	09/26/2024	Diesel fuel	603.8300.000.5130	1,253.78
EMERGENCY APPARATUS MA...	133249	09/26/2024	Fire truck service pump test &...	603.8300.000.5410	1,056.47
EMERGENCY APPARATUS MA...	133250	09/26/2024	Fire truck service pump test &...	603.8300.000.5410	699.08
EMERGENCY APPARATUS MA...	133251	09/26/2024	Fire truck service pump test &...	603.8300.000.5410	536.32
EMERGENCY APPARATUS MA...	133252	09/26/2024	Fire truck service pump test &...	603.8300.000.5410	1,028.22
EMERGENCY APPARATUS MA...	133253	09/26/2024	Fire truck service pump test &...	603.8300.000.5410	2,667.94
EMERGENCY APPARATUS MA...	133254	09/26/2024	Fire truck service pump test &...	603.8300.000.5410	2,209.49
EMERGENCY APPARATUS MA...	133255	09/26/2024	Fire truck service pump test &...	603.8300.000.5410	2,011.89
UNIFIRST CORPORATION	1410086389	09/26/2024	Uniforms-Mechanics 9.9.2024	603.8300.000.5175	28.18
UNIFIRST CORPORATION	1410086389	09/26/2024	Shop Rentals 9.9.2024	603.8300.000.5430	173.13
UNIFIRST CORPORATION	1410087625	09/26/2024	Uniforms-Mechanics 9.16.2024	603.8300.000.5175	28.18
UNIFIRST CORPORATION	1410087625	09/26/2024	Shop Rentals 9.16.2024	603.8300.000.5430	154.97
UNIFIRST CORPORATION	1410089173	09/26/2024	Mechanics Uniforms 9.23.2024	603.8300.000.5175	28.18
UNIFIRST CORPORATION	1410089173	09/26/2024	Shop Rentals 9.23.2024	603.8300.000.5430	166.11
MTI DISTRIBUTING CO	1447724-00	09/26/2024	Fuel pump	603.8300.000.5405	168.25
MTI DISTRIBUTING CO	1448317-00	09/26/2024	Fuel pump returns	603.8300.000.5405	-152.13
FACTORY MOTOR PARTS COM...	1-Q07742	09/26/2024	Stock battery	603.8300.000.5410	206.96
FACTORY MOTOR PARTS COM...	1-Q07829	09/26/2024	Battery for FD squad car	603.8300.000.5410	166.46
SOUTH EAST TOWING, Inc.	244342	09/26/2024	Fire truck towing fees	603.8300.000.5310	660.00
DIAMOND MOWERS INC	271241	09/26/2024	Flail mower coupling spline	603.8300.000.5405	166.40
L.T.G. POWER EQUIPMENT	288301	09/26/2024	Mower starter	603.8300.000.5405	310.29
DELEGARD TOOLS	416792/1	09/26/2024	Inflator & chemical resistant b...	603.8300.000.5160	368.75
CINTAS CORPORATION	4205502716	09/26/2024	Shop Rug Rentals	603.8300.000.5430	324.25

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TOWMASTER TRAILERS INC	471758	09/26/2024	Strobe light for F550	603.8300.000.5410	875.00
WORLD FUEL SERVICES	491591551856-41801	09/26/2024	Stock oil	603.8300.000.5410	1,008.59
WORLD FUEL SERVICES	491593982035-41801	09/26/2024	Dump truck diesel fuel	603.8300.000.5410	196.40
INVER GROVE FORD	5348167	09/26/2024	Mounting kit for squad car	603.8300.000.5410	23.12
INVER GROVE FORD	5348172	09/26/2024	Squad car brake lining	603.8300.000.5410	72.22
BIG TOP RENTAL, INC.	79502	09/26/2024	PW portable restroom rental 7..	603.8300.000.5430	70.00
BIG TOP RENTAL, INC.	79503	09/26/2024	PW portable restroom rental 8..	603.8300.000.5430	70.00
GRAINGER	9253132451	09/26/2024	Out of service tags and batteri...	603.8300.000.5150	40.43
SNAP-ON INDUSTRIAL	ARV/62474680	09/26/2024	1/4" shank driver	603.8300.000.5160	25.61
INTERSTATE POWER SYSTEMS,...	C001210176-01	09/26/2024	Stock Transmission Filters	603.8300.000.5410	543.72
TRENCHERS PLUS, INC.	IT10401	09/26/2024	Winch rope for chipper machi...	603.8300.000.5405	541.80
MACQUEEN EMERGENCY GR...	P11530	09/26/2024	Brackets, nuts & screws for Fir...	603.8300.000.5410	74.36
MACQUEEN EMERGENCY GR...	P11539	09/26/2024	Fire truck battery charger	603.8300.000.5410	1,255.40
MACQUEEN EMERGENCY GR...	P11543	09/26/2024	Fire truck switches	603.8300.000.5410	419.16
TRI-STATE BOBCAT INC.	P23747	09/26/2024	Skid loader sheds	603.8300.000.5405	1,531.80
TRI-STATE BOBCAT INC.	P23748	09/26/2024	Skid loader filters & filter fuel	603.8300.000.5405	221.89
TRI-STATE BOBCAT INC.	P24683	09/26/2024	Stock filters	603.8300.000.5405	158.91
TRI-STATE BOBCAT INC.	P24684	09/26/2024	Toolcat filters	603.8300.000.5405	88.54
NUSS TRUCK AND EQUIPMENT	PSO134579-1	09/26/2024	Relay valve and modulator for...	603.8300.000.5410	1,297.87
NUSS TRUCK AND EQUIPMENT	PSO134579-2	09/26/2024	Credit for modulator return	603.8300.000.5410	-140.00
NUSS TRUCK AND EQUIPMENT	PSO136694-1	09/26/2024	Patch truck pressure sensor	603.8300.000.5410	196.37
NUSS TRUCK AND EQUIPMENT	PSO136694-2	09/26/2024	Aftermarket kit for patch truck	603.8300.000.5410	63.04
ZIEGLER INC	SI000534996	09/26/2024	Generator repairs	603.8300.000.5405	726.26
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	603.8300.000.5058	10.74
ARROW PEST CONTROL	10257	10/03/2024	pest control in maintenance b...	603.8300.000.5310	74.00
FACTORY MOTOR PARTS COM...	1-10077055	10/03/2024	Stock Filters	603.8300.000.5410	208.60
FACTORY MOTOR PARTS COM...	1-10077071	10/03/2024	Breather & Fuel Filters for Loa...	603.8300.000.5410	42.69
FACTORY MOTOR PARTS COM...	1-10077073	10/03/2024	Stock filters	603.8300.000.5410	186.80
OVERHEAD DOOR CO OF THE ...	137317	10/03/2024	Door inspections	603.8300.000.5400	958.65
UNIFIRST CORPORATION	1410090510	10/03/2024	Mechanic Uniforms	603.8300.000.5175	28.18
UNIFIRST CORPORATION	1410090510	10/03/2024	Shop Rentals	603.8300.000.5430	171.38
PERFECTION PLUS, INC	315634	10/03/2024	10.2024 cleaning svcs	603.8300.000.5310	521.62
C.J. SPRAY, INC.	3254544	10/03/2024	Linelazer painter spray tips	603.8300.000.5405	79.06
TOTAL CONSTRUCTION & EQU...	40400	10/03/2024	Overhead hoist repairs	603.8300.000.5400	339.80
CINTAS CORPORATION	4206919413	10/03/2024	Rug rentals	603.8300.000.5430	437.73
WORLD FUEL SERVICES	494454302718-41801	10/03/2024	Stock oil	603.8300.000.5410	1,916.54
INVER GROVE FORD	5348419	10/03/2024	TPMS Sensor Kit for Squad Car	603.8300.000.5410	52.89
INVER GROVE FORD	5348512	10/03/2024	Mirror assembly for squad car	603.8300.000.5410	327.22
INVER GROVE FORD	5348542	10/03/2024	Brake Lining Squad Car	603.8300.000.5410	380.65
INVER GROVE FORD	5348804	10/03/2024	Fire truck latch	603.8300.000.5410	70.52
INVER GROVE FORD	5348816	10/03/2024	Misc. parts for F250 repairs	603.8300.000.5410	250.98
INVER GROVE FORD	5348818	10/03/2024	PD squad car brake lining	603.8300.000.5410	74.98
INVER GROVE FORD	5348856	10/03/2024	F250 ignition coil	603.8300.000.5410	114.54
INVER GROVE FORD	5348880	10/03/2024	Brake parts for unmarked squ...	603.8300.000.5410	229.97
INVER GROVE FORD	5348881	10/03/2024	Brake rotors for unmarked sq...	603.8300.000.5410	257.60
INVER GROVE FORD	5348882	10/03/2024	Fire truck latch	603.8300.000.5410	72.93
INVER GROVE FORD	5348989	10/03/2024	Screws for F250 repairs	603.8300.000.5410	26.18
INVER GROVE FORD	5348994	10/03/2024	F250 ignition coil	603.8300.000.5410	114.54
POMP'S TIRE SERVICE, INC.	980124404	10/03/2024	F250 tires	603.8300.000.5410	606.08
CENTENNIAL GLASS	I00014274	10/03/2024	Squad car windshield repairs	603.8300.000.5410	440.00
NUSS TRUCK AND EQUIPMENT	PSO140368-1	10/03/2024	Dump truck sensors	603.8300.000.5410	1,422.82
NUSS TRUCK AND EQUIPMENT	PSO140368-2	10/03/2024	Credit - returned sensors	603.8300.000.5410	-216.00
NUSS TRUCK AND EQUIPMENT	SWO034479-1	10/03/2024	Dump truck venturi pipe and ...	603.8300.000.5410	2,540.61
MACQUEEN EMERGENCY GR...	W06506	10/03/2024	Fire truck water leak	603.8300.000.5410	263.17
MACQUEEN EMERGENCY GR...	W14710	10/03/2024	Sweeper machine broom repa...	603.8300.000.5405	868.30
Fund 603 - CENTRAL EQUIPMENT Total:					59,964.63
Fund: 605 - CITY FACILITIES					
HUEBSCH SERVICES	20345672	09/19/2024	lobby mats	605.8500.000.5430	176.60
GRAINGER	9238881560	09/19/2024	cleaning supplies	605.8500.000.5125	191.12
GRAINGER	9244130440	09/19/2024	Gas solenoid valve for fire stat...	605.8500.000.5150	163.86

Expense Approval Report

Payment Dates: 9/18/2024 - 10/8/2024

Vendor Name	Payable Number	Post Date	Description (Item)	Account Number	Amount
WELLS FARGO CREDIT CARD A...	Amazon MktpL Rk9pp1e22 Pat...	09/21/2024	Pressure washer	605.8500.000.5160	227.69
WELLS FARGO CREDIT CARD A...	Amazon MktpL Ru43z1vy0 Teri...	09/21/2024	umbrella & stand for City Hall ...	605.8500.000.5190	212.82
WELLS FARGO CREDIT CARD A...	Department Of Labor An Aaro...	09/21/2024	Aaron F boiler license renewal	605.8500.000.5335	20.00
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Patric...	09/21/2024	more stain for fire station 3 ro...	605.8500.000.5150	57.53
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Patric...	09/21/2024	sealant for fence and brushes	605.8500.000.5150	73.00
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Patric...	09/21/2024	Towels, trowel and roof seala...	605.8500.000.5150	150.67
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Patric...	09/21/2024	JB weld for fixing leaky toilet in...	605.8500.000.5150	14.96
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Patric...	09/21/2024	stain for fire station 3 rooftop...	605.8500.000.5150	37.97
WELLS FARGO CREDIT CARD A...	The Home Depot #2843 Patric...	09/21/2024	Microwave for police depart...	605.8500.000.5160	83.00
MEI TOTAL ELEVATOR SOLUTI...	1092139	09/26/2024	cellular dialer device & installa...	605.8500.000.5400	600.00
APEC	125828	09/26/2024	HVAC filters FS #2	605.8500.000.5125	414.29
APEC	125829	09/26/2024	HVAC filters for fire station #3	605.8500.000.5125	61.37
APEC	125830	09/26/2024	HVAC filters for fire station #1	605.8500.000.5125	103.16
APEC	125831	09/26/2024	HVAC filters for City Hall & PD	605.8500.000.5125	1,488.77
TWIN CITY GARAGE DOOR	387340649	09/26/2024	repaired eye sensor garage do...	605.8500.000.5400	586.12
TOTAL CONSTRUCTION & EQU...	40401	09/26/2024	garage door power repair	605.8500.000.5400	577.00
ALL FLAGS, LLC	435604	09/26/2024	USA, POW & MN flags for VM...	605.8500.000.5125	916.16
CINTAS CORPORATION	5229812792	09/26/2024	first aid supplies refill in PD br...	605.8500.000.5190	231.44
NASSEFF PLUMBING & HEATI...	62101	09/26/2024	rebuilt RPZ near fire suppressi...	605.8500.000.5400	1,442.29
GRAINGER	9249647265	09/26/2024	nitrile gloves	605.8500.000.5125	55.62
JAYSON DIGIDIO	9/30/2024	09/30/2024	Food truck reimbursement	605.8500.000.5490	20.00
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	605.8500.000.5058	10.08
LVC COMPANIES, INC.	151696	10/03/2024	Water Plant Fire Alarm Retrofit	605.8500.000.5605	15,376.67
HUEBSCH SERVICES	20349143	10/03/2024	lobby mats	605.8500.000.5430	176.60
PERFECTION PLUS, INC	315634	10/03/2024	10.2024 cleaning svcs	605.8500.000.5310	5,133.19
Fund 605 - CITY FACILITIES Total:					28,601.98

Fund: 606 - TECHNOLOGY FUND

WELLS FARGO CREDIT CARD A...	Amazon MktpL Rk0fs36n2 Mar...	09/21/2024	Laptop stand and mount	606.8600.000.5105	53.95
WELLS FARGO CREDIT CARD A...	Amazon MktpL Rk9pg2nx1 Ma...	09/21/2024	Laptop stand and mount	606.8600.000.5105	62.98
WELLS FARGO CREDIT CARD A...	Amazon MktpL Rv9jq5rw1 Ma...	09/21/2024	iPad case replacement	606.8600.000.5190	65.99
WELLS FARGO CREDIT CARD A...	Amzn Mktp US R43v48np1 Ma...	09/21/2024	ID printer ink	606.8600.000.5105	58.92
WELLS FARGO CREDIT CARD A...	Dnh Godaddy#3219038664 M...	09/21/2024	Domain Name registration	606.8600.000.5335	899.98
WELLS FARGO CREDIT CARD A...	Esri Marc Gade WF 08/24	09/21/2024	GIS ESRI Training	606.8600.000.5340	1,920.00
WELLS FARGO CREDIT CARD A...	Idzones Levata Marc Gade WF...	09/21/2024	ID Printer	606.8600.000.5160	997.99
WELLS FARGO CREDIT CARD A...	Zoom.U5 888-799-9666 Marc ...	09/21/2024	Zoom license for Parks & Recr...	606.8600.000.5395	31.98
INSIGHT PUBLIC SECTOR	1101200577	09/26/2024	Office 365 Monthly license 8....	606.8600.000.5395	2,577.50
AT&T MOBILITY	287298707874X09032024	09/26/2024	FD Cell Phones 8.25.2024	606.8600.000.5320	1,012.32
AT&T MOBILITY	287298708193X09032024	09/26/2024	PD Cell Phones 8.25.2024	606.8600.000.5320	2,953.46
AT&T MOBILITY	287299110577X09032024	09/26/2024	Cell Phones 8.25.2024	606.8600.000.5320	3,476.12
MARCO TECHNOLOGIES, LLC	37399186	09/26/2024	Printers & Copiers Contract 9...	606.8600.000.5430	6,427.33
LOCAL GOVERNMENT INFOR...	69014	09/26/2024	PD Network Services 01.01.24 ...	606.8600.000.5395	870.00
VERIZON WIRELESS	9972214174	09/26/2024	Monthly Cell Phones 8.2024	606.8600.000.5320	600.17
CDW GOVERNMENT INC	AA5HR6A	09/26/2024	65W USB-C AC Adapter	606.8600.000.5190	60.88
SPOK, INC.	H0317493U	09/26/2024	Monthly Translation Svcs 8.20...	606.8600.000.5395	5.57
INNOVATIVE OFFICE SOLUTIO...	IN4647164	09/26/2024	Copier/Printer Paper	606.8600.000.5105	187.52
MEDSURETY, LLC	IN34422	09/30/2024	Payroll	606.8600.000.5058	28.00
INNOVATIVE OFFICE SOLUTIO...	IN4651132	10/03/2024	Paper for copy room	606.8600.000.5105	93.76
HARRIS COMPUTER SYSTEMS	MUNCT0001096	10/03/2024	Business Licensing Module	606.8600.000.5395	6,825.00
Fund 606 - TECHNOLOGY FUND Total:					29,209.42

Fund: 702 - ESCROW FUND

ST. PAUL PIONEER PRESS	0824572521	09/19/2024	NoPH: Insite Dev - 24-35VAC	702.5100.229.2050	24.96
ST. PAUL PIONEER PRESS	0824572521	09/19/2024	NoPH - IG Hospitality 24-28IUP	702.5100.239.2050	23.92
ST. PAUL PIONEER PRESS	0824572521	09/19/2024	2024 Ultra-Thin Bonc	702.5100.241.2050	187.20
ST. PAUL PIONEER PRESS	0824572521	09/19/2024	NoPH: Xcel Energy 24-32CV	702.5100.241.2050	28.60
SHORT ELLIOTT HENDRICKSON...	473618	09/19/2024	Progress Billing	702.3100.294.2050	906.00
BUILDER'S LOT GROUP, LLC.	9/17/2024	09/26/2024	Escrow LOC Release - Ruby M...	702.3100.226.2050	13,936.25
BUILDER'S LOT GROUP, LLC.	9/17/2024	09/26/2024	Escrow Release - Ruby Mead...	702.3100.233.2050	11,233.89
BRUCE LENZEN DESIGN BUILD,...	9/18/2024	09/26/2024	Escrow Release - 11880 Albav...	702.3100.299.2050	960.17
BRUCE LENZEN DESIGN BUILD,...	9/18/2024B	09/26/2024	LAP Escrow Release - 11880 A...	702.3100.300.2050	10,000.00

Expense Approval Report

Payment Dates: 9/18/2024 - 10/8/2024

Vendor Name	Payable Number	Post Date	Description (Item)	Account Number	Amount
WSB & ASSOCIATES, INC.	R-024005-000-3	10/03/2024	Stormwater Design Review for...	702.5100.220.2050	1,380.50
Fund 702 - ESCROW FUND Total:					38,681.49
Grand Total:					3,536,615.58



Request for Council Action

SUBJECT: **Personnel Actions**

MEETING DATE: October 14, 2024

ITEM TYPE: Consent Agenda

CONTACT: Cora Bauer, HR Coordinator, 651.450.2490

ACTION REQUESTED

The Council is asked to confirm and approve the personnel actions as attached.

BACKGROUND

The attached listing of hires, promotions, resignations and/or retirements is presented for Council approval. Data contained in the attachment is not public information until after Council takes action and therefore the attachment is not visible to the public prior to approval.

FISCAL IMPACT

All positions to be filled are funded within the adopted City budget.

RECOMMENDATION

Staff recommends approval of the attached personnel actions.

ATTACHMENTS

1. Personnel Actions 10.14.24 (hires-terms)



Personnel Actions - Council Agenda Attachment

Meeting Date:	October 14, 2024
Item Type:	Consent Agenda
Contact:	Cora Bauer
Prepared by:	Cora Bauer
Reviewed by:	Janet Shefchik, HR Manager

Seasonal/Temporary Employment Hires:

Lexy Banitt, Police Cadet
Kieran Mountain, Operations Assistant I VMCC
Cade Fitzloff, Operations Assistant I VMCC
Audrey Swartz, Golf Course Concessionaire
Ryan Gervais, Operations Assistant II VMCC
Logan Chatleain, Golf Course Operations
Mason McKnight, Operations Assistant I VMCC
Owen Nielsen, Operations Assistant I VMCC
Kierra Henderson, Non-certified Swim Instructor

Voluntary Resignations, Retirements and/or Terminations:

Nora Schletty, Recreation Intern
Alex Fredeen, Lead Youth Camp Counselor
Caleb Myran, Lead Youth Camp Counselor
Kyle Deutsch, Assistant Youth Camp Counselor
Anthony Zepeda, Assistant Youth Camp Counselor
Eliana Meyer, Assistant Youth Camp Counselor
Gianna Dvorak, Assistant Youth Camp Counselor
Alyssa Deutsch, Assistant Youth Camp Counselor
Joseph Sanders, Assistant Youth Camp Counselor
Alayna Swainey, Assistant Youth Camp Counselor
Amanda Baars, Assistant Youth Camp Counselor
Alexa Bade, Assistant Youth Camp Counselor
Danika Anderson, Assistant Youth Camp Counselor
Liam Melgaard, Assistant Youth Camp Counselor
Peyton Rosendale, Birthday Party Host
Tania Serafimov, Fitness Instructor



Request for Council Action

SUBJECT: Resolution Amending Position Classification Plan

MEETING DATE: October 14, 2024
ITEM TYPE: Consent Agenda
CONTACT: Janet Shefchik, HR Manager, 651.450.2512
Kris Wilson, City Administrator, 651.450.2511

ACTION REQUESTED

The Council is asked to adopt the attached Resolution, amending the City's position classification plan.

BACKGROUND

To comply with Minnesota Pay Equity law, the City maintains a formal position classification plan that assigns each staff position within the organization to a pay grade. Each pay grade then has a minimum and maximum wage or salary amount, and incremental steps for moving through the range.

A recent vacancy at the Assistant Finance Director level has provided the opportunity to examine the structure of the department for organizational effectiveness. The Assistant Finance Director position is currently responsible for providing direct supervision to all Finance Department staff, with the exception of the Director, and also carrying out several large responsibilities directly. This involves supervising 7.5 FTEs performing a range of work, including project accounting, payroll, accounts payable and accounts receivable / utility billing. Upon review, it is recommended that the Utility Billing Coordinator position be elevated to a supervisory role, supervising 2.5 FTEs focused in the areas of utility billing and accounts receivable, and be shifted to report directly to the Finance Director. The Assistant Finance Director position would then supervise the remaining 4 FTEs and have more time to devote to their direct responsibilities.

A job description was developed for the revised position of Utility Billing & Accounts Receivable Supervisor, to replace the existing position of Utility Billing Coordinator. The new job description was sent to the City's compensation consultant for evaluation, and has been recommended for placement at Grade 20. As a supervisory position, the Utility Billing Accounts Receivable Supervisor will be exempt (i.e. "salaried"). If approved, the City will follow its internal process to formally reclassify the incumbent employee and determine their placement within the new range.

At this time, the Council is asked to adopt an amended position classification plan to reflect the following changes:

Replace the position of Utility Billing Coordinator at Grade 18 with Utility Billing & Accounts Receivable Supervisor at Grade 20.

FISCAL IMPACT

The modest salary increase resulting from this change can be accommodated within the adopted 2024 budget and the preliminary 2025 budget.

RECOMMENDATION

Staff recommends adoption of the attached Resolution, amending the City's position classification plan.

ATTACHMENTS

1. Resolution Approving Amended Position Classification Plan (October 2024)
2. Inver Grove Heights Position Classification Plan (October 2024 amendment)

**CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA**

RESOLUTION NO. 2024-230

RESOLUTION AMENDING THE CITY'S POSITION CLASSIFICATION PLAN

WHEREAS, the City maintains a formal position classification plan that assigns each staff position within the City organization to a pay grade. Each pay grade then has a minimum and maximum wage or salary amount, and incremental steps for moving within the range; and

WHEREAS, from time to time there is a need to amend the classification plan to add or remove positions to coincide with the changing needs of the organization or to adjust the classification of an existing position to maintain competitive rates of pay within the market or reflect changes in job duties.

NOW THEREFORE, BE IT RESOLVED by the Inver Grove Heights City Council that the following changes be made to the City's Position Classification Plan:

Remove the Utility Billing Coordinator position from Grade 18

Add the Utility Billing & Accounts Receivable Supervisor position to Grade 20.

Approved by the City Council of the City of Inver Grove Heights, Minnesota this 14th day of October 2024.

Brenda Dietrich, Mayor

ATTEST:

Rebecca Kiernan, City Clerk

City of Inver Grove Heights Job Ratings – Salary Grade & Exempt Status

Classification Title:	Salary Grade	Exempt Status
City Administrator	31	E
Chief of Police	28	E
Director of Public Works	27	E
Director of Parks & Recreation	27	E
Fire Chief	27	E
Director of Community Development	27	E
Director of Finance	27	E
Deputy Fire Chief	24	E
Police Commander	24	E
Human Resources Manager	24	E
City Engineer	24	E
Technology Manager	23	E
Police Lieutenant	22	E
Assistant Finance Director	22	E
Assistant Chief/Fire Marshal	22	E
Assistant Chief/Fire Ops & Standards	22	E
Chief Building Official	22	E
Assistant City Engineer (P.E.)	21	E
City Planner	21	E
Facilities Maintenance Superintendent	21	E
Parks Superintendent	21	E
Communications Manager	21	E
Recreation Superintendent	21	E
Shift Captain – Fire	21	NE
Street Maintenance Superintendent	21	E
Utilities Superintendent	21	E
Community Center Manager	20	E
Golf Course Clubhouse Superintendent	20	E
Sergeant	20	NE
Utility Billing & Accounts Receivable Supervisor	20	E
City Clerk	19	E
Golf Course Superintendent	19	E
Shift Lieutenant - Fire	19	NE
Associate Planner	18	NE
Fire Operations Supervisor	18	E
Senior Accountant	18	NE
Systems Administrator	18	E
Aquatics Coordinator	17	NE
Firefighter/Fire Inspector	17	NE
Fitness Coordinator	17	NE
Graduate Civil Engineer	17	E
Police Officer	17	NE
Senior Engineering Technician	17	NE
Senior Combination Inspector (Bldg.)	17	NE
Accountant/Wage and Benefits Coord.	16	NE
Assistant Planner	16	NE
Environmental Specialist	16	NE
Combination Inspector (Bldg.)	16	NE
Firefighter	16	NE

Classification Title:	Salary Grade	Exempt Status
Golf Operations Coordinator	16	E
Mechanic Lead Worker	16	NE
Park Maintenance Coordinator	16	NE
Recreation Coordinator	16	NE
Support Services Supervisor	16	E
Assist. Golf Course Superintendent	15	E
Engineering Technician	15	NE
Environmental Resources Tech.	15	NE
GIS Specialist	15	NE
Human Resources Coordinator	15	NE
Code Compliance Coordinator	15	NE
Water Plant Operator	15	NE
Accounting Technician, Sr.	14	NE
Admin. & Tech. Support Coordinator	14	NE
GIS Tech II	14	NE
Golf Course Mechanic	14	NE
IT Specialist	14	NE
Mechanic	14	NE
Street Maintenance Lead Worker	14	NE
Utilities Lead Worker	14	NE
Communications Specialist	13	NE
Deputy City Clerk	13	NE
Accounting Technician	12	NE
Administrative Specialist	12	NE
Community Develop. Support Spec.	12	NE
Engineering Support Specialist	12	NE
Public Works Support Specialist	12	NE
Records Specialist	12	NE
Sign Worker – Street Maintenance	12	NE
Sr. Office Support	11	NE
Recreation Specialist	11	NE
Evidence Technician	10	NE
GIS Tech I	10	NE
Office Support II	10	NE
City Facilities Maintenance Worker	10	NE
Parks Maintenance Worker	10	NE
Street Maintenance Worker	10	NE
Utility Maintenance Worker	10	NE
VMCC Maintenance Worker	10	NE
Custodian II	9	NE
Lead Customer Service Specialist	9	NE
Office Support	9	NE
VMCC Operations Worker	9	NE
Customer Service Specialist	8	NE
Golf Course Technician	4	NE
Police Cadet	3	NE
Golf Course Cashier	2	NE
Table last updated	As of:	10/14/24



Request for Council Action

SUBJECT: Summary of Conclusions Regarding City Administrator's Performance Evaluation

MEETING DATE: October 14, 2024
ITEM TYPE: Consent Agenda
CONTACT: Bridget Nason, City Attorney

ACTION REQUESTED

The Council is asked to approve a summary of conclusions regarding the City Administrator's performance evaluation.

BACKGROUND

At its September 23, 2024 meeting, the City Council met in closed session pursuant to Minn. Stat. Sec. 13D.05, subd. 3(a) to evaluate the performance of City Administrator Kris Wilson. State statute requires that at its next regular meeting after holding a closed session to evaluate the performance of an employee, the Council must summarize its conclusions regarding the evaluation. Therefore, the Council is asked to adopt the following as its summary of its conclusions regarding the evaluation of the City Administrator, including the related salary adjustment.

Summary of Conclusions Regarding Evaluation of City Administrator Kris Wilson

The City Council met in closed session to conduct a performance evaluation of City Administrator Kris Wilson at its September 23, 2024 meeting. The Council evaluated the City Administrator in the following areas and found the City Administrator meets or exceeds expectations in the seven areas of evaluation, namely: 1) City Council relationships; 2) communication; 3) citizen inquires and complaints; 4) decision making/problem solving; 5) dependability and interpersonal skills; 6) fiscal and strategic management; and 7) organizational leadership. The City Council expressed appreciation for the City Administrator's professionalism, engagement within the City, and leadership. The Council provided direction to the City Administrator regarding areas for priority and continued focus. The Council directed that the City Administrator's salary be increased to \$208,281 retroactive to September 1, 2024.

FISCAL IMPACT

The salary increase to be approved can be accommodated within the City's adopted budget.

RECOMMENDATION

Adopt the above summary of the Council's conclusions regarding its recent performance evaluation of the City Administrator.

ATTACHMENTS

None



Request for Council Action

SUBJECT: **Resolution Accepting Federal COPS Hiring Grant**

MEETING DATE: October 14, 2024

ITEM TYPE: Consent Agenda

CONTACT: Melissa Chiodo, Police Chief, 651.450.2526

ACTION REQUESTED

The Council is asked to adopt the attached Resolution, authorizing the Police Chief to enter into a grant agreement with the federal Community Oriented Policing Service (COPS) office for a grant award in the amount of \$375,000.

BACKGROUND

The Police Department was given approval by the City Council in May 2024 to submit an application for a grant from the U.S. Department of Justice Community Oriented Policing Services Office (COPS). The grant is to fund partial wage and benefit costs for three additional police officers to be hired in 2025. On September 30, the Police Department was officially notified that it has been awarded the grant of \$375,000.

FISCAL IMPACT

This grant will pay for about one third of the officers' salary and benefits each year for three years and the City will be responsible for the remainder of those costs. The grant will be paid to the City on a reimbursement basis once the officers are hired.

RECOMMENDATION

Staff recommends approval of the attached Resolution, authorizing the Chief of Police to formally accept the federal COPS Hiring Grant for \$375,000 to help cover a portion of the wage and benefits costs for three 3 new police officers.

ATTACHMENTS

1. Resolution COPS 2024 Application Award Acceptance

**CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA**

RESOLUTION NO. 2024-231

**RESOLUTION ACCEPTING THE COMMUNITY ORIENTED
POLICING SERVICES (COPS) HIRING GRANT**

WHEREAS, the Inver Grove Heights Police Department has a need for additional police officers to further its community policing strategies and enhance collaboration with other law enforcement agencies in Dakota County, and

WHEREAS, the Department of Justice recognizes the need for additional police officers at agencies in the United States to enhance community policing strategies, and

WHEREAS, the Community Oriented Policing Services (COPS) Office has selected the Inver Grove Heights Police Department as a recipient of a hiring grant in the amount of \$375,000;

NOW THEREFORE BE IT RESOLVED, by the City Council of the City of Inver Grove Heights, Minnesota, that the City hereby accepts the 2024 COPS Grant Award in the amount of \$375,000 and authorizes Police Chief Melissa Chiodo to enter into the required grant agreement and other binding documents associated with the City's receipt of this grant award.

Adopted this 14th day of October, 2024.

Brenda Dietrich, Mayor

Attest:

Rebecca Kiernan, City Clerk



Request for Council Action

SUBJECT: **Resolution Authorizing DWI Officer Grant Agreement with Minnesota Department of Public Safety**

MEETING DATE: October 14, 2024

ITEM TYPE: Consent Agenda

CONTACT: Joshua Otis, Commander, 651.450.2528

ACTION REQUESTED

The Council is asked to adopt the attached Resolution, authorizing the Police Chief to enter into a grant agreement with the Minnesota Department of Public Safety for the DWI Officer Grant from October 1, 2024 through September 30, 2025.

BACKGROUND

The Minnesota Department of Public Safety funds several programs designed to reduce incidents of impaired driving through the application of various enforcement strategies. All enforcement grants support the statewide Toward Zero Deaths (TZD) safety program, which works to create a safe driving culture in Minnesota by supporting a goal of zero road fatalities. The City of Inver Grove Heights received this grant in FY2021, FY2022, and FY2024, which paid for a dedicated DWI Officer.

At its July 22 2024 meeting, the City Council authorized the Police Chief to apply for this grant again for the upcoming year. The Minnesota Department of Public Safety awarded the grant to the IGH PD for FY2025 (October 1, 2024, through September 30, 2025), which now requires formal acceptance by the Council to enter into the grant agreement.

FISCAL IMPACT

The grant is for \$142,786.50, which will be paid to the City on a reimbursement basis, to be used towards the assigned officer's wages and benefits. The City would be responsible for the cost of providing DWI enforcement equipment, which we already have, and a patrol vehicle, which we already have as part of our fleet of vehicles.

RECOMMENDATION

Staff recommends adoption of the attached Resolution.

ATTACHMENTS

1. Resolution - DWI Officer Grant FY2025 (10-1-24 to 9-30-25)
2. FY25 IGH PD DWI Officer Grant Agreement

**CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA**

**RESOLUTION AUTHORIZING EXECUTION OF AGREEMENT BETWEEN
THE CITY OF INVER GROVE HEIGHTS AND MINNESOTA DEPARTMENT OF
PUBLIC SAFETY FOR THE DWI OFFICER GRANT FOR OCTOBER 1, 2024,
THROUGH SEPTEMBER 30, 2025**

RESOLUTION NO. 2024-232

WHEREAS, The City of Inver Grove Heights and the Minnesota Department of Public Safety agree to have a grant-funded DWI officer position from October 1, 2024, through September 30, 2025.

NOW, THEREFORE BE IT hereby RESOLVED, by the City Council of the City of Inver Grove Heights, Minnesota, as follows:

1. The City Council hereby approves entering into a grant agreement with the Minnesota Department of Public Safety for the DWI Officer grant for the period of October 1, 2024, through September 30, 2025.
2. The City Council hereby authorizes Police Chief Chiodo to execute such the DWI Officer grant agreement and amendments as are necessary to implement the project on behalf of the Inver Grove Heights Police Department and to be the fiscal agent and administer the grant.

Adopted by the City Council of Inver Grove Heights this 14th day of October 2024.

Ayes:

Nays:

Brenda Dietrich, Mayor

Attest:

Rebecca Kiernan, City Clerk



Minnesota Department of Public Safety (“State”) Office of Traffic Safety 445 Minnesota Street, Suite 1620 Saint Paul, MN 55101	Grant Program: 2025 NHTSA: DWI / Traffic Safety Officer Grant Contract Agreement No.: A-OFFICR25-2025-IGHPD-018
Grantee: Inver Grove Heights Police Department 8150 Barbara Avenue Inver Grove Heights, MN 55077-3412	Grant Contract Agreement Term: Effective Date: 10/01/2024 Expiration Date: 09/30/2025
Grantee’s Authorized Representative: Police Commander Joshua Otis 8150 Barbara Avenue Inver Grove Heights, MN 55077-3415 (651)450-2526 jotis@ighmn.gov	Grant Contract Agreement Amount: Original Agreement \$142,786.50 Matching Requirement \$ 0.00
State’s Authorized Representative: Duane Siedschlag, Impaired Driving Program Coordinator 445 Minnesota Street, Suite 1620 Saint Paul, MN 55101 (651)221-7078 Duane.siedschlag@state.mn.us	Federal Funding: CFDA/ALN: 20.608 & 20.608 & 20.600 FAIN: 69A37523300001640MNA & 69A37523300001640MNA & 69A37523300004020MNO State Funding: N/A Special Conditions: None

Under Minn. Stat. § 299A.01, Subd 2 (4) the State is empowered to enter into this grant contract agreement.

Term: The creation and validity of this grant contract agreement conforms with Minn. Stat. § 16B.98 Subdivision 5. Effective date is the date shown above or the date the State obtains all required signatures under Minn. Stat. § 16B.98, Subdivision 7, whichever is later. Once this grant contract agreement is fully executed, the Grantee may claim reimbursement for expenditures incurred pursuant to the Payment clause of this grant contract agreement. Reimbursements will only be made for those expenditures made according to the terms of this grant contract agreement. Expiration date is the date shown above or until all obligations have been satisfactorily fulfilled, whichever occurs first.

The Grantee, who is not a state employee, will:

Perform and accomplish such purposes and activities as specified herein and in the Grantee’s approved 2025 NHTSA: DWI / Traffic Safety Officer Application [“Application”] which is incorporated by reference into this grant contract agreement and on file with the State at 445 Minnesota Street, Suite 620, Saint Paul, MN 55101. The Grantee shall also comply with all requirements referenced in the 2025 NHTSA: DWI / Traffic Safety Officer Guidelines and Application which includes the Terms and Conditions and Grant Program Guidelines (<https://app.dps.mn.gov/EGrants>), which are incorporated by reference into this grant contract agreement.

Budget Revisions: The breakdown of costs of the Grantee’s Budget is contained in Exhibit A, which is attached and incorporated into this grant contract agreement. As stated in the Grantee’s Application and Grant Program Guidelines, the Grantee will submit a written change request for any substitution of budget items or any deviation and in accordance with the Grant Program Guidelines. Requests must be approved prior to any expenditure by the Grantee.



Matching Requirements: (If applicable.) As stated in the Grantee's Application, the Grantee certifies that the matching requirement will be met by the Grantee.

Payment: As stated in the Grantee's Application and Grant Program Guidance, the State will promptly pay the Grantee after the Grantee presents an invoice for the services actually performed and the State's Authorized Representative accepts the invoiced services and in accordance with the Grant Program Guidelines. Payment will not be made if the Grantee has not satisfied reporting requirements.

Certification Regarding Lobbying: (If applicable.) Grantees receiving federal funds over \$100,000.00 must complete and return the Certification Regarding Lobbying form provided by the State to the Grantee.

1. ENCUMBRANCE VERIFICATION

Individual certifies that funds have been encumbered as required by Minn. Stat. § 16A.15.

Signed: _____

Date: _____

3. STATE AGENCY

Signed: _____
(with delegated authority)

Title: _____

Date: _____

Grant Contract Agreement No./ P.O. No. A-OFFICR25-2025-IGHPD-018 / 3000098174

Project No.25-03-03

2. GRANTEE

The Grantee certifies that the appropriate person(s) have executed the grant contract agreement on behalf of the Grantee as required by applicable articles, bylaws, resolutions, or ordinances.

Signed: _____

Print Name: _____

Title: _____

Date: _____

Signed: _____

Print Name: _____

Title: _____

Date: _____

Signed: _____

Print Name: _____

Title: _____

Date: _____

Distribution: DPS/FAS
Grantee
State's Authorized Representative



Organization: Inver Grove Heights Police Department

Budget Summary

Budget				
Budget Category	State Reimbursement	Local Match		
DWI TSO Salary & Fringe				
Officer Salary	\$142,786.50	\$0.00		
Total	\$142,786.50	\$0.00		
Operating Expense				
Operating Expense	\$0.00	\$0.00		
Total	\$0.00	\$0.00		
TZD Conference				
TZD Conference	\$0.00	\$0.00		
Total	\$0.00	\$0.00		
Total	\$142,786.50	\$0.00		



Request for Council Action

SUBJECT: **Approval of Exempt Gambling Permit for Inver Grove Heights Hockey Association**

MEETING DATE: October 14, 2024

ITEM TYPE: Consent Agenda

CONTACT: Rebecca Kiernan, City Clerk, 651.450.2513

ACTION REQUESTED

The Council is asked to approve the application for an exempt gambling permit from the Inver Grove Heights Hockey Association to hold a raffle on January 5, 2025 at the Veteran's Memorial Community Center.

BACKGROUND

The Inver Grove Heights Hockey Association, a non-profit group, is raising funds for their operating expenses so that the association does not need to increase registration costs for participants. Proceeds from this fundraiser will benefit the overall members of the IGH Hockey Association.

FISCAL IMPACT

None

RECOMMENDATION

Staff recommends approval of the application for an Exempt Gambling Permit for the IGH Hockey Association.

ATTACHMENTS

1. 2025-01-05 LG220 Application - IGH Hockey Association Raffle

LG220 Application for Exempt Permit

An exempt permit may be issued to a nonprofit organization that:

- conducts lawful gambling on five or fewer days, and
- awards less than \$50,000 in prizes during a calendar year.

If total raffle prize value for the calendar year will be \$1,500 or less, contact the Licensing Specialist assigned to your county by calling 651-539-1900.

Application Fee (non-refundable)

Applications are processed in the order received. If the application is postmarked or received 30 days or more before the event, the application fee is **\$100**; otherwise the fee is **\$150**.

Due to the high volume of exempt applications, payment of additional fees prior to 30 days before your event will not expedite service, nor are telephone requests for expedited service accepted.

ORGANIZATION INFORMATION

Organization Name: Inver Grove Heights Hockey Previous Gambling Permit Number: X- 00704-24-013
 Minnesota Tax ID Number, if any: 41-1502801 Federal Employer ID Number (FEIN), if any: _____
 Mailing Address: PO Box 2592
 City: Inver Grove Hts. State: MN Zip: 55076 County: Dakota
 Name of Chief Executive Officer (CEO): Joe Tuccitto
 CEO Daytime Phone: 651-428-1371 CEO Email: IGHHApresident@gmail.com
 (permit will be emailed to this email address unless otherwise indicated below)
 Email permit to (if other than the CEO): _____

NONPROFIT STATUS

Type of Nonprofit Organization (check one):

☐ Fraternal ☐ Religious ☐ Veterans ☒ Other Nonprofit Organization

Attach a copy of one of the following showing proof of nonprofit status:

(DO NOT attach a sales tax exempt status or federal employer ID number, as they are not proof of nonprofit status.)

- ☐ **A current calendar year Certificate of Good Standing**
 Don't have a copy? Obtain this certificate from:
 MN Secretary of State, Business Services Division
 60 Empire Drive, Suite 100
 St. Paul, MN 55103
 Secretary of State website, phone numbers:
www.sos.state.mn.us
 651-296-2803, or toll free 1-877-551-6767
- ☒ **IRS income tax exemption (501(c)) letter in your organization's name**
 Don't have a copy? To obtain a copy of your federal income tax exempt letter, have an organization officer contact the IRS toll free at 1-877-829-5500.
- ☐ **IRS - Affiliate of national, statewide, or international parent nonprofit organization (charter)**
 If your organization falls under a parent organization, attach copies of both of the following:
 1. IRS letter showing your parent organization is a nonprofit 501(c) organization with a group ruling; and
 2. the charter or letter from your parent organization recognizing your organization as a subordinate.

GAMBLING PREMISES INFORMATION

Name of premises where the gambling event will be conducted (for raffles, list the site where the drawing will take place): Veterans Memorial Community Center

Physical Address (do not use P.O. box): 8055 Barbara Ave

Check one:
☒ City: Inver Grove Hts. Zip: 55076 County: Dakota
☐ Township: _____ Zip: _____ County: _____

Date(s) of activity (for raffles, indicate the date of the drawing): Sunday, January 5th

Check each type of gambling activity that your organization will conduct:

☐ Bingo ☐ Paddlewheels ☐ Pull-Tabs ☐ Tipboards ☒ Raffle

Gambling equipment for bingo paper, bingo boards, raffle boards, paddlewheels, pull-tabs, and tipboards must be obtained from a distributor licensed by the Minnesota Gambling Control Board. EXCEPTION: Bingo hard cards and bingo ball selection devices may be borrowed from another organization authorized to conduct bingo. To find a licensed distributor, go to www.mn.gov/gcb and click on **Distributors** under the **List of Licensees** tab, or call 651-539-1900.

LOCAL UNIT OF GOVERNMENT ACKNOWLEDGMENT (required before submitting application to the Minnesota Gambling Control Board)

**CITY APPROVAL
for a gambling premises
located within city limits**

- ☐ The application is acknowledged with no waiting period.
- ☐ The application is acknowledged with a 30-day waiting period, and allows the Board to issue a permit after 30 days (60 days for a 1st class city).
- ☐ The application is denied.

Print City Name: _____

Signature of City Personnel: _____

Title: _____ Date: _____

**The city or county must sign before
submitting application to the
Gambling Control Board.**

**COUNTY APPROVAL
for a gambling premises
located in a township**

- ☐ The application is acknowledged with no waiting period.
- ☐ The application is acknowledged with a 30-day waiting period, and allows the Board to issue a permit after 30 days.
- ☐ The application is denied.

Print County Name: _____

Signature of County Personnel: _____

Title: _____ Date: _____

TOWNSHIP (if required by the county)

On behalf of the township, I acknowledge that the organization is applying for exempted gambling activity within the township limits. (A township has no statutory authority to approve or deny an application, per Minn. Statutes, section 349.213.)

Print Township Name: _____

Signature of Township Officer: _____

Title: _____ Date: _____

CHIEF EXECUTIVE OFFICER'S SIGNATURE (required)

The information provided in this application is complete and accurate to the best of my knowledge. I acknowledge that the financial report will be completed and returned to the Board within 30 days of the event date.

Chief Executive Officer's Signature: _____ Date: 9/21/2024
(Signature must be CEO's signature; designee may not sign)

Print Name: JOE TUCCA

REQUIREMENTS

Complete a separate application for:

- all gambling conducted on two or more consecutive days; or
- all gambling conducted on one day.

Only one application is required if one or more raffle drawings are conducted on the same day.

Financial report to be completed within 30 days after the gambling activity is done:

A financial report form will be mailed with your permit. Complete and return the financial report form to the Gambling Control Board.

Your organization must keep all exempt records and reports for 3-1/2 years (Minn. Statutes, section 349.166, subd. 2(f)).

MAIL APPLICATION AND ATTACHMENTS

Mail application with:

- _____ a copy of your proof of nonprofit status; and
- _____ application fee (non-refundable). If the application is postmarked or received 30 days or more before the event, the application fee is **\$100**; otherwise the fee is **\$150**. Make check payable to **State of Minnesota**.

To: Minnesota Gambling Control Board
1711 West County Road B, Suite 300 South
Roseville, MN 55113

Questions?

Call the Licensing Section of the Gambling Control Board at 651-539-1900.

Data privacy notice: The information requested on this form (and any attachments) will be used by the Gambling Control Board (Board) to determine your organization's qualifications to be involved in lawful gambling activities in Minnesota. Your organization has the right to refuse to supply the information; however, if your organization refuses to supply this information, the Board may not be able to determine your organization's qualifications and, as a consequence, may refuse to issue a permit. If your organization supplies the information requested, the Board will be able to process the

application. Your organization's name and address will be public information when received by the Board. All other information provided will be private data about your organization until the Board issues the permit. When the Board issues the permit, all information provided will become public. If the Board does not issue a permit, all information provided remains private, with the exception of your organization's name and address which will remain public. Private data about your organization are available to Board members, Board staff whose work requires access to the information; Minnesota's Depart-

ment of Public Safety; Attorney General; Commissioners of Administration, Minnesota Management & Budget, and Revenue; Legislative Auditor, national and international gambling regulatory agencies; anyone pursuant to court order; other individuals and agencies specifically authorized by state or federal law to have access to the information; individuals and agencies for which law or legal order authorizes a new use or sharing of information after this notice was given; and anyone with your written consent.



IRS Department of the Treasury
Internal Revenue Service

P.O. Box 2508
Cincinnati OH 45201

In reply refer to: 0248574146
Feb. 24, 2011 LTR 4168C E0
41-1502801 000000 00

00026490

BODC: TE

INVER GROVE HEIGHTS HOCKEY
ASSOCIATION
4020 75TH ST E
INVER GROVE MN 55076-4364



032667

Employer Identification Number: 41-1502801
Person to Contact: MRS. CRUZ
Toll Free Telephone Number: 1-877-829-5500

Dear TAXPAYER:

This is in response to your Feb. 14, 2011, request for information regarding your tax-exempt status.

Our records indicate that you were recognized as exempt under section 501(c)(3) of the Internal Revenue Code in a determination letter issued in NOVEMBER 1985.

Our records also indicate that you are not a private foundation within the meaning of section 509(a) of the Code because you are described in section 509(a)(2).

Donors may deduct contributions to you as provided in section 170 of the Code. Bequests, legacies, devises, transfers, or gifts to you or for your use are deductible for Federal estate and gift tax purposes if they meet the applicable provisions of sections 2055, 2106, and 2522 of the Code.

Please refer to our website www.irs.gov/eo for information regarding filing requirements. Specifically, section 6033(j) of the Code provides that failure to file an annual information return for three consecutive years results in revocation of tax-exempt status as of the filing due date of the third return for organizations required to file. We will publish a list of organizations whose tax-exempt status was revoked under section 6033(j) of the Code on our website beginning in early 2011.



Request for Council Action

SUBJECT: **Resolution Appointing Additional Election Judges for the 2024 General Election**

MEETING DATE: October 14, 2024

ITEM TYPE: Consent Agenda

CONTACT: Katie Malott, Deputy City Clerk, 651.450.2470

ACTION REQUESTED

The Council is asked to adopt the attached Resolution, appointing additional election judges for the General Election on November 5, 2024.

BACKGROUND

Minnesota Statute 204B.21 provides that election judges for precincts in a municipality shall be appointed by the governing body of the municipality. To date, the Council has appointed 139 individuals to serve as election judges for 2024. However, given the large voter turnout expected and the desire to ensure a positive voter experience, staff is seeking the appointment of an additional 103 individuals to serve as election judges.

FISCAL IMPACT

RECOMMENDATION

Staff recommends adoption of the attached Resolution, appointing additional election judges for the 2024 General Election.

ATTACHMENTS

1. 2024 Resolution Additional EJs General

CITY OF INVER GROVE HEIGHTS

DAKOTA COUNTY, MINNESOTA

RESOLUTION NO. 2024-233

A RESOLUTION APPOINTING ADDITIONAL ELECTION JUDGES

WHEREAS, Minnesota Statute provides that election judges for precincts in a municipality shall be appointed by the governing body of the municipality; and

WHEREAS, the appointments shall be made at least 25 days before the election at which the election judges will serve;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Inver Grove Heights, Minnesota, that the individuals listed on the attached Exhibit A are hereby appointed to serve as election judges for the Minnesota State General Election on November 5th, 2024 at the hourly rate of \$12.88 for election judges and \$15.19 for head judges; and

BE IT FURTHER RESOLVED that the election judges hereby appointed shall be in addition to those previously appointed by action of the City Council and may be further supplemented by subsequent action of the City Council; and

BE IT FURTHER RESOLVED that the City Clerk and/or the Deputy Clerk are hereby authorized to assign duly appointed election judges to individual precincts and to specific tasks and duties as needed for the effective and efficient conduct of election operations and to designate Head Election Judges from within those election judges appointed by the City Council.

DATED this 14th day of October 2024.

Brenda Dietrich, Mayor

Attest:

Rebecca Kiernan, City Clerk

EXHIBIT A: 2024 Additional Election Judges for the City of Inver Grove Heights, MN

Albert Eiden	Joan Seterstrom	Drew Anderson	Mark Sampson
Amara Malekebu	John Rohleder	Dylan Novacek	Mary Ann Stewart
Amy Biermaier	Josh Hiti	Elizabeth Korth	Mary DiMarco
Amy Boodram	Julie Olson	Heather Pickett	Mary Garfield
Amy Delgado	Karen Altenhofen	James Abbott	Mary Miller
Angela High-Pippert	Karen Ockwig	James Norquist	Michelle Kelly
Anna Amundson	Kari Schuch	Jane Cain	Milo Komatsu
Anthony Kiris	Katherine Myers	Jane Rief	Nicole Briguët
Betty Hockinson	Kathleen Alexander	Janet Lindblad	Nora Gottwalt
Bill Laramy	Kathleen Miles	Jeannie Williams	Pariann Schenk
Blong Moua	Kelly Landy	Jeffrey Gould	Patricia Orgas
Brook Williams	Kevin Killion	Jennifer Harstad	Paulette Stark
Bruce Ekholm	Khadji Ahmed	Jeri Lastoka	Paulette Tanem
Carol Brunzell	Laura McGlauchlen	Jerry Johnson	Peter Hokana
Cathrine Tuione	Leroy Both	Joan Davenport	Rebecca Kulas
Charlotte Rowland	Leslie Martin	Ryan Morissette	Renee Petersen
Cherlyn Auvinen	Lisa Leonidas	Sallie Harris	Robert Jordan
Christopher Riess	Lori Jaeger	Sharon Karels	Robert Rooney
Cody Snyder	Lori Johnson	Shelly Hooper	Ron Smith
Courtney Barrette	Lorrie Hiti	Susan Peterson	Sierra Morris
David Corniea	Lynnel Taylor	Suzanne Aten	Vanaja Rajenderan
David Larson	Lynn Waska	Suzette Allaire	Vernon Ockwig
David Leonidas	Madeline Ngo	Theresa GanglGhassemlouei	Victoria Simmonds
David Morgan	Margaret Cudahy	Thomas Rasmussen	Wayne Oesterrich
Diane Hawkins	Margaret Dostal Fell	Tom Kieffer	Yvonne Erhart
Donald Olson	Marilyn Porter	Tracy Mulcahy	



Request for Council Action

SUBJECT: **Resolution Declaring Surplus Property and Authorizing Disposal or Donation**

MEETING DATE: October 14, 2024

ITEM TYPE: Consent Agenda

CONTACT: Rebecca Kiernan, City Clerk, 651.450.2513

ACTION REQUESTED

The Council is asked to adopt the attached Resolution, declaring approximately 30 lateral file cabinets as surplus property and allowing for their disposal.

BACKGROUND

Because of the City's efforts to retain data electronically in a data repository (Laserfiche), staff have been emptying lateral file cabinets throughout City Hall, which used to house paper records for Building Inspections, Engineering, and Finance. Some cabinets are already empty and ready to be removed, and more will become surplus with each passing month. In total, there will be approximately 30 unneeded lateral file cabinets when the imaging projects are complete. In order to repurpose this space within City Hall, the cabinets need to be disposed of.

Unfortunately, because the City is not alone in moving away from paper records, there is little to no demand for used filing cabinets, making it unlikely they can be sold. However, staff will work to dispose of them in the most appropriate way possible, including recycling.

FISCAL IMPACT

None.

RECOMMENDATION

Staff recommends adoption of the attached Resolution, declaring lateral filing cabinets as public surplus and authorizing staff to dispose of them.

ATTACHMENTS

1. Resolution

**CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA**

RESOLUTION NO. 2024-234

**RESOLUTION DECLARING LATERAL FILING CABINETS AS
SURPLUS EQUIPMENT AND AUTHORIZING DISPOSAL OR
DONATION**

WHEREAS, the City of Inver Grove Heights owns approximately 30 lateral filing cabinets which is no longer needed for public service and can be offered for disposal or donation pursuant to the terms of Minnesota Statutes, Sections 471.345, 471.64, and 471.3459 and;

WHEREAS, the City is no longer in need of 30 lateral filing cabinets as we migrate to electronic data and;

NOW, THEREFORE BE IT RESOLVED, BY THE CITY OF INVER GROVE HEIGHTS that:

1. The City owned lateral filing cabinets be declared as surplus.
2. City Staff are authorized to dispose or donate such lateral filing cabinets.

Adopted by the City of Inver Grove Heights this 14th day of October, 2024.

Brenda Dietrich, Mayor

ATTEST:

Rebecca Kiernan, City Clerk



Request for Council Action

SUBJECT: **Appointment of Auditors for Years Ending December 31, 2024, 2025 and 2026**

MEETING DATE: October 14, 2024

ITEM TYPE: Consent Agenda

CONTACT: Amy Hove, Finance Director, 651.450.2521

ACTION REQUESTED

The Council is asked to appoint Abdo as the City's financial auditors for the years ending December 31, 2024, 2025 and 2026.

BACKGROUND

Each year, the City of Inver Grove Heights prepares an Annual Comprehensive Financial Report (ACFR) for submission to the State Auditor, which is required under Minnesota Statute. The ACFR is also submitted to the Government Finance Officers Association (GFOA) for consideration of their Certificate of Achievement in Financial Reporting awards program. The City has been a recipient of this award since 1986.

The City's current auditor has been Abdo, LLC (Abdo) and the City has been happy with their services. Although pleased with its existing relationship with Abdo, it is beneficial for all departments to periodically review their professional service arrangements to ensure competitiveness among available vendors. As such, in July 2024, the Council authorized the issuance of a request for proposals (RFP) to solicit auditing services for a five-year period, covering fiscal years ending in 2024, 2025, 2026, 2027, and 2028.

Staff posted the RFP on multiple online sites, including the League of Minnesota Cities, as well as directly noticed seven CPA firms that specialize in these types of auditing services. The City received proposals back from three firms: Abdo LLC, Creative Planning (BerganKDV), and Clifton Larson Allen LLP (CLA).

Staff evaluated each firm in a number of categories, including:

- technical qualifications, which included depth of experience with the GFOA awards program as well as experience and exposure with other MN and metro-area cities,
- quality of the staffing proposed for the assignment, and
- the firm's ability to meet scheduling requirements.

All three firms were brought in for interviews, and staff conducted reference checks. Pricing proposals were extremely comparable for the respondents - with basic audit service pricing coming in slightly lower for two of the respondents but the single audit pricing component favoring the third. The difference between the highest cost proposal and lowest cost proposal for the entire 5-

year contract period (assuming a single audit was needed in all five years) was only \$6,000, so staff centered their recommendation on which vendor would best suit the City at this time.

There are several factors that lead to the staff's current recommendation to continue with Abdo for auditing services for a 3-year term:

- 2024/2025 is the final year of the City's SAFER grant, so having the same auditors conducting those final single audits would be beneficial and more efficient to those reviews.
- Switching audit firms is a challenge that requires extra time for audit prep and creates a higher learning curve for both City staff and the new auditors coming in. The current vacancy in the Assistant Finance Director position, which is the key position responsible for coordinating the annual audit, would make that transition extra challenging.
- The City's accounting structure has undergone a number of changes recently (chart of account changes, fund consolidations, restructuring of Community Center and Golf Course departments) so keeping with the current auditor, who understands those changes and the history behind them would be helpful.
- The City has been happy with the relationship and auditing services of Abdo.
- Staff were able to negotiate additional pricing decreases which limits annual price increases to 5%, and provides the lowest cost for the City.
- Due to the competitiveness and the quality of the respondents, staff wanted to allow for reconsideration of auditing services after a three-year period so the current recommendation is to enter into a three-year agreement, rather than a five-year agreement as originally proposed.

FISCAL IMPACT

Annual audit costs are budgeted within the Finance Department's budget and the proposed costs are in line with amounts budgeted.

RECOMMENDATION

Staff recommends that the Council accept the attached proposal and appoint Abdo as the City's financial auditors for the years ending December 31, 2024, 2025 and 2026.

ATTACHMENTS

1. Abdo Engagement Proposal



October 14, 2024

Honorable Mayor and Council
City of Inver Grove Heights
Inver Grove Heights, Minnesota

The following sets forth the engagement of our services for the certified audit of the accounts of the City of Inver Grove Heights, Minnesota (the City).

We will audit the financial statements of the City for the years ending December 31, 2024, 2025 and 2026 in accordance with auditing standards generally accepted in the United States of America. Our audit will include tests of the accounting records and other procedures we consider necessary to enable us to express an opinion that the financial statements are fairly presented, in all material respects, in conformity with the financial reporting provisions of the Minnesota Office of the State Auditor.

An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements; therefore, our audit will involve judgment about the number of transactions to be examined and the areas to be tested. We will plan and perform the audit to obtain reasonable rather than absolute assurance about whether the financial statements are free of material misstatement, whether caused by error or fraud. Because of the concept of reasonable assurance and because we will not perform a detailed examination of all transactions, there is a risk that a material misstatement may exist and not be detected by us. In addition, an audit is not designed to detect errors, fraud, or other illegal acts that are immaterial to the financial statements. However, we will inform you of any material errors and any fraud that comes to our attention. We will also inform you of any other illegal acts that come to our attention, unless clearly inconsequential. Our responsibility as auditors is limited to the period covered by our audit and does not extend to matters that might arise during any later periods of which we are not engaged as auditors.

We will perform the auditing services discussed above for the calendar years 2024, 2025 and 2026.

<u>Year</u>	<u>City Audit</u>	<u>OSA Reporting Form</u>	<u>Single Audit, per major program</u>
2024	\$54,000	\$1,000	\$5,000
2025	\$56,700	\$1,050	\$5,250
2026	\$59,550	\$1,100	\$5,500

The above fees are based on anticipated cooperation from your personnel and the assumption that unexpected circumstances will not be encountered during the audit. If significant additional time is necessary, we will discuss it with you and arrive at a new fee estimate before we incur the additional costs.

- Our fee does not include additional fees for additional time require for implementation of additional governmental accounting standards. Those fees would be discussed and agreed to prior to performing the services.
- Our fee for the City Audit includes the city audit, the required management communication letter, the Auditors Report on Minnesota Legal Compliance, the auditor presentation to the Council, and general consulting related to the audit.

Edina Office

5201 Eden Avenue, Ste 250
Edina, MN 55436
P 952.835.9090

Mankato Office

100 Warren Street, Ste 600
Mankato, MN 56001
P 507.625.2727

Scottsdale Office

14500 N Northsight Blvd, Ste 233
Scottsdale, AZ 85260
P 480.864.5579

We appreciate the opportunity to continue service with the City and believe this letter accurately summarizes the significant terms of our engagement. If you have any questions, please let us know. If you agree with the terms of our engagement as described in this letter, please sign and return a copy to our office. If you have any questions, please contact Bonnie Schwieger at 952.715.3065.

Very truly yours,



Abdo

Bonnie Schwieger, CPA
Governmental Services Partner

RESPONSE:

This letter correctly sets forth the understanding of the **City of Inver Grover Heights, Minnesota**.

Signature

Brenda Dietrich, Mayor

Date:

October 14th, 2024





Request for Council Action

SUBJECT: **Resolution Renewing a Joint Powers Agreement for Technical Services with the Dakota County Soil & Water Conservation District**

MEETING DATE: October 14, 2024

ITEM TYPE: Consent Agenda

CONTACT: Brian Connolly, Public Works Director, 651.450.2571

ACTION REQUESTED

The Council is asked to adopt the attached Resolution, renewing a Joint Powers Agreement with the Dakota County Soil & Water Conservation District for technical services related to City conservation projects.

BACKGROUND

Since May of 2013, the City of Inver Grove Heights has maintained a series of Joint Powers Agreements (JPAs) with the Dakota County Soil & Water Conservation District (DCSWCD) for technical services related to design and review of City conservation projects. The JPA has allowed the City to solicit assistance and services from DCSWCD for items related to water quality, wetland conservation, grant writing, and watershed management efforts on an as-needed basis, to supplement existing City staff capabilities. Past JPAs typically had three-year terms, and the current JPA with DCSWCD for technical service assistance expires on December 31, 2024. The proposed renewal of the JPA would have a three-year term of January 1, 2025 through December 31, 2027.

FISCAL IMPACT

There is no direct fiscal impact from the approval of the JPA. Historically, when the City has solicited services from DCSWCD, the cost for those services have been included in existing projects (as part of the legal, engineering, administrative, and finance (LEAF) costs), and any future services would be financed through similar project-specific budgets. For reference purposes, the City has paid Dakota County \$722.50 for various supplemental technical services during the current JPA term (2022-2024).

RECOMMENDATION

Staff recommends adoption of the attached Resolution, approving renewal of the JPA for technical services with the Dakota County Soil & Water Conservation District.

ATTACHMENTS

1. Resolution - Joint Powers Agreement with DCSWD
2. JPA - IGH & DCSWCD - 2025-2027

**CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA**

RESOLUTION NO. 2024-235

**RESOLUTION TO ENTER INTO A JOINT POWERS AGREEMENT WITH DAKOTA COUNTY
SOIL AND WATER CONSERVATION DISTRICT (DCSWCD) FOR TECHNICAL SERVICES**

WHEREAS, since 2013, the City of Inver Grove Heights has maintained Joint Power Agreements (JPA's) for technical services with the Dakota County Soil and Water Conservation District (DCSWCD) to assist the City of Inver Grove Heights with technical design and review efforts related to conservation projects, including water quality, wetland conservation, grant writing, and watershed management efforts on an as-needed basis; and

WHEREAS, the current JPA for technical services expires on December 31, 2024; and

WHEREAS, DCSWCD has prepared a new JPA to extend these technical services an additional three years, through December 31, 2027.

**NOW, THEREFORE, BE IT RESOLVED BY THE INVER GROVE HEIGHTS CITY COUNCIL,
THAT:**

1. The Joint Powers Agreement with Dakota County Soil and Water Conservation District (DCSWCD) for technical services for conservation projects from January 1, 2025, through December 31, 2027, is hereby approved.
2. The Mayor and City Clerk are hereby authorized to carry out the agreement on the City's behalf.

Approved by the City Council of the City of Inver Grove Heights, Minnesota on this 14th day of October 2024.

Brenda Dietrich, Mayor

ATTEST:

Rebecca Kiernan, City Clerk

**JOINT POWERS AGREEMENT BETWEEN
THE DAKOTA COUNTY SOIL AND WATER CONSERVATION DISTRICT AND
THE CITY OF INVER GROVE HEIGHTS
FOR TECHNICAL SERVICES FOR CONSERVATION PROJECTS**

THE PARTIES TO THIS AGREEMENT are the Dakota County Soil and Water Conservation District ("SWCD") and the City of Inver Grove Heights ("City"), both political subdivisions of the State of Minnesota and "governmental units" as that term is defined in Minn. Stat. § 471.59. This Agreement is made pursuant to the authority conferred upon the parties by Minn. Stat. § 471.59. (The SWCD and the City are hereinafter referred to collectively as the "Parties").

NOW THEREFORE, the Parties, in joint and mutual exercise of their powers, agree as follows:

1. PURPOSE. The purpose of this Agreement is to define the responsibilities and obligations of the SWCD and the City for technical services to be provided by the SWCD to the City as more fully described herein.
2. TERM. This Agreement shall be effective on January 1, 2025 and shall remain in effect until December 31, 2027, unless earlier terminated by law or according to the provisions of this Agreement.
3. SCOPE OF SERVICES. The City agrees to purchase the SWCD staff hours to provide technical assistance related to the planning, design and installation of voluntary conservation practices, or regulatory assistance associated with the Minnesota Wetland Conservation Act, on an as-needed and as-available basis, and according to the applicable staff hourly rate set annually by the SWCD Board.

The SWCD reserves the right to refuse requests for technical assistance based on availability of staff time. The SWCD will provide services in a manner consistent with the care and skill normally exercised by members of the SWCD's profession performing the same services under similar conditions. The SWCD will procure, at its expense, all licenses, permits or other rights needed to provide services under this Agreement. The SWCD will inform the City of any changes in licenses or permits within five days of the change.

4. TIME OF PAYMENT. The City shall make payment to the SWCD within 35 days of the date on which an itemized invoice is received. If an invoice is incorrect, defective, or otherwise improper, the City shall notify the SWCD within 10 days of receiving the incorrect invoice. Upon receiving the corrected invoice, the City shall make payment within 35 days.
5. PAYMENT FOR UNAUTHORIZED CLAIMS. The City may refuse to pay any claim that is not specifically authorized by this Agreement. Payment of a claim shall not preclude the City from questioning the propriety of the claim. The City reserves the right to offset any overpayment or disallowance of claim by reducing future payments.
6. PAYMENT UPON EARLY TERMINATION. In the event this Agreement is terminated before the completion of services, the City shall pay the SWCD for services provided in a satisfactory manner, in a pro-rated sum of the rates set forth in Section 3 above based upon actual time spent.
7. COMPLIANCE WITH LAWS/STANDARDS. The SWCD shall abide by all federal, state or local statutes, ordinances, rules and regulations now in effect or hereafter adopted pertaining to this Agreement or to the facilities, programs and staff for which the SWCD is responsible.
8. INDEPENDENT CONTRACTOR STATUS. Nothing in this Agreement is intended or should be construed as creating the relationship of a partnership, joint venture or employer-employee relationship between the Parties. Officers, employees or agents of one party shall not be considered officers, employees or agents of the other party.
9. SUBCONTRACTING/ASSIGNMENT. A party shall not enter into any subcontract for the performance of the services contemplated under this Agreement nor assign any interest in this Agreement without prior written consent of the other party and subject to such conditions and provisions as are deemed

necessary. The subcontracting or assigning party shall be responsible for the performance of its subcontractors or assignees unless otherwise agreed.

10. LIABLE FOR OWN ACTS. Each party to this Agreement shall be liable for the acts of their own officers, employees and agents and the results thereof to the extent authorized by law and shall not be responsible for the acts of the other party, its officers, employees and/or agents. It is understood and agreed that the provisions of the Municipal Tort Claims Act, Minn. Stat. Ch. 466, and other applicable laws govern liability arising from a party's acts or omissions. In the event any tort claims are filed against either party, nothing in this Agreement shall be construed to allow a claimant to obtain separate judgments or separate liability caps from the other individual Parties. Each party warrants that it has an insurance or self-insurance program and that it has minimum coverage consistent with the liability limits contained in Minn. Stat. Ch. 466.
11. COOPERATION AND TIMELINESS. The SWCD and City will cooperate and use reasonable efforts to carry out efficiently the various provisions of this Agreement. The Parties agree to resolve disputes in an equitable and timely manner. Time is of the essence in this Agreement. A party may consider the other party's failure to perform the other party's duties within the timelines under this Agreement as a material breach.
12. AUTHORIZED REPRESENTATIVES. The following named persons are designated the authorized representatives of Parties for purposes of this Agreement. These persons have authority to bind the party they represent and to consent to modifications and subcontracts, except that, the authorized representatives shall have only the authority specifically or generally granted by its respective Board. Notification required to be provided pursuant to this Agreement shall be provided to the following named persons and addresses unless otherwise stated in this Agreement, or in a modification of this Agreement.

To the SWCD:

Ashley Gallagher or successor, Director
Dakota County SWCD
4100 220th Street West, Suite 102
Farmington, MN 55024
Telephone: (651) 480-7781

To the City:

Brian Connolly or successor
Public Works Director
City of Inver Grove Heights
8150 Barbara Avenue
Inver Grove Heights, MN 55077

13. LIAISONS. To assist the Parties in the day-to-day performance of this Agreement and to develop service, ensure compliance and provide ongoing consultation, a liaison shall be designated by the SWCD and the City. The Parties shall keep each other continually informed, in writing, of any change in the designated liaison. At the time of execution of this Agreement, the following persons are the designated liaisons:

SWCD Liaison: Curt Coudron
Telephone: (651) 480-7774
Email: curt.coudron@co.dakota.mn.us

City Liaison: Paul Merchlewicz
Telephone: (651) 450-2572
Email: pmerchlewicz@ighmn.gov

14. DEFAULT: FORCE MAJEURE. Neither party shall be liable to the other party for any loss or damage resulting from a delay or failure to perform due to unforeseeable acts or events outside the defaulting party's reasonable control, providing the defaulting party gives notice to the other party as soon as possible. Acts and events may include acts of God, acts of terrorism, war, fire, flood, epidemic, pandemic, acts of civil or military authority, and natural disasters.

15. DATA PRIVACY. All data created, collected, received, stored, used, maintained, or disseminated in the performance of this Agreement is subject to the requirements of the Minnesota Government Data Practices Act, Minn. Stat. Ch. 13 and the Minnesota Rules implementing the Act now in force or hereafter adopted as well as the federal laws on data privacy.

The City may give the SWCD access to, or the SWCD may become aware of, private or confidential information in performing services under this Agreement. Private and confidential information is data that is not public under Minn. Stat. Ch. 13. The SWCD will keep the private and confidential information only for use in performing services under this Agreement. The SWCD will impose procedures as are necessary to assure nondisclosure of private and confidential information directly or indirectly to third parties.

16. OWNERSHIP OF WORK PRODUCT. If the SWCD uses the City's copyrighted material in performing work for this Agreement, the SWCD will protect the City's right, title and interest in the copyrighted material. Before using a third party's copyrighted material, the SWCD will get permission from the third-party. Where applicable, work products created by the SWCD under this Agreement are "works made for hire" as defined in the U.S. Copyright Act. The City owns the copyright interests in the work product. The City may use, copy and make derivative works of the same, with no duty for an accounting to the SWCD. The SWCD may use portions or excerpts from the materials prepared under this Agreement.

17. RECORDS DISCLOSURE/RETENTION. Bonds, records, documents, papers, accounting procedures and practices, and other evidences relevant to this Agreement are subject to the examination, duplication, transcription and audit by each party to this Agreement and the Legislative or State Auditor, pursuant to Minn. Stat. § 16C.05, Subd. 5. Such evidences are also subject to review by the Comptroller General of the United States, or a duly authorized representative, if federal funds are used for any work under this Agreement. Each governmental unit agrees to maintain such evidences for a period of six years from the date services or payment were last provided or made or longer if any audit in progress requires a longer retention period.

18. TERMINATION. Either party may terminate this Agreement for cause by giving seven days' written notice or without cause by giving 30 days' written notice, of its intent to terminate, to the other party. Such notice to terminate for cause shall specify the circumstances warranting termination of this Agreement. Cause shall mean a material breach of this Agreement and any supplemental agreements or amendments thereto. Notice of Termination shall be made by certified mail or personal delivery to the authorized representative of the other party. Termination of this Agreement shall not discharge any liability, responsibility or other right of any party, which arises from the performance of or failure to adequately perform the terms of this Agreement prior to the effective date of termination.

Notwithstanding any provision of this Agreement to the contrary, either party may immediately terminate this Agreement if it does not obtain funding from the Minnesota Legislature, Minnesota Agencies, or other funding source, or if its funding cannot be continued at a level sufficient to allow payment of the amounts due under this Agreement.

19. MODIFICATIONS. Any alterations, variations, modifications, or waivers of the provisions of this Agreement shall only be valid when they have been reduced to writing and signed by the authorized representatives of the parties.
20. MINNESOTA LAW TO GOVERN. This Agreement shall be governed by and construed in accordance with the substantive and procedural laws of the State of Minnesota, without giving effect to the principles of conflict of laws. All proceedings related to this Agreement shall be venued in the County of Dakota, State of Minnesota.
21. DISPOSITION OF PROPERTY. Any property purchased with City money to perform services under this Agreement is owned by the City and will be returned by the SWCD to the City at the termination of this Agreement.
22. SEVERABILITY. The provisions of this Agreement shall be deemed severable. If any part of this Agreement is rendered void, invalid, or unenforceable, such rendering shall not affect the validity and

enforceability of the remainder of this Agreement unless the part or parts that are void, invalid or otherwise unenforceable shall substantially impair the value of the entire Agreement with respect to either party.

23. FINAL AGREEMENT. This Agreement is the final expression of the agreement of the parties and the complete and exclusive statement of the terms agreed upon, and supersedes all prior negotiations, understandings or agreements. There are no representations, warranties, or stipulations, either oral or written, not contained in this Agreement.
24. SURVIVORSHIP. The following provisions under this Agreement survive after the termination date of this Agreement: Sections 10 (Liable for Own Acts); 14 (Force Majeure); 15 (Data Privacy); 16 (Ownership of Work Product); 17 (Records Disclosure/Retention); 20 (Minnesota Law to Govern); and 21 (Disposition of Property).

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement on the date(s) indicated below.

CITY OF INVER GROVE HEIGHTS

By _____
Brenda Dietrich, Mayor
Date of Signature October 14th, 2024

Attest _____
Rebecca Kiernan, City Clerk
Date of Signature October 14th, 2024

DAKOTA COUNTY SOIL AND WATER CONSERVATION DISTRICT

By _____
Kevin Chamberlin, Chair
Board of Supervisors
Date of Signature _____

Approved as to Form:

/s/ Brian J. Wisdorf 9/16/2024
Assistant Dakota County Attorney Date
KS-24-539



Request for Council Action

SUBJECT: **Change Order No. 1 for City Project No. 2020-03 - ADA Pedestrian Ramp Improvements**

MEETING DATE: October 14, 2024

ITEM TYPE: Consent Agenda

CONTACT: Paul Merchlewicz, City Engineer, 651.450.2572

ACTION REQUESTED

The Council is asked to approve Change Order No. 1 for City Project No. 2020-03 - ADA Pedestrian Ramp Improvements.

BACKGROUND

In 2021, the City received notice of award for the 2020 Regional Solicitation Project Selection for the improvement of various pedestrian ramps within the City to bring them into compliance with Americans with Disabilities Act (ADA) standards. In 2023, staff moved forward with designing the pedestrian ramp modifications using MnDOT's Level 1 design process. This process is the most general approach to design and allows staff and contractor to "field fit" facilities appropriately at each location.

In March 2024, the Council approved plans and authorized the advertisement for bidding (Resolution 2024-051). Bids were received and the project was subsequently awarded to McNamara Contracting, Inc. in May 2024 (Resolution 2024-106) for \$228,230. At the same Council meeting, a budget for the project was approved for a total of \$292,134.40. As part of the process for awarding the project, due to federal grant funding, staff was required by MnDOT to perform a bid analysis, and it was determined that the costs associated with each item were reasonable and in conformance with historical and accepted costs based on reference information and field conditions.

During construction, quantity overruns were encountered that were necessary to construct the ramps and adjacent areas so that they conformed to ADA standards. Overruns for this type of work are not uncommon given the amount of detail and accuracy in this approach to design. While overrunning quantities on projects is typical and usually does not require a change order, the increase in expected costs associated with these necessary overruns are outside the contingency appved as part of the original budget request.

FISCAL IMPACT

As part of the 2020 Regional Solicitation, the awarded grant allowed for federal participation up to \$250,240. A stipulation of the grant is that the City provide a match of 20% of the overall project cost. The following table illustrates expected project funding splits:

	Design Estimate	Project Award	Actual Construction Cost (with Change Order)
Total Project Construction Cost	\$ 337,542.00	\$ 228,230.00	\$ 228,230.00
Maximum Federal Participation(-)	\$ 250,240.00	\$ 182,584.00	\$ 250,240.00
Contract Changes (+)	\$ -	\$ -	\$ 99,166.19
Expected City Responsibility	\$ 87,302.00	\$ 45,646.00	\$ 77,156.19

The above funding splits are based on an expected maximum federal contribution and have a resultant City cost share of 23.6%. The City is responsible for financing all costs not covered by the federal participation costs. Final actual City costs will be determined in coordination with MnDOT through the Delegated Contracting Process and presented as a budget resolution at a future Council meeting. The anticipated City cost share as a result of the change order (\$77,156) is still below the original CIP budget for the project (\$87,302). Funding for the City cost share would come from the Pavement Management - Local Streets (Fund 440).

RECOMMENDATION

Staff recommends approval of Change Order No. 1, in the amount of \$99,166.19, for City Project No. 2020-03 - ADA Pedestrian Ramp Improvements.

ATTACHMENTS

1. Change Order #1 Inver Grove ADA_SIG(Flattened)



2020-03 Pedestrian Ramp ADA Compliance Change Order No. 1

Project Location	City of Inver Grove Heights		
Local Agency	City of Inver Grove Heights	Local Project No.	2020-03
Contractor	McNamara Contracting Inc.	Contract No.	2020-03
Address/City/State/Zip	16700 Chippendale Avenue / Rosemount / MN / 55068		
Original Contract Price	\$228,230.00		
Previous Change Orders	\$0.00		
Current Change Order Amount	\$99,166.19		
Contract Price with all Change Orders	\$327,396.19		

Issue: The Engineer has determined the Contract needs to be revised in accordance with specification 1402.5 - Extra Work.

This change order is to authorize the Contractor to overrun quantity items specified in the Contract Documents so that work may be completed in compliance with ADA standards. The initial design of the ADA pedestrian ramps was based upon Level 1 design standards as defined by MnDOT. A Level 1 design is the most general approach to design and allows the Contractor to field fit facilities appropriately to each location. While overrunning quantities on projects is typical and usually doesn't require a change order, the increase in expected costs associated with these necessary overruns will be outside of the requested contingency in the original budget request.

Resolution:

The Agency will: provide compensation for all necessary work included to meet the ADA requirements and defined by the original contract documents.

The Contractor will: construct all work in conformance with the provided plans and specifications and per Federal, State, and Local standards so that the City may recoup all necessary grant funding that has been awarded as part of the Federal grant process.

Entitlement:

Contract Time: is not changed

Estimate of Cost: will be determined upon final computation of quantities necessary to construct the final project to standards. Total current expected project overrun is \$99,166.19. This will place the total estimated construction cost at \$327,396.19.



2020-03 Pedestrian Ramp ADA Compliance Change Order No. 1

Contractor: Spencer

Date: 10-7-24

Print Name: Joe Koscielak

Project Engineer: Paul C. Merchlewicz

Date: 10/7/2024

Print Name: Paul Merchlewicz

*Public Works Director: Brian Connolly

Date: 10/7/2024

Print Name: Brian Connolly

**Change orders above \$10,000 require approval by Director of Public Works*

**Mayor: _____

Print Name: Brenda Dietrich

Date: 10/14/2024

***Change orders resulting in costs greater than the contingency authorized by City Council via a budget resolution require City Council Approval*



Request for Council Action

SUBJECT: **Approval of Amended Open Space Plan for Plat of Archer Trail**

MEETING DATE: October 14, 2024

ITEM TYPE: Consent Agenda

CONTACT: Heather Botten, Associate Planner, 651.450.2569

ACTION REQUESTED

The Council is asked to adopt the attached Resolution, approving an amended Open Space Plan for the Plat of Archer Trail.

BACKGROUND

At its September 23, 2024 meeting, the City Council approved development plans and a number of related documents for the development of the Plat of Archer Trail. One of the approved documents was the open space plan for the development. The Developer has proposed a revised open space plan, which will preserve additional parking area for future commercial redevelopment on Outlot B, while still meeting all of the zoning ordinance requirements related to open space for this development. The total open space provided by the Developer continues to significantly exceed the minimum open space required by city regulations for this development.

The Council is asked to approve the revised open space plan and revision of the various previously-approved development documents to incorporate this revised open space plan. Both the previously-approved open space plan and the revised open space plan are attached to this agenda item.

The original open space calculations are as follows:

OPEN SPACE CALCULATIONS		
NET DEVELOPABLE	18.2 ACRES	GROSS SITE AREA
REQUIRED TOTAL OPEN SPACE	3.6 ACRES	NET DEVELOPABLE AREA X 20%
REQUIRED CONTIGUOUS OPEN SPACE (100' MINIMUM WIDTH)	2.7 ACRES	REQUIRED OPEN SPACE X 75%
REQUIRED UNDISTURBED OPEN SPACE	1.8 ACRES	REQUIRED OPEN SPACE X 50%
PROVIDED TOTAL OPEN SPACE	6.4 ACRES	MEETS REQUIREMENT
PROVIDED CONTIGUOUS OPEN SPACE	2.9 ACRES	MEETS REQUIREMENT
PROVIDED UNDISTURBED OPEN SPACE	1.8 ACRES	MEETS REQUIREMENT

The revised open space calculations are as follows:

OPEN SPACE CALCULATIONS		
NET DEVELOPABLE	18.2 ACRES	GROSS SITE AREA
REQUIRED TOTAL OPEN SPACE	3.8 ACRES	NET DEVELOPABLE AREA X 20%
REQUIRED CONTIGUOUS OPEN SPACE (100' MINIMUM WIDTH)	2.7 ACRES	REQUIRED OPEN SPACE X 75%
REQUIRED UNDISTURBED OPEN SPACE	1.8 ACRES	REQUIRED OPEN SPACE X 50%
PROVIDED TOTAL OPEN SPACE	6.1 ACRES	MEETS REQUIREMENT
PROVIDED CONTIGUOUS OPEN SPACE	2.9 ACRES	MEETS REQUIREMENT
PROVIDED UNDISTURBED OPEN SPACE	1.8 ACRES	MEETS REQUIREMENT

FISCAL IMPACT

n/a

RECOMMENDATION

Staff recommends adoption of the attached Resolution, amending the Open Space Plan for the Plat of Archer Trail.

ATTACHMENTS

1. Previously Approved Open Space Plan
2. Amended Open Space Plan
3. Resolution Approving Amended Open Space Plan

ARGENTA TRAIL
SOUTHWEST CORNER OF 70TH STREET WEST & ARGENTA TRAIL
INTERSECTION, INVER GROVE HEIGHTS
STUART DEVELOPMENT CORPORATION

HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

Matthew R. Parvizi
DATE: 08/26/2024 LICENSE NO. 44285

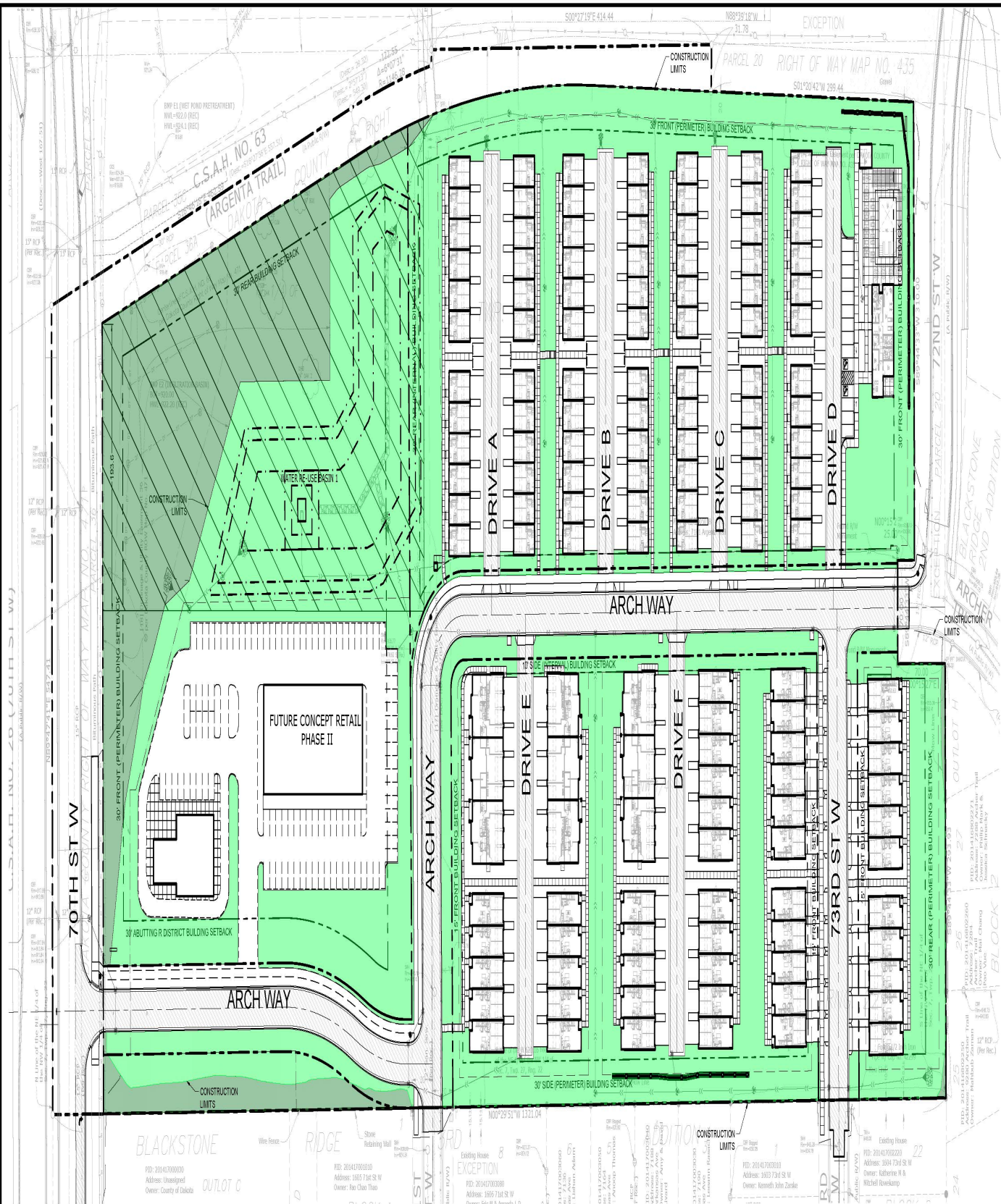
ISSUE/SUBMITTAL SUMMARY	
DATE	DESCRIPTION
08/26/2024	PRELIMINARY PLAT
08/26/2024	PRELIMINARY PLAT & RESUBMITTAL
08/26/2024	FINAL SET
08/26/2024	FINAL PLAT & RESUBMITTAL
08/26/2024	CITY PERMITAL
08/26/2024	CITY PERMITAL
08/26/2024	CITY PERMITAL

REVISION SUMMARY

DATE	DESCRIPTION

SITE PLAN - OPEN SPACE EXHIBIT

C2.7



LEGEND:

	DISTURBED OPEN SPACE
	UNDISTURBED OPEN SPACE
	CONTIGUOUS OPEN SPACE (100' WIDTH MINIMUM)

AREA CALCULATIONS

TOTAL SITE GROSS AREA	19.85 ACRES
PROPOSED COUNTY ROW	1.63 ACRES
BELOW CHW LEVEL	N/A ACRES
WITHIN WETLAND BOUNDARIES	N/A ACRES
BLUFFS ABUTTING TO PUBLIC WATERS	N/A ACRES
PARK LAND TO BE DEDICATED	0.00 ACRES
TOTAL NET DEVELOPABLE AREA	18.22 ACRES

OPEN SPACE CALCULATIONS

NET DEVELOPABLE	18.2 ACRES	GROSS SITE AREA
REQUIRED TOTAL OPEN SPACE	3.6 ACRES	NET DEVELOPABLE AREA X 20%
REQUIRED CONTIGUOUS OPEN SPACE (100' MINIMUM WIDTH)	2.7 ACRES	REQUIRED OPEN SPACE X 75%
REQUIRED UNDISTURBED OPEN SPACE	1.8 ACRES	REQUIRED OPEN SPACE X 50%
PROVIDED TOTAL OPEN SPACE	6.4 ACRES	MEETS REQUIREMENT
PROVIDED CONTIGUOUS OPEN SPACE	2.9 ACRES	MEETS REQUIREMENT
PROVIDED UNDISTURBED OPEN SPACE	1.8 ACRES	MEETS REQUIREMENT

SITE PLAN LEGEND:

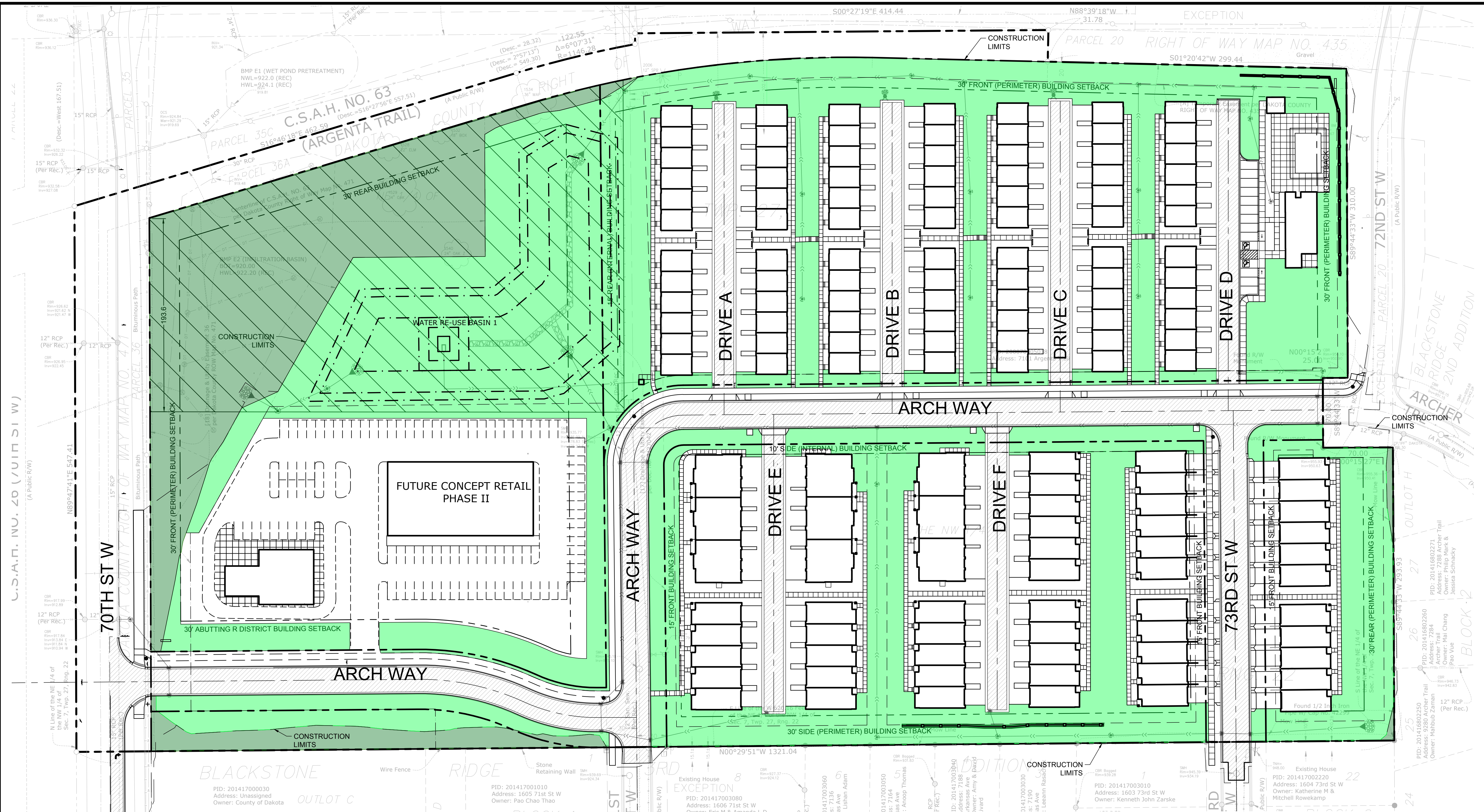
	BITUMINOUS PAVEMENT: SEE GEOTECHNICAL REPORT FOR AGGREGATE BASE & WEAR COURSE DEPTH. SEE DETAIL.
	HEAVY DUTY BITUMINOUS PAVEMENT (IF APPLICABLE): SEE GEOTECHNICAL REPORT FOR AGGREGATE BASE & WEAR COURSE DEPTH. SEE DETAIL.
	CURB AND GUTTER: SEE NOTES (T.O.) TIP OUT GUTTER WHERE APPLICABLE-SEE PLAN
	CONCRETE PAVEMENT (IF APPLICABLE) AS SPECIFIED (PAD OR WALK): SEE GEOTECHNICAL REPORT FOR AGGREGATE BASE & CONCRETE DEPTHS. WITHIN ROW SEE CITY DETAIL. WITHIN PRIVATE PROPERTY SEE CDS DETAIL.
	PROPERTY LINE
	CONSTRUCTION LIMITS

APPROVED:

PAUL C. MERCHLE, P.E.
City Engineer, Inver Grove Heights
DATE: 8/26/2024
No changes or revisions to this plan are allowed without written approval from the above signatory, their successor, or their designee.



SEE SHEET C0.1 FOR GENERAL SITE NOTES



LEGEND:

	DISTURBED OPEN SPACE
	UNDISTURBED OPEN SPACE
	CONTIGUOUS OPEN SPACE (100' WIDTH MINIMUM)

APPROVED:

PAUL C. MERCHLEWICZ, P.E.
City Engineer, Inver Grove Heights
10/7/2024
DATE

No changes or revisions to this plan are allowed without written approval from the above signatory, their successor, or their designee.

AREA CALCULATIONS	
TOTAL SITE, GROSS AREA	19.85 ACRES
PROPOSED COUNTY ROW	1.63 ACRES
BELOW OHW LEVEL	N/A ACRES
WITHIN WETLAND BOUNDARIES	N/A ACRES
BLUFFS ABUTTING TO PUBLIC WATERS	N/A ACRES
PARK LAND TO BE DEDICATED	0.00 ACRES
TOTAL NET DEVELOPABLE AREA	18.22 ACRES

OPEN SPACE CALCULATIONS		
NET DEVELOPABLE	18.2 ACRES	GROSS SITE AREA
REQUIRED TOTAL OPEN SPACE	3.6 ACRES	NET DEVELOPABLE AREA X 20%
REQUIRED CONTIGUOUS OPEN SPACE (100' MINIMUM WIDTH)	2.7 ACRES	REQUIRED OPEN SPACE X 75%
REQUIRED UNDISTURBED OPEN SPACE	1.8 ACRES	REQUIRED OPEN SPACE X 50%
PROVIDED TOTAL OPEN SPACE	6.1 ACRES	MEETS REQUIREMENT
PROVIDED CONTIGUOUS OPEN SPACE	2.9 ACRES	MEETS REQUIREMENT
PROVIDED UNDISTURBED OPEN SPACE	1.8 ACRES	MEETS REQUIREMENT

SITE PLAN LEGEND:

	BITUMINOUS PAVEMENT. SEE GEOTECHNICAL REPORT FOR AGGREGATE BASE & WEAR COURSE DEPTH, SEE DETAIL.
	HEAVY DUTY BITUMINOUS PAVEMENT (IF APPLICABLE). SEE GEOTECHNICAL REPORT FOR AGGREGATE BASE & WEAR COURSE DEPTH, SEE DETAIL.
	CONCRETE PAVEMENT (IF APPLICABLE) AS SPECIFIED (PAD OR WALK) SEE GEOTECHNICAL REPORT FOR AGGREGATE BASE & CONCRETE DEPTHS, WITHIN ROW SEE CITY DETAIL, WITHIN PRIVATE PROPERTY SEE CSG DETAIL.
	PROPERTY LINE
	CONSTRUCTION LIMITS

SEE SHEET C0.1 FOR GENERAL SITE NOTES

Know what's below.
Call before you dig.

1" = 50'-0"
25'-0" 0 50'-0"

CivilSite
Civil Engineering • Surveying • Landscape Architecture
5000 Glenwood Avenue
Golden Valley, MN 55422
civilsitegroup.com 612-615-0060

ARGENTA TRAIL
SOUTHWEST CORNER OF 70th STREET WEST & ARGENTA TRAIL
INTERSECTION, INVER GROVE HEIGHTS

STUART DEVELOPMENT CORPORATION
1000 WEST 80TH STREET, MINNEAPOLIS, MN 55420

PROJECT

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Matthew R. Pavlek
DATE 08/20/2024 LICENSE NO. 44263

ISSUE/SUBMITTAL SUMMARY	
DATE	DESCRIPTION
10/23/2023	PRELIMINARY PLAT/PUD
11/20/2023	PRELIMINARY PLAT/PUD RESUBMITTAL
6/7/2024	PRICING SET
6/17/2024	FINAL PLAT / PUD SUBMITTAL
7/19/2024	CITY RESUBMITTAL
8/20/2024	CITY RESUBMITTAL
8/20/2024	CITY RESUBMITTAL

REVISION SUMMARY	
DATE	DESCRIPTION
8/30/2024	OPEN SPACE AREA REVISION

SITE PLAN - OPEN SPACE EXHIBIT

C2.7
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**CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA**

RESOLUTION NO. 2024-236

**A RESOLUTION APPROVING AMENDED OPEN SPACE PLAN FOR PLAT OF
ARCHER TRAIL**

**CASE NO. 24-24PUD
(Stuart Development)**

WHEREAS, on September 23, 2024, the City Council approved a series of development-related documents for the property legally described on **Exhibit A** which is being replatted as the plat of Archer Trail, as legally described on **Exhibit B**, which included the Final Plat, Development Contract, Stormwater Facilities Maintenance Agreement, Stormwater Reuse System Maintenance Agreement, Open Space Easement, Acknowledgement of PUD Zoning, and PUD Development Plan; and

WHEREAS, the Final Development Plans were approved, subject to revisions as approved by the City Engineer, and the various other development-related documents were approved subject to minor revisions as required by the City Attorney; and

WHEREAS, the Developer has prepared a revised open space plan for the Development, which provides for significantly more total open space than required for the Development, while slightly reducing the total open space for the Development, which has been reviewed by the City Planner and found to be in conformity with all City zoning ordinance requirements for open space plans for a PUD in the City's Northwest Area.

NOW, THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF INVER GROVE HEIGHTS as follows:

1. That the revised open space plan prepared by CivilSite Group and identified as Sheet C2.7, with a revision date of 8/30/2024, is hereby approved as the Open Space Plan for the Development.
2. The Open Space Easement, Development Contract, PUD Development Acknowledgement, and all other previous Development Approvals are authorized to be updated to reflect that the updated open space plan is the approved open space plan for the development of the Plat of ARCHER TRAIL.

BE IT FURTHER RESOLVED BY THE CITY COUNCIL, that the City Clerk or Deputy City Clerk are hereby authorized and directed to record a certified copy of this Resolution at the Dakota County Recorder's Office.

Passed this 14th day of October, 2024.

Brenda Dietrich, Mayor

ATTEST:

Rebecca Kiernan, City Clerk

EXHIBIT A
LEGAL DESCRIPTION OF PROPERTY BEING REPLATTED AS THE PLAT OF
ARCHER TRAIL

Real property located in Dakota County and legally described as follows:

The Northeast 1/4 of the Northwest 1/4 of Section 7, Township 27 North, Range 22 West,
EXCEPT the West 620.12 feet thereof

AND EXCEPTING Parcels 35, 35B, 35C and 35D, DAKOTA COUNTY ROAD RIGHT OF WAY MAP
NO. 471.

AND EXCEPTING Parcel 20, DAKOTA COUNTY ROAD RIGHT OF WAY MAP. NO. 435.

EXHIBIT B
LEGAL DESCRIPTION OF REPLATTED PROPERTY

Real property located in Dakota County and legally described as follows:

Lot 1, Block 1, ARCHER TRAIL
Lot 1, Block 2, ARCHER TRAIL
Lot 1, Block 3, ARCHER TRAIL
Outlots A, B, and C, ARCHER TRAIL



Request for Council Action

SUBJECT: **Assessment Hearings and Resolutions Adopting Final Assessment Rolls for 2024 Pavement Management Projects 2024-09D, 2024-09F, 2024-09G, 2024-09H, and 2024-09I**

MEETING DATE: October 14, 2024
ITEM TYPE: Public Hearing
CONTACT: Paul Merchlewicz, City Engineer, 651.450.2572

ACTION REQUESTED

The Council is asked to hold assessment hearings and then adopt the attached Resolutions regarding the final assessment rolls for City Project Nos. 2024-09D, 2024-09F, 2024-09G, 2024-09H, and 2024-09I.

BACKGROUND

On March 18, 2024, the City Council awarded a contract in the amount of \$5,316,421.80 to McNamara Contracting, Inc. and approved budgets for the City Projects as noted in the table below:

Project No.	Project Name	Bid Contract	Total Budget
2024-09D	Delano Way and Dempsey Way Area	\$789,526.90	\$923,746.48
2024-09F	Corcoran Path and Dawson Way Area	\$1,050,404.50	\$1,228,973.27
2024-09G	South Grove Area 7	\$2,122,739.05	\$2,759,560.76
2024-09H	96th and 99th Street Area	\$1,278,523.35	\$1,495,872.32
2024-09I	Bixby Way	\$75,228.00	\$91,025.89
TOTAL		\$5,316,421.80	\$6,499,178.72

The following points summarize the work associated with each project area:

- **2024-09D** - Full Depth Reclamation, Storm Improvements, Curb Improvements, Utility Adjustments, Water Main Improvements.
- **2024-09F** - Full Depth Reclamation, Storm Improvements, Sidewalk & Trail Improvements, Utility Adjustments, Water Main Improvements.
- **2024-09G** - Full Depth Reclamation, Storm Improvements, Sidewalk & Trail Improvements, Curb Improvements, Utility Adjustments, Water Main Improvements.

- **2024-09H** - Full Depth Reclamation (96th St., Baxter Ct., Barton Tr.), Mill & Overlay (99th St. and Baxter Trl.), Storm Improvements, Curb Improvements.
- **2024-09I** - Mill and Overlay, Storm Improvements, Curb Improvements, Utility Adjustments.

All projects have reached substantial completion and now only require final punch list items to be resolved before contract completion. The estimated total costs for each project are as follows:

- **2024-09D**: \$814,418.86 estimated total project cost (11.8% under budget)
- **2024-09F**: \$1,302,950.58 estimated total project cost (6% over budget)
- **2024-09G**: \$2,433,852.5 estimated total project cost (11.8% under budget)
- **2024-09H**: \$1,251,365.03 estimated total project cost (16.3% under budget)
- **2024-09I**: \$62,183.52 estimated total project cost (31.7% under budget)

Staff held an informational open house from 5:00 to 7:00 pm on Thursday, October 3, 2024, with project boards and final assessment rolls available for review and discussion on all five projects. 35 residents representing 27 properties attended. Questions were answered by staff regarding the assessment payment process.

FISCAL IMPACT

Projects 2024-09D, 2024-09F, 2024-09G, and portions of 2024-09H were full depth reclamation projects with street and storm costs assessed at a rate of 55%, shared on a per-parcel basis for single family properties in accordance with the City Assessment Policy.

Portions of Project 2024-09H and all of 2024-09I were mill and overlay projects with street and storm costs assessed at a rate of 80%, shared on a per-parcel basis for single family properties in accordance with the City Assessment Policy.

Assessment terms vary based on the amount to be assessed, with terms and rates as follows:

Assessment Amount	Term (Years)	Interest Rate
\$1,000 to \$4,999	5	4.39%
\$5,000 to \$9,999	10	4.63%
\$10,000+	15	4.92%

The following table summarizes the per-policy assessments for street and storm improvements per project:

Project No.	Assessable Costs (Street/Storm & Trail/Sidewalk)	Total Assessed	Final Assessment	Assessment Basis
2024-09D	\$762,605	\$419,432	\$6,765.04	Per-parcel
2024-09F	\$1,204,778	\$662,628	\$7,872.56 \$1,499.78 to \$3,591.72	Per-parcel Per-parcel (Townhomes)

2024-09G	\$2,268,677	\$1,136,650	\$7,221.74 \$3,938.20 \$55,373.66	Per-parcel Per-Unit (Condos) Adjusted Front Footage (Apartment)
2024-09H	\$1,251,365	\$682,345	\$10,686.86 \$5,266.54	Per-parcel (FDR) Per-parcel (Mill & Overlay)
2024-09I	\$53,763	\$43,010	\$1,654.22	Per-parcel

RECOMMENDATION

Staff recommends Council hold the assessment hearings and then adopt the attached Resolutions, adopting the final assessment rolls for City Project Nos. 2024-09D, 2024-09F, 2024-09G, 2024-09H, and 2024-09I. As there are five project areas included in this Request for Council Action, the Council is asked to hold each project hearing and approve each Resolution independently.

ATTACHMENTS

1. Resolution Adopting Final Assessment Roll 2024-09D
2. Final Assessment Roll 2024-09D
3. Resolution Adopting Final Assessment Roll 2024-09F
4. Final Assessment Roll 2024-09F
5. Resolution Adopting Final Assessment Roll 2024-09G
6. Final Assessment Roll 2024-09G
7. Resolution Adopting Final Assessment Roll 2024-09H
8. Final Assessment Roll 2024-09H
9. Resolution Adopting Final Assessment Roll 2024-09I
10. Final Assessment Roll 2024-09I

**CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA**

RESOLUTION NO. 2024-237

**RESOLUTION APPROVING SPECIAL ASSESSMENTS AND ADOPTING FINAL ASSESSMENT
ROLL FOR THE 2024 PAVEMENT MANAGEMENT INITIATIVE
CITY PROJECT NO. 2024-09D – DELANO WAY AND DEMPSEY WAY AREA**

WHEREAS, pursuant to proper notice duly given as required by law, the City Council of the City of Inver Grove Heights has met, heard, and passed upon all objections to the proposed special assessments for the improvements for City Project No. 2024-09D which includes pavement rehabilitation by means of full depth reclamation along with storm improvements, curb improvements, utility adjustments, watermain improvements, and appurtenances along 80th Street from 100 feet east of Concord Blvd to Delano Way, Delano Way from 80th Street to Delano Court, Delano Court from Delano Way to its terminus, Delano Circle from Delano Way to its terminus, and Dempsey Way from Delano Court to 80th Street.

**NOW THEREFORE, BE IT RESOLVED BY THE INVER GROVE HEIGHTS CITY COUNCIL
THAT:**

1. The special assessments and the final assessment roll, a copy of which is attached hereto and made a part hereof, is hereby accepted and shall constitute the special assessment levied against the parcels named herein, and each tract of land herein included is hereby found to be benefited by the improvement in at least the amount of the special assessment levied against it.
2. Such assessment shall be payable in equal installments extending over a period of 10 years beginning in 2025 and shall bear interest at the rate of 4.63 percent per annum beginning January 1, 2025.
3. The owner of any property, so assessed, may at any time prior to certification of the assessment to the County Auditor, pay the whole of the assessment on such property with interest accrued to the date of payment, to the City Treasurer, except that no interest shall be charged if the entire assessment is paid in 2024, within thirty days from the adoption of this resolution; and the owner may, at any time thereafter, pay to the County Treasurer the entire amount of the assessment remaining unpaid, with interest accrued to December 31 of the year in which such payment is made. Such payment must be made before November 15, or interest will be charged through December 31 of the next succeeding year (or such later date as determined by the Council), except no interest shall be charged or accrued in 2024.
4. The Clerk shall, forthwith, transmit a certified duplicate of this assessment to the County Auditor to be extended on the property tax lists of the County, and such assessments shall be collected and paid in the same manner as other taxes.

Approved by the City Council of the City of Inver Grove Heights, Minnesota this 14th day of October 2024.

Brenda Dietrich, Mayor

ATTEST:

Rebecca Kiernan, City Clerk

CP 2024-09D Delano Way and Dempsey Way Area Preliminary Assessment Roll									
#	PIN	Property Type Classification	Owner	Site Address	Front Footage	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
FULL DEPTH RECLAMATION									
1	206407501010	RESIDENTIAL	OVERTURF MICHAEL J & LISA A	7870 DEMPSEY WAY	256	\$6,765.05	\$6,765.05	\$6,765.04	
2	206407501020	RESIDENTIAL	TRUST COMPANY OF TENNESSEE TSTE	7878 DEMPSEY WAY	100	\$6,765.05	\$6,765.05	\$6,765.04	
3	206407501030	RESIDENTIAL	ALBRECHT ETHAN & ANGELA HETTINGER	7886 DEMPSEY WAY	93	\$6,765.05	\$6,765.05	\$6,765.04	
4	206407501040	RESIDENTIAL	TOBRITZHOFFER BRIAN CHARLES & KELSEY JOY TOBRITZHOFFER	7894 DEMPSEY WAY	93	\$6,765.05	\$6,765.05	\$6,765.04	
5	206407501050	RESIDENTIAL	COLLOPY GARY T & MICHELLE L	7902 DEMPSEY WAY	93	\$6,765.05	\$6,765.05	\$6,765.04	
6	206407501060	RESIDENTIAL	CORNIEA WILLIAM J & PATRICIA	7910 DEMPSEY WAY	107	\$6,765.05	\$6,765.05	\$6,765.04	
7	206407501070	RESIDENTIAL	SCHWARK KYLE R & JANE V	7918 DEMPSEY WAY	100	\$6,765.05	\$6,765.05	\$6,765.04	
8	206407501080	RESIDENTIAL	LARSON DAVID A & ANNE L	7926 DEMPSEY WAY	97	\$6,765.05	\$6,765.05	\$6,765.04	
9	206407501090	RESIDENTIAL	HODGE MIRIAM G	7934 DEMPSEY WAY	79	\$6,765.05	\$6,765.05	\$6,765.04	
10	206407501100	RESIDENTIAL	ANDERSON GARY LEE & DEBRA M	7942 DEMPSEY WAY	74	\$6,765.05	\$6,765.05	\$6,765.04	
11	206407501110	RESIDENTIAL	BOUGHTON DANIEL & RICKA	7950 DEMPSEY WAY	100	\$6,765.05	\$6,765.05	\$6,765.04	
12	206407501120	RESIDENTIAL	BOEHMKE NICHOLE & TIMOTHY	7958 DEMPSEY WAY	100	\$6,765.05	\$6,765.05	\$6,765.04	
13	206407501130	RESIDENTIAL	LARSON KEITH R & KATHRYN A	7966 DEMPSEY WAY	95	\$6,765.05	\$6,765.05	\$6,765.04	
14	206407501140	RESIDENTIAL	ERIN JUNGSMANN & GRANT JOHNSON	7974 DEMPSEY WAY	83	\$6,765.05	\$6,765.05	\$6,765.04	
15	206407501150	RESIDENTIAL	CHAPMAN DION T & NY DEER	7982 DEMPSEY WAY	99	\$6,765.05	\$6,765.05	\$6,765.04	
16	206407501160	RESIDENTIAL	MERCURIO RICHARD J & WENDY R	7990 DEMPSEY WAY	223	\$6,765.05	\$6,765.05	\$6,765.04	
17	206407501170	RESIDENTIAL	COLLETTE LAWRENCE E & DIANNE E COLLETTE	8016 DELANO CT	359	\$6,765.05	\$6,765.05	\$6,765.04	
18	206407501180	RESIDENTIAL	WICKE BRIAN J & ROBIN E	8020 DELANO CT	104	\$6,765.05	\$6,765.05	\$6,765.04	
19	206407501190	RESIDENTIAL	JOHNSON VICTOR L & TRUDY J	8022 DELANO CT	110	\$6,765.05	\$6,765.05	\$6,765.04	
20	206407501200	RESIDENTIAL	DUNN JAMES FRANCIS & SHARI L CROWE	8024 DELANO CT	67	\$6,765.05	\$6,765.05	\$6,765.04	
21	206407501210	RESIDENTIAL	HANCOCK JAMES T & VIKKI L	8023 DELANO CT	67	\$6,765.05	\$6,765.05	\$6,765.04	
22	206407501220	RESIDENTIAL	SELLEN JOSHUA & ELIZABETH	8021 DELANO CT	136	\$6,765.05	\$6,765.05	\$6,765.04	
23	206407501230	RESIDENTIAL	GUNDERMAN JAMES M & JOELLE I	8019 DELANO CT	101	\$6,765.05	\$6,765.05	\$6,765.04	
24	206407501240	RESIDENTIAL	NAVAS JULIE & LUIS NAVAS	8017 DELANO CT	296	\$6,765.05	\$6,765.05	\$6,765.04	
25	206407501250	RESIDENTIAL	SCHRAM THOMAS J & MONICA J	8015 DELANO WAY	193	\$6,765.05	\$6,765.05	\$6,765.04	
26	206407501260	RESIDENTIAL	HANSEN JAYME F & SHARI LYNN BONNEAU	8013 DELANO WAY	100	\$6,765.05	\$6,765.05	\$6,765.04	
27	206407501270	RESIDENTIAL	EMERSON GEORGE JR & ELIZABET	8011 DELANO WAY	100	\$6,765.05	\$6,765.05	\$6,765.04	

CP 2024-09D Delano Way and Dempsey Way Area Preliminary Assessment Roll									
#	PIN	Property Type Classification	Owner	Site Address	Front Footage	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
28	206407501280	RESIDENTIAL	SFR BORROWER 2022-1 LLC	8009 DELANO WAY	100	\$6,765.05	\$6,765.05	\$6,765.04	
29	206407501290	RESIDENTIAL	STEIN JASON & MELISSA STEIN	8007 DELANO WAY	88	\$6,765.05	\$6,765.05	\$6,765.04	
30	206407501300	RESIDENTIAL	SARANTOS STEPHEN M & DARCY J	8005 DELANO WAY	75	\$6,765.05	\$6,765.05	\$6,765.04	
31	206407501310	RESIDENTIAL	RANK ROBIN ELAINE	8003 DELANO WAY	79	\$6,765.05	\$6,765.05	\$6,765.04	
32	206407501320	RESIDENTIAL	HOFFMAN JEFFERY & ELIZABETH	8001 DELANO WAY	243	\$6,765.05	\$6,765.05	\$6,765.04	
33	206407502010	RESIDENTIAL	CRAIN KITTY KATHERINE	8012 DELANO WAY	230	\$6,765.05	\$6,765.05	\$6,765.04	
34	206407502020	RESIDENTIAL	FARLEY DOROTHY R	8010 DELANO WAY	90	\$6,765.05	\$6,765.05	\$6,765.04	
35	206407502030	RESIDENTIAL	KESTI MARK A	8004 DELANO WAY	225	\$6,765.05	\$6,765.05	\$6,765.04	
36	206407502040	RESIDENTIAL	GUTZMAN SARAH M & ROY H	8000 DEMPSEY WAY	100	\$6,765.05	\$6,765.05	\$6,765.04	
37	206407502050	RESIDENTIAL	JOHNSON CRAIG C & JULIE L	7871 DEMPSEY WAY	95	\$6,765.05	\$6,765.05	\$6,765.04	
38	206407502060	RESIDENTIAL	LOTHENBACH GARY T & JUDITH	7879 DEMPSEY WAY	100	\$6,765.05	\$6,765.05	\$6,765.04	
39	206407502070	RESIDENTIAL	KORTE THOMAS L & RUTH S	7887 DEMPSEY WAY	110	\$6,765.05	\$6,765.05	\$6,765.04	
40	206407502080	RESIDENTIAL	URSIN DANIEL G & JOYCE D	7899 DEMPSEY WAY	128	\$6,765.05	\$6,765.05	\$6,765.04	
41	206407502090	RESIDENTIAL	LARSON DOUGLAS & KATHLEEN LARSON	7911 DEMPSEY WAY	108	\$6,765.05	\$6,765.05	\$6,765.04	
42	206407502100	RESIDENTIAL	PENNING RUSSELL J JR & MERRI	7917 DEMPSEY WAY	100	\$6,765.05	\$6,765.05	\$6,765.04	
43	206407502110	RESIDENTIAL	NESBITT SUSAN & ROBERT II	7933 DEMPSEY WAY	202	\$6,765.05	\$6,765.05	\$6,765.04	
44	206407502120	RESIDENTIAL	FEDERAL NATIONAL MORTGAGE ASSOCIATION	7955 DEMPSEY WAY	93	\$6,765.05	\$6,765.05	\$6,765.04	
45	206407502130	RESIDENTIAL	LAVOIE CRAIG R & JANE M	7961 DEMPSEY WAY	93	\$6,765.05	\$6,765.05	\$6,765.04	
46	206407502140	RESIDENTIAL	HEUER SCOTT J & DEBORAH L	7977 DEMPSEY WAY	157	\$6,765.05	\$6,765.05	\$6,765.04	
47	206407502150	RESIDENTIAL	SCHINDELDECKER GARY L	7985 DEMPSEY WAY	100	\$6,765.05	\$6,765.05	\$6,765.04	
48	206407502160	RESIDENTIAL	SCOTT DON FRANCIS & LOIS	7991 DEMPSEY WAY	95	\$6,765.05	\$6,765.05	\$6,765.04	
49	206407502170	RESIDENTIAL	ZEMAN RICHARD T & RUTH A	7995 DEMPSEY WAY	103	\$6,765.05	\$6,765.05	\$6,765.04	
50	206407502180	RESIDENTIAL	KRECH VERNON M & TAMRA A	7999 DEMPSEY WAY	91	\$6,765.05	\$6,765.05	\$6,765.04	
51	206407502190	RESIDENTIAL	WEBINGER DAN & KIM A	8018 DELANO WAY	210	\$6,765.05	\$6,765.05	\$6,765.04	
52	206407502200	RESIDENTIAL	HER FU & ZA LAO	8016 DELANO WAY	90	\$6,765.05	\$6,765.05	\$6,765.04	
53	206407502210	RESIDENTIAL	GARCIA JOSE F LARA	8008 DELANO CIR	235	\$6,765.05	\$6,765.05	\$6,765.04	
54	206407502220	RESIDENTIAL	JAQUES MARC A & BARBARA S	8002 DELANO CIR	103	\$6,765.05	\$6,765.05	\$6,765.04	
55	206407502230	RESIDENTIAL	LABORE DUSTIN T & CHERYL M	7890 DELANO CIR	129	\$6,765.05	\$6,765.05	\$6,765.04	

CP 2024-09D Delano Way and Dempsey Way Area Preliminary Assessment Roll									
#	PIN	Property Type Classification	Owner	Site Address	Front Footage	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
56	206407502240	RESIDENTIAL	KAIN DARREN K & JODI L	7884 DELANO CIR	77	\$6,765.05	\$6,765.05	\$6,765.04	
57	206407502250	RESIDENTIAL	TRUDEAU THOMAS J & CYNTHIA L	7880 DELANO CIR	61	\$6,765.05	\$6,765.05	\$6,765.04	
58	206407502260	RESIDENTIAL	LEITCH THOMAS M & JULIE A	7873 DELANO CIR	61	\$6,765.05	\$6,765.05	\$6,765.04	
59	206407502270	RESIDENTIAL	TABBERT POLLY R	7877 DELANO CIR	61	\$6,765.05	\$6,765.05	\$6,765.04	
60	206407502280	RESIDENTIAL	KUEHNAST PAUL J & MARLYS R	7885 DELANO CIR	103	\$6,765.05	\$6,765.05	\$6,765.04	
61	206407502290	RESIDENTIAL	MICHAEL ROBERT JR SEIDL	7895 DELANO CIR	101	\$6,765.05	\$6,765.05	\$6,765.04	
62	206407502300	RESIDENTIAL	KEEFER ROBERT L & PATRICIA	8003 DELANO CIR	100	\$6,765.05	\$6,765.05	\$6,765.04	
TOTALS:					7561	\$ 419,433	\$ 419,432.89	\$ 419,432.48	-\$0.41

IGH STREET & STORM ASSESSMENT (FDR)	
TOTAL STREET & STORM COST:	\$762,605.25
ASSESSABLE STREET & STORM COST (55%):	\$419,432.89
TOTAL IGH PROJECT ADJUSTED FRONT FOOTAGE (LF):	7,561
NET ASSESSMENT RATE PER LF (ASSESABLE STREET & STORM COST / ADJUSTED FRONT FOOTAGE):	\$55.47
AMOUNT ASSESSED (NON-RESIDENTIAL):	\$0.00
AMOUNT ASSESSED (RESIDENTIAL) (ASSESABLE STREET & STORM COST - NON-RESIDENTIAL AMOUNT ASSESSED):	\$419,432.89
# OF RESIDENTIAL UNITS:	62
ASSESSMENT RATE PER UNIT (RESIDENTIAL RATE):	\$6,765.05
TOTAL FINAL ASSESSMENT:	\$419,432.48

**CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA**

RESOLUTION NO. 2024-238

**RESOLUTION APPROVING SPECIAL ASSESSMENTS AND ADOPTING FINAL ASSESSMENT
ROLL FOR THE 2024 PAVEMENT MANAGEMENT INITIATIVE
CITY PROJECT NO. 2024-09F – CORCORAN PATH AND DAWSON WAY AREA**

WHEREAS, pursuant to proper notice duly given as required by law, the City Council of the City of Inver Grove Heights has met, heard, and passed upon all objections to the proposed special assessments for the improvements for City Project No. 2024-09F which includes pavement rehabilitation by means of full depth reclamation along with storm improvements, curb improvements, sidewalk and trail improvements, utility adjustments, watermain improvements, and appurtenances along Cooper Path from Cooper Way to Concord Boulevard, Corcoran Path from Cooper Path to Concord Boulevard, Copperfield Way from Corcoran Path to Dawson Way, Copperfield Court from Copperfield Way to its terminus, Dawson Way from Custers Trail to Dawson Avenue, Dawson Avenue from Custers Trail to Dawson Way, and Dawson Court from Dawson Way to its terminus.

**NOW THEREFORE, BE IT RESOLVED BY THE INVER GROVE HEIGHTS CITY COUNCIL
THAT:**

1. The special assessments and the final assessment roll, a copy of which is attached hereto and made a part hereof, is hereby accepted and shall constitute the special assessment levied against the parcels named herein, and each tract of land herein included is hereby found to be benefited by the improvement in at least the amount of the special assessment levied against it.
2. Such assessment shall be payable in equal installments extending over a period of five years for assessments between \$1,000 and \$4,999.99 and 10 years for assessments between \$5,000 and \$9,999.99 beginning in 2025 and shall bear interest at the rate of 4.39 percent and 4.63 percent respectively, per annum, beginning January 1, 2025.
3. The owner of any property, so assessed, may at any time prior to certification of the assessment to the County Auditor, pay the whole of the assessment on such property with interest accrued to the date of payment, to the City Treasurer, except that no interest shall be charged if the entire assessment is paid in 2024, within thirty days from the adoption of this resolution; and the owner may, at any time thereafter, pay to the County Treasurer the entire amount of the assessment remaining unpaid, with interest accrued to December 31 of the year in which such payment is made. Such payment must be made before November 15, or interest will be charged through December 31 of the next succeeding year (or such later date as determined by the Council), except no interest shall be charged or accrued in 2024.
4. The Clerk shall, forthwith, transmit a certified duplicate of this assessment to the County Auditor to be extended on the property tax lists of the County, and such assessments shall be collected and paid in the same manner as other taxes.

Approved by the City Council of the City of Inver Grove Heights, Minnesota this 14th day of October 2024.

Brenda Dietrich, Mayor

ATTEST:

Rebecca Kiernan, City Clerk

CP 2024-09F Corcoran Path and Dawson Way Area Preliminary Assessment Roll											
#	PIN	Property Type Classification	Owner	Association	Site Address	Front Footage	Adjusted Front Footage	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
FULL DEPTH RECLAMATION											
1	201235001010	RESIDENTIAL	TEGANTVOORT BRAD A		8345 COPPERFIELD WAY	82	82	\$7,872.56	\$7,872.56	\$7,872.56	
2	201235001020	RESIDENTIAL	FISCHER SCOTT ALBERT		8325 COPPERFIELD WAY	80	80	\$7,872.56	\$7,872.56	\$7,872.56	
3	201235001030	RESIDENTIAL	KRAUS ROBERT & CATHERINE		8297 COPPERFIELD CT	224	224	\$7,872.56	\$7,872.56	\$7,872.56	
4	201235001040	RESIDENTIAL	HORNE NICHOLAS & LAURA ADAMS		8287 COPPERFIELD CT	95	95	\$7,872.56	\$7,872.56	\$7,872.56	
5	201235001050	RESIDENTIAL	BREWER JOSEPH BERNARD & WANYING ZHANG		8277 COPPERFIELD CT	95	95	\$7,872.56	\$7,872.56	\$7,872.56	
6	201235001060	RESIDENTIAL	LAU KARI L		8267 COPPERFIELD CT	91	91	\$7,872.56	\$7,872.56	\$7,872.56	
7	201235001070	RESIDENTIAL	MCCABE JAN-MARIE		8274 COPPERFIELD CT	173	173	\$7,872.56	\$7,872.56	\$7,872.56	
8	201235001080	RESIDENTIAL	MULCAHY YVONNE A & ROBERT M		8292 COPPERFIELD CT	248	248	\$7,872.56	\$7,872.56	\$7,872.56	
9	201235001090	RESIDENTIAL	WATSON JESSE & AMY WATSON		8284 DAWSON WAY	222	222	\$7,872.56	\$7,872.56	\$7,872.56	
10	201235001100	RESIDENTIAL	MATSON CHAD M & KATRINA L MATSON		8288 DAWSON WAY	78	78	\$7,872.56	\$7,872.56	\$7,872.56	
11	201235002010	RESIDENTIAL	WELLENS BRIAN K & ANN M		8287 DAWSON WAY	135	135	\$7,872.56	\$7,872.56	\$7,872.56	
12	201235002020	RESIDENTIAL	QUINTERO JOSE		8281 DAWSON WAY	127	127	\$7,872.56	\$7,872.56	\$7,872.56	
13	201235002030	RESIDENTIAL	WATSON WILLIAM P & JEANNE M BADE		8271 DAWSON CT	289	289	\$7,872.56	\$7,872.56	\$7,872.56	
14	201235002040	RESIDENTIAL	CERVENKA RICHARD E & TAMMY L		8265 DAWSON CT	70	70	\$7,872.56	\$7,872.56	\$7,872.56	
15	201235002050	RESIDENTIAL	MARTIN RICHARD J JR TSTE & GAIL P TSTE MARTIN		8259 DAWSON CT	67	67	\$7,872.56	\$7,872.56	\$7,872.56	
16	201235002060	RESIDENTIAL	MARFORI JOEL & KATHERINE		8262 DAWSON CT	68	68	\$7,872.56	\$7,872.56	\$7,872.56	
17	201235002070	RESIDENTIAL	IMMEL JOEL & KATIE		8268 DAWSON CT	320	320	\$7,872.56	\$7,872.56	\$7,872.56	
18	201235002080	RESIDENTIAL	CAMPOBASSO ANTHONY G & MEGHAN B CAMPOBASSO		8263 DAWSON WAY	213	213	\$7,872.56	\$7,872.56	\$7,872.56	
19	201235002090	RESIDENTIAL	KITSCH JONATHAN HENRY		8257 DAWSON WAY	85	85	\$7,872.56	\$7,872.56	\$7,872.56	
20	201235002100	RESIDENTIAL	MARRERO JOSE A & SUZANNE MARRERO		8251 DAWSON WAY	85	85	\$7,872.56	\$7,872.56	\$7,872.56	
21	201235003010	RESIDENTIAL	CODOLUTO STEPHEN & CARYN		8332 COPPERFIELD WAY	167	167	\$7,872.56	\$7,872.56	\$7,872.56	
22	201235003020	RESIDENTIAL	CLANCY LORI & PATRICK		8314 COPPERFIELD WAY	105	105	\$7,872.56	\$7,872.56	\$7,872.56	
23	201235003030	RESIDENTIAL	EBERHARDT JEFFERY		8296 COPPERFIELD WAY	85	85	\$7,872.56	\$7,872.56	\$7,872.56	
24	201235003040	RESIDENTIAL	CAULFIELD ERIC & KATHLEEN		8278 COPPERFIELD WAY	243	243	\$7,872.56	\$7,872.56	\$7,872.56	
25	201235003050	RESIDENTIAL	HALLIGAN DANIEL G & CAROL A		8278 DAWSON WAY	88	88	\$7,872.56	\$7,872.56	\$7,872.56	
26	201235003060	RESIDENTIAL	STEICHEN CLAUDIA J		8276 DAWSON WAY	92	92	\$7,872.56	\$7,872.56	\$7,872.56	
27	201235003070	RESIDENTIAL	MCKNIGHT JOSHUA & SARAH M		8272 DAWSON WAY	86	86	\$7,872.56	\$7,872.56	\$7,872.56	
28	201235003080	RESIDENTIAL	LIBMAN MICHAEL P		8270 DAWSON WAY	85	85	\$7,872.56	\$7,872.56	\$7,872.56	
29	201235003090	RESIDENTIAL	MANKOWSKI MARGARET A & STEVEN & GENE C & STANLEY C S MANKOWSKI		8266 DAWSON WAY	85	85	\$7,872.56	\$7,872.56	\$7,872.56	
30	201235003100	RESIDENTIAL	CHENOWETH ANGELA		8264 DAWSON WAY	85	85	\$7,872.56	\$7,872.56	\$7,872.56	
31	201235003110	RESIDENTIAL	WICKLUND DAVID W & JAN M		8260 DAWSON WAY	105	105	\$7,872.56	\$7,872.56	\$7,872.56	
32	204470002010	RESIDENTIAL-TOWNHOME/CONDOMINIUM	RYAN CHARISSA & GAILYN	LEGEND ESTATES	8678 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
33	204470002020	RESIDENTIAL-TOWNHOME/CONDOMINIUM	WALLACE THOMAS	LEGEND ESTATES	8680 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
34	204470002030	RESIDENTIAL-TOWNHOME/CONDOMINIUM	NOVACEK CYNTHIA	LEGEND ESTATES	8682 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
35	204470003010	RESIDENTIAL-TOWNHOME/CONDOMINIUM	KEATING PETER & ERIN PAULSON	LEGEND ESTATES	8660 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
36	204470003020	RESIDENTIAL-TOWNHOME/CONDOMINIUM	POPOWITZ JOSEPH DENNIS	LEGEND ESTATES	8662 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	

CP 2024-09F Corcoran Path and Dawson Way Area Preliminary Assessment Roll											
#	PIN	Property Type Classification	Owner	Association	Site Address	Front Footage	Adjusted Front Footage	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
37	204470003030	RESIDENTIAL-TOWNHOME/CONDOMINIUM	SIDDIQUI JUNAID A & KRISTA S	LEGEND ESTATES	8664 CORCORAN PATH	478	956	\$1,741.09	\$1,741.09	\$1,741.08	
38	204470003040	RESIDENTIAL-TOWNHOME/CONDOMINIUM	LEE PAT D & NG A SAN	LEGEND ESTATES	8666 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
39	204470003050	RESIDENTIAL-TOWNHOME/CONDOMINIUM	WILLIAMS TIMOTHY C & KARA	LEGEND ESTATES	8674 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
40	204470003060	RESIDENTIAL-TOWNHOME/CONDOMINIUM	HETHERINGTON SEAN D	LEGEND ESTATES	8672 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
41	204470003070	RESIDENTIAL-TOWNHOME/CONDOMINIUM	NELSON MATTHEW	LEGEND ESTATES	8670 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
42	204470003080	RESIDENTIAL-TOWNHOME/CONDOMINIUM	JEFFREY RICHARD A & STACY A	LEGEND ESTATES	8668 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
43	204470004010	RESIDENTIAL-TOWNHOME/CONDOMINIUM	CHEN ZHIYU	LEGEND ESTATES	8642 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
44	204470004020	RESIDENTIAL-TOWNHOME/CONDOMINIUM	ANDERBERG PAUL R	LEGEND ESTATES	8644 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
45	204470004030	RESIDENTIAL-TOWNHOME/CONDOMINIUM	MUELLER DAVE	LEGEND ESTATES	8646 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
46	204470004040	RESIDENTIAL-TOWNHOME/CONDOMINIUM	SWEENEY BRIAN & HINZ-SWEENEYALANNA	LEGEND ESTATES	8648 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
47	204470004050	RESIDENTIAL-TOWNHOME/CONDOMINIUM	GOSSETT MATTHEW & KIRA	LEGEND ESTATES	8656 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
48	204470004060	RESIDENTIAL-TOWNHOME/CONDOMINIUM	GERTEN KATIE M	LEGEND ESTATES	8654 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
49	204470004070	RESIDENTIAL-TOWNHOME/CONDOMINIUM	LI JIN	LEGEND ESTATES	8652 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
50	204470004080	RESIDENTIAL-TOWNHOME/CONDOMINIUM	RYAN HAILEY E	LEGEND ESTATES	8650 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
51	204470005010	RESIDENTIAL-TOWNHOME/CONDOMINIUM	CLASSEN LORI K	LEGEND ESTATES	8630 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
52	204470005020	RESIDENTIAL-TOWNHOME/CONDOMINIUM	LOWE SUSAN DENISE TSSTE	LEGEND ESTATES	8632 CORCORAN PATH	573	1146	\$1,741.09	\$1,741.09	\$1,741.08	
53	204470005030	RESIDENTIAL-TOWNHOME/CONDOMINIUM	LAPORTE KATHLEEN	LEGEND ESTATES	8634 CORCORAN PATH			\$1,741.09	\$1,741.09	\$1,741.08	
54	205674001010	RESIDENTIAL-TOWNHOME/CONDOMINIUM	JOSEPH THERESA M	PARK POINT	8654 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
55	205674001020	RESIDENTIAL-TOWNHOME/CONDOMINIUM	SHERRY LORI ANNE	PARK POINT	8658 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
56	205674001030	RESIDENTIAL-TOWNHOME/CONDOMINIUM	ESPESETH RODGER O	PARK POINT	8662 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
57	205674001040	RESIDENTIAL-TOWNHOME/CONDOMINIUM	MICHELKAMP JANE M	PARK POINT	8664 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
58	205674001050	RESIDENTIAL-TOWNHOME/CONDOMINIUM	LEIF JEFFREY N & AMY B LEIF	PARK POINT	8670 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
59	205674001060	RESIDENTIAL-TOWNHOME/CONDOMINIUM	KINDEM JON L & KAREN A	PARK POINT	8674 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
60	205674001070	RESIDENTIAL-TOWNHOME/CONDOMINIUM	GIBSON JOHN W & CAROL A	PARK POINT	8678 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
61	205674001080	RESIDENTIAL-TOWNHOME/CONDOMINIUM	OROURKE MICHAEL J & MARY KAY	PARK POINT	8682 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
62	205674001090	RESIDENTIAL-TOWNHOME/CONDOMINIUM	DOTSON SONYA RENEE	PARK POINT	8705 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
63	205674001100	RESIDENTIAL-TOWNHOME/CONDOMINIUM	HOCKING WILLIAM J & SUSAN C	PARK POINT	8701 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
64	205674001110	RESIDENTIAL-TOWNHOME/CONDOMINIUM	LETSON JANE	PARK POINT	8697 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
65	205674001120	RESIDENTIAL-TOWNHOME/CONDOMINIUM	TWEDT LANCE A & LOIS A	PARK POINT	8693 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
66	205674001130	RESIDENTIAL-TOWNHOME/CONDOMINIUM	SIEPELMAYER LORETTA A	PARK POINT	8689 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	

CP 2024-09F Corcoran Path and Dawson Way Area Preliminary Assessment Roll											
#	PIN	Property Type Classification	Owner	Association	Site Address	Front Footage	Adjusted Front Footage	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
67	205674001140	RESIDENTIAL- TOWNHOME/CONDOMINIUM	CARLSON JILL & RHONDA DECOTEAU	PARK POINT	8685 COLLIN WAY	682	1364	\$3,591.72	\$3,591.72	\$3,591.72	
68	205674001150	RESIDENTIAL- TOWNHOME/CONDOMINIUM	CLUCAS KENNETH R & CATHY A	PARK POINT	8681 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
69	205674001160	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MOTZ DONALD C & BARBARA J	PARK POINT	8677 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
70	205674001170	RESIDENTIAL- TOWNHOME/CONDOMINIUM	GELAO DAVID J & KATHLEEN A	PARK POINT	8673 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
71	205674001180	RESIDENTIAL- TOWNHOME/CONDOMINIUM	KELLY GREGORY D & BIUNDA	PARK POINT	8669 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
72	205674001190	RESIDENTIAL- TOWNHOME/CONDOMINIUM	JOHNSON THOMAS A & ANNE S	PARK POINT	8665 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
73	205674001200	RESIDENTIAL- TOWNHOME/CONDOMINIUM	LINDBLAD SHAUN & JANET	PARK POINT	8661 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
74	205674001210	RESIDENTIAL- TOWNHOME/CONDOMINIUM	PAULSON SCOTT & DIANE	PARK POINT	8657 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
75	205674001220	RESIDENTIAL- TOWNHOME/CONDOMINIUM	STANDING ELLEN & WILLIAM	PARK POINT	8653 COLLIN WAY			\$3,591.72	\$3,591.72	\$3,591.72	
76	205674002010	RESIDENTIAL- TOWNHOME/CONDOMINIUM	KROGH RICHARD B & DIANNE R	PARK POINT	8630 CORBIN CT	682	1364	\$3,591.72	\$3,591.72	\$3,591.72	
77	205674002020	RESIDENTIAL- TOWNHOME/CONDOMINIUM	CANNIFF MACKENZIE R & KATHLEEN A CANNIFF	PARK POINT	8634 CORBIN CT			\$3,591.72	\$3,591.72	\$3,591.72	
78	205674002030	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ENTGELMEIER JAMES J TSTE & NANCY TSTE ENTGELMEIER	PARK POINT	8638 CORBIN CT			\$3,591.72	\$3,591.72	\$3,591.72	
79	205674002040	RESIDENTIAL- TOWNHOME/CONDOMINIUM	DOLS JEFFREY J & MARIA A	PARK POINT	8642 CORBIN CT			\$3,591.72	\$3,591.72	\$3,591.72	
80	205674002050	RESIDENTIAL- TOWNHOME/CONDOMINIUM	DERR DANIEL P & TIMOTHY W LOUGHNEY	PARK POINT	8646 CORBIN CT			\$3,591.72	\$3,591.72	\$3,591.72	
81	205674002060	RESIDENTIAL- TOWNHOME/CONDOMINIUM	HENRY EARL J & CHARLOTTE C	PARK POINT	8650 CORBIN CT			\$3,591.72	\$3,591.72	\$3,591.72	
82	207150002010	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MANCINI DAWN C & ROBERT M	SPRINGWOOD PONDS CONDOMINIUMS	8365 COPPERFIELD WAY	407	814	\$1,499.78	\$1,499.78	\$1,499.78	
83	207150002020	RESIDENTIAL- TOWNHOME/CONDOMINIUM	NEUJAHN ELAINE E	SPRINGWOOD PONDS CONDOMINIUMS	8371 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
84	207150002030	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MURPHY MARYLIN	SPRINGWOOD PONDS CONDOMINIUMS	8375 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
85	207150002040	RESIDENTIAL- TOWNHOME/CONDOMINIUM	QUIRK ROBERT B & DAWN M QUIRK	SPRINGWOOD PONDS CONDOMINIUMS	8381 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
86	207150002050	RESIDENTIAL- TOWNHOME/CONDOMINIUM	STEVENS GLEN & TERESA STEVENS	SPRINGWOOD PONDS CONDOMINIUMS	8385 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
87	207150002060	RESIDENTIAL- TOWNHOME/CONDOMINIUM	DOPPLER MARCUS L & VALERIE J ROCHELLE-DOPPLER	SPRINGWOOD PONDS CONDOMINIUMS	8391 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
88	207150002070	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ROGERS PAMELA	SPRINGWOOD PONDS CONDOMINIUMS	8395 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
89	207150002080	RESIDENTIAL- TOWNHOME/CONDOMINIUM	LINDBERG JAMES & KRISTINE	SPRINGWOOD PONDS CONDOMINIUMS	8401 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
90	207150002090	RESIDENTIAL- TOWNHOME/CONDOMINIUM	NUFFER ELIZABETH A	SPRINGWOOD PONDS CONDOMINIUMS	8405 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
91	207150002100	RESIDENTIAL- TOWNHOME/CONDOMINIUM	SUNDRUM JOYCE A	SPRINGWOOD PONDS CONDOMINIUMS	8411 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
92	207150002110	RESIDENTIAL- TOWNHOME/CONDOMINIUM	PHELPS NANCY K	SPRINGWOOD PONDS CONDOMINIUMS	8415 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
93	207150002120	RESIDENTIAL- TOWNHOME/CONDOMINIUM	STASSEN BONITA F	SPRINGWOOD PONDS CONDOMINIUMS	8421 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
94	207150002190	RESIDENTIAL- TOWNHOME/CONDOMINIUM	PALLA CHARLES & CHERYL R	SPRINGWOOD PONDS CONDOMINIUMS	8501 COPPERFIELD WAY	407	814	\$1,499.78	\$1,499.78	\$1,499.78	
95	207150002200	RESIDENTIAL- TOWNHOME/CONDOMINIUM	BJORNSON MICHELLE RAE	SPRINGWOOD PONDS CONDOMINIUMS	8505 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
96	207150002210	RESIDENTIAL- TOWNHOME/CONDOMINIUM	LOGAN MICHAEL & BARBARA	SPRINGWOOD PONDS CONDOMINIUMS	8511 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	

CP 2024-09F Corcoran Path and Dawson Way Area Preliminary Assessment Roll											
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97	207150002220	RESIDENTIAL- TOWNHOME/CONDOMINIUM	PIEPER MARY ANN	SPRINGWOOD PONDS CONDOMINIUMS	8515 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
98	207150002230	RESIDENTIAL- TOWNHOME/CONDOMINIUM	LASTOKA JERI L	SPRINGWOOD PONDS CONDOMINIUMS	8521 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
99	207150002240	RESIDENTIAL- TOWNHOME/CONDOMINIUM	SNAZA EILEEN T	SPRINGWOOD PONDS CONDOMINIUMS	8525 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
100	207150002250	RESIDENTIAL- TOWNHOME/CONDOMINIUM	BURY THUONG & MICHAEL BURY	SPRINGWOOD PONDS CONDOMINIUMS	8531 CORCORAN PATH	739	1478	\$1,499.78	\$1,499.78	\$1,499.78	
101	207150002260	RESIDENTIAL- TOWNHOME/CONDOMINIUM	PENA ESPERANZA	SPRINGWOOD PONDS CONDOMINIUMS	8535 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
102	207150002270	RESIDENTIAL- TOWNHOME/CONDOMINIUM	DOMINGUEZ GUMARO & NINFA PLIEGO DOMINGUEZ	SPRINGWOOD PONDS CONDOMINIUMS	8541 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
103	207150002280	RESIDENTIAL- TOWNHOME/CONDOMINIUM	HALGRIMSON TERRY M	SPRINGWOOD PONDS CONDOMINIUMS	8545 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
104	207150002290	RESIDENTIAL- TOWNHOME/CONDOMINIUM	WARD CYNTHIA M & SCOTT R WARD	SPRINGWOOD PONDS CONDOMINIUMS	8551 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
105	207150002300	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MITCHELL MARY S	SPRINGWOOD PONDS CONDOMINIUMS	8555 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
106	207150002310	RESIDENTIAL- TOWNHOME/CONDOMINIUM	KIMBROUGH SANDY	SPRINGWOOD PONDS CONDOMINIUMS	8561 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
107	207150002320	RESIDENTIAL- TOWNHOME/CONDOMINIUM	FRONK SUZANNE & TIMOTHY	SPRINGWOOD PONDS CONDOMINIUMS	8565 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
108	207150002330	RESIDENTIAL- TOWNHOME/CONDOMINIUM	WEBER SHARON A	SPRINGWOOD PONDS CONDOMINIUMS	8571 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
109	207150002340	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ROBOLE ROBERT W & MARLYS M ROBOLE	SPRINGWOOD PONDS CONDOMINIUMS	8575 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
110	207150002350	RESIDENTIAL- TOWNHOME/CONDOMINIUM	GEGEN WILLIAM C & JILL P	SPRINGWOOD PONDS CONDOMINIUMS	8581 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
111	207150002360	RESIDENTIAL- TOWNHOME/CONDOMINIUM	RASMUSSEN MARK & SHLELLEY RASMUSSEN	SPRINGWOOD PONDS CONDOMINIUMS	8585 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
112	207150002370	RESIDENTIAL- TOWNHOME/CONDOMINIUM	LAW SUSAN J	SPRINGWOOD PONDS CONDOMINIUMS	8591 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
113	207150002380	RESIDENTIAL- TOWNHOME/CONDOMINIUM	AUTH GARRETT J & MARY K	SPRINGWOOD PONDS CONDOMINIUMS	8595 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
114	207150002390	RESIDENTIAL- TOWNHOME/CONDOMINIUM	GOIN GREGORY M & GORENE E	SPRINGWOOD PONDS CONDOMINIUMS	8601 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
115	207150002400	RESIDENTIAL- TOWNHOME/CONDOMINIUM	BARBARA CATHERINESCHILLER TRUST AGREE	SPRINGWOOD PONDS CONDOMINIUMS	8605 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
116	207150002410	RESIDENTIAL- TOWNHOME/CONDOMINIUM	DILLON DANIEL C LIVING TRUS	SPRINGWOOD PONDS CONDOMINIUMS	8611 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
117	207150002420	RESIDENTIAL- TOWNHOME/CONDOMINIUM	JACOBSON GREGORY & CHERYL JACOBSON	SPRINGWOOD PONDS CONDOMINIUMS	8615 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
118	207150003010	RESIDENTIAL- TOWNHOME/CONDOMINIUM	BADE ROBERT W & BETTY J	SPRINGWOOD PONDS CONDOMINIUMS	8500 CORCORAN PATH	979	1958	\$1,499.78	\$1,499.78	\$1,499.78	
119	207150003020	RESIDENTIAL- TOWNHOME/CONDOMINIUM	YESKE RICHARD P & JANICE M	SPRINGWOOD PONDS CONDOMINIUMS	8504 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
120	207150003030	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MENS WARD D & DIANNE C	SPRINGWOOD PONDS CONDOMINIUMS	8510 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
121	207150003040	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MAKI TAINA RACHELLE	SPRINGWOOD PONDS CONDOMINIUMS	8514 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
122	207150003050	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ANDERSON JOYCE E	SPRINGWOOD PONDS CONDOMINIUMS	8520 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
123	207150003060	RESIDENTIAL- TOWNHOME/CONDOMINIUM	GINGERICH LOREN W & CLAUDIA GINGERICH	SPRINGWOOD PONDS CONDOMINIUMS	8524 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
124	207150003070	RESIDENTIAL- TOWNHOME/CONDOMINIUM	BECHT MARY E	SPRINGWOOD PONDS CONDOMINIUMS	8530 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
125	207150003080	RESIDENTIAL- TOWNHOME/CONDOMINIUM	GRANT SEAN & TAMI KADRLIK	SPRINGWOOD PONDS CONDOMINIUMS	8534 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
126	207150003090	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MILLIKEN KENNETH W & MARSHA A	SPRINGWOOD PONDS CONDOMINIUMS	8540 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	

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127	207150003100	RESIDENTIAL- TOWNHOME/CONDOMINIUM	GILBERT SHERYL A	SPRINGWOOD PONDS CONDOMINIUMS	8544 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
128	207150003110	RESIDENTIAL- TOWNHOME/CONDOMINIUM	DRAINE SHIRLEY N	SPRINGWOOD PONDS CONDOMINIUMS	8550 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
129	207150003120	RESIDENTIAL- TOWNHOME/CONDOMINIUM	GRUENEWALD PATRICIA B	SPRINGWOOD PONDS CONDOMINIUMS	8554 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
130	207150003130	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ANDERSON JOHN TODD & DEANNA MARIE ANDERSON	SPRINGWOOD PONDS CONDOMINIUMS	8560 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
131	207150003140	RESIDENTIAL- TOWNHOME/CONDOMINIUM	DANIELS CONSTANCE E	SPRINGWOOD PONDS CONDOMINIUMS	8564 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
132	207150003150	RESIDENTIAL- TOWNHOME/CONDOMINIUM	SIGRIST CHERYLLYN	SPRINGWOOD PONDS CONDOMINIUMS	8570 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
133	207150003160	RESIDENTIAL- TOWNHOME/CONDOMINIUM	HANDAHL COLLEEN M	SPRINGWOOD PONDS CONDOMINIUMS	8574 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
134	207150101010	RESIDENTIAL- TOWNHOME/CONDOMINIUM	SCHENK PARIANN M	SPRINGWOOD PONDS CONDOMINIUMS	8590 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
135	207150101020	RESIDENTIAL- TOWNHOME/CONDOMINIUM	PETERSON DANETTE M	SPRINGWOOD PONDS CONDOMINIUMS	8594 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
136	207150101030	RESIDENTIAL- TOWNHOME/CONDOMINIUM	KNUTSON CAROLE A & EDWARD O NATALINO	SPRINGWOOD PONDS CONDOMINIUMS	8610 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
137	207150101040	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MCGUINE CAROL	SPRINGWOOD PONDS CONDOMINIUMS	8614 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
138	208210004080	RESIDENTIAL	KRYZER ALLEN L & GLENDA G		8231 DAWSON AVE	85	85	\$7,872.56	\$7,872.56	\$7,872.56	
139	208210004090	RESIDENTIAL	PARROW THOMAS E JR & DEBRA L PARROW		8245 DAWSON AVE	85	85	\$7,872.56	\$7,872.56	\$7,872.56	
140	207150004054	RESIDENTIAL- TOWNHOME/CONDOMINIUM	CAREY DUBBS	SPRINGWOOD PONDS CONDOMINIUMS	8341 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
141	207150004055	RESIDENTIAL- TOWNHOME/CONDOMINIUM	JAMIE LINDBOE & NICOLE THOMPSON	SPRINGWOOD PONDS CONDOMINIUMS	8343 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
142	207150004042	RESIDENTIAL- TOWNHOME/CONDOMINIUM	HARRY PLENDL	SPRINGWOOD PONDS CONDOMINIUMS	8345 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
143	207150004043	RESIDENTIAL- TOWNHOME/CONDOMINIUM	PAULA METOXEN	SPRINGWOOD PONDS CONDOMINIUMS	8347 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
144	207150004053	RESIDENTIAL- TOWNHOME/CONDOMINIUM	CORNELIUS LUJUAN EMILY	SPRINGWOOD PONDS CONDOMINIUMS	8349 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
145	207150004120	RESIDENTIAL- TOWNHOME/CONDOMINIUM	KATHLEEN A LEISZ	SPRINGWOOD PONDS CONDOMINIUMS	8350 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
146	207150004056	RESIDENTIAL- TOWNHOME/CONDOMINIUM	SANDEEP SHRESTHA & HEIDI ZUNKER	SPRINGWOOD PONDS CONDOMINIUMS	8351 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
147	207150004109	RESIDENTIAL- TOWNHOME/CONDOMINIUM	EMILY MARIE ROSENBERG	SPRINGWOOD PONDS CONDOMINIUMS	8352 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
148	207150004041	RESIDENTIAL- TOWNHOME/CONDOMINIUM	BRITTANY HUBACK	SPRINGWOOD PONDS CONDOMINIUMS	8353 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
149	207150004110	RESIDENTIAL- TOWNHOME/CONDOMINIUM	GAVIN S OLIVERAS & LISA DAVANNAVONG	SPRINGWOOD PONDS CONDOMINIUMS	8354 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
150	207150004044	RESIDENTIAL- TOWNHOME/CONDOMINIUM	SARA A TUVEY	SPRINGWOOD PONDS CONDOMINIUMS	8355 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
151	207150004052	RESIDENTIAL- TOWNHOME/CONDOMINIUM	DAVID A & TERI EILERTSON	SPRINGWOOD PONDS CONDOMINIUMS	8357 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
152	207150004119	RESIDENTIAL- TOWNHOME/CONDOMINIUM	SUDEEP SHRESTHA	SPRINGWOOD PONDS CONDOMINIUMS	8358 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
153	207150004057	RESIDENTIAL- TOWNHOME/CONDOMINIUM	PATRICIA A TURCOTTE	SPRINGWOOD PONDS CONDOMINIUMS	8359 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
154	207150004118	RESIDENTIAL- TOWNHOME/CONDOMINIUM	DELLA WARREN & DANIEL TRASKA	SPRINGWOOD PONDS CONDOMINIUMS	8360 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
155	207150004040	RESIDENTIAL- TOWNHOME/CONDOMINIUM	JESSICA GOULET	SPRINGWOOD PONDS CONDOMINIUMS	8361 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
156	207150004111	RESIDENTIAL- TOWNHOME/CONDOMINIUM	SCOTT G LARSON	SPRINGWOOD PONDS CONDOMINIUMS	8362 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	

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157	207150004045	RESIDENTIAL-TOWNHOME/CONDOMINIUM	KELLY M DARROW	SPRINGWOOD PONDS CONDOMINIUMS	8363 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
158	207150004112	RESIDENTIAL-TOWNHOME/CONDOMINIUM	MARCELENO J PAEZ	SPRINGWOOD PONDS CONDOMINIUMS	8364 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
159	207150004051	RESIDENTIAL-TOWNHOME/CONDOMINIUM	JAMES E TAKO	SPRINGWOOD PONDS CONDOMINIUMS	8365 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
160	207150004058	RESIDENTIAL-TOWNHOME/CONDOMINIUM	KENDRA K LANGERT	SPRINGWOOD PONDS CONDOMINIUMS	8367 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
161	207150004117	RESIDENTIAL-TOWNHOME/CONDOMINIUM	ANDREW VERNON BRONSON	SPRINGWOOD PONDS CONDOMINIUMS	8368 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
162	207150004039	RESIDENTIAL-TOWNHOME/CONDOMINIUM	STACEY CAIN	SPRINGWOOD PONDS CONDOMINIUMS	8369 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
163	207150004116	RESIDENTIAL-TOWNHOME/CONDOMINIUM	GERALD P WUSSOW	SPRINGWOOD PONDS CONDOMINIUMS	8370 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
164	207150004046	RESIDENTIAL-TOWNHOME/CONDOMINIUM	JASON & CAROLYN DIETRICH	SPRINGWOOD PONDS CONDOMINIUMS	8371 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
165	207150004113	RESIDENTIAL-TOWNHOME/CONDOMINIUM	MAY ELLEN STAMPER	SPRINGWOOD PONDS CONDOMINIUMS	8372 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
166	207150004050	RESIDENTIAL-TOWNHOME/CONDOMINIUM	DIANNE MALAVE RODRIGUEZ	SPRINGWOOD PONDS CONDOMINIUMS	8373 CORCORAN CIR	1169	2338	\$1,499.78	\$1,499.78	\$1,499.78	
167	207150004114	RESIDENTIAL-TOWNHOME/CONDOMINIUM	TYLER & TANNER TATAREK	SPRINGWOOD PONDS CONDOMINIUMS	8374 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
168	207150004059	RESIDENTIAL-TOWNHOME/CONDOMINIUM	CARRIE L BLESENER	SPRINGWOOD PONDS CONDOMINIUMS	8375 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
169	207150004038	RESIDENTIAL-TOWNHOME/CONDOMINIUM	JARED J KLUCK	SPRINGWOOD PONDS CONDOMINIUMS	8377 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
170	207150004115	RESIDENTIAL-TOWNHOME/CONDOMINIUM	TERRY E ENGELSON	SPRINGWOOD PONDS CONDOMINIUMS	8378 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
171	207150004047	RESIDENTIAL-TOWNHOME/CONDOMINIUM	JEANNE M BRAUN	SPRINGWOOD PONDS CONDOMINIUMS	8379 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
172	207150004049	RESIDENTIAL-TOWNHOME/CONDOMINIUM	MICHAEL JOHN HAYES	SPRINGWOOD PONDS CONDOMINIUMS	8381 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
173	207150004108	RESIDENTIAL-TOWNHOME/CONDOMINIUM	DAVID DESROCHER	SPRINGWOOD PONDS CONDOMINIUMS	8382 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
174	207150004060	RESIDENTIAL-TOWNHOME/CONDOMINIUM	SUSAN A TITEL	SPRINGWOOD PONDS CONDOMINIUMS	8383 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
175	207150004097	RESIDENTIAL-TOWNHOME/CONDOMINIUM	VALERIE M EVENSON	SPRINGWOOD PONDS CONDOMINIUMS	8384 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
176	207150004037	RESIDENTIAL-TOWNHOME/CONDOMINIUM	JENNIFER R JAHNS & LYNAEA HINTZ	SPRINGWOOD PONDS CONDOMINIUMS	8385 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
177	207150004098	RESIDENTIAL-TOWNHOME/CONDOMINIUM	JUDD C THOMPSON & LINDA K THOMPSON	SPRINGWOOD PONDS CONDOMINIUMS	8386 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
178	207150004048	RESIDENTIAL-TOWNHOME/CONDOMINIUM	JANE WALKUSH	SPRINGWOOD PONDS CONDOMINIUMS	8387 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
179	207150004107	RESIDENTIAL-TOWNHOME/CONDOMINIUM	MICHELLE BOYDEN & HALEIGH LINN	SPRINGWOOD PONDS CONDOMINIUMS	8388 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
180	207150004036	RESIDENTIAL-TOWNHOME/CONDOMINIUM	BLAKE STEVEN	SPRINGWOOD PONDS CONDOMINIUMS	8391 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
181	207150004106	RESIDENTIAL-TOWNHOME/CONDOMINIUM	ZIEGLER EMMA & SELENA	SPRINGWOOD PONDS CONDOMINIUMS	8392 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
182	207150004025	RESIDENTIAL-TOWNHOME/CONDOMINIUM	STACY R LUNDELL & MICHAEL A NELSON	SPRINGWOOD PONDS CONDOMINIUMS	8393 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
183	207150004099	RESIDENTIAL-TOWNHOME/CONDOMINIUM	NANCY J SLAGERMAN	SPRINGWOOD PONDS CONDOMINIUMS	8394 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
184	207150004035	RESIDENTIAL-TOWNHOME/CONDOMINIUM	NELLIE SAUNDERS	SPRINGWOOD PONDS CONDOMINIUMS	8395 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
185	207150004100	RESIDENTIAL-TOWNHOME/CONDOMINIUM	JEAN A GARMAN	SPRINGWOOD PONDS CONDOMINIUMS	8396 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
186	207150004026	RESIDENTIAL-TOWNHOME/CONDOMINIUM	LASHAWN LOLLIE	SPRINGWOOD PONDS CONDOMINIUMS	8397 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	

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187	207150004105	RESIDENTIAL- TOWNHOME/CONDOMINIUM	GARY RAY CAMERON	SPRINGWOOD PONDS CONDOMINIUMS	8398 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
188	207150004034	RESIDENTIAL- TOWNHOME/CONDOMINIUM	BRITTANY SCHNEIDER	SPRINGWOOD PONDS CONDOMINIUMS	8399 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
189	207150004027	RESIDENTIAL- TOWNHOME/CONDOMINIUM	CORINNE M CAVANAGH	SPRINGWOOD PONDS CONDOMINIUMS	8401 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
190	207150004104	RESIDENTIAL- TOWNHOME/CONDOMINIUM	THERESA A JONES	SPRINGWOOD PONDS CONDOMINIUMS	8402 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
191	207150004033	RESIDENTIAL- TOWNHOME/CONDOMINIUM	SHARON CHAMBERS	SPRINGWOOD PONDS CONDOMINIUMS	8403 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
192	207150004101	RESIDENTIAL- TOWNHOME/CONDOMINIUM	TARA M TAGGART	SPRINGWOOD PONDS CONDOMINIUMS	8404 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
193	207150004028	RESIDENTIAL- TOWNHOME/CONDOMINIUM	LISA JEAN FRANCISCUS	SPRINGWOOD PONDS CONDOMINIUMS	8405 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
194	207150004102	RESIDENTIAL- TOWNHOME/CONDOMINIUM	TERRANCE P CARROLL & MARY LOU CARROLL	SPRINGWOOD PONDS CONDOMINIUMS	8406 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
195	207150004032	RESIDENTIAL- TOWNHOME/CONDOMINIUM	LINDSAY RAE WAYNE	SPRINGWOOD PONDS CONDOMINIUMS	8407 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
196	207150004103	RESIDENTIAL- TOWNHOME/CONDOMINIUM	KAREN K GEORGE	SPRINGWOOD PONDS CONDOMINIUMS	8408 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
197	207150004029	RESIDENTIAL- TOWNHOME/CONDOMINIUM	THOMAS FRANKE	SPRINGWOOD PONDS CONDOMINIUMS	8409 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
198	207150004096	RESIDENTIAL- TOWNHOME/CONDOMINIUM	KATHLEEN M KRANZ	SPRINGWOOD PONDS CONDOMINIUMS	8410 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
199	207150004031	RESIDENTIAL- TOWNHOME/CONDOMINIUM	THOMAS KURT BUCHHOLZ	SPRINGWOOD PONDS CONDOMINIUMS	8411 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
200	207150004085	RESIDENTIAL- TOWNHOME/CONDOMINIUM	GARY PAUL REGNIER	SPRINGWOOD PONDS CONDOMINIUMS	8412 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
201	207150004030	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MARY A MOTTRAM	SPRINGWOOD PONDS CONDOMINIUMS	8413 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
202	207150004086	RESIDENTIAL- TOWNHOME/CONDOMINIUM	GREGORY KOECHER	SPRINGWOOD PONDS CONDOMINIUMS	8414 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
203	207150004095	RESIDENTIAL- TOWNHOME/CONDOMINIUM	SUDEEP SHRESTHA	SPRINGWOOD PONDS CONDOMINIUMS	8416 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
204	207150004024	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ANDREW R & STACI L COLE	SPRINGWOOD PONDS CONDOMINIUMS	8417 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
205	207150004013	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MEGAN CAPRA	SPRINGWOOD PONDS CONDOMINIUMS	8419 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
206	207150004094	RESIDENTIAL- TOWNHOME/CONDOMINIUM	FLORASTEEN GUNN	SPRINGWOOD PONDS CONDOMINIUMS	8420 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
207	207150004023	RESIDENTIAL- TOWNHOME/CONDOMINIUM	3L RE3 LLC	SPRINGWOOD PONDS CONDOMINIUMS	8421 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
208	207150004087	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MARY S SCHWEICH	SPRINGWOOD PONDS CONDOMINIUMS	8422 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
209	207150004014	RESIDENTIAL- TOWNHOME/CONDOMINIUM	DENISE A BREAUT	SPRINGWOOD PONDS CONDOMINIUMS	8423 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
210	207150004088	RESIDENTIAL- TOWNHOME/CONDOMINIUM	TERRY MYHRE & DESTINY HOSTETLER	SPRINGWOOD PONDS CONDOMINIUMS	8424 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
211	207150004022	RESIDENTIAL- TOWNHOME/CONDOMINIUM	VICKI L SILVA	SPRINGWOOD PONDS CONDOMINIUMS	8425 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
212	207150004093	RESIDENTIAL- TOWNHOME/CONDOMINIUM	9223 73RD STREET LLC	SPRINGWOOD PONDS CONDOMINIUMS	8426 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
213	207150004015	RESIDENTIAL- TOWNHOME/CONDOMINIUM	STEPHANIE L HAMER	SPRINGWOOD PONDS CONDOMINIUMS	8427 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
214	207150004021	RESIDENTIAL- TOWNHOME/CONDOMINIUM	JOHN PERRY & EMILY GORMAN	SPRINGWOOD PONDS CONDOMINIUMS	8429 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
215	207150004092	RESIDENTIAL- TOWNHOME/CONDOMINIUM	RANDALL T JEANS	SPRINGWOOD PONDS CONDOMINIUMS	8430 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
216	207150004016	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MEGAN M HALVERSON	SPRINGWOOD PONDS CONDOMINIUMS	8431 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	

CP 2024-09F Corcoran Path and Dawson Way Area Preliminary Assessment Roll											
#	PIN	Property Type Classification	Owner	Association	Site Address	Front Footage	Adjusted Front Footage	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
217	207150004089	RESIDENTIAL- TOWNHOME/CONDOMINIUM	SUDEEP SHRESTHA	SPRINGWOOD PONDS CONDOMINIUMS	8432 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
218	207150004020	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MICHELLE SEIGER	SPRINGWOOD PONDS CONDOMINIUMS	8433 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
219	207150004090	RESIDENTIAL- TOWNHOME/CONDOMINIUM	SALYNE R HUBERTY	SPRINGWOOD PONDS CONDOMINIUMS	8434 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
220	207150004017	RESIDENTIAL- TOWNHOME/CONDOMINIUM	BRITTNEY A CARTER	SPRINGWOOD PONDS CONDOMINIUMS	8435 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
221	207150004091	RESIDENTIAL- TOWNHOME/CONDOMINIUM	WILLIAM T COLLINS	SPRINGWOOD PONDS CONDOMINIUMS	8436 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
222	207150004019	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MARCIA S AVERBOOK	SPRINGWOOD PONDS CONDOMINIUMS	8437 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
223	207150004078	RESIDENTIAL- TOWNHOME/CONDOMINIUM	JENNA MARIE WILLEMARCK & CODY ROBERT WILLEMARCK	SPRINGWOOD PONDS CONDOMINIUMS	8438 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
224	207150004018	RESIDENTIAL- TOWNHOME/CONDOMINIUM	JULIE A OLSON	SPRINGWOOD PONDS CONDOMINIUMS	8439 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
225	207150004079	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MARY KOSOWSKI	SPRINGWOOD PONDS CONDOMINIUMS	8440 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
226	207150004077	RESIDENTIAL- TOWNHOME/CONDOMINIUM	NATHAN L BEIKLER	SPRINGWOOD PONDS CONDOMINIUMS	8444 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
227	207150004080	RESIDENTIAL- TOWNHOME/CONDOMINIUM	KARLA HODNEFIELD	SPRINGWOOD PONDS CONDOMINIUMS	8446 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
228	207150004076	RESIDENTIAL- TOWNHOME/CONDOMINIUM	JO ANN DANMEIER	SPRINGWOOD PONDS CONDOMINIUMS	8448 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
229	207150004081	RESIDENTIAL- TOWNHOME/CONDOMINIUM	JENNIFER L BEHR	SPRINGWOOD PONDS CONDOMINIUMS	8450 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
230	207150004006	RESIDENTIAL- TOWNHOME/CONDOMINIUM	RACHEL MAY	SPRINGWOOD PONDS CONDOMINIUMS	8451 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
231	207150004075	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ANA ALVAREZ	SPRINGWOOD PONDS CONDOMINIUMS	8454 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
232	207150004005	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ELINOR JACKSON & SUSANNA JACKSON	SPRINGWOOD PONDS CONDOMINIUMS	8455 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
233	207150004082	RESIDENTIAL- TOWNHOME/CONDOMINIUM	YEVGENIY KRYAZH	SPRINGWOOD PONDS CONDOMINIUMS	8456 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
234	207150004074	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ADRIAN MELENDEZ	SPRINGWOOD PONDS CONDOMINIUMS	8458 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
235	207150004007	RESIDENTIAL- TOWNHOME/CONDOMINIUM	JULIANA DAVISON	SPRINGWOOD PONDS CONDOMINIUMS	8459 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
236	207150004083	RESIDENTIAL- TOWNHOME/CONDOMINIUM	TANA J LOTZER	SPRINGWOOD PONDS CONDOMINIUMS	8460 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
237	207150004004	RESIDENTIAL- TOWNHOME/CONDOMINIUM	SANDEEP SHRESTHA & HEIDI ZUNKER	SPRINGWOOD PONDS CONDOMINIUMS	8461 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
238	207150004067	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ANNE M MCPHILLIPS	SPRINGWOOD PONDS CONDOMINIUMS	8462 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
239	207150004066	RESIDENTIAL- TOWNHOME/CONDOMINIUM	VANESSA FLORES-ORTIZ	SPRINGWOOD PONDS CONDOMINIUMS	8463 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
240	207150004073	RESIDENTIAL- TOWNHOME/CONDOMINIUM	CHRISTOPHER P GREGG	SPRINGWOOD PONDS CONDOMINIUMS	8464 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
241	207150004003	RESIDENTIAL- TOWNHOME/CONDOMINIUM	JAMES & KAREN TAYLOR	SPRINGWOOD PONDS CONDOMINIUMS	8465 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
242	207150004084	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ZACHARY WALZ	SPRINGWOOD PONDS CONDOMINIUMS	8466 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
243	207150004065	RESIDENTIAL- TOWNHOME/CONDOMINIUM	8467 CORCORAN PATH LLC	SPRINGWOOD PONDS CONDOMINIUMS	8467 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
244	207150004068	RESIDENTIAL- TOWNHOME/CONDOMINIUM	MICHAEL JAMES CORRIGAN	SPRINGWOOD PONDS CONDOMINIUMS	8468 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
245	207150004008	RESIDENTIAL- TOWNHOME/CONDOMINIUM	CHRISTY L OLINGER	SPRINGWOOD PONDS CONDOMINIUMS	8469 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
246	207150004002	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ERICA JANE DERIFIELD	SPRINGWOOD PONDS CONDOMINIUMS	8471 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	

CP 2024-09F Corcoran Path and Dawson Way Area Preliminary Assessment Roll											
#	PIN	Property Type Classification	Owner	Association	Site Address	Front Footage	Adjusted Front Footage	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
247	207150004069	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ZANUDRA PERRY	SPRINGWOOD PONDS CONDOMINIUMS	8472 COPPERFIELD WAY	10871	16538	\$1,499.78	\$1,499.78	\$1,499.78	
248	207150004064	RESIDENTIAL- TOWNHOME/CONDOMINIUM	DENNIS & JACQUELINE BALLESTEROS	SPRINGWOOD PONDS CONDOMINIUMS	8473 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
249	207150004001	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ANDREW GUBASH	SPRINGWOOD PONDS CONDOMINIUMS	8475 CORCORAN CIR			\$1,499.78	\$1,499.78	\$1,499.78	
250	207150004009	RESIDENTIAL- TOWNHOME/CONDOMINIUM	JOHN ASLAM CONNER & ZIBA SEKANDAR	SPRINGWOOD PONDS CONDOMINIUMS	8475 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
251	207150004063	RESIDENTIAL- TOWNHOME/CONDOMINIUM	NHIA VANG	SPRINGWOOD PONDS CONDOMINIUMS	8477 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
252	207150004070	RESIDENTIAL- TOWNHOME/CONDOMINIUM	KENDALL BENSON	SPRINGWOOD PONDS CONDOMINIUMS	8478 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
253	207150004010	RESIDENTIAL- TOWNHOME/CONDOMINIUM	BENJAMIN J KIEFFER	SPRINGWOOD PONDS CONDOMINIUMS	8479 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
254	207150004071	RESIDENTIAL- TOWNHOME/CONDOMINIUM	LISA ANN BENNEROTTE	SPRINGWOOD PONDS CONDOMINIUMS	8482 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
255	207150004062	RESIDENTIAL- TOWNHOME/CONDOMINIUM	ADAM L NETZER	SPRINGWOOD PONDS CONDOMINIUMS	8483 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
256	207150004011	RESIDENTIAL- TOWNHOME/CONDOMINIUM	TRAVIS G STILLER	SPRINGWOOD PONDS CONDOMINIUMS	8485 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
257	207150004061	RESIDENTIAL- TOWNHOME/CONDOMINIUM	DEBORAH L PELLAND	SPRINGWOOD PONDS CONDOMINIUMS	8487 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
258	207150004072	RESIDENTIAL- TOWNHOME/CONDOMINIUM	BARRY J ROOZEN & MEGHANN ROOZEN	SPRINGWOOD PONDS CONDOMINIUMS	8488 COPPERFIELD WAY			\$1,499.78	\$1,499.78	\$1,499.78	
259	207150004012	RESIDENTIAL- TOWNHOME/CONDOMINIUM	KAREN K RAUSCHNOT	SPRINGWOOD PONDS CONDOMINIUMS	8489 CORCORAN PATH			\$1,499.78	\$1,499.78	\$1,499.78	
TOTALS:						10871	16538	\$ 662,628	\$ 662,627.96	\$ 662,627.68	-\$0.27

IGH STREET & STORM ASSESSMENT (FDR)	
TOTAL STREET & STORM COST:	\$1,204,778.10
ASSESSABLE STREET & STORM COST (55%):	\$662,627.96
TOTAL IGH PROJECT ADJUSTED FRONT FOOTAGE (LF):	16,538
NET ASSESSMENT RATE PER LF (ASSESABLE STREET & STORM COST / ADJUSTED FRONT FOOTAGE):	\$40.07
AMOUNT ASSESSED (NON-RESIDENTIAL):	\$402,833.56
AMOUNT ASSESSED (RESIDENTIAL) (ASSESABLE STREET & STORM COST - NON-RESIDENTIAL AMOUNT ASSESSED):	\$259,794.39
# OF RESIDENTIAL UNITS:	33
ASSESSMENT RATE PER UNIT (RESIDENTIAL RATE):	\$7,872.56
TOTAL PROPOSED ASSESSMENT:	\$662,627.68

**CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA**

RESOLUTION NO. 2024-239

**RESOLUTION APPROVING SPECIAL ASSESSMENTS AND ADOPTING FINAL ASSESSMENT
ROLL FOR THE 2024 PAVEMENT MANAGEMENT INITIATIVE
CITY PROJECT NO. 2024-09G – SOUTH GROVE AREA 7**

WHEREAS, pursuant to proper notice duly given as required by law, the City Council of the City of Inver Grove Heights has met, heard, and passed upon all objections to the proposed special assessments for the improvements for City Project No. 2024-09G which includes full depth reclamation along with storm improvements, curb improvements, sidewalk and trail improvements, utility adjustments, watermain improvements, and appurtenances Generally between 78th Street and 80th Street: Charles Way from 78th Street to Clayton Avenue, Claiborne Way from Charles Way to Clayton Avenue, Clayton Avenue, Comstock Avenue from 80th Street to Conroy Way, Cooper Avenue, Cooper Court, Corey Path from 80th Street to Dawn Avenue, 79th Street from Corey Path Dawn Avenue, Dawn Avenue, Davidson Court from Dawn Avenue to its terminus, and Danner Court from Davidson Court to its terminus.

**NOW THEREFORE, BE IT RESOLVED BY THE INVER GROVE HEIGHTS CITY COUNCIL
THAT:**

1. The special assessments and the final assessment roll, a copy of which is attached hereto and made a part hereof, is hereby accepted and shall constitute the special assessment levied against the parcels named herein, and each tract of land herein included is hereby found to be benefited by the improvement in at least the amount of the special assessment levied against it.
2. Such assessment shall be payable in equal installments extending over a period of five years for assessments between \$1,000 and \$4,999.99, 10 years for assessments between \$5,000 and \$9,999.99, and 15 years for assessments greater than \$10,000, beginning in 2025, and shall bear interest at the rate of 4.39 percent, 4.63 percent, and 4.92 percent respectively, per annum, beginning January 1, 2025.
3. The owner of any property, so assessed, may at any time prior to certification of the assessment to the County Auditor, pay the whole of the assessment on such property with interest accrued to the date of payment, to the City Treasurer, except that no interest shall be charged if the entire assessment is paid in 2024, within thirty days from the adoption of this resolution; and the owner may, at any time thereafter, pay to the County Treasurer the entire amount of the assessment remaining unpaid, with interest accrued to December 31 of the year in which such payment is made. Such payment must be made before November 15, or interest will be charged through December 31 of the next succeeding year (or such later date as determined by the Council), except no interest shall be charged or accrued in 2024.
4. The Clerk shall, forthwith, transmit a certified duplicate of this assessment to the County Auditor to be extended on the property tax lists of the County, and such assessments shall be collected and paid in the same manner as other taxes.

Approved by the City Council of the City of Inver Grove Heights, Minnesota this 14th day of October 2024.

Brenda Dietrich, Mayor

ATTEST:

Rebecca Kiernan, City Clerk

CP 2024-09G South Grove Area 7 Preliminary Assessment Roll								
#	PIN	Property Type Classification	Owner	Site Address	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
FULL DEPTH RECLAMATION								
2	203651001010	RESIDENTIAL-APARTMENTS	DAKOTA COUNTY CDWORKFORCE HOUSING LL	7812 CHANDLER LN	\$55,373.67	\$55,373.67	\$55,373.66	
3	203652101030	RESIDENTIAL	PRICE CAROLINE ANN	7824 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
4	203652101040	RESIDENTIAL	PORTUGAL WAYNE & NANCY	7830 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
5	203652101050	RESIDENTIAL	REMACKEL JOSEPH JOHN JR	7852 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
6	203652101060	RESIDENTIAL	WULFF WILLIAM B & JEAN M	7874 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
7	203652101070	RESIDENTIAL	KNUTSON STEVEN LEE	7880 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
8	203652101080	RESIDENTIAL	KELECIC JASON & JEAN M	7898 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
9	203652101090	RESIDENTIAL	OEHME RICHARD W & DEBBIE L	7908 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
10	203652101100	RESIDENTIAL	WHITE FRANK & MARIA WHITE	7918 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
11	203652101110	RESIDENTIAL	HALVORSON AMANDA MARIE & MATTHEW ALAN FOX	7926 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
12	203652101120	RESIDENTIAL	PFEIFER RONALD M	7932 COOPER CT	\$7,221.75	\$7,221.75	\$7,221.74	
13	203652101130	RESIDENTIAL	CORNELL BRADLEY J & JEANNE M	7938 COOPER CT	\$7,221.75	\$7,221.75	\$7,221.74	
14	203652101140	RESIDENTIAL	CHANDLER ALLEN R & CAROL J	7944 COOPER CT	\$7,221.75	\$7,221.75	\$7,221.74	
15	203652101150	RESIDENTIAL	DETERS RONALD & PATRICIA	7948 COOPER CT	\$7,221.75	\$7,221.75	\$7,221.74	
16	203652101160	RESIDENTIAL	ROUBIK JAMES P & NICOLE A	7952 COOPER CT	\$7,221.75	\$7,221.75	\$7,221.74	
17	203652101170	RESIDENTIAL	FOLEY BRYCE & HOLLY FOLEY	7988 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
18	203652101180	RESIDENTIAL	WICKLANDER KIMBERLY CHERYL	7956 COOPER CT	\$7,221.75	\$7,221.75	\$7,221.74	
19	203652102120	RESIDENTIAL	HILSGEN MATTHEW P & JENNIFER L HILSGEN	7949 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
20	203652102130	RESIDENTIAL	GERLACH MATTHEW JOHN & ERIN	7935 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
21	203652102140	RESIDENTIAL	FEGLEY STEVEN J	7929 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
22	203652102150	RESIDENTIAL	STEIN KARL L & MICHELLE A	7915 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
23	203652102160	RESIDENTIAL	BLES KATHY L & BRIAN W	7899 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
24	203652102170	RESIDENTIAL	STARK PAULETTE A	7877 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
25	203652102180	RESIDENTIAL	BECKER LISA & MARCUS OLSON	7869 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
26	203652102190	RESIDENTIAL	MYERS GERALD M & NORMA J	7849 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
27	203652102200	RESIDENTIAL	GREENE TIFFANY	7827 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
28	203652102210	RESIDENTIAL	BOERBON ROBERT B & SUZANNE	7821 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
29	203652103010	RESIDENTIAL	SCHMIDT CHRISTINE	7956 COMSTOCK AVE	\$7,221.75	\$7,221.75	\$7,221.74	
30	203652103040	RESIDENTIAL	SKOV JAMES E & JANE L	7963 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
31	203652103050	RESIDENTIAL	CHRISTENSEN RONNIE L JR & LISA K	7979 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	

CP 2024-09G South Grove Area 7 Preliminary Assessment Roll								
#	PIN	Property Type Classification	Owner	Site Address	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
32	203652103060	RESIDENTIAL	ESPERSEN DAVID & JUDY	7995 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
33	203652103070	RESIDENTIAL	OLNESS MELISSA M & JEROME R & MARILYN W ENGBRETSON	7992 COMSTOCK AVE	\$7,221.75	\$7,221.75	\$7,221.74	
34	203652103080	RESIDENTIAL	OHMANN MICHAEL J & JO E	7982 COMSTOCK AVE	\$7,221.75	\$7,221.75	\$7,221.74	
35	203652103090	RESIDENTIAL	PROKOP DONALD J & LINDA	7970 COMSTOCK AVE	\$7,221.75	\$7,221.75	\$7,221.74	
36	203652104070	RESIDENTIAL	VITRO JOSEPH M	7995 COMSTOCK AVE	\$7,221.75	\$7,221.75	\$7,221.74	
37	203652104080	RESIDENTIAL	DEUTSCH JEFFRY A & SUSAN S	7987 COMSTOCK AVE	\$7,221.75	\$7,221.75	\$7,221.74	
38	203652104090	RESIDENTIAL	RIECK TRAVIS & KATHRYN RIECK	7975 COMSTOCK AVE	\$7,221.75	\$7,221.75	\$7,221.74	
39	203652105060	RESIDENTIAL	JOEL E & SUSANNA J GUST	7958 CLAYTON AVE	\$7,221.75	\$7,221.75	\$7,221.74	
40	203652105070	RESIDENTIAL	HEESCH DANIEL T & AMI L	7972 CLAYTON AVE	\$7,221.75	\$7,221.75	\$7,221.74	
41	203652105080	RESIDENTIAL	SATAK NATHAN R S	7996 CLAYTON AVE	\$7,221.75	\$7,221.75	\$7,221.74	
42	201962501030	RESIDENTIAL	CHIRHART GARY J & KRISTIN M	7854 DANNER CT	\$7,221.75	\$7,221.75	\$7,221.74	
43	201962501040	RESIDENTIAL	TUIONE JOSEPH A & ANDREA L	7876 DANNER CT	\$7,221.75	\$7,221.75	\$7,221.74	
44	201962501050	RESIDENTIAL	HILDEBRANDT LEE B & SUSAN E	7898 DANNER CT	\$7,221.75	\$7,221.75	\$7,221.74	
45	201962501060	RESIDENTIAL	COLWELL ADAM J & KARLA D JOHNSON	7916 DANNER CT	\$7,221.75	\$7,221.75	\$7,221.74	
46	201962501070	RESIDENTIAL	HINKLE THOMAS C & KATELYN R PLAN	7921 DANNER CT	\$7,221.75	\$7,221.75	\$7,221.74	
47	201962501080	RESIDENTIAL	BRENT A FREDRICKSON	7897 DANNER CT	\$7,221.75	\$7,221.75	\$7,221.74	
48	201962501090	RESIDENTIAL	LUNDBERG MATTHEW J & ELYSE N LUNDBERG	7875 DANNER CT	\$7,221.75	\$7,221.75	\$7,221.74	
49	201962501100	RESIDENTIAL	AUGE KEVIN J & CAROL A	7853 DANNER CT	\$7,221.75	\$7,221.75	\$7,221.74	
50	201962501110	RESIDENTIAL	DECKER JASON & MIRANDA DECKER	7831 DANNER CT	\$7,221.75	\$7,221.75	\$7,221.74	
51	201962601010	RESIDENTIAL	ASMUNDSON KAREN ELIZABETH LYNG	7830 DAVIDSON CT	\$7,221.75	\$7,221.75	\$7,221.74	
52	201962601020	RESIDENTIAL	MCCARTHY TASIA	7832 DAVIDSON CT	\$7,221.75	\$7,221.75	\$7,221.74	
53	201962601030	RESIDENTIAL	HITE TROY JAMESON & LAURA ELLEN HITE	7834 DANNER CT	\$7,221.75	\$7,221.75	\$7,221.74	
54	205850001030	RESIDENTIAL	COREY JACOB D	7808 CHARLES WAY	\$7,221.75	\$7,221.75	\$7,221.74	
55	205850001040	RESIDENTIAL	HUNT TROY ANTHONY & PAMELA ANN HUNT	7816 CHARLES WAY	\$7,221.75	\$7,221.75	\$7,221.74	
56	205850001050	RESIDENTIAL	OLSON PETER & MELISSA ANDERSON	7824 CHARLES WAY	\$7,221.75	\$7,221.75	\$7,221.74	
57	205850001060	RESIDENTIAL	BENITEZ ALEZANDER W ROGEL	7832 CHARLES WAY	\$7,221.75	\$7,221.75	\$7,221.74	
58	205850002010	RESIDENTIAL	KHALIL LEWIS & SAMIA KAMEL	7835 CLAYTON AVE	\$7,221.75	\$7,221.75	\$7,221.74	
59	205850002020	RESIDENTIAL	GOLISH CHAD L	7855 CLAYTON AVE	\$7,221.75	\$7,221.75	\$7,221.74	
60	205850002030	RESIDENTIAL	ANDERSON ROBERT A	7875 CLAYTON AVE	\$7,221.75	\$7,221.75	\$7,221.74	
61	205850003010	RESIDENTIAL	NELSON DARYL W & KAREN A	7982 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
62	205850003020	RESIDENTIAL	DONG BO & JUNYAN LI	7974 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
63	205850003030	RESIDENTIAL	YORK MARK TSTE & TRACY TSTE YORK	7966 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	

CP 2024-09G South Grove Area 7 Preliminary Assessment Roll								
#	PIN	Property Type Classification	Owner	Site Address	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
64	205850003040	RESIDENTIAL	GRESHOWAK KRISTIE & JAMIE	7958 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
65	205850003050	RESIDENTIAL	FRANCOUR MICHAEL B & LISA M	7950 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
66	205850003060	RESIDENTIAL	KARINEN KERRY B & DEBRA SUE KARINEN	7916 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
67	205850003070	RESIDENTIAL	AUSEN TROY & SHELLEY	7906 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
68	205850003080	RESIDENTIAL	HANSEN RACHEL & CODY HANSEN	7896 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
69	205850003090	RESIDENTIAL	ALLEN DOUGLAS G & HEATHER A ALLEN	7935 CHARLES WAY	\$7,221.75	\$7,221.75	\$7,221.74	
70	205850003100	RESIDENTIAL	IHZ PROPERTY ILLINOIS LP	7943 CHARLES WAY	\$7,221.75	\$7,221.75	\$7,221.74	
71	205850003110	RESIDENTIAL	MILLER MARY J	7951 CHARLES WAY	\$7,221.75	\$7,221.75	\$7,221.74	
72	205850003120	RESIDENTIAL	GREGORY S MILLER REVOCABLE TRUST	7959 CHARLES WAY	\$7,221.75	\$7,221.75	\$7,221.74	
73	205850003130	RESIDENTIAL	DIFRONZO MICKEY J & JANE M	7967 CHARLES WAY	\$7,221.75	\$7,221.75	\$7,221.74	
74	205850004010	RESIDENTIAL	FOX DARYL L & MICHELE	7987 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
75	205850004020	RESIDENTIAL	MORGAN MARSHA DIANE	7979 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
76	205850004030	RESIDENTIAL	CHANG KENG S	7971 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
77	205850004040	RESIDENTIAL	WOHLWEND MICHAEL D & KAYE L WOHLWEND	7963 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
78	205850004050	RESIDENTIAL	SMEN TEK LAWRENCE G & ADRIA H	7955 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
79	205850004060	RESIDENTIAL	TRINH THAO L & GIAM M NGUYEN	7947 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
80	205850004070	RESIDENTIAL	RAMIREZ MARILYN & LUIS T RAMIREZ	7939 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
81	205850004080	RESIDENTIAL	BROWN ROBERT H	7931 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
82	205850004090	RESIDENTIAL	SNODGRASS MARILU & EUGENE W BROWN	7923 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
83	205850004100	RESIDENTIAL	FISCHER RITA E	7919 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
84	205850004110	RESIDENTIAL	HURT PATRICK & ARLENE J MUSSELMAN	7915 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
85	205850004120	RESIDENTIAL	BRACE ERIC R & NATALIE BRACE	7907 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
86	205850004130	RESIDENTIAL	ERICKSON STEVEN R & ANNETTE M	7899 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
87	205850004140	RESIDENTIAL	LATTERELL DONALD & KELLEY BUSSIAN LATTERELL	7891 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
88	205850004150	RESIDENTIAL	VOKOUN DENISE	7883 CLAIBORNE LN	\$7,221.75	\$7,221.75	\$7,221.74	
89	205850101010	RESIDENTIAL	HALLEY LANE	7815 CLAYTON AVE	\$7,221.75	\$7,221.75	\$7,221.74	
90	205850101020	RESIDENTIAL	STEIN DENITA K & MICHAEL J	7825 CLAYTON AVE	\$7,221.75	\$7,221.75	\$7,221.74	
91	206420001020	RESIDENTIAL	HEITZINGER KATHRYN L	7826 DAVIDSON CT	\$7,221.75	\$7,221.75	\$7,221.74	
92	206420001030	RESIDENTIAL	ROBERT M & RACHEL A DIFRONZO	7822 DAVIDSON CT	\$7,221.75	\$7,221.75	\$7,221.74	
93	206420001040	RESIDENTIAL	BOSWORTH RODNEY K	7818 DAVIDSON CT	\$7,221.75	\$7,221.75	\$7,221.74	
94	206420001050	RESIDENTIAL	EISEN KEVIN M & WENDY K	7806 DAWN AVE	\$7,221.75	\$7,221.75	\$7,221.74	

CP 2024-09G South Grove Area 7 Preliminary Assessment Roll								
#	PIN	Property Type Classification	Owner	Site Address	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
95	206420001060	RESIDENTIAL	ROULEAU MICHAEL K & JENNIFER	7814 DAVIDSON CT	\$7,221.75	\$7,221.75	\$7,221.74	
96	206420002010	RESIDENTIAL	JONES CHARLES JR & VALERIE	7980 DAWN AVE	\$7,221.75	\$7,221.75	\$7,221.74	
97	206420002020	RESIDENTIAL	CASANOVA MELANIE G & MICHAEL CASANOVA	7960 DAWN AVE	\$7,221.75	\$7,221.75	\$7,221.74	
98	206420002030	RESIDENTIAL	DEWING DENISE M	7940 DAWN AVE	\$7,221.75	\$7,221.75	\$7,221.74	
99	206420002040	RESIDENTIAL	COY KENNETH W SR	7920 DAWN AVE	\$7,221.75	\$7,221.75	\$7,221.74	
100	206420002050	RESIDENTIAL	SOINE GREGORY L & SUSAN M	7900 DAWN AVE	\$7,221.75	\$7,221.75	\$7,221.74	
101	206420002060	RESIDENTIAL	MIKE LAWRENCE B & DEBRA K	7880 DAWN AVE	\$7,221.75	\$7,221.75	\$7,221.74	
102	206420002070	RESIDENTIAL	KENNEDY JOHN P	7860 DAWN AVE	\$7,221.75	\$7,221.75	\$7,221.74	
103	206420002080	RESIDENTIAL	KOSMAN TROY RICHARD & MERI J DURAND	7840 DAWN AVE	\$7,221.75	\$7,221.75	\$7,221.74	
104	206420003010	RESIDENTIAL	HEILMAN JODY P & SUSAN L	7985 DAWN AVE	\$7,221.75	\$7,221.75	\$7,221.74	
105	206420003020	RESIDENTIAL	GACKSTETTER STEVEN & PAMELA	7965 DAWN AVE	\$7,221.75	\$7,221.75	\$7,221.74	
106	206420003030	RESIDENTIAL	PENNER LAURA & RICHARD RELLER	7945 DAWN AVE	\$7,221.75	\$7,221.75	\$7,221.74	
107	206420003040	RESIDENTIAL	MALECEK DALE & KATHERINE	7915 DAWN AVE	\$7,221.75	\$7,221.75	\$7,221.74	
108	206420003050	RESIDENTIAL	LOOSEN EDWARD J & TERESA M	7901 DAWN AVE	\$7,221.75	\$7,221.75	\$7,221.74	
109	206420003060	RESIDENTIAL	KIMBLE BARTON & CATHERINE	3936 79TH ST E	\$7,221.75	\$7,221.75	\$7,221.74	
110	206420003070	RESIDENTIAL	SNELL SAMUEL & LISA SNELL	3928 79TH ST E	\$7,221.75	\$7,221.75	\$7,221.74	
111	206420003080	RESIDENTIAL	ARNESON MARK A & MELINDA K	3914 79TH ST E	\$7,221.75	\$7,221.75	\$7,221.74	
112	206420003090	RESIDENTIAL	ACHESON GRAHAM S & SIOBHAN K	7938 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
113	206420003100	RESIDENTIAL	VIDAL FRANCIS J & ELENITA	7950 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
114	206420003110	RESIDENTIAL	KNEER DAVID J & CARRIE A	7960 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
115	206420003120	RESIDENTIAL	STEFFEL LANE R & JENIFER E	7996 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
116	206420004010	RESIDENTIAL	MCCOY SCOTT GERALD	3949 79TH ST E	\$7,221.75	\$7,221.75	\$7,221.74	
117	206420004020	RESIDENTIAL	IBRAHIM DHIMBIL	3935 79TH ST E	\$7,221.75	\$7,221.75	\$7,221.74	
118	206420004030	RESIDENTIAL	ADAMS MICHAEL S & ANN M	3927 79TH ST E	\$7,221.75	\$7,221.75	\$7,221.74	
119	206420004040	RESIDENTIAL	ALICH KENNETH R & JUDY	7874 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
120	206420004050	RESIDENTIAL	OHNESWERE RAJENDRANAUTH & TOULSIEDAI OHNESWERE	7846 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
121	206420004060	RESIDENTIAL	MCCANN BARNEY D	7834 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
122	206420004070	RESIDENTIAL	RODRIGUEZ ANTONY L & JULIANA L DAVISON	7832 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
123	206420004080	RESIDENTIAL	BRIGUET TODD L & JENNIFER L	7830 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
124	206420005010	RESIDENTIAL	SCHWAB CRAIG T & MARY JO R	7995 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
125	206420005020	RESIDENTIAL	LEE PETRONA A	7983 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	

CP 2024-09G South Grove Area 7 Preliminary Assessment Roll								
#	PIN	Property Type Classification	Owner	Site Address	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
126	206420005030	RESIDENTIAL	OFTEDAHL THOMAS & PATRICIA	7967 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
127	206420005040	RESIDENTIAL	JORGENSEN DENNIS	7951 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
128	206420005050	RESIDENTIAL	JOHNSON WILLIAM G & MARILEE R TAYLOR	7935 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
129	206420005060	RESIDENTIAL	JOHNSON BRUCE & GAIL	7919 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
130	206420005070	RESIDENTIAL	HARRIS DENVER CHARLES & KIM	7893 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
131	206420005080	RESIDENTIAL	DEAN JEFFREY W & MARY R	7877 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
132	206420005090	RESIDENTIAL	WHITE RYAN THOMAS & MOLLY	7861 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
133	206420005100	RESIDENTIAL	COREY PAUL G	7845 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
134	206420005110	RESIDENTIAL	OMAN MATTHEW	7843 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
135	206420005120	RESIDENTIAL	PERRON CHAD W & REBECCA L	7841 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
136	206420005130	RESIDENTIAL	JOHNSON JULIE R TSTE	7839 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
137	206420005140	RESIDENTIAL	BLAZEK TRENT L & MICHAEL L BLAZEK	7837 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
138	206420005150	RESIDENTIAL	BODSBERG KYLE P & STACY J	7835 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
139	206420005160	RESIDENTIAL	ZUBULAKE DEENA	7833 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
140	206420005170	RESIDENTIAL	FISHER THOMAS D & VICTORIA	7831 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
141	206420005180	RESIDENTIAL	GUST JOHN & AMANDA THEIS	7829 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
142	206420005190	RESIDENTIAL	ZERON DENISE & STEVEN ZERON	7827 COREY PATH	\$7,221.75	\$7,221.75	\$7,221.74	
144	206600103001	RESIDENTIAL-CONDOMINIUM	PHILLIP E ROSENBERGER	7928 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
145	206600103002	RESIDENTIAL-CONDOMINIUM	VITORIA FREITAS KLOEPPNER	7930 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
146	206600103003	RESIDENTIAL-CONDOMINIUM	FREDERICK C RAUSCHNOT & MARILYN M RAUSCHNOT	7932 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
147	206600103004	RESIDENTIAL-CONDOMINIUM	NICHOAS E STEINKOPF	7934 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
148	206600103005	RESIDENTIAL-CONDOMINIUM	KAREN FAITH	7936 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
149	206600103006	RESIDENTIAL-CONDOMINIUM	JENNIFER L LITTLER	7938 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
150	206600103007	RESIDENTIAL-CONDOMINIUM	TODD W METTLER	7940 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
151	206600103008	RESIDENTIAL-CONDOMINIUM	MARGARET NAGLE BRELJE	7942 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
152	206600103009	RESIDENTIAL-CONDOMINIUM	ANTONIO MILLER	7944 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
153	206600103010	RESIDENTIAL-CONDOMINIUM	KATHYANN ZELLMER	7946 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
154	206600103011	RESIDENTIAL-CONDOMINIUM	DELORES E TSTE JOHNSON	7948 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
155	206600103012	RESIDENTIAL-CONDOMINIUM	MARY B MANSUR	7950 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
156	206600103013	RESIDENTIAL-CONDOMINIUM	MINNESOTA CAPITALMANAGEMENT LLC	7952 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
157	206600103014	RESIDENTIAL-CONDOMINIUM	JONATHAN D STRONG & JULIA L RADEMAKER	7954 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
158	206600103015	RESIDENTIAL-CONDOMINIUM	MARK TAN	7956 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	

CP 2024-09G South Grove Area 7 Preliminary Assessment Roll								
#	PIN	Property Type Classification	Owner	Site Address	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
159	206600103016	RESIDENTIAL-CONDOMINIUM	TERRIE L BOETTCHER	7958 CHARLES WAY	\$3,938.21	\$3,938.21	\$3,938.20	
162	203652102010	RESIDENTIAL	SCHWEGEL LESLIE & CHERYL	7807 COOPER AVE	\$7,221.75	\$7,221.75	\$7,221.74	
TOTALS:					\$1,210,762	\$1,136,652.07	\$1,136,650.20	

IGH STREET & STORM ASSESSMENT (FDR)	
TOTAL STREET & STORM COST: ¹	\$2,201,385.62
ASSESSABLE STREET & STORM COST (55%):	\$1,210,762.09
TOTAL IGH PROJECT ADJUSTED FRONT FOOTAGE (LF):	20,291
NET ASSESSMENT RATE PER LF (ASSESSABLE STREET & STORM COST / ADJUSTED FRONT FOOTAGE):	\$59.67
AMOUNT ASSESSED (NON-RESIDENTIAL):	\$192,495.12
AMOUNT ASSESSED (RESIDENTIAL) (ASSESSABLE STREET & STORM COST - NON-RESIDENTIAL AMOUNT ASSESSED):	\$1,018,266.97
# OF RESIDENTIAL UNITS:	141
ASSESSMENT RATE PER UNIT (RESIDENTIAL RATE):	\$7,221.75
TOTAL PROPOSED ASSESSMENT:	\$1,136,650.20

¹ Total Street and Storm Cost does not include additional 8-foot street width on Dawn Way or Clayton Avenue (\$67,291)

**CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA**

RESOLUTION NO. 2024-240

**RESOLUTION APPROVING SPECIAL ASSESSMENTS AND ADOPTING FINAL ASSESSMENT
ROLL FOR THE 2024 PAVEMENT MANAGEMENT INITIATIVE
CITY PROJECT NO. 2024-09H – 96TH AND 99TH STREET AREA**

WHEREAS, pursuant to proper notice duly given as required by law, the City Council of the City of Inver Grove Heights has met, heard, and passed upon all objections to the proposed special assessments for the improvements for City Project No. 2024-09H which includes pavement rehabilitation by means of full depth reclamation and mill and overlay along with storm improvements, curb improvements and related appurtenances along Baker Court from 96th Street to its terminus, 96th Street from Baker Court to Courthouse Boulevard Court, Barton Trail from 96th Street to its terminus, Baxter Trail from 96th Street to its terminus, and 99th Street from Barnes Avenue to its terminus.

**NOW THEREFORE, BE IT RESOLVED BY THE INVER GROVE HEIGHTS CITY COUNCIL
THAT:**

1. The special assessments and the final assessment roll, a copy of which is attached hereto and made a part hereof, is hereby accepted and shall constitute the special assessment levied against the parcels named herein, and each tract of land herein included is hereby found to be benefited by the improvement in at least the amount of the special assessment levied against it.
2. Such assessment shall be payable in equal installments extending over a period of 10 years for assessments between \$5,000 and \$9,999.99 and 15 years for assessments greater than \$10,000, beginning in 2025, and shall bear interest at the rate of 4.63 percent and 4.92 percent respectively, per annum, beginning January 1, 2025.
3. The owner of any property, so assessed, may at any time prior to certification of the assessment to the County Auditor, pay the whole of the assessment on such property with interest accrued to the date of payment, to the City Treasurer, except that no interest shall be charged if the entire assessment is paid in 2024, within thirty days from the adoption of this resolution; and the owner may, at any time thereafter, pay to the County Treasurer the entire amount of the assessment remaining unpaid, with interest accrued to December 31 of the year in which such payment is made. Such payment must be made before November 15, or interest will be charged through December 31 of the next succeeding year (or such later date as determined by the Council), except no interest shall be charged or accrued in 2024.
4. The Clerk shall, forthwith, transmit a certified duplicate of this assessment to the County Auditor to be extended on the property tax lists of the County, and such assessments shall be collected and paid in the same manner as other taxes.

Approved by the City Council of the City of Inver Grove Heights, Minnesota this 14th day of October 2024.

Brenda Dietrich, Mayor

ATTEST:

Rebecca Kiernan, City Clerk

CP 2024-09H 96th Street and 99th Street Area Preliminary Assessment Roll										
#	PIN	Property Type Classification	Owner	Site Address	Front Footage	Adjusted Front Footage	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
FULL DEPTH RECLAMATION										
1	204769001060	RESIDENTIAL	DAVIS CANDICE L & JEFFREY A HOPPE	9756 BARTON TRL	167	167	\$10,686.87	\$10,686.87	\$10,686.86	
2	204752001010	RESIDENTIAL	CRESCINI RUBEN R & MARIA R	2298 96TH ST E	373	373	\$10,686.87	\$10,686.87	\$10,686.86	
3	204752001020	RESIDENTIAL	BERGUM MICHAEL D & LAURIE A	9655 BARTON TRL	709	709	\$10,686.87	\$10,686.87	\$10,686.86	
4	204752002010	RESIDENTIAL	ACHMAN GREGG A & VIRGINIA B	2293 96TH ST E	570	570	\$10,686.87	\$10,686.87	\$10,686.86	
5	204752002020	RESIDENTIAL	TENNEY JOHN H & LYNN A TENNEY	2337 96TH ST E	296	296	\$10,686.87	\$10,686.87	\$10,686.86	
6	204752002030	RESIDENTIAL	LYDDY MARK A & JENNIFER J	2381 96TH ST E	146	146	\$10,686.87	\$10,686.87	\$10,686.86	
7	204752002051	RESIDENTIAL	KRUSE DANIEL H & REBECCA L	2425 96TH ST E	116	116	\$10,686.87	\$10,686.87	\$10,686.86	
8	204752002052	RESIDENTIAL	WHALEY JOHN C & MARY V	2469 96TH ST E	169	169	\$10,686.87	\$10,686.87	\$10,686.86	
9	204752002060	RESIDENTIAL	VANG PAO GE & MAY KIA THAO	2513 96TH ST E	297	297	\$10,686.87	\$10,686.87	\$10,686.86	
10	204752002070	RESIDENTIAL	THILMANY JEREMY & SHAUNA THILMANY	2557 96TH ST E	300	300	\$10,686.87	\$10,686.87	\$10,686.86	
11	204752002080	RESIDENTIAL	MATYKIEWICZ LEE G & NANCY J HALEY	2601 96TH ST E	275	275	\$10,686.87	\$10,686.87	\$10,686.86	
12	204752002090	RESIDENTIAL	HUNTING ALLAN E & AMY E	2645 96TH ST E	202	202	\$10,686.87	\$10,686.87	\$10,686.86	
13	204752002100	RESIDENTIAL	KOURY PAUL J & WENDY L	2689 96TH ST E	217	217	\$10,686.87	\$10,686.87	\$10,686.86	
14	204752002110	RESIDENTIAL	KOURY PAUL J & WENDY L		180	180	\$10,686.87	\$10,686.87	\$10,686.86	
15	204752002120	RESIDENTIAL	HENRY SHARI J	2777 96TH ST E	521	521	\$10,686.87	\$10,686.87	\$10,686.86	
16	204752003010	RESIDENTIAL	SCHULTE BRIAN & TARA	9670 BARTON TRL	217	217	\$10,686.87	\$10,686.87	\$10,686.86	
17	204752003020	RESIDENTIAL	ROBERTSON JEFFREY W & KELLY K	2386 96TH ST E	680	680	\$10,686.87	\$10,686.87	\$10,686.86	
18	204752003030	RESIDENTIAL	TALLARINI THOMAS D JR & RACHEL	2430 96TH ST E	306	306	\$10,686.87	\$10,686.87	\$10,686.86	
19	204752003040	RESIDENTIAL	HUDSON HUGH L & CAROLYN J	2474 96TH ST E	287	287	\$10,686.87	\$10,686.87	\$10,686.86	
20	204752003050	RESIDENTIAL	WESTRA JAMES T & KATHRYN K	2518 96TH ST E	220	220	\$10,686.87	\$10,686.87	\$10,686.86	
21	204752003060	RESIDENTIAL	WEGNER RICHARD & ORLANDA	2562 96TH ST E	225	225	\$10,686.87	\$10,686.87	\$10,686.86	
22	204752003070	RESIDENTIAL	BECKMAN MARVIN L & KATHLEEN BECKMAN	2606 96TH ST E	235	235	\$10,686.87	\$10,686.87	\$10,686.86	
23	204752003080	RESIDENTIAL	LOUCK JOHN W & MARION T	2650 96TH ST E	254	254	\$10,686.87	\$10,686.87	\$10,686.86	
24	204752003090	RESIDENTIAL	NORTON JAMES W & DEBRA N	2694 96TH ST E	245	245	\$10,686.87	\$10,686.87	\$10,686.86	
25	204752003100	RESIDENTIAL	WOOG JANICE MARIE	2738 96TH ST E	243	243	\$10,686.87	\$10,686.87	\$10,686.86	
26	204752003110	RESIDENTIAL	RYAN & MERRI GUGGISBERG	2782 96TH ST E	117	117	\$10,686.87	\$10,686.87	\$10,686.86	
27	204752004010	RESIDENTIAL	JENNE JAMES F & BONITA L	2826 96TH ST E	344	344	\$10,686.87	\$10,686.87	\$10,686.86	
28	204752101010	RESIDENTIAL	PATNODE THOMAS J & AMY W	2807 96TH ST E	401	401	\$10,686.87	\$10,686.87	\$10,686.86	
29	204752101020	RESIDENTIAL	PROCHNIAK MATTHEW P & MARNIE L	2847 96TH ST E	197	197	\$10,686.87	\$10,686.87	\$10,686.86	
30	204752101031	RESIDENTIAL	FREDEEN JONATHAN & INGRID		152	152	\$10,686.87	\$10,686.87	\$10,686.86	
31	204752101041	RESIDENTIAL	FREDEEN JONATHAN & INGRID	2893 96TH ST E	186	186	\$10,686.87	\$10,686.87	\$10,686.86	
32	204752101050	RESIDENTIAL	WOOG STEVE & COLENE	2927 96TH ST E	285	285	\$10,686.87	\$10,686.87	\$10,686.86	
33	204752101060	RESIDENTIAL	EVENSON WILLIAM R & JACQUELINE A SHIRVINSKI	2965 96TH ST E	356	356	\$10,686.87	\$10,686.87	\$10,686.86	
34	204752101070	RESIDENTIAL	TSCHIDA JOHN W & JACQUELINE	3025 96TH ST E	402	402	\$10,686.87	\$10,686.87	\$10,686.86	
35	204752101080	RESIDENTIAL	PERSAUD MAHENDRA & INDRANIE PERSAUD	3071 96TH ST E	628	628	\$10,686.87	\$10,686.87	\$10,686.86	
44	204752103010	RESIDENTIAL	SWANSON DAVID F & SANDRA K M	2872 96TH ST E	628	628	\$10,686.87	\$10,686.87	\$10,686.86	
45	204752103020	RESIDENTIAL	WIELAND JEFFREY D & DAWN A	2956 96TH ST E	651	651	\$10,686.87	\$10,686.87	\$10,686.86	
47	204752104010	RESIDENTIAL	THOMAS GERALD D & COLLEEN M	3042 96TH ST E	321	321	\$10,686.87	\$10,686.87	\$10,686.86	
48	204752104020	RESIDENTIAL	GONIER LARRY W TSTE & JOYCE P TSTE GONIER	3078 96TH ST E	308	308	\$10,686.87	\$10,686.87	\$10,686.86	
49	207660001010	RESIDENTIAL	WOODWARD ANTHONY J & MEGAN P	9595 BAKER CT	250	250	\$10,686.87	\$10,686.87	\$10,686.86	
50	207660001020	RESIDENTIAL	DANIEL F GLEASON & TESSA R BRIGHT	9589 BAKER CT	161	161	\$10,686.87	\$10,686.87	\$10,686.86	
51	207660001030	RESIDENTIAL	DANNER DOUGLAS E & GINA R	9583 BAKER CT	198	198	\$10,686.87	\$10,686.87	\$10,686.86	
52	207660001040	RESIDENTIAL	AQEL RAED B HASAN	9577 BAKER CT	127	127	\$10,686.87	\$10,686.87	\$10,686.86	
53	207660001050	RESIDENTIAL	RUNQUIST LARS & LORI A JOHNSON	9580 BAKER CT	123	123	\$10,686.87	\$10,686.87	\$10,686.86	

CP 2024-09H 96th Street and 99th Street Area Preliminary Assessment Roll										
#	PIN	Property Type Classification	Owner	Site Address	Front Footage	Adjusted Front Footage	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
54	207660001060	RESIDENTIAL	RUNQUIST LARS & LORI ANN JOHNSON		216	216	\$10,686.87	\$10,686.87	\$10,686.86	
55	207660001070	RESIDENTIAL	RUNQUIST LARS & LORI ANN JOHNSON		278	278	\$10,686.87	\$10,686.87	\$10,686.86	
56	207660001080	RESIDENTIAL	SCHMID JOHN R & STEPHANIE L	9592 BAKER CT	850	850	\$10,686.87	\$10,686.87	\$10,686.86	
57	207660002010	RESIDENTIAL	DEVILER VIRGINIA C	2020 96TH ST E	0	0	\$10,686.87	\$5,343.43	\$5,343.42	Indirect access property assessed at 50% the per unit residential rate
58	207660002020	RESIDENTIAL	NAKASHIMA JUN & DAWN	2070 96TH ST E	60	60	\$10,686.87	\$10,686.87	\$10,686.86	
59	207660002030	RESIDENTIAL	PETER & LINDSAY WENZEL	2120 96TH ST E	201	201	\$10,686.87	\$10,686.87	\$10,686.86	
60	207660002040	RESIDENTIAL	AMENT BRIAN & MICHELLE	2170 96TH ST E	243	243	\$10,686.87	\$10,686.87	\$10,686.86	
61	207660002050	RESIDENTIAL	ABBOTT WILLIE J & NICOLE	2220 96TH ST E	286	286	\$10,686.87	\$10,686.87	\$10,686.86	
62	204769001050	RESIDENTIAL	MAGED & JULIE AYOUB	9757 BARTON TRL	167	167	\$10,686.87	\$10,686.87	\$10,686.86	
77	204752201010	RESIDENTIAL	SCOTT L STREIFF	9712 BENJAMIN TRL	0	0	\$10,686.87	\$5,343.43	\$5,343.42	Indirect access property assessed at 50% the per unit residential rate
78	204752201020	RESIDENTIAL	GABRIEL ROJAS CARDONA AND SARAH K WESTALL	9716 BENJAMIN TRL	0	0	\$10,686.87	\$5,343.43	\$5,343.42	Indirect access property assessed at 50% the per unit residential rate
TOTALS:					15910	16234	\$ 612,215	\$ 571,747.47	\$ 571,746.98	

IGH STREET & STORM ASSESSMENT (FDR)	
TOTAL STREET & STORM COST:	\$1,113,118.35
ASSESSABLE STREET & STORM COST (\$590):	\$612,215.09
TOTAL IGH PROJECT ADJUSTED FRONT FOOTAGE (LF):	16,234
NET ASSESSMENT RATE PER LF (ASSESABLE STREET & STORM COST / ADJUSTED FRONT FOOTAGE):	\$37.71
AMOUNT ASSESSED (NON-RESIDENTIAL):	\$24,437.32
AMOUNT ASSESSED (RESIDENTIAL) (ASSESABLE STREET & STORM COST - NON-RESIDENTIAL AMOUNT ASSESSED):	\$587,777.78
# OF RESIDENTIAL UNITS:	55
ASSESSMENT RATE PER UNIT (RESIDENTIAL RATE):	\$10,686.87
TOTAL PROPOSED ASSESSMENT:	\$571,746.98

#	PIN	Property Type Classification	Owner	Site Address	Front Footage	Adjusted Front Footage	Per Policy Assessment	Proposed Feasibility Assessment	Final Assessment Roll	Notes
MILL AND OVERLAY										
36	204752102010	RESIDENTIAL	KUEFLER DARIAN K & JESSICA E	9741 BAXTER TRL	406	406	\$5,266.54	\$5,266.54	\$5,266.54	
37	204752102020	RESIDENTIAL	STORO RENY E	9803 BAXTER TRL	343	343	\$5,266.54	\$5,266.54	\$5,266.54	
38	204752102030	RESIDENTIAL	SABIN JAMES E & CYNTHIA	9851 BAXTER TRL	298	298	\$5,266.54	\$5,266.54	\$5,266.54	
39	204752102040	RESIDENTIAL	THOME CHRISTOPHER J & DIAN	9893 BAXTER TRL	241	241	\$5,266.54	\$5,266.54	\$5,266.54	
40	204752102050	RESIDENTIAL	STEWART JUSTIN & ASHLEY	9909 BAXTER TRL	60	60	\$5,266.54	\$5,266.54	\$5,266.54	
41	204752102060	RESIDENTIAL	LAFFEN DANNY C & ELIZABETH	9912 BAXTER TRL	63	63	\$5,266.54	\$5,266.54	\$5,266.54	
42	204752102070	RESIDENTIAL	BOWE JAMES L & TAMMY J BOWE	9882 BAXTER TRL	340	340	\$5,266.54	\$5,266.54	\$5,266.54	
43	204752102080	RESIDENTIAL	KLINT JEFFREY D & RHONDA K	9816 BAXTER TRL	677	677	\$5,266.54	\$5,266.54	\$5,266.54	
63	200210077015	RESIDENTIAL	POLSKI ROBERT J JR	2405 99TH ST E	60	60	\$5,266.54	\$5,266.54	\$5,266.54	
64	204769001010	RESIDENTIAL	LIDHOLM STEVE	2291 99TH ST E	216	216	\$5,266.54	\$5,266.54	\$5,266.54	
65	204769001020	RESIDENTIAL	GREER JON A & ANNE L	2263 99TH ST E	216	216	\$5,266.54	\$5,266.54	\$5,266.54	
66	204769001030	RESIDENTIAL	SEILS GARY M & VANESSA L	2239 99TH ST E	200	200	\$5,266.54	\$5,266.54	\$5,266.54	
67	204769001040	RESIDENTIAL	SALSCHIEDER TIMOTHY J & TIA R	2306 99TH ST E	45	45	\$5,266.54	\$5,266.54	\$5,266.54	
68	204769001070	RESIDENTIAL	WILLAERT KEITH D & NATALIE M	2385 99TH ST E	255	255	\$5,266.54	\$5,266.54	\$5,266.54	

#	PIN	Property Type Classification	Owner	Site Address	Front Footage	Adjusted Front Footage	Per Policy Assessment	Proposed Feasibility Assessment	Final Assessment Roll	Notes
69	204769001080	RESIDENTIAL	SCHAEFER DAVID P & SUSAN L	2353 99TH ST E	252	252	\$5,266.54	\$5,266.54	\$5,266.54	
70	204769001090	RESIDENTIAL	MILLERBERND JEFFREY & ANN	2323 99TH ST E	252	252	\$5,266.54	\$5,266.54	\$5,266.54	
71	204769002021	RESIDENTIAL	VANG JANNET & KA ZOUA YANG	2240 99TH ST E	309	309	\$5,266.54	\$5,266.54	\$5,266.54	
72	204769002022	RESIDENTIAL	JANCIK JON T & LYNN M	2290 99TH ST E	364	364	\$5,266.54	\$5,266.54	\$5,266.54	
73	204769002030	RESIDENTIAL	FRANKE DAVID & RITA	2324 99TH ST E	247	247	\$5,266.54	\$5,266.54	\$5,266.54	
74	204769002040	RESIDENTIAL	PARTRIDGE THOMAS M & KAREN J	2354 99TH ST E	232	232	\$5,266.54	\$5,266.54	\$5,266.54	
75	204769002050	RESIDENTIAL	FINDORFF KARL & LUCINDA TRUST	2386 99TH ST E	280	280	\$5,266.54	\$5,266.54	\$5,266.54	
TOTALS:					5882	5882	\$ 110,597	\$ 110,597.34	\$ 110,597.34	

IGH STREET & STORM ASSESSMENT (M&O)	
TOTAL STREET & STORM COST:	\$138,246.68
ASSESSABLE STREET & STORM COST (80%):	\$110,597.34
TOTAL IGH PROJECT ADJUSTED FRONT FOOTAGE (LF):	5,882
NET ASSESSMENT RATE PER LF (ASSESABLE STREET & STORM COST / ADJUSTED FRONT FOOTAGE):	\$18.80
AMOUNT ASSESSED (NON-RESIDENTIAL):	\$0.00
AMOUNT ASSESSED (RESIDENTIAL) (ASSESABLE STREET & STORM COST - NON-RESIDENTIAL AMOUNT ASSESSED):	\$110,597.34
# OF RESIDENTIAL UNITS:	21
ASSESSMENT RATE PER UNIT (RESIDENTIAL RATE):	\$5,266.54
TOTAL PROPOSED ASSESSMENT AFTER CAPS:	\$110,597.34

Total FDR + M&O	
\$	682,344.32

9583 Baker Court
Inver Grove Heights, MN 55077

October 8, 2024

Rebecca Kiernan, IGH City Clerk
8150 Barbara Avenue
Inver Grove Heights, MN 55077

Dear Ms. Kiernan,

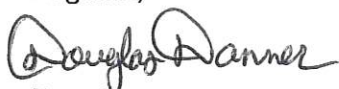
We, Douglas Danner and Gina Danner, are formally submitting an objection to the special assessment in the amount of \$10,686.86 proposed for our property at 9583 Baker Court in Inver Grove Heights, MN (Parcel ID 207660001030) for the roadway improvements recently completed under the 96th Street Area and 99th Street Area Project No. 2024-09H. We would like our objection noted in the record to preserve our right to appeal if no adjustment is made by the City Council to our special assessment.

We are challenging the special assessment as it does not meet the criteria specified in Minnesota Statue 429.

Objection 1 – The benefit in our property value increase from repaving the existing roadway and making curb repairs is less than the amount of the proposed special assessment at \$10,686.86. A special assessment that exceeds the special benefit is a taking of property without fair compensation and violates both the Fourteenth Amendment of the United States Constitution and the Minnesota Constitution. The City should pay its fair share of the project cost.

Objection 2 - Our property in Titcomb Acres west of Dakota County 53 does not benefit from the street improvements made in the Marcott Woods neighborhood east of Dakota County 53 also known as Barnes Avenue. As recorded in the proposed assessment roll Titcomb Acres properties have a total of 2993 adjusted front footage while Marcott Woods properties account for 13241 adjusted front footage. Because our neighborhood is segregated from Marcott Woods by a county road, we should be required to pay for only our share of 2993 linear feet in our neighborhood to contribute to the cost of the project. At an assessment rate \$37.71 per linear foot as determined by the IGH City staff each 13 residential units in Titcomb Acres would be assessed \$8,682.00. Marcott Woods residents should pay their fair share. We should have to pay only our share at \$8,682.00 which benefits our property.

Regards,


Douglas Danner
dougdanner@aol.com


Gina Danner
grdanner@gmail.com

John & Stephanie Schmid

9592 Baker Court
Inver Grove Heights, MN 55077
612-760-9206

Rebecca Kiernan
Inver Grove Heights

October 13, 2024

Dear Ms. Kiernan

We, John and Stephanie Schmid, residing at 9592 Baker Court, Inver Grove Heights, are writing to formally object to the pavement assessment. We would like our objection noted in the record to preserve our right to appeal.

We believe that our property does not benefit from the street improvement in Marcott Woods east of Barnes Avenue and should only be assessed for our portion of the re-pavement west of Barnes Avenue.

We also believe that the benefit from the work being paid for by the special assessment is less than the amount of the special assessment, and the city should pay its fair share of the project cost.

We propose a *minimum reduction* of \$2,000 based on our neighborhood 2993 linear foot front footage cost of \$37.71 as determined by IGH staff.

Thank you for your consideration.

Warm Regards,

John and Stephanie Schmid
612 760 9206
Stephanieschmid1@gmail.com

**Larkin Hoffman**

8300 Norman Center Drive
Suite 1000
Minneapolis, MN 55437-1060

General: 952-835-3800
Fax: 952-896-3333
Web: www.larkinhoffman.com

October 9, 2024

Rebecca Kierman, City Clerk
City of Inver Grove Heights
8150 Barbara Avenue
Inver Grove Heights, MN 55077

VIA EMAIL ONLY
rkierman@ighmn.gov

Re: City Project No. 2024-09H: 96th and 99th Street Area (the “Project”)
Objection to Proposed Special Assessments
Our Clients: Lars Runquist and Lori Ann Johnson

Dear Ms. Kierman:

Our firm represents property owners Lars Runquist and Lori Ann Johnson in connection with the above-referenced Project and the proposed special assessments concerning the following properties (referred to herein as the “Properties”):

Parcel No.	Address	Proposed Assessment
207660001050	9580 Baker Court	\$10,686.86
207660001060	Vacant Parcel	\$10,686.86
207660001070	Vacant Parcel	\$10,686.86
		\$32,060.58

This letter constitutes our clients’ written objections, pursuant to Minn. Stat. §§429.061 and 429.0181, to the imposition of special assessments by the City of Inver Grove Heights (the “City”) against the Properties. Under Minnesota law, a special assessment must confer a “special benefit” on the property to be assessed, and the amount of the special assessment may not exceed the special benefit conferred on the property. “Special benefit” is defined as an immediate increase in the property’s market value resulting from the project. In other words, the assessed property must increase in value by at least as much as the assessment sum. An assessment that exceeds the amount of special benefit conferred will be set aside by the district court and deemed an unconstitutional taking, subjecting the City to liability for violating both the Minnesota Constitution and Fifth and Fourteenth Amendments to the United States Constitution (which includes the award of attorneys’ fees to the challenging property owner).

There has not been a showing by the City that the street improvements included in the City’s proposed special assessments will result in the immediate increase in the value of the Properties. The streets adjacent to the Properties were already improved with paved streets (to the extent that they border a street). Of particular concern are the two lots adjacent to our clients’ residence. These lots (parcels ending in -060 and -070) are vacant with no improvements and no current plans for development but were assessed at the same rate (\$10,686.86) as improved properties. It

is our understanding that these two lots are the only undeveloped privately-owned parcels specially assessed in conjunction with the Project. This creates a significant burden on our clients of over \$32,000 in proposed special assessment for a short stretch of roadway that is utilized solely for accessing their home (parcel 207660001050). Accordingly, our clients, without admitting or acknowledging any special benefit, believe that relief in the form of a reduced assessment should be provided as to the two undeveloped lots.

Our clients' objections to the special assessments include, but are not limited to, the following: (a) The City has failed to comply with the provisions of Minn. Stat. Ch. 429 and/or the City's own policies and procedures in adopting and calculating the special assessments; (b) The special assessments are not uniform upon the same class of property; (c) The improvements for which the special assessments were levied do not result in an increase of fair market value to the Properties in an amount equal to or greater than the amount of the special assessments; (d) The special assessments are arbitrary, capricious, unreasonable, and unconstitutional; and (e) The special assessments exceed the special benefits conferred and effect a taking in violation of the state constitution and the Fifth and Fourteenth Amendments to the United States Constitution.

Our clients, therefore, ask that the City not approve the special assessments as proposed.

Please do not hesitate to contact me with any questions.

Sincerely,



Rob A. Stefonowicz, for
Larkin Hoffman Daly & Lindgren Ltd.

Direct Dial: 952-896-3254
Direct Fax: 952-842-1718
Email: rstefonowicz@larkinhoffman.com

cc: Clients (via email)

October 11, 2024

Daniel Gleason and Tessa Bright

- *tessa.r.bright@gmail.com*

9589 Baker Court

Inver Grove Heights, MN 55077

Phone: *651 503 3970*

City Council –

I am writing to object to the assessments for the pavement management project for the 96th Street Area and 99th Street Area (Project No. 2024-09H).

A special assessment can be challenged if it doesn't meet three criteria: (1) your property must receive a benefit from the improvement; (2) the amount of the assessment must not exceed the benefit (meaning the increase in market value to your property due to the improvement); and (3) the assessment is applied uniformly to the same class of property in the assessed area.

In my opinion both:

(1) our property does not benefit from the street improvement east of Barnes Avenue and should be assessed for our share of only the adjusted front footage of our neighborhood Titcomb Acres and

(2) the amount of the proposed assessment to our property is greater than the increase in value that our property received from the re-pavement.

We bought 9589 Baker Court in August of 2023, one month prior to the decision to move ahead with the pavement project. In no part of the assessment or sale of the house was the condition of the road Baker Court considered. I am requesting a written report by an assessor to prove our property value has increased by the assessment amount due to the project.

In addition, I also believe this law is unjust and is not fairly assessed. Daniel and I are both in our mid-30s and 9589 Baker Court is our second property that we have owned. Our first house we bought was in North East, Minneapolis at which we lived for 5 years. During those years in NE Minneapolis, we were also assessed for a street pavement project and assessed to pay for a new road. I think the assessment process is an unfair process as I do not believe that we should have to pay for 2 new road pavement projects in a time line of being homeowners for only 6 years. I know part of this was luck but I wonder how often homeowners consider selling sooner to avoid these projects. This has put financial strains on our growing family. The state and city governments should be managing the tax funds provided by all citizens that use the roads to pay for these projects.

Tessa Bright and Daniel Gleason

October 11, 2024

Tessa Bright 10/11/24
Daniel Gleason 10/11/24
Daniel Gleason

Anthony and Megan Woodward
9595 Baker Court
Inver Grove Heights, MN 55077

October 13, 2024

Rebecca Kiernan, IGH City Clerk
8150 Barbara Avenue
Inver Grove Heights, MN 55077

Dear Ms. Kiernan,

We, Anthony Woodward and Megan Woodward, are formally submitting an objection to the special assessment in the amount of \$10,686.86 proposed for our property at 9595 Baker Court in Inver Grove Heights, MN (*Parcel ID 207660001010*) for the roadway improvements recently completed under the 96th Street Area and 99th Street Area Project No. 2024-09H. We would like our objection noted in the record to preserve our right to appeal if no adjustment is made by the City Council to our special assessment.

We are challenging the special assessment as it does not meet the criteria specified in Minnesota Statute 429.

Objection 1 – The benefit in our property value increase from repaving the existing roadway and making curb repairs is less than the amount of the proposed special assessment at \$10,686.86. A special assessment that exceeds the special benefit is a taking of property without fair compensation and violates both the Fourteenth Amendment of the United States Constitution and the Minnesota Constitution. The City should pay its fair share of the project cost.

Objection 2 - Our property in Titcomb Acres west of Dakota County 53 does not benefit from the street improvements made in the Marcott Woods neighborhood east of Dakota County 53 also known as Barnes Avenue. As recorded in the proposed assessment roll Titcomb Acres properties have a total of 2993 adjusted front footage while Marcott Woods properties account for 13241 adjusted front footage. Because our neighborhood is segregated from Marcott Woods by a county road, we should be required to pay for only our share of 2993 linear feet in our neighborhood to contribute to the cost of the project. At an assessment rate \$37.71 per linear foot as determined by the IGH City staff each 13 residential units in Titcomb Acres would be assessed \$8,682.00. Marcott Woods residents should pay their fair share. We should have to pay only our share at \$8,682.00 which benefits our property.

Regards,

Anthony Woodward Megan Woodward

Anthony Woodward
ajwood06@gmail.com

Megan Woodward
meganpwoodward@gmail.com

Rebecca Kiernan

From: Nicole Abbott <nicole-abbott@outlook.com>
Sent: Saturday, October 12, 2024 9:04 PM
To: Rebecca Kiernan
Cc: Willie 651-308-0777
Subject: 96th Street East Special Assessment

Hi Rebecca,

We would like to formally object to the assessment assigned to 2220 96th Street East and would like the objection noted in the record. We do not live in the Marcott Woods neighborhood and therefore, our property does not benefit from the street improvement of Marcott Woods, which is east of Barnes Avenue. We live in the Titcomb Acres neighborhood and should only be assessed for our portion of the repavement, west of Barnes Avenue. The benefit from the work being paid for by the special assessment is less than the cost of the special assessment and the city should pay those extra project costs being placed on the residents of our neighborhood. With 2,993 total front footage for our neighborhood, divided among the 13 residential units, our neighborhood should pay no more than \$8,682 per residential unit. This number is arrived upon based on the determined amount of \$37.71 per linear foot of frontage, as determined by the IGH staff.

Please let us know if there is a formal process to have this objection noted for the record. If you need one of us to stop in on Monday before the meeting and sign this request or provide a formal copy, we would be happy to do so. Please let us know.

Thank you,
Nicole and Willie Abbott
715-889-1249

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**CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA**

RESOLUTION NO. 2024-241

**RESOLUTION APPROVING SPECIAL ASSESSMENTS AND ADOPTING FINAL ASSESSMENT
ROLL FOR THE 2024 PAVEMENT MANAGEMENT INITIATIVE
CITY PROJECT NO. 2024-09I – BIXBY WAY AREA**

WHEREAS, pursuant to proper notice duly given as required by law, the City Council of the City of Inver Grove Heights has met, heard, and passed upon all objections to the proposed special assessments for the improvements for City Project No. 2024-09I which includes pavement rehabilitation by means of mill and overlay along with storm improvements, utility adjustments, curb improvements and related appurtenances along Bixby Way from 65th Street to Blaine Avenue.

**NOW THEREFORE, BE IT RESOLVED BY THE INVER GROVE HEIGHTS CITY COUNCIL
THAT:**

1. The special assessments and the final assessment roll, a copy of which is attached hereto and made a part hereof, is hereby accepted and shall constitute the special assessment levied against the parcels named herein, and each tract of land herein included is hereby found to be benefited by the improvement in at least the amount of the special assessment levied against it.
2. Such assessment shall be payable in equal installments extending over a period of five years for assessments between \$1,000 and \$4,999.99 beginning in 2025 and shall bear interest at the rate of 4.39 percent, per annum, beginning January 1, 2025.
3. The owner of any property, so assessed, may at any time prior to certification of the assessment to the County Auditor, pay the whole of the assessment on such property with interest accrued to the date of payment, to the City Treasurer, except that no interest shall be charged if the entire assessment is paid in 2024, within thirty days from the adoption of this resolution; and the owner may, at any time thereafter, pay to the County Treasurer the entire amount of the assessment remaining unpaid, with interest accrued to December 31 of the year in which such payment is made. Such payment must be made before November 15, or interest will be charged through December 31 of the next succeeding year (or such later date as determined by the Council), except no interest shall be charged or accrued in 2024.
4. The Clerk shall, forthwith, transmit a certified duplicate of this assessment to the County Auditor to be extended on the property tax lists of the County, and such assessments shall be collected and paid in the same manner as other taxes.

Approved by the City Council of the City of Inver Grove Heights, Minnesota this 14th day of October 2024.

Brenda Dietrich, Mayor

ATTEST:

Rebecca Kiernan, City Clerk

CP 2024-09I Bixby Way Preliminary Assessment Roll										
#	PIN	Property Type Classification	Owner	Site Address	Front Footage	Adjusted Front Footage	Per Policy Assessment	Proposed Final Assessment	Final Assessment Roll	Notes
MILL & OVERLAY										
1	201420003150	RESIDENTIAL-TOWNHOUSE	SPIES WILLIAM ROBERT & MARY BETH RENKEN	2488 BIXBY WAY	50	50	\$1,654.23	\$1,654.23	\$1,654.22	
2	201420003160	RESIDENTIAL-TOWNHOUSE	HANSEN ROBERT J & SUSAN M	2494 BIXBY WAY	70	70	\$1,654.23	\$1,654.23	\$1,654.22	
3	201420002010	RESIDENTIAL-TOWNHOUSE	BERGHOLTZ CLARK H & STEPHANIE	6508 BIXBY WAY	80	80	\$1,654.23	\$1,654.23	\$1,654.22	
4	201420002020	RESIDENTIAL-TOWNHOUSE	GABRIEL ROBERT J & SHIRLEY M	6528 BIXBY WAY	50	50	\$1,654.23	\$1,654.23	\$1,654.22	
5	201420002030	RESIDENTIAL-TOWNHOUSE	THURY EUGENE & FAYE	6548 BIXBY WAY	50	50	\$1,654.23	\$1,654.23	\$1,654.22	
6	201420002040	RESIDENTIAL-TOWNHOUSE	MERCADO DONALD & SUSANNE MERCADO	6568 BIXBY WAY	50	50	\$1,654.23	\$1,654.23	\$1,654.22	
7	201420002050	RESIDENTIAL-TOWNHOUSE	MATSON SARAH A	6588 BIXBY WAY	50	50	\$1,654.23	\$1,654.23	\$1,654.22	
8	201420002060	RESIDENTIAL-TOWNHOUSE	CZAIA CAROL A	6608 BIXBY WAY	50	50	\$1,654.23	\$1,654.23	\$1,654.22	
9	201420002070	RESIDENTIAL-TOWNHOUSE	ABDELLA LEAH E	6628 BIXBY WAY	50	50	\$1,654.23	\$1,654.23	\$1,654.22	
10	201420002080	RESIDENTIAL-TOWNHOUSE	ERICKSON MANDY G	6648 BIXBY WAY	50	50	\$1,654.23	\$1,654.23	\$1,654.22	
11	201420002090	RESIDENTIAL-TOWNHOUSE	LUDWIGSON JOEL R TSTE & LYNNETTE M TSTE APITZ	6658 BIXBY WAY	50	50	\$1,654.23	\$1,654.23	\$1,654.22	
12	201420002100	RESIDENTIAL-TOWNHOUSE	STURM CYNTHIA D	6678 BIXBY WAY	201	201	\$1,654.23	\$1,654.23	\$1,654.22	
13	201420003010	RESIDENTIAL-TOWNHOUSE	CISNEROS NICK & ANGELITA	6503 BIXBY WAY	67	67	\$1,654.23	\$1,654.23	\$1,654.22	
14	201420003020	RESIDENTIAL-TOWNHOUSE	LEITCH KAREN A	6523 BIXBY WAY	52	52	\$1,654.23	\$1,654.23	\$1,654.22	
15	201420003030	RESIDENTIAL-TOWNHOUSE	SWASER DOUGLAS J & SUSAN M GANZER	6543 BIXBY WAY	52	52	\$1,654.23	\$1,654.23	\$1,654.22	
16	201420003040	RESIDENTIAL-TOWNHOUSE	OLSZEWSKI DOUGLAS JAMES & DEBO	6563 BIXBY WAY	52	52	\$1,654.23	\$1,654.23	\$1,654.22	
17	201420003050	RESIDENTIAL-TOWNHOUSE	KINNEY MARY C	6583 BIXBY WAY	52	52	\$1,654.23	\$1,654.23	\$1,654.22	
18	201420003060	RESIDENTIAL-TOWNHOUSE	WALDEN FRANKLIN D & MAE E	6603 BIXBY WAY	52	52	\$1,654.23	\$1,654.23	\$1,654.22	
19	201420003070	RESIDENTIAL-TOWNHOUSE	SELBITSCHKA EUGENE T & DEBRA J SELBITSCHKA	6623 BIXBY WAY	52	52	\$1,654.23	\$1,654.23	\$1,654.22	
20	201420003080	RESIDENTIAL-TOWNHOUSE	BUCHNER FAMILY TST	6643 BIXBY WAY	52	52	\$1,654.23	\$1,654.23	\$1,654.22	
21	201420003090	RESIDENTIAL-TOWNHOUSE	MERCHANT DANIEL C & SUSAN M	6653 BIXBY WAY	52	52	\$1,654.23	\$1,654.23	\$1,654.22	
22	201420003100	RESIDENTIAL-TOWNHOUSE	WINECKE DONNA	6673 BIXBY WAY	51	51	\$1,654.23	\$1,654.23	\$1,654.22	
23	201420003110	RESIDENTIAL-TOWNHOUSE	LEHMAN STEVE R & NANCY E	2464 BIXBY WAY	35	35	\$1,654.23	\$1,654.23	\$1,654.22	
24	201420003120	RESIDENTIAL-TOWNHOUSE	CALLSTROM CURTIS & JEAN E	2470 BIXBY WAY	23	23	\$1,654.23	\$1,654.23	\$1,654.22	
25	201420003130	RESIDENTIAL-TOWNHOUSE	CLOUD DUANE M	2476 BIXBY WAY	24	24	\$1,654.23	\$1,654.23	\$1,654.22	
26	201420003140	RESIDENTIAL-TOWNHOUSE	JAMESON EDWARD M & BARBARA A	2482 BIXBY WAY	31	31	\$1,654.23	\$1,654.23	\$1,654.22	
TOTALS:					1448	1448	\$43,010	\$43,010.00	\$43,009.72	

IGH STREET & STORM ASSESSMENT (M&O)	
TOTAL STREET & STORM COST:	\$53,762.50
ASSESSABLE STREET & STORM COST (80%):	\$43,010.00
TOTAL IGH PROJECT ADJUSTED FRONT FOOTAGE (LF):	1,448
NET ASSESSMENT RATE PER LF (ASSESABLE STREET & STORM COST / ADJUSTED FRONT FOOTAGE):	\$29.70
AMOUNT ASSESSED (NON-RESIDENTIAL):	\$0.00
AMOUNT ASSESSED (RESIDENTIAL) (ASSESABLE STREET & STORM COST - NON-RESIDENTIAL AMOUNT ASSESSED):	\$43,010.00
# OF RESIDENTIAL UNITS:	26
ASSESSMENT RATE PER UNIT (RESIDENTIAL RATE):	\$1,654.23
TOTAL PROPOSED ASSESSMENT AFTER CAPS:	\$43,009.72



Request for Council Action

SUBJECT: Certification of Delinquent Utility Balances

MEETING DATE: October 14, 2024

ITEM TYPE: Public Hearing

CONTACT: Amy Hove, Finance Director, 651.450.2521

ACTION REQUESTED

The Council is asked to adopt the attached Resolution, approving the current list of certified delinquent utility account balances and authorizing staff to submit any balances that remain delinquent at the end of November to Dakota County for collection on next year's property tax bills.

BACKGROUND

On a monthly basis, utility accounts with unpaid balances are charged a 3.33% late fee and sent a late notice. Those accounts that remain unpaid as of August 20 each year receive a delinquent notice that warns of pending certification. The delinquent notice includes the following: balance due, deadline to pay before Council certification, payment options, and information on the additional 8% administrative handling fee plus 8% interest added when certified and reported to the County Auditor. In September, at total of 1,035 delinquent notices were mailed out.

Active Accounts with Delinquent Balances

As of October 8, there remain 524 delinquent accounts with balances totaling \$256,176.18. The average delinquent balance is \$489. Staff recommends certification of these balances based on the previous collection steps taken. If the list was submitted today, the total balance on active accounts, with fees and interest included, would be \$297,420.

Previous years' amounts are listed below (as a reminder, the City did not certify balances in 2020 and 2021 due to the COVID pandemic):

Year	Total Delinquent Balances	Fees & Interest	Balances Plus Fees & Interest
2018	\$155,604	\$25,052	\$180,656
2019	\$166,043	\$26,567	\$192,610
2022	\$307,904	\$49,265	\$357,169
2023	\$199,512	\$31,922	\$231,434
2024	\$256,176	\$41,244	\$297,420

Additionally, there are 66 accounts with a delinquent balance of less than \$50. These account balances total \$437.58. Staff recommends *not* certifying these accounts as the accounts will remain active, will still receive monthly/quarterly bills and will continue to accrue late fees on any balances owing. This is consistent with past practice of not certifying delinquent balances of less than \$50.

Inactive Accounts with Delinquent Balances

A delinquent balance on an inactive account results from a property changing hands and the former owner not paying off their final bill. Because the City's current residential billing cycle covers a three-month span, it is rare for properties to change hands at the exact start of a new billing cycle. What this means is that staff provide an estimated bill that is used at closing. When the new owner calls for service and public works picks up that final reading, the final read is processed within the system and billed out to the former owner. When an inactive account has a delinquent balance, both the former property owner and new property owner receive notification of pending certification.

There are 9 inactive accounts within the utility billing system totaling \$2,533.80 in delinquent balances; if fees and interest were added, this figure would be \$2,944. Staff recommend certifying these balances.

Administrative Fees & Interest Charges

There is a gap in time between when the Council approves the certification list and when staff submits the final list to Dakota County in late November. During this time, staff will continue to accept payments and remove accounts and balances from the list so that the final certification to Dakota County is accurate. However, because of the various timing issues that occur during this process, staff recommend applying the administrative fees and interest as follows:

- 8% Administrative Fee - added to any unpaid balances after Council approves certification
- 8% Interest Charge - added to any unpaid balances when the final certification is sent to Dakota County (approximately 30 days after Council approval)

FISCAL IMPACT

The certification of delinquent balances will ensure the City's utility funds collect the revenues for services already provided in a reasonable timeframe.

RECOMMENDATION

Staff recommends adoption of the attached Resolution, approving the current list of certified delinquent balances and authorizing staff to submit any balances that remain delinquent after 30 days to Dakota County for collection on next year's property tax bills.

ATTACHMENTS

1. Resolution Certifying Delinquent Utility Balances
2. Active Collection Register
3. Inactive Collection Register

**CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA**

RESOLUTION NO. 2024-242

**RESOLUTION CERTIFYING UNPAID DELINQUENT WATER, SEWER, AND STORM
WATER CHARGES TO THE COUNTY AUDITOR TO BE COLLECTED WITH OTHER
TAXES ON SAID PROPERTY**

WHEREAS, City of Inver Grove Heights ordinances establish rules, rates and charges for water, sewer, and storm water services, and

WHEREAS, Minnesota Statutes 444.075 provides that all unpaid water, sewer, and storm water charges may be certified to the County Auditor for collection with taxes against property, and

WHEREAS, the City's Administrative Code Chapter XVIII, Section 3, subdivision B states that delinquent utility bills shall be certified to the County each year, along with adding an 8% administrative charge and 8% interest on unpaid balances; and

WHEREAS, each delinquent utility bill has been sent a delinquent notice and intent to certify, and

WHEREAS, an assessment roll will be prepared specifying the amount to be certified against each specific property.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF INVER GROVE HEIGHTS: that

1. There is hereby determined to be \$256,176.18 in unpaid delinquent utility balances on active accounts.
2. There is hereby determined to be \$2,533.80 in unpaid delinquent utility balances on inactive accounts.
3. That such amounts are hereby certified to the County Auditor for collection with other taxes on said properties.
4. That a copy of this resolution, together with the final assessment rolls, be sent to the Dakota County Auditor.

Adopted this 14th day of October 2024 by the City Council of Inver Grove Heights, MN.

ATTEST:

Brenda Dietrich, Mayor

Rebecca Kiernan, City Clerk

Active Accounts - Recommended to Certify

Account	Service Address	Parcel ID	Delinquent Balance	Balance Plus Fee and Interest (rounded)
04-09463-03	6840 DIXIE AVE E	20-00200-51-020	294.89	343.00
04-09863-02	3095 65TH ST E	20-00300-28-020	57.23	67.00
05-20167-00	6666 CAHILL AVE	20-00300-51-011	70.13	82.00
02-00679-07	6825 CAHILL AVE	20-00300-53-030	110.53	129.00
02-07069-06	1820 60TH ST E	20-00500-02-010	600.74	697.00
05-19503-02	1401 70TH ST E	20-00500-53-010	150.79	175.00
05-19511-02	6545 BABCOCK TRL E	20-00500-77-020	150.79	175.00
03-05127-06	7076 BLAINE AVE	20-00900-02-051	211.41	246.00
03-11909-01	3090 UPPER 76TH ST E	20-01000-51-060	819.16	951.00
01-19696-03	7007 RIVER RD	20-01100-29-010	63.21	74.00
01-07295-04	7852 CONCORD BLVD E	20-01100-54-020	229.85	267.00
05-17289-01	20-01100-55-041	20-01100-55-041	191.07	222.00
05-20077-02	8365 COURTHOUSE BLVD E	20-01700-07-020	101.31	118.00
05-16447-01	8665 ALVERNO AVE	20-01800-51-012	135.73	158.00
03-00865-01	8820 BACARDI AVE E	20-01800-58-131	807.70	937.00
03-00517-02	8830 BACARDI AVE E	20-01800-58-181	1,546.78	1,795.00
05-17931-01	9207 RICH VALLEY BLVD	20-01900-04-011	150.79	175.00
05-16639-01	9140 RICH VALLEY BLVD	20-01900-27-012	91.35	106.00
05-16649-02	9120 RICH VALLEY BLVD	20-01900-27-016	156.40	182.00
05-16657-02	9161 RICH VALLEY BLVD	20-01900-28-020	90.97	106.00
05-16185-02	20-01900-52-012	20-01900-52-012	99.16	116.00
05-16219-02	1780 93RD CIR	20-02000-03-014	145.83	170.00
05-16631-02	1242 90TH ST E	20-02000-26-031	88.15	103.00
05-16703-04	9063 ROBERT TRL S	20-02000-29-020	79.54	93.00
05-16331-02	9967 ANAWANDA PATH E	20-02000-55-030	63.55	74.00
05-18097-01	9169 COURTHOUSE BOULEVAR	20-02100-04-020	95.56	111.00
05-18175-02	9865 BRENT AVE S	20-02100-78-070	162.21	189.00
05-17601-02	9276 INVER GROVE TRL	20-02200-08-020	135.73	158.00
05-17749-01	9091 INVER GROVE TRL	20-02300-28-021	143.55	167.00
05-17791-01	20-02700-02-011	20-02700-02-011	241.45	281.00
05-17773-01	3995 102ND ST E	20-02700-02-020	102.95	120.00
05-17805-01	3995 102ND ST E	20-02700-02-030	95.74	112.00
04-16103-04	10498 COURTHOUSE BLVD	20-02700-27-050	117.51	137.00
05-18207-02	10045 COURTHOUSE BLVD E	20-02700-28-010	150.79	175.00
05-18289-02	3111 105TH ST E	20-02700-31-010	150.89	176.00
05-18421-02	10020 BARNES TRL	20-02800-05-100	129.94	151.00
03-02197-08	4501 AUDREY AVE E	20-02910-75-020	771.70	896.00
05-18779-01	10873 AKRON AVE E	20-03000-75-012	150.79	175.00
05-18677-01	11618 AKRON AVE S	20-03200-50-016	148.63	173.00
05-21468-00	11794 AKRON AVE E	20-03200-52-060	150.79	175.00
03-00137-02	5373 BABCOCK TR E	20-03210-07-010	125.62	146.00
03-01867-02	5744 BABCOCK TR E	20-03210-76-010	943.62	1,095.00
03-01899-03	5641 BABCOCK TR E	20-03210-78-060	1,800.48	2,089.00
03-01945-03	5821 BABCOCK TR E	20-03210-79-010	91.67	107.00
02-07229-01	5952 BACON AVE E	20-03310-52-030	1,581.17	1,835.00
05-51255-01	5871 CAHILL AVE G	20-03410-51-020	97.74	114.00
02-00625-02	5871 CAHILL AVE	20-03410-52-021	522.87	607.00
03-00267-04	3880 75TH ST E	20-11420-02-060	225.74	262.00
03-00225-06	3786 75TH ST E	20-11420-03-030	770.20	894.00
03-00201-05	3770 75TH ST E	20-11420-03-050	967.30	1,123.00
03-00173-06	3680 75TH ST E	20-11420-04-010	221.47	257.00
03-03765-08	7690 DAWN AVE E	20-11700-01-010	886.26	1,029.00
02-14159-03	9285 CHENEY TR	20-11775-02-120	677.20	786.00
02-14245-05	9010 CARTER PATH	20-11800-01-060	1,066.49	1,238.00
02-14107-02	8947 CARTER CT	20-11800-02-110	1,174.91	1,363.00
02-10825-05	8648 CALLAHAN TR	20-11851-01-040	1,338.96	1,554.00
05-20197-01	20-11865-00-010	20-11865-00-010	70.02	82.00
04-16113-01	9058 BUCHANAN TR	20-11866-01-020	232.14	270.00
01-16183-01	7580 ALPINE CT	20-12052-04-010	294.55	342.00
01-16251-02	7631 ADDISEN CT	20-12054-01-090	158.29	184.00
01-16303-04	7686 ADDISEN PATH	20-12056-02-050	1,621.08	1,881.00

Active Accounts - Recommended to Certify

Account	Service Address	Parcel ID	Delinquent Balance	Balance Plus Fee and Interest (rounded)
01-16317-03	7642 ADDISEN PATH	20-12057-04-090	546.33	634.00
01-16409-01	1528 76TH ST W	20-12058-02-060	220.92	257.00
02-12281-05	8727 CONCORD CT	20-12100-01-140	82.86	97.00
02-10309-01	8271 DAWSON CT E	20-12350-02-030	728.84	846.00
01-09051-05	6511 CRAIG AVE E	20-13250-01-010	333.10	387.00
01-09073-02	6559 CRAIG AVE E	20-13250-01-060	927.21	1,076.00
01-09107-01	3864 67TH ST E	20-13250-01-180	514.78	598.00
01-09097-06	3914 67TH ST E	20-13250-01-240	168.81	196.00
01-09121-01	3879 67TH ST E	20-13250-02-140	931.14	1,081.00
01-10029-03	6883 CRAIG CT	20-13251-01-010	251.31	292.00
01-09239-01	6863 CRAIG CT	20-13251-01-021	386.88	449.00
01-10467-06	6805 CRAIG CT E	20-13251-01-052	730.84	848.00
01-12191-01	6812 CRAIG CT E	20-13251-01-070	267.46	311.00
01-09227-23	6830 CRAIG CT	20-13251-01-080	255.30	297.00
01-09223-12	6832 CRAIG CT E	20-13251-01-080	395.43	459.00
05-17917-02	1745 93RD CIR E	20-14000-01-042	93.50	109.00
02-13079-03	8530 COLLEGE TR	20-14062-01-120	92.34	108.00
02-13689-05	8518 COLLEGE TR	20-14062-01-140	184.44	214.00
02-11649-04	8615 BIRCH BLVD	20-14080-02-060	1,179.08	1,368.00
01-16579-02	6952 ARCHER TR	20-14163-04-020	57.16	67.00
01-16551-02	6976 ARCHER TR	20-14163-06-020	393.49	457.00
01-16519-03	6983 ARCHER TR	20-14163-09-030	136.32	159.00
01-16721-03	6963 ARCHER PL	20-14164-04-020	78.54	92.00
01-16797-04	6905 ARCHER CT	20-14164-07-050	560.05	650.00
01-18167-02	6512 ARCTIC WAY	20-14167-01-040	853.61	991.00
01-17025-01	6589 ALVERNO LN	20-14167-02-150	280.78	326.00
01-16617-01	6896 ALVERNO CT	20-14167-03-160	1,586.67	1,841.00
01-16663-02	6828 ALVERNO CT	20-14167-03-220	1,127.39	1,308.00
01-16719-02	6580 ALVERNO LN	20-14167-05-080	53.12	62.00
05-21572-00	20-14168-00-050	20-14168-00-050	181.38	211.00
01-17047-01	7222 ARCHER TR	20-14168-02-150	157.21	183.00
01-16839-01	7284 ARCHER TR	20-14168-02-260	252.82	294.00
01-16565-03	7263 ARCHER TR	20-14168-04-020	277.21	322.00
01-18191-01	7189 ARKANSAS AVE	20-14170-02-090	163.67	190.00
01-18153-00	1661 73RD ST W	20-14170-02-130	184.33	214.00
01-18097-02	7188 ARKANSAS AVE	20-14170-03-040	166.97	194.00
05-18463-02	10136 BARNES TRL	20-14300-05-010	156.49	182.00
01-15013-03	5474 BRYCE AVE	20-15095-01-630	340.69	396.00
05-17343-01	8920 89TH CT	20-15200-01-120	78.09	91.00
03-16549-02	6848 AQUA TR	20-15800-02-210	71.93	84.00
03-16291-01	6947 ABRA LN	20-15800-02-330	474.55	551.00
03-16361-03	6967 ANGELA TR	20-15800-03-080	196.08	228.00
03-16498-02	6917 ANGELA TR	20-15800-03-210	185.75	216.00
03-16581-01	6918 ANGELA TR	20-15800-03-630	181.25	211.00
03-16664-01	6754 ALLEN CT	20-15801-01-010	55.68	65.00
03-16644-01	6761 ALLEN CT	20-15801-01-100	358.94	417.00
03-04017-05	2584 76TH ST E	20-16400-01-040	675.22	784.00
03-04027-05	2630 76TH ST E	20-16400-02-020	508.50	590.00
03-04183-01	7616 BORMAN WAY E	20-16400-02-080	103.54	121.00
03-04141-04	7648 BORMAN WAY E	20-16400-02-200	80.96	94.00
02-10069-01	2075 67TH ST E	20-17100-01-100	538.17	625.00
02-07533-02	2150 68TH ST E	20-17100-05-070	977.71	1,135.00
05-19089-01	1638 112TH CT W	20-17800-01-100	73.80	86.00
03-03951-04	2525 76TH ST E #104	20-18210-02-104	57.72	67.00
03-03867-01	2600 75TH ST E #111	20-18210-02-111	250.13	291.00
03-03885-04	2600 75TH ST E #115	20-18210-02-115	173.56	202.00
03-03917-01	2600 75TH ST E #214	20-18210-02-214	839.08	974.00
03-03927-01	2600 75TH ST E #216	20-18210-02-216	251.49	292.00
03-03937-05	2600 75TH ST E #218	20-18210-02-218	408.03	474.00
03-04047-02	7675 BOWMAN CT	20-18211-03-120	320.37	372.00
03-02821-05	7327 BORMAN AVE E	20-18212-05-030	1,307.68	1,517.00

Active Accounts - Recommended to Certify

Account	Service Address	Parcel ID	Delinquent Balance	Balance Plus Fee and Interest (rounded)
03-03797-01	7555 BORMAN CT E	20-18212-07-020	384.74	447.00
03-03815-03	7570 BORMAN CT E	20-18212-07-050	1,703.52	1,977.00
01-15909-04	8087 DARCY LN	20-18291-01-100	729.74	847.00
01-15973-05	8080 DANA PATH	20-18291-01-160	337.28	392.00
01-15407-04	8125 DARCY LN	20-18291-01-200	254.37	296.00
01-15207-06	8167 DARCY LN	20-18291-01-260	419.56	487.00
01-14977-04	8197 DARCY LN	20-18291-01-420	232.77	271.00
01-15267-01	8199 DARCY LN	20-18291-01-430	384.21	446.00
01-14861-01	8225 DARCY LN	20-18291-01-470	547.09	635.00
01-14837-06	8233 DARCY LN	20-18291-01-540	91.60	107.00
01-14631-04	8247 DARCY LN	20-18291-01-550	87.42	102.00
01-14831-04	8251 DARCY LN	20-18291-01-570	120.93	141.00
01-16437-03	8685 COLE CT	20-18299-01-040	469.94	546.00
03-11795-10	9357 ESK LN	20-18404-04-020	312.40	363.00
03-11851-05	9301 AVALON CT	20-18404-05-050	1,686.67	1,957.00
03-12927-05	9202 TYNE LN	20-18404-06-020	131.97	154.00
03-11933-04	9242 TYNE LN	20-18404-06-050	71.04	83.00
03-12343-05	9395 ESK LN	20-18405-02-020	141.41	165.00
01-16567-01	6458 CRAIG AVE	20-18600-01-050	229.81	267.00
01-16537-01	6460 CRAIG AVE	20-18600-01-060	586.40	681.00
01-16755-00	6436 CROSBY AVE E	20-18600-03-040	315.25	366.00
01-01723-05	8053 CLEADIS AVE E	20-18850-01-030	890.73	1,034.00
01-01149-01	8119 CLEADIS AVE E	20-18850-01-070	114.84	134.00
01-02025-01	8040 CLOMAN AVE E	20-18850-03-020	448.93	521.00
01-04173-05	8213 CLOMAN AVE E	20-18851-02-020	264.54	307.00
01-04093-08	8310 CLEADIS AVE E	20-18851-02-140	448.73	521.00
01-04149-01	8240 CLOMAN AVE E	20-18851-03-040	845.78	982.00
01-04145-01	8268 CLOMAN AVE E	20-18851-03-050	503.39	584.00
01-04059-02	8325 CLEADIS AVE E	20-18851-05-020	577.70	671.00
03-14851-01	7140 BLAINE AVE E	20-19400-01-030	1,426.67	1,655.00
02-00565-02	6280 CARLEDA WAY E	20-19500-03-020	319.09	371.00
02-00567-01	6300 CARLEDA WAY E	20-19500-03-030	1,377.88	1,599.00
01-18047-01	1877 80TH ST E	20-19600-00-110	728.81	846.00
01-14987-01	6072 CROMWELL CT	20-19800-01-100	1,662.33	1,929.00
03-02631-07	2685 79TH CT E	20-20100-01-020	534.00	620.00
03-02633-02	2705 79TH CT E	20-20100-01-030	147.18	171.00
03-00877-01	1916 55TH	20-22100-01-120	294.21	342.00
03-00867-01	1914 55TH	20-22100-01-130	1,245.77	1,446.00
05-16177-02	9765 ARKANSAS PATH	20-22450-01-011	74.40	87.00
05-20271-01	20-23900-00-130	20-23900-00-130	114.09	133.00
05-20269-01	20-23900-00-140	20-23900-00-140	58.23	68.00
05-18105-04	9405 BUCKLEY CT E	20-25800-01-040	92.92	108.00
05-20603-02	9969 ADAM AVE	20-27100-01-050	116.86	136.00
03-00745-03	4815 BOYD AVE E	20-29200-01-050	576.44	669.00
05-16437-01	8225 ARGENTA TRL	20-29300-00-020	182.01	212.00
03-13935-04	7138 BESTER CT	20-29500-01-050	409.62	476.00
03-13861-04	7141 BESTER CT	20-29500-01-060	278.36	323.00
01-04589-10	7930 BARBARA AVE E	20-30250-01-070	1,235.78	1,434.00
01-04549-03	7948 BARBARA AVE E	20-30250-01-131	155.00	180.00
01-04523-01	7950 BARBARA AVE E	20-30250-01-141	420.91	489.00
03-16183-03	5039 BRENT AVE E	20-30300-01-050	260.27	302.00
03-03083-05	4590 AUGUST WAY E	20-31100-01-080	927.88	1,077.00
03-03029-03	4502 AUGUST WAY E	20-31100-01-140	578.09	671.00
03-03003-04	4507 AUGUST WAY E	20-31100-02-020	314.27	365.00
03-02963-04	4545 AUGUST WAY E	20-31100-02-050	99.69	116.00
03-02423-01	4585 AUGUST WAY E	20-31100-02-080	369.05	429.00
03-02253-01	4550 AUDREY AVE E	20-31100-02-150	1,166.02	1,353.00
03-02227-05	4520 AUDREY AVE E	20-31100-02-180	284.54	331.00
03-02319-06	1805 46TH ST E	20-31100-03-020	128.33	149.00
03-02205-01	4511 AUDREY AVE E	20-31100-03-070	96.77	113.00
03-03679-03	4580 BACON CT E	20-31101-02-010	158.31	184.00

Active Accounts - Recommended to Certify

Account	Service Address	Parcel ID	Delinquent Balance	Balance Plus Fee and Interest (rounded)
03-03661-03	4550 BACON AVE E	20-31101-02-020	247.96	288.00
03-03649-01	2020 UPPER 45TH ST E	20-31101-02-030	868.17	1,008.00
03-03307-09	4620 BARBARA AVE E	20-31101-03-070	102.40	119.00
02-13949-01	9078 CHENEY TR	20-32700-01-010	710.47	825.00
02-14071-04	9238 CHENEY TR	20-32700-01-180	338.00	393.00
03-16608-01	7228 AUBURN LN	20-32800-02-030	197.33	229.00
02-13325-01	6936 DELAROSA CT	20-35500-01-020	1,466.07	1,701.00
01-05379-01	7761 BARBARA AVE E	20-36400-01-190	346.75	403.00
01-04357-02	7801 BANKS PATH	20-36400-01-300	204.79	238.00
01-04845-09	7541 BANNING WAY	20-36400-04-062	242.61	282.00
04-09701-01	7654 BARBARA CT E	20-36400-04-180	196.14	228.00
04-09705-01	7740 BARBARA AVE E	20-36400-04-270	2,357.45	2,735.00
01-04667-01	2165 78TH CT E	20-36400-04-301	111.06	129.00
01-04655-01	2169 78TH CT E	20-36400-04-302	275.96	321.00
01-05411-01	2080 78TH ST E	20-36400-05-140	251.33	292.00
01-08867-01	6450 DAWN WAY E	20-36500-10-092	644.65	748.00
01-08929-06	6310 DAWN WAY E	20-36500-11-021	917.78	1,065.00
01-08907-02	6374 DAWN WAY E	20-36500-11-110	865.40	1,004.00
01-08903-07	6384 DAWN WAY E	20-36500-11-143	116.40	136.00
01-08751-01	6367 DAWN AVE E	20-36500-11-201	853.45	991.00
01-08735-05	6317 DAWN AVE E	20-36500-11-270	1,020.16	1,184.00
01-08727-01	6301 DAWN AVE E	20-36500-11-301	841.80	977.00
05-20179-01	20-36500-14-200	20-36500-14-200	58.23	68.00
01-08553-05	6415 DELANEY AVE E	20-36500-16-300	449.12	521.00
01-08561-04	6472 DELANEY AVE E	20-36500-17-070	666.55	774.00
01-07609-06	6259 CONCORD BLVD E	20-36500-20-130	360.25	418.00
05-20403-02	20-36500-21-120	20-36500-21-120	109.32	127.00
04-09359-10	6370 CONCORD BLVD E	20-36500-22-030	203.62	237.00
01-08529-01	6476 DELILAH AVE E	20-36500-23-110	792.51	920.00
04-09367-03	6526 DOFFING AVE E	20-36500-34-030	742.57	862.00
05-17113-03	20-36500-34-220	20-36500-34-220	123.78	144.00
03-04595-04	3864 78TH ST E	20-36520-01-080	856.53	994.00
03-05235-01	7892 CONROY WAY E	20-36521-02-080	100.17	117.00
03-05207-02	7910 CONROY WAY E	20-36521-02-110	853.82	991.00
03-05455-01	7935 COOPER AVE E	20-36521-02-130	1,142.13	1,325.00
03-05409-01	7899 COOPER AVE E	20-36521-02-160	562.20	653.00
03-05351-03	7827 COOPER AVE E	20-36521-02-200	606.59	704.00
05-21351-01	20-36550-03-201	20-36550-03-201	104.26	121.00
01-08567-03	6513 DELANEY AVE E	20-36550-04-030	185.84	216.00
05-21352-01	20-36550-04-110	20-36550-04-110	104.26	121.00
01-08631-01	6558 DAWN AVE E	20-36550-04-140	883.24	1,025.00
05-21354-01	20-36550-04-191	20-36550-04-191	104.26	121.00
01-08849-03	3950 65TH ST E	20-36550-05-041	7,020.31	8,144.00
01-08807-04	6585 DAWN AVE E	20-36550-05-230	862.98	1,002.00
01-08971-03	6535 DAWN WAY E	20-36550-06-111	573.83	666.00
01-09013-03	6570 CROSBY AVE E	20-36550-06-241	171.12	199.00
01-09047-03	6520 CRAIG AVE E	20-36550-07-100	651.60	756.00
01-09035-02	6565 CROSBY AVE E	20-36550-07-210	157.72	183.00
05-18499-01	1805 102ND ST	20-36604-02-010	75.36	88.00
05-18625-01	1040 102ND ST E	20-36605-01-010	77.51	90.00
05-18613-02	10227 RICH VALLEY BLVD	20-36607-03-010	84.29	98.00
05-21062-00	10394 ANDREA TRL	20-36608-01-160	277.83	323.00
04-17025-01	8450 COURTHOUSE BLVD	20-36721-01-010	1,278.53	1,484.00
01-10247-02	7260 BANCROFT WAY E	20-36800-01-080	195.71	228.00
01-10379-03	7299 BANCROFT WAY E	20-36800-02-110	404.18	469.00
01-10225-01	7346 BANCROFT WAY E	20-36800-03-090	1,212.24	1,407.00
01-10283-04	7354 BARBARA AVE E	20-36800-05-010	190.32	221.00
01-00789-03	3110 81ST ST E	20-37950-01-070	205.88	239.00
03-00833-01	4849 BRENT AVE	20-38700-00-120	517.43	601.00
03-00767-02	2830 47TH ST E	20-38700-00-304	556.05	646.00
05-21070-01	20-39900-00-050	20-39900-00-050	105.35	123.00

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Account	Service Address	Parcel ID	Delinquent Balance	Balance Plus Fee and Interest (rounded)
03-02881-09	7445 BORMAN AVE E	20-40600-01-080	200.00	232.00
03-01779-03	2422 53RD ST E	20-41300-03-040	257.33	299.00
02-06973-06	5850 ASHER AVE E	20-42501-00-010	395.37	459.00
02-03849-01	6150 BRENT AVE E	20-43100-02-030	569.41	661.00
02-02933-02	6045 BOWMAN AVE E	20-43101-01-080	1,977.15	2,294.00
02-03965-03	6060 BOWMAN AVE E	20-43101-02-090	282.09	328.00
02-03969-01	6070 BOWMAN AVE E	20-43101-02-100	1,058.17	1,228.00
01-08007-01	6775 CONCORD BLVD E	20-43250-00-190	668.94	776.00
01-07325-08	113 LINDEN ST	20-43251-01-050	1,002.15	1,163.00
01-07431-08	5942 CONCORD BLVD E	20-43251-04-110	426.54	495.00
01-07401-08	5960 CONCORD BLVD E	20-43251-04-170	260.84	303.00
05-21088-02	VACANT 20-43251-04-210	20-43251-04-210	183.27	213.00
01-15447-06	4527 BLOOMBERG LN	20-44001-03-050	483.29	561.00
01-15451-03	4545 BLOOMBERG LN	20-44001-03-070	246.33	286.00
01-15603-01	4680 BLOOMBERG LN	20-44002-01-010	402.56	467.00
02-08171-06	3528 CLOMAN	20-44352-09-020	138.89	162.00
02-08299-04	3534 CLOMAN	20-44352-11-040	464.86	540.00
02-08261-06	3548 CLOMAN	20-44352-12-040	443.77	515.00
02-08005-07	3511 67TH ST E	20-44352-16-020	426.46	495.00
05-18447-01	10630 BORMAN AVE	20-44500-01-020	123.73	144.00
05-16921-02	4 HIGH RD	20-47300-00-083	96.68	113.00
02-12969-01	5889 BURKE TR	20-47375-02-030	339.70	395.00
05-16359-01	9550 ARNOLD AVE	20-47400-03-060	134.39	156.00
05-21098-00	2469 96TH ST E	20-47520-02-052	228.44	265.00
05-21182-01	9893 BAXTER TRL	20-47521-02-040	217.14	252.00
05-21259-00	9005 ALGER CT	20-47575-04-070	92.91	108.00
05-21260-00	9033 ALGER CT	20-47575-05-010	99.84	116.00
05-20155-02	8971 ARALIA CT	20-48100-03-030	98.33	115.00
05-20103-03	8799 AUDUBON	20-48101-01-020	109.13	127.00
02-06901-01	6095 BABCOCK TR E	20-48275-01-010	467.04	542.00
03-05389-05	7075 BLAKE PATH	20-48625-01-030	1,256.36	1,458.00
03-05475-02	7133 BLAKE PATH	20-48625-01-090	163.64	190.00
03-05693-01	2725 71ST ST E	20-48625-04-030	243.48	283.00
03-00909-01	4871 BRYCE AVE E	20-50350-02-100	732.66	850.00
05-20193-01	20-51000-00-040	20-51000-00-040	58.23	68.00
01-01721-01	8116 CARMEN AVE E	20-51000-02-080	753.69	875.00
01-01005-02	8110 CASPER E	20-51001-01-080	122.99	143.00
01-02953-01	7610 BLACKWELL CT N	20-53500-01-070	174.64	203.00
01-03241-02	2360 78TH ST E	20-53500-01-280	627.76	729.00
01-03637-04	2461 79TH ST E	20-53530-01-061	490.73	570.00
03-00317-04	3960 75TH ST E	20-53650-01-040	154.67	180.00
03-02395-01	3882 CRAIG WAY E	20-53651-01-020	399.73	464.00
03-02981-01	3858 CRAIG WAY E	20-53651-02-010	451.61	524.00
03-00243-04	3866 CRAIG WAY E	20-53651-02-030	578.14	671.00
03-03033-01	3830 CRAIG WAY E	20-53651-03-010	794.22	922.00
03-03047-01	3834 CRAIG WAY E	20-53651-03-020	100.54	117.00
03-01031-04	3870 UPPER 75TH ST E	20-53651-04-030	513.54	596.00
03-01217-01	3950 UPPER 75TH ST E	20-53651-06-030	779.29	904.00
03-02207-05	3970 76TH WAY E	20-53651-10-030	405.00	470.00
03-02355-03	3904 76TH WAY E	20-53651-12-020	100.00	116.00
03-02323-09	3920 76TH WAY E	20-53651-12-060	249.58	290.00
03-02359-03	3833 CONROY TR E	20-53652-03-050	495.06	575.00
03-02073-01	3897 CONROY TR E	20-53652-06-010	497.28	577.00
03-02129-02	3877 CONROY TR E	20-53652-06-060	502.34	583.00
03-01957-01	3822 CONROY TR E	20-53652-08-020	653.31	758.00
03-01859-07	3808 CONROY TR E	20-53652-09-020	970.91	1,127.00
03-01803-06	3800 CONROY TR E	20-53652-10-020	488.56	567.00
03-00721-09	3704 CONROY TR E	20-53652-18-040	745.97	866.00
03-00335-07	3686 CONROY CT E	20-53652-20-030	473.79	550.00
03-00283-07	3676 CONROY CT E	20-53652-21-020	95.10	111.00
03-03017-01	3781 CONROY TR E	20-53652-25-020	355.97	413.00

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03-03001-01	3783 CONROY TR E	20-53652-25-030	292.82	340.00
03-02961-01	3789 CONROY TR E	20-53652-26-020	199.60	232.00
03-01739-01	3790 CONROY TR E	20-53652-27-040	563.19	654.00
03-01087-09	3768 CONROY TR E	20-53652-28-030	577.91	671.00
03-01075-11	3766 CONROY TR E	20-53652-28-040	210.90	245.00
03-01025-03	3758 CONROY TR E	20-53652-29-040	135.16	157.00
03-00777-03	3720 CONROY TR E	20-53652-30-030	817.55	949.00
01-01213-02	2433 72ND CT E	20-53700-01-040	158.04	184.00
01-02335-09	7378 BLAINE CT E	20-53700-02-200	259.13	301.00
01-01965-04	2334 75TH ST E	20-53700-04-113	56.61	66.00
02-10941-07	8474 BRADFORD CT	20-54870-01-210	925.25	1,074.00
02-11281-06	8444 BREWSTER AVE	20-54890-05-020	172.82	201.00
05-21511-00	1735 86TH CT E	20-55050-02-030	100.71	117.00
03-16693-00	1594 76TH ST W	20-56900-02-100	484.60	563.00
03-16599-01	1572 76TH ST W	20-56900-02-190	891.90	1,035.00
01-01845-03	7225 BESTER AVE E	20-57500-01-080	213.09	248.00
05-21235-01	11290 ALAMEDA AVE	20-57680-02-060	308.65	359.00
01-13601-02	11545 ALAMEDA AVE	20-57681-01-080	54.91	64.00
05-16627-02	1244 90TH ST E	20-62500-01-010	76.34	89.00
05-16629-02	1246 90TH ST E	20-62500-01-020	129.13	150.00
04-09687-01	3840 67TH ST E	20-63251-01-050	590.96	686.00
01-06445-08	7878 DEMPSEY WAY E	20-64075-01-020	251.42	292.00
01-06765-07	8011 DELANO WAY E	20-64075-01-270	861.14	999.00
01-07203-01	8018 DELANO WAY E	20-64075-02-190	206.52	240.00
03-05771-01	7835 COREY PATH E	20-64200-05-150	742.40	862.00
03-05725-05	7829 COREY PATH E	20-64200-05-180	388.16	451.00
03-02259-01	1425 56TH ST E	20-64450-01-060	418.59	486.00
03-02177-04	5539 ANGUS AVE E	20-64450-02-070	846.98	983.00
03-16129-01	0 79TH ST E	20-64500-03-012	78.12	91.00
03-00459-01	2865 UPPER 79TH CT E	20-64501-01-010	354.99	412.00
03-01489-02	7605 BOYD AVE E	20-64502-03-010	1,354.30	1,571.00
03-01427-01	7465 BOYD AVE E	20-64504-01-050	672.60	781.00
05-17679-01	3545 94TH ST E	20-64600-01-010	75.02	88.00
05-17585-02	3700 94TH ST E	20-64600-01-060	87.85	102.00
04-09905-03	5440 ROBERT TR S	20-65900-01-060	247.32	287.00
02-07925-09	1808 63RD ST E	20-65950-01-120	209.90	244.00
02-07757-04	6375 BALLANTINE AVE E	20-65950-04-060	162.98	190.00
02-12023-01	6401 BARCLAY AVE	20-65951-01-100	516.17	599.00
02-10175-04	6482 BARCLAY AVE	20-65951-02-070	368.18	428.00
03-01091-01	5068 BRYCE AVE E	20-66200-01-240	287.61	334.00
03-01169-05	2920 51ST ST E	20-66200-02-111	138.21	161.00
01-19667-00	7873 AUSTIN WAY	20-66480-02-030	53.44	62.00
01-18300-03	7857 AUSTIN WAY	20-66480-02-060	71.38	83.00
03-00293-03	4629 BOWER PATH E	20-67100-01-110	1,099.54	1,276.00
03-16481-01	6381 APPLE CT	20-67201-01-010	873.15	1,013.00
03-16453-02	6355 APPLE CT	20-67201-01-070	860.80	999.00
03-16293-02	6339 APPLE CT	20-67201-02-010	10,878.56	12,620.00
03-16427-01	6348 APPLE CT	20-67201-02-140	300.75	349.00
01-03213-04	3265 80TH ST E #208	20-68300-02-208	343.06	398.00
01-03299-06	3275 80TH ST E #306	20-68300-02-306	75.45	88.00
01-03611-01	3295 80TH ST E #506	20-68300-02-506	104.11	121.00
01-05353-01	8321 COOPER WAY E	20-69300-03-140	1,059.76	1,230.00
01-05301-01	8355 COOPER WAY E	20-69300-06-020	192.43	224.00
01-04883-02	8436 COOPER WAY E	20-69300-07-060	102.33	119.00
01-04955-01	8476 COOPER WAY E	20-69300-09-030	144.53	168.00
02-06715-08	4043 74TH ST E	20-71150-01-050	234.00	272.00
02-06739-05	7394 DAWN AVE E	20-71150-01-080	639.03	742.00
02-05997-11	7374 DAWN AVE E	20-71150-01-100	446.77	519.00
02-06667-07	7453 CONCORD BLVD E	20-71150-02-010	689.90	801.00
03-00705-01	4059 75TH ST E	20-71150-02-150	642.47	746.00
02-06507-07	3914 74TH ST E	20-71150-03-060	293.16	341.00

Active Accounts - Recommended to Certify

Account	Service Address	Parcel ID	Delinquent Balance	Balance Plus Fee and Interest (rounded)
03-00839-02	7466 CRAIG AVE E	20-71150-03-110	504.70	586.00
03-00775-01	3971 75TH ST E	20-71150-03-180	177.82	207.00
02-06339-02	3878 73RD ST E	20-71150-05-080	934.51	1,085.00
02-05329-09	3895 UPPER 73RD ST E	20-71150-05-140	905.79	1,051.00
02-05711-08	3968 72ND ST E	20-71150-06-020	1,147.48	1,332.00
02-06033-01	7270 COOPER AVE E	20-71150-06-130	1,529.47	1,775.00
02-06045-02	3819 73RD ST E	20-71150-06-140	314.35	365.00
02-06363-04	3818 73RD ST E	20-71151-02-010	649.85	754.00
02-06483-01	3692 73RD ST E	20-71151-02-090	411.55	478.00
02-04977-06	7350 CLEVE AVE E	20-71151-02-150	870.64	1,010.00
02-05119-05	3723 UPPER 73RD ST E	20-71151-02-230	806.75	936.00
02-06829-01	3573 75TH ST E	20-71151-05-100	304.47	354.00
02-06821-01	7450 CLAYTON AVE E	20-71151-06-150	549.65	638.00
01-04875-01	7307 CLAYTON AVE E	20-71152-01-020	386.65	449.00
01-04945-03	7286 CLAY AVE E	20-71152-01-101	2,149.00	2,493.00
01-04833-01	7413 CLAYTON AVE E	20-71152-01-260	123.65	144.00
01-04843-01	7393 CLAYTON AVE E	20-71152-01-270	239.01	278.00
01-01359-02	3324 73RD ST E	20-71152-02-080	679.99	789.00
01-01335-01	7326 CARMEN AVE E	20-71152-02-130	708.50	822.00
01-01329-02	7374 CARMEN AVE E	20-71152-02-140	211.88	246.00
01-01317-03	3287 74TH ST E	20-71152-02-160	154.42	180.00
01-01305-07	3317 74TH ST E	20-71152-02-180	60.12	70.00
01-01291-01	3331 74TH ST E	20-71152-02-200	501.79	583.00
01-06043-04	3194 72ND ST E	20-71152-03-190	81.56	95.00
01-01647-01	7417 CARMEN AVE E	20-71152-04-050	351.62	408.00
01-01691-03	7462 CAHILL AVE	20-71152-04-130	888.15	1,031.00
01-01717-10	7356 CAHILL AVE	20-71152-04-180	105.06	122.00
01-01543-06	3280 74TH ST E	20-71152-05-100	142.44	166.00
01-01585-01	3337 75TH ST E	20-71152-05-200	1,453.74	1,687.00
01-04449-01	7505 CLAYTON AVE E	20-71152-06-010	238.77	277.00
01-04531-02	3364 75TH ST E	20-71152-06-070	326.23	379.00
01-04671-02	3303 76TH ST E	20-71152-06-190	672.99	781.00
01-03731-03	7583 CARMEN AVE E	20-71152-07-170	742.84	862.00
01-03723-01	7567 CARMEN AVE E	20-71152-07-180	927.21	1,076.00
02-08485-01	6971 DAWN AVE E	20-71153-01-080	1,028.34	1,193.00
02-06783-01	6920 CLOMAN AVE E	20-71153-04-020	62.76	73.00
02-08219-01	6921 CLEVE AVE E	20-71153-06-020	564.28	655.00
01-04443-02	6940 CLAY AVE E	20-71153-07-130	122.99	143.00
01-04423-05	6930 CLAY AVE E	20-71153-07-140	218.47	254.00
01-04287-04	6941 CLAY AVE E	20-71153-08-040	215.30	250.00
01-03725-03	6960 CLAUDE AVE E	20-71153-08-110	357.65	415.00
01-03279-01	6940 CASPER AVE E	20-71153-09-130	92.10	107.00
02-07599-01	3549 71ST ST E	20-71154-01-150	84.26	98.00
02-07541-02	3619 71ST ST E	20-71154-01-200	109.24	127.00
02-07509-01	3727 71ST ST E	20-71154-01-250	592.14	687.00
02-07057-01	3747 UPPER 71ST ST E	20-71154-03-011	200.53	233.00
02-07255-03	3738 UPPER 71ST ST E	20-71154-04-012	346.06	402.00
02-07237-03	3660 UPPER 71ST ST E	20-71154-04-040	375.78	436.00
02-06383-03	3518 71ST ST E	20-71154-05-020	358.92	417.00
02-06433-05	3544 71ST ST E	20-71154-05-050	56.42	66.00
02-07025-03	7167 CORLISS WAY E	20-71155-04-012	446.34	518.00
02-07001-01	7143 CORLISS WAY E	20-71155-04-070	137.06	159.00
02-07165-01	3823 72ND ST E	20-71155-05-050	677.77	787.00
02-06899-01	7172 CORLISS WAY E	20-71156-02-100	824.33	957.00
02-07347-03	3972 UPPER 71ST ST E	20-71156-03-020	766.25	889.00
02-07331-01	3918 UPPER 71ST ST E	20-71156-03-050	1,025.01	1,190.00
02-07125-03	3949 72ND ST E	20-71156-03-120	260.51	303.00
01-03767-01	3220 70TH ST E	20-71157-01-090	333.53	387.00
01-03653-07	3191 71ST ST E	20-71157-01-210	107.72	125.00
01-03633-04	3221 71ST ST E	20-71157-01-230	309.16	359.00
01-04597-01	3238 71ST ST E	20-71157-02-040	104.43	122.00

Active Accounts - Recommended to Certify

Account	Service Address	Parcel ID	Delinquent Balance	Balance Plus Fee and Interest (rounded)
01-04669-05	3140 71ST ST E	20-71157-02-100	119.69	139.00
01-04731-01	7122 CAHILL AVE	20-71157-02-130	97.71	114.00
01-04879-03	7157 CARMEN AVE E	20-71157-02-250	120.58	140.00
01-04957-01	7125 CARMEN AVE E	20-71157-02-290	385.50	448.00
01-04961-05	7117 CARMEN AVE E	20-71157-02-300	1,035.06	1,201.00
01-04385-01	7126 CARMEN AVE E	20-71157-03-070	137.77	160.00
01-04405-04	7138 CARMEN AVE E	20-71157-03-090	175.07	204.00
01-04439-02	7186 CARMEN AVE E	20-71157-03-120	635.44	738.00
01-04479-01	3249 UPPER 71ST ST E	20-71157-03-160	703.12	816.00
01-04495-02	3279 UPPER 71ST ST E	20-71157-03-180	1,085.86	1,260.00
01-05889-06	7134 CLAUDE AVE E	20-71157-05-060	102.33	119.00
01-05803-02	7169 CLAY AVE E	20-71157-05-200	968.98	1,125.00
01-05733-01	7135 CLAY CT E	20-71157-05-290	64.63	75.00
01-03751-04	7197 CLAYTON AVE E	20-71157-06-140	247.93	288.00
01-03707-04	7171 CLAYTON AVE E	20-71157-06-170	1,439.96	1,671.00
01-03693-05	7161 CLAYTON AVE E	20-71157-06-180	965.98	1,121.00
01-03467-06	3468 70TH ST E	20-71157-07-030	178.38	207.00
01-05951-01	7070 CLAUDE AVE E	20-71157-07-140	76.72	89.00
01-03523-01	3477 71ST ST E	20-71157-07-220	636.23	739.00
02-06711-01	6812 CLOMAN AVE E	20-71160-01-050	797.23	925.00
02-06671-06	3595 68TH ST E	20-71160-01-080	727.95	845.00
02-08325-01	3520 68TH ST E	20-71160-02-040	626.70	727.00
02-08273-04	3527 69TH ST E	20-71160-02-110	144.08	168.00
02-08301-01	6825 CLOMAN AVE E	20-71160-02-180	1,365.66	1,585.00
01-03395-03	3296 68TH CT E	20-71160-03-200	667.77	775.00
01-03373-03	3274 68TH CT E	20-71160-03-230	84.31	98.00
01-10131-04	6810 CARMEN AVE E	20-71160-03-270	114.31	133.00
01-04723-01	6840 CARMEN AVE E	20-71160-03-280	1,567.35	1,819.00
01-02715-03	6829 CLAYTON AVE E	20-71160-03-470	368.03	427.00
01-02875-05	6805 CAIN AVE E	20-71160-05-130	194.09	226.00
01-04917-02	6931 CARLEDA AVE E	20-71160-06-080	860.88	999.00
01-05199-01	6941 CARMEN CT E	20-71160-07-200	136.18	158.00
01-02939-01	6868 CAIN AVE E	20-71160-09-080	188.84	220.00
01-03123-03	6895 CARLEDA AVE E	20-71160-09-110	85.63	100.00
01-03095-01	6889 CARLEDA AVE E	20-71160-09-120	791.03	918.00
02-07653-01	6968 DELANEY AVE E	20-71161-01-040	890.55	1,034.00
02-07761-01	4046 UPPER 69TH ST E	20-71161-03-020	148.56	173.00
02-07787-01	6990 DAWN AVE E	20-71161-03-060	74.75	87.00
02-06693-03	7046 DAWN CT E	20-71161-04-130	279.59	325.00
02-06515-01	7053 DELANEY AVE E	20-71161-04-270	662.37	769.00
03-03491-01	3595 77TH ST E	20-71163-02-060	872.60	1,013.00
03-03383-06	3530 77TH ST E	20-71163-03-020	145.01	169.00
03-03349-03	3574 77TH ST E	20-71163-03-050	635.05	737.00
03-03187-05	3800 77TH ST E	20-71163-04-030	528.08	613.00
03-03081-01	3964 77TH ST E	20-71163-04-140	984.34	1,142.00
03-04373-08	3817 78TH ST E	20-71163-04-290	1,031.31	1,197.00
03-04363-03	3801 78TH ST E	20-71163-04-300	760.45	883.00
03-16473-01	7614 CONNIE LN	20-71180-01-230	629.97	731.00
03-16633-01	7668 CRUISE WAY	20-71181-02-050	58.55	68.00
03-05435-03	4850 BABCOCK TR E #211	20-71275-04-211	143.84	167.00
03-05519-03	4850 BABCOCK TR E #232	20-71275-04-232	369.80	429.00
03-10415-02	2138 49TH WAY E	20-71290-01-511	117.16	136.00
03-12209-03	10938 ALISON CT	20-71395-05-020	1,111.90	1,290.00
03-13019-03	10668 ALTON CT	20-71397-02-150	341.03	396.00
03-13563-01	10704 ALISON WAY	20-71397-03-040	465.23	540.00
03-13279-05	10935 ANDOVER CT	20-71398-02-120	193.58	225.00
03-13265-02	10875 ANDES CIR	20-71398-02-290	1,037.15	1,204.00
03-13729-01	10624 ALISON WAY	20-71399-01-040	397.12	461.00
03-13805-05	10619 ALVIN CT	20-71399-02-020	1,175.04	1,364.00
01-13651-02	10972 ALAMEDA PATH	20-71401-01-050	59.18	69.00
02-07047-02	1909 59TH CT E	20-72450-01-020	879.62	1,021.00

Active Accounts - Recommended to Certify

Account	Service Address	Parcel ID	Delinquent Balance	Balance Plus Fee and Interest (rounded)
02-07253-02	5967 BACON AVE E	20-72450-01-200	211.19	245.00
02-07239-02	5943 BACON AVE E	20-72450-01-220	808.54	938.00
03-11971-01	7412 BOLTON WAY	20-73250-02-310	134.39	156.00
05-18491-02	2350 105TH ST E	20-73300-03-050	135.73	158.00
05-17511-01	8134 INVER GROVE TRL	20-75900-01-020	136.39	159.00
05-17419-01	8180 INVER GROVE TRL	20-75900-01-030	75.36	88.00
01-11205-05	8289 CLAYMORE CT	20-76500-01-050	264.70	308.00
03-00771-04	5447 BABCOCK TR E #208	20-77200-02-408	54.44	64.00
03-12545-05	7367 BRADEN TR	20-77500-01-190	491.72	571.00
03-12449-05	7331 BRADEN TR	20-77500-01-250	121.53	141.00
03-12317-05	7245 BOND WAY	20-77500-01-380	474.36	551.00
03-12903-06	7336 BRADEN TR	20-77500-01-410	1,665.05	1,932.00
03-12901-07	7352 BRADEN TR	20-77500-01-460	575.81	668.00
03-12753-05	7416 BRADY PATH	20-77500-01-590	515.27	598.00
01-04861-06	7335 CLAYTON AVE E	20-80900-00-010	1,802.09	2,091.00
02-02493-01	6492 BONNER CT	20-81300-01-020	2,757.36	3,199.00
02-01629-01	2612 BORDEN WAY E	20-81300-02-081	820.39	952.00
02-12025-01	6498 BORDEAUX CT	20-81325-01-080	663.74	770.00
05-20233-02	20-81400-03-010	20-81400-03-010	75.89	89.00
05-20359-02	20-81403-00-020	20-81403-00-020	132.97	155.00
02-01343-10	6655 BUCKLEY CIR E #304	20-81403-02-304	552.85	642.00
03-10383-04	7571 CAHILL CT E	20-81450-01-022	96.77	113.00
05-18331-02	2922 105TH ST	20-81465-01-010	150.79	175.00
01-11807-06	6159 DAWN WAY E	20-81500-01-310	870.50	1,010.00
01-13395-03	6445 CORYELL CT	20-81501-01-050	269.78	313.00
01-05507-06	3738 CUNEEN TR E	20-82100-02-010	151.12	176.00
01-05569-02	3842 CUNEEN TR E	20-82100-02-050	96.95	113.00
01-06181-03	8130 COPLAND WAY E	20-82100-05-030	984.05	1,142.00
01-05749-01	8088 COREY PATH E	20-82100-06-090	1,407.00	1,633.00
01-06579-01	8195 CUSTERS TR E	20-82100-06-280	1,172.30	1,360.00
01-07413-03	8036 DAWN AVE E	20-82100-07-020	156.19	182.00
05-19075-02	11355 ALBAVAR PATH	20-84001-02-070	150.79	175.00
05-21112-00	8726 ALVAREZ AVE	20-84275-03-021	156.30	182.00
02-08109-01	7279 DEGRIO WAY E	20-84300-01-020	1,443.29	1,675.00
02-08027-01	7355 DEGRIO WAY E	20-84300-01-120	104.99	122.00
01-11189-02	7295 BABCOCK TR E	20-88950-01-010	100.96	118.00
			256,176.18	297,420.00

Inactive Accounts Recommended to Certify

Account	Service Address	Parcel ID	Delinquent Balance	Balance Plus Fee and Interest (rounded)
04-09497-06	8205 COLLEGE TR E	20-22500-01-010	147.66	172.00
04-09503-06	8209 COLLEGE TR E	20-22500-01-010	481.37	559.00
04-09501-06	8213 COLLEGE TR E	20-22500-01-010	617.78	717.00
01-08561-03	6472 DELANEY AVE E	20-36500-17-070	155.41	181.00
01-02997-01	3255 80TH ST E #102	20-68300-02-102	158.83	185.00
02-06599-03	7153 CLOMAN AVE E	20-71154-05-150	99.08	115.00
02-07053-06	3757 UPPER 71ST ST E	20-71155-04-090	245.16	285.00
01-03703-01	3127 71ST ST E	20-71157-01-180	84.48	98.00
02-02497-08	6494 BONNER CT	20-81300-01-010	544.03	632.00
			2,533.80	2,944.00



Request for Council Action

SUBJECT: Adoption of Assessment Roll for the 2024 Public Nuisance & Diseased Tree Abatement Program**MEETING DATE:** October 14, 2024**ITEM TYPE:** Public Hearing**CONTACT:** Tyson Rainey

ACTION REQUESTED

The Council is asked to hold a Public Hearing and then adopt the attached Resolution, adopting the assessment roll for the 2024 Public Nuisance & Diseased Tree Abatement Program.

BACKGROUND

The property owners noted below were notified in writing of code compliance violation(s) on their properties, including long grass and weeds, diseased trees, refuse, and other nuisance conditions. The notices sent explained that if property owners did not correct the violation(s), the City would abate the nuisance(s) and bill them for the cost of the abatement(s). The owners of the properties listed below were billed for the cost of the abatement(s) but those bills remain unpaid. A Notice of Pending Assessment and request for payment was sent twice to the property owners, with no response. Staff has therefore prepared the following assessment roll to recoup the cost of the nuisance abatement(s).

If approved as proposed, property owners have thirty (30) days to pay their assessment(s) in full. After that, the Special Assessments will be sent to Dakota County to be placed on the property tax list to be paid in two equal installments extending over a period of one (1) year.

The following parcels are proposed to be placed on the Assessment Roll for the 2024 Nuisance Abatement Costs:

PID	PROPERTY ADDRESS	VIOLATION TYPE	AMOUNT
207115201270	7393 CLAYTON AVE	LAWN CUT	\$220.00
206720102050	6323 APPLE CT	LAWN CUT	\$135.00
206720102010	6339 APPLE CT	LAWN CUT	\$135.00
203650011253	6325 DAWN AVE	LAWN CUT	\$135.00
208210007020	8036 DAWN AVE	LAWN CUT	\$135.00
206720002140	6386 ALVINA CT	LAWN CUT	\$135.00
207115201270	7393 CLAYTON AVE	LAWN CUT	\$220.00

203655006111	6535 DAWN WAY	JUNK REMOVAL	\$414.00
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FISCAL IMPACT

The City seeks to recoup a total of \$1,529.00 in unpaid abatement costs via this assessment process.

RECOMMENDATION

Staff recommends adoption of the attached Resolution, approving the Assessment Roll for the 2024 Public Nuisance & Diseased Tree Abatement Program.

ATTACHMENTS

- 1. Resolution 2024-XX Assessment Roll 2024-10-14 CC

**CITY OF INVER GROVE HEIGHTS
DAKOTA COUNTY, MINNESOTA**

RESOLUTION NO. 2024-243

**RESOLUTION ADOPTING THE ASSESSMENT ROLL FOR 2024 PUBLIC NUISANCE &
DISEASED TREE ABATEMENTS.**

Property located and legally described as follows:

See Exhibit A

WHEREAS, the City Council of the City of Inver Grove Heights is the official governing body of the City of Inver Grove Heights, Minnesota; and

WHEREAS, the City Council has the authority to assess public nuisance abatement or removal costs pursuant to Minnesota Statutes, Chapter 429.101 and City Code Title 5, Chapter 8 and Chapter 9; and

WHEREAS, notice of public hearing on the proposed assessment roll for public nuisance abatements on the properties identified on EXHIBIT A, which is attached hereto and incorporated herein, was published in the official newspaper of the City and notice was mailed to all persons listed on the official records of Dakota County as owners of the affected parcels or lots; and

WHEREAS, a public hearing before the City Council, as noticed, was held on October 14, 2024, where all interested persons were given an opportunity to be heard or otherwise comment on the proposed assessment; and

WHEREAS, the City Council finds that the various parcels listed on EXHIBIT A received public nuisance abatement or removal services, or both, but did not pay the City for said services.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF INVER GROVE HEIGHTS, that the assessment roll is hereby approved subject to the following condition(s):

1. The assessment roll, a copy of which is attached hereto and made a part hereof, is hereby adopted and shall constitute the special assessment against the lands named therein, and each tract of land therein included is hereby found to be benefited by the proposed assessment levied against it.
2. The assessment for each parcel shall be payable in two equal installments extending over a period of one (1) year, the installments will appear on the 2025 property tax statement and shall bear an interest rate of eight percent (8%) of the unpaid balance.
3. The owner of any property, so assessed, may at any time prior to certification of the assessment to the County Treasurer on November 13, 2024, pay the whole of the assessment with interest on such property, except no interest shall be charged if the whole of the assessment is paid to the City within thirty (30) days from the adoption of

- this resolution. The owner may, at any time, thereafter, pay the entire amount of the assessment with interest to the County Treasurer.
4. A certified copy of the assessment roll, along with this resolution shall be transmitted to the County Treasurer to be extended on the property tax lists of the County, and such assessments shall be collected and paid over the same manner as other municipal taxes.

Adopted by the City Council of Inver Grove Heights this 14th day of October, 2024.

Brenda Dietrich, Mayor

ATTEST:

Rebecca Kiernan, City Clerk

EXHIBIT A**ASSESSMENT ROLL FOR
ABATEMENT OF PUBLIC NUISANCE**

PID	PROPERTY ADDRESS	VIOLATION TYPE	AMOUNT
207115201270	7393 CLAYTON AVE	LAWN CUT	\$220.00
206720102050	6323 APPLE CT	LAWN CUT	\$135.00
206720102010	6339 APPLE CT	LAWN CUT	\$135.00
203650011253	6325 DAWN AVE	LAWN CUT	\$135.00
208210007020	8036 DAWN AVE	LAWN CUT	\$135.00
206720002140	6386 ALVINA CT	LAWN CUT	\$135.00
207115201270	7393 CLAYTON AVE	LAWN CUT	\$220.00
203655006111	6535 DAWN WAY	JUNK REMOVAL	\$414.00

TOTAL: \$1,529.00



Request for Council Action

SUBJECT: Approval of Rental Housing Licenses

MEETING DATE: October 14, 2024

ITEM TYPE: Regular Business

CONTACT: Mary Lein, Assistant to the Chief Building Official, 651-450-2552

ACTION REQUESTED

The Council is asked to consider approval of rental housing licenses.

BACKGROUND

The City Council adopted a rental licensing ordinance, requiring all rental property owners to obtain a rental license every two (2) years. The purpose of the ordinance is to assure proper maintenance of structures to preserve neighborhood stability, protect the quality of existing rental housing stock, and maintain property values. The ordinance provides for basic safety and living standards for rentals.

The following rental license applications have been submitted:

RENTAL ADDRESS	PROPERTY OWNER	PROPERTY MANAGER
3290 Lower 67th St. E	Livine & Eric Riera Homestead, FL 33032	Livine & Eric Riera Homestead, FL 33032
6275 Bolland Trail	Brian Peterson Woodbury, MN 55125	Brian Peterson Woodbury, MN 55125

The above applications were complete, and included the necessary fee payments and BCA background check documents. The City of Inver Grove Heights Police Chief/Designee has also reviewed and approved the license applications.

FISCAL IMPACT

None

RECOMMENDATION

Community Development and Police Department staff recommend approval of the licenses listed above.

ATTACHMENTS

None



Request for Council Action

SUBJECT: **Consider Response to Citizen Petition Requesting the City Require an Environmental Assessment Worksheet for a Proposed Development in the Northwest Area**

MEETING DATE: October 14, 2024

ITEM TYPE: Regular Business

CONTACT: Jason Ziemer, Community Development Director, 651-450-2546

ACTION REQUESTED

The Council is asked to issue a response to the petition filed with the Environmental Quality Board, seeking to require National Land Holdings, LLC to complete an Environmental Assessment Worksheet (EAW).

BACKGROUND

National Land Holdings, LLC (the "Developer") has requested approval of a Comprehensive Plan amendment and rezoning of approximately 108 acres of land located in the Northwest Expansion Area. The reguiding and rezoning requests are necessary to support the conceptual development proposed by the Developer.

According to the current land use application, the Developer is seeking to reguide the property located at 6470 and 6680 S. Robert Trail from Low Density Residential (LDR) and Low-Medium Density Residential (LMDR) to High-Density Residential (HDR) and rezone them from Agricultural (A) to Multiple-Family Residential (R-3C). The Developer is also seeking to rezone real property at 1401 70th Street from Agricultural (A) to Multiple-Family Residential (R-3A). The three properties are hereafter referred to collectively as the "Subject Property."

The Planning Commission held public hearings for these requests on August 7 and September 17, 2024. On September 24, the City received a citizen petition (Petition) filed with the Environmental Quality Board (EQB), requesting the City require an Environmental Assessment Worksheet (EAW).

Northwest Expansion Area AUAR

In 2005, the City adopted an Alternative Urban Areawide Review (AUAR) for the Northwest Expansion Area. This report was subsequently updated in 2007, 2014 and 2020. Minnesota Rules 4410.3610, Subp. 7, requires a local government entity to update their AUAR report every five (5) years and/or if any of the eight (8) circumstances as stated in Subp. 7 apply to a proposed development.

An AUAR is one of three types of environmental reviews identified by Minnesota Statute; the process for which is described in Minnesota Rules (MR) 4410. The other two forms of environmental review are the EAW and Environmental Impact Statement (EIS). Those same Minnesota Rules establish the threshold test by which different project categories trigger the need for a mandatory EAW (MR

4410.4300) or EIS (MR 4410.4400).

Whereas an EAW and EIS are each site-specific environmental studies based on a specific development plan, an AUAR is an area-wide study based on one or more different development scenarios for that specific geographic area. An AUAR still assesses the cumulative environmental impact of development, and also identifies recommended mitigation strategies related to any identified impacts. Specifically, an AUAR is a planning tool to proactively analyze environmental impacts of anticipated development before it happens. Environmental effects explored include, but are not limited to, air quality, natural resources, water resources, wildlife habitat, and traffic patterns, as well as the impact on public utilities. The outcome of environmental studies – whether it be an EAW, EIS or AUAR – does not approve nor deny a project, nor do they block a project from moving forward. Rather, such studies create awareness and identification of potential impacts, and develop mitigation measures to minimize the resulting impacts. That information is vital to both private developers and public entities.

Why would the City opt for an AUAR versus requiring a developer to complete an EAW or EIS?

Aiding in development due diligence is one reason. Completing an AUAR not only helps expedite the development process, but also informs developers as they begin looking at land and plan their development concepts. Looking at a larger geographic area also benefits cities, allowing them to forecast and model the future needs and expansion of public utilities and roadways for a growing community, which in turn enables cities to plan financially.

Petition for EAW

As noted above, on September 24, City staff received notice from the state Environmental Quality Board (EQB) that a citizen petition had been filed, requesting the City of Inver Grove Heights require the Developer to complete an Environmental Assessment Worksheet (EAW) for the proposed development. In that petition, the petitioners outlined the following concerns:

- **Environmental Preservation:** The petitioners allege that the proposed development area encompasses significant natural resources and wildlife habitats that may be adversely affected.
- **Community Health and Safety:** The petitioners allege that the potential development may lead to increased traffic, pollution, and noise, which could negatively impact the health and well-being of nearby residents.
- **Sustainability:** The petitioners propose that sustainable development practices should be considered that prioritize the preservation of open space and natural habitats.

The engineering, planning and design consulting firm of Kimley-Horn was hired to assist City staff and the City Council with review of the Petition, and the drafting of the response to the petitioners and EQB regarding the request for an EAW. Kimley-Horn had assisted the City with the 2020 AUAR Update, and is therefore familiar with the document and the City's Northwest Expansion Area.

As outlined in the attached memo, Kimley-Horn reviewed the petition in comparison to the applicable Minnesota Rules governing environmental studies, including whether the existing AUAR remains valid in consideration of the Petition. Additionally, Kimley-Horn thoroughly evaluated the three concerns in comparison to the active AUAR and the different resource areas evaluated in the Northwest Expansion Area AUAR, and in relation to the current status of the pending land use application and conceptual development as proposed by the Developer.

Summary of Findings

As outlined in the attached memorandum, based on their review of the Petition in relation to

Minnesota Rules and the existing, active AUAR, it is the finding of Kimley-Horn, with concurrence by City staff, that the Petition fails to present material evidence that demonstrates the need for additional environmental review beyond what is covered in the current AUAR. The AUAR not only adequately identifies potential environmental impacts, but also proposes measures necessary to mitigate the resulting impacts potentially caused by development on the Subject Property and/or in the Northwest Expansion Area. With the potential environmental impacts documented, the Developer will need to comply with the necessary mitigation measures, including those identified in the AUAR and companion city policies and development standards. This includes, but is not limited to, the City's 2040 Comprehensive Plan, Northwest Area standards and other zoning regulations, engineering and stormwater design standards, etc.

FISCAL IMPACT

None.

RECOMMENDATION

City staff recommend the Council adopt the attached Resolution, denying the citizen petition for an Environmental Assessment Worksheet (EAW).

ATTACHMENTS

1. Resolution_Denying Petition Request for EAW_10-14-2024
2. Petition Response Memo_Kimley-Horn_10-14-2024
3. EQB_Complete Petition Transmittal Letter_IGH_Proposed Development 108-Acres
4. EQB_EAW Petition Complete

CITY OF INVER GROVE HEIGHTS, MINNESOTA

RESOLUTION 2024-244

RESOLUTION DENYING A PETITION FOR PREPARATION OF AN ENVIRONMENTAL ASSESSMENT WORKSHEET FOR THE APPLICATION BY NATIONAL LAND HOLDINGS, LLC FOR THE REZONING AND REGUIDING OF THE PROPERTY LOCATED AT 6470 AND 6680 SOUTH ROBERT TRAIL AND 1401 70TH STREET EAST

WHEREAS, on June 17, 2024, the City of Inver Grove Heights (“City”) received a Land Use Application from National Land Holdings, LLC (“Proposer”) to: 1) rezone the real property located at 6470 and 6680 S. Robert Trail from A, Agricultural to R-3C, Multiple-Family Residential and reguide the property from LDR, Low Density Residential and LMDR, Low-Medium Density Residential to HDR, High-Density Residential; and 2) rezone the real property located at 1401 70th Street from A, Agricultural to R-3A, Multiple-Family Residential, (collectively, both properties will be referred to as the “Subject Property”) in order to have the zoning and guiding of the Subject Property in place to support a future planned development of the Subject Property with a conceptual plan of 752 residential units consisting of a mixture of townhomes, apartments, and single-family homes (the “Project”); and,

WHEREAS, no development of the Subject Property can occur until the Proposer applies for and receives a number of additional City land use-related approvals, including approval of Preliminary Plat, Final Plat and a Planned Unit Development Plan, which will include requirements related to open space, number and type of residential units, and location of the same; and,

WHEREAS, the aforementioned Land Use Application was the subject of public hearings before at the City’s Planning Commission on August 7, 2024 and September 17, 2024; and,

WHEREAS, on September 24, 2024, the City received a citizen petition (“Petition”) from the Environmental Quality Board (“EQB”) requesting that the City require an Environmental Assessment Worksheet (“EAW”) for the Project; and,

WHEREAS, the EQB designated the City as the Responsible Governmental Unit (“RGU”) for the Project; and,

WHEREAS, the Subject Property is located within the City’s Northwest Expansion Area, and is subject to an active Alternative Urban Areawide Review (“AUAR”) which was last updated in 2020; and,

WHEREAS, the EQB’s rules (Minnesota Rules, Part 4410.1100, subpart 6) require the City to determine whether the evidence presented by the petitioners, proposers, and other persons or otherwise known to the RGU demonstrates that, because of the nature or location of a project, that project may have the potential for significant environmental effects; and,

WHEREAS, the EQB rules (Minnesota Rules, Part 4410.1700, subpart 7) further require the City to consider the following factors in making such determination:

- a. Type, extent, and reversibility of environmental effects;

- b. Cumulative potential effects: whether the cumulative potential effect is significant; whether the contribution from the project is significant when viewed in connection with other contributions to the cumulative potential effect; the degree to which the project complies with approved mitigation measures specifically designed to address the cumulative potential effect; and the efforts of the proposer to minimize the contributions from the project;
- c. The extent to which the environmental effects are subject to mitigation by ongoing public regulatory authority; and
- d. The extent to which environmental effects can be anticipated and controlled as a result of other available environmental studies undertaken by public agencies or the project proposer, including other environmental impact statements; and,

WHEREAS, on October 14, 2024, the City Council considered the request for the EAW and a response to the Petition prepared by City staff and consultants, including a memorandum from Kimley-Horn and Associates, Inc. dated October 14, 2024 (“Memorandum”).

NOW, THEREFORE, BE IT RESOLVED, BY THE CITY COUNCIL OF THE CITY OF INVER GROVE HEIGHTS, MINNESOTA that, after careful consideration and based on all of the evidence presented by the petitioners, proposers, and other persons or otherwise known to the RGU, including the Petition and the Memorandum and the evidence and testimony presented to the City Council in its agenda packet and at its meeting on October 14, 2024, and upon consideration of the factors and criteria set forth in Minnesota Rules, Part 4410.1100, subpart 6 and Part 4410.1700, subpart 7, the City Council hereby determines and makes the following Findings of Fact with respect to the petition for an EAW for the Project:

1. The City has an active Alternative Urban Area Wide Review (AUAR), last updated in 2020 for the entirety of the City’s Northwest Expansion Area. This AUAR constitutes the required environmental review of the Northwest Expansion Area. The Subject Property is located within the Northwest Expansion Area.
2. The proposed reguinding and rezoning of the Subject Property for the purpose of supporting a future conceptual development of the Subject Property with a conceptual plan of 752 residential units, if approved, would result in residential development that is consistent with the development assumptions established under the AUAR and the approval and construction of the project will comply with the conditions of the plan for mitigation as stated in AUAR; therefore, all required environmental review for the Project has been satisfied and no further environmental review is required per Minnesota Rules, Parts 4410.1100 to 4410.1700 and 4410.2100 to 4410.3000.
3. The petition fails to present material evidence that demonstrates an EAW is needed or that there is any need for additional environmental review beyond what is covered in the existing AUAR.

BE IT FURTHER RESOLVED, that the Petition to require preparation of an EAW is hereby denied based on the Findings of Fact listed above.

BE IT FURTHER RESOLVED, that the City staff and consultants are hereby authorized and directed to act in accordance with this Resolution and denial of the Petition. The City Clerk is specifically authorized and directed to mail a copy of this Resolution to the representative for the petitioners, EQB and Proposer, as required by Minnesota Rules, within five (5) days of the resolution adoption date. The City Clerk is also specifically authorized to complete the online submission form for the EQB Monitor found on the EQB’s Web site and to upload a copy of this Resolution.

Adopted this 14th day of October, 2024.

By _____
Brenda Dietrich, Mayor

Attest:

Rebecca Kiernan, City Clerk

MEMORANDUM

To: Jason Ziemer and Heather Botten,
City of Inver Grove Heights

From: Leila Bunge,
Kimley-Horn and Associates, Inc.

Date: October 14, 2024

Subject: *Citizen Petition for an Environmental Assessment Worksheet for the Proposed 6470 and 6680 S. Robert Trail and 1401 70th Street E Development*

SECTION 1. SUMMARY

National Land Holdings, LLC (Developer) has proposed a new residential development on a 108-acre property located at 6470 and 6680 S. Robert Trail and 1401 70th Street E, Inver Grove Heights (Subject Property). The proposed development consists of a total of 752 residential units with a mix of townhomes, apartments, and single-family homes. (See Attachment A for location and plans.) At this time, the Developer has applied for a Comprehensive Plan amendment and re-zoning of the Subject Property necessary to support the proposed development; the formal development application for City entitlement approval is pending action on the current application.

On September 24, 2024, the City of Inver Grove Heights (City) received notification from the Minnesota Environmental Quality Board (EQB) that a citizen petition for an Environmental Assessment Worksheet (EAW) was submitted regarding the project. The EQB determined the City is the responsible governmental unit (RGU) for the petition, meaning the City is responsible for reviewing and approving or denying the petition. The notice was published in the EQB Monitor on October 1, 2024. The citizen petition outlined concerns pertaining to:

- Environmental Preservation: The proposed development area encompasses significant natural resources and wildlife habitats that may be adversely affected.
- Community Health and Safety: The potential development may lead to increased traffic, pollution, and noise, which could negatively impact the health and well-being of nearby residents.
- Sustainability: Sustainable development practices should be considered that prioritize the preservation of open space and natural habitats.

The City retained Kimley-Horn to assist with the review of the citizen petition and documents pertaining to the proposed development to respond to the EAW petition in a memorandum to present to City Council for a decision.

The City provided the following documents for Kimley-Horn's review:

- A Citizen Petition for Submission to the EQB with material evidence, dated September 18, 2024.
- Notification of citizen petition from the EQB to the City of Inver Grove Heights, dated September 24, 2024.

- Northwest Expansion Area Alternative Urban Areawide Review (AUAR) Update, dated May 2020.

The area proposed to be re-guided and re-zoned is located within study area for the Northwest Expansion AUAR that was completed in 2005, and subsequently updated in 2007, 2014, and 2020. (See Attachment B for the location within the 2020 AUAR Update within the Proposed Land Use figure.) As a matter of full disclosure, Kimley-Horn assisted the City with the current Northwest Expansion Area AUAR, finalized and adopted in 2020.

As described in Minnesota Rules 4410.3610, subpart 2, item A¹, any proposed development that is consistent with the development assumptions of a completed AUAR are exempt from additional review, so long as the project complies with the conditions of the mitigation plan. Additionally, Minnesota Rules 4410.3610, subpart 2, item E states:

If a specific project will be reviewed through the procedures of this part (AUAR) rather than through the EAW or EIS procedures and the project itself would otherwise require preparation of an EIS pursuant to part 4410.4400 or will comprise at least 50 percent of the geographic area to be reviewed, the RGU must follow the additional procedures of subpart 5a in the review.

In this case, the proposed development does not comprise 50 percent or more of the Northwest Expansion Area, and therefore does not need to go through the additional scoping procedures.

Additionally, Minnesota Rules, part 4410.3610, subpart 7 describes when an AUAR must be revised to remain valid.² As described below, none of those circumstances apply, which means that the 2020 AUAR Update remains valid and the development at 6470 and 6680 S. Robert Trail and 1401 70th Street E does not trigger an additional or separate mandatory EAW.

- A. Five years have passed since the RGU adopted the original environmental analysis document and plan for mitigation or the latest revision.** The current AUAR and mitigation plan was finalized in May 2020 and adopted in August 2020, and therefore is valid through August 2025. According to Minnesota rules, the required five (5) year update of the Northwest Expansion Area AUAR will be updated in 2025 to reflect any changes in development that have occurred since the last AUAR update.
- B. A comprehensive plan amendment is proposed that would allow an increase in development over the levels assumed in the environmental analysis document.** Although a comprehensive plan amendment is proposed for this development, the change in land use, if approved, would not result in an increase in the overall development assumed for residential development in the 2020 AUAR Update.
- C. Total development within the area would exceed the maximum levels assumed in the environmental analysis document.** The 2020 AUAR Update assumed a total of 7,907 residential units for the Northwest Expansion Area. After subtracting pre-existing homes and recent residential development, there are 2,415 units still available under the 2020 AUAR Update. National Land

¹ <https://www.revisor.mn.gov/rules/4410.3610/#rule.4410.3610.2.A>

² <https://www.revisor.mn.gov/rules/4410.3610/>

Holdings, LLC is proposing 752 units, which leaves 1,663 units still available for future development within the AUAR study area. (See Unit Determination Table on next page.)

- D. Development within any subarea delineated in the environmental analysis document would exceed the maximum levels assumed for that subarea in the document.** There are no subareas delineated in the 2020 AUAR Update that limits the development in this area.
- E. A substantial change is proposed in public facilities intended to service development in the area that may result in increased adverse impacts on the environment.** There are no substantial changes in proposed public facilities to serve this development.
- F. Development or construction of public facilities will occur on a schedule other than that assumed in the environmental analysis document or plan for mitigation, so as to substantially increase the likelihood or magnitude of potential adverse environmental impacts or to substantially postpone the implementation of identified mitigation measures.** The proposed development does not result in a change to the development or construction of public facilities from what was contemplated in the 2020 AUAR Update.
- G. New information demonstrates that important assumptions or background conditions used in the analysis presented in the environmental analysis document are substantially in error and that environmental impacts have consequently been substantially underestimated.** All environmental impacts of forecasted development in the Northwest Expansion Area were thoroughly vetted and evaluated with the original and all subsequent AUAR updates and reconfirmed with the 2020 AUAR Update. There are no assumptions or background information that were substantially underestimated or substantially in error.
- H. The RGU determines that other substantial changes have occurred that may affect the potential for, or magnitude of, adverse environmental impacts.** There are no substantial changes within the study area that would affect the potential for adverse environmental impacts.

Table: Unit Determination for Northwest Expansion Area

AUAR Projected Units (May 2020 AUAR Update)	7,907
Existing Residential Units*	(193)
Constructed/Approved Units	(1,444)
AUAR Available Unit Capacity	6,270

* Existing Residential Units includes previous rural residential development unlikely to redevelop.

AUAR Remaining Unit Capacity	6,270
Proposed Development Units	(752)
Available Post-Development Units	5,518

Available Post-Development Units	5,518
Future Estimated Development [^]	(3,855)
Projected Unused Unit Capacity	1,663

[^] Future Estimated Development based on average unit density for all remaining land.

As described in the above Unit Determination Table, the Northwest Expansion Area has an available residential unit capacity of 5,518 units post-proposed development. Using an average unit density forecast, as assumed in the 2020 AUAR Update, future development would absorb an estimated 3,855 units, leaving

an available, unused unit capacity of 1,663 units of the original 7,907 as projected in the 2020 AUAR Update. Thus, the Northwest Expansion Area has sufficient land to support the proposed and future developments, with additional residential units remaining.

SECTION 2. AUAR OVERVIEW

An AUAR is a Minnesota state specific process as outlined in State Statute and Minnesota Rules, part 4410. An AUAR is a planning tool that local governments use to understand how one or several development scenarios will affect the environment of the community. The purpose of completing an AUAR is to:

- inform the public about the future development scenarios
- provide information on future permitting and approvals
- help identify potential impacts and mitigation strategies.

An AUAR does not approve or deny a project. Rather, it is a source of information to guide other approvals and permitting decisions.

The resource areas evaluated in the Northwest Expansion Area AUAR and subsequent updates that relate to the Petitioner's concerns are described below.

Cover Types: This section provides an estimate of pre-development and post-development land cover.

The proposed development includes approximately eight (8) acres of public parks and open space located on the east and west side of the development area; this exceeds the City's 20 percent open space requirement. Additional trails and sidewalks are proposed within the site as well.

The proposed development is also required to comply with the City's Tree Protection and Preservation Ordinance (City Code 10-15D) to minimize and mitigate tree removal in wooded areas of the city, the Landscaping Ordinance (City Code 10-15-11) that prescribes open space landscaping requirements, and the Northwest Area Overlay District (City Code 10-15J) that was established for the purpose of regulating development to be consistent with the City's Comprehensive Plan while creating a cost efficient storm sewer system.

The proposed development plan is designed to avoid and account for the different wetland management types and applicable wetland buffers, which is consistent with the recommendations of the City's Natural Resource Inventory and Management Plan to protect and restore natural community areas in the Northwest Expansion Area.

Permits and Approvals Required: This section provides a review of all local, state and federal permits, approvals, certifications, and financial assistance required for a project, including current status.

The Developer is requesting to re-zone the development area from Agricultural to R-3C, Multi-Family Residential and from Agriculture to R-3A, Multi-Family Residential. If re-zoning is approved, the developer will be required to procure any, and all, applicable local, state or federal permits and development-related approvals and entitlements as required by the City prior to project implementation.

Land Use: This section summarizes historical, current, and proposed land use, plans, and zoning within and in the vicinity of the study area. Future development proposals are reviewed for compatibility with the surrounding area, and measures are addressed, as needed, to mitigate incompatibility.

According to the current 2040 Comprehensive Plan, most of the land within the proposed development area is guided as Low-Medium Density Residential (4-8 units per acre); the northwest corner is designated as Low Density Residential (1-4 units per acre). The proposed development area includes an estimated 62.7 net developable acres of Low-Medium Density Residential, which is consistent with the 2040 Land Use Plan. The remainder of the land is proposed to change from Low Density Residential to High-Density Residential through a Comprehensive Plan amendment. That area has an estimated 25.8 net developable acres. The proposed development is anticipated to meet City land use requirements.

Geology, Soils, and Topography/Landforms: This section reviews the underlying geology for the study area. Any potential limitations that geologic features may have on future development are addressed with mitigation measures, if needed.

Soils and topography have been reviewed through the AUAR process for suitability relating to development features including erosion potential, soil stability, slopes, and permeability. The proposed development is required to meet standards set by the city regarding grading and erosion control. This includes compliance with Stormwater Pollution Prevention Plan (SWPPP) and National Pollutant Discharge Elimination System (NPDES) programs, slope restrictions, and construction erosion control measures.

Water Resources: This section of the AUAR addresses all water related aspects of a proposed project including surface water, groundwater, wastewater, stormwater, and water appropriation. Effects from future activities on these resources are described and minimization or mitigation measures are summarized.

The developer has completed a wetland delineation of the site and has submitted the report for review by a Technical Evaluation Panel (TEP). The proposed development plan is designed to avoid and account for the different wetland management types and applicable wetland buffers, which is consistent with the recommendations of the Natural Resource Inventory and Management Plan to protect and restore natural community areas in the Northwest Expansion Area.

The site is supplied with municipal water and sanitary sewer as these were constructed in the Northwest Expansion Area to service this type of planned development. The proposed development will be required to meet the City's stormwater quality, rate control, and other stormwater management requirements.

Contamination/Hazardous Materials/Wastes: This section includes pre-development site conditions including any existing contamination or potential environmental hazards are summarized and an estimate on future development generated waste.

The 2020 AUAR Update noted that a Phase I Environmental Site Assessment (ESA) would typically be required for new development to identify any potential site contamination concerns that exist on the site and identify what mitigation would be needed to be resolved prior to construction. National Land Holdings, LLC has completed this site investigation through a Phase I ESA for the proposed development.

Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Rare Features): This section reviews fish, wildlife, plant communities, and sensitive ecological resources within and in the vicinity of the

study area, and impacts to these resources are presented. Mitigation measures to minimize effects to these features are discussed.

The City completed a Natural Resource Inventory and Management Plan for the Northwest Expansion Area in 2004, and the inventory of natural areas by qualitative rank was included in the 2005 AUAR. (See Attachment B.) This inventory included an evaluation for floristic quality, wildlife habitat value, aesthetic, recreational, educational, and cultural values, and stormwater susceptibility. Several of the habitats are within or adjacent to the site and future development would need to follow the recommendations from the Natural Resource Inventory and Management Plan, including:

- Create and maintain buffer strips around natural resource areas.
- Avoid impacts to high quality sites, identified as Manage 1 and 2 areas in the Plan, and preserve these areas and if needed; redirect unavoidable impacts to lowest quality areas.
- Minimize the area of grading or clearing in natural communities to develop buildings, lots and other structures.
- Implement techniques to reduce the amount of phosphorus entering wetlands and other waterbodies.
- Implement strategies to manage and restore natural community areas identified in the plan.
- Identify areas of potential sheet erosion and restore groundcover in these areas to prevent erosion and sedimentation.
- Protect the greenway corridors identified in the Natural Resource Inventory and Management Plan and use the corridors to provide trails and to implement the Surface Water Management Plan where this is compatible with the natural resources in the corridors.

A review of the DNR Natural Heritage Inventory System (NHIS) database was also conducted for the 2020 AUAR Update, resulting in the identification of one (1) state- and one (1) federally-listed species. Those species included the Loggerhead Shrike, a bird species, (State-Listed) and Rusty Patched Bumble Bee, a bee species, (Federally-Listed). Potential mitigation measures are identified in Section 11, Page 26 of the Northwest Expansion Area AUAR.

While the AUAR does not identify specific locations of potential habitat of these species, National Land Holdings, LLC would be required to comply with the mitigation measures identified in the 2020 AUAR Update for species and habitat protection.

Visual: This section identifies any scenic views or vistas within and near the study area. Potential visual effects and measures are described to avoid, minimize, or mitigate visual effects from future development.

The National Land Holdings, LLC project is within the scope of the 2020 AUAR Update, which states that residential developments are required to be built to City Code to be consistent with the City's Comprehensive Plan, Natural Resource Inventory and Management Plan, Surface Water Management Plan, and related City Ordinances. Therefore, it is not anticipated to impact visual resources.

Air: This section describes future development as it is reviewed for stationary source emissions, vehicle emissions, and dust/odors, and any control or mitigation measures for these three air emissions.

Temporary increases in air emissions can be anticipated during construction and mitigation measures can be utilized. Such measures could include construction best management practices aimed at reducing dust and debris and enforcing idling restrictions on construction vehicles.

Noise: This section identifies all sources, characteristics, duration, quantities, and intensity of noise generated during future development construction and operation are identified. Post-project noise levels are compared to pre-project noise levels. Measures that will be taken to minimize or mitigate noise effects.

Temporary increases in noise can be anticipated during project construction. Typical construction noise are temporarily generated by construction activities, and the contractor will adhere to state standards for construction, which states “construction noise is permitted Monday through Friday from 7 AM to 9 PM, and Saturday through Sunday and holidays from 9 AM to 5 PM.”

The mitigation measures identified in the 2020 AUAR Update still apply, and any residential development needs to conduct a noise mitigation study to consider any potential mitigation measures, if warranted.

Transportation: this section identifies an estimate of impacts on transportation and traffic associated with future development and measures to minimize or mitigate.

National Land Holdings LLC proposes to construct a segment of the 65th Street extension to serve the site, which follows the roadway and related development outlined in the 65th Street Small Area Plan for the area. The developer would be required to coordinate with Dakota County for any connections with CSAH 26 (70th Street) and with the Minnesota Department of Transportation (MnDOT) for any connections with Robert St. (Hwy 3). Any improvements as required by those agencies in relation to the proposed development would be the responsibility of the developer. Dakota County is currently studying improvements to CSAH 26 (70th St.)³

The 2020 AUAR Update identified the following planned and programmed transportation improvements in the 2040 Comprehensive Plan to accommodate future growth and capacity within the AUAR study area:

- construction of a 2-lane urban roadway on CR 28, 0.62 miles east from Hwy 3
- expand CSAH 26 to a 4-lane roadway
- new interchange at I-494 and CSAH 63.

SECTION 3. CONCLUSION

In summary, the citizen petition for an EAW outlined concerns pertaining to:

- Environmental Preservation: The proposed development area encompasses significant natural resources and wildlife habitats that may be adversely affected.
 - **An evaluation of potential impacts and mitigation requirements for residential development in the Northwest Area Expansion is documented in the 2020 AUAR Update in the Cover Types, Permits and Approvals, Geology/Soils, Water Resources,**

³ <https://www.co.dakota.mn.us/Transportation/PlannedConstruction/CR26AllenCahill>

and Fish/Wildlife/Plant Communities sections and as summarized in Section 2 of this memorandum.

- Community Health and Safety: The potential development may lead to increased traffic, pollution, and noise, which could negatively impact the health and well-being of nearby residents.
 - **An evaluation of potential impacts and mitigation requirements for residential development in the Northwest Area Expansion is documented in the 2020 AUAR Update in the Permits and Approvals, Visual, Air, Noise, and Transportation sections and as summarized in Section 2 of this memorandum.**
- Sustainability: Sustainable development practices should be considered that prioritize the preservation of open space and natural habitats.
 - **An evaluation of potential impacts and mitigation requirements for residential development in the Northwest Area Expansion is documented in the 2020 AUAR Update in the Cover Types, Permits and Approvals, Land Use, Geology/Soils, Water Resources, and Fish/Wildlife/Plant Communities sections and as summarized in Section 2 of this memorandum.**

The petition fails to present material evidence that demonstrates the need for additional environmental review beyond what is covered in the existing 2020 AUAR Update. This is based on the review of the available information listed in Sections 1 and 2 of this memorandum and the factors listed in Minnesota Rules 4410.1700, subpart 7⁴ that describes the criteria for whether a project has the potential for significant environmental effects:

A. Type, extent, and reversibility of environmental effects.

- The project does not exceed a mandatory threshold outside of what is already covered through the 2020 AUAR Update (See Section 1 for additional information).
- The environmental effects identified in the petition are localized and can be mitigated through the City's land use application process in conjunction with other applicable agencies.
- The identified effects are reversible until the potential final discretionary approvals of granted through the City approval process.

B. Cumulative potential effects. The RGU shall consider the following factors: whether the cumulative potential effect is significant; whether the contribution from the project is significant when viewed in connection with other contributions to the cumulative potential effect; the degree to which the project complies with approved mitigation measures specifically designed to address the cumulative potential effect; and the efforts of the proposer to minimize the contributions from the project.

- The project is not part of a prior or future project that would contribute to cumulative effects.

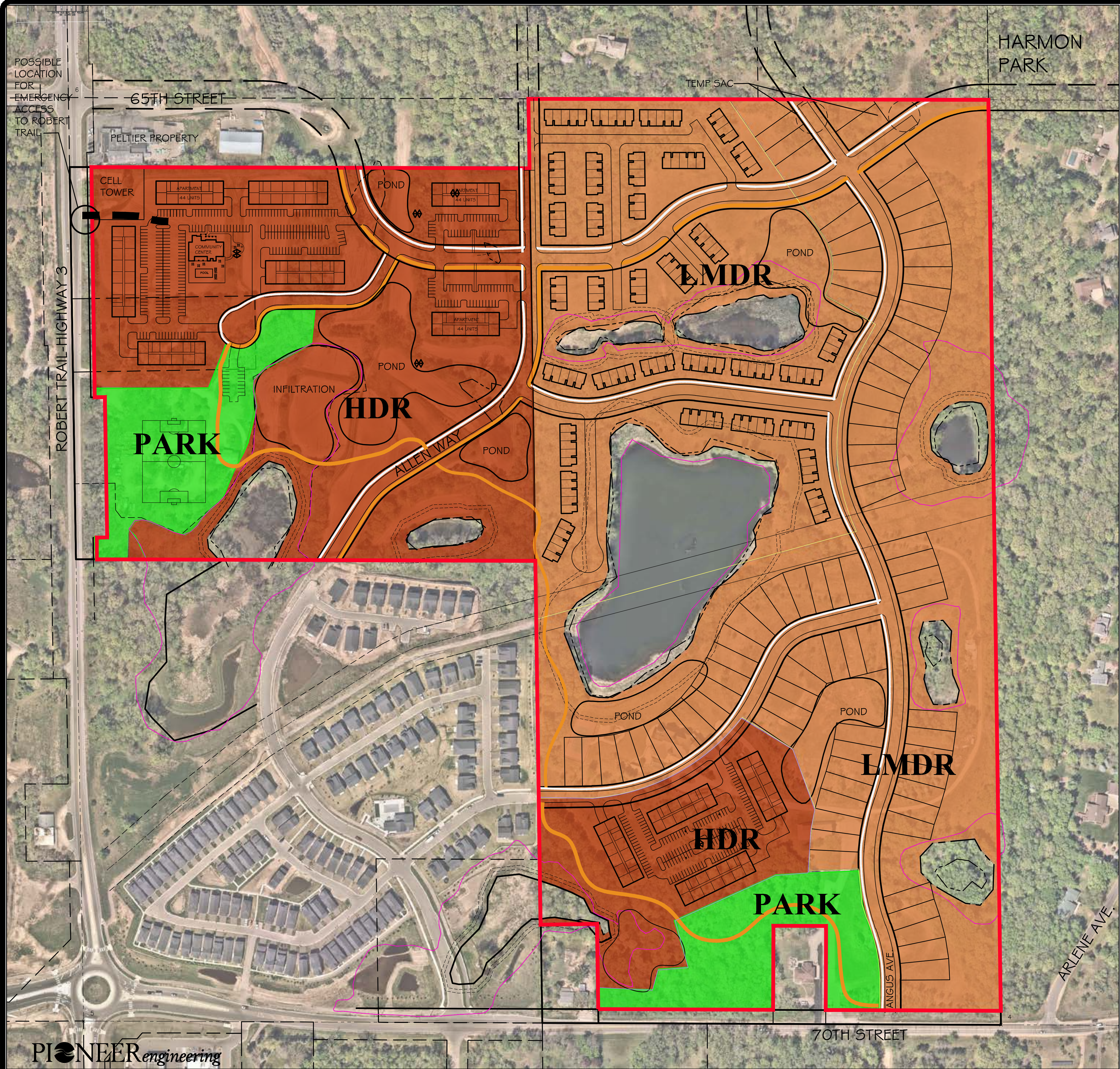
⁴ <https://www.revisor.mn.gov/rules/4410.1700/>

- Any potential impacts from reasonably foreseeable nearby future projects would be addressed through regulatory permitting and approval processes, minimizing the potential for cumulative effects.
- C. The extent to which the environmental effects are subject to mitigation by ongoing public regulatory authority. The RGU may rely only on mitigation measures that are specific and that can be reasonably expected to effectively mitigate the identified environmental impacts of the project.
- Environmental effects from the project can be anticipated and avoided, mitigated, or minimized, as described in the preliminary review summarized in Section 2.
 - The developer will complete the applicable, recommended mitigation that was identified in the 2020 AUAR Update.
 - The City's development review process will subject the project design and site plan to City approval.
- D. The extent to which environmental effects can be anticipated and controlled as a result of other available environmental studies undertaken by public agencies or the project proposer, including other EISs.
- The proposed development is a known event with known effects.
 - Redevelopment of this type within an urban setting is neither unique nor unanticipated. The environmental effects of this redevelopment can be anticipated and controlled by the City's formal land use application and regulatory processes.

Based on the information documented above, Kimley-Horn recommends that the City of Inver Grove Heights deny the citizen petition for an EAW.

Attachment A.

Proposed Development Location



SITE DATA:

PROJECT AREA: ±108 ACRES GROSS (±77 ACRES ME, ±31 ACRES LUND)
WETLAND: 11 ACES
CELL TOWER AREA: ±0.5 ACRE
DEDICATED PARK: ±8 ACRES (UPLAND ONLY, WETLANDS AND BASINS EXCLUDED)

NET DEVELOPABLE AREA: ±88.5 ACRES

CURRENT ZONING: AG
2040 GUIDE PLAN: LOW DENSITY (1-4 UNITS/ACRE) LUND AND LOW-MEDIUM DENSITY (4-8 UNITS/ACRE) ME PROPERTY AND SOUTHEAST CORNER OF LUND PROPERTY

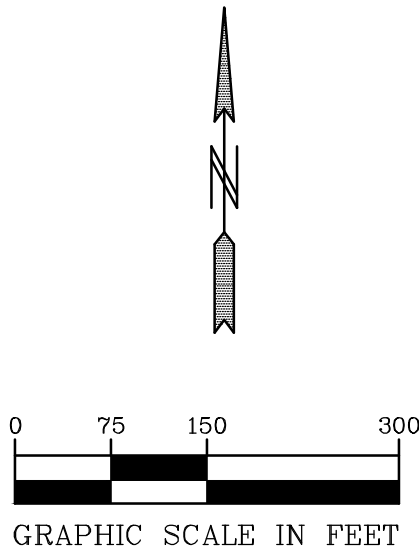
PROPOSED ZONING: PUD NORTHWEST AREA (R-1C, R-3B, R-3C)

PROPOSED UNITS: 752
APARTMENTS LUND PROPERTY: 340
APARTMENTS ME PROPERTY: 184
TOWNHOME UNITS: 145
50' WIDE SINGLE FAMILY: 83

PROPOSED LAND USE WITHIN EACH PRODUCT AREA
(NET AREAS EXCLUDE WETLANDS AND DEDICATED PARK)

- HIGH DENSITY RESIDENTIAL (12+ UNITS/ACRE)**
LUND APARTMENTS
NET AREA: ±25.8 ACRES
UNITS: ±340
NET DENSITY: ±13.1 UNITS/ACRE
- HIGH DENSITY RESIDENTIAL (12+ UNITS/ACRE)**
ME APARTMENTS
NET AREA: 7.3 ACRES
UNITS: ±184
NET DENSITY: 25.2 UNITS/ACRE
- LOW-MEDIUM DENSITY RESIDENTIAL (4-8 UNITS/ACRE)**
THE CURRENT LAND USE: NO AMENDMENT IN THIS AREA
SINGLE FAMILY AND ROW TOWNHOMES
NET AREA: 55.4 ACRES
UNITS: ±228
NET DENSITY: 4.1 UNITS/ACRE
- PUBLIC PARKS AND OPEN SPACE (±4 ACRES ON WEST SIDE, ±4 ACRES ON EAST)**

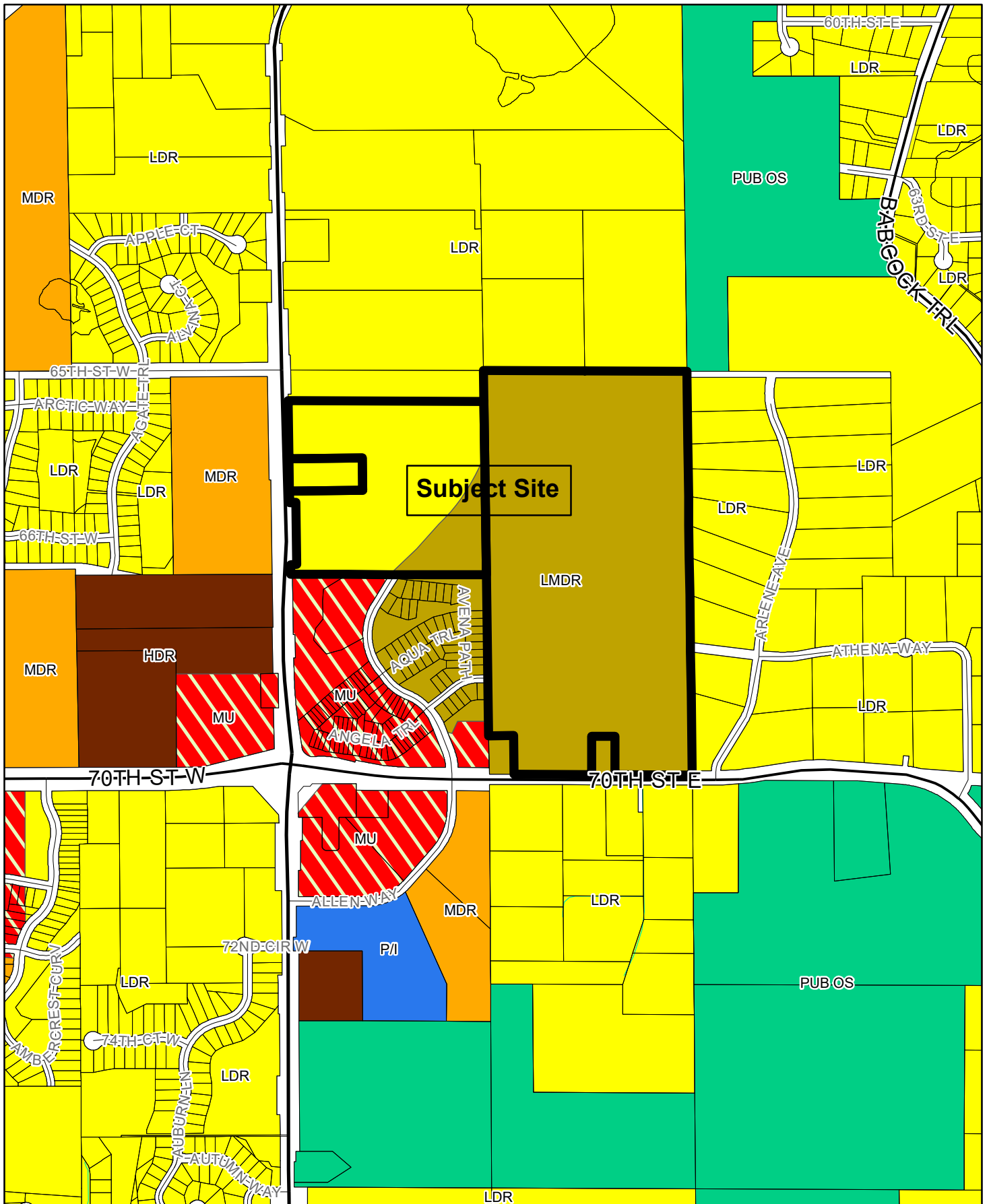
- PROJECT AREA
- REGIONAL BASIN
- ESTIMATED WETLAND
- PROPOSED TRAIL

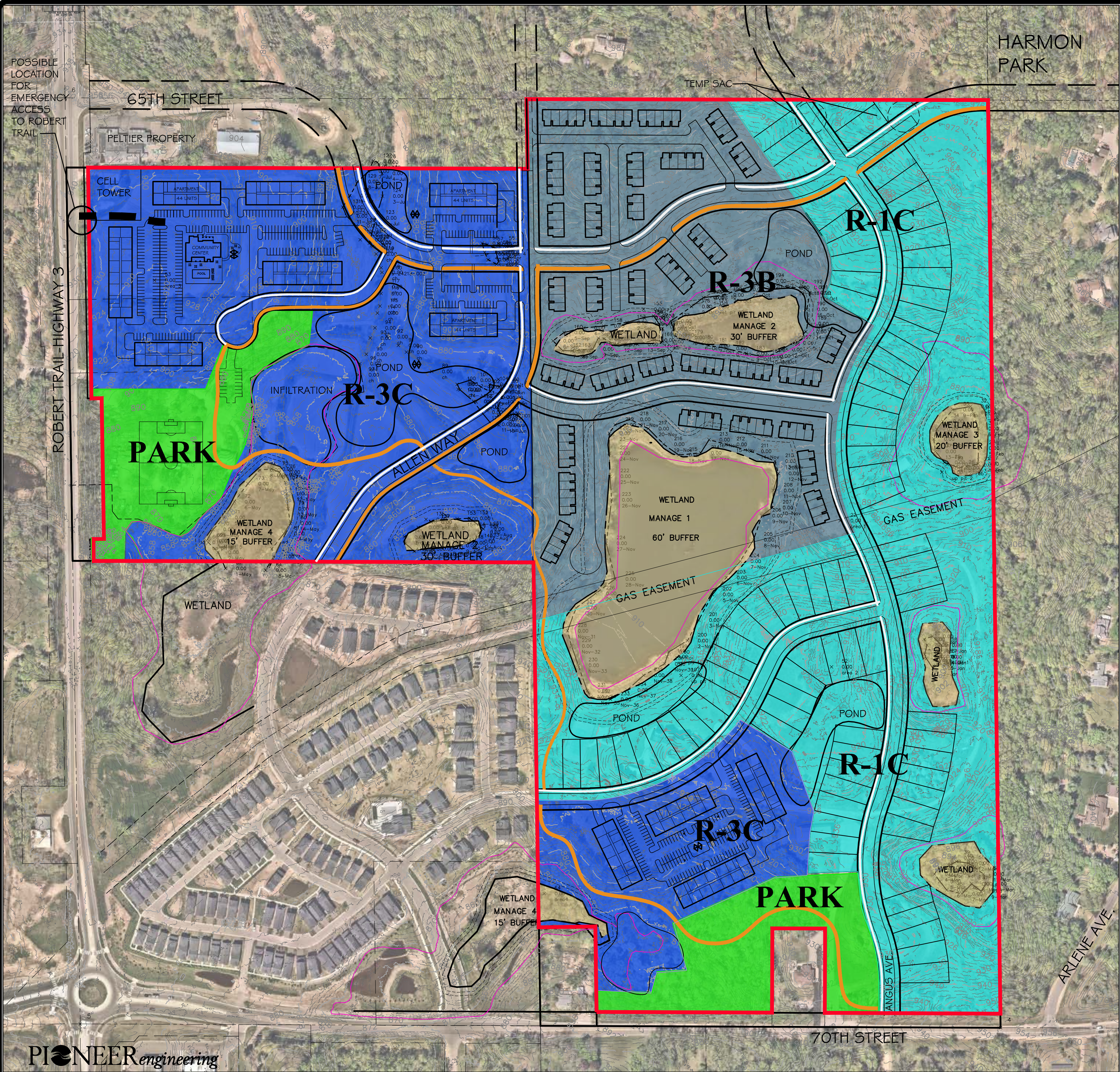




Existing Comprehensive Plan Map

Case No. 24-22PAZ





SITE DATA:

PROJECT AREA: ±108 ACRES GROSS (±77 ACRES ME, ±31 ACRES LUND)
WETLAND: 11 ACES
CELL TOWER AREA: ±0.5 ACRE
DEDICATED PARK: ±8 ACRES (UPLAND ONLY, WETLANDS AND BASINS EXCLUDED)

NET DEVELOPABLE AREA: ±88.5 ACRES

CURRENT ZONING: AG
2040 GUIDE PLAN: LOW DENSITY (1-4 UNITS/ACRE) LUND AND LOW-MEDIUM DENSITY (4-8 UNITS/ACRE) ME PROPERTY AND SOUTHEAST CORNER OF LUND PROPERTY

PROPOSED ZONING: PUD NORTHWEST AREA (R-1C, R-3B, R-3C)

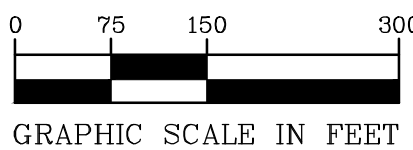
PROPOSED UNITS: 752
APARTMENTS LUND PROPERTY: 340
APARTMENTS ME PROPERTY: 184
TOWNHOME UNITS: 145
50' WIDE SINGLE FAMILY: 83

ZONING WITHIN EACH PRODUCT AREA (NET AREAS EXCLUDE WETLANDS AND DEDICATED PARK)

- R-3C (PUD NW AREA)**
LUND APARTMENTS
NET AREA: ±25.8 ACRES
UNITS: 340
- R-3C (PUD NW AREA)**
ME APARTMENTS
NET AREA: 7.3 ACRES
UNITS: 184
- R-3B (PUD NW AREA)**
ROW TOWNHOMES
NET AREA: 20.9 ACRES
UNITS: 145
- R-1C (PUD NW AREA)**
SINGLE FAMILY DETACHED
NET AREA: 34.5 ACRES
LOTS: 83
- P PUBLIC INSTITUTIONAL**
PARK (±4 ACRES ON WEST SIDE, ±4 ACRES ON EAST)

OPEN SPACE EXCLUDING DEDICATED PARK: ±40 ACRES
20% OPEN SPACE REQUIRED FOR NORTHWEST AREA PUD
(APPROX 22 ACRES REQUIRED)

- PROJECT AREA
- REGIONAL BASIN
- ESTIMATED WETLAND
- PROPOSED TRAIL



Revisions

7-23-2024-adjusted road alignment on site plan



Sanitary sewer may be extended through these areas.
Sanitary sewer location dependent upon grading plans and engineering calculations

SALEM HILLS PARK

HARMON PARK

65TH STREET

FUTURE 65TH ST. EXTENSION

FUTURE 65TH STREET EXTENSION

Location option for an emergency access to Robert Trail

ROBERT TRAIL HIGHWAY 3

Cell Tower

65TH STREET

City Park

Infiltration Basin

ALLEN WAY

ALLEN WAY

ALLEN WAY

70TH STREET

ARLINE AVE.

INVER WOOD VILLAGE

Inver Grove Heights, Minnesota

Site Data:
Net Developable Area: 88.5 Acres

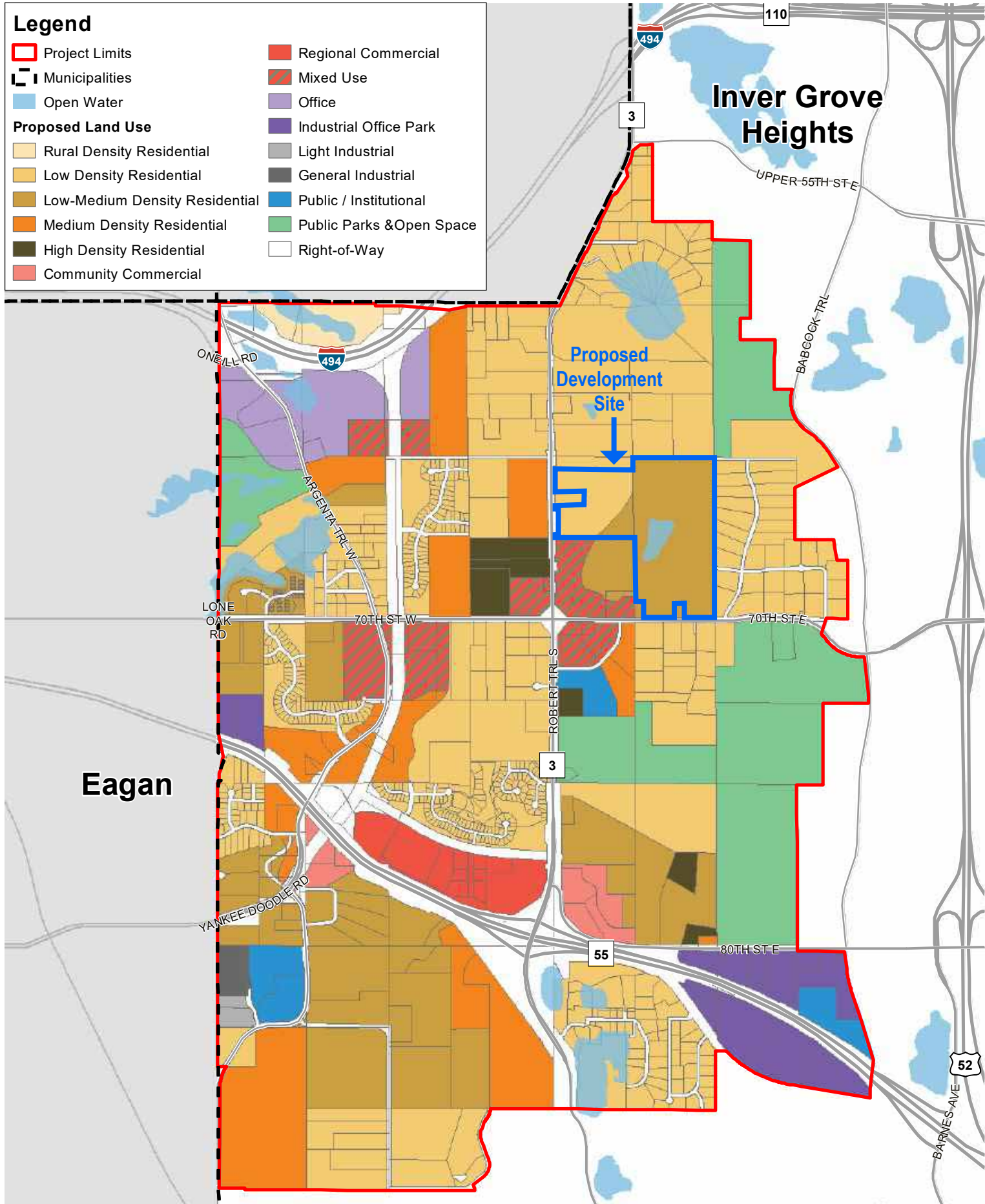
Proposed Units: 752
Single Family: 83
Townhomes: 145
Apartments: 524
Overall Net Density: 8.5 Units/Acre

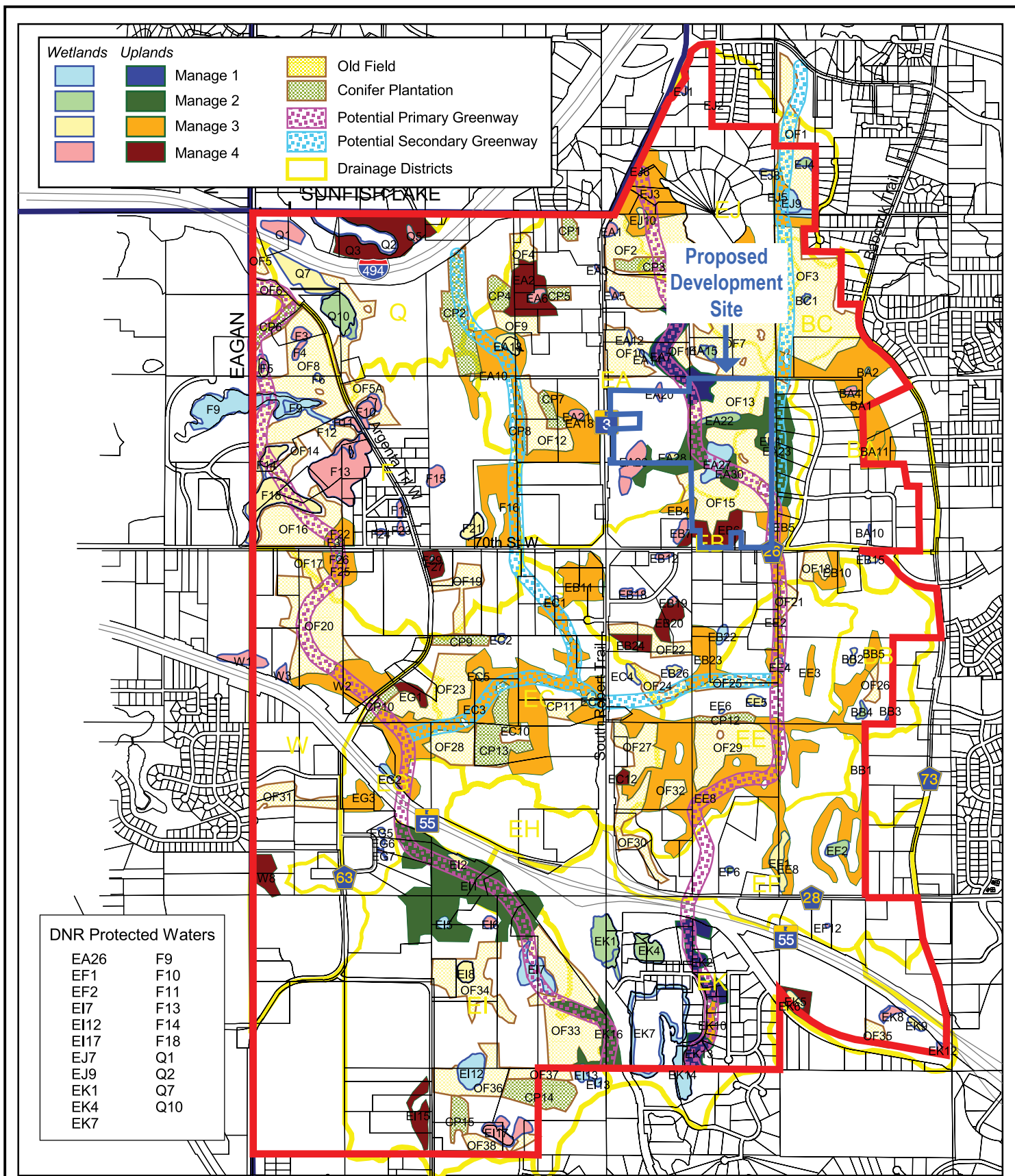
Concept plan is for illustration purposes only and subject to change.

INVER WOOD GOLF COURSE

Attachment B.

Proposed Development Location with the 2020 AUAR Update (Proposed Land Use and Wetland and Upland Management Classification Figures)





City of Inver Grove Heights

Northwest Expansion Area AUAR

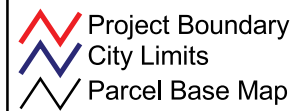
Wetland and Upland Management Classification

Figure 10-3



March 2005

I:\476\47604116\cad\GIS\avprojects\auar.apr



MINNESOTA
ENVIRONMENTAL QUALITY BOARD

Minnesota Environmental Quality Board
520 Lafayette Road North
Saint Paul, MN 55155

VIA E-MAIL (cover letter & petition)

September 24, 2024

Jason Ziemer
Community Development Director
City of Inver Grove Heights
8055 Barbara Avenue
Inver Grove Heights, MN 55077
jziemer@ighmn.gov

RE: Petition for an Environmental Assessment Worksheet for the Proposed
Development on the 108-acre Property located at 6470 & 6680 S. Robert Trail and 1401 70th
Street E.

Dear Jason Ziemer,

The Environmental Quality Board (EQB) received a petition on September 23, 2024 requesting that an Environmental Assessment Worksheet (EAW) be prepared for the project described in the petition, and on September 24, 2024 the EQB determined that the City of Inver Grove Heights is the appropriate governmental unit to decide the need for an EAW.

All requirements for Minnesota's Environmental Review Program, including when review is required and when review is exempt can be found in Minnesota Rules, chapter [4410](#). Please note, a project may not be started, and a final governmental decision may not be made to grant a permit, approve a project, or begin a project, until a decision has been made for this petition. Project construction includes any activities which directly affect the environment, including preparation of land.

The procedures to be followed in making the decision on the enclosed petition (EAW need decision) are found in part [4410.1100](#). Key points in the procedures include:

1. As the designated RGU, you are required to decide the need for preparation of an EAW, considering the evidence presented by the petitioners or otherwise known to you about the nature and location of the project. In making your decision, you should consider the evidence submitted and take into account the factors listed in part [4410.1700](#), subpart 7. Note that these procedures require that a record of decision, including specific findings of fact, be maintained.
2. You have 15 working days from the date of the receipt of this petition to decide on the need for an EAW. (See part [4410.1100](#).)
 - For RGU decisions made by a board, council, or other body which meets on a periodic basis, the time period may be extended by the RGU for an additional 15 days.
 - For RGU decisions not made by a board, council, or other body, the RGU may request an extension from the EQB of up to an additional 15 days.

September 24, 2024

3. You must provide written notification of your final decision to the proposer, the petitioners' representative, and the EQB, within 5 working days of that decision.
 - a. To notify the EQB of your decision on the need for an EAW, please email env.review@state.mn.us. The EQB requests that you include a copy of your record of decision, including instances where environmental review is mandatory, voluntary, or exempt.
4. When notices of decision are sent to EQB, please ensure that:
 - a. Decisions have undergone all foreseeable and applicable local administrative processes.
 - b. The representative providing notices is authorized to do so on behalf of your responsible unit of government.
5. Should you have any concerns about the timelines for final decisions and the timing of any needed processes, please contact the EQB as soon as possible.
6. If for any reason you are unable to act on the petition at this time (e.g., no application has yet been filed or the application has been withdrawn or denied), the petition will remain in effect for a period of one year and must be acted upon prior to any final decision concerning the project identified in the petition. It is recommended that you notify in writing both the petitioners' representative and the EQB if you are unable to act on the petition at the time it is received.

Notice of the petition and its assignment to your unit of government will be published in the *EQB Monitor* on October 1, 2024.

If you have any questions or need any assistance, please do not hesitate to contact us at env.review@state.mn.us or 651-757-2873.

Sincerely,

Sarah Lerohl

Sarah Lerohl
Environmental Review Program
Environmental Quality Board

cc: Karen Van DeVelde, Petitioner's Representative
vandy18@msn.com

Petition for Environmental Assessment Worksheet

To: City Council of Inver Grove Heights &

Date: 9/18/2024

Subject: Request for Environmental Impact Survey for Proposed Development on 108-Acre Property

We, the undersigned residents and concerned stakeholders of Inver Grove Heights, respectfully petition the City Council to conduct a comprehensive Environmental Assessment Worksheet for the proposed development on the 108-acre property located at 6470 & 6680 S. Robert Trail and 1401 70th Street E.

Reasons for Petition:

1. **Environmental Preservation:** The proposed development area encompasses significant natural resources and wildlife habitats that may be adversely affected. An EIS will help identify potential impacts on the local ecosystem, including flora, fauna, and water resources, in accordance with Minnesota Rule 4410.4600.
2. **Community Health and Safety:** The potential development may lead to increased traffic, pollution, and noise, which could negatively impact the health and well-being of nearby residents. A thorough assessment is necessary to evaluate these risks.
3. **Sustainability:** We urge the city to consider sustainable development practices that prioritize the preservation of open space and natural habitats, ensuring a balanced approach to growth and environmental stewardship.

Petitioner's Representative:

Karen Van DeVelde

6565 Arlene Ave.

Inver Grove Heights, MN 55077

651-402-2215

vandy18@msn.com

Signature	Name First/last	Address	Date	Count
Diane Rademacher	Diane Rademacher	6560 Arlene Ave 55077	8-12-24	H
Nancy Linn	NANCY COLLIER	1286 70th St E 55077	8-12-24	5
Don Hegg	Don Hegg	6985 ARLENE AVE 55077	8/12/24	26
Deb Cook	Deb Cook	6805 Athena Way 55077	08-12-24	M
Mary Cook	Mary Cook	6805 Athena Way 55077	8-12-24	8
Dustin Oehler	Dustin Oehler	6835 Athena Way 55077	8-12-24	29
Jayne Deeb	Jayne Deeb	6810 Arlene 55077	8-12-24	210
David D. VanDeKilde	DAVID VanDeKilde	6565 Arlene Ave 55077	8-13-24	11
Steve Rademacher	Steve Rademacher	6560 Arlene Ave 55077	8-13-24	12
Kristen Olson	Kristen Olson	6556 Arlene Ave 55077	8-13-24	13
Mary Hillegas	Mary Hillegas	6755 Arlene Ave 55077	8-19-24	14
Craig Hillegas	Craig Hillegas	6755 ARLENE AVE 55077	8-19-24	15
Rue Shigita	6190 S. Robert	6190 S. Robert 55077	8/19/24	16
Larry Nelson	Larry Nelson	6855 Arlene Ave 55077	8/19/24	17
Lynne Nelson	Lynne Nelson	6855 Arlene Ave 55077	8/19/24	18
Crissy Willig	Crissy Willig	6930 Athena Way 55077	8/21/24	19
Paul Willig	PAUL WILLIG	6830 ATHENA WAY 55077	8/21/24	20
Gene Ruthen	Gene Ruthen	6605 Arlene Ave 55077	8/22/24	21
Marcia Ruthen	Marcia Ruthen	6605 Arlene Ave 55077	8/22/24	22
Andy Hansen	Andy Hansen	6950 Arlene Ave 55077	8/22/24	23

Travis Evans	Travis Evans	3516 77th St E IGH 55076	8/11/24	26
Lu Kostant	Lillian Kallestad	441 Sidney St. E St Paul, MN 55107	8/11/24	27
Wyndsey Voss	Wyndsey Voss	7633 Cody Ln, IGH 55076	8/11/24	28
Griffin Voss	Griffin Voss	7633 Cody Ln, IGH 55076	8/11/24	29
X Maddox Voss	X Maddox Voss	7633 Cody Lane 55076	8/11/24	30
				31
				32
Maurice A. Nelson	Maurice A. Nelson	Contact/651-848-1511 3150 78th St. E. IGH	8/11/24	33 ³¹
Annmarie	Annmarie	2301 California St Minneapolis MN	8/11/24	34 ³²
Brenda Soto	Brenda Soto	17401 Kenyon Ave. trlr 56, Lakeville, MN	8/11/24	35 ³³
Patti Williams	Patti Williams	2680 Boudreau Ct. IGH	8/11/24	36 ³⁴
Gary Williams	Gary Williams	268 Boudreau Ct IGH	8/11/24	37 ³⁵
Tim Demma	Tim Demma	2695 Boudreau IGH	8/11/24	38 ³⁶
Marilynn Demma	MARILYNN DEMMA	2695 Boudreau IGH	8/11/24	39 ³⁷
Narissa Demma	Narissa Demma	2695 Boudreau IGH	8/11/24	40 ³⁸
Krista Arnold	Krista Arnold	3500 78th St. E. 55076	8/11/24	41 ³⁹
School	School	3501 78th Street East 55076	8/11/24	42 ⁴⁰
Angie Scott	Angie Scott	55076 1300 Clayton Ave E	8/11/24	43 ⁴¹
Mario Martinez	Mario Martinez	55076 5752 Carlson Ave NW	8-11-24	44 ⁴²
Naomi Joshua	Naomi Joshua	686 Bedford 55076	8/11/24	45 ⁴³

Thuse Bussan	Thomas Bussan	3561 E 78 th St IGH	8-11-24	5
Judith A. Bussan	Judith A. Bussan	3561 E 78 th St IGH	8-11-24	6
Ronald Tolsma	Ron Tolsma	3605 E 78 th St IGH	8-11-24	7
Lori Tolsma	Lori Tolsma	3605 78 th St IGH	8-11-24	8
Monica Buerzow	Monica Buerzow	3635 78 th St IGH	8-11-24	9
Steve Buerzow	STEVE Buerzow	3635 78 th St IGH	8-11-24	10
Matt Burr	Matt Burr	3681 78 th St IGH	8-11-24	11
Becky Amundson	Becky Amundson	3695 78 th St IGH	8-11-24	12
J. J. Thurn	Jillien Thurn	7830 Conroy Way IGH	8-11-24	13
Chelsi Marks	Chelsi Marks	7844 Conroy Way IGH	8-11-24	14
Tony Schnab	Tony Schnab	7835 Conroy Way 55076	8/11/24	15
Travy Binger	Travy Binger	3767 78 th St E 55076	8-11-24	16
Dan GREISINGER	Dan GREISINGER	3753 77 th St E 55076	8/11/24	17
Carolyn Ryan	Carolyn Ryan	3710 77 th St E 55076	8/11/24	18
Rachel Ryan	Rachel Ryan	3710 77 th St E 55076	8/11/24	19
Jessica Ross	Jessica Ross	3634 77 th St E 55076	8/11/24	20
Nick Ross	Nick Ross	3634 77 th St E 55076	8/11/24	21
JERRY	JERRY	3609-77 th St E 55076	22	22
Sheldon Ledbetter	Sheldon Ledbetter	3595 77 th St E 55076	8-11-24	23
Matt Longworth	Matt Longworth	3574 77 th St E 55076	8/11/24	24
Matt Stoffel	Matt Stoffel	3574 77 th St E 55076	8/11/24	25

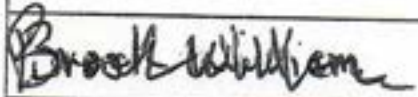
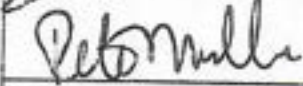
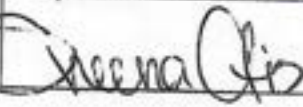
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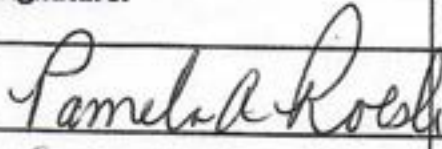
Signature	name Print First/Last	Address	Date	Count
	Lesley Dean	4752 Blaylock Way IGH, MN 55076	8-13-24	
Mary Burns	Mary Burns	7610 Banning Way IGH MN 55076	8/13/24	
Judy Akemann	JUDY AKEMANN	8728 Callahan Trl I.G.H. MN 55076	8/13/24	
Terry Akemann	TERRY AKEMANN	8728 CALLAHAN Trl Inver Grove Hts, MN 55076	8/13/24	
Nancy Todd	Nancy Todd	6125 Bowman Ave E I.G.H., MN 55076	8/13/24	
Joy Schmitt	Joy Schmitt	8575 Asiatic Ave IGH MN 55076	8-13-24	
Georgann Dean	Georgann Dean	4752 Blaylock Way I.G.H., MN 55076	8-13/24	
Bruce Brun	Bruce Brun	7610 Banning Way 55077	8/13/24	
Mark Reeder	Mark Reeder	7610 Banning Way 55077	8/13/24	
Maureen Fahy	Maureen Fahy	13970 Pennock Ave Apple Valley MN 55124	8/13/24	
Erin Fahy	Erin Fahy	13970 Pennock Ave Apple Valley, MN 55124	8/13/2024	
Jennifer Dean	Jennifer Dean	3255 78th St IGH MN 55076	8-13-24	
Caiden Hiles	Caiden Hiles	9700 hudson blvd 55076	8-16-24	
Devan Dunbar	Devan Dunbar	9700 Hudson blvd 55077	8-16-24	
Adeline Sobiech	Adeline Sobiech	801 Lindbergh Dr. South Little Falls MN 56123	8/17/24	
Amber Sobiech	Amber Sobiech	801 Lindbergh Dr Little Falls MN	8/17/24	
Judy Jarman	Judy Jarman	312 23rd Ct. S. South St. Paul, MN 55075	9/5/24	
Mary Beth Serlie	Mary Beth Serlie	308 23rd Court S. St. Paul MN	9-5-24	
Vicki Lough	Vicki Lough	55P 227 17th Ave N	9-5-24	
Reegyn Waldman	Reegyn Waldman	SSP	9-5-24	

Donald Miller	Amanda Ludescher	3545 77th St E. 55076	8/13/24	64
Olivia Jenkins	Olivia Jenkins	5455 Bryce Ave. 55076	8/13/24	65
Hunter Overland	HUNTER OVERLAND	3992 77th St E. 55076	8/14/24	66
Justin Overland	Justin Overland	3992 77th St E. 55076	8/14/24	67
Teen Star	Tecara Jensen	3441-78th IGH	8-14-24	68
Jasier R	Jasier R	651-332 IGH	8-14	69
Mymy B.	Mymy B	55076	8-14	70
Leshi Lemboche	Leshi Lemboche	8410 Cooper Way 55076	8-14-24	71
Amy Will	Amy Williamson	7311 Clay Ave IGH	8/14/24	72
Abraham Dorte	Abraham Dorte	7952 Charles Way IGH	8/14/24	73
Adam Ganser	Adam Ganser	6530 Hickory St. NE 55076	8/18/24	74
MARISSA SANIEJA	MARISSA SANIEJA	55076	9/1/24	75
				76
				77
				78
				79
				80
				81

Vivian Joshua	Vivian Joshua	6036 Sumter Ave N IGH	11	44
Kyrian Jimenez	Kyrian Jimenez	10030 Sumter Ave S IGH	11	45
Emil Gordon	Emil Gordon	1125 77th St NE alameda IGH	11	46
Calvin Koller	Calvin Koller	6521 Humboldt Ave IGH	08/11/24	47
Megan Miles	Megan Miles	3235 88th St IGH	11	48
Dan Van	Dan Van	5704 74th St IGH	8-11-24	49
Milane Nedo	Milane Nedo	3704 74th St IGH	8-11-24	50
Iris Mendez	Iris Mendez	7690 Dawn Ave 55076	8-11-24	51
Lose Ortiz	Lose Ortiz	7690 Dawn Ave 55076	8/11/24	52
Ruben E. Gaona	Ruben E. Gaona	5595 77th St 55076	8-12-24	53
JALYN JIMENEZ	JALYN JIMENEZ	3775 72nd St W 55076	8-12-24	54
Kristin Brown	Kristin Brown	55076	8-12-24	55
JAY A. BIGGS	JAY A. BIGGS	1590 110th Court W 55077	8.12.24	56
Kenneth E. Ewald	Kenneth E. Ewald	55057	8.12.24	57
NIKITA WEISSLER	NIKITA WEISSLER	55018	8/13/24	58
Shelley McLees	Shelley McLees	7332 Clay Ave 55076	8/13/24	59
Ferri Allen	Ferri Allen	8309 78th St 55076	8.13.24	60
Theodore Lojovich	Theodore Lojovich	3940 Upper 73rd St E 55076	8/13/24	61
Michelle Lojovich	Michelle Lojovich	3940 Upper 73rd St E 55076	8/13/24	62
Notre Briget	Notre Briget	7830 Corey Rd IGH	8-13-24	63

Signature:	Print First/Last Name:	Address:	Dates:	Count
	Karen Van DeLede	6505 Arlene Ave 55077	8/12	1
	Theresa Petersen	1525 Arlene Ave 55077	8/12	2
	Timothy Petersen	6505 Arlene Ave 55077	8/12	3

Signature:	Print First/Last Name:	Address:	Dates:	Count
	Brook Williams	3515 78th St E, 55077	8/10/24	1
	Wade Williams	3515 78th St E, 55076	08/10/24	2
	Peter Muller	3482 76th St E 55076	8/10/24	3
	Dreena Otis	1515 Claugen Way #1 55076	8/10/24	4

Signature:	Print First/Last Name:	Address:	Dates:	Count
	P Roester Pamela	7605 Banning Way 55077	8/13/24	1
	Sue Erickson	7113 Ball and Trl 55077	8-13-24	1

Name City State Postal Code Country Signed On

~~Karen VanDeVelde~~ ~~US~~ ~~2024-08-21~~

Suzanne Aten Inver Grove Heights MN 55077 US 2024-08-22 - 8355 Angus Ave

Alicja Granias Inver Grove Heights MN 55076 US 2024-08-22 - 4619 Bower Path

Lisa Stout Fairmont MN 56031 US 2024-08-22 - 133 Maple St.

Lorri Dankers Eagan MN 55122 US 2024-08-22 - 8388 Claymore

Kathryn West Saint Paul MN 55118 US 2024-08-22 214 Cutrice St. W

Karen Tennis Inver Grove Heights MN 55077 US 2024-08-22 1878 54th Court E

Raul Ruiz Saint Paul MN 55118 US 2024-08-22

Gayle Wallace Inver Grove Heights MN 55077 US 2024-08-22 4932 Rich Valley Blvd

BONNY TROYE SUNFISH LAKE MN 55077 US 2024-08-22 5500 Cenex Dr.

carrie willig Rosemount MN 55068 US 2024-08-22 16535 Flagstaff Ave W

Allison Loew Inver Grove Heights MN 55077 US 2024-08-22 1490 Upper 55th S.E

Joan Duncanson Elbert INVER GROVE HEIGHTS MN 55077 US 2024-08-22 8569 Alverno Av.

Catherine Prokopowicz Inver Grove Heights MN 55077 US 2024-08-23 1850 58th Court E

J Johnson Inver Grove Heights MN 55077 US 2024-08-23 5440 Audobon Ave

Evelyn Duchene Eagan MN 55123 US 2024-08-23 6950 Cleve Ave

Jane Lavole Saint Paul MN 55105 US 2024-08-23 2127 Iglehart Ave

Kathy Hesse Edina MN 55439 US 2024-08-23 5601 Dewey Hill Rd Apt 212

Sue Filpp Hastings MN 55033 US 2024-08-23 562 Marmik Circle

~~Abby Robinson~~ ~~Baldwin~~ ~~LA~~ ~~70514~~ ~~US~~ ~~2024-08-23~~

~~gabe knipp~~ ~~Charlotte~~ ~~NC~~ ~~28202~~ ~~US~~ ~~2024-08-24~~

~~Suzanne White~~ ~~Lebanon~~ ~~PA~~ ~~17042~~ ~~US~~ ~~2024-08-24~~

Kate Van De Velde White Bear Lake MN 55110 US 2024-08-24 250 Bruening Ct

~~Judith Rasor~~ ~~San Antonio~~ ~~TX~~ ~~78201~~ ~~US~~ ~~2024-08-24~~

Victoria Lawrence Inver Grove Heights MN 55077 US 2024-08-25 11542 Avery Dr

Ashley Brptzel Minneapolis MN 55413 US 2024-08-25

~~McKenzie Terry~~ ~~Saint Petersburg~~ ~~FL~~ ~~33702~~ ~~US~~ ~~2024-08-25~~

Kayla Ravn Inver grove heights MN 55077 US 2024-08-25 8108 Barbara Ave

Courtney Reckinger Inver Grove Heights MN 55076 US 2024-08-25 8495 Delaney Ct

Ronald Teo Saint Paul MN 55077 US 2024-08-25 1080 82nd St. E

Kirstin Petersen Inver Grove Heights MN 55077 US 2024-08-25 6525 Arlene Ave

Robert Lundquist Eagan MN 55077 US 2024-08-26 3435 Washington Dr #203

Katie Kocourek Saint Paul MN 55118 US 2024-08-26 605 High Ridge Circle

Hunt Kathleen Inver Grove Heights MN 55076 US 2024-08-26 2602 49th St E

Tamara Martin Saint Paul MN 55114 US 2024-08-26 988 County Rd D

~~Kierra Miller Pigeon MI 48755 US 2024-08-26~~

James L Lauck Jr Eagan MN 55123 US 2024-08-26

Dawn Lauck Inver Grove Heights MN 55077 US 2024-08-26

Wendy Connell Inver Grove Heights MN 55076 US 2024-08-26

~~Graig Hillegas Eagan MN 55123 US 2024-08-26~~

Kelly Stadelman Inver Grove Hts MN 55077 US 2024-08-26

Brenna McCarthy Inver Grove Heights MN 55077 US 2024-08-27

John Stadelman Inver Grove Heights Saint Paul MN 5507755113 US 2024-08-27

~~Gloria Navan Lawrenceville GA 30042 US 2024-08-27~~

~~Becky Walls Ninety Six SC 29666 US 2024-08-28~~

~~Cynthia Allen Lawre GA 30043 US 2024-08-29~~

6785 Athena Way

6785 Athena Way

5375 Audobon Ave unit 106

63rd East St.

13158 Izanti St Me

1695 63rd St

Dear Inver Grove Heights Officials,

I am writing to you regarding the upcoming Zoning Change Proposal on the Planning Commission Agenda on 9/17/2024 concerning the proposed development located at 6470 & 6680 S. Robert Trail and 1401 70th Street E. I am hoping that the following Minnesota Statutes will be useful in your decision, as there has not been an Environmental Impact Statement (EIS) prepared for this Zoning Change Proposal. Without this information, it would be impossible for the Planning Commission to make an informed decision regarding this matter.

Pursuant [Minnesota Statute Sec. 116D.04\(a\)](#), an Environmental Impact Statement is required "Where there is potential for significant environmental effects resulting from any major governmental action, the action must be preceded by a detailed environmental impact statement prepared by the responsible governmental unit."

Additionally, pursuant [Minnesota Statute Sec. 116D.04\(e\)](#), "An environmental assessment worksheet must also be prepared for a proposed action whenever material evidence accompanying a petition by not less than 100 individuals who reside or own property in the state, submitted before the proposed project has received final approval by the appropriate governmental units, demonstrates that, because of the nature or location of a proposed action, there may be potential for significant environmental effects."

Following the authority granted by Minnesota Statute Sec. 116D, [Minnesota Rules Part 4410.2000](#) Subpart 2 states "An EIS shall be prepared for any project that meets or exceeds the thresholds of any of the EIS categories listed in part 4410.4400."

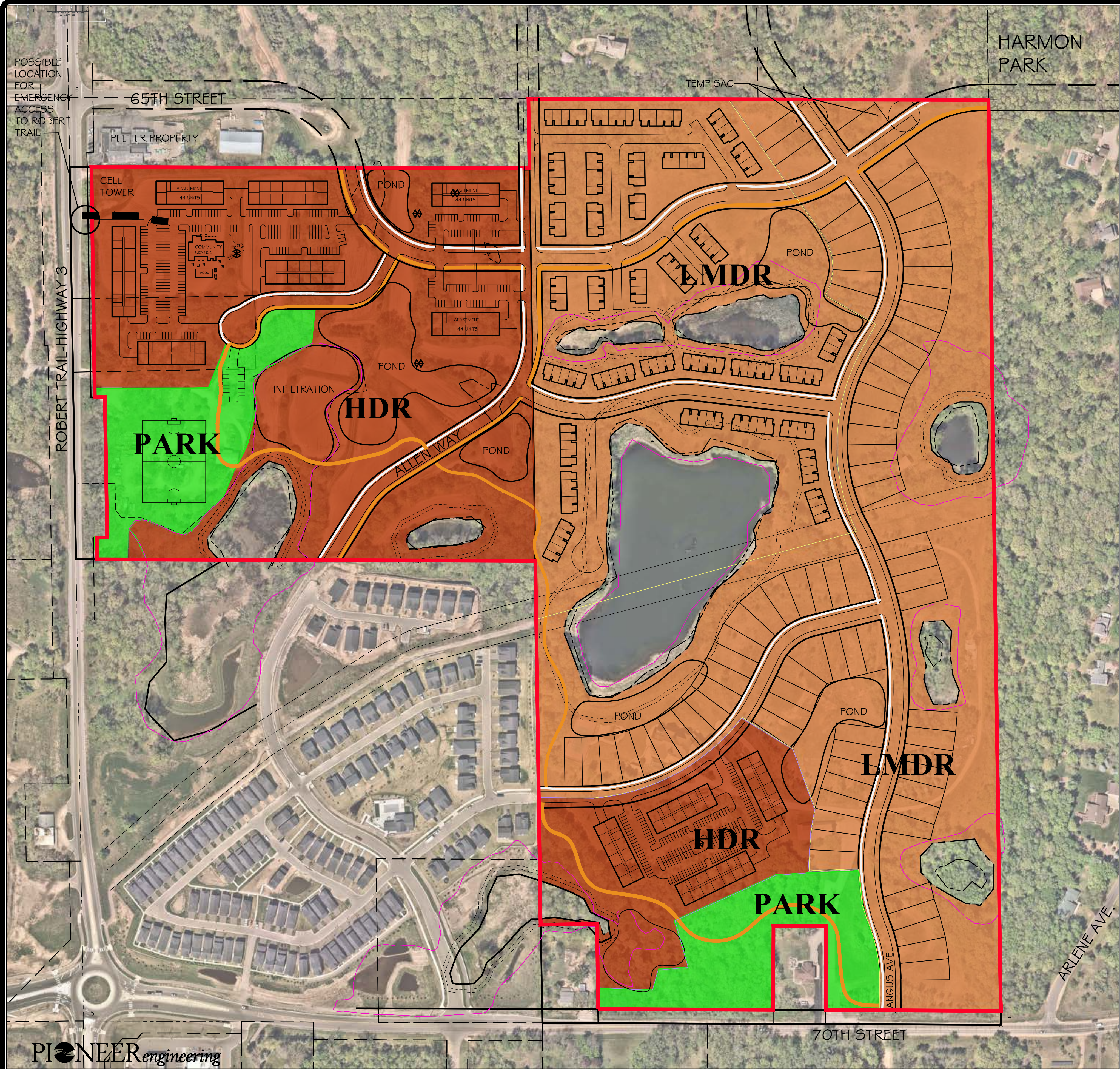
[Minnesota Rules Part 4410.4400](#) states "An EIS is required for residential development if the total number of units that the proposer may ultimately develop on all contiguous land owned by the proposer or for which the proposer has an option to purchase, [...] equals or exceeds a threshold of this subpart.". This threshold, as described in [Minnesota Rules Part 4410.4400 Subpart 14 \(A\)](#) is 400 units, which is exceeded by this proposal, no matter how it is broken up into smaller contiguous plats.

The Inver Grove Heights City Council and Planning Commission should be aware of the attached petition by residents regarding this Zoning action and the relevant Minnesota Statutes this Zoning Change may breach. Beyond the legal ramifications for the City of Inver Grove Heights, the Planning Commission commencing a vote on this major change to the wild spaces in Inver Grove Heights without information on the environmental impact can be considered deeply unethical.

We urge the Planning Commission to remove this from their agenda until a proper Environmental Impact Statement has been prepared for this zoning change.

Thank you,

Concerned Residents and Stakeholders of Inver Grove Heights



SITE DATA:

PROJECT AREA: ±108 ACRES GROSS (±77 ACRES ME, ±31 ACRES LUND)
WETLAND: 11 ACES
CELL TOWER AREA: ±0.5 ACRE
DEDICATED PARK: ±8 ACRES (UPLAND ONLY, WETLANDS AND BASINS EXCLUDED)

NET DEVELOPABLE AREA: ±88.5 ACRES

CURRENT ZONING: AG
2040 GUIDE PLAN: LOW DENSITY (1-4 UNITS/ACRE) LUND AND LOW-MEDIUM DENSITY (4-8 UNITS/ACRE) ME PROPERTY AND SOUTHEAST CORNER OF LUND PROPERTY

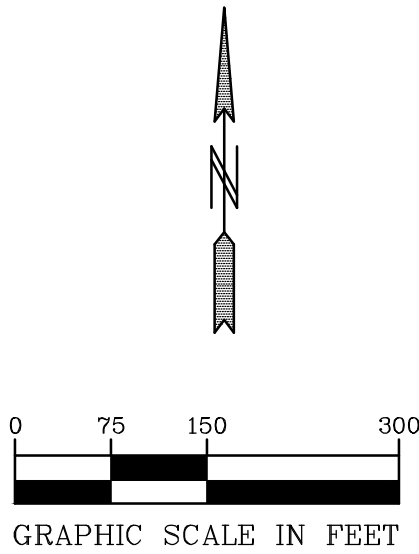
PROPOSED ZONING: PUD NORTHWEST AREA (R-1C, R-3B, R-3C)

PROPOSED UNITS: 752
APARTMENTS LUND PROPERTY: 340
APARTMENTS ME PROPERTY: 184
TOWNHOME UNITS: 145
50' WIDE SINGLE FAMILY: 83

PROPOSED LAND USE WITHIN EACH PRODUCT AREA
(NET AREAS EXCLUDE WETLANDS AND DEDICATED PARK)

- HIGH DENSITY RESIDENTIAL (12+ UNITS/ACRE)**
LUND APARTMENTS
NET AREA: ±25.8 ACRES
UNITS: ±340
NET DENSITY: ±13.1 UNITS/ACRE
- HIGH DENSITY RESIDENTIAL (12+ UNITS/ACRE)**
ME APARTMENTS
NET AREA: 7.3 ACRES
UNITS: ±184
NET DENSITY: 25.2 UNITS/ACRE
- LOW-MEDIUM DENSITY RESIDENTIAL (4-8 UNITS/ACRE)**
THE CURRENT LAND USE: NO AMENDMENT IN THIS AREA
SINGLE FAMILY AND ROW TOWNHOMES
NET AREA: 55.4 ACRES
UNITS: ±228
NET DENSITY: 4.1 UNITS/ACRE
- PUBLIC PARKS AND OPEN SPACE (±4 ACRES ON WEST SIDE, ±4 ACRES ON EAST)**

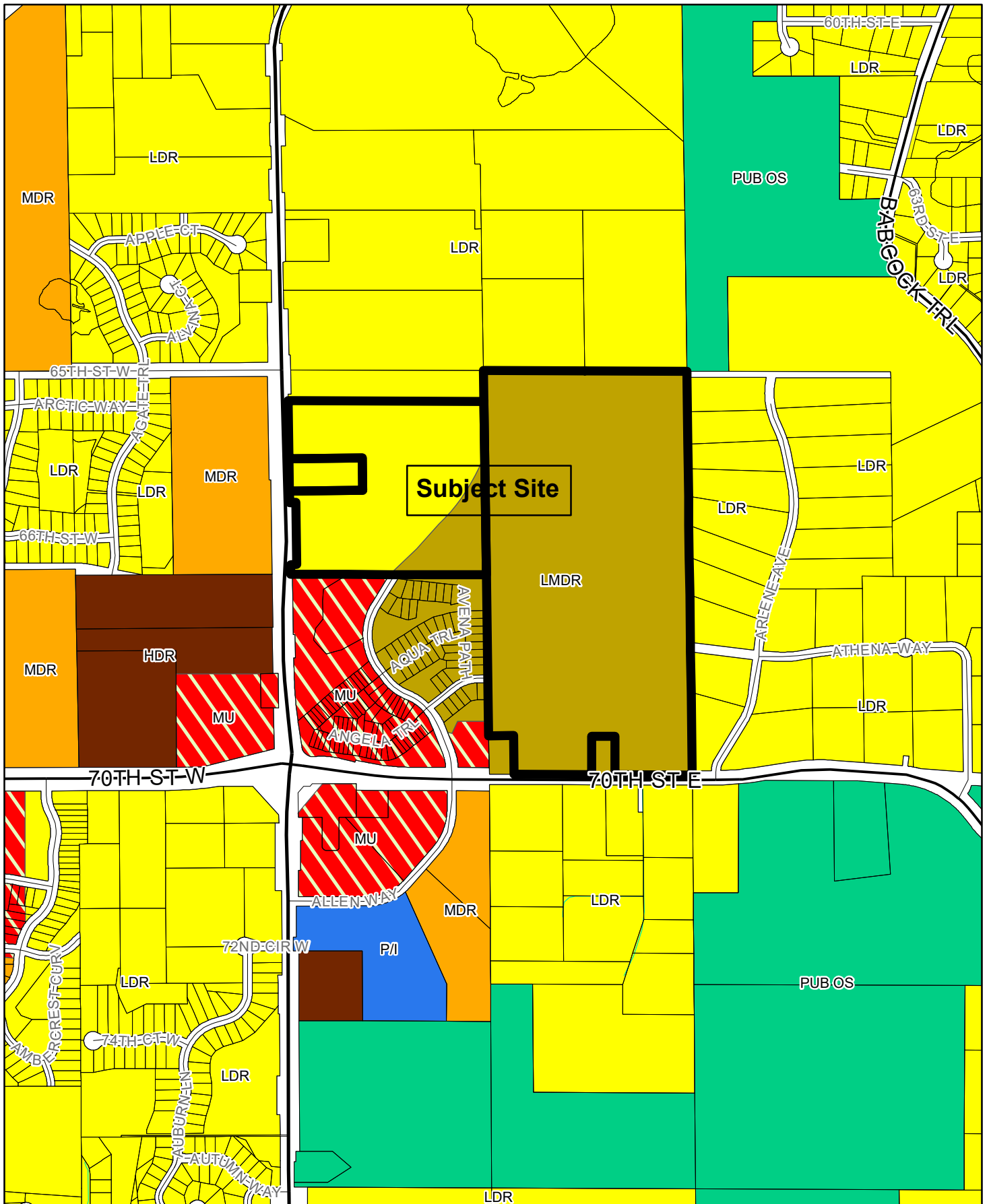
- PROJECT AREA
- REGIONAL BASIN
- ESTIMATED WETLAND
- PROPOSED TRAIL

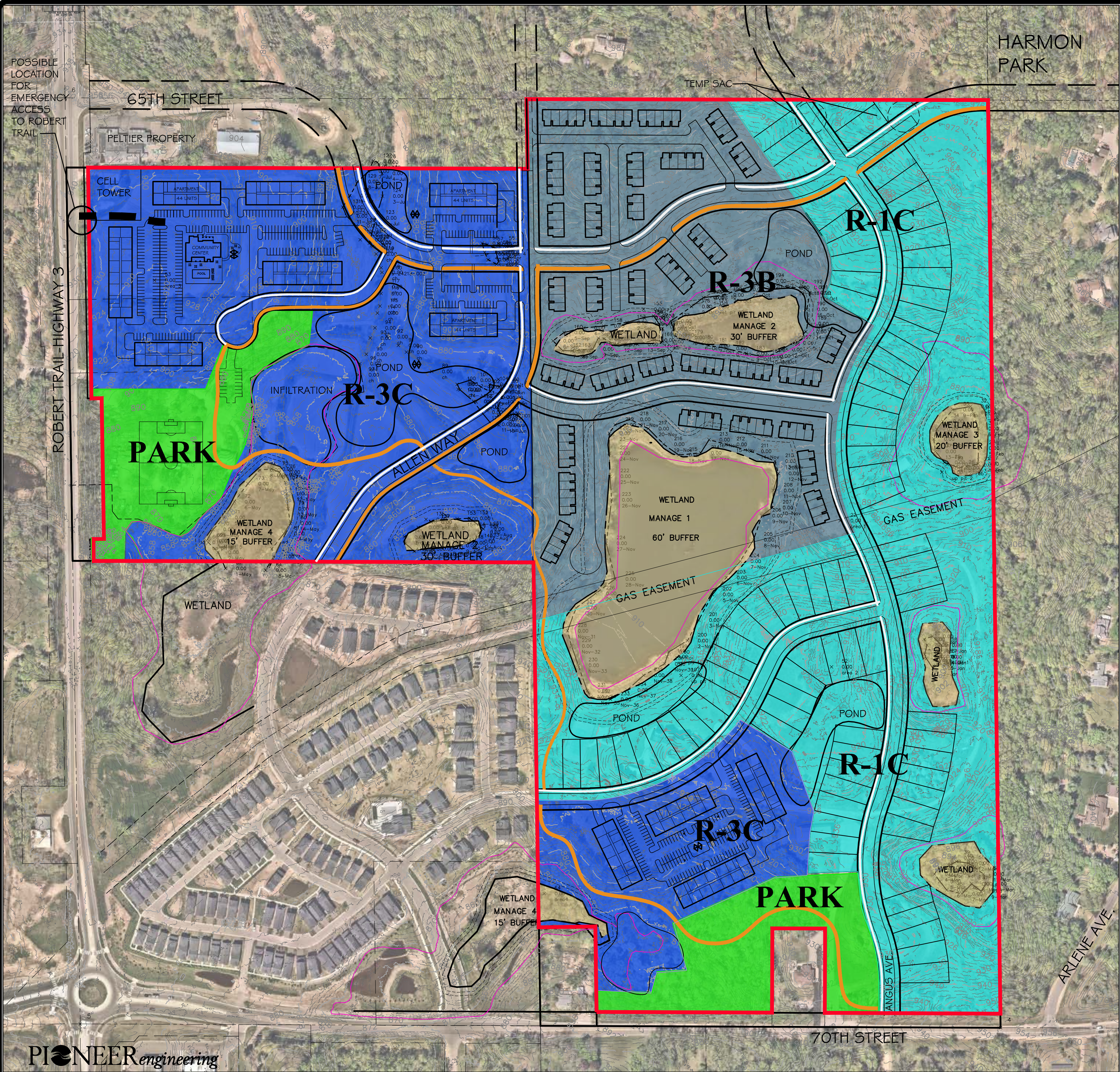




Existing Comprehensive Plan Map

Case No. 24-22PAZ





SITE DATA:

PROJECT AREA: ±108 ACRES GROSS (±77 ACRES ME, ±31 ACRES LUND)
WETLAND: 11 ACES
CELL TOWER AREA: ±0.5 ACRE
DEDICATED PARK: ±8 ACRES (UPLAND ONLY, WETLANDS AND BASINS EXCLUDED)

NET DEVELOPABLE AREA: ±88.5 ACRES

CURRENT ZONING: AG
2040 GUIDE PLAN: LOW DENSITY (1-4 UNITS/ACRE) LUND AND LOW-MEDIUM DENSITY (4-8 UNITS/ACRE) ME PROPERTY AND SOUTHEAST CORNER OF LUND PROPERTY

PROPOSED ZONING: PUD NORTHWEST AREA (R-1C, R-3B, R-3C)

PROPOSED UNITS: 752
APARTMENTS LUND PROPERTY: 340
APARTMENTS ME PROPERTY: 184
TOWNHOME UNITS: 145
50' WIDE SINGLE FAMILY: 83

ZONING WITHIN EACH PRODUCT AREA (NET AREAS EXCLUDE WETLANDS AND DEDICATED PARK)

- R-3C (PUD NW AREA)**
LUND APARTMENTS
NET AREA: ±25.8 ACRES
UNITS: 340
- R-3C (PUD NW AREA)**
ME APARTMENTS
NET AREA: 7.3 ACRES
UNITS: 184
- R-3B (PUD NW AREA)**
ROW TOWNHOMES
NET AREA: 20.9 ACRES
UNITS: 145
- R-1C (PUD NW AREA)**
SINGLE FAMILY DETACHED
NET AREA: 34.5 ACRES
LOTS: 83
- P PUBLIC INSTITUTIONAL**
PARK (±4 ACRES ON WEST SIDE, ±4 ACRES ON EAST)

OPEN SPACE EXCLUDING DEDICATED PARK: ±40 ACRES
20% OPEN SPACE REQUIRED FOR NORTHWEST AREA PUD
(APPROX 22 ACRES REQUIRED)

- PROJECT AREA
- REGIONAL BASIN
- ESTIMATED WETLAND
- PROPOSED TRAIL



Sanitary sewer may be extended through these areas.
Sanitary sewer location dependent upon grading plans and engineering calculations

Location option for an emergency access to Robert Trail

INVER WOOD VILLAGE

Inver Grove Heights, Minnesota

Site Data:
Net Developable Area: 88.5 Acres

Proposed Units: 752
Single Family: 83
Townhomes: 145
Apartments: 524
Overall Net Density: 8.5 Units/Acre

Concept plan is for illustration purposes only and subject to change.

Date: June 17, 2024

To: City of Inver Grove Heights

From: Pioneer Engineering, Inc. John Molinaro, President
National Land Holdings, LLC (the "Developer")

Re: Inver Hills Village
Lund and M&E Properties Comprehensive Plan Amendment and Re-Zoning
6570 South Robert Trail Inver Grove Heights, MN 55077
6680 South Robert Trail Inver Grove Heights, MN 55077
1401 70th Street East, Inver Grove Heights, MN 55077

Thank you for taking the time to review this application for amendment of the City's Comprehensive Plan and rezoning.

The Properties

The project area consists of approximately 31 gross acres on the Lund property and 77 acres on the M&E property for a total of 108 acres. Land parcels are located on the east side of Highway 3 and north of 70th Street. This property is directly north of the newly platted Canvas at Inver Grove Heights development and west of Inver Grove Acres. Parcels are comprised of rolling terrain with areas of woodland, regional basins, and wetlands.

Comprehensive Plan

The project plan addresses a number of objectives identified in planning for development of the Northwest Area which were incorporated in the City's 2040 Comprehensive Plan.

- Utilize recent investments in sewer and water infrastructure;
- Update and adjust land uses based on development constraints, property owner interests, capital improvement costs and market conditions;
- Guide development to ensure infrastructure investments are adequately funded;
- Utilize Planned Unit Development Process (PUD);
- Focus new development within the Northwest Area while ensuring that mitigation measures preserve and protect the environment;
- Continue implementing the Northwest Area zoning ordinances as a model for innovative stormwater management and development patterns;
- Manage stormwater within the development utilizing infiltration methods;
- Provide for a fair and reasonable open space pattern;

- Acquire parks in the Northwest Area for new planned residential growth, including neighborhood parks; and
- Provide trail connections to open space, parks, and regional trail system.

Land Use

The property currently has two land use designations. The majority of the site north of Allen Way on the Lund property is low density residential allowing 1-4 units/acre. However, staff recommended higher density in close proximity to Robert Trail. The entirety of the M & E property and the far southeast corner of the Lund property are designated low-medium density residential allowing 4-8 units/acre. This application is requesting a Comprehensive Plan amendment allowing different land use designations throughout the project area. Single family homes will fall into low density (1-4 units/acre), the townhome area will remain at low-medium density (4-8 units/acre), and the two apartment areas will be high density residential (12+ units/acre).

We understand the City has recently approved Comprehensive Plan amendments to reguide a number properties in the Northwest Area to lower density than designated in the Comprehensive Plan. This was due to physical constraints of the rolling, wooded Northwest Area that has regional basins and wetlands, but also due to the market demands of the past 10-15 years. The Developer proposes to increase the density for portions of the property as there is demand in this market for higher density apartments in addition to townhomes and single-family lots creating a mixed-use development with life cycle housing suitable for several demographics. Sewer capacity studies are completed and the concept plan is within sewer capacity limits.

Proposed land use designations are depicted on the submitted concept plan. Apartments border Highway 3 to the west, a commercial property and ultimately 65th Street to the north. Apartments shown on the M&E property are located north of 70th Street. The south end of the Lund property proposes a large buffer comprised of open space, dedicated park, and wetlands providing separation to the Canvas development. The eastern portion of the development provides a buffer of land between the proposed single family homes and the existing single family homes in Inver Grove Acres.

Zoning

As part of the Northwest Area, the developer is submitting an application for a rezoning to PUD, as required. Proposed is an overlay of the PUD onto zoning districts most suitable for the underlying products and Comprehensive Plan land uses. The Developer is requesting rezoning the single family area to R-1C PUD, the townhomes to R-3B PUD, and the apartments to R-3C PUD. The goal of the concept plan is to create mixed-use neighborhood fully compliant with the letter of both the zoning ordinance and the comprehensive plan.

Infrastructure

The property is served by sewer and water extension from the south through the Canvas development. It has been determined by the City engineer and third-party consulting engineer that there is infrastructure capacity to serve 340 units on the Lund property and 412 units on the M & E property. Sanitary sewer is entirely gravity, and no lift stations are anticipated.

Allen Way will continue north from Canvas to the proposed 65th street extension. A sidewalk and a trail abut Allen Way.

The 65th Street Extension has been discussed for many years. After substantial discussion with City staff, Planning Commission, City Council, and area residents, the City determined the best alignment options for a future 65th Street extension is from the intersection at Robert Trail following the natural contours of the land through the development to the northeast corner of the M&E property on the south side of Harmon Park. Right of way for 65th Street is proposed at 74-feet in width, starting at the intersection north of the Peltier property on Robert Trail and continuing east past the commercial buildings. It will extend through the Lund property to the east, through the northerly portion of the project, and then to the northeast corner of the project area. This road will have limited individual driveway access and will conform to all City engineering standards for a collector road including minimum curve radii. A trail is proposed on one side of 65th Street and a sidewalk on the other side.

Park and Open Space

As part of a PUD in the Northwest Area, a minimum of 20% is required open space. The site plan exceeds this requirement. Substantial open space is proposed along the eastern boundary and southern Lund boundary adjacent to Canvas. Trails are situated along the future 65th alignment and are extended to the trails and sidewalks on Allen Way in Canvas to 65th Street. In addition to the trails along the right of way (ROW), an interior trail will connect the two public park areas.

Based on a number of meetings with City Staff and the Parks Director, the Developer has proposed dedication of public parks in two locations within the project as follows: (a) approximately 4-acres on the Lund property along Highway 3; and approximately 4-acres on the south end of the M&E property along 70th Street. Parks will be dedicated to the City and open to the public. Programming and design for these parks is the responsibility of the City.

Product

Apartments

Proposed are high-quality market rate apartments with underground parking and EV charging stations including features typical of new construction in the market area. Examples of completed apartment developments are included in the application. Proposed are 1-3 bedrooms appealing to professionals and senior residents desiring single level living with substantial amenities.



Northwest Expansion Area

Alternative Urban Areawide Review (AUAR) Update

Prepared for:

City of Inver Grove Heights

Prepared by:

Kimley-Horn and Associates, Inc.

May 2020

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List of Attachments

- Attachment A: 2019 AUAR Figures
- Attachment B: 2014 AUAR Figures
- Attachment C: 2007 AUAR Figures and Attachments
- Attachment D: 2005 AUAR Figures and Attachments
- Attachment E: Response to Agency Comments

Inver Grove Heights Northwest Expansion Area Alternative Urban Areawide Review (AUAR)

1. Project Title

Inver Grove Heights Northwest Expansion Area

2. Proposer

Proposer: City of Inver Grove Heights
Contact Person: Heather Botten
Title: Associate Planner
Address: 8150 Barbara Avenue
City, State, ZIP: Inver Grove Heights, MN, 55077-3410
Phone: (651) 450-2569
Email: hbotten@invergroveheights.org

3. RGU

RGU: City of Inver Grove Heights
Contact Person: Heather Rand
Title: Community Development Director
Address: 8150 Barbara Avenue
City, State, ZIP: Inver Grove Heights, MN, 55077-3410
Phone: (651) 450-2546
Email: hrاند@invergroveheights.org

4. Reason for EAW Preparation

2005

Not applicable.

2007 Update

The City of Inver Grove Heights, in consultation with the Environmental Quality Board (EQB) and the City Attorney, have determined that a proposed Comprehensive Plan Amendment and proposed development application, warrant an Update to the Northwest Expansion Area AUAR per Minnesota Rules Chapter 4410.3610.

2014 Update

Not applicable.

2019 Update

The 2019 AUAR Update was completed to comply with Minnesota Rules Chapter 4410.3610 Subp 7A.

5. Project Location

County: Dakota

City/Township: City of Inver Grove Heights

PLS Location ($\frac{1}{4}$, $\frac{1}{4}$, Section, Township, Range): Sections 5, 6, 7, 8, 17, and 18 of T27N, R22W

At a minimum, attach each of the following to the EAW/AUAR:

- **Copy(ies) of USGS 7.5 minute, 1:24:000 scale map (photocopy is OK) indicating the project boundaries**
- **Maps of the following:**
 - **A map clearly depicting the boundaries of the AUAR and any subdistricts used in the AUAR analysis**
 - **Land use and planning and zoning maps as required in conjunction with Sections 9 and 28**
 - **A cover type map as required by Section 10**

Additional maps may be included throughout the document wherever maps are useful for displaying the relevant information.

The maps listed below are included in Attachments A, B, C, and D:

- **Project Location:** A map indicating the project location and its regional context. **(in Attachment A); Figure 5-1 (2005 & 2007 AUAR).**
- **Project Boundaries:** A map depicting the project boundary of the AUAR study area. **(in Attachment A); Figure 5-2 (2005 & 2007 AUAR).**
- **Existing Land Use:** A map showing current zoning in and around the AUAR Study Area. **(in Attachment A); Figure 5-3 (2005, 2007, & 2014 AUAR).**
- **Existing Zoning:** A map showing current land use in and around the AUAR Study Area. **(in Attachment A); Figure 5-4 (2005, 2007, & 2014 AUAR).**
- **Proposed Land Use:** A map showing proposed land use in and around the AUAR Study Area. **(in Attachment A); Figure 5-5 (2005, 2007, & 2014 AUAR).**

6. Description

- a. Anticipated types and intensity (density of residential, commercial/warehouse and light industrial development throughout the AUAR area):**

Table 6-1: Proposed Land Uses

Land Use Category	Existing Acres	Planned Acres			
		2005	2007	2014	2019
Rural Residential	0	0	0	0	27
Vacant or Agricultural	1,684	0	0	0	0
Low Density Residential	404	820	820	818	1,079
Low/Mid Density Residential	96	743	747	614	465
Medium Density Residential	94	343	334	356	283

Land Use Category	Existing Acres	Planned Acres			
		2005	2007	2014	2019
High Density Residential	0	65	65	20	40
Mixed Use (Residential)	0	46	46	51	76
Mixed Use (Commercial)	0	23	23	25	22
Commercial	26	59	59	147	89 ¹
Office/Industrial	67	306	164	240	200 ²
Public/Institutional	11	11	11	56	48
Natural/Open Space/Golf	758	724	724	766	760 ³
Office/Industrial/Commercial	0	0	47	47	0
Total Area	3,140	3,140	3,140	3,140	3,089 ⁴

STUDY AREA DESCRIPTION

2005

The AUAR study area is a 3,140-acre area in the northwest portion of the city of Inver Grove Heights. The location is shown on Figure 5-1 (2005 & 2007 AUAR). The area is bounded by Interstate 494 on the north, Babcock Trail on the east (approximately), the city's boundary with Eagan on the west, and includes an area just south of Highway 55 on the south. The site is currently occupied by rural and large-lot residential uses, wetlands and other natural areas, and a golf course.

2007 and 2014

No update.

2019

Some development has occurred within the Northwest Area since the original AUAR in 2005. Industrial, Commercial, low-and medium-density residential, and park areas have been established since 2005. A number of public infrastructure projects have been completed since 2014 and are included in the subsequent sections. See **Figure 1** (in Attachment A) for project location.

CURRENT AND FUTURE ZONING

2005

The site is currently zoned for Agricultural and Residential uses, with small areas of Commercial uses near State Highway 3 (see Figure 5-4 in 2005 & 2007 AUAR). The long-term land use proposed for the area in the City's Comprehensive Plan includes a full range of residential uses from low to high density, mixed use commercial/residential, industrial, office, commercial, park, golf course, and institutional uses. The zoning for the area will reflect these uses. The proposed land uses are shown in Figure 5-5 (2005 & 2007 AUAR).

¹ This total includes Regional Commercial and Community Commercial land uses.

² This total includes General Industrial, Industrial Office Park, Light Industrial, and Office land uses.

³ This total includes open space and right-of-way.

⁴ This total is from the 2040 Comprehensive Plan.

2007

The updated land uses summarized in Table 6-1 are shown on Figure 5-5A—Updated Proposed Land Use (2007 AUAR). The proposed land use has been updated in a portion of the Northwest Expansion Area, located in the northwest quadrant of the TH 55 and TH 3 interchange. The proposed land use update and updated Development Scenario that has been developed is consistent with the proposed Comprehensive Plan Amendment and proposed development application.

A new land use category was created for the purpose of this update. Office/Industrial/Commercial category was created for a portion of the site that would give the City of Inver Grove Heights the greatest flexibility. The AUAR update will analyze this category as commercial – the most intensive use.

2014

No update. See Figure 5-5 (2014 AUAR) for existing land use.

2019

The land use categories remain relatively the same as the 2014 AUAR; however, some of the locations of the land uses have changed. The updated existing land uses are shown on **Figure 3** (in Attachment A).

PROPOSED DEVELOPMENT

2005

The City of Inver Grove Heights has completed several significant planning studies in the Northwest Expansion Area. The City completed a Natural Resources Inventory and Management Plan for the area in 2004. This plan was used in developing the Hydrologic and Hydraulic Analysis for the area, also completed in 2004. Both of these plans have heavily influenced the land use plan proposed for the Northwest Area. The City also worked with a Task Force of local residents in developing all three plans.

The results of the Natural Resources Inventory and Hydrologic and Hydraulic Analysis were used extensively to shape the proposed land uses and patterns for the area, along with existing roadway infrastructure. The Northwest Expansion Area is an area of rolling topography, with closed basins that do not have outlets at normal water levels. The area also has a variety of good and high-quality upland and wetland natural resources that the City and its residents would like to protect for the long term. The City and its Northwest Area Task force have determined that the development plan for the area will use a variety of low-impact development techniques and preservation of existing natural resources and regional basins to manage stormwater in the area. The land use plan therefore features relatively large green spaces and corridors to allow for stormwater infiltration and collection in the regional basin areas. These areas are shown on Figures 17-1 to 17-3 (in Attachment C and D) and are located within the low to medium density residential areas and open space areas shown on the land use plan.

Proposed Industrial areas, Commercial areas, and higher-density Residential areas are associated with major transportation corridors within the study area, particularly Interstate 494 and State Highway 55. The City is also proposing an area of Mixed Use,

which would include a mix of residential and commercial uses. This area is located around the intersection of State Highway 3 and 70th Street.

Proposed land uses and densities in the AUAR study area include the following:

- **Low Density Residential** – Densities within this area may vary from 1 to 4 units per acre and are likely to average approximately 2.0 units per acre. Some existing residential areas included in this category are currently less than 1 unit per acre.
- **Low/Mid Density Residential** – Densities within this area may vary from 4 to 8 units per acre and are likely to average approximately 4.0 units per acre.
- **Medium Density Residential** – Densities within this area may vary from 8 to 12 units per acre and are likely to average approximately 8 units per acre.
- **High Density Residential** – Densities within this area may vary from 12.0 to 35 units per acre and are likely to average approximately 12.0 units per acre.
- **Mixed-Use Residential and Commercial** – This land use will include commercial uses mixed with residential uses on the same parcel. The City estimates that approximately 2/3 of each parcel will be residential in use and 1/3 commercial. Residential uses in the Mixed-Use areas will average 15.0 units/acre but may vary from 12 to 35 units per acre.
- **Commercial** – Floor area ratios for this land use are between 0.25 and 0.35 for retail uses and 0.25 and 0.5 for office uses. Impervious surface coverage is up to 70 percent.
- **Industrial** – Floor area ratios for this land use are between 0.25 and 0.35 for retail uses and 0.25 and 0.5 for office uses. Impervious surface coverage is up to 70 percent.
- **Institutional Land Uses** – Land use primarily for public lands and facilities such as City Hall, the community center, public works and schools. This category also includes religious institutions such as churches and cemeteries.

The topography and natural features of the AUAR area are likely to limit the density that may be achieved on many parcels in all of the proposed land use districts. Therefore, the densities that the City has assumed for each of the land use areas for the analysis in this AUAR is at the lower-end of the allowable densities in each land use classification.

2007

A new land category was created for the purpose of this update. Office/Industrial/Commercial category was created for a portion of the site that would give the City of Inver Grove Heights the greatest flexibility. The AUAR update will analyze this category as commercial – the most intensive land use.

- **Office/Industrial/Commercial** – Floor area ratios for this land use are between 0.25 and 0.35, with impervious coverage up to 70 percent.

2014

No update.

2019

The 2040 Comprehensive Plan designated the following proposed land uses within the AUAR study area:

- **Low Density Residential** – Densities within this area may vary from 1 to 4 units per acre and are likely to average approximately 2 units per acre. Some existing residential areas included in this category are currently less than 1 unit per acre.
- **Low/Mid Density Residential** – Densities within this area may vary from 4 to 8 units per acre and are likely to average approximately 4 units per acre.
- **Medium Density Residential** – Densities within this area may vary from 8 to 12 units per acre and are likely to average approximately 8 units per acre.
- **High Density Residential** – Densities within this area may vary from 12 to 35 units per acre and are likely to average approximately 12 units per acre.
- **Mixed-Use Residential and Commercial** – This land use will include commercial uses mixed with residential uses on the same parcel. The City estimates that approximately 2/3 of each parcel will be residential in use and 1/3 commercial. Residential uses in the Mixed-Use areas will average 15 units/acre but may vary from 12 to 35 units per acre.
- **Commercial** – Floor area ratios for this land use are between 0.25 and 0.35 for retail uses and 0.25 and 0.5 for office uses. Impervious surface coverage is up to 70 percent.
- **Industrial** – Floor area ratios for this land use are between 0.25 and 0.35 for retail uses and 0.25 and 0.5 for office uses. Impervious surface coverage is up to 70 percent.
- **Institutional Land Uses** – Land use primarily for public lands and facilities such as City Hall, the community center, public works and schools. This category also includes religious institutions such as churches and cemeteries.

CONSISTENCY WITH INVER GROVE HEIGHT'S COMPREHENSIVE PLAN

2005

The City's Comprehensive Plan was adopted by the City Council on June 8, 1998, and by the Metropolitan Council on March 25, 1999. The land use plan for the Northwest Expansion Area has changed in some minor respects from the land use plan included in the City's Comprehensive Plan, but the overall residential density of approximately 3 units per acre remains the same for the area. The proposed land use plan is therefore consistent with the adopted Comprehensive Plan.

2007

The City of Inver Grove Heights has proposed a Comprehensive Plan Amendment that is consistent with the updated Development Scenario as discussed above.

2014

No update.

2019

The City updated their Comprehensive Plan in October 2019 and the proposed land uses have been incorporated into the 2019 AUAR Update.

- b. Infrastructure planned to serve the development (roads, sewers, water, stormwater systems, etc.). Roadways intended primarily to serve the adjoining land uses within an AUAR area are normally expected to be a part of an AUAR. More “arterial” types of roadways that would cross an AUAR area are an optional inclusion in the AUAR analysis; if they are to be included, a more intensive level of review, generally including an analysis of alternative routes, is necessary).**

ROADWAY NETWORK

2005

Based on the new traffic that will be generated by development of the Northwest Expansion Area, four primary roads will need to be improved to accommodate future growth. The Mitigation Plan recommends that CR 63 in the southbound direction be widened to a 5- or 6-lane roadway from north of I-494 to south of TH 55. TH 3 should also be widened from south of the interchange with TH 55 to the north of the Interstate 494. CR 73 will require the addition of lanes. CR 26 will need to be widened beginning to the east of CR 73 and continuing to the west of CR 63.

The AUAR analysis quantifies the impacts that the proposed development will have on the regional system, including Interstate 494 and TH 55. The analysis assumes a new interchange at I-494 and CR 63 and at the intersection of CR 63 and State Highway 55, as described in the City's Thoroughfare Plan.

2007

No change in the recommended mitigation due to the updated land uses.

2014

- The City of Inver Grove Heights, the City of Eagan, and Dakota County have completed and adopted the 2010 Regional Roadway System Visioning Study for northeast Eagan and northwest Inver Grove Heights.
- The City completed and adopted the Northwest Area Collector Street Plan, dated May 2012.
- The City and Dakota County are conducting a design study for County Road (CR) 28 and County State Aid Highway (CSAH) 63 from south of Trunk Highway (TH) 55 to south of CSAH 26 in advance of improving these roadways in 2016. A 2014 feasibility study for the future Argenta Trail Corridor from south of CSAH 26 to I-494 will also be conducted to consider the location of the future arterial connection to the potential future interchange along I-494 between TH 149 and TH 3.
- City Project No. 2009-01 Trunk Highway 3 and Amana Trail/proposed 80th Street Roundabout was completed.

- City Project No. 2010-41 Trunk Highway 3 Right Turn Lane—Argenta Hills 2nd Addition was completed.

2019

The City's guiding documents include:

- Northwest Area Collector Street Plan
- Regional Roadway Visioning Study to be updated in 2020 by Dakota County

See Attachment A for a list of street projects the city completed between 2014 and 2019.

SANITARY SEWER SYSTEM

2005

The estimated sewer flow rate for the Northwest Expansion Area is 1,200 gallons per acre per day. All areas within the AUAR study area will be served by sanitary sewer, based on the City's Comprehensive Plan (1998). The proposed City trunk sewer system will connect to the Metropolitan Council Environmental Services (MCES) regional system. Proposed sewer system alignments have been routed to avoid impacts to proposed stormwater infiltration basins and areas of high-quality natural resources.

The City will construct sanitary sewer improvements to serve the AUAR area in general accordance with the 2020 Comprehensive Plan for the City. The sewer flows from this area will go to the MCES interceptor systems and Metropolitan Wastewater Treatment Facility, which has capacity available to serve this area.

2007

The City of Inver Grove Heights has completed a feasibility study of these improvements, called the Northwest Area Water and Sanitary Extensions Feasibility Report, dated May 2005. The City awarded the first phase of these improvements, Northwest Area Utility Improvements Lift Station R-9.1, in July 2007.

2014

- The City of Inver Grove Heights constructed trunk sanitary sewer and watermain facilities with the following projects: City Project No. 2003-15 NW Area Trunk Utility Improvements – located from TH 55/Babcock Trail, north along Babcock Trail to 80th Street, west to TH 3, north to 70th Street; Project No. 2003-15A NW Area Lift Station – located within the NW quadrant of Amana Trail and Trunk Highway 3; Argenta Hills/Amana Trail Trunk Utilities – located within the Target development and along newly constructed Amana Trail from TH 3 to Alverno Avenue; Argenta Hills 8th Addition – located along Alverno Avenue from Amana Trail to north terminus of Alverno Avenue; and Inver Glen Senior Housing Project – located from TH 3, along Allen Way to the developments easterly boundary.
- A Preliminary Engineering Report has been prepared for trunk sanitary sewer facilities in City Project No. 2014-13 NW Area Trunk Utilities – Argenta District, located between Amana Trail and proposed 65th Street within the Argenta District.

2019

The City of Inver Grove Heights constructed sanitary sewer facilities with the following projects: development projects in Blackstone Vista, Blackstone Vista 3rd, Blackstone Ponds, Blackstone Ponds 2nd, Blackstone Ponds 3rd, Blackstone Ridge, Windwood 2nd, Industrial Equites, Argenta Hills 8th, 9th, Scenic Hills; Holiday Station; City projects 2014-11 Argenta Trail and Highway 55, 2015-10 NWA Utilities Alverno Trail to Blackstone Vista, 2015-11 NWA Lift Station, 2015-13 NWA Trunk Utilities 70th Street LS to Blackstone Ridge, 2015-16 Trunk Utilities Argenta Trail to Blackstone Ridge, 2016-08 TH3 Roundabout 70th Street.

MUNICIPAL WATER SYSTEM

2005

The City of Inver Grove Heights currently operates six municipal supply wells with a total groundwater appropriation of 1,250 million gallons per year (MGY) in 2003. The wells are used on a rotating schedule.

The project area will be served by expanding the existing municipal water supply system. Development of the project area will require additional appropriation of groundwater for municipal water supply. Five additional wells will likely be required to meet the ultimate system demand. The number of new wells required will depend on the capacities of the future wells. The ultimate projected municipal water system demand is 2,295 MGY (2005 estimate).

New wells will be completed in the Jordan Sandstone portion of the Prairie du Chien-Jordan aquifer system. Each new well is expected to have a capacity of 1,200 gallons per minute (gpm). While the City's current wells will experience a gradual increase in pumping and additional wells will be constructed, the aquifer is expected to be able to accommodate the additional withdrawals, based on recent tests.

2007

The City of Inver Grove Heights has completed a feasibility study of these improvements, called the Northwest Area Water and Sanitary Extensions Feasibility Report, dated May 2005. The City awarded the first phase of these improvements, Northwest Area Utility Improvements Lift Station R-9.1, in July 2007.

2014

- The City of Inver Grove Heights constructed trunk sanitary sewer and watermain facilities with the following projects: City Project No. 2003-15 NW Area Trunk Utility Improvements – located from TH 55/Babcock Trail, north along Babcock Trail to 80th Street, west to TH 3, north to 70th Street; Argenta Hills/Amana Trail Trunk Utilities – located within the Target development and along newly constructed Amana Trail from TH 3 to Alverno Avenue; Argenta Hills 8th Addition – located along Alverno Avenue from Amana Trail to north terminus of Alverno Avenue and Inver Glen Senior Housing project – located from TH 3, along Allen Way to the development's easterly boundary.

- A Preliminary Engineering Report has been prepared for trunk watermain facilities in City Project No. 2014-13 NW Area Truck Utilities – Argenta District, located from Amana Trail and proposed 65th Street within the Argenta District.
- In 2013, the City constructed Project No. 2006-18 Asher Water Tower Replacement.
- Well #9 (Well ID 759561) was constructed in 2008.

2019

The City prepared the following guidance documents between 2014 and 2019.

- Northwest Area Trunk Utilities North Robert District Alternative 2, Bolton and Menk, 2014
- Water Pressure Zone, 2015
- City of Inver Grove Heights wellhead protection Plan, Stantec, September 2016
- Trunk Watermain Model, 2017
- Third Generation of the Local Water Supply Plan was prepared and approved by the DNR in February 2020.

STORMWATER SYSTEM

2005

The City's Surface Water Plan for the Northwest Expansion Area proposes an approach that minimizes connected impervious surfaces, increases flow path and time over previous surfaces, and decentralizes treatment in local and regional infiltration areas. The approach focuses on a variety of local Best Management Practices (BMPs), and collection and further treatment/infiltration of excess water in the numerous existing natural basins in the area. The plan includes a number of alternative practices with infiltration to provide for pretreatment before discharge to wetland basins and preserves the infiltration capacity of the natural basins.

The land use plan features relatively large green spaces and corridors to allow for stormwater infiltration and collection in the regional basin areas. The areas are shown on Figures 17-1 to 17-3 (in Attachment C and D) and are located within the low to medium density residential areas and open space area shown on the land use plan.

2007

The City of Inver Grove Heights has adopted a stormwater manual for the Northwest Area on May 29, 2007.

2014

- The City of Inver Grove Heights has built stormwater management facilities and protected regional basins in the following projects: Inver Pointe Business Park (United Properties), IGH Investments LLC – Argenta Hills Site Construction Plans (Amana Trail and Target Development), Argenta Hills 2nd through 8th Addition, 2009-01 Intersection (round-a-bout along TH 3), City Project No. 2013-03 SP-27

Stormwater Facilities Repairs, City Project No. 2010-41 Trunk Highway 3 Right Turn Lane – Argenta Hills 2nd Addition, Inver Glen Senior Housing projects.

- The City utilizes the following documents for stormwater guidance:
 - Northwest Area Stormwater Manual, adopted on May 29, 2007.
 - The Second-Generation Water Resources Management Plan adopted on December 8, 2008. The plan is being updated in 2014 to the 3rd Generation Plan.
 - The 3rd Generation Lower Mississippi River Watershed Management Plan prepared in August 2011.
 - The Northwest Area Regional Basin Map and Stormwater Model prepared on March 1, 2011. The map and stormwater model are being updated in 2014. Updates to the map and model will be a required condition of approval for developments.
 - Dakota County Soil and Water Conservation District (DCSWCD) Low Impact Design (LID) Standards are applicable for filtration and infiltration BMPs. The current LID standards may be found on the DCSWCD website.
- March 17, 2014, the City's MS4 General Permit coverage was extended, reauthorizing the new permit. The City will meet requirements of the new permit from the date permit coverage was extended.
- The Gun Club Lake Watershed Management Organization (GCLWMO) was disbanded and the Eagan-Inver Grove Heights Watershed Management Organization (EIGHWMO) was created in 2014.
- Atlas 14, published in 2013, is the most current frequency and duration stormwater information at the time of this AUAR update. The Northwest Area stormwater management plan will be updated to incorporate Atlas 14 data as published by the National Oceanic and Atmospheric Administration (NOAA) for the 2-, 10- and 100- year rainfall events and the 100-year critical volume (10-day snow melt) for development stormwater management plans and landlocked basins.

2019

The City of Inver Grove Heights constructed stormwater system facilities with the following projects: development projects in Blackstone Vista, Blackstone Vista 3rd, Blackstone Ponds, Blackstone Ponds 2nd, Blackstone Ridge, Windwood 2nd, Argenta Hills 8th and 9th, Scenic Hills; City Projects 2014-11 Argenta Trail and Highway 55, and 2016-08 TH 3 Roundabout at 70th Street.

- The City adopted the 3rd generation Water Resources Management Plan, December 2014
- The City adopted the 4th generation Water Resources Management Plan, December 2018
- The Stormwater Manual was updated to include the Atlas 14 data and this information will be used for future development stormwater management plans and landlocked basins.

c. Information about the anticipated staging of various developments, to the extent known, and of the infrastructure, and how the infrastructure staging will influence the development schedule.

Note: the RGU must assure that the development described complies with the requirements of Minnesota Rules, part 4410.3610, subpart 3, and that it properly orders the AUAR and sets the description in that order as required by that section.

2005

The City of Inver Grove Heights has an approved Comprehensive Plan as required by the referenced rules. The Plan includes a Capital Improvement Program and plans for phasing infrastructure in the AUAR area. The City adopted the Comprehensive Plan on June 8, 1998. The Metropolitan Council approved the plan on March 25, 1999. The Inver Grove Heights City Council adopted an official resolution ordering the AUAR as required on September 27, 2004.

Development of the area will occur over the next 20 years. The pace of development will depend on market conditions and individual property owner decisions regarding development or redevelopment. Infrastructure will be staged so that necessary sewer, water, roadway, and other infrastructure is in place to accommodate proposed development. Some roadway infrastructure development will depend on the plans and schedule of the Minnesota Department of Transportation and Dakota County. Other infrastructure phasing will be determined by the City based on its Comprehensive Plan and Infrastructure Plans.

2007

No update.

2014

The Inver Grove Heights Northwest Expansion Area AUAR is located on 3,089 acres in the northwest portion of the city. The AUAR was completed in August 2005 and adopted by City Council in February 2006 with an update in 2007. An AUAR Update Addendum has been prepared to address updates in proposed land use and Development Scenario.

2019

The City of Inver Grove Heights updated their Comprehensive Plan for 2040, which includes updates to the Capital Improvement Program and plans for phasing infrastructure in the AUAR area.

d. Provide a 50 or fewer word abstract for EQB Monitor notice:

2005

Inver Grove Heights Northwest Expansion Area AUAR is located on 3,140 acres in the northwest portion of Inver Grove Heights, Dakota County. Proposed land uses include a variety of residential, industrial, commercial, mixed-use, institutional and parks/open space uses.

2007

Inver Grove Heights Northwest Expansion Area AUAR is located on 3,140 acres in the northwest portion of Inver Grove Heights, Dakota County. The AUAR was completed in August 2005. An AUAR Update has been prepared to address updates in the proposed land uses and the Development Scenario.

2014

No update.

2019

Inver Grove Heights Northwest Expansion Area AUAR is located on 3,089 acres in the northwest portion of Inver Grove Heights, Dakota County. The AUAR was last updated in 2014 and an AUAR Update has been prepared to comply with Minnesota Rules Chapter 4410.3610 Subp 7A. The 2019 AUAR update includes land use updates included in the 2040 Comprehensive Plan.

7. Project Magnitude Data

The cumulative totals of the parameters called for should be given for each major development scenario.

2005

One Development Scenario is proposed for this AUAR. The scenario represents the maximum amount of development that is predicted in the project area, based on the City's Comprehensive Plan, Natural Resource Management Plan, and Surface Water Management Plan. The actual level of development realized on the site may be less than this scenario, based on market conditions and development proposals received and approved by the City.

2007

An updated Development Scenario has been developed for this Update. A new land use category was created. The Office/Industrial/Commercial land use category was created for a portion of the Northwest Area that would give the City of Inver Grove Heights the greatest flexibility. The AUAR update will analyze this category as commercial—the most intensive land use.

2014

No change.

2019

A new development scenario has been created based on the 2040 Comprehensive Plan. The new scenario is depicted in Table 7-1.

CUMULATIVE DEVELOPMENT TOTALS

Table 7-1 represents projected cumulative development totals for the project area. These totals are based on policies and standards as established within the City of Inver Grove Heights Comprehensive Plan and Zoning Ordinance.

Table 7-1: Cumulative Development Totals

Measure	2005	2007 & 2014	2019
Total Project Acreage	3,140	3,140	3,089
Number of Residential Units (maximum)	Attached: 4,707 Detached: 2,383	Attached: 4,676 Detached: 2,378	Attached: 5,744 Detached: 2,163
Units Per Building (maximum)	N/A	N/A	N/A
Industrial and Related Office Uses (maximum)	Industrial & Office: 140 acres Office: 1,434,760 square feet Commercial: 1,674,215 square feet	Industrial & Office: 219 acres Office: 1,330,260 square feet Commercial: 2,214,625 square feet	Commercial: 362,637 square feet Office/Industrial: 784,080 square feet
Building Height (maximum)	Single Family/ Townhome: 35 feet Multifamily Residential: 70 feet Retail: 50 feet Industrial: 60 feet Office: 100 feet	Single Family/ Townhome: 35 feet Multifamily Residential: 70 feet Retail: 50 feet Industrial: 60 feet Office: 100 feet	Single Family/ Townhome: 35 feet Multifamily Residential: 70 feet Retail: 50 feet Industrial: 60 feet Office: 100 feet

8. Permits and Approvals Required

List all known local, state, and federal permits, approvals, and funding required. A list of major approvals likely to be required by the anticipated types of development projects should be given. This list will help orient reviewers to the idea that the AUAR process is only one piece of the regulatory framework that will protect environmental resources. The list can also serve as a starting point for the development of the implementation aspects of the mitigation plan to be developed as part of the AUAR.

Table 8-1: Required Permits and Approvals

Unit of Government	Type of Application	Status
City of Inver Grove Heights	Preliminary Plat Approvals	To be applied for
	Schematic Plan Approvals	To be applied for
	Final Plat Approvals	To be applied for
	Rezoning Approvals	To be applied for
	Comprehensive Plan Amendment	To be applied for
	Planned Unit Development (PUD) Permits	To be applied for
	Conditional Use Permits	To be applied for
	Grading Permits	To be applied for
	Water Connection Permits	To be applied for
	Building Permits	To be applied for

Unit of Government	Type of Application	Status
	Wetland Conservation Act Permits and Approvals	To be applied for
	Road Right-of-Way Permits	To be applied for
	Approval of Sanitary Sewer and Municipal Water Extensions	To be applied for
	Final AUAR and Mitigation Plan Adoption	To be applied for
Dakota County	County Roadway Access Permits	To be applied for
	Contiguous Plat Review	To be applied for
Metropolitan Council/ Environmental Services	Tier 2 Sewer Plan	To be applied for
	Sanitary Sewer Extension Permit	To be applied for
	New Freeway Interchange Approvals	To be applied for
Minnesota Pollution Control Agency	Approval of Facility Plan and Construction	To be applied for
	Plans and Specifications (for Minnesota Public Facilities Authority Funding eligibility)	To be applied for
	Application for National Pollutant Discharge Elimination System (NPDES) General Permit for discharge of stormwater during construction activities	To be applied for
	Application for Sewer Extension Permit	To be applied for
	Section 401 Certification	To be applied for
Minnesota Department of Health	Water Main Plan Review	To be applied for
	Wellhead Protection Plan	To be applied for
	Water Well Permits	To be applied for
Minnesota Department of Natural Resources	Protected Water Permit	To be applied for
	Water Appropriation Permit	To be applied for
Minnesota Department of Transportation	Utility Permit for Work in Right-of-Way of Trunk Highway	To be applied for
	New Freeway Interchange Approvals	To be applied for
	Access Permits	To be applied for
	Drainage Permits	To be applied for
	Plat Approval	To be applied for
US Army Corps of Engineers	Application for Wetland/Water Project—Public Linear Utility Project (GP/LOP-98-MN-Section 404 Activities in Minnesota)	To be applied for
Gun Club Lake & Lower Mississippi WMOs	Grading and Stormwater Permits Review	To be applied for
	Flow allocations when intercommunity determination is required	To be applied for

9. Land Use

Describe the current and recent past land use and development on the site and on adjacent lands. Discuss the compatibility of the project with adjacent and nearby land uses; indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazard due to past land uses, such as soil contamination or abandoned storage tanks.

2005

Section 9 is not needed for an AUAR but can be covered by Sections 20 and 28. See Sections 20 and 28.

2007, 2014, and 2019

No update.

10. Cover Types

The following information should be provided:

a. A cover type map, at least at the scale of a USGS topographic map, depicting:

- *Wetlands—identified by type (Circular 39)*
- *Watercourses—rivers, streams, creeks, ditches*
- *Lakes—identify protected water status and shoreland management classification*
- *Woodlands—identify native and old field*
- *Cropland*
- *Current development*

b. An “overlay” map showing anticipated development in relation to the cover types; this map should also depict any “protection areas,” existing or proposed, that will preserve sensitive cover types. Separate maps for each major development scenario should generally be provided.

2005

The generalized breakdown of cover types before and after development is shown on the chart that follows. The location of cover types is shown in Figure 10-1 (2005 & 2007 AUAR). The location of cover types in relationship to proposed development is shown in Figure 10-2 (2005 AUAR) and Figure 10-2A (2007 AUAR). The natural communities identified in the City's Natural Resource Inventory and their classifications based on ecological quality are shown on Figure 10-3 (in Attachment C and D).

2007

Note that Figure 10-2—Land Cover and Proposed Land Use (2007 AUAR) has been updated to reflect the updated proposed land uses. Refer to Figure 10-2A—Updated Land Cover and Proposed Land Use (2007 AUAR).

Table 10-1: Cover Types

Cover Type	Before (Acres)	After (Acres)		
		2005	2007 & 2014	2019
Types 1 to 7 Wetlands	267	267	267	190
Woodlands/Brushland	652	359	359	496
Field/Grassland	1,523	98	98	1,065
Residential	594	2,017	2,012	833
Commercial/Industrial/Office	93	388	393	87
Institutional	11	11	11	20
Right-of-Way	N/A	N/A	N/A	398
Total	3,140	3,140	3,140	3,089

NORTHWEST EXPANSION AREA NATURAL RESOURCE INVENTORY

2005

The City of Inver Grove Heights completed a Natural Resource Inventory and Management Plan for the Northwest Expansion Area in 2004. The inventory included using existing natural resource data for the area, aerial photos, and field visits to identify natural areas by experienced ecologists. In a few cases, landowners did not give permission for ecologists to visit their properties, so that only aerial photos or views from adjacent areas were used to identify resources in these areas.

The field inventory was a qualitative assessment of wetland and upland communities. It included identification of major plant species in the canopy, subcanopy, shrub, and ground cover of forest and woodland natural communities. In non-forested natural communities, dominant grasses and forbs were identified. The field inventory emphasized gathering data on disturbance indicators of natural communities such as exotic species and erosion.

Classification of the natural areas to determine the natural community type was done using methodology outlined in Minnesota's Native Vegetation, a Key to Natural Communities (Minnesota DNR, 1993). Each community was assigned a qualitative rank, ranging from A to D, with "A" quality communities being the highest in ecological quality, and "D" communities being the lowest. Standard ecological criteria were used to evaluate the health of natural communities were used to determine the quality rankings. These criteria included degree of native species diversity, age of trees, and amount of disturbance, such as invasion by non-native plant species. The rankings reflect how closely the natural community area resembles an intact or "pristine" community of its type in the local area – "A" quality communities are most like intact natural areas, "D" quality communities have been highly altered from this standard.

The wetland field inventory included identification of plant species and a determination of predominant hydrology for each wetland basin. The Minnesota Routine Assessment Method (MnRAM) Version 2.0 was used to assess wetland functions on a qualitative basis. Wetlands were evaluated for floristic quality, wildlife habitat value, aesthetic, recreational, educational, and cultural values, and stormwater susceptibility.

2007 and 2014

No update.

2019

Some impacts to areas identified in the natural resource inventory have occurred since 2005; however, no significant changes to the natural resource inventory have occurred. Impacts to “A” quality upland and wetland communities have been minimized to the extent practicable. See **Figure 6** (Attachment A) for an updated figure of existing cover types.

RARE SPECIES AND NATIVE PLANT COMMUNITIES

2005

The Minnesota DNR’s Natural Heritage Database identified two plant species that are present in the AUAR area that have no legal protection status but are tracked by the DNR database. These include *Liparis lilifolia* (Lilia-leaved twayblade) and *Triodanis leptocarpa* (Venus’ looking glass).

The DNR’s database also identified an Oak Forest of sufficient size and quality to be included in state lists of significant natural communities identified by the County Biological Survey.

The database describes the locations and conditions of these communities. All are on privately-owned sites. The locations of these plants and communities have also been noted in the Inver Grove Heights Natural Resources Inventory and Management Plan. The Plan includes recommendations for restoration of the Oak Forest and the natural communities that include the identified plant species. Copies of the DNR Natural Heritage Database information are included in the Attachments.

2007 and 2014

No update.

2019

See Section 11 for updates to Rare Species and Native Plant Communities since the 2014 update.

GREENWAY CORRIDORS

2005

A local advisory committee reviewed the upland and wetland ranking criteria and identified greenway corridors in the study area. Both Primary and Secondary Greenways are identified on the Natural Resource Inventory maps included in the Attachments. The Conceptual Greenway corridors that were developed during the Natural Resource Inventory are consistent with those developed later during the North Dakota County Greenway Planning project completed by the DCSWCD.

2007, 2014, and 2019

No update.

SUMMARY

2005

The Natural Resources Inventory identified and classified 43 upland sites, 184 wetland sites and 25 semi-natural areas based on their natural resource quality. A summary of the areas

inventoried is presented in Table 10-2 and shown on Figure 10-3 (in Attachment C and D). (Semi-natural areas are open space communities that are composed of an assemblage of plants that have resulted largely due to recent human activities, such as conifer plantations and old fields.)

Table 10-2: Summary of Natural Areas and Semi-Natural Areas Inventoried

Land Cover Type	Number of Areas	Acres	Percent of Total	Percent of Land in Study Area
Wetland Natural Areas	184	267	21.1%	8.5%
Upland Natural Areas	43	452	35.7%	14.4%
Semi-natural Areas	25	547	43.2%	17.4%
Total	252	1,266	100.0%	

2007, 2014, and 2019

No update.

UPLAND COMMUNITIES

2005

Table 10-3 shows a summary of Management Classification for upland natural communities identified in the Northwest Expansion Area. These areas are shown on Figure 10-3 (in Attachment C and D). The table indicates that only a fraction of the total number of natural communities identified fell into the highest quality categories of Manage 1 and Manage 2.

Although Oak Woodland-Brushland represents the vast majority of upland natural area occurrences in the study area, they are generally in moderate to poor conditions as a result of past grazing and subsequent lack of management. There is one area of Oak Woodland-Brushland classified as Manage 1 in the study area. The area also includes two Manage 1 Mesic Oak Forests, and one Manage 2 occurrence for each Dry Oak Forest and Dry Prairie.

Table 10-3: Upland Management Classification Summary

Community Type	Management Class	Number of Occurrences	Acres of Community Type
Dry Prairie (hill subtype)	3	2	5.0
Dry Prairie (sand-gravel subtype)	2	1	
Dry Oak Savanna	3	1	2.4
	4	6	
Oak Woodland-Brushland	3	18	340.8
	2	1	
	1	1	
Oak Forest, Dry	4	1	50.0
Oak Forest, Mesic	3	2	28.5
	1	2	
Lowland Hardwood Forest	4	4	24.8
	3	3	
Total		43	451.5

2007, 2014, and 2019

No update.

WETLANDS

2005

The most common wetland community types in the Northwest Expansion Area are Wet Meadow, Shallow Marsh, Shallow Open Water, and Deep Marsh. Roughly two-thirds of these community types are classified as Manage 3 or Manage 4. In a general sense, this would tend to indicate that many of these areas are of somewhat lower quality and adversely affected by runoff, surrounding land uses, and invasive species. Some wetland types that are uncommon in the Metro Area, but occur in the Northwest Expansion Area, are Shrub Carr and Alder Thicket. Table 10-4 summarizes the wetland types and their quality rankings in the study area.

Table 10-4: Wetland Management Classification Summary

Community Type	Management Class	Number of Occurrences	Acres of Community Type
Seasonally flooded basin	1	1	1.1
Sedge meadow	1	3	10.7
	2	1	
	3	2	
	4	20	
Wet meadow	1	7	68.7
	2	8	
	3	19	
	4	20	
Alder thicket	1	1	3.5
Shrub carr	1	1	6.0
	2	1	
	3	1	
Hardwood swamp	1	4	14.8
	3	7	
	4	6	
Shallow marsh	1	8	52.4
	2	7	
	3	15	
Shallow open water	1	2	51.5
	2	2	
	3	10	
	4	10	
Deep marsh	1	6	49.5
	2	4	
	3	10	
	4	9	
Other	1	1	8.6
	4	2	
Total		184	266.8

2007 and 2014

No update.

2019

Some wetland impacts have occurred within the AUAR study area since 2005. Those wetland impacts have been minimized to the extent practicable and have been mitigated. The wetland inventory and management plan has not been updated to reflect these minor changes to wetlands within the AUAR study area.

11. Fish, Wildlife and Sensitive Resources

- a. **Describe fish and wildlife resources on or near the site and discuss how they would be affected by the project. Describe any measures to be taken to minimize or avoid adverse impacts. The description of wildlife and fish resources should be related to the habitat types depicted on the cover type maps (of Section 10). Any differences in impacts between development scenarios should be highlighted in the discussion.**
- b. **Are there any state-listed endangered, threatened, or special-concern species; rare plant communities; colonial waterbird nesting colonies; native prairie or other rare habitats; or other sensitive ecological resources on or near the site?**
☒ Yes ☐ No

FISH RESOURCES

2005

There are no fishery resources within the project area. The City's Surface Water Management Plan for the Northwest Expansion Area is designed to control the quantity and quality of runoff from the AUAR area to avoid any negative impacts to downstream resources. The detailed analysis is included in Section 17 – Water Quality – Surface Water Runoff.

2007, 2014, and 2019

No update.

WILDLIFE RESOURCES

2005

The Minnesota County Biological Survey did not identify any endangered, threatened, or special-concern wildlife species within the project area. Wildlife resources in the area are birds, mammals, amphibians, and reptiles that are common in suburban and exurban areas of the Twin Cities.

The Minnesota DNR's Natural Heritage Database identified two plant species that are present in the AUAR area that have no legal protection status but are tracked by the DNR database. These include *Liparis lilifolia* (Lila-leaved twayblade) and *Triodanis leptocarpa* (Venus' looking glass).

The DNR's database also identified an Oak Forest of sufficient size and quality to be included in state lists of significant natural communities identified by the County Biological Survey.

The database describes the locations and conditions of these communities. All are on privately-owned sites. The locations of these plants and communities have also been noted in the Inver Grove Heights Natural Resources Inventory and Management Plan. The Plan includes recommendations for restoration of the Oak Forest and the natural communities that include the identified plant species. Copies of the DNR Natural Heritage Database information are included in the Attachments.

The wildlife species currently using the AUAR area include a variety of animals that are common in suburban and exurban areas in the Twin Cities. Development of residential, commercial, and other land uses in the Northwest Area and the infrastructure to serve new land uses will result in loss or change of some habitat areas and movement of some animals to other locations. The protection of high-quality habitat areas in the Northwest Expansion Area, as specified in the City's Natural Resources Inventory and Management Plan, as well as management and restoration of other wetland and upland habitat areas and the connections among habitat areas will provide habitat for the wildlife species that are using the area. Since protection of wildlife resources is dependent on protection and restoration of habitat, the recommendations for protection of wildlife resources are the same as those listed in Section 10 – Cover Types.

2007 and 2014

No update.

2019

A review of the DNR Natural Heritage Inventory System (NHIS) database was conducted (LA-965) for the AUAR study area and the area within one mile of the AUAR study area. One state- and one federally-listed species were identified (see Table 11-1).

Additionally, ten mapped regionally significant ecological areas (RSEA) were identified and six of them are within the AUAR study area.

Table 11-1: Species Within the AUAR Study Area

Species	Type	Status	Last Recorded Date	Habitat	In Study Area?	Potential Mitigation Measures
Loggerhead Shrike	Bird	Endangered (State-Listed)	1994	Grassy open areas with scattered trees and shrubs	Yes	Required tree removal within potentially suitable habitat areas or areas with known occurrences will take place outside breeding season (April – July).
Rusty patched bumble bee	Bee	Endangered (Federally-Listed)	2018	Grassland with flowering plants from April through October, underground and abandoned rodent cavities or clumps of grasses above ground as nesting sites, and undisturbed soil for hibernating queens to overwinter	Yes	Mowing and vegetation disturbance to occur in early spring, prior to the active season. Disturbed areas will be reseeded using native seed mixes.

12. Physical Impacts on Water Resources

- a. Will the project involve the physical or hydrologic alteration (dredging, filling, stream diversion, outfall structure, diking, impoundment) of any surface water (lake, pond, wetland, stream, drainage ditch)?
☒ Yes ☐ No
- b. If yes, identify the water resource to be affected and describe: the alteration, including the construction process; volumes of dredged or fill material; area affected; length of stream diversion; water surface area affected; timing and extent of fluctuations in water surface elevations; spoil disposal sites; and proposed mitigation to minimize impacts.

2005

Proposed development in the project area has the potential to impact the wetlands in the area. The potential impacts of development on these resources are detailed and quantified in Sections 10 and 17. The City's Natural Resource Inventory and Management Plan and Surface Water Management Plan have identified methods to avoid or minimize

impacts to wetlands in the project area, and water resources downstream are summarized below.

2007

No update.

2014

- The City of Inver Grove Heights has built stormwater management facilities and protected regional basins in the following projects: Inver Pointe Business Park (United Properties), IGH Investments LLC—Argenta Hills Site Construction Plans (Amana Trail and Target Development), Argenta Hills 2nd through 8th Addition, 2009-01 Intersection (roundabout along TH 3), City Project No. 2013-03 SP-27 Stormwater Facilities Repairs, City Project No. 2010-41 Trunk Highway 3 Right Turn Lane—Argenta Hills 2nd Addition, Inver Glen Senior Housing projects.
- The City utilizes the following documents for stormwater guidance:
 - Northwest Area Stormwater Manual, adopted on May 29, 2007.
 - The Second-Generation Water Resources Management Plan adopted on December 8, 2008. The plan is being updated in 2014 to the 3rd Generation Plan.
 - The 3rd Generation Lower Mississippi River Watershed Management Plan prepared in August 2011.
 - The Northwest Area Regional Basin Map and Stormwater Model prepared on March 1, 2011. The map and stormwater model are being updated in 2014. Updates to the map and model will be a required condition of approval for developments.
 - DCSWCD Low Impact Design (LID) Standards are applicable for filtration and infiltration BMPs. The current LID standards may be found on the DCSWCD website.
- On March 17, 2014, the City's MS4 General Permit coverage was extended, reauthorizing the new permit. The City will meet requirements of the new permit from the date permit coverage was extended.
- The Gun Club Lake Watershed Management Organization (GCLWMO) was disbanded and the Eagan-Inver Grove Heights Watershed Management Organization (EIGHWMO) was created in 2014.
- Atlas 14, published in 2013, is the most current frequency and duration stormwater information at the time of this AUAR update. The Northwest Area stormwater management plan will be updated to incorporate Atlas 14 data as published by the National Oceanic and Atmospheric Administration (NOAA) for the 2-, 10- and 100- year rainfall events and the 100-year critical volume (10-day snow melt) for development stormwater management plans and landlocked basins.

2019

- Third generation Water Resources Management Plan adopted December 2014.
- Fourth generation Water Resource Management Plan adopted December 2018.

There are several goals and policies associated with surface water management for the Northwest Area in Chapter 3 and 10 of the 2040 Comprehensive Plan.

From Chapter 3:

- Goal 1: Conserve and enhance key natural resources to respect, reflect, and protect the natural environment of Inver Grove Heights
 - Policy 1: Emphasize proper management of open space areas in order to preserve the trees, steep slopes, water quality and similar significant features of these areas and protect the natural environment of Inver Grove Heights.
- Goal 2: Promote future urban development in Inver Grove Heights to sustain the character and function of essential natural resources.
 - Policy 4: Consider re-establishing a program of periodically testing water bodies within the community in order to assess the long-range effects that urbanization has on these water bodies and correspondingly, in order to undertake any necessary protective measures that may be pointed out through this monitoring system.
 - Policy 8: Continue implementing the Northwest Area zoning ordinances as a model for innovative stormwater management and development patterns.

From Chapter 10:

- Water Quality of Lakes and Ponds
 - Policy 1: Water bodies designated as lakes by the City will be managed to meet the City's water quality criteria for non-degradation of water quality, with allowance for natural variability.
- Goal: Stormwater Runoff Quality, Rates, and Volumes
 - Policy 1: Operate, manage, and maintain the City's stormwater system to ensure proper functioning of the system and to meet the requirements of the City's NPDES Phase II MS4 Permit and other agency requirements.
 - Policy 2: Improve the quality of stormwater runoff reaching the Mississippi River by reducing nonpoint source pollution (including sediment) carried as stormwater runoff.
 - Policy 3: Minimize flood damage to residential, business, commercial and public structures and property, and protect against increased flooding caused by land disturbing activities and other projects.
 - Policy 4: Reduce volumes of stormwater runoff and the amount of impervious surfaces in the developed parts of the City. Goal 5: In the Northwest Area - limit the rates and volumes, and increase the treatment of stormwater runoff, by managing stormwater runoff as close to its source as possible and mimicking the system's natural hydrology. Incorporate the "treatment train" approach with a goal to require that at least 50% of

water quality treatment is provided by BMPs located in the upstream areas of the site.

The 2040 Comprehensive Plan also states that the city will continue implementing the NW Area PUD ordinance to protect natural resources and valued open space corridors.

WETLANDS

2005

Wetlands in the project area are regulated by several agencies, including the US Army Corps of Engineers, Minnesota Board of Water and Soil Resources (BWSR), the Minnesota Pollution Control Agency (MPCA), and City of Inver Grove Heights. The City of Inver Grove Heights has accepted the responsibility for the administration of the Minnesota Wetland Conservation Act (WCA). The City uses the DCSWCD for technical assistance for WCA issues. Construction plans for the site that propose direct alteration of indirect impact to wetlands within the project area will require permits from the appropriate regulatory agencies.

Information about the types and acreage of wetlands in the project area are detailed in Section 10, above. Wetlands in the AUAR area were inventoried using the Minnesota Routine Assessment Methodology (MnRAM) and classified in four types based on their vegetation communities and susceptibility to stormwater impacts. The task force for the Natural Resource Inventory developed recommendations for management of the wetlands based on their classification, with the greatest protection given to the highest quality wetlands. Recommended Wetland Management Standards adopted by the City are included in Table 12-1.

Table 12-1: Recommended Wetland Management Standards

Management Classification	Buffer Strip (slopes <15%)	Buffer Strip (slopes >15%)	Structural Setback from Edge of Buffer	Stormwater Phosphorus Pretreatment Required	Stormwater Quantity Required
Manage 1	60 feet	90 feet	10 feet	Limit loadings to 2x predevelopment loadings (0.25 lbs/ac/yr)	Storm bounce – maintain high water level (HWL) at or below existing conditions from 100-year storm
Manage 2	30 feet	45 feet	10 feet	Limit concentration to 150 parts per billion (ppb)	Storm bounce – maintain HWL bounce at or below existing conditions plus 0.5 feet for 100-year storm
Manage 3	20 feet	30 feet	10 feet	Limit concentration to predevelopment concentrations (200 ppb)	No requirement

Management Classification	Buffer Strip (slopes <15%)	Buffer Strip (slopes >15%)	Structural Setback from Edge of Buffer	Stormwater Phosphorus Pretreatment Required	Stormwater Quantity Required
Manage 4	15 feet	20 feet	10 feet	No requirement – enhancement recommended	No requirement

The City will implement these standards along with standards adopted in the Surface Water Management Plan (see Section 17) for waterbodies in the AUAR area. Section 17 provides detailed analysis of the potential stormwater impacts to wetlands and basins in the AUAR area and includes recommendations for management of surface water runoff to avoid or minimize potential impacts.

2007 and 2014

No update.

2019

Some wetland impacts have occurred within the AUAR study area since 2005. Those wetland impacts have been minimized to the extent practicable and have been mitigated. The wetland inventory and management plan has not been updated to reflect these minor changes to wetlands within the AUAR study area.

- June 2018 Northwest Area Regional Basin Map by EOR.
- June 2017 Robert District Basin Map update.

13. Water Use

a. Will the project involve the installation or abandonment of any wells?

☒ Yes ☐ No

b. For abandoned wells, give the location and unique well number. For new wells, or other previously unpermitted wells, give the location and purpose of the well and the Unique Well Number (if known).

2005

A search of the Minnesota Geological Survey's County Well Index (CWI) was performed, and records were found for 176 wells in the project area. A majority of the wells are used for domestic water supply. Figure 13-2 (in Attachment C and D) shows the location of these wells, and Table 13-1 summarizes what is known about these wells. One of the wells is recorded in the database as being inactive. Just over half of the wells were located using the coordinates provided in database files distributed with the CWI. The remaining wells were located using the address and/or public land survey system data provided in CWI. Other wells recorded in the CWI database may be located within the project area, but the location information provided for these wells is either insufficient or inaccurate.

The CWI only identifies wells that have been assigned a unique identification number and only includes a minority of the wells in Minnesota. Aerial photographs and a USGS 7 ½ minute topographic map were used to identify properties not identified in the CWI

database that are expected to contain or to have contained a water well. 118 properties were identified as probable well locations (see Figure 13-2 in Attachment C and D and Table 13-2).

Since this area has historically been used for farming and rural residences, it is possible that there are other wells in this area that are not accounted for. The possibility exists that unsealed, abandoned wells may be encountered after construction begins. In that event, those wells will have to be properly sealed and abandoned to meet codes required by the Minnesota Department of Health.

The City's Comprehensive Plan calls for conversion/rezoning of portions of the area from low density residential to higher density residential, industrial, and commercial land uses. Existing wells on sites that are redeveloped will be sealed before construction begins in accordance with codes required by the Minnesota Department of Health. Municipal water service may be made available to residences and businesses currently served by private wells. City of Inver Grove Heights codes allow property owners to retain private wells after connecting to the municipal water supply, but no cross-connection between the municipal water system and other water supplies is permitted (City of Inver Grove Heights Ordinance 705.25).

2007 and 2014

No update.

2019

A search of the Minnesota Geological Survey's County Well Index (CWI) was performed, and records were found for 192 wells in the AUAR study area. Almost all of the wells are used for domestic water supply and several are abandoned. Existing wells on sites that are redeveloped will be sealed before construction begins in accordance with codes required by the Minnesota Department of Health. See **Figure 7** (in Attachment A) for an updated figure of possible wells. The City completed a Wellhead Protection Plan in September 2016.

With respect to c and d, below, if the area requires new water supply wells, specific information about that appropriation and its potential impacts on groundwater levels should be given; if groundwater levels would be affected, any impacts resulting on other resources should be addressed. With respect to possible individual appropriations by future projects, a general assessment of the likely need for such should be indicated, and if there is potential for major appropriations or environmental issues resulting from individual appropriations, a more detailed assessment of those should be included along with a discussion for mitigation for potential problems.

- c. Will the project require an appropriation of ground or surface water (including dewatering)?

☒ Yes ☐ No

- d. If yes, indicate the source, quantity, duration, purpose of the appropriation, and DNR water appropriation permit number of any existing appropriation. Discuss the impact of the appropriation on groundwater levels.

2005⁵

The City of Inver Grove Heights currently operates six municipal supply wells with a total groundwater appropriation of 1,250 million gallons per year (MGY) in 2003. The DNR water appropriations permit number for Inver Grove Heights is 806052. Two wells are located east of the project area along 75th Street. The other four wells are located further to the east, three wells in South Valley Park and one just east of North Valley Park. Raw water is pumped from the wells to the water treatment facility located just east of the AUAR area at the intersection of Babcock Trail and 75th Street.

Five of the six wells are completed in the Jordan Sandstone portion of the Prairie du Chien Jordan aquifer system and have capacities of 1,200 gallons per minute (gpm). One well is completed in the Mount Simon-Hinckley aquifer and has a capacity of 1,000 gpm. While each well may yield at least 1,000 gpm, the use of each well is not constant. The average daily discharge for each well is considerably less than the well capacity. A total of 1,116 million gallons were pumped from the wells in 2003. The water demand rarely requires that all wells be activated simultaneously. Therefore, the wells are used on a rotation schedule.

The project area will be served by expanding the existing municipal water supply system. Development of the project area will require additional appropriation of groundwater for municipal water supply. The City's capital improvement plan calls for an additional four wells to meet the ultimate system demand. An expansion of the water treatment plant is also planned. The ultimate projected municipal water system demand is 2,139 MGY (*Water Supply Plan, Inver Grove Heights, Minnesota, 1996*, prepared by Bonestroo Rosene Anderlik & Assoc.). Additional water appropriations permit requests will be staged with development to stay ahead of demand.

Analysis of proposed land uses in the AUAR area has revealed that the projected total maximum day water demand will be approximately 1.3 million gallons per day greater than previously projected. Therefore, a fifth additional well will likely be required to meet the ultimate system demand. The number of new wells required will depend on the capacities of the future wells. The ultimate projected municipal water system demand is estimated to be 2,295 MGY (2005 estimate), including the fifth additional well proposed for the system. Additional water appropriations permit requests will be staged with development to stay ahead of demand.

New wells will be completed in the Jordan Sandstone portion of the Prairie du Chien-Jordan aquifer system. The City is currently seeking sites for at least two new wells. The most likely location for the new wells is the Inverwood Golf Course, located along the

⁵ Sources: Hundley, Steven J. (1983) Soil Survey of Dakota County, Minnesota. U. S. Department of Agriculture Soil Conservation Service.
Meyer, G. N. and Lusardi, B. A. (2000) Surficial Geology of the St. Paul 30 x 60 minute Quadrangle, Minnesota, Minnesota, Geological Survey M-Series Map M-106. Arc/Info export files and pdf file.
Minnesota Geological Survey (1990) Geologic Atlas of Dakota County, Minnesota, N. H. Balaban and Howard C. Hobbs eds., University of Minnesota, St. Paul.
Minnesota Geological Survey (2000) Bedrock Geology and Structure of the Seven-County Twin Cities Metropolitan Area, Minnesota, Arc/Info export files.

eastern boundary of the AUAR area. Each new well is expected to have a capacity of 1,200 gpm.

The effect of pumping generally results in a temporary lowering of groundwater levels in the aquifer while the wells are operating. The performance of the City's current wells indicates that the aquifer is highly permeable and able to yield the additional water. Therefore, while the City's current wells will experience a gradual increase in pumping and additional wells will be constructed, the aquifer is expected to be able to accommodate the additional withdrawals.

In recent aquifer-pumping tests of Wells 7 and 8, located along 75th Street east of the AUAR area, the water level in Well 8 dropped 38 feet after pumping the well at 1,400 gpm over an 8-hour period. Drawdown due to pumping Well 8 reached an equilibrium level after approximately four hours. Interference drawdown of 9 feet was measured at a distance of approximately 1,300 feet from Well 8 at Well 7. Well 7 was pumped at a rate of 1,300 gpm for a period of 24 hours. Maximum drawdown in Well 7 was approximately 32 feet, and interference drawdown in Well 8 was approximately 10 feet.

Pumping tests, borehole flow-meter logs, and other data collected in the Twin Cities and southeastern Minnesota have demonstrated that the lower part of the Prairie du Chien Group (Oneota Formation) acts as a regional semi-confining layer between the upper part of the Prairie du Chien Group (Shakopee Formation) and the Jordan Sandstone. Groundwater extraction in one part of the aquifer system, either the Prairie du Chien Group or the Jordan Sandstone, is expected to influence hydraulic heads in the formation not being pumped, but to a much lesser degree than the pumped part of the aquifer system.

Most water wells in Inver Grove Heights and surrounding areas are completed in the Prairie du Chien Group portion of the Prairie du Chien-Jordan aquifer system, in the unconsolidated Quaternary aquifers, or in the St. Peter Sandstone. It is unlikely that pumping from current or proposed City wells will have a detrimental impact on domestic or non-community wells in or around the project area. New municipal wells will be constructed at a sufficient distance to prevent excessive interference between the municipal wells. Adequate well spacing will also limit the potential cumulative drawdown that could occur at the locations of other existing wells.

The Inverwood Golf Course operates irrigation wells completed at a depth of 422 feet. A geologic log is not available, but, given the well location and depth, the well is likely completed in the Jordan Sandstone. The DNR considers potential well interference problems before issuing water appropriation permits. The City of Inver Grove Heights will work with the golf course to locate new wells at a sufficient distance from the existing wells to avoid interference with operation of the existing wells.

2007

No update.

2014

- Well field development occurred in 2008, adding Well No. 9 at 7302 Babcock Avenue. The new well is in the Jordan Aquifer and has a capacity of 1,400 gpm.

- A Water System Model update and the Wellhead Protection Study will be completed in 2014.
- The Water Treatment Plant was expanded in 2007 to provide a treatment capacity of 12 million gallons per day (MGD).
- The Asher Tower Elevated Water Tank was reconstructed in 2013, providing one million gallons (1 MG) of storage capacity.
- A Northwest Area water model and pressure zone map was developed in 2008 and is being updated in 2014.

2019

The existing and future water system for the AUAR study area is shown in Chapter 8 of the 2040 Comprehensive Plan and was developed based on the northwest area water system improvements included in the May 2005 Northwest Area Feasibility Report and more recent Northwest Water System Study completed in January of 2017. The third generation of the Local Water Supply Plan was approved by the DNR in February 2020. A 12-inch and 16-inch water main is proposed within the AUAR study area to support existing and future development. As identified in the 2040 Comprehensive Plan and the Third Generation of the Local Water Supply Plan, one additional well may be needed by 2040 depending on future development.

Table 13-1: Existing Well Locations

Unique No.	Address	Well Use ⁶	Depth Completed	Aquifer ⁷	Notes
00100994	5690 ROBERT TR S	DO	395	OPDC	
00100994	5772 ROBERT TR S	DO	395	OPDC	
00101043	1286 70TH ST E	DO	252	OPDC	
00104132	6736 ARGENTA TR W	DO	260	OPDC	
00104188	8305 ANGUS AVE E	DO	275	QBAA	
00104312	1155 82ND ST E	DO	155	QUUU	
00107145	4 HIGH RD	DO	291	OPDC	
00107303	8329 ALTA AVE E	DO	178	QUUU	
00107303	8375 ALTA AVE E	DO	178	QUUU	
00124323	1224 70TH ST W	DO	255	QBAA	
00124349	6780 W. ARGENTA TR.	DO	300	OPDC	
00124349	6780 ARGENTA TR W	DO	300	OPDC	
00127186	1714 80TH ST E	DO	272	OPDC	
00127187	1407 80TH ST E	DO	276	OPDC	
00127188	7660 ARGENTA TR W	DO	291	OPDC	
00127189	6710 ARGENTA TR W	DO	271	OPDC	
00127189	6714 ARGENTA TR W	DO	271	OPDC	
00127196	8569 ALVERNA	DO	295	QBUA	

⁶ Well use codes: DO—Domestic; IR—Irrigation; PN—Public supply, non-community, transient. This field is blank where the use is not provided in CWI.

⁷ Aquifer codes: QBAA—Quaternary artesian, QBUA—buried Quaternary, QUUU—Unidentified Quaternary, QWTA—Water Table, OSTP—Saint Peter Sandstone, OPDC—Prairie du Chien, OPCJ—Prairie du Chien-Jordan, MTPL—multiple. This field is blank where geological and/or well construction information was not provided.

Unique No.	Address	Well Use ⁶	Depth Completed	Aquifer ⁷	Notes
00127591	6970 ARGENTA TR W	DO	302	QBAA	
00129164	8475 ANN MARIE TR	DO	239	QBAA	
00129251	1126 70TH ST E	DO	260	OPDC	
00136461	7010 ANGUS AVE E	DO	295	MTPL	
00136504	8485 ANNALISA PATH	DO	212	QBAA	
00141811	1181 80TH ST E	PN	261	OPDC	Clover Leaf Motel well
00146831	8350 ANNALISA PATH	DO	303	OPDC	
00159489	7376 COURTHOUSE BLVD E	DO	175	QBAA	
00171835	8505 ANGUS AVE E	DO	249	QBUA	
00171835	8480 ANNALISA PATH	DO	249	QBUA	
00177070	11 HIGH RD	DO	317	OSTP	
00179705	1932 COURTHOUSE BLVD W	DO	125	QBAA	
00182815	7834 ALBERTA WAY W	DO	292	OPDC	
00182969	7840 ALBERTA WAY W	DO	308	OPDC	
00185277	8315 ANNALISA PATH	DO	243	QWTA	
00185937	1878 70TH ST W	DO	217	QWTA	
00185980	6930 ATHENA WAY	DO	300	OPDC	
00185983	15 HIGH RD	DO	290	OPDC	
00186044	7940 ALBERTA WAY W	DO	175	QWTA	
00188208	2000 70TH ST W	DO	276	OPDC	
00190477	1162 82ND ST E	DO	241	OPDC	
00190477	1186 82ND ST E	DO	241	OPDC	
00194093	8240 ANGUS AVE E	DO	280	OPDC	
00194197	7160 ROBERT TR S	PN	215	OSTP	
00198282	7830 ALBERTA WAY W	DO	278	QWTA	
00198297	1715 70TH ST E	DO	280	OPDC	
00198328	6800 ATHENA WAY	DO	280	OPDC	
00198339	8141 COURTHOUSE BLVD CT E	DO	300	OPDC	
00198340	8185 COURTHOUSE BLVD CT	DO	275	QBAA	
00198345	7929 ARGENTA TRL W	DO	260	QBAA	
00198350	7120 ALLEN WAY	DO	280	OPDC	
00207279	280 SMITH AVE N	DO	294	OPDC	
00208361	6570 ROBERT TR S	DO	290	OPDC	
00208366	1472 60TH ST W	DO	175	QUUU	
00208367	6854 ARGENTA TR W	DO	285	OPDC	
00208367	6770 ARGENTA TR	DO	285	OPDC	
00208368	7115 ALTA AVE E	DO	300	OPDC	
00208368	7075 ANGUS AVE E	DO	300	OPDC	
00208378	8195 BABCOCK TR E	DO	275	OPDC	
00208379	8373 ALTA AVE E	DO	140	QUUU	
235590	MNDOT 35E/494 PARCEL 14		177	QUUU	Status unknown
00247444	5830 ROBERT TR S	DO	273	OSTP	Well is inactive
00401105	6797 ARKANSAS AVE W	DO	306	OPDC	
00404811	17 HIGH RD	DO	300	OPDC	
00404813	6785 ARLENE AVE	DO	320	OPDC	
00405088	1845 77TH ST W	DO	317	OPDC	
00408263	1466 70TH ST W	DO	280	OPDC	

Unique No.	Address	Well Use ⁶	Depth Completed	Aquifer ⁷	Notes
00408269	501 ROLLING HILLS CIR	DO	325	OPDC	
00410991	1225 80TH ST E	DO	250	OPDC	
00412467	6875 ATHENA WAY	DO	320	OPDC	
00412468	1805 BUR OAK DR	DO	320	OPDC	
00412482	6980 ARKANSAS AVE W	DO	123	QWTA	
00416002	6640 ARLENE AVE	DO	320	MTPL	
00416015	500 ROLLING HILLS CIR	DO	173	QWTA	
00416018	6855 ARLENE AVE	DO	300	OPDC	
00416023	6680 ARLENE AVE	DO	253	QBAA	
00416049	6705 ARLENE AVE	DO	358	OPDC	
00417573	8561 ALVERNO AVE W	DO	345	QBAA	
00418617	6785 ATHENA WAY	DO	300	OPDC	
00418625	8265 BABCOCK TR	PN	280	OPDC	Inver Hills Assembly of God Church
00418626	1795 70TH ST E	DO	260	MTPL	
00418641	6790 ATHENA WAY	DO	320	OPDC	
00418646	7920 ALBERTA WAY W	DO	340	OPDC	
00418655	6605 ARLENE AVE	DO	320	MTPL	
00418660	6600 ARLENE AVE	DO	280	OPDC	
00418661	6860 ATHENA WAY	DO	280	OPDC	
00418663	8505 ANGUS AVE E	DO	280	QBAA	
00418664	6985 ARLENE AVE	DO	300	MTPL	
00418669	6910 ATHENA WAY	DO	320	MTPL	
00424909	6980 ARLENE AVE	DO	300	MTPL	
00425219	8285 ANNALISA PATH	DO	280	OPDC	
00425266	7 HIGH RD	DO	300	OSTP	
00426353	6565 ARLENE AVE	DO	300	OPDC	
00426363	6890 ATHENA WAY	DO	320	OPDC	
00426377	8715 ALVERNO	DO	380	OPDC	
00426386	7080 ALLEN WAY	DO	240	OPDC	
00426908	1206 60TH ST W	DO	275	OSTP	
00426923	6810 ARLENE AVE	DO	310	OPDC	
00427037	8011 COURTHOUSE BLVD E	DO	212		
00427141	6525 ARLENE AVE	DO	335	OPDC	
00429860	1225 80TH ST E	DO	280	OPDC	
00429893	8345 ANNALISA PATH	DO	300	OPDC	
00429894	6830 ATHENA WAY	DO	300	OPDC	
00435200	6925 ARLENE AVE	DO	290	OPDC	
00435236	5580 ROBERT TR S	DO	360	OPDC	
00437855	6560 ARLENE AVE	DO	260	OPDC	
00437888	8480 ANNALISA PATH	DO	340	OPDC	
00437918	6805 ATHENA WAY	DO	300	OPDC	
00437920	6655 ARLENE AVE	DO	340	OPDC	
00441920	8410 ANNALISA PATH	DO	307	OPDC	
00443613	8665 ALVERNO AVE	DO	231	QBAA	
00443885	1215 82ND ST E	DO	162	QBAA	
00443922	6261 ARGENTA TR W	DO	250	OPDC	

Unique No.	Address	Well Use ⁶	Depth Completed	Aquifer ⁷	Notes
00451545	6710 ARLENE AVE	DO	320	OPDC	
00451625	6815 ROBERT TR S	DO	252		
00457160	8001 COURTHOUSE BLVD	DO	162	QBUA	
00457166	1304 COURTHOUSE BLVD E	DO	147		
00457178	8003 COURTHOUSE BLVD	DO	216		
00460111	7085 ALLEN WAY	DO	230		
00460145	1620 80TH ST E	DO	215		
00460149	6835 ATHENA WAY	DO	315		
00463545	INVERWOOD GOLF COURSE	IR	422	OPCJ?	DNR permit no. 926022
00466761	8355 ANGUS AVE?	DO			
00474305	1234 70TH AVE	DO	282		
00474317	8450 ALTA AVE	DO	200		
00479100	1597 80TH ST E	PN	280	OPDC?	Inverwood Golf Course
00479118	1872 70TH ST W	DO	245		
00481504	1285 70TH ST W	DO	312	OPDC?	
00481510	7350 COURT HOUSE BL	DO	200		
00494802	1202 70TH ST W	DO	333		
00498421	1735 70TH ST W	DO	240		
00498428	7161 ROBERT TR S	DO	240		
00498434	8215 ANGUS AVE E	DO	300		
00498439	1597 80TH ST E	PN	280	OPDC?	Inverwood Golf Course comfort station
00506634	6190 ROBERT TR S	DO	340		
00506652	8100 ADELBERT AVE E	DO	210		
00524113	5830 ROBERT TR S	DO	280		
00524250	1954 COURTHOUSE BLVD W	DO	236		
00526974	1125 80TH ST E	DO	280		
00534326	1180 70TH ST W	DO	320		
00546339	6680 ARLENE AVE	DO	295		
00554745	7250 ARGENTA TR	DO	260		
00558267	8136 ADELBERT AV	DO	208		
00562261	8308 ALVERNO AVE W	DO	257		
00569783	1225 80TH ST E	DO	250		
00573827	7465 ROBERT TR S	DO	360		
00585164	6302 SOUTH ROBERT TR	DO	320		
00585173	8670 ALVERNO AV	DO	360		
00589981	6742 ARGENTA TR W	DO	280		
00595063	1086 60TH ST	DO	268		
00597774	7925 ARGENTA TR W	DO	345		
627065	7755 ARGENTA TR	DO	195		
629088	280 SMITH AVE N	DO	240		
636371	8420 ALVERNO AV W	DO	323		
642428	8308 ALVERNO AVE W	DO	330		
642435	6275 ROBERT TR S	DO	300		
00651961	8152 ADELBERT AVE E	DO	222		

Unique No.	Address	Well Use ⁶	Depth Completed	Aquifer ⁷	Notes
664148	1130 70TH ST W	DO	320		
666267	6712 ARGENTA TR	DO	280		
672585	280 SMITH AVE N	DO	365		
675280	6818 ARGENTA TR W	DO	278		
679293	8523 ALVERNO AVE W	DO	390		
686596	8385 ANGUS AVE	DO	320		
686648	280 SMITH AVE N	IR	360	OPDC	DNR permit no. 043087
704963	1603 69TH ST W	DO	267		
W0000010	6818 ARKANSAS AVE W	DO			
W0000203	8480 ANNALISA PATH	DO	220		
W0000232	1597 80TH ST E	DO	160		
W0000360	8201 ANGUS AVE E	DO			
W0000526	6155 ROBERT TR S	DO	280		
W0000526	1086 60 ST W	DO	280		
W0000737	NOT ASSIGNED	DO	350		City of Inver Grove Heights, PIN 20-00800-014-01
W0000737	1526 70TH ST E	DO	350		
W0000760	8290 ANGUS AVE E	DO			
W0000774	6760 ARKANSAS AVE W	DO			
W0000808	7985 ARGENTA TR	DO			
W0000996	1148 60TH ST W	DO			
Not Assigned	6180 ROBERT TR S	DO			

Table 13-2: Probable Well Locations

Address
6515 BABCOCK TR E
6308 ROBERT TR S
6184 ROBERT TR S
6520 ROBERT TR S
1271 70TH ST E
1415 70TH ST E
1184 60TH ST W
6321 ROBERT TR S
6385 ROBERT TR S
6351 ARGENTA TRL W
6480 ARGENTA TR W
6660 ARGENTA TR W
6720 ARGENTA TR W
6689 ARGENTA TR W
6659 ARGENTA TR W
6743 ARGENTA TR W
6912 ARGENTA TR W
6922 ARGENTA TR W
1605 68TH ST W

Address
1633 68TH ST W
1655 68TH ST W
1630 68TH ST W
1654 68TH ST W
1636 69TH ST W
1658 69TH ST W
1600 69TH ST W
1601 70TH ST W
1629 70TH ST W
6963 ARKANSAS AVE W
6921 ARKANSAS AVE W
6863 ARKANSAS AVE W
6889 ROBERT TR S
1165 70TH ST W
7215 ROBERT TR S
1060 72ND CIR
1090 70TH ST W
1100 70TH ST W
1120 70TH ST W
1216 70TH ST W
1210 70TH ST W
1400 70TH ST W
1266 70TH ST W
7455 ROBERT TR S
7475 ROBERT TR S
1230 70TH ST W
7245 ROBERT TR S
1700 70TH ST W
7241 ARGENTA TR W
7278 ARGENTA TR W
7305 ARGENTA TR W
7333 ARGENTA TR W
7475 ARGENTA TR
7482 ARGENTA TR
1644 COURTHOUSE BLVD W
7587 ARGENTA TR
7923 ARGENTA TR W
7890 ALBERTA WAY W
7875 ALBERTA WAY W
7757 ROBERT TR S
7038 ANGUS AVE E
7182 ANGUS AVE E
7248 ANGUS AVE E
7175 ANGUS AVE E
7079 ANGUS AVE E
1418 70TH ST E
7185 ALTA AVE E
7260 ROBERT TR S
7456 ROBERT TR S

Address
7340 ANGUS AVE
1183 80TH ST E
7884 ROBERT TR S
1375 80TH ST E
1401 80TH ST E
1467 80TH ST E
1760 80TH ST E
1850 80TH ST E
1462 80TH ST E
8140 COURTHOUSE BLVD E
8150 COURTHOUSE BLVD E
8115 COURTHOUSE BLVD E
8119 COURTHOUSE BLVD E
8112 ADELBERT AVE E
1227 82ND ST E
1191 82ND ST E
1129 82ND ST E
1204 82ND ST E
1240 82ND ST E
1090 82ND ST E
1102 82ND ST E
8415 ANGUS AVE
8315 ALTA AVE E
8350 ANGUS AVE E
8304 ANNALISA PATH
8380 ANNALISA PATH
8450 ANN MARIE TR E
8482 ANNE MARIE TR
8381 ANNALISA PATH
8380 ANGUS AVE E
8302 ALVERNO AVE W
1565 82ND ST
8334 ARGENTA TR W
HOLY TRINITY SERBIAN ORTHODOX CHURCH
8245 ARGENTA
1712 82ND ST W
8580 ALVERNO AVE W
5722 ROBERT TR S
5900 ROBERT TR S
5910 ROBERT TR S
5904 ROBERT TR S
5898 ROBERT TR S
2 HIGH RD
6 HIGH RD
8 HIGH RD
12 HIGH RD
10 HIGH RD
9 HIGH RD

Address

5 HIGH RD

The 16 new identified wells are all wells that have not had their locations field checked. The locations are calculated from the township-range-section-subsection provided by the submitter of the well log.

14. Water-Related Land Use Management Districts

- a. Does any part of the project site involve a shoreland zoning district, a delineated 100-year floodplain, or a state and federally designated wild and scenic river land use district?

☒ Yes ☐ No

- b. If yes, identify the district and discuss the compatibility of the project with the land use restrictions of the district. Such districts should be delineated on appropriate maps and the land use restrictions applicable in those districts should be described. If any variances or deviations from these restrictions within the AUAR are envisioned, this should be discussed.

2005

The AUAR area does not include any floodplain areas.

The area does include several designated shoreland areas. These areas are delineated on the City's official Zoning Map. The City's Shoreland Ordinance regulates land uses, structures, and other requirements in these areas. The City will enforce the Shoreland Ordinance in the AUAR area, and no variances or deviations from the Shoreland Ordinance are envisioned for development in this area.

2007, 2014, and 2019

No update.

15. Water Surface Use

- a. Will the project change the number or type of watercraft on any waterbody?

☐ Yes ☒ No

- b. If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other users or fish and wildlife resources. This item need only be addressed if the AUAR area would include or adjoin recreational waterbodies.

Not applicable.

16. Erosion and Sedimentation

- a. Describe any steep slopes or highly erodible soils and identify them on the site map. Describe the erosion and sedimentation measures to be used during and after construction of the project. The number of acres to be graded and number of cubic

yards of soil to be moved need not be given; instead, a general discussion of the likely earthmoving needs for development of the area should be given, with an emphasis on unusual or problem areas. In discussing mitigation measures, both the standard requirements of local ordinances and any special measures that would be added for AUAR purposes should be included.

2005

Figure 16-1 (in Attachment C and D) indicates that scattered areas of slopes between 12-20 percent exist throughout the AUAR area.

The City's Subdivision Ordinance includes provisions for management of disturbance in Protected Areas such as steep slopes.

2007, 2014, and 2019

No update.

17. Water Quality—Surface Water Runoff

It is expected that the AUAR will have a detailed analysis of stormwater issues. A map of the proposed stormwater management system and of the waterbodies that will receive stormwater should be provided.

The description of the stormwater system should identify on-site and “regional” detention ponding and also indicate whether the various ponds will be new waterbodies or converted existing ponds or wetlands. Where on-site ponds will be used but have not yet been designed, the discussion should indicate the design standards that will be followed.

The following types of waterbodies must be given special analysis:

- **Lakes:** Within the Twin Cities metro area, a nutrient budget analysis must be prepared for any “priority lake” identified by the Metropolitan Council. Outside of the metro area, lakes needing a nutrient budget analysis must be determined by consultation with the MPCA and DNR staffs.
- **Trout Streams:** If stormwater discharges will enter or affect a trout stream, an evaluation of the impacts on the chemical composition and temperature regime of the stream and consequent impacts on the trout population (and other species of concern) must be included.

BACKGROUND

2005

Watershed Setting

The details of the stormwater management system proposed for the Northwest Expansion Area are best described by combining Section 17a and b into a single discussion. The Northwest Expansion Area is located within two watershed areas. Figure 17-1 (in Attachment C and D) illustrates the watershed divide between the Lower Mississippi River Water Management Organization (LMRWMO) and the Gun Club Lake Water Management

Organization (GCLWMO). The approximate acreage of Northwest Expansion Area within the LMRWMO and GCLWMO is 2,650 acres and 760 acres, respectively.

The Northwest Expansion Area within the LMRWMO watershed can be sub-divided into a series of 115 subwatersheds, which are shown on Figure 17-2 (in Attachment C and D). Each of these subwatersheds was characterized for water quantity modeling under existing conditions and was subsequently modeled for developed conditions in detail as part of the City's *Northwest Expansion Area Hydrologic & Hydraulic Analysis* (February 2004). The Northwest Expansion Area within the GCLWMO watershed can be sub-divided into a series of 53 subwatersheds as delineated and modeled in the City's *2020 Comprehensive Plan*, also shown on Figure 17-2 (in Attachment C and D).

The Northwest Expansion Area does not contain or drain to a DNR designated trout stream or a priority lake as identified by the Metropolitan Council. Reference to Figure 17-3 (in Attachment C and D), however, shows that a fair number of these natural basins are delineated as wetlands and that three are lakes (Dickman, Hornbeam, and Rosenberger).

Discharge from the Study Area

The LMRWMO and the GCLWMO are considered to be tributary to the Mississippi and Minnesota Rivers, respectively. However, the geologic history of the Northwest Expansion Area has resulted in closed basin drainage; that is, runoff discharges to existing natural basins that in most cases do not have outlets or overflows that operate, and thus are landlocked. Under existing conditions, water flows into these basins and leaves through a combination of seepage (infiltration) into the ground and evaporation.

As identified on Figure 17-2 (in Attachment C and D), the only stormwater discharge from the Northwest Expansion Area within the LMRWMO watershed under existing conditions occurs at two locations: Basin EP-080a (Rosenberger Lake) and Subwatershed BP-005 (to DNR Protected Wetland 241W). Stormwater discharge from the GCLWMO watershed under existing conditions occurs at five locations: Hornbeam Lake (Q-11) to the City of Sunfish Lake and four stormwater management basins (F-25, W-2, W-4, and W-8) to the City of Eagan's stormwater management system.

Alternative Stormwater Management

In the past, the goal of an urban drainage system was to rush water away as fast as possible into a receiving stream or nearby lake or wetland. When it became evident that this was not a sustainable water management practice, the approach changed to the routing of water into detention ponds. Although many of these ponds were designed according to US Environmental Protection Agency's (EPA) Nationwide Urban Runoff Program (NURP) criteria based on 1980s studies, they too have some deficiencies in effective treatment and management of runoff.

Recently, communities have begun to employ a variety of strategies to treat runoff water by infiltrating it into the ground as close to its source as possible to mimic the natural hydrology of the system in the areas with permeable soils. This not only limits the volume and rate of runoff that occurs, it also eliminates the migration of polluting material that is picked up by runoff as it flows over urban surfaces. Infiltration also replenishes critical groundwater supplies that are used as drinking water sources. So called "alternative" runoff management

practices merely seek to mimic the way precipitation would behave without human intervention; that is, it attempts to soak water into the ground as if the land's surface did not have impervious surfaces. Caution, however, must always be exercised so that a high concentration of polluting material is not introduced.

In this respect the stormwater management approach proposed for the Northwest Expansion Area is an alternative to the collect and concentrate approaches from the past. The environmental benefits of this approach include reduced wetland and open space impact, improved water quality, potential regulatory credits (suitable for NPDES Phase II, Total Maximum Daily Loads (TMDLs), and watershed/local stormwater planning), reduced runoff and erosion, closer to natural water infiltration/recharge, reduced runoff and erosion, reduced negative upland habitat impact, and enhanced public awareness.

Taking advantage of the good soils and geologic conditions in the Northwest Expansion Area, the City is proposing an approach that minimizes connected impervious surfaces, increases flow path and time over previous surfaces, and decentralizes treatment (smaller localized BMPs as opposed to large-scale facility development) as a first measure of control. With implementation of these measures as standard practice, collection and further treatment/infiltration of excess water in the numerous existing natural basins may occur. A carefully planned and engineered approach that combines a number of alternative practices with infiltration provides for pretreatment before discharge to wetland basins and preserves the infiltration capacity of the natural basins. This infiltration approach mimics the conditions of the existing landscape rather than simply collecting and disposing of runoff to downstream resources that do not currently receive runoff from the area.

While stormwater conveyance has already been planned for the GCLWMO watershed as outlined in the City's *2020 Comprehensive Plan*, the stormwater management approach outlined in this section of the report is intended to be utilized across the entire Northwest Expansion Area. With implementation of this approach within the GCLWMO watershed, the rates and volumes of runoff previously planned for may be reduced. The City will continue to coordinate with the adjacent cities of Eagan and Sunfish Lake regarding stormwater management for runoff from the Northwest Expansion Area.

2007, 2014, and 2019

No update. See Figure 17-1 (in Attachment B) for watershed districts.

SURFACE WATER MODELING METHODOLOGY

2005

To adequately predict the impact that development of the Northwest Expansion Area will have on water resources, a tool is needed to incorporate development and infrastructure assumptions. The model used for this exercise is XP-SWMM 2000 (XP Software, Inc.). This model is used to contrast existing conditions with proposed changes associated with development within a watershed. The model looks at the change in land use and land cover and relates the change to runoff behavior. Runoff predictions can be made for variable frequency events and routed through the proposed drainage system to the existing natural basins. The model output and routing can then be used to determine areas where flooding or high water will occur, and then can be used to design a system of stormwater management

facilities, which could include detention storage, diversion, infiltration, or any number of associated BMPs.

Land Use & Percent Impervious

Existing land use consists mainly of low to medium density residential, forest, tall grass, and agriculture. Percent imperviousness for existing conditions is based on Minnesota Land Cover Classification System (MCCLS) GIS data provided by the DCSWCD. Percent imperviousness for developed conditions is based on the upper range of density units/per acre proposed in Figure 5-5 – Future Land Use 2005 & 2007 AUAR) while taking into account preservation of wetlands, critical event floodplains, lakes, and other inherently unbuildable areas such as steep slopes.

Runoff Methodology

The Green-Ampt Infiltration methodology within the runoff mode of XP-SWMM was used to simulate the infiltration of rainfall since this method is set up to function with continuous simulations and because this method has physically-based parameters that can be predicted using existing data and previous studies. Application of the Green-Ampt equation within XP-SWMM requires definition of three parameters:

1. Initial soil moisture deficit – This parameter is an estimate of the antecedent soil moisture conditions, which affect the initial soil infiltration rate. This parameter becomes important for accurate estimation of infiltration during simulation of a single event or for initial storms of a continuous simulation.
2. Soil capillary suction – This parameter influences the movement of a wetting front through the soil profile. Estimation of this value influences the initial soil infiltration rate (during the early stage of a storm event) but loses impact over time.
3. Saturated hydraulic conductivity – This parameter estimates the rate of water movement through a saturated soil profile and represents the most variable component of the Green-Ampt equation. For this reason, it is also the best parameter to use for infiltration calibration. This is the most significant of the three parameters needed and ultimately drives the saturated infiltration rate. Estimation of this parameter is also (indirectly) responsible for the rate at which the soil moisture content is recovered after a storm event.

Initial values for these parameters were assigned to each of the three US Department of Agriculture Soil Conservation Service (USDA SCS) soil texture groups (Loamy Sand, Sandy Loam, and Silty Loam) within the Northwest Expansion Area based on values recommended by XP-SWMM. Unique composite values for these parameters were developed for each subwatershed based on soil type weighted average.

Basin Storage

Existing basin stage-storage curves were developed from two-foot topographic mapping. Storage under proposed conditions is maintained as existing, except as discussed below, to take into account development grading activities. Shallow depressions that exist in rural areas (primarily occurring in the southwest portion of the Northwest Expansion Area) are assumed to be developed and no longer available for stormwater management under

proposed conditions. It is unlikely that all of these basins will be eliminated during the development process. However, to be conservative, it is assumed that these areas will develop to the maximum extent possible with reliance only on local on-site BMPs and the remaining natural basins identified on Figure 17-2 (in Attachment C and D).

In addition, storage for Basins EP-036a, EP-059c, and EP-064 was modified from existing conditions to concentrate storage into a smaller surface area, thereby providing additional developable area. These basins should maintain at least 10.8 acre-feet, 3.4 acre-feet, and 7.8 acre-feet of infiltration storage, respectively.

Basin Infiltration Rates

Rating curves were developed to simulate the infiltration capacity of the basins at different depths based on conservative soil infiltration rates assigned by subwatershed type. Previous studies on infiltration processes in similar geologic and topographic settings in the Metro Area have identified a range of infiltration rates between 0.02 and 0.32 inches per hour for less sandy soils and 0.12 and 0.60 inches per hour for sandy soils.

A single infiltration rate is assigned to dry basins, while two infiltration rates are assigned to wet basins. Wet basins are less permeable in the bottom, where water has ponded historically. Soils data supports that higher permeable materials typically surrounds the low permeability materials, forming an outer ring on the side slopes of the basin. A higher infiltration rate is applied to the outer ring, comparable to the infiltration rate applied over a dry basin with similar soil types.

Table 17-1 summarizes the assigned basin infiltration rates applied as a function of depth (for both existing and proposed condition models) for each subwatershed type.

Table 17-1: Natural Basin Infiltration Rates

Subwatershed Type	Depth in the Basin	Infiltration Rate
Type I: Wet basins in less sandy soils	0 to 4 feet	0.07 inches/hour
	4+ feet	0.30 inches/hour
Type II: Wet basins in sandy soils	0 to 4 feet	0.07 inches/hour
	4+ feet	0.50 inches/hour
Type III: Dry basins in less sandy soils	Any	0.30 inches/hour
Type IV: Dry basins in sandy soils	Any	0.50 inches/hour

Evaporation

To account for water budget losses due to evaporation, mean monthly evaporation (inches) was used from the USDA SCS (currently the Natural Resource Conservation Services) Hydrology Guide for Minnesota.

Rainfall Events

During this analysis it became evident that the development of a system that mimics existing conditions (by incorporating infiltration BMPs) requires an evaluation of multiple events. While the system should be designed for the worst-case scenario, it should also be designed and managed so that the BMPs will operate effectively for the smaller rainfall events (e.g., the 5-year 24-hour rainfall event) as well as the 100-year 24-hour rainfall event. As a result, this analysis looks at a number of rainfall events in evaluating the ability of BMPs to mimic the

natural hydrology of the system. Modeled rainfall events fall under two major categories: 1) synthetic rainfall curves (SCS Type II) and 2) recorded rainfall.

Synthetic rainfall events modeled for the Northwest Expansion Area include the 1-year 24-hour rainfall event (2.4 inch), the 5-year 24-hour rainfall event (3.6 inch), the 100-year 24-hour rainfall event (6.0 inch), the back-to-back 100-year 24-hour rainfall event (12.0 inch), and the 100-year 10-day rainfall event (10.9 inch). Shorter duration events represent greater intensities but less rainfall amounts which would not typically be critical in a volume-sensitive system such as this area. Snowmelt is addressed in the next section.

Actual recorded rainfall data was obtained from the Minneapolis-St. Paul Airport and used to run a continuous rainfall simulation for a sub-area of the Northwest Expansion Area from 1982 to 1987. This sub-area bound by 70th Street on the north, Highway 55 on the south, Argenta on the west and Robert Trail on the east is representative of the overall Northwest Expansion Area's existing hydrologic and geomorphic setting and is also representative of the overall proposed land use plan. The time period of 1982 to 1987 was selected for continuous simulation from the last 30 years of rainfall record since this represents the longest period of above average annual rainfall and contains the largest single event of record (9.15 inches on July 23, 1987), which significantly exceeds the 100-year 10-day snowmelt event with 7.2 inches of rain. Review of the results for proposed conditions for this continuous event demonstrate that all the natural basins recover from the precipitation events and do not continue to have rising water levels through this period. This is significant since back-to-back storms and extended wet periods could be a concern in this type of drainage system. Given the observed recovery of the natural basins in this area, this continuous event was not run for the entire Northwest Expansion Area.

Snowmelt Runoff Event

The 100-year snowmelt runoff event is simulated by a 7.2 inch, 10-day spring runoff event. During snowmelt simulations, it is often assumed that the ground is frozen solid and that no infiltration occurs. In reality, infiltration occurs to an extent (even on frozen ground). The soil's ability to infiltrate under frozen conditions is largely dependent upon the antecedent soil moisture conditions at the time of the initial freeze and the soil's texture. If soil moisture is low when freeze occurs, soil pore spaces can be preserved. The most restrictive conditions occur if the soils freeze while saturated, thereby forming a hardpan that does not allow infiltration. In either case, ground conditions are typically thawing over the 10-day simulation period with increasing infiltration rates over the period of the runoff simulation.

In evaluating the worst-case scenario for both existing and proposed conditions, the 100-year 10-day runoff/snowmelt event is modeled with no infiltration and no depressional storage (BMPs). This is a very conservative estimate of the volume of runoff being generated for the event and assumes that all of the 7.2 inches of runoff is completely delivered to the system. That is, all of the runoff is routed through the system without infiltration losses.

Identification of Worst-Case Scenario

A number of single larger events were modeled to determine the critical event for each subwatershed in the system. These events include the 100-year 24-hour rainfall event (6.0 inch), the 100-year 10-day rainfall event (10.9 inch), the 100-year 10-day runoff/snowmelt event (7.2 inch), and the back-to-back 100-year 24-hour rainfall events (12.0 inch).

Comparison of high-water levels indicates that the critical event for the majority of the subwatersheds under existing and proposed conditions is the 100-year snowmelt runoff event (7.2 inches in 10 days). In some cases where the 100-year 24-hour high water level is equal to or slightly above the high-water level for the 10-day runoff event, the difference is not considered to be significant enough to clearly demonstrate that the critical event is not the 10-day snowmelt event. Larger differences between these events are due to the inability of existing small culverts to handle the quick delivery of runoff produced by the 24-hour event. Conversely, the culverts are capable of handling the slow delivery of water in the 10-day event. Therefore, overall the system is “volume driven,” and the critical flooding event is in almost all cases the 100-year 10-day snowmelt/runoff event.

Proposed Conditions Best Management Practices

After identifying the worst-case scenario, the proposed conditions model was modified to evaluate the effect of infiltration BMPs on the critical high-water level for the basins. This scenario evaluated the construction of infiltration BMPs for volume control. By making some generalizations about the size and capacity of the BMPs, a simplified method for simulating the impact these practices would have on runoff was developed. It was assumed that a raingarden with the following maximum dimensions could be constructed to handle the runoff generated by two single family residential lots:

- Length = 50 feet
- Width = 10 feet
- Storage depth (at the surface) = 1 to 1.5 feet
- Storage depth (subsurface) = 4 feet

Figure 17-4 (in Attachment D) illustrates the concept design configuration for the raingardens. The construction of the perforated pipe is important since it serves as an observation well for future monitoring efforts as well as a conduit for runoff during frozen ground conditions. This design is based upon preliminary research results being developed by Dr. Kenneth Potter at the University of Wisconsin – Madison, who is generating optimal design configurations for raingardens. This design configuration is also based upon a size that will be non-intrusive yet effective given the development setting. The trench may be constructed to the specifications identified above or it may be split into multiple practices provided the overall storage volume and infiltration capacity is being maintained.

Of the four parameters identified above, storage depth at the surface and below the surface are the least flexible and should not be changed. Restricting the maximum ponding depth above ground to 1-1.5 feet reduces the time that there will be standing water in the raingarden, provides a suitable habitat for the vegetation, and allows for wet-dry cycling of the soils. Restricting the storage depth underground ensures that the storage volume will be available within a reasonable time period allowing for back-to-back rainfall events.

Given this design configuration, the amount of depressional storage to be incorporated in the model was determined (Table 17-2). This depressional storage (defined as a depth in inches) is effectively retained in the subwatershed simulating the storage capacity of the raingardens by reducing the total volume of runoff generated for the given event.

Note that the depressional storage identified in Table 17-2 for single events was applied based on land use intensity for the following land use categories: low density residential (less

than 30% impervious) and medium to high density residential (greater than 30% impervious). This is a low or conservative estimate of the volume control that could be achieved in the system while also providing more volume control for land uses with more imperviousness. This amounts to an overall land dedication for raingardens of about 2 to 3%. The proposed design configuration would allow for a reasonable land dedication that would fit the overall objectives of Northwest Expansion Area as proposed in Figure 5-5 – Future Land Use (2005 & 2007 AUAR).

Table 17-2: Depressional Storage Values

Rainfall Event	Depressional Storage due to Best Management Practices (BMPs) [inches]	
	Low Density Residential ($\leq 30\%$ Impervious)	Medium to High Density Residential/Light Industrial/Commercial ($>30\%$ Impervious)
1-year, 5-year, and 100-year 24-hour rainfall events	0.8	1.2
100-year 10-day rainfall event	2.6	3.9

The higher depressional storage associated with the 100-year, 10-day event is due to the fact that the infiltration rate in the raingardens occurs for the complete duration of the event (10-days) instead of only one day.

2007

No update.

2014

Atlas 14, published in 2013, is the most current frequency and duration stormwater information at the time of this AUAR update. The Northwest Area Stormwater Management Plan will be updated to incorporate Atlas 14 data as published by NOAA for the 2-, 10-, and 100-year rainfall events and the 100-year critical event (10-day snow melt) for development stormwater management plans and landlocked basins.

The Northwest Area Regional Basin Map and Stormwater Model was prepared on March 1, 2011 and includes mapping of the 100-year critical storm elevations for landlocked basins within the Northwest Area drainage. The map and stormwater model are being updated in 2014. Updates to the map and model will be a required condition of approval for future developments.

The 3rd Generation Lower Mississippi River Watershed Management Plan prepared in August 2011 requires a one-inch (1") impervious surface infiltration or filtration requirement depending on soil types and in-situ soil capacity to infiltrate.

2019

An ordinance update in 2016 requires infiltration of runoff per northwest area standards. Filtration for water quality may be allowed in tight soils.

The 4th Generation Water Resources Management Plan was prepared in December 2018 and includes the same requirements as what was established in the 3rd Generation Plan.

STORMWATER MANAGEMENT APPROACH

2005

There are three essential elements of the stormwater management approach proposed for the Northwest Expansion Area including: 1) smart land use planning that promotes open space and limits imperviousness, 2) management of small storm event runoff via alternative BMPs, and 3) preservation of the numerous natural basins for management of large storm events.

Smart Land Use Planning

Smart land use planning that integrates hydrologic function into site design and conserves natural resources and open space is critical to the success of the proposed stormwater management approach. This provides an ecologically friendly means to self-mitigate the impact that development brings to the water cycle. Development which provides diverse housing styles, minimizes impervious surface coverage, incorporates natural features as integral elements, and promotes cluster development or concentration of building pads to preserve open space will minimize runoff volume from the site and maximize the ability to infiltrate stormwater runoff in local BMPs and existing natural basin. Other specific benefits of this approach are:

- Preservation of open space;
- Minimization of land disturbance;
- Protection of natural systems and processes, and incorporation of natural site elements into the hydrologic design;
- Customization of infrastructure to each site rather than uniform design;
- Decentralization of runoff collection;
- Management of surface water at its source; and
- Groundwater/aquifer recharge.

Many of these smart land use planning elements are proposed in the *Draft Subd. 37. Northwest Area Planned Unit Development Overlay District* (Hoisington Koegler Group Inc. January 11, 2005) which, upon adoption, will guide development. Of special note, this draft ordinance currently specifies a minimum of 20% of the buildable development area shall be preserved as additional natural area/open space.

Development can also be designed to minimize or eliminate curbs, gutters, wide roadways, and the inlets/outlets and pipes that must accompany all of these features. Rather, this approach is flexible in its application from use on a lot-by-lot basis to entire portions of a community.

Alternative Best Management Practices

Alternative stormwater management practices provide measures for the City to reduce the overall volume of water draining to existing natural basins. Alternative management techniques typically do not use single-event designs (e.g., 100-year frequency) like traditional systems that handle big events while disregarding routine/frequent events. This approach

means that routine small events will not be “over-drained” as they would be in a traditional big conveyance system.

The best potential for these practices is infiltration of water close to the location where the precipitation deposits it, mimicking the pre-development runoff condition. The list of practices included under the term “alternative” is extensive. Applications of special interest to the Northwest Expansion Area because of its need to reduce volume flowing to the existing natural basins should focus on infiltration. Infiltration practices could include but are not limited to raingardens, vegetated swales, parking lot bioretention, infiltration trenches/basins, and green roofs.

Disconnection of impervious surfaces is a simple, but commonly overlooked, BMP that can be used to reduce the amount of runoff volume discharged from a site. These methods can be incorporated into development design at the time of construction or retrofit into runoff improvement programs associated with redevelopment of existing areas. Examples of typical methods that can be used to disconnect impervious areas include:

- Routing roof leaders to a vegetated area or a rain barrel;
- Minimizing paved surfaces through such methods as using narrow streets in residential areas, limiting commercial parking space, joint or shared parking, and locating businesses and residences close to the street to minimize driveway length;
- Using permeable pavement or paving blocks for low traffic and overflow parking areas;
- Amending soil and/or loosening it after compaction to encourage infiltration; and
- Using vegetated swales or raingardens to accept runoff rather than pipes.

Modeling the post-development condition, BMPs were idealized as raingardens capable of fully retaining the 1- to 2-year event volume and limiting the 5-year event post development runoff volume to the existing condition volume. As development occurs it will be necessary to ensure that adequate onsite infiltration is provided, and site-specific characteristics should be assessed to determine the most appropriate type and location of BMPs. To this end, the City has proposed a companion document or stormwater design manual for the *Draft Subd. 37. Northwest Area Planned Unit Development Overlay District*. The stormwater design manual would be developed to provide guidance in the selection, design, and construction of site specific, alternative stormwater management BMPs and is intended to be a comprehensive manual which not only summarizes the requirements and design recommendations for the Northwest Expansion Area, but also details operation and maintenance requirements and specifications.

It must always be kept in mind that these alternative BMPs are as well engineered as the more structural practices utilized in the water management system. Although concrete and conduit are not dominant features, the systems do have structure to them and have been sized to perform a specific function. Simply installing and ignoring them will result in their demise over a relatively short period of time. If, however, they are installed properly, monitored for effectiveness and properly maintained, these alternative systems will provide decades of low maintenance service.

Preservation of Existing Natural Basins

Although the land use planning and alternative stormwater management BMPs try to match the natural hydrologic function as close to normal as possible, it is important to keep in mind that storm and melt events sometimes occur in excess of the ability of any management practice to manage. Therefore, runoff will also be linked to the existing natural basins. Currently these areas function in most cases as infiltration basins without outlets under normal water levels. These basins would continue to function in this manner in post-development conditions. This will allow for routine treatment of small and moderate events, but also provides the added protection for large-scale flooding events. In addition to the preservation of the basin itself, emergency overflows to downstream basin (as identified on Figure 17.2 in Attachment C and D) must be preserved during development.

2007, 2014, and 2019

No update.

SURFACE WATER MODELING RESULTS

2005

A comparison of the high-water levels for each rainfall event (see Table 17.3 in Attachment D) indicates that the stormwater management approach in most cases reduces or maintains the runoff volume from proposed conditions as compared to the existing conditions runoff for the 1-year 24-hour rainfall event.

The proposed stormwater management approach is also in most cases capable of retaining most of the increased runoff generated for the 5-year 24-hour rainfall event. This positive effect is even more pronounced in the case of the 100-year 24-hour rainfall event and in most cases the infiltration capacity of the downstream existing basin is capable of handling the increased runoff with little to no increase in high water level. In the case of the 100-year 10-day runoff event (worst-case scenario), the alternative stormwater BMPs are conservatively assumed ineffective and high-water levels remain unchanged except as a result of storage losses due to development.

As previously mentioned, stormwater discharges from the LMRWMO watershed are at two locations including: the Rosenberger Lake (EP-080a) and DNR Wetland 241W (BP-005). Table 17-3 compares peak discharge rates and volumes of runoff discharged from the Northwest Expansion Area under existing and proposed conditions.

Table 17-3: Discharge from the LMRWMO Watershed

Event	Land Use	Basin BP-005		Basin EP-080a	
		Peak Rate (cfs)	Total Volume (acre-feet)	Peak Rate (cfs)	Total Volume (acre-feet)
1-Year 24-hour rainfall	Existing	0	0	0.9	4.1
	Proposed	0	0	0.2	1.1
	Change	0	0	-0.7	-3.0
5-year 24-hour rainfall	Existing	0	0	3.5	12.3
	Proposed	0	0	1.9	7.4
	Change	0.0	0.0	-1.6	-4.9
100-year 24-hour rainfall	Existing	6.5	4.0	8.7	35.4
	Proposed	5.4	3.5	8.7	32.9

Event	Land Use	Basin BP-005		Basin EP-080a	
		Peak Rate (cfs)	Total Volume (acre-feet)	Peak Rate (cfs)	Total Volume (acre-feet)
	Change	-1.1	-0.5	0.0	-2.5
10-day snowmelt (worst-case scenario)	Existing	15.8	27.3	8.8	116.8
	Proposed	15.8	27.3	8.8	122.1
	Change	0.0	0.0	0.0	5.3

As can be seen from this table, the proposed stormwater management approach maintains or reduces the amount of discharge from the Northwest Expansion Area except in the case of Rosenberger Lake under the worst-case scenario. This is due to the development of smaller depressions in subwatersheds tributary to this basin. The increased volume is not expected to be problematic given the infrequency of this event and given that the increased volume of water translates to less than a 0.1-foot increase in surface water elevation.

The finalized modeling results indicate that implementation of the proposed alternative stormwater management plan and preliminary land use concept would allow the Northwest Quadrant to be developed as a closed system. As long as proper sequencing of construction and system monitoring is conducted, the cost of implementation and maintenance may be similar to conventional systems at the local scale. The City is planning for the additional maintenance that may be needed to maintain the functioning of the proposed system. At the regional scale, given that a conventional system would need a large outlet project, this proposed self-contained stormwater management system should be much more cost effective.

Water Quality Assessment

Existing and proposed storm bounce for the 100-year 24-hour event was compared for the wetlands within the Northwest Expansion Area per the Natural Resource Inventory) Report (Bonestroo, October 2003, Page 4-15) recommended wetland management standards. Figure 17.3 (in Attachment C and D) identifies wetlands by management class. In this report, wetlands in the Northwest Expansion Area are assigned management classifications based on the susceptibility to adverse impact due to increased stormwater bounce ranging from 1 (high susceptibility to stormwater bounce) to 4 (low susceptibility to stormwater bounce). The management classifications are based on the Site Management Classification Flow Chart on page 4-11 of the Natural Resource Inventory. This report also provides recommended buffer widths and phosphorus pretreatment requirements based on the wetland classifications. Table 17-4 summarizes the recommended wetland management standards as proposed in the report.

Table 17-4: Recommended Wetland Management Standards

Management Classification	Buffer Strip (feet)		Structural Setback from Edge of Buffer (feet)	Stormwater Phosphorous Treatment Requirement	Stormwater Quantity Requirement
	Slopes <15%	Slopes >15%			
Manage 1	60	90	10	Limit loading to 2x predevelopment loadings	Storm bounce – Maintain high water level at or below existing conditions for 100-year storm
Manage 2	30	45	10	Limit concentration to 150 parts per billion (ppb)	Storm bounce – Maintain high water level at or below existing conditions plus 0.5 feet for 100-year storm
Manage 3	20	30	10	Limit concentration to predevelopment concentrations (200 ppb)	No requirement
Manage 4	15	20	10	No requirement – enhancement recommended	No requirement

Of all the wetlands delineated in the Northwest Expansion Area, only three would realize a storm bounce that exceeds the recommended bounce criteria according to the model. These wetlands are within Subwatersheds EP-073a, EP-071, and SP-23. In order to prevent this undesired bounce, a higher stormwater management standard (or additional stormwater management storage) is required within these subwatersheds upstream of the existing wetlands.

Additional Storage Requirements

The additional volume necessary for compliance with the proposed wetland storm bounce criteria and necessary in areas that high water levels would compromise developable land is identified in Table 17-5. This table also identifies other new basins previously planned for in the *Pilot Study Area H&H* (EOR, 2002). Alternatives to new basins that could be investigated include diversion of runoff to adjacent basins with excess storage.

Table 17-5: Additional Storage Requirements

Basin	Volume (acre-feet)	Comment
EP-073a	8.7	Additional storage necessary for compliance with wetland storm bounce criteria.
EP-071	10.6	Additional storage necessary for compliance with wetland storm bounce criteria.
EP-104	12.0	Enhancement of the existing basin to include an additional 12 acre-feet of storage, thereby reducing the floodplain footprint.
SP-9	0.9	Previously planned for the in the <i>Pilot Study Area H&H</i> . Basin SP-24 and SP-21 could accommodate this storage volume.

Basin	Volume (acre-feet)	Comment
SP-23	0.5	Additional storage necessary for compliance with wetland storm bounce criteria.
SP-25	4.0	Previously planned for in the <i>Pilot Study Area H&H</i> .
SP-28	0.5	Previously planned for in the <i>Pilot Study Area H&H</i> . Basin SP-24 and SP-21 could accommodate this storage volume.
SP-36	3.9	Previously planned for in the <i>Pilot Study Area H&H</i> .
SP-48	13.8	Previously planned for in the <i>Pilot Study Area H&H</i> .

Table 17-6 compares the existing and proposed 100-year, 24-hour storm bounce for all wetlands within the LMRWMO watershed, after the incorporation this additional stormwater management storage.

Table 17-6: Wetland Storm Bounce Assessment

Basin ID Proposed Conditions	Starting Water Level (feet)	Existing High-Water Level 100-year 24-hour Rainfall Event (6.0 inch) (feet)	Proposed High Water Level 100-year 24-hour Rainfall Event (6.0 inch) (feet)	Difference in Bounce Between Existing and Proposed (feet)	Natural Resource Inventory Management Classification
EP-018	935	935.5	935.5	0.0	1
EP-031b	901	901.7	901.6	-0.1	1
EP-071	831	844.9	845.1	0.2	1
EP-073a	840	842.3	842.4	0.1	1
EP-076	893	893.5	893.5	0.0	1
EP-080a	801	802.4	802.2	-0.1	1
EP-080b	901	903.0	903.0	0.0	1
SP-23	863	866.6	866.6	0.0	1
BP-032	891	895.5	895.4	-0.1	2
BP-049a	925	927.6	927.5	0.0	2
EP-010b	898	904.7	904.5	-0.1	2
EP-013	851	858.2	858.6	0.3	2
EP-016b	901	906.2	906.1	0.0	2
EP-016c	907	910.7	910.7	0.0	2
EP-027c	888	890.7	890.7	0.0	2
EP-027e	941	944.9	943.9	-1.0	2
EP-027f	849	851.2	851.3	0.1	2
EP-039	947	852.4	852.1	-0.3	2
EP-058a	877	881.8	881.8	0.0	2
EP-060b	897	902.4	902.6	0.1	2
EP-078	807	809.2	809.0	-0.1	2
EP-079a	807	809.3	809.0	-0.3	2
BP-036	923	931.1	931.1	0.0	3
BP-048b	925	927.9	927.9	0.0	3
EP-045	879	881.9	881.8	0.0	3
EP-059a	799	902.2	902.4	0.2	3
EP-074a	925	828.5	828.8	0.3	3
EP-074b	937	841.5	841.5	0.0	3
EP-102a	901	908.0	907.9	-0.1	3

Basin ID Proposed Conditions	Starting Water Level (feet)	Existing High- Water Level 100-year 24- hour Rainfall Event (6.0 inch) (feet)	Proposed High Water Level 100-year 24- hour Rainfall Event (6.0 inch) (feet)	Difference in Bounce Between Existing and Proposed (feet)	Natural Resource Inventory Management Classification
EP-104	891	897.6	894.0	-3.6	3
QP-5	923	926.1	926.4	0.3	3
SP-26	915	919.2	919.2	0.0	3
SP-10	935	939.1	938.7	-0.4	3
SP-29	957	959.1	959.7	0.6	3
SP-12	835	841.8	844.0	2.2	3
SP-32	923	928.1	927.7	-0.4	3
BP-038a	853	892.5	892.0	-0.5	4
BP-049b	943	945.4	945.4	0.0	4
EP-005d	953	955.8	955.8	0.0	4
EP-009	889	899.0	898.6	-0.3	4
EP-011	883	889.8	892.1	2.3	4
EP-016a	903	904.7	904.6	-0.1	4
EP-025b	897	900.0	900.2	0.2	4
EP-027a	847	853.6	855.3	1.7	4
EP-031a	875	881.0	881.2	0.2	4
EP-034	849	859.2	860.6	1.3	4
EP-035b	853	857.7	857.6	-0.1	4
EP-036a	861	866.1	867.7	1.5	4
EP-038a	867	872.0	871.7	-0.3	4
EP-044	885	890.5	890.4	-0.1	4
EP-106	859	864.9	865.0	0.2	4
EP-107a	855	858.4	858.4	0.0	4

2007 and 2014

No update.

2019

The 4th Generation Water Resources Management Plan was prepared in December 2018 includes updates to the stormwater management to comply with the MS4 permit requirements for the next 10 years. The plan identifies a revised program including implementation priorities.

18. Water Quality—Wastewaters

- a. Describe sources, quantities, and composition (except for normal domestic sewage) of all sanitary and industrial wastewaters produced or treated at the site.

2005

Land uses within the AUAR study area are guided to be a combination of residential, commercial, industrial/office space, and public/institutional uses. While the majority of the study area is guided to be residential, the proposed land use is summarized as follows (does not include natural areas, parks, and open space).

Table 18-1: Proposed Land Use

Land Use	Area (acres)			
	2005	2007	2014	2019
Low Density Residential (LDR)	820	820	818	1,079
Low/Mid Density Residential (LMD)	743	747	614	465
Medium Density Residential (MDR)	343	334	356	283
High Density Residential (HDR)	65	65	20	40
Mixed Use (Residential/Commercial) (MU)	69	69	76	98
Commercial (Comm)	59	59	147	89
Office/Industrial (O/I)	306	264	240	200
Public/Institutional (P/I)	11	11	56	48
Office/ Industrial/ Commercial (O/I/C)	0	47	47	0

The estimated sewer flows for the non-residential land uses are as follows:

Table 18-2: Estimated Sewer Flows for Non-Residential Land Uses

Land Use	Area (acres)			Average Flow (gallons/acre/day)			Total Average Flow (MGD)		
	2005	2007	2019	2005	2007	2019	2005	2007	2019
Comm	59	59	89	1,200	1,200		0.007	0.0708	0.1067
I/O	306	264	200	1,200	1,200		0.367	0.3168	0.24
P/I	11	11	48	1,200	1,200		0.013	0.0132	0.0576
O/I/C	N/A	47	N/A	N/A	1,200	N/A	N/A	0.0564	N/A
TOTAL	--	--	--	--	--	--	0.387	0.457	0.40403

The estimated overall sewer flow rate (1,200 gallons/acre/day) was estimated for this analysis to accommodate the need for flexibility in planning for services for this area. The Comprehensive Plan includes a range of proposed densities for each land use area. City staff identified a likely density at which each land use type is likely to develop for use in the AUAR analysis (discussed in Section 6). Most areas are unlikely to develop at the highest densities allowed in the Comprehensive Plan due to the physical constraints of the area and city requirements for dedication of open space. However, it is possible that some areas may develop at the maximum allowed in the Comprehensive Plan. Therefore, a conservative flow rate estimate was used in this analysis rather than the MCES standard sewer flow rate for planning purposes, which is 800 gallons/acre/day.

If a sewer flow rate of 1,200 gallons/acre/day is used for the AUAR area rather than 800 gallons/acre/day, the increased sewer rate requires a larger pipe size in only 1,400 feet of the total proposed alignment and increases the estimated infrastructure costs for the area by just \$3,000. This nominal increase in pipe size and cost provides the desired flexibility in the development of this area that may be needed based on the Comprehensive Plan.

2007

See Table 18-1 and Table 18-2.

Note error in the original (2005) calculation of sewer flow for the commercial land. The original calculation was for 0.007 MGD, when it is actually 0.0708 MGD. The original sewer flow for non-residential land uses should have been 0.451 MGD compared to the

Updated AUAR sewer flow for non-residential land uses of 0.457 MGD. This represents a 0.006 MGD increase.

2014

A preliminary Engineering Report has been prepared for trunk sanitary sewer facilities in City Project No. 2014-13 Northwest Area Trunk Utilities—Argenta District.

2019

According to the 2040 Comprehensive Plan, there are five new lift stations and several sanitary sewer lines planned within the AUAR study area.

- b. Describe any waste treatment methods to be used and give estimates of composition after treatment, or if the project involves on-site sewage systems, discuss the suitability of the site conditions for such systems. Identify receiving waters (including groundwater) and estimate the impact of the discharge on the quality of the receiving waters. (If discharge may affect a lake consult “EAW Guidelines” about whether a nutrient budget analysis is needed.)**

2005

In accordance with the City of Inver Grove Heights Comprehensive Plan, dated July 1998, all areas within the AUAR study area will be served by sanitary sewer extended from existing City trunk sewer systems connected to the MCES regional systems. Figure 18-1 (in Attachment B, C and D) identify preliminary alignments to serve the AUAR study area with sanitary sewer.

2007, 2014, and 2019

No update.

- c. If wastes will be discharged into a sewer system or pretreatment system, identify the system and discuss the ability of the system to accept the volume and composition of the wastes. Identify any improvements which will be necessary.**

2005

The City of Inver Grove Heights will construct sanitary sewer improvements to serve the AUAR study area in general accordance with the 2020 Comprehensive Plan for the city. The sewer flows from this area to the MCES interceptor systems and eventually to the MCES Metropolitan Wastewater Treatment Facility, which has capacity available to serve this area. The sewer system that will provide service to this area is a 24-inch reinforced concrete sewer with a capacity of approximately 9.25 MGD, more than suitable to handle the 6.44 MGD design flows.

2007

With the exception of a minor increase in non-residential wastewater flow of 0.006 MGD, and an anticipated reduction in wastewater flow due to a reduction in the total number of dwelling units, wastewater does not change with this update.

The City of Inver Grove Heights has adopted the completed feasibility study of these improvements, called the Northwest Area Water and Sanitary Extensions Feasibility

Report, dated May 2005. The City awarded the first phase of these improvements, Northwest Area Utility Improvements Lift Station R-9.1, in July 2007.

2014 and 2019

Sanitary Sewer projects completed since 2007 are included in Section 6b.

19. Geologic Hazards and Soil Conditions

Approximate depth (in feet) to groundwater: 0 minimum 20 average

Approximate depth (in feet) to bedrock: 110 minimum 250 average

- a. **Describe any of the following geologic site hazards to groundwater and also identify them on the site map: sinkholes, shallow limestone formations, or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.**

2005

Information from the *Geologic Atlas of Dakota County* (Minnesota Geological Survey, 1990), *Bedrock Geology and Structure of the Twin Cities Metropolitan Area* (Minnesota Geological Survey, 2000), US Geological Survey 7 ½ minute quadrangles, and well logs from the County Well Index (CWI) were used to determine depth to bedrock and depth to groundwater. A map of bedrock geologic units (MGS, 2000) is provided as Figure 19-1 (in Attachment C and D). A map of depth to bedrock (MGS, 1990) is provided as Figure 19-2 (in Attachment D).

A buried bedrock valley is mapped in the project area with branches entering from the northwest and northeast, converging and exiting along the southern boundary of the project area. The upper bedrock units (Decorah Formation, Platteville Formation, Glenwood Formation, and St. Peter Sandstone) have been completely eroded across most of the project area. The bedrock valley is eroded completely through the Prairie du Chien Group and into the underlying Jordan Sandstone in the southern part of the project area.

Based on the data presented in the geologic atlas, the minimum depth to bedrock within the project area is greater than 100 feet. Minimum depth to bedrock occurs where surficial depressions overlie relatively higher areas of St. Peter Sandstone. Bedrock is generally within 250 feet of the surface where the St. Peter Sandstone is present. Depth to bedrock is generally greater than 200 feet where the Prairie du Chien Group is the uppermost bedrock unit.

No sinkholes, shallow limestone formations, or karst conditions are present within the project area. Karst conditions are known to exist in the Prairie du Chien Group in southeastern Minnesota, but geologic hazards related to karst such as sinkholes occur where the Prairie du Chien Group is shallowly buried, and the water table occurs within the carbonate bedrock unit. The Platteville Formation limestone is likely the uppermost bedrock unit in a small area along the northeast boundary of the project area. The Platteville Formation is thin in this area, however, and is buried by a minimum of 150 feet of unconsolidated sediments.

Plate 5 of the *Geologic Atlas of Dakota County* maps the water table elevation in the project area to be between approximately 775 and 900 feet (25 feet contour intervals) with the lowest water table elevations occurring along the southern border of the project area. Few wells are open across or completed near the water table where it occurs in the till and other moraine deposits. Most water wells in the area are completed in buried Quaternary or bedrock aquifers, and water levels in those wells do not signify the position of the water table. The water table is expected to occur at or near the surface under most surface waterbodies. The water table map provided in the geologic atlas is based on surface water elevations, topography, and measurements made in a few selected shallow wells. More detailed information on the configuration of the water table is not available.

A perched water table occurs in some areas, and some ponds form water table mounds in which the water table slopes away from the pond in all directions. Groundwater is assumed to occur at or near the surface beneath and near surface waterbodies. Groundwater flow patterns are complex around some ponds and wetlands, with shallow groundwater flowing into and out of the waterbody and the waterbody also recharging water into deeper aquifers. Some ponds and wetlands may be perched above an unsaturated zone overlying the lower, regional water table. In general, hydraulic head decreases with depth below the water table. The glacial till in which the water table occurs across most of the project area is not typically used for water supply.

The depth to groundwater varies greatly across the AUAR area. Surface elevation within the project area ranges from approximately 800 feet to 990 feet. According to the geologic atlas, the water table elevation in the project area ranges from approximately 775 feet to 900 feet. As described above, groundwater occurs at or near the surface beneath and near ponds and wetlands. Poorly drained depressions and drainage ways on the site become seasonally saturated to a depth at or near the surface. In upland areas, the water table is generally greater than 20 feet below the land surface.

2007, 2014, and 2019

No update.

- b. Describe the soils on the site, giving SCS classifications, if known. Discuss soil granularity and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.**

2005

Soils in the area are related to the glacial and post-glacial parent materials in which they formed. A soils map of the AUAR area is provided on Figure 19-3 (in Attachment C and D). Surficial geology is mapped on Plate 3 of the geologic atlas and in *Surficial Geology of the St Paul 30 X 60 Minute Quadrangle* (Meyer and Lusardi, 2000). A map of the surficial geology derived from Minnesota Geological Survey data is provided as Figure 19-4 (Attachment C and D). The project area is located on the St. Croix Moraine, a geomorphic feature of hummocky terrain marking the stable terminus of the Superior Lobe glacier during Late Wisconsinan time. Late Wisconsinan glacial, fluvial, and lacustrine sediments of Superior provenance belong to the Cromwell Formation. The moraine overlies older glaciofluvial outwash deposits, also derived from the Superior

Lobe. The buried outwash overlies Superior Lobe till from an earlier glacial advance. Erosional remnants of Pre-Late Wisconsinan till and outwash deposits overlie bedrock in some areas.

The moraine is composed primarily of sandy loam-textured till. Till is unsorted sediment deposited by glacial ice. The moraine also includes stratified ice-contact and lake sediments. Ice-contact deposits consist of stratified sand, gravelly sand, and cobbly gravel, deposited by melt water flowing at or behind the ice margin, interbedded with unsorted sandy to loamy mudflow deposits and silty lake sediments.

Glacial melt water from the later Grantsburg Sublobe of the Des Moines Lobe cut through the St. Croix Moraine in the southwest corner of the project area. The melt water deposited sand and gravelly sand outwash of the New Ulm Formation. The outwash consists of a mixture of Des Moines Lobe sediments and reworked Superior Lobe sediments. Much of this area was covered by a thin mantle of loess (wind-blown silt and fine sand with some clay associated with glacial margins).

Soils are mapped in the *Soil Survey of Dakota County, Minnesota* (Hundley, 1983). A map of surficial soil texture is provided in Figure 19-3 (in Attachment C and D). Soils formed in the moraine belong to the Kingsley-Mahtomedi association of gently sloping to very steep, well drained and excessively drained soils. Soils in this association vary in texture from loamy sand to silty loam. Soils formed on the outwash plain belong to the Waukegan-Wadena-Hawick association of level to very steep, well drained and excessively drained soils formed in silty and loamy sediments over sandy sediments.

Most soils throughout the AUAR area are moderately permeable to moderately rapidly permeable. Soils formed in outwash and other sandy sediments are generally moderately permeable in the upper part and moderately rapid to rapidly permeable in the lower part. In most areas, there is not a near surface, laterally consistent low permeability layer restricting vertical infiltration to groundwater, and the groundwater is susceptible to contamination from wastes or chemicals spread or spilled on the surface. The time of travel to the water table for contaminants will vary from hours to years depending on the properties of the contaminant and site-specific conditions. Groundwater is most susceptible beneath and near ponds and wetlands where the water table is near the surface.

Shallow groundwater near the water table is not generally used for water supply. Deeper aquifers are less sensitive to pollution than the water table system. A map of the sensitivity of the Prairie du Chien-Jordan aquifer system to pollution is provided in Plate 7 of the *Geologic Atlas of Dakota County* (MGS, 1990) and is duplicated for the AUAR area in Figure 19-5 (in Attachment C and D). The sensitivity ratings are based on a matrix of factors including the presence of bedrock confining layers and the composition and thickness of material overlying bedrock. Estimated travel times for conservative water-borne contaminants to reach the Prairie du Chien-Jordan aquifer are as follows: High – weeks to years, High-Moderate – years to a decade, Moderate – several years to decades, Low-Moderate – several decades, Low – several decades to a century.

The Quaternary aquifers are generally more susceptible to pollution because they occur at shallower depth and above bedrock confining units, where bedrock confining units

are present. Sensitivity of the buried Quaternary aquifer(s) varies from high to moderate depending on thickness and composition of overlying deposits. In general, for the buried Quaternary aquifer(s), areas mapped as having Low-Moderate or Moderate sensitivity in Figure 19-5 (in Attachment C and D) will have Moderate to High-Moderate sensitivity, and areas mapped as having High-Moderate sensitivity will have High sensitivity.

2007, 2014, and 2019

No update.

20. Solid Wastes; Hazardous Wastes; Storage Tanks

- a. **Describe the types, amounts, and compositions of solid or hazardous wastes to be generated, including animal manure, sludge, and ashes. Identify the method and location of disposal. For projects generating municipal solid waste indicate if there will be a source separation plan; list type(s) and how the project will be modified to allow recycling.**

2005

A variety of waste is expected to be generated by the proposed development, as it will include residential, commercial and office, and industrial development.

As is currently the case in Inver Grove Heights, solid waste will be collected weekly by a licensed hauler and disposed of at a licensed landfill. Curbside collection of materials for recycling will also be available in the study area, as will collection of yard waste. Using statistical information collected by Dakota County, and the Development Scenario proposed for the study area, an estimate of total municipal solid waste generated under existing conditions and at build-out was prepared (see Table 20-3). In addition, volumes of existing and predicted recycling/source separation programs were calculated.

Existing land use in the study area is mainly agricultural, with undeveloped areas, a golf course, and scattered residential neighborhoods. Some commercial/industrial development is also present along the highway corridors. Because the bulk of the property is undeveloped or has been used agriculturally, current waste generation is much less than what will be generated after development. Future land uses designated for the study area are shown in Table 20-1.

Table 20-1: Future Land Use

Land Use	Area (acres)			
	2005	2007	2014	2019
Low Density Residential (2.0 du/ac)	820	820	818	1,079
Low/Mid Density Residential (4.0 du/ac)	743	747	614	465
Medium Density Residential (6.5 du/ac)	343	334	356	283
High Density Residential (12.0 du/ac)	65	65	20	40
Commercial	59	59	147	89
Office/Industrial	306	264	240	200
Mixed Use (Residential)	46	46	51	76
Mixed Use (Commercial)	23	23	25	22
Public/Institutional	11	11	56	48
Natural areas/ Open Space/Golf Course	725	724	766	760

Land Use	Area (acres)			
	2005	2007	2014	2019
Office/ Institutional/ Commercial	0	47	47	0

For the purposes of calculating waste generation estimates, it is assumed that 1 domestic unit represents 1 household.

As the City of Inver Grove Heights does not track solid waste generation, statistics were derived using information from another city in Dakota County to estimate what could be expected after development of the project area.

Table 20-2: Waste Generation Per Household

Type	Calculation
Persons Per Household	2.6 persons/household
Waste generation per household	1.25 tons/household/year
Residential recycling, curbside	0.21 tons/household/year
Residential recycling, drop-off	0.05 tons/household/year
Yard waste, composed	0.10 tons/household/year
Non-Residential Waste Generation	33.44 tons/acre/year
Non-Residential Recycling	2.49 tons/acre/year

Calculations were completed using the above statistical information and the Development Scenario proposed for the study area. Comparisons of current and predicted potential waste generation quantities are presented in Table 20-3. Estimates related to recycling and yard waste composting are presented in the text following the table.

Table 20-3: Solid Waste Generation

Source	Existing Units		Under Existing Land Use		Potential Units			Under Proposed Development Scenario		
	2005	2007	2005	2007	2005	2007	2019	2005	2007	2019
Residential	300 households (estimated)		375 tons/year		7,715 households (max)	7,054 households (max)	7,097 households (max)	9,644 tons/year	8,818 tons/year	9,884 tons/year
Non-Residential	123 acres		4,113 tons/year		398 acres	404 acres	359 acres	13,309 tons/year	13,510 tons/year	12,005 tons/year
Total Waste Generated			4,488 tons/year					22,953 tons/year	22,328 tons/year	21,889 tons/year

Solid waste generated in the city of Inver Grove Heights is collected on a weekly basis. The waste is taken to a landfill licensed to accept such waste for disposal. Materials for recycling and composting are also collected. Collection service will be expanded to service the AUAR study area, after development.

Under current conditions, it is estimated that approximately 63 tons of residential solid waste is recycled via curbside pick-up per year in the study area, and approximately 15 tons is recycled via drop-off sites. After development, it is estimated that approximately 1,620 tons/year of residential solid waste would be recycled via curbside pick-up and 386 tons/year would be recycled via drop-off sites each year. Currently, the amount of recycling in the area associated with the existing non-residential development is

estimated to be approximately 306 tons per year. Under proposed conditions, it is estimated to be approximately 991 tons per year.

It is estimated that approximately 0.10 tons of yard waste per household is composted each year. Under current conditions, yard waste composting is estimated to be 30 tons/year for the study area. Under potential development conditions, approximately 772 tons of yard waste from the study area would be composted per year.

2007

- Estimated Residential Curb-side Recycling: 1,481 tons/year
- Estimated Residential Drop-off Recycling: 353 tons/year
- Estimated Non-Residential Recycling: 1,006 tons/year

2014

No update.

2019

- Estimated Residential Curb-side Recycling: 1,660 tons/year
- Estimated Residential Drop-off Recycling: 395 tons/year
- Estimated Non-Residential Recycling: 894 tons/year

- b. Identify any toxic or hazardous materials to be used or present on the project site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge, or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge, or emission.**

2005

Information obtained from Environmental Data Resources, Incorporated (EDR) January 7, 2005 was used to assess the presence of registered underground and aboveground storage tanks (USTs and ASTs), hazardous waste generators currently existing within the study area, and the potential occurrence of past spills or releases. The EDR report identified numerous sites of potential concern within the study area (see attached map and table).

There were 18 areas of potential concern (30 addresses) identified in the report, corresponding to the numbers on the attached map. In some cases, more than one site is associated with the number. Sites identified included 17 where some type of release has occurred:

- 3 leaking underground storage tank (LUST) sites
- 10 spill sites
- 1 agricultural spill site
- 1 emergency response notification system site
- 1 leaking aboveground storage tank (LAST) site

- 1 unpermitted dump site (identified in the MN LS database)

Other sites where chemicals and/or petroleum products are used and stored included:

- 11 small quantity hazardous waste generator (SQG) sites
- 7 underground storage tank (UST) sites
- 1 aboveground storage tank (AST) site

Numerous additional sites of potential concern have also been identified near the study area.

Information has been requested from the Dakota County Environmental Management Office regarding sites of potential concern identified in Dakota County records. The County indicated that due to the large size of the AUAR area, the County could not provide this data, but has provided a link that the City can use to access this data as needed. The County's database is a "snapshot" in time, and sites may change over the course of development in the AUAR area. Given the size and changing nature of the database, it is recommended that the City work with potential developers to access the County's database as development is proposed to identify whether the development area includes a site of known contamination, hazardous waste storage, or other areas of potential concern. If problem areas are identified, a Phase I investigation could be initiated, and the site issues addressed prior to construction.

It should also be noted that disposals and releases could occur between the time of final AUAR approval and actual development plans for the site. In light of this reality, it seems prudent to revisit the issue of potential contamination during the site development process. Typically, a Phase I environmental site assessment (Phase I ESA) would be required by a lender in conjunction with a property transaction where some type of financial assistance (i.e., loan) is being sought. The Phase I ESA would presumably identify any potential site contamination concerns that exist at that time, allowing the issue to be resolved prior to construction.

Due to the past and current agricultural use of property within the study area, a variety of pesticides have likely been used and stored within the study area. Small storage tanks for petroleum products are also likely to have been or remain present at farmsteads within the study area. If contamination is discovered during the course of development, the developer or other responsible party will be required to address the situation in accordance with MPCA rules.

The temporary and potential future use of hazardous materials and petroleum products within the study area is addressed below in part c.

2007 and 2014

No update.

2019

The MPCA "What's in my Neighborhood" information was reviewed, and Figure 8 was created to identify the sites tracked by MPCA.

- c. Indicate the number, location, size, and use of any above or below ground tanks to be used for storage of petroleum products or other materials (except water). Describe any emergency response containment plans.

2005

During construction activities, it is likely that portable storage tanks of fuel for construction vehicles and machinery may be temporarily located in various areas of the study area. For the purpose of minimizing impact due to potential spills, the re-fueling of vehicles and machinery will be conducted away from surface waters, wetlands, and other sensitive areas.

Approximately 296.1 acres of commercial and office/industrial development are proposed within the study area. In addition, 63.1 acres of mixed-use development are also proposed. A variety of businesses would be permitted under these land use designations and could include those types that use and store various amounts of chemicals or petroleum products; in addition, some may utilize aboveground or belowground tank systems. At this time, it is not known if or where these businesses would be located within the study area. Any business using or storing chemicals or petroleum products would be subject to local and state rules regulating such activity.

2007

The updated Development Scenario land uses have a total of 393 acres of commercial, office, industrial, or mixed-use development.

2014

No update.

2019

The updated Development Scenario land uses have a total of 387 acres of commercial, office, industrial, or mixed-use development.

21. Traffic

Parking spaces added: [2005]: 21,207 [2007]: 23,170

Existing spaces (if project involves expansion): [2005]: 300

Estimated total Average Daily Traffic (ADT) generated: [2005]: 91,310 [2007]: 102,181

Estimated maximum peak hour traffic generated (if known) and its timing:

[2005]: P.M. Peak Hour: 3,583 trips in 4,468 trips out

[2007]: P.M. Peak Hour: 3,975 trips in 4,463 trips out

For each affected road indicate the ADT and the directional distribution of traffic with and without the project. Provide an estimate of the impact of traffic congestion on the affected roads and describe any traffic improvements which will be necessary. If the project is within the Twin Cities Metropolitan Area, discuss its impact on the regional transportation system.

INTRODUCTION

2005

The proposed development of the land uses assumed for this AUAR will increase the traffic volumes on roadways within the city. A traffic impact analysis of the assumed development has been conducted in order to identify whether roadway and/or other transportation improvements will need to be undertaken. The analysis was performed at a planning level and attempts to identify the traffic related impacts of the potential development. Identified impacts are then evaluated to determine what mitigation efforts need to be enacted so that transportation service can be provided at an acceptable level.

The project area is shown in Figure 21-1 (2005 AUAR). The roadways and intersections for analysis were determined in conjunction with the City of Inver Grove Heights staff.

There were four major roadways analyzed as part of this review.

- County Road 26 (70th Street) – east-west “A” Minor Arterial
- County Road 63 (Argenta Trail) – north-south Community Collector Road
- Trunk Highway 3 (South Robert Trail) – north-south “A” Minor Arterial
- County Road 73 (Babcock Trail) – north-south Community Collector Road

In addition to examining the corridors as a whole, the following intersections were also examined:

- CR 63 and CR 26
- TH 3 and CR 26
- CR 73 and CR 26
- TH 55 and TH 3 interchange ramps
- TH 55 and CR 63 proposed future interchange ramps

These intersections were analyzed for traffic volumes and approach geometry, both existing and proposed. The analysis also assumed an interchange at CR 63 and Interstate 494 would be constructed and in-place for the future condition. Traffic volumes are presented at this potential intersection of Interstate 494 and CR 63 without an attempt to determine lane geometry.

2007, 2014, and 2019

No update.

EXISTING CONDITIONS

2005

The most recent daily traffic volume information for the primary roadways in the project area was obtained from 2003 Minnesota Department of Transportation (MnDOT) Average Annual Daily Traffic (AADT) maps. As a part of this study, turning movement counts were taken during the morning and afternoon peak traffic periods on Tuesday, November 9, 2004 at the following intersections:

- CR 26 and CR 63
- CR 26 and TH 3
- CR 26 and CR 73
- TH 3 and TH 55 eastbound and westbound ramp terminals

Currently, all four subject roads are two-lane roads, and their intersections are controlled with a four-way stop condition. The intersection at CR 26 and CR 63 has a single lane for all movements of traffic. The intersection of TH 3 and CR 26 has a single lane for all movements in addition to a designated right turn lane for the northbound and southbound directions. The intersection of CR 73 and CR 26 has designated left turn lanes as well as one through lane and one through/right turn lane in the eastbound and westbound directions. The existing lane configurations with the existing traffic volumes are shown in Figure 21-2 (in Attachment C and D).

The daily capacity of any individual roadway is based upon many factors. These factors may include the number of lanes provided, number of access points per mile, number of signalized intersections per mile, percentage of truck traffic, and the physical grade of the roadway. However, for planning purposes, a generalized average daily traffic (ADT) threshold for the roadways is used. Table 21-1 shows the generalized ADT volume thresholds for a roadway type and number of lanes in terms of level of service. Level of service (LOS) is a quality measure describing operational conditions within a traffic stream, generally in terms of service measures such as speed, freedom to maneuver, traffic interruptions, and comfort. A LOS A represents the best result with little or no delay. A LOS F represents the worst result with excessive delay and queues. A LOS D is usually the lowest accepted by most agencies within the metro area.

Table 21-1: Generalized Average Daily Traffic Volume Thresholds⁸

Facility Type	Number of Lanes	Maximum ADT Volume at Level of Service ⁹				
		A	B	C	D ¹⁰	E
Principal Arterial	5	11,400	18,200	29,100	32,600	36,300
	4	7,600	12,100	19,400	23,300	27,600
	3	4,900	7,900	12,700	17,000	21,100
	2	3,100	5,000	8,000	12,000	15,900
Minor Arterial	4/5	8,500	13,600	17,000	25,200	28,600
	3	4,300	6,900	11,100	14,800	18,500
	2	2,700	4,300	6,900	10,300	13,700
Collector	5	9,000	14,400	23,100	25,900	28,600
	4	6,100	9,800	15,700	19,100	22,500
	3	3,700	5,900	9,400	12,500	15,700
	2	2,200	3,600	5,800	8,800	11,700

Based on the information presented in both Table 21-1 and Figure 21-2 (in Attachment C and D), the LOS for each roadway can be determined. All roadways are currently operating acceptably with CR 26 at a LOS C between CR 63 and TH 3 and east of CR 73. CR 26 is

⁸ Source: Florida DOT, MnDOT

⁹ ADT Volumes above the LOS E maximum threshold would be considered LOS F.

¹⁰ LOS D is usually the lowest acceptable LOS allowed by most agencies within the metro area.

operating at a LOS D between TH 3 and CR 73 and west of CR 63. North of CR 26, CR 63 is operating at a LOS A, while between CR 26 and TH 55 it is operating at a LOS B. South of TH 55, CR 63 is operating at a LOS D. TH 3 has a LOS D north of CR 26, a LOS C between CR 26 and TH 55, and a LOS D south of TH 55. CR 73 operates at a LOS B and C north and south of CR 26, respectively.

The AM and PM peak hour volumes of each intersection were analyzed using the Synchro/SimTraffic software package, which uses the methodology presented in the Highway Capacity Manual. These results are also presented in terms of LOS. Figure 21-3 (in Attachment C and D) shows the existing LOS for each movement and the overall intersection. More detailed LOS results and queue analyses are provided in Attachment D. Generally, the intersections within this project area are performing adequately. The lone exception is the intersection of TH 3 and CR 26, which currently has individual movements at a LOS E or LOS F and an overall intersection LOS E during the PM peak hour. This suggests some improvements are needed today.

2007 and 2014

No update.

2019

Traffic counts were completed for County Road (CR) 63, and CSAH 26 (Lone Oak Road) between 2014 and 2019. The counts have been used for the roadway reconstruction projects within the study area. The updated counts will be included in the Regional Roadway Visioning Study that will be updated in 2020. Attachment A for a list of street projects the City completed between 2014 and 2019.

ASSUMED LAND USE

2005

To begin analyzing the project area, it was necessary to project the trips that would be generated as a result of the land use assumptions. The determination of the trip generation characteristics of the development begins with assumptions concerning the expected land use and densities of the development. Information provided by the City of Inver Grove Heights identified the land use characteristics of the area. The project area was broken down into nine transportation analysis zones (TAZ), shown in Figure 21-4 (in Attachment C and D). Land uses, and densities of each development were assumed for each TAZ. Table 21-2 shows the land use and size of each land use within each TAZ.

Table 21-2: Land Use Types and Sizes Per Zone

TAZ	Land Use Types	Size	
1	Medium Density Residential	545	DU
	Office	338,680	SF
2	High Density Residential	687	DU
	Medium Density Residential	320	DU
	Low/Mid Density Residential	352	DU
	Low Density Residential	168	DU
	Mixed Use—Residential	260	DU
	Mixed Use—Commercial	94,745	SF

TAZ	Land Use Types	Size	
	Office	892,980	SF
3	High Density Residential	96	DU
	Medium Density Residential	493	DU
	Low/Mid Density Residential	624	DU
	Low Density Residential	48	DU
	Mixed Use—Residential	290	DU
	Mixed Use—Commercial	105,635	SF
	Park	58	AC
4	Low/Mid Density Residential	271	DU
	Commercial	660,240	SF
5 [2005]	Medium Density Residential	166	DU
	Low/Mid Density Residential	282	DU
	Low Density Residential	163	DU
	Commercial	714,495	SF
	Office	203,100	SF
	Industrial	18.7	AC
5 [2007]	Medium Density Residential	114	DU
	Low/Mid Density Residential	298	DU
	Low Density Residential	163	DU
	Commercial	1,164,905	SF
	Office	95,600	SF
	Industrial	8.8	AC
6	Medium Density Residential	29	DU
	Low/Mid Density Residential	388	DU
	Low Density Residential	220	DU
	Mixed Use—Residential	135	DU
	Mixed Use—Commercial	49,005	SF
	Commercial	50,095	SF
	Industrial	40	AC
	Public/Institution—Church	24	AC
7	Low/Mid Density Residential	39	DU
	Low Density Residential	213	DU
8	Medium Density Residential	371	DU
	Low/Mid Density Residential	674	DU
	Low Density Residential	256	DU
9	Industrial	48	AC

AC = Acres DU = Dwelling Units SF = Square Feet of Gross Building Area

Note: Only the proposed future land uses are shown. Existing developments are not included in this summary.

Using the land use and density information, the projected trip generation was determined using the Institute of Transportation Engineers (ITE) report titled Trip Generation, 7th Edition, 2003. This industry standard document provides average rates of land uses based upon studies completed across the nation. Table 21-3 provides the estimated 2025 trip generation for each land use.

Table 21-3: Estimated 2025 Vehicle Trips

TAZ	Estimated 2025 Vehicle Trips ¹¹				
	AM Peak Hour		PM Peak Hour		Daily (2-Way)
	Entering	Exiting	Entering	Exiting	
1	503	262	276	512	6,923
2	1,467	978	1,144	1,687	26,951
3	247	748	880	580	16,647
4	333	410	960	1,103	31,852
5 [2005]	795	603	1,274	1,636	40,096
5 [2007]	778	705	1,760	2,128	58,214
6	438	505	648	652	13,742
7	47	142	160	94	2,412
8	202	659	721	411	11,074
9	299	61	77	272	2,486
Subtotal ¹¹ [2005]	4,331	4,366	6,139	6,947	152,183
Subtotal ¹¹ [2007]	4,314	4,470	6,626	7,439	170,301
New Vehicle Trips [2005]	2,598	2,620	3,683	4,168	91,310
New Vehicle Trips [2007]	2,587	2,682	3,975	4,463	102,181

Only the totals of 'New Vehicle Trips' shown in Table 21-3 represent new traffic on the roadway system in the study area. These trips are established by reducing the total development trip generation to account for the following factors:

- Pass-By – Pass-by trips account for trips that are already on the road but see something that sparks their interest and decide to stop. They would already be on the road and are not considered a new trip despite the new decision to stop.
- Multi-Use – Multi-use trips account for those that make multiple stops within the project area. An example of this behavior is a driver that makes several stops at various stores in different locations.
- Internal – Some of the trips generated do not use the primary roadways for their trip purpose.
- Other Modes – Other modes of transportation include the use of transit systems, bicyclists, pedestrians, and multi-modal transportation.

The total volume of new trips on the area roadways is estimated at approximately 91,310 following application of the reduction factors.

With the new traffic determined, these volumes were then distributed to the study area roadway system based upon knowledge of the area, the existing flow of traffic, and input from the City. Traffic distribution was adjusted to reflect new roadways and connections within the study area, including a proposed new interchange at I-494 and CR 63. Some trips generated were diverted onto the 'ring roads' surrounding a mixed-use commercial area in TAZ 2, 3, and 6. The 'ring road' surrounding the mixed land use area in TAZ 6 is currently available, while the 'ring roads' in TAZ 2 and 3 are proposed. The traffic flowing in this area was adjusted to reflect drivers using those roads to avoid the main intersection of TH 3 and CR 26. The City has also proposed the completion of a collector roadway connecting the

¹¹ Trip generation before deductions for pass-by, multi-use, and diverted trips. This is not the expected new traffic on the roadway system.

city of Eagan to CR 73. This new east-west roadway would be established at approximately 65th Avenue. This new collector roadway would be expected act as a reliever to CR 26 and an alternate route across the northern portion of the study area. Another future connection would extend Yankee Doodle Road north through the new TH 55/CR 63 interchange and then east to an eventual intersection with TH 3. These roadways were all considered in the distribution of the projected development volumes. Figure 21-5 (in Attachment C and D) shows the projected development a.m. and p.m. peak hour volumes for the subject intersections.

With projected development volumes determined, the existing traffic was then increased to account for the following factors:

- Background Growth – Daily trips that increase as the population in this regional area increases.
- New Interchanges – As better access becomes available to drivers; their driving behavior and choices would change as well. For instance, motorists will likely shift from TH 3 to CR 63 if a new interchange at I-494 and CR 63 is built.
- New Traffic – With the addition of a new interchange, drivers from regions outside the project area may change their driving patterns and enter/exit the project area to use the new interchange

A new interchange was assumed at the juncture of I-494 and CR 63. While projected traffic volumes were determined for this new interchange, an interchange design, including the necessary approach lanes, was not examined. It is assumed that if a new interchange is determined for this location, the design will be established at that time. The interchange that drivers are currently using to access I-494 is by way of TH 3. This non-standard interchange may cause confusion to some drivers, causing them to change their routes to a simpler, more common intersection, if available. The trips associated with the new interchange were adjusted to account for both existing trips and new trips generated by the new intersection. The projected 2025 volumes are the combination of the development volumes added to the existing volumes with some additional changes.

The projected ADT was determined in the same manner as the peak hour volumes. New daily trips generated by the proposed development were distributed to the roadway system assuming the new roadway discussed earlier. The existing volumes were increased to account for background growth and traffic shifts of existing traffic were determined based upon the new roadways. The sum of the existing traffic, background growth and traffic shifts, and the new development traffic is the 2025 projected traffic. The projected ADT volumes are shown in Figure 21-6 (in Attachment C and D) along with the turning movement volumes at the study intersections.

Among regional roadways, the highest impacts of the proposed development will be to I-494 and TH 55 due to their proximity to the project location. However, no significant increase in congestion levels are anticipated due to the additional vehicle trips added to the regional roadway system. The 2003 AADT on I-494 is 83,000 according to MnDOT traffic volumes. The proposed development would increase traffic on I-494 west of CR 63 by approximately 15,550 vehicles. East of CR 63 traffic would be increased by less than 4,600 vehicles. The 2003 AADT on TH 55 is 19,000 and 18,100 east of TH 3 and west of CR 63, respectively. TH 55 west of

CR 63 can expect to see an increase in traffic of less than 5,600 vehicles. East of TH 3, the highway can expect to see an increase in traffic of less than 2,500 vehicles. The TH 55 and I-494 corridors currently operate at satisfactory levels and are expected to continue to operate at satisfactory levels even after full development of the project area.

2007

The total volume of new daily trips on the area roadways is estimated at approximately 102,181 following application of reduction factors.

Figure 21-5A (in Attachment C) shows the updated project development a.m. and p.m. peak hour volumes for the subject intersections.

The updated projected ADT volumes are shown in Figure 21-6A (in Attachment C) along with the turning movement volumes at the study intersections.

2014 and 2019

No update.

TRAFFIC ROUTES AND TRAFFIC GENERATION UPDATES

2014

- The City of Inver Grove Heights, the City of Eagan, and Dakota County have completed and adopted the 2010 Regional Roadway System Visioning Study for northeast Eagan and northwest Inver Grove Heights.
- The City completed and adopted the Northwest Area Collector Street Plan, dated May 2012.
- The City and Dakota County are conducting a design study for CR 28 and CSAH 63 from south of TH 55 to south of CSAH 26 in advance of improving these roadways in 2016. A 2014 feasibility study for the Argenta Trail Corridor from south of CSAH 26 to I-494 will also be conducted to consider the location of the future arterial connection to the potential future interchange along I-494 between TH 149 and TH 3 which is currently unfunded
- City Project No. 2009-01 Trunk Highway 3 and Amana Trail/proposed 80th Street Roundabout was completed.
- City Project No. 2010-41 Trunk Highway 3 Right Turn Lane—Argenta Hills 2nd Addition was completed.

2019

The City has identified the following planned and programmed transportation improvements in the 2040 Comprehensive Plan for the Northwest Expansion Area:

- Construction of a 2-lane urban roadway on CR 28, 0.62 miles east from TH 3
- Expand CSAH 26 to a 4-lane roadway
- New interchange at I-494 and CSAH 63

22. Vehicle-Related Air Emissions

- a. **Provide an estimate of the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts. (If the project involves 500 or more parking spaces, consult "EAW Guidelines" about whether a detailed air quality analysis is needed).**

2005

Carbon monoxide (CO) levels are elevated near roadway intersections due to the emission of this pollutant from the vehicles idling and passing by. The State of Minnesota has ambient CO standards that are designed to protect human health and the environment. The standards are:

- 1-hour average: 30 parts per million (ppm); and
- 8-hour average: 9 ppm

Concentrations near or above these levels are most likely to occur near intersections that are severely congested (LOS D, E, or F). Bonestroo, Rosene, and Anderlik Associates (BRA) evaluated key intersections serving the project area and predicted that the intersection of TH 3 and CR 26 would have an LOS of D during the afternoon peak period. All other intersections would have an LOS of C or better during morning and afternoon peak-hour periods.

This report evaluates the impacts of vehicle CO emissions near the intersection of TH 3 and CR 26 using MPCA procedures. The procedure requires use of EPA models to evaluate the impact of traffic on ambient CO levels to compare with the Minnesota CO standards.

2007, 2014, and 2019

No update.

BACKGROUND CO LEVELS

2005

To demonstrate compliance with standards, the modeled impacts of the area vehicle traffic is added to the ambient background CO concentration in the project area. For this analysis, 1-hour and 8-hour background concentrations are conservatively assumed to be 3.0 parts per million (ppm).

2007, 2014, and 2019

No update.

VEHICLE EMISSIONS

2005

Motor vehicle tailpipe CO emission factors were estimated with the EPA Mobile 6.2 model. Year 2025 CO emission factors used in the modeling are as follows:

- Idle – 81.6 grams per hour

- 35 mph – 12.7 grams per mile

2007, 2014, and 2019

No update.

MODELED VEHICLE EMISSION IMPACTS

2005

The EPA CAL3QHC dispersion model is used to estimate CO concentrations at points near intersections.

Site-Specific Inputs

CAL3QHC model output files are provided in Attachment D. The model outputs provide details of all required site-specific model inputs, including:

- Site and roadway geometry,
- Vehicle emission rates for characteristic speeds along modeled roadways,
- Traffic signal cycle times,
- Traffic signal red light times, and
- Clearance lost time – used default time of 3.0 seconds.

Traffic signal information was provided by Bonestroo and Associates. The analysis uses year 2025 emission rates and traffic levels.

2007, 2014, and 2019

No update.

METEOROLOGICAL INPUTS

2005

Meteorological inputs to the CAL3QHC model included the following:

- Wind Speed: 1 meter/second
- Stability Class: D
- Mixing Height: 1000 meters
- Surface Roughness Length: 108 centimeters

180 wind directions, in increments of 2 degrees, were input to the model to determine worst-case direction.

Receptors

Three receptors were placed in each quadrant of the intersection, 10 feet from the edge of the nearest travel lane.

2007, 2014, and 2019

No update.

MODELED CONCENTRATIONS

2005

The following table presents the maximum predicted 1-hour and 8-hour CO concentrations at the modeled receptor locations. The 8-hour concentrations were calculated using a persistence factor of 0.7.

Table 22-1: Modeled CO Concentrations, TH 3 / CR 26 – PM Rush Hour

Receptor Quadrant	Maximum Concentration (ppm)		
	Background CO	1-hour Average	8-hour Average
SE	3.0	6.3	4.4
NE	3.0	6.2	4.3
NW	3.0	6.4	4.5
SW	3.0	6.0	4.2

All predicted values are within the Minnesota ambient standards. No mitigation for impacts is indicated based on this analysis.

2007

Traffic volumes have changed as a result of the project. However, as previously demonstrated, the maximum CO concentrations are well below the Minnesota ambient standards. The recent changes will not adversely impact the CO concentrations as to cause an exceedance of the ambient standards.

2014 and 2019

No update.

23. Stationary Source Air Emissions

- Will the project involve any stationary sources of air emissions (such as boilers or exhaust stacks)?
☐ Yes ☒ No
- Describe the types, sources, quantities and compositions of any emissions from stationary sources of air emissions such as boiler, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult EAW Guidelines for a listing) and any greenhouse gases (such as carbon dioxide, methane, nitrous oxide) and ozone-depleting chemicals (chloro-fluorocarbons, hydrofluorocarbons, perfluorocarbons, or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

Not applicable.

24. Dust, Odors, Noise

- Will the project generate dust, odors, or noise during construction and/or operation?
☒ Yes ☐ No
- If yes, describe the sources, characteristics, duration, and quantities or intensity, and any proposed measures to mitigate adverse impacts. Also identify the locations of sensitive

receptors in the vicinity and estimate the impacts on these receptors. Discuss potential impacts on human health or quality of life.

2005

Stephen B. Platisha Associates, Inc. (SBP) has conducted a traffic noise impact study for the proposed development. The modeling analysis used the MnDOT Minnoise computer model and traffic predictions prepared by BRA. Additionally, SBP conducted noise monitoring at two sites in the project area. The impact assessment is based on existing and 2025 peak-hour traffic levels. A copy of the full study including data appendices is available on request from the City of Inver Grove Heights.

MINNESOTA NOISE STANDARDS

2005

Minnesota Rules Chapter 7030 provide the Minnesota standards for noise. These standards describe the limiting levels of sound established on the basis of present knowledge for the preservation of health and welfare. These standards are designed to be consistent with sleep, speech, annoyance, and hearing conservation requirements for receivers within areas grouped according to land use activities. The Minnesota standards are as follows:

Table 24-1: Minnesota Noise Standards

	7:00 AM to 10:00 PM		10:00 PM to 7:00 AM	
	L ₁₀	L ₅₀	L ₁₀	L ₅₀
NAC-1 (Residential)	65	60	55	50
NAC-2 (Commercial)	70	65	70	65
NAC-3 (Industrial)	80	75	80	75

L₁₀ means the sound level which is exceeded for 10 percent of the time for a one-hour period. L₅₀ means the sound level which is exceeded 50 percent of the time for a one-hour period. Sound levels are expressed in dBA. A dBA is a unit of sound level expressed in decibels and weighted for the purpose of approximating the human response to sound.

Minnesota Statutes, Section 116.07, Subd. 2a, exempt noise from local and county roads from the requirements of these noise rules unless full control of access to the road has been acquired.

2007, 2014, and 2019

No update.

MINNOISE MODEL

2005

The Minnoise model is a modified (modified by the Minnesota Department of Transportation) version of the Federal Highway Administration's (FHWA) Optima/Stamina model that is used to predict noise levels from highway projects and to assist with the development of noise barriers.

Model Assumptions

Noise level predictions were based on the following data and assumptions:

- The noise analysis was completed for the peak afternoon rush hour and peak nighttime traffic noise hour (6:00 am to 7:00 am).
- Traffic data for existing and year 2025 for the study area was generated by BRA and is provided in 2005 AUAR.
- Shielding from natural or man-made barriers was not considered.
- The analysis assumed acoustically soft ground cover between the roadway and all receiver locations ($\alpha = 0.5$).
- Vehicle mix was based on counts conducted during noise monitoring, with 6 percent heavy trucks and 4 percent medium trucks.
- Constant vehicle speeds of 40 mph on CR 63, 45 mph on CR 73, 50 mph on TH 3 and CR 26, and 65 mph on TH 55 and I-494 were assumed.

All noise modeling output files are provided in Attachment B in the full air and noise analysis report, available from the City of Inver Grove Heights.

Existing Noise Levels: Noise Modeling Locations

Using the Minnoise computer model and traffic and roadway information provided by BRA, SBP modeled existing noise levels generated by traffic on roadways serving the project area. Noise impacts were estimated for hypothetical receptor locations at various distances from the center of the median of the following roadways:

- Robert Street (TH 3)
- County Road 26
- County Road 63
- County Road 73
- TH 55
- I-494

Existing Noise Levels – Daytime Modeling Results

The results of the modeling for the daytime existing noise levels are provided in Table 24-2 and Tables 24-1, 24-3, and 24-4 (in Attachment D). The tables show the distance to which State noise standards are exceeded for NAC-1 ("residential") areas and the distance to which the FHWA noise abatement criteria are exceeded.

The State daytime standard is based on the suitability of an area for outdoor use. Certain highway expansion projects using federal funds must consider mitigation when the FHWA noise abatement criteria are approached.

Existing Noise Levels – Nighttime

Minnesota noise rules define nighttime as the hours between 10:00 p.m. and 7:00 a.m. Peak nighttime traffic noise levels typically occur during the 6:00 a.m. – 7:00 a.m. hour.

The nighttime NAC-1 ("residential") standards ($L_{10} = 55$ dBA, $L_{50} = 50$ dBA) are designed to prevent interference with sleep in a building with partially open windows. New residential developments are exempt from this standard if the buildings have year-round climate control and meet minimum construction standards for noise level attenuation.

Table 24-1 (in Attachment D) shows the approximate distance from the center of the State Highways and I-494 to which nighttime standards are exceeded.

Existing Noise Levels – Noise Monitoring Results

In addition to the modeling of project area noise levels, noise level monitoring was also conducted at locations within the project area to further define existing noise levels. The following table presents the results of monitoring conducted by SBP at two project area locations and the results of monitoring conducted by MnDOT in the project area as part of their metro wide monitoring program.

Table 24-2: Noise Monitoring Results

	Date	Time	L_{10}	L_{50}
R1 – TH 3	2/02/05	8:13 am – 9:13 am	61.0	55.0
R2 – TH 55	2/04/05	8:40 am – 9:40 am	76.0	71.0
R3 – TH 55/TH3 ¹²	N/A	N/A	69.0	N/A
R4 – I-494 ¹²	N/A	N/A	65.0	N/A

2007, 2014, and 2019

No update.

POST-DEVELOPMENT NOISE LEVELS

2005

Using the Minnoise computer model and traffic and roadway information provided by BRA, SBP estimated post-development noise levels generated by traffic on roadways serving the project area. Noise impacts were estimated for hypothetical receptor locations at various distances from the center of the median of the following roadways:

- Robert Street (TH 3)
- County Road 26
- County Road 63
- County Road 73
- TH 55
- I-494

Post-development Noise Levels – Daytime Modeling Results

The results of the modeling for the 2025 post-development daytime noise levels are provided in Tables 24-3 through 24-6 (in Attachment D). The tables show the distance to

¹² Monitoring at locations R3 and R4 was conducted by MnDOT. Times and dates were not available. L_{50} was not determined.

which State noise standards are exceeded for NAC-1 ("residential") areas and the distance to which the FHWA noise abatement criteria are exceeded.

The State daytime NAC-1 standard is based on the suitability of an area for outdoor use. Certain highway expansion projects using federal funds must consider mitigation when the FHWA noise abatement criteria are approached.

Table 24-7 (in Attachment D) shows the distance to which Minnesota NAC-2 ("commercial") standards are exceeded for each roadway.

Post Development Noise Levels – Nighttime

Minnesota noise rules define nighttime as the hours between 10:00 p.m. and 7:00 a.m. Peak nighttime traffic noise levels typically occur during the 6:00 a.m. – 7:00 a.m. hour.

The nighttime NAC-1 ("residential") standards ($L_{10} = 55$ dBA, $L_{50} = 50$ dBA) are designed to prevent interference with sleep in a building with partially open windows. New residential developments are exempt from this standard if the buildings have year-round climate control and meet minimum construction standards for noise level attenuation.

Table 24-8 (in Attachment D) shows the approximate distance from the center of the roadways to which Minnesota nighttime standards are exceeded.

2007, 2014, and 2019

No update.

25. Nearby Resources

Are any of the following resources on or in proximity to the site:

a. archaeological, historical, or architectural resources?

☒ Yes ☐ No

2005

Field work related to archaeological, historical, and architectural resources was preceded by a literature and records search which focused on inventory files maintained at the Minnesota Historical Society as well as references and reports compiled for previous cultural resource investigations in northern Dakota County and adjacent portions of Washington County.

As results of the literature and records search had been negative and as areas of proven archaeological potential -- uplands adjacent to streams and larger lakes -- are rare within the study area, the consultant ARS (Archaeological Research Services) in consultation with the State Historic Preservation Office (SHPO), decided to use a staged approach which would focus the initial field review on areas in a lacustrine setting and then expand survey coverage only if initial results had proven positive.

Many of the inspected uplands have been cultivated for decades and were so again in 1999. Others have been disturbed by recent residential development. In most cases, disturbance appeared to have been deep enough to have brought to the surface a sample of any archaeological evidence present in the soil. Consequently, close-interval visual inspection was often deemed to provide sufficient survey coverage.

Areas that appeared undisturbed or were too vegetated to offer adequate subsoil exposure were shovel tested. Tests were placed at approximate 10-meter intervals and measured 35-40 centimeters (cm) in diameter. They were taken out in 10 cm levels down into sterile mineral soil, with soil contents screened onto tarpaulins through quarter-inch hardware cloth. Once soil profiles had been noted, tests were immediately backfilled, and the sod replaced.

No area was surveyed without written or verbal approval by the property owner. Figure 25 (in Attachment C and D) shows the parcels where ARS staff was not granted entry for either archaeological survey or the review of historic structures.

It should be noted that an earlier archaeological survey conducted by ARS along TH 55 already had covered that segment of the corridor that traverses Section 7, including expanded coverage around the intersections with Argenta Trail and South Robert Trail -- areas that now could be excluded from further review. Results of the corridor survey had proven negative (Harrison 1996).

2007, 2014, and 2019

No update.

RESULTS

2005

The study area encompasses all or part of five lakes/lake clusters with a surface area of at least 30 acres. According to the 1993 USGS map, only three are named (Figure 25 in Attachment C and D). The others were informally named by ARS staff. Each will be described below along with a discussion of survey coverage. As results proved negative, more detailed survey records will be kept on file by ARS rather than included as attachments.

Robert Trail as well as a smaller access road flank the southern and southeastern shores of **Horseshoe Lake** which otherwise falls entirely outside the survey area. Neither shore segment has any archaeological potential. The southeastern has been completely modified by road construction, the southern is low and marshy.

A few hundred meters to the east, the enclosed basin of **Dickman Lake** is surrounded by a series of knolls. Those around the northern half all support fairly recent homes; those around the southern half are still mostly wooded except for the open, grassy yard of a large private residence.

Two property owners denied access, while the rest were cooperative. No one could remember finding any artifacts even though most appeared to be avid gardeners. ARS conducted a complete visual inspection of all existing disturbances: harvested and fall-cultivated gardens, animal burrows, shoreline bank erosion, graded access roads and areas around boat landings as well as trenches dug for utilities and fairly elaborate watering systems -- subsoil exposure more than equivalent to that provided by standard shovel testing and all of it negative.

On two larger properties that abut the southern third of the lake, ARS staff shovel-tested the narrow crests of wooded ridges that directly overlook the water. In addition, they

examined a number of windfalls from recent windstorms. Tests were placed at approximate 10-meter intervals. Soil profiles were undisturbed and fairly consistent. Again, results were negative.

Two miles further south, the northernmost of the **Marcott Lakes** -- a landlocked chain of five small lakes -- extends into the study area and due north of that are two smaller ponds.

Permission was not granted to survey the properties around the ponds, nor to test the parcels on the narrow isthmus between the ponds and the northern shore of the lake. Instead, ARS staff completed a thorough visual inspection of numerous subsoil exposures on the isthmus (gardens, graded access roads and parking areas, recent construction sites). Similar exposure was abundant on properties east of the lake, all of them very sloping towards the shore and disturbed on the crest due to the need for extensive landscaping for building sites and driveways. Negative results indicated that these areas were totally lacking in archaeological potential.

The only parcel that appeared likely to have attracted historic Native American use was a small peninsula that trends north into Marcott Lake from the southern edge of the AUAR area. In 1999, because its owners were in the process of selling the property, they did not allow any testing. In 2004, ARS was again refused permission to conduct any testing. Construction of a sizeable modern residence would probably have disturbed any historic cultural evidence present on the southern half of the peninsula but the northern half, wooded and largely undisturbed, appears to have considerable archaeological potential.

In western Section 6, west of Argenta Trail, is a cluster of small, isolated lakes named by ARS the **Argenta Lakes**. As shown on Figure 25 (in Attachment C and D), access was denied to most of the uplands around them but where field inspections could be accomplished -- visual inspection of numerous deep disturbances around buildings, on cultivated fields and in gardens -- the negative results suggested a total lack of archaeological potential.

Half a mile further north is another unnamed lake by ARS referred to as **Section 6 Lake**. It is landlocked, in a long and narrow basin. Only its southeastern half falls within the study area.

The south/southwestern shore of this lake features a long steep northward slope all the way to the lake. Above that, the relatively level crest of the ridge has been disturbed by a couple of building sites as well as by grading and clearing and erosion along the upper edge of the slope. Visual inspection and shovel testing of less disturbed areas proved negative. The north/northeastern shore is even steeper: a wooded, fairly level-crested esker which was tested at five-meter intervals wherever the crest was wide enough to have invited historic use. Soil profiles were undisturbed and consistent, with approximately 15-20 cm of dark greyish brown sandy loam over a lighter greyish brown sandy loam mixed with dense gravel and numerous cobbles. All tests proved negative.

2007, 2014, and 2019

No update.

REVIEW OF HISTORIC STRUCTURES: METHODOLOGY AND RESULTS

Methodology

2005

In addition to the sources consulted about the general history of Dakota County and Inver Grove Heights (above, Section 2.2.2), a variety of documents were used to identify locations where historic structures would be likely to survive -- mostly 19th and early 20th century plat maps as well as aerial photographs taken in the 1930s - 1950s, and a 1967 USGS topographic quadrangle map for Inver Grove Heights -- all listed in Section 6.

In addition, the historic architecture inventory maintained by SHPO was consulted for information about properties listed for the AUAR area and its immediate vicinity. All locations of possible interest were numbered and marked on a topographic map (Figure 25 in Attachment C and D).

An effort was then made to visit all of these locations. Where possible, permission was asked to photograph the buildings and an interview conducted with the owner. Where permission was denied, ARS staff described and photographed what could be seen from the nearest public road. In a few cases, even that approach proved fruitless due to distance or the presence of dense woods.

At the time the above-mentioned archaeological survey was conducted by ARS along TH 55 through Section 7, a companion survey focused on standing structures was completed by Hess, Roise and Company of Minneapolis. Within that corridor segment are several historic properties which will only be described briefly below, with reference made to the final report for the TH 55 review (Roise 1996).

2007, 2014, and 2019

No update.

Results

2005

The locations of reviewed properties are shown in Figure 25 (in Attachment C and D), referenced by field numbers assigned by ARS staff and supplemented, as appropriate, with the official Minnesota Historical Society (MHS) historic structures inventory file number.

ARS 1 = 6471 Argenta Trail

A 1950s-1960s residence; a large newer-looking shed which may contain a modified older outbuilding; the lower portion of a brick silo.

ARS 2 = 6659-6689 Argenta Trail

A large modern rambler, a large barn which appears well preserved, a modified chicken coop, a granary.

ARS 3 = 6743 Argenta Trail

1 1/2 story older brick residence with a modern addition at the back.

ARS 4 = 6922 Argenta Trail

Modern residence and garage as well as two smaller, remodeled outbuildings. Another early homestead which once stood adjacent to this one, appears to be gone.

ARS 5 = 1165 70th Street West

Permission was not given to access the property which was photographed from South Robert Street. It appears to feature a remodeled older residence, a large gothic-roofed barn with a sagging roof, and a smaller, newer gambrel-roofed outbuilding on cement block foundation.

ARS 6 and 7 = 1200 60th Street West

Part of property once farmed by the Schindeldecker family.

Permission to access and photograph was denied by current owners.

No older buildings left -- a modern home appears to have replaced the original farm residence at ARS 6.

ARS 7a = 6321 South Robert Trail

Also once part of the Schindeldecker farm.

Now occupied by a modern residence and garage but according to the owner, there is an old trash dump to the north of the house.

ARS 8 = 6308 South Robert Trail (MHS: DK-IVG-03)

Older buildings include a residence and a granary from the early 1880s, and a small shed (well house). A modern garage stands at the location of a barn which burned in the mid-1970s.

ARS 9 = 6180 South Robert Street

Formerly part of the Schindeldecker property. Now a modern residence on a heavily landscaped lot.

ARS 10 = 1401 70th Street East

A remodeled farm residence, a dilapidated older barn, a newer gambrel-roof barn, a brick silo and two smaller outbuildings.

ARS 11 = 6925 Athena

Now features a newer residence. No trace of an older farm except for an old farm access road on north side of property.

ARS 12 = 1286 West 70th Street

An older, heavily remodeled residence, a barn with concrete silo, an older outbuilding modified into a garage, a cinder block well house.

ARS 13 = 1694 West 70th Street

All buildings have been removed -- the property is now part of a golf course.

ARS 14a = Babcock Trail -- no address (MHS DK-IVG-06)

School No.8 -- building in good condition but integrity marred by a garage-style door cut into the southern wall. Also features a small storage shed and a now collapsed outhouse.

ARS 14b = 7301 Babcock Trail

Part of the old Glassing farm, shown on an 1879 plat.

Now a florist business, the property features a heavily remodeled farm residence, a well-preserved barn, some smaller out buildings as well as a newer greenhouse and modern shop buildings.

ARS 15 = 1714 West 80th Street

A much-remodeled older house, a well-preserved barn with brick silo, a small granary, a modern garage and metal shed.

ARS 16. No address

Nothing left of original farm -- now part of a golf course.

ARS 17 = 1407 West 80th Street

Noted as Maple Lake Farm on 1896 plat. Now replaced by a modern residence and garage.

ARS 18 = 1181 West 80th Street (MHS DK-IVG-20 (Cloverleaf Motel) and DK-IVG-21 (Older Barn))

Reviewed for MnDOT and found to be ineligible for the National Register of Historic Places (Nunnally 1993).

ARS 19 = 1462 West 80th Street

Older residence, barn, remnant of silo, wooden outbuilding.

ARS 20 = 7757 South Robert Trail

No access provided -- photographed from South Robert Street. Now a construction business, the property includes an older but remodeled residence as well as four new pole barns.

ARS 21 & 22. No address (MHS DK-IVG-04)

No access granted. From the road, the buildings appear to be completely gone.

ARS 23 = 7215 72nd Circle West

One of the first farms in Section 7 (Andreas 1874) and homesteaded by the Sach family. Still owned by members of that family in 2000 who then used the barn for livestock, the property now has new owners. It includes an older residence, a gambrel-roof barn, a silo and a modern machine shed.

ARS 24 = 7260 South Robert Trail

Brick farm residence, well house and barn foundation observed in 2000 since obliterated after farm was destroyed by fire in 2004.

ARS 25 = 7101 Argenta Trail

Another Sach family farm: residence and garage modern built on location of old farm house. Still extant: a well house with wind mill remnant, a machine shed, a corn crib with attached but dilapidated shed, a granary with metal siding, an outhouse and a field stone barn foundation.

ARS 26 = 7312 Argenta Trail

Another Sach farm but no longer in the family.

Older residence, well house, small milking shed, fieldstone and concrete foundations for a large barn, a small barn and a silo.

ARS 27 = 7475 Argenta Trail

The former location of a school house, it now features a quonset hut and some modern sheds, which serve as a maintenance area for Inver Grove Sanitation.

ARS 28 = 7482 Argenta Trail

All that remains of the farm is a remodeled brick residence and a barn foundation now reused for a chicken coop.

ARS 29 = 7587 Argenta Trail

Old but remodeled residence, well preserved barn, large pole barn, two garages. No longer a residence but used by a construction business for storage.

ARS 30 = 7925 Argenta Trail ***

Older residence with added garage, a rather dilapidated gambrel-roof barn, and a granary remodeled into a second residence. *Too lacking in integrity to meet National Register of Historic Places (NRHP) criteria.*

ARS 31 = 6570 South Robert Trail

Now used by Lakewinds Nursery. Permission not given to take photographs or inspect buildings. Property an older, resided residence, a Quonset-style barn, a granary, and two wooden outbuildings. May need further documentation.

ARS 32 = 8225 Argenta Trail***

Property is now owned by Riverside Lutheran church. It includes a modern garage and an older farm house with original lap siding but also some altered windows. *Too lacking in integrity to meet NRHP criteria.*

ARS 32a. No address

Unmarked cemetery owned by the church, located south of the ARS 32 residence, in an open, grassy area.

ARS 33 = 8334 Argenta Trail

Shown as the J. Corrigan property in 1874 (Andreas) and 1896 (Union Publishing).

Now a home-based business. Permission to photograph denied.

Older residence has been remodeled and resided with a new addition. Barn, concrete silo, and several outbuildings appear to be in fair shape.

Although it appears too lacking in integrity to meet NRHP criteria, it still seems to be of considerable local historic significance. May need further review.

ARS 34 = 1712 West 82nd Street***

Now the CRM Ranch, a horse boarding business. Features an old residence with additions, a gambrel-roof barn with a concrete silo, a milk house and a chicken coop now used for horses as well as five newer buildings added by the present owners. The rural setting is well-preserved. *Although the property appears too lacking in integrity to meet NRHP criteria, it still seems to be of considerable local historic interest.*

ARS 35 = 8420 Alverno Avenue West

Older farm house with small addition, granary, slightly remodeled milk house – all of them resided, as well as a well-preserved barn, a metal pole barn, and an executive-style new home. *Overall too lacking in integrity to meet NRHP criteria, but the barn is of very considerable interest.*

ARS 36 = 7940 Alberta Avenue West

Now a modern residence – no older structures

ARS 37 = 1354 Courthouse Boulevard

The original farm house has been replaced by a modern rambler. Adjacent to it is a second residence which, according to the owner, incorporates an older guest/summer house for the farm, none of it visible on the exterior.

ARS 38 = 8011 Courthouse Boulevard

Features an older house with an addition and a newer porch, a well house with windmill remnants, and a small garage with attached residence. The barn, still standing in 2000, has now collapsed. The property appears to have been staked for development.

ARS 39 = 8152 82nd Street East***

Shown as "Lakeside Farm" on an 1896 plat, the property now includes a wood-frame residence, a gothic-arch barn, a granary (or machine shed) now converted into a garage, and a well house. Since it was photographed in 2000, the farm house has been remodeled with new dormers and a wrap-around porch.

ARS 40 = 8136 Alderbert

Photographed in 2000, the property included two buildings, which appeared to be summer homes: one older house and a cabin, both built with split log siding. One has now been removed, the other one is heavily remodeled.

ARS 41 & 42

Within the TH 55/South Robert Trail interchange are two properties listed by MHS as DK-IVG-018 (Bridge No. 5820, built in 1940) and DK-IVG-019 (Clover-Leaf Intersection). Both are located within the highway corridor and their management is the responsibility of MnDOT.

2007, 2014, and 2019

No update.

b. prime or unique farmland?

☐ Yes ☒ No

c. designated parks, recreation areas, or trails?

☒ Yes ☐ No

2005

The Northwest Expansion Area includes a large open space area called Harmon Park and the Inverwood Hills Golf Course. These uses will remain in place as development occurs in the Northwest Expansion Area.

The land use plan for the area anticipates maintaining large areas of open space and greenway corridors in the Expansion Area as development occurs. The area also has a variety of good and high-quality upland and wetland natural resources that the City and its residents would like to protect for the long term. The City and its Northwest Area Task Force have determined that the development plan for the area will use a variety of low-impact development techniques and preservation of existing natural resources and regional basins to manage stormwater in the area. The land use plan therefore features relatively large green spaces and corridors to allow for stormwater infiltration and collection in the regional basin areas. These plans and strategies to achieve them are discussed in Sections 6, 10 and 17 of this AUAR.

The Task Force for the Natural Resources Inventory and Management Plan identified greenway corridors in the study area. Both Primary and Secondary Greenways are identified on Natural Resource Inventory maps. The Conceptual Greenway corridors that were developed during the Natural Resources Inventory are consistent with those developed later during the North Dakota County Greenway Planning project completed by the DCSWCD.

2007

The City of Inver Grove Heights adopted the Northwest Expansion Area Park System Plan, dated March 29, 2007. This plan identifies potential future park locations and trails throughout the Northwest Area.

2014

The City of Inver Grove Heights adopted the 2030 Comprehensive Plan, which includes the City's vision for parks and trails in the Northwest Area and throughout the community. Additional refinements to the Northwest Area Park and Trail plan are a part of the City's effort to update the entire park, recreation, and trail plan through an effort the City has called "Future of Our Parks – Park and Recreation System Plan." The plan is envisioned to determine the future needs of the community's park and recreation needs and provide for a specific 5-year plan and 10-15-year vision.

The City of Inver Grove Heights supports the Mendota to Lebanon Hills Master Plan.

2019

The City has drafted the 2040 Comprehensive Plan, which includes the City's vision for parks and trails in the Northwest Area. There are several new proposed trail connections, sidewalks, and parks within the AUAR study area.

d. scenic views and vistas?

☒ Yes ☐ No

2005

The rolling topography of the Northwest Expansion Area creates scenic views and vistas in many locations. These vistas include views of woodlands, wetlands, and natural areas. The City's land use plan and Natural Resources Management Plan seek to preserve a large portion of these natural areas as development occurs. The plans place particular emphasis on preserving high quality upland and wetland natural areas (Management Areas 1 and 2, shown on Figure 10-3 in Attachment C and D). Preservation of these natural areas should help to preserve the scenic character of the study area as development occurs. Higher-density development is proposed along major roadway corridors, where it will not impact the existing scenic views within the area.

2007, 2014, and 2019

No update.

e. other unique resources?

☐ Yes ☒ No

f. If any items are answered Yes, describe the resource and identify any impacts on the resource due to the project. Describe any measures to be taken to minimize or avoid adverse impacts.

No change.

26. Visual Impacts

a. Will the project create adverse visual impacts? (Examples include: glare from intense lights; lights visible in wilderness areas; and large visible plumes from cooling towers or exhaust stacks.)

☐ Yes ☒ No

27. Compatibility and Plans

a. Is the project subject to an adopted local comprehensive land use plan or any other applicable land use, water, or resource management plan of a local, regional, state, or federal agency?

☒ Yes ☐ No

b. If yes, identify the applicable plan(s), discuss the compatibility of the project with the provisions of the plan(s), and explain how any conflicts between the project and the plan(s) will be resolved. If no, explain.

The AUAR must include a statement of certification from the RGU that is comprehensive plan complies with the requirements set out at 4410.3610, subpart 1. The AUAR document should discuss the proposed AUAR area development in the context of the comprehensive plan. If this has not been done as part of the responses to items 6, 9, 19, 22, and others, it must be addressed here; a brief synopsis should be presented here if the material has been presented in detail under other items. Necessary amendments to comprehensive plan elements to allow for any of the development scenarios should be noted. If there are any management plans of any other local, state, or federal agencies applicable to the AUAR area, the document must discuss the compatibility of the plan with the various development scenarios studied, with emphasis on any incompatible elements.

COMPATIBILITY WITH PLANS AND LAND USE REGULATIONS

2005

The City of Inver Grove Heights completed its comprehensive plan consistent with the requirements of the Metropolitan Land Planning Act requirements. This plan was reviewed by the Metropolitan Council and found to be consistent with the Regional Blueprint and with the Metropolitan Council's regional systems plans. On June 8, 1998 the City of Inver Grove Heights officially adopted its Comprehensive Plan as official public policy. This plan complies with the requirements set out in Minnesota Rules 4410.3610, subpart 1, which requires local comprehensive plans to address land use, transportation, and sanitary sewer systems.

The land use plan for the Northwest Expansion Area has changed in some respects from the land use plan included in the City's Comprehensive Plan, but the overall residential density of approximately 3 units per acre remains the same for the area. The proposed land use plan is therefore consistent with the adopted Comprehensive Plan. The protection of large open space and natural areas to implement the surface water plan has required the shifting of the proposed location of some residential units from areas to be preserved as open space and stormwater management areas, to developable areas, so that there is more medium-density residential use shown on the current plan than in the Comprehensive Plan. The location of proposed Commercial and Industrial land uses is consistent with the Comprehensive Plan.

The response to Section 6 provides a detailed description of the AUAR in the context of the City of Inver Grove Heights Comprehensive Plan.

The AUAR and proposed development are generally consistent with the City's Comprehensive Plan, Natural Resource Inventory and Management Plan, Surface Water Management Plan, and related City Ordinances.

2007

The City of Inver Grove Heights will be updating its Comprehensive Plan in 2008.

The City of Inver Grove Heights is currently processing a Comprehensive Plan Amendment that is consistent with the land use changes proposed in the Northwest Expansion Area AUAR Update and the updated Development Scenario. Land located at the northwest quadrant of TH 55 and TH 3 will change from guided as Industrial Office

Park to guided as Community Commercial and Low/Medium Density Residential. This is consistent with the updated Development Scenario. This Comprehensive Plan Amendment will be reviewed by the Planning Commission and City Council in August 2007. The Metropolitan Council will review this amendment in September 2007.

2014

No update.

2019

The City of Inver Grove Heights has drafted its 2040 Comprehensive Plan and the AUAR Study area has been updated to reflect the land use changes as described in Section 6 (Project Description) and Section 9 (Land Use).

28. Impact on Infrastructure and Public Services

- a. **Will new or expanded utilities, roads, or other infrastructure, or public services be required to serve the project?**
☒ Yes ☐ No
- b. **If yes, describe the new or additional infrastructure/services needed. (Any infrastructure that is a “connected action” with respect to the project must be assessed in this EAW; see “EAW Guidelines” for details.)**

This item should first of all summarize information on physical infrastructure presented under other items (such as 6, 18, 19, and 22).

Other major infrastructure or public services not covered under the other items should be discussed as well. As noted above and in the “EAW Guidelines,” the RGU must be careful to include project-associated infrastructure as an explicit part of the AUAR review if it is to be exempt from project-specific review in the future.

2005

The new infrastructure (roads, utilities, etc.) required to serve the project are detailed under the appropriate sections in this AUAR. These include Section 13 (Water Use), Section 17 (Water Quality-Surface Water Runoff), Section 18 (Wastewaters), Section 20 (Solid Wastes), and Section 21 (Traffic).

School Districts 196 and 199 serve the AUAR area. Neither district has plans for additional schools within the AUAR area.

The City is currently completing a study of City Hall facility, police, and fire service needs for the community that will identify needs for the next 20 years, when the City is likely to be fully-developed. This study is expected to identify needs for expansion of existing facilities, or additional neighborhood facilities in the AUAR area and other areas within the community.

2007 and 2014

No update.

2019

The new infrastructure required to serve the AUAR study area are detailed in Section 13 (Water Use), Section 17 (Water Quality-Surface Water Runoff), Section 18 (Wastewaters), Section 20 (Solid Wastes), and Section 21 (Traffic).

SUMMARY OF INFRASTRUCTURE PROPOSED FOR THE NORTHWEST EXPANSION AREA

Roadway Network

2005

Based on the new traffic that will be generated by development of the Northwest Expansion Area, four primary roads will need to be improved to accommodate future growth. The Mitigation Plan recommends that CR 63 in the southbound direction be widened to a four-lane roadway from north of I-494 to south of TH 55. TH 3 should also be widened from south of the interchange with TH 55 to the north of the intersection with I-494. CR 73 will require the addition of lanes. CR 26 will need to be widened beginning to the east of CR 73 and continuing to the west of CR 63.

The AUAR analysis indicates that the proposed development will have minimal impact on the regional system, including I-494 and TH 55. The analysis assumes a new interchange at I-494 and CR 63, as described in the City's Thoroughfare Plan. The City will need to work with MnDOT and Dakota County regarding timing and funding of improvements to County and State roadways. Local roadway improvements will be phased with development.

2007 and 2014

No update.

2019

Planned and programmed roads in the AUAR study area are described in Section 21 (Traffic).

Sanitary Sewer System

2005

The estimated sewer flow rate for the Northwest Expansion Area is 1,200 gallons per acre per day. All areas within the AUAR study area will be served by sanitary sewer, with the exception of four existing neighborhoods, based on the City's Comprehensive Plan (1998). The existing neighborhoods will be served with sanitary sewer only if necessary for health reasons, or if the neighborhoods request this service. The proposed City trunk sewer system will connect to the MCES regional system. Proposed sewer system alignments have been routed to avoid impacts to proposed stormwater infiltration basins and areas of high-quality natural resources.

The City will construct sanitary sewer improvements to serve the AUAR area in general accordance with the 2020 Comprehensive Plan for the City. The sewer flows from this area will go to the MCES interceptor systems and Metropolitan Wastewater Treatment Facility, which has capacity available to serve this area.

2007 and 2014

No update.

2019

Proposed sanitary sewer facilities are described in Section 18 (Water Quality – Wastewaters).

Municipal Water System

2005

The City of Inver Grove Heights currently operates six municipal supply wells with a total ground-water appropriation of 1,250 MGY in 2003. The wells are used on a rotation schedule.

The project area will be served by expanding the existing municipal water supply system. Development of the project area will require additional appropriation of groundwater for municipal water supply. Five additional wells will likely be required to meet the ultimate system demand. The number of new wells required will depend on the capacities of the future wells. The ultimate projected municipal water system demand is 2,295 MGY.

New wells will be completed in the Jordan Sandstone portion of the Prairie du Chien-Jordan aquifer system. Each new well is expected to have a capacity of 1,200 gpm. While the City's current wells will experience a gradual increase in pumping and additional wells will be constructed, the aquifer is expected to be able to accommodate the additional withdrawals, based on recent tests. New wells will be constructed prior to development.

2007 and 2014

No update.

2019

Municipal water facilities are described in Section 13 (Water Use).

Stormwater System

2005

The City's Surface Water Plan for the Northwest Expansion Area proposes an approach that minimizes connected impervious surfaces, increases flow path and time over pervious surfaces, and decentralizes treatment in local and regional infiltration areas. The approach focuses on a variety of local BMPs, and collection and further treatment/infiltration of excess water in the numerous existing natural basins in the area. The plan includes a number of alternative practices with infiltration to provide for pretreatment before discharge to wetland basins and preserves the infiltration capacity of the natural basins.

The land use plan features relatively large green spaces and corridors to allow for stormwater infiltration and collection in the regional basin areas. These areas are located within the low to medium density residential areas and open space areas shown on the land use plan.

2007, 2014, and 2019

No update.

29. Related Developments; Cumulative Impacts

Minnesota Rule part 4410.1700, subpart 7, item B requires that the RGU consider the “cumulative” potential effects of related or anticipated future projects when determining the need for an environmental impact statement. Identify any past, present, or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative impacts. Describe the nature of the cumulative impacts and summarize any other available information relevant to determining whether there is a potential for significant environmental effects due to cumulative impacts (or discuss each cumulative impact under appropriate item(s) elsewhere in this form).

This item does not require a response for an AUAR with respect to cumulative impacts of potential developments within the AUAR boundaries, since the entire AUAR process is intended to deal with cumulative impacts from related developments within the AUAR area; it is presumed that the responses to all items on the EAW form encompass the impacts from all anticipated developments within the AUAR area.

However, the questions of this item should be answered with respect to the cumulative impacts of development within the AUAR boundaries compared with past, present, and reasonably foreseeable future projects outside of the AUAR area, where such cumulative impacts may be potentially significant.

2005

Much of the area around the Northwest Expansion Area is already developed, including areas in Eagan to the west, Mendota Heights and Sunfish Lake to the north, and portions of Inver Grove Heights to the east. The difficult topography of the Expansion Area has contributed to delay of development in this area, so that it is a relatively large area of “infill” development within this part of the metro area. Therefore, cumulative impacts resulting from future projects in the area around the AUAR area are likely to be limited.

The City of Eagan is currently looking at a variety of options for additional development in the area to the west of the AUAR area, near I-494. Depending on the land use options identified for the future of this area, development here could result in traffic impacts that along with development in the AUAR area are significant for regional roadways. The Cities of Eagan and Inver Grove Heights have been working together and sharing traffic data from the AUAR study and studies in Eagan and will use this information to examine potential cumulative impacts on roadways in the area.

The traffic analysis section (Section 21) notes the need to expand several regional roadways to accommodate the traffic expected from development of the AUAR area. This includes expanding TH 3 to a 4-lane roadway within the project area. Other recent environmental review documents completed for communities in Dakota County (Farmington and Empire Township) have also indicated the need to expand the capacity of TH 3. This route is currently designated for “Preservation” by MnDOT. These issues have been discussed with MnDOT staff during other AUAR processes, and the agency is aware of these issues.

The stormwater management system proposed for the AUAR area is planned to avoid impacts to adjacent areas, and therefore no cumulative impacts are expected with projects in adjacent areas.

The Comprehensive Plan completed by the City of Inver Grove Heights, which includes proposed development in the AUAR area, addresses the growth planned for the community by the Metropolitan Council, and plans for the infrastructure needed to accommodate this growth, in light of growth expected in surrounding areas. The proposed infrastructure is consistent with the capacity of regional systems to serve this area. The City's Comprehensive Plan plus the special studies completed for the AUAR area, including the Natural Resources Inventory and Management Plan, sewer and water studies, stormwater studies, traffic management studies, and related plans along with this AUAR, have identified the potential impacts of development across the AUAR area, and have prepared strategies and approaches to avoid impacts where possible, and mitigate for other impacts, while maintaining the amount and types of growth proposed in the City's Comprehensive Plan.

2007

The City of Eagan completed the Northeast Land Use Study in June 2005. The result of that study was that the current Comprehensive Plan should continue to guide development in the northeast area of Eagan.

Dakota County, along with the City of Eagan, the City of Inver Grove Heights, FHWA, MnDOT, Metropolitan Council, the City of Mendota Heights, and the City of Sunfish Lake have completed the Dakota County North-South Corridor Study: Eagan-Inver Grove Heights Travel Demand Study. The objective of this study was to conduct a travel demand model study to forecast future traffic flow concentrations and patterns as a result of the increased future development identified by local plans in the northeast Eagan and northwest Inver Grove Heights area. The travel demand model study included forecasting travel demand on all major city, county, and state highways within the study area. Completion: The study was completed in July 2007. Dakota County, the City of Eagan, and the City of Inver Grove Heights are in the process of approval consideration at the Board/Council level.

2014

No update.

2019

The 2040 Comprehensive Plan was approved in 2019 and outlines the needed infrastructure and resources for the AUAR study area and surrounding communities to support the expected growth.

30. Other Potential Environmental Impacts

If the project may cause any adverse environmental impacts which were not addressed by items 1 to 28, identify them here, along with any proposed mitigation.

2005

None identified.

2007

The AUAR Update does not introduce any other adverse environmental impact that has not been addressed previously.

2014

No update.

2019

No update.

31. Summary of Issues

List any impacts and issues identified above that may require further investigation before the project is commenced. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

2005

The Mitigation Plan that follows identifies the issues that might impact the Annexation Area and the mitigation steps to be taken.

2007

The AUAR Update has been reviewed and updated the Final Mitigation Plan for the Northwest Expansion Area AUAR, dated August 2005. The Final Mitigation Plan Update follows as separate document.

2014

No update.

2019

No update.

32. Mitigation Plan

a. Introduction

The Mitigation Plan is used by the City of Inver Grove Heights to guide development of the Northwest Expansion Area through avoidance, minimization, and/or mitigation of environmental impacts. The plan is not intended to modify the regulatory agencies' responsibilities for implementing their respective regulatory programs, or to create additional regulatory requirements. Elements of the 2005 Mitigation Plan that have been completed or updated to date include the following:

- Completed the 2010 Regional Roadway Visioning Study
- Complete the Northwest Area Collector Street Plan
- Asher Water Tower was reconstructed
- The City has built stormwater management facilities and protected regional basins with the approved developments

- Adopted Northwest Area Stormwater manual
- The Northwest Area Regional Basin map and Stormwater Model was prepared; this includes mapping of the 100-year critical storm elevations for the landlocked basins
- Well field development occurred adding Well No. 9 in the City
- Adopted the 2030 Comprehensive Plan, 2010

The City will continue to implement Mitigation Plan as the remaining portions of the Northwest Area are developed.

b. Cover Types

2005

The Natural Resources Inventory and Management Plan for the Northwest Expansion Area includes general recommendations for management and restoration of each natural community type, as well as specific recommendations for protection, management, and restoration of the natural areas in study area. This plan and its recommendations were accepted by the City of Inver Grove Heights in January 2004. These management recommendations have been incorporated into the Mitigation Plan for this AUAR.

MITIGATION PLAN RECOMMENDATIONS FOR NATURAL COMMUNITIES (ADDITIONAL RECOMMENDATIONS THAT APPLY SPECIFICALLY TO WETLAND COMMUNITIES ARE INCLUDED IN SECTION 12)

- Implement the Land Use Plan and Surface Water Management Plan for the AUAR study area. These plans recommend protection of large areas of the existing upland and wetland open spaces. The highest level of protection is proposed for the upland and wetland natural communities in the Manage 1 and Manage 2 Classes (Figure 10-3 in Attachment C and D), and areas identified for stormwater infiltration (Figure 17.1 in Attachment C and D). The protection of infiltration areas is discussed in Section 17. Water Quality—Surface Water Runoff. The City anticipates adoption of ordinances to implement these plans before development occurs in the AUAR area.
- Adopt a Zoning Ordinance that provides for protection of higher quality natural community areas. The City is currently developing a new Zoning Ordinance, called Subdivision 37-Northwest Area Planned Unit Development Overlay District. The draft ordinance proposes the following:
 - 20% of each development area be set aside as permanent open space
 - Half of this open space area be left in its natural state
 - The remaining half of this open space area may be used for passive or active recreation, or the location of stormwater management facilities
 - Priorities for design of the remaining developable areas (80%) include
 - Avoiding impacts to areas identified as Manage 1 and Manage 2 communities in the Natural Resource Inventory and Management Plan

- Avoiding impacts to identified corridors, buffers, and stormwater management areas
 - Avoiding impacts to identified park and trail areas
- The ordinance will provide a “density bonus” on developable portions of the property, so that the landowner/developer can develop the total number of units within the developable portion of the site that would have been allowed on the property before exclusions for natural areas, corridors, and parks/trails.
- Prior to adoption of the final zoning and subdivision ordinances for the area, the City will conduct public hearings, gather more information and seek input from the community, the landowners and potential developers. As a result of this investigative process, the ordinances as adopted may vary from the draft ordinance, and the City may also adopt alternate means to achieve the proposed mitigation. However, the goals and objectives relating to mitigation and the desired quality of development will remain substantially similar to those envisioned by the draft ordinance.
- Implement the recommendations of the Natural Resource Inventory and Management Plan to protect and restore natural community areas in the Northwest Expansion Area. This plan makes general and specific recommendations to reduce the impact of development in the Northwest Expansion Area, including the following:
 - Create and maintain buffer strips around natural resource areas
 - Avoid impacts to high quality sites (identified as Manage 1 and 2 areas in the Plan)—preserve these areas and if needed, redirect unavoidable impacts to lowest quality areas
 - Minimize the area of grading or clearing in natural communities to develop buildings, lots, and other structures
 - Implement techniques to reduce the amount of phosphorus entering wetlands and other waterbodies
 - Implement strategies to manage and restore natural community areas identified in the plan
 - Several sites within the City are well-suited for use as wetland restoration or banking sites. This includes sites containing degraded wetlands, or in some cases, sites with proper hydrology and soils for restoration as wetlands. These sites should be considered for wetland restoration or banking sites as the City implements its surface water management plan.
 - Many of the forest/woodland areas within the city lack sufficient groundcover to prevent sheet erosion. Actively eroding areas degrade the quality of the woodland as well as wetlands downstream. The City and prospective developers should identify areas of potential sheet erosion and restore groundcover in these areas to prevent erosion and sedimentation.
 - Harmon Park and the Inver Wood Golf Course represent opportunities to restore prairie and savanna. The City should seek grant funds or willing partners to restore natural communities on this site.

- Protect the Greenway corridors identified in the Natural Resource Inventory and Management Plan and use the corridors to provide trails and to implement the Surface Water Management Plan where this is compatible with the natural resources in the corridors.
- Identify and implement strategies to manage and restore some significant resources within the city, including the Argenta Trail wetlands, Marcott Chain of Lakes and associated upland areas, Nichols' Sedge Meadow, Kladek's Prairie, and several other natural areas identified in Section 7.4 of the Management Plan.
- Implement the City's Stormwater, Wetland, and Tree Preservation ordinances to protect natural communities in the Northwest Expansion Area. These ordinances are currently being revised by the City to reflect the Surface Water Management Plan and Natural Resources Inventory and Management Plan. The new ordinances are scheduled to be completed and adopted before development occurs in the Expansion Area.

2007

No change in the Natural Resources Inventory with this update. The City has implemented the following mitigation measures:

- The City of Inver Grove Heights adopted the Northwest Area Overlay Zoning Ordinance (Section 515.80, Subdivision 39) in May 2007. The Ordinance requires the preservation of significant natural resources through open space regulations.
- The City of Inver Grove Heights adopted a revised Tree Protection and Preservation Ordinance (Section 515.90, Subdivision 28) in June 2007.
- The City of Inver Grove Heights adopted the Northwest Area Stormwater Manual, dated May 29, 2007.

2014

The Northwest Area Regional Basin Map and Stormwater Model was prepared on March 1, 2011. The map and stormwater model are being updated in 2014. Updates to the map and model will be a required condition for approval of future developments.

2019

The City has drafted their 2040 Comprehensive Plan that outlines several goals and policies to address natural resource preservation and protection measures as outlined in Section 12 (Physical Impacts on Water Resources).

c. Fish, Wildlife, and Sensitive Resources

2005

The significant wildlife habitat in the AUAR study area includes the remaining woodland and wetlands on the site. These are identified in the City's Natural Resource Inventory and Management Plan.

- The City will implement the recommendations included in Section 10—Cover Types to protect Fish and Wildlife Habitat in the Northwest Expansion Area.

2007

No change to existing fish, wildlife, and sensitive resources or habitat with this update.

2014

No update.

2019

The City will implement the recommendations included in Section 10 (Cover Types) and Section 11 (Fish, Wildlife, and Sensitive Resources) to protect Fish and Wildlife Habitat in the Northwest Expansion Area.

d. Physical Impacts on Water Resources

2005

Protection measures for waterbodies in the AUAR area include the following:

- Implement the recommendations of the Surface Water Management Plan and *Subdivision 37- Northwest Area Planned Unit Development Overlay District* for the Northwest Expansion Area for managing development and the potential impacts of runoff quantity and quality to waterbodies in the AUAR area (additional discussion in Section 17 of this analysis and in Section 17 of the Mitigation Plan). Prior to adoption of the final zoning and subdivision ordinances for the area, the City will conduct public hearings, gather more information and seek input from the community, the landowners and potential developers. As a result of this investigative process, the ordinances as adopted may vary from the draft ordinance, and the City may also adopt alternate means to achieve the proposed mitigation. However, the goals and objectives relating to mitigation and the desired quality of development will remain substantially similar to those envisioned by the draft ordinance.
- Wetlands in Gun Club Lake Watershed (not included in the Surface Water Plan for the Northwest Expansion Area) that potentially need to be mitigated for stormwater bounce should be identified through hydrologic and hydraulic modeling. This could be completed on a site-by-site basis, or a comprehensive effort that includes the entire area. Protection requirements for wetlands in this watershed are those included in the Natural Resource Inventory and Management Plan. Combinations of conventional and alternative stormwater systems can be used to mitigate excessive stormwater bounce in wetlands in the Gun Club Lake Watershed, with an emphasis on alternative infiltration methods.
- Assure no net loss of wetlands in the study area as it develops by protecting existing wetlands or mitigating for wetland losses based on the requirements of the Wetland Conservation Act and the City's Wetland Ordinance.
- Implement the recommendations in the Natural Resource Inventory for management of wetlands, including vegetated buffer strips, structural setbacks, stormwater pretreatment requirements, and restoration and management recommendations for specific wetland included in Section 7.4 of the Natural Resources Inventory Management Plan.

- Update the City's Wetland Ordinance, including buffer requirements. This ordinance is scheduled to be updated and adopted before development occurs in the Northwest Expansion Area.
- Require the use, management, and enforcement of BMPs to control erosion and sedimentation during and after construction as required by the NPDES construction permit.

2007

No change in the physical impact in water resources with this update. The City has implemented the following mitigation measures:

- The City of Inver Grove Heights adopted the Northwest Area Overlay Zoning Ordinance (Section 515.80, Subdivision 39) in May 2007. The Ordinance requires the preservation of significant water resources through open space regulation.
- The City of Inver Grove Heights adopted the Northwest Area Stormwater Manual, dated May 29, 2007.
- The City of Inver Grove Heights adopted the Hydrologic & Hydraulic modeling study for the Gun Club Lake Watershed in 2007.

2014

No update.

2019

The City has drafted their 2040 Comprehensive Plan that outlines several goals and policies to address natural resource preservation and protection measures as outlined in Section 12 (Physical Impacts on Water Resources).

e. Water Use

2005

The Mitigation Plan includes the following protection strategies related to Water Supply:

- The City will require that unsealed, abandoned wells are properly sealed and abandoned to meet codes required by the Minnesota Department of Health.
- The City will work with the golf course to locate the new municipal supply wells at a sufficient distance from the irrigation well to not interfere with operation of the existing well.

2007

This update did not perform further research on either existing wells or probable wells. The City of Inver Grove Heights has adopted the completed feasibility study of these improvements, called the Northwest Area Water and Sanitary Extensions Feasibility Report, dated May 2005. The City awarded the first phase of these improvements, Northwest Area Utility Improvements Lift Station R-9.1, in July 2007.

- The City Council approved a consultant contract for the Well Field Development on August 31, 2007.

2014

No update.

2019

The City has drafted their 2040 Comprehensive Plan that outlines plans to add new water and sewer connections to support future growth in the Northwest Expansion Area.

f. Erosion and Sedimentation

2005:

- The developer will be required to submit a plan for soil erosion and sediment control during construction and after development as a part of the Preliminary Plat.
- The Mitigation Plan includes provisions in Sections 10 and 17 that require the developer to minimize erosion and sedimentation by identifying and protecting areas of existing native vegetation to minimize soil exposure and resulting erosion and sedimentation during development.
- The City will require the use, management, and enforcement of BMPs to control erosion and sedimentation during and after construction as required by the NPDES construction permit, the City's proposed Subdivision 37—Northwest Area Planned Unit Development Overlay District Ordinance, and its new Erosion and Sedimentation Control Ordinance. The new ordinance increases the size of vegetated buffers required in areas of steep slopes and includes other provisions to minimize erosion.

2007

No change to response with this update. The City has implemented the following mitigation measures:

- The City of Inver Grove Heights adopted the Northwest Area Overlay Zoning Ordinance (Section 515.80, Subdivision 39) in May 2007. This ordinance has provisions to identify, avoid and protect steep slopes
- The City of Inver Grove Heights adopted the Northwest Area Stormwater Manual, dated May 29, 2007.

2014

The City of Inver Grove Heights will be updating the erosion and sediment control ordinances to be in conformance with the MS4 reauthorization requirements.

2019

The City has drafted their 2040 Comprehensive Plan that addresses erosion and sediment control as part of future development. This includes an implementation plan for operating, managing, and maintaining the City's stormwater system to ensure proper functioning of the system and to meet the requirements of the City's NPDES Phase II MS4 Permit and other agency requirements.

g. Water Quality – Surface Water Runoff

2005

The stormwater management approach laid-out earlier in this section describes an approach driven by the need to protect and preserve the infiltration capacity of the existing natural basins within the Northwest Expansion Area. These basins, identified in Figure 17-2 (in Attachment C and D), are the backbone of the proposed stormwater management system and provide the means to prevent degradation of downstream resources. This approach provides a preliminary framework to allow the City and developers to proceed with some knowledge of the design specifics that will be needed. The City will assure that the developers will design and build the final local drainage and stormwater management system within this overall framework. Tools to accomplish this include but are not limited to adoption of the Draft Subd. 37. Northwest Area Planned Unit Development Overlay District and development and implementation of the accompanying stormwater design manual to provide guidance in the selection, design, and construction of site specific, alternative stormwater management BMPs and operation and maintenance requirements.

Prior to adoption of the final zoning and subdivision ordinances for the area, the City will conduct public hearings, gather more information and seek input from the community, the landowners, and potential developers. As a result of this investigative process, the ordinances as adopted may vary from the draft ordinance, and the City may also adopt alternate means to achieve the proposed mitigation. However, the goals and objectives relating to mitigation and the desired quality of development will remain substantially similar to those envisioned by the draft ordinance.

In addition, the City of Inver Grove Heights acquired a Phase II NPDES permit in 2003. This federal permit is administrated by the MPCA. The City also adopted a Stormwater Pollution Prevention Program (SWPPP). The SWPPP includes controls including but not limited to:

- Public education and outreach;
- Public participation and involvement;
- Illicit discharge detection and elimination;
- Construction site runoff control;
- Post-construction site runoff control; and
- Pollution prevention/good housekeeping.

Wetlands in the Northwest Expansion Area are proposed to be regulated for stormwater discharge. Mitigation of runoff to wetlands that realize an increase in stormwater bounce in excess of the proposed wetland management class standard is proposed. Wetland storm bounce can be mitigated through a higher infiltration BMP standard for the contributing subwatershed or diversion of runoff to basins with excess storage can be considered.

As discussed previously in the water quality assessment in Section 17, initial modeling showed that only three basins within the Northwest Expansion Area require stormwater bounce mitigation in order to comply with the proposed wetland storm bounce standard. It should be noted that the smart land use planning, infiltration BMPs, and preservation of existing natural basins assumed in the future runoff condition modeling is not considered mitigation but are integral parts of the expected development.

Departure from this proposed stormwater management approach could result in additional wetland bounce and increased need for mitigation of runoff. Developers will be responsible for coordinating with the City to ensure that the final drainage and runoff management system is designed and constructed in accordance to the plan and its accompanying regulatory tools.

Wetlands in GCLWMO that potentially need to be mitigated for stormwater bounce should be identified through Hydrologic & Hydraulic modeling. This could be completed on a site-by-site basis, or a comprehensive effort that includes the entire area. As development impacts other high-quality wetlands, the mitigation approach should be the same. Combinations of conventional and alternative stormwater systems can be used to mitigate excessive stormwater bounce, with an emphasis on, and priority given to alternative infiltration methods.

Many alternative practices are installed because, once established, they may require less maintenance than traditional facilities. This does not mean, however, that alternative approaches can be installed and subsequently ignored. The City is planning to develop a maintenance program for stormwater facilities in the Northwest Expansion Area, and train City personnel or others charged with maintenance about the function and operational design of the particular practice so that they know what to look for in performance.

Formally establishing a City controlled operations and maintenance program is essential to effectively implementing alternative stormwater management. The following steps are adapted from EPA's recommended steps to establish such a program:

1. Establish a regulatory framework (ordinance or regulations) within which to formalize a cooperative agreement with a homeowner, developer, or any other entity, including the City, that will be maintaining an alternative system;
2. Incorporate maintenance into design and construction specifications, including pre-treatment;
3. Identify the mechanism for stable, long-term funding (even if it is the homeowner);
4. Formalize a regular inspection schedule, criteria for departing from the schedule (ex. after a large event or when a problem is evident) and keep a log of inspections;
5. Define triggers for action (ex. 5 inches of sediment accumulation will trigger action to clean a forebay);

6. Prevent sediment, debris, and litter from moving into and accumulating in the system;
7. Make provisions for monitoring (visual or actual sampling) of treatment criteria;
8. Develop a training and education program, possibly with a certification element;
9. If water is not draining down after 4 to 6 days, remove accumulated fine sediments until coarse soils are exposed and replant with raingarden vegetation; and
10. Develop an informational booklet for homeowners on need and role of infiltration raingardens in neighborhoods.

2007

No change to the stormwater plan is anticipated due to the change in land use. The hydrologic modeling completed for the AUAR used maximum impervious surface cover to account for different development densities. Section 6 of the AUAR defines maximum impervious surface coverage for both commercial and industrial as 70%.

At this time many of the stormwater recommendations set forth in the original document have passed in to city ordinance under Section 39 of the Inver Grove Heights Northwest Area Overlay Zoning Ordinance. The stormwater ordinance requires the preservation of ponding and infiltration areas through the open space regulation. Stormwater manual adopted May 29, 2007.

- The City of Inver Grove Heights adopted the Hydrologic & Hydraulic modeling study for the Gun Club Lake Watershed in 2007.

2014

No updates.

2019

The City's guiding documents for development projects include:

- June 2014, Northwest Area Regional Basin map by EOR
- June 2017, Robert District Basin Map update

See Attachment A for a list of projects the where the City constructed stormwater system facilities between 2014 and 2019.

The City's 2040 Comprehensive Plan also addresses goals for managing stormwater and providing cost effective municipal infrastructure for future growth.

h. Water Quality – Wastewaters

2005

Sanitary sewer and water system alignments are designed to avoid impacts to the regional infiltration areas identified in the City's Surface Water Management Plan. It is important to avoid disturbance and construction activities within these areas to preserve their function to infiltrate stormwater. Impacts to small, local infiltration areas have been avoided where possible as well. If sanitary sewer infrastructure must be constructed in or

near these local basins, impacts will be limited to the smallest possible area, and to the sides of the basins, to preserve the infiltration capacity of the bottom areas of the basins.

The proposed alignments have also been routed to avoid impacts to the high-quality natural resource areas identified in the City's Natural Resource Inventory and Management Plan (the areas identified as Manage 1 and Manage 2 areas). Where Manage 3 and Manage 4 areas cannot be avoided, construction practices will minimize impacts to the Manage 3 and Manage 4 areas, and restore these areas as needed. These recommendations are consistent with the City's Natural Resources Inventory and Management Plan.

Trench excavation during the installation of both sanitary sewer and watermain will result in some impacts to the surrounding areas. Trench widths will only be as wide as they need to be to comply with the current safety regulations, and where necessary, trenches will be further minimized through the use of mechanical trench stabilization techniques. It is anticipated that trenchless construction techniques will be utilized to install utilities in areas of valuable natural resources. The installation of watermain generally requires minimal trench widths as the pipes are proposed to be installed with 7.5 feet of cover. Sanitary sewer installation will require additional trench width and depth due to the rolling topography of the Northwest Area. Trench depths as deep as 50 feet may be encountered, but these areas are anticipated to be limited and located away from areas containing natural resources in an effort to avoid impacts.

The recommendations to avoid impacts to natural resource areas and stormwater infiltration areas are included in the Mitigation Plan.

2007 and 2014

No updates.

2019

According to the 2040 Comprehensive Plan, there are five new lift stations and several sanitary sewer lines planned within the AUAR study area.

See Attachment A for a list of projects the where the City sanitary sewer system facilities between 2014 and 2019.

i. Solid Wastes; Hazardous Wastes; Storage Tanks

2005

1. Past and present land uses have resulted in disposals of solid and hazardous wastes and release of contaminants in the AUAR area that may impact public health and safety and the environment. The City will work with the project developers to identify sites of potential contamination and to develop a contingency plan in case contaminated soil and/or groundwater are encountered during site development.
2. It should be noted that additional disposals and releases could also occur between the time of final AUAR approval and actual development plans for the site. In light of this reality, the issue of potential contamination should be addressed during the site development process. Typically, a Phase I ESA would be required by a lender in conjunction with a property transaction where some type of financial assistance (i.e.,

loan) is being sought. The Phase I ESA would presumably identify any potential site contamination concerns that exist at that time, allowing the issue to be resolved prior to construction.

2007, 2014, and 2019

No changes to mitigation strategies are proposed with this update.

j. Traffic

2005

The corridors and intersections were re-examined with the projected traffic to determine infrastructure improvements that may be needed to maintain adequate traffic operations. Based on this analysis, it is recommended that the four primary roads be improved to accommodate future growth. Projected ADT volumes on CR 63 suggest a five- or six-lane roadway may be needed from the assumed I-494 interchange to the proposed TH 55 interchange. The exact number of lanes will depend upon the number and type of access provided along the corridor. South of TH 55, CR 63 is recommended to provide four lanes for through traffic. TH 3 should also be widened to provide four lanes along its entire length in the study area. The projected daily traffic volumes on CR 73 are at the edge of a LOS D for a two-lane collector roadway and may need to provide three lanes depending upon the number and type of access. If proper access control is maintained, it is likely that CR 73 could provide satisfactory traffic operations as a two-lane roadway. CR 26 is recommended to provide four lanes for through traffic, except between CR 63 and TH 3. In that section, projected ADT volumes suggest a five- or six-lane roadway will be required, depending upon the number and type of access along that roadway section. Table 32-1 shows the recommended number of lanes based on 2025 ADT volumes.

Table 32-1: 2025 Lane Recommendations

Road	Segment	2003 AADT Volume ¹³	2025 AADT Volume		Number of Lanes	
			2005	2007	Existing	Recommended
CR 63 (Argenta Trail)	North of CR 26, South of I-494	2,150	29,575	30,300	2	5/6 ¹⁴
	South of CR 26, North of TH 55	3,400	26,700	28,500	2	5/6 ¹⁴
	South of TH 55	6,500	20,950	21,500	2	4
TH 3 (S. Robert Trail)	North of CR 26	8,200	21,250	23,500	2	4
	South of CR 26	6,700	19,925	21,825	2	4
	South of TH 55	7,600	18,650	19,350	2	4
CR 73 (Babcock Trail)	North of CR 26	2,450	8,850	9,450	2	2/3 ¹⁴
	South of CR 26	2,220	9,200	9,950	2	2/3 ¹⁴
	West of CR 63	6,000	20,850	21,950	2	4

¹³ Annual Average Daily Traffic from MnDOT flow maps

¹⁴ Number of lanes will depend of number and type of roadway access points

Road	Segment	2003 AADT Volume ¹³	2025 AADT Volume		Number of Lanes	
			2005	2007	Existing	Recommended
CR 26 (70 th Street)	East of CR 63, West of TH 3	5,700	30,225	31,725	2	5/6 ¹⁴
	West of TH 3, East of CR 73	7,200	25,175	26,475	2 or 4	4
	East of CR 73	10,000	17,700	18,300	2	4

Analysis of the 2025 AM and PM peak hour projections at the study intersections determined recommendations for the lane geometry. Based upon those analyses, the following lane geometry at each intersection is recommended:

Intersection of CR 26 and CR 63

- Signalized intersection.
- Potential for dual left turns in the southbound and westbound directions. For the purposes of this analysis, a third westbound through lane on CR 26 was assumed to terminate at this intersection as a westbound left turn lane.
- Single left turn lane in northbound and eastbound directions.
- Single right turn lane in all directions. For the purposes of this analysis, the northbound right turn lane was assumed to provide a free movement into a third westbound through lane on CR 26.
- Two through lanes for the eastbound and westbound approaches.
- Three through lanes for the northbound and southbound approaches.

Intersection of CR 26 and TH 3

- Signalized intersection.
- Potential for dual left turn lanes in the eastbound and westbound directions. For the purposes of this analysis, a third eastbound through lane on CR 26 was assumed to terminate at this intersection as an eastbound left turn lane.
- Single left turn lanes in northbound and southbound directions.
- Designated right turn lanes in all four directions. For the purposes of this analysis, the southbound right turn lane was assumed to provide a free movement into a third eastbound through lane on CR 26.
- Two through lanes for all four approaches.

Intersection of CR 26 and CR 73

- Signalized intersection.
- Single left turn lane in all four directions.
- Designated right turn lane in all four directions.
- Two through lanes in eastbound and westbound directions.

- One through lane for the northbound and southbound approaches.

Intersection of TH 3 and TH 55 Westbound

- Signalized intersection.
- Two through lanes in northbound and southbound directions.
- Single left turn lane in northbound direction.
- Single right turn lane for the southbound approach.
- Two approach lanes for the westbound movement on the exit ramp.

Intersection of TH 3 and TH 55 Eastbound

- Signalized intersection.
- Two through lanes in northbound and southbound directions.
- Single left turn lane in southbound direction.
- Single right turn lane for the northbound approach.
- Two approach lanes for the eastbound movement on the exit ramp.

Intersection of CR 63 and TH 55 Westbound

- Signalized intersection.
- Two through lanes in northbound and southbound directions.
- Single left turn lane in northbound direction.
- Single right turn lane in southbound direction. For the purposes of this analysis, a third southbound through lane on CR 63 was assumed to terminate at this intersection as this southbound right turn lane.
- Two approach lanes for the eastbound approach on the exit ramp.
- A third northbound through lane on CR 63 was not needed at this intersection but was assumed to be provided at some point to the north of this intersection.

Intersection of CR 63 and TH 55 Eastbound

- Signalized intersection.
- Two through lanes in northbound and southbound directions.
- Single left turn lane in northbound direction.
- Single right turn lane in southbound direction.
- Two approach lanes for the eastbound approach on the exit ramp.

A pictorial representation of the proposed geometry for the project area is shown along with the 2025 projected volumes in Figure 21-6 (in Attachment C and D). Although this report recommends signalized intersections, a Signal Justification Report will need to be completed for each intersection prior to the installation of any signal system.

A summary of the LOS for each intersection with the recommended lane geometry and projected AM and PM peak hour volumes is shown in Figure 21-7 (in Attachment C and D). More detailed LOS results and queue analyses are provided in 2005 document. As shown, each intersection is expected to provide acceptable traffic operations with a LOS D or better. Most individual movements also operate at a LOS D or better with four exceptions. During the PM peak hour, the left turn movement for the westbound, eastbound, and northbound approaches at the intersection of CR 63 and CR 26 are expected to operate at a LOS E. Similarly, the left turn movement for the eastbound approach on CR 26 at TH 3 is expected to operate at a LOS E during the PM peak hour. While these results are not desirable, it is likely the effect of a longer cycle length necessary to provide enough green time for other directions. Given the overall acceptable level of service for each intersection, additional capacity in the form of more approach lanes would not be cost effective. Thus, these movements will likely experience some added delay during the PM peak hour. At other times, these left turn movements are expected to provide satisfactory traffic operations.

The traffic analysis has been conducted assuming an interchange at I-494 and CR 63. Although projected volumes for a potential interchange are provided, the design and number of lanes was not. If an interchange is approved at this location, the design would be determined at that point.

This potential interchange is discussed in the City of Inver Grove Heights thoroughfare plan and is necessary to help serve the area traffic demands and the traffic generated by future development in the City's northwest area. The interchange proposal will need to undergo an analysis and approval process required by the Metropolitan Council, MnDOT, and FHWA. Since such approvals are complex and time consuming, this process should commence as early as possible. The interchange will help to reduce volumes on adjacent interchanges along I-494. Interchange spacing does not appear to be an issue. Pending approval of an interchange, programming and funding of an interchange would need to be accomplished by MnDOT.

2007

All of the previously recommended geometry and traffic control is sufficient with the new intersection turning movement volumes. All approaches and intersections operate at LOS D or better.

Figure 21-6A (in Attachment C) shows a pictorial representation of the proposed geometry and traffic control along with the updated 2025 volumes. The geometry and traffic control remain unchanged from Figure 21-6 (in Attachment C and D). An Intersection Control Evaluation (ICE) must now be performed prior to installing new forms of traffic control.

The updated LOS summary can be found in Figure 21-7A. The only change to intersection level of service is at the CR 26/CR 63 intersection, which changed from LOS C to D with updated land uses.

The City of Inver Grove Heights, City of Eagan, and Dakota County, in partnership with FHWA, MnDOT, and Metropolitan Council, completed the Dakota County North-South Corridor Travel Demand Study in July 2007. These agencies will complete a detailed study

of the transportation system in the study area, the screening of alternatives, and a formal review and documentation within the next two years.

2014

No updates.

2019

The City has identified the following planned and programmed transportation improvements in the 2040 Comprehensive Plan:

- Construction of a 2-lane urban roadway on CR 28, 0.62 miles east from TH 3
- Expand CSAH 26 to a 4-lane roadway
- New interchange at I-494 and CSAH 63

See Attachment A for a list of street projects the City completed between 2014 and 2019.

k. Dust, Odors, Noise

2005

The analyses of traffic noise impacts for this proposed development indicate that areas near the project area roadways will have noise levels above State noise standards for residential areas. Any site plan that proposes residential development in the impact areas should conduct a detailed noise study to define any required noise mitigation strategies. Potential mitigation strategies may include one or a combination of the following:

- Buffer zones
- Noise barriers
- Strategic building placement
- Building construction requirements

Buffer Zones

Table 3-1 of the 2005 document provides an assessment of the distance from the roadways that State daytime noise standards are exceeded. One potential strategy for mitigating the impact is to buffer the areas between the residences and the roadways with vegetation or a combination of vegetation and noise barriers. At least 100 feet of dense coniferous vegetation is recommended to provide reduction in noise volumes.

Noise Barriers

Noise barriers (e.g., walls or berms) between the roadways and the residential areas could also be constructed to reduce noise impacts. The effectiveness of barriers depends on the height and extent of the barriers and the specific location of the barriers relative to the roadways and the residential areas.

Strategic Building Placement

Buildings can act as barriers if located to protect areas for outdoor use or to protect residences.

Building Construction Requirements

Specifying noise mitigating construction materials and techniques can reduce the impact of traffic on indoor noise levels.

2007

Traffic volumes have changed as a result of the project, and noise levels may change accordingly. However, traffic volume changes would need to change by a factor of two to be perceptible. The traffic volume changes are well below changing by a factor of two, and noise level changes will be less than perceptible levels.

The mitigation measures identified in the AUAR will still apply, and any residential development still needs to conduct a noise mitigation study to consider mitigation measures.

2014 and 2019

No updates.

I. Nearby Resources

2005

The negative results of the archaeological suggest that the archaeological potential is minimal for small isolated lakes and wetlands in Dakota County. The results also indicate that additional survey further from water would be pointless.

Visual inspection of the farmsteads and schools shown on plats and maps published between 1874 and 1967 proved a few of them to be completely gone but in most cases, there are still older components mixed in with newer construction such as replaced or heavily remodeled residences and modern storage buildings such as garages and pole barns. Only a few retain enough integrity to warrant more intensive evaluation.

- When any of the properties that have been identified as having enough integrity to warrant more intensive evaluation is scheduled for development, federal law (i.e., Section 106 of the National Historic Preservation Act and guidelines issued by the Secretary of the Interior) should be followed. For further detail, refer to individual comments provided above with each of the entries in Section 4.2 for the 2005 AUAR.

2007, 2014 and 2019

No further archaeological, historical, or architectural investigation or research was conducted with this update.

m. Compatibility with Plans

2005

The City will be seeking approval of a Comprehensive Plan Amendment from the Metropolitan Council that includes the land use changes proposed for the Northwest Area since the adoption of the City's Comprehensive Plan.

2007 and 2014

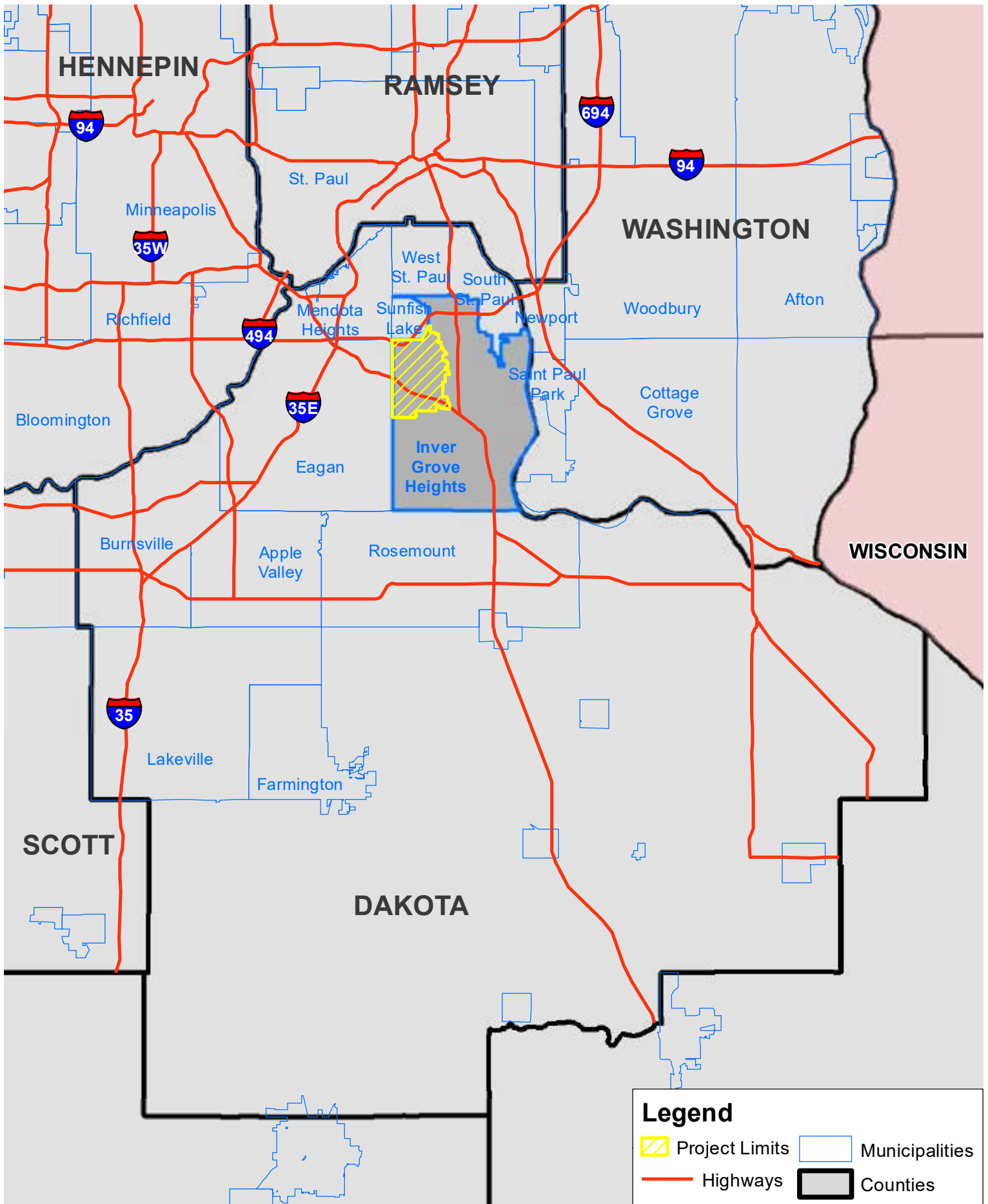
No update.

2019

The City of Inver Grove Heights has drafted its 2040 Comprehensive Plan and the AUAR Study area has been updated to reflect the land use changes as described in Section 6 (Project Description) and Section 9 (Land Use).

Attachments

ATTACHMENT A: 2019 AUAR UPDATE FIGURES and Completed Projects



Kimley»Horn

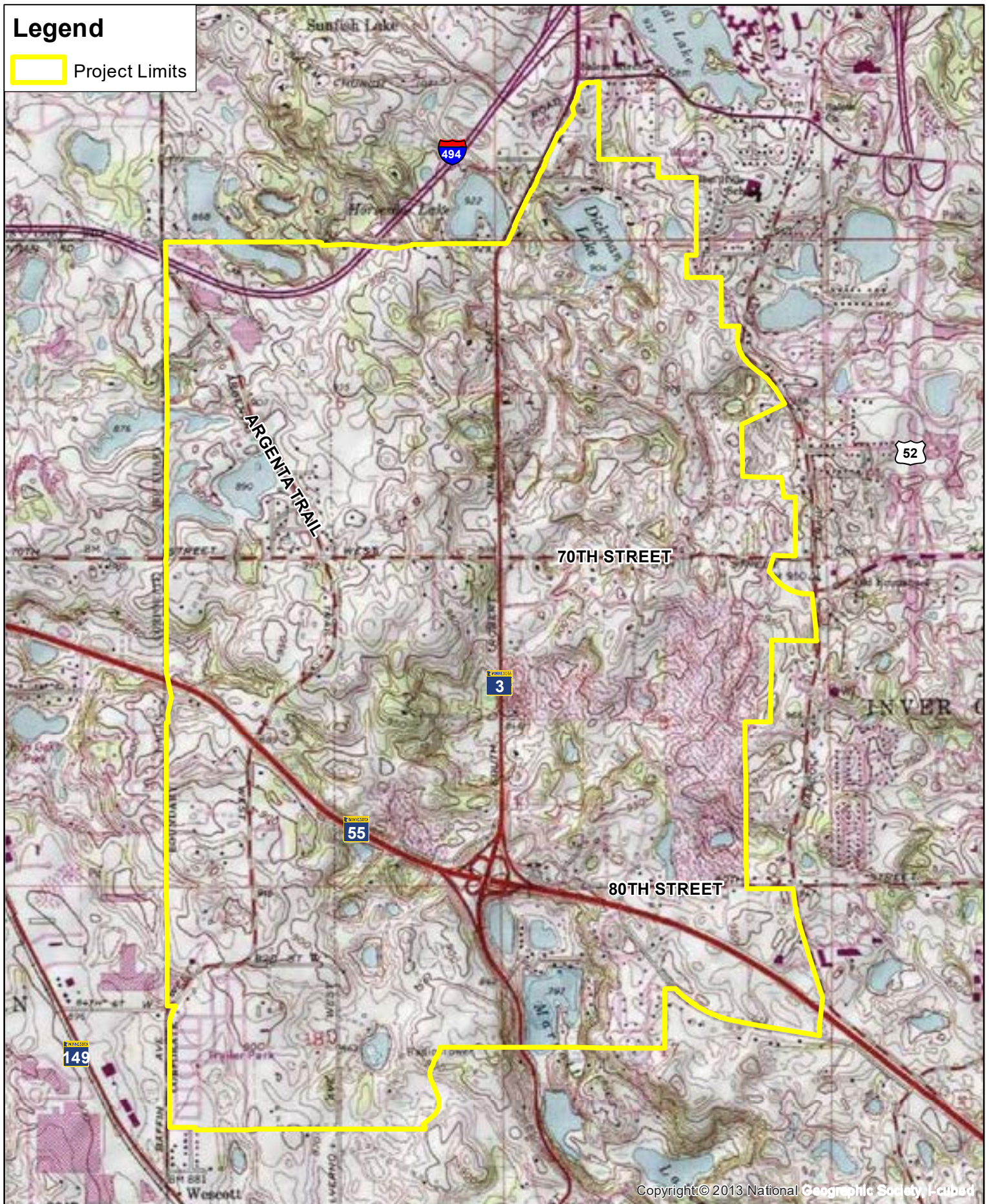


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Miles

Figure 1
Project Location

Legend

 Project Limits



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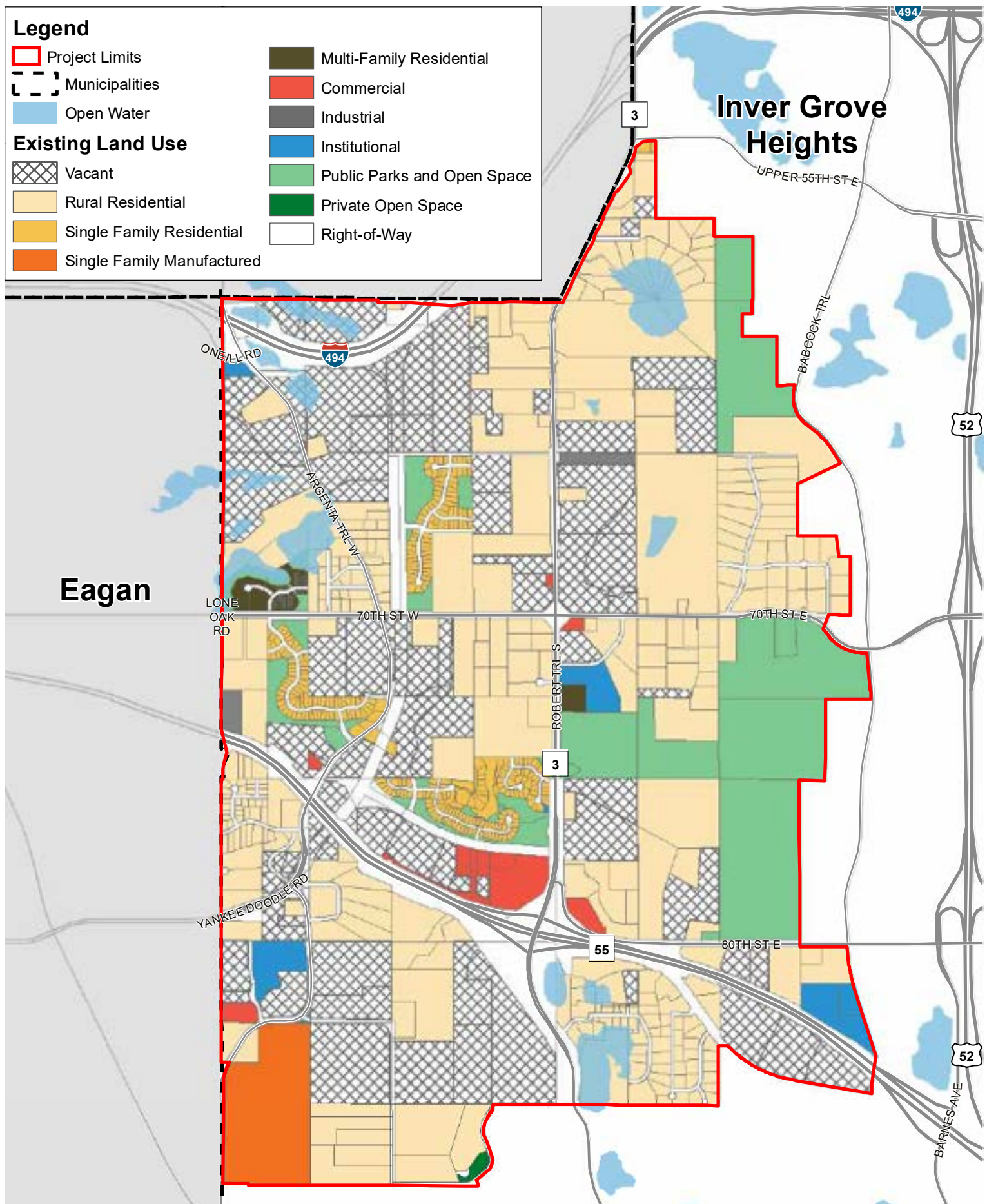


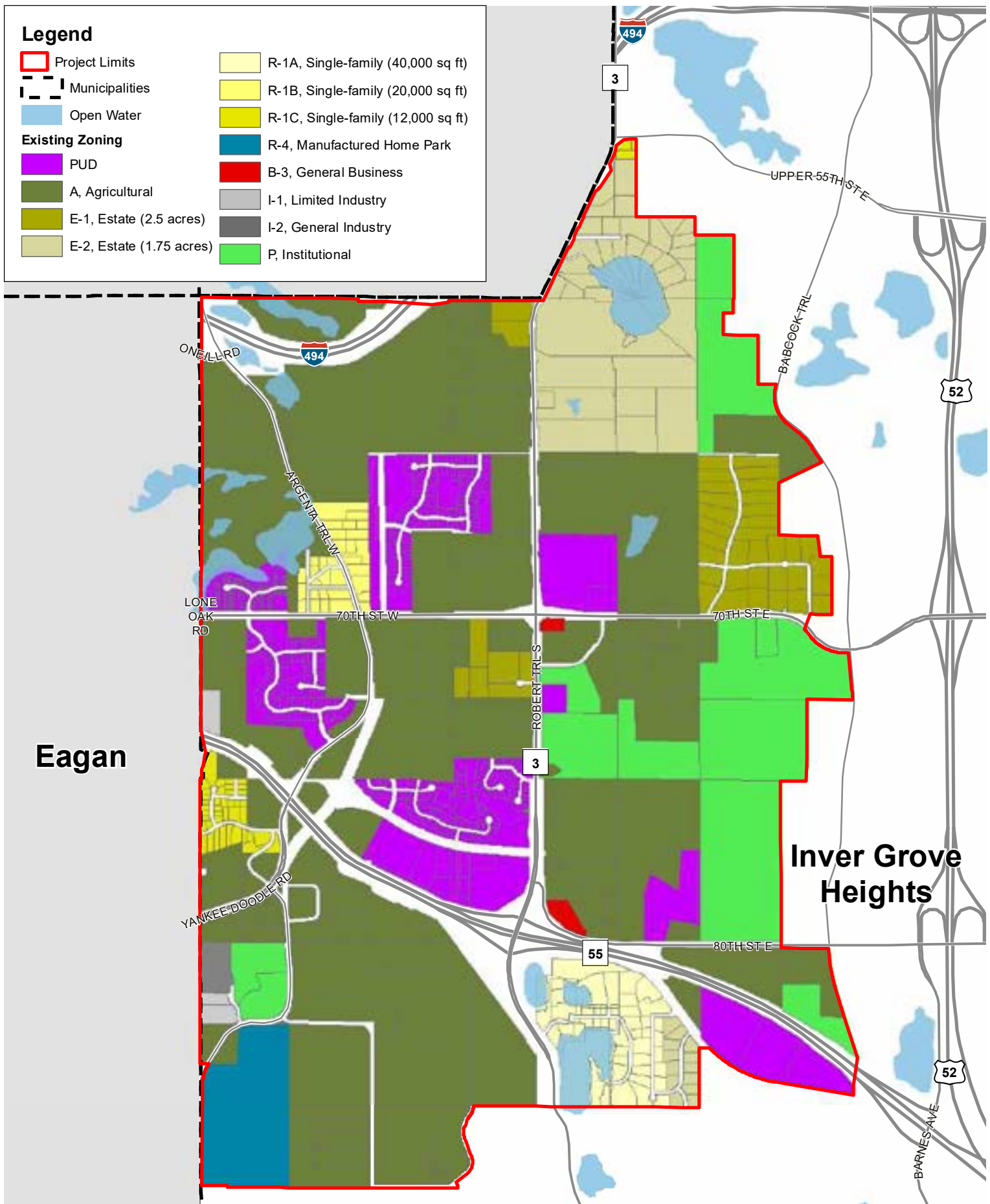
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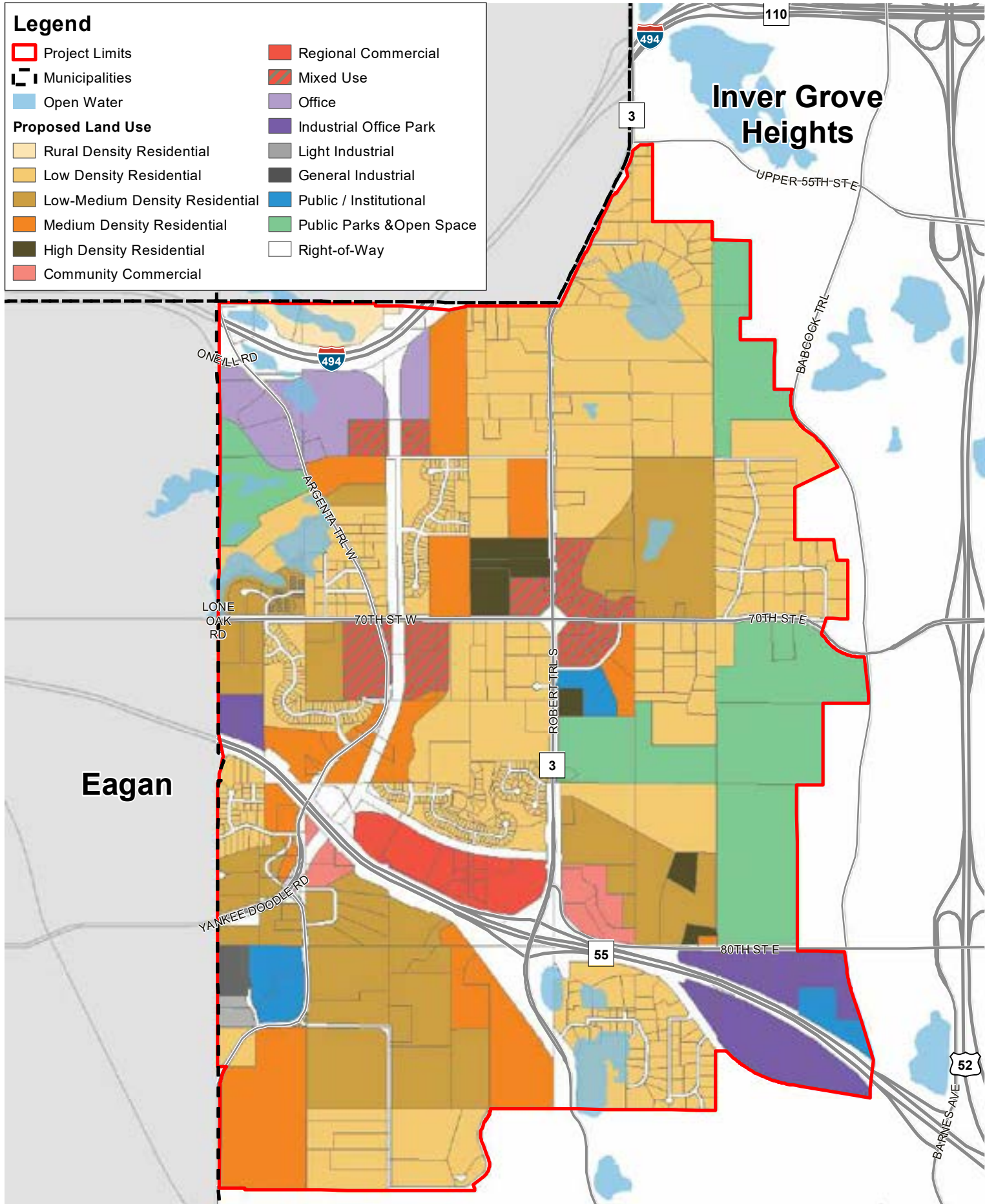


0 1,000 2,000 Feet

Figure 2
USGS Topographical Map







Legend

Project Limits

Municipalities

Water

Cover Types

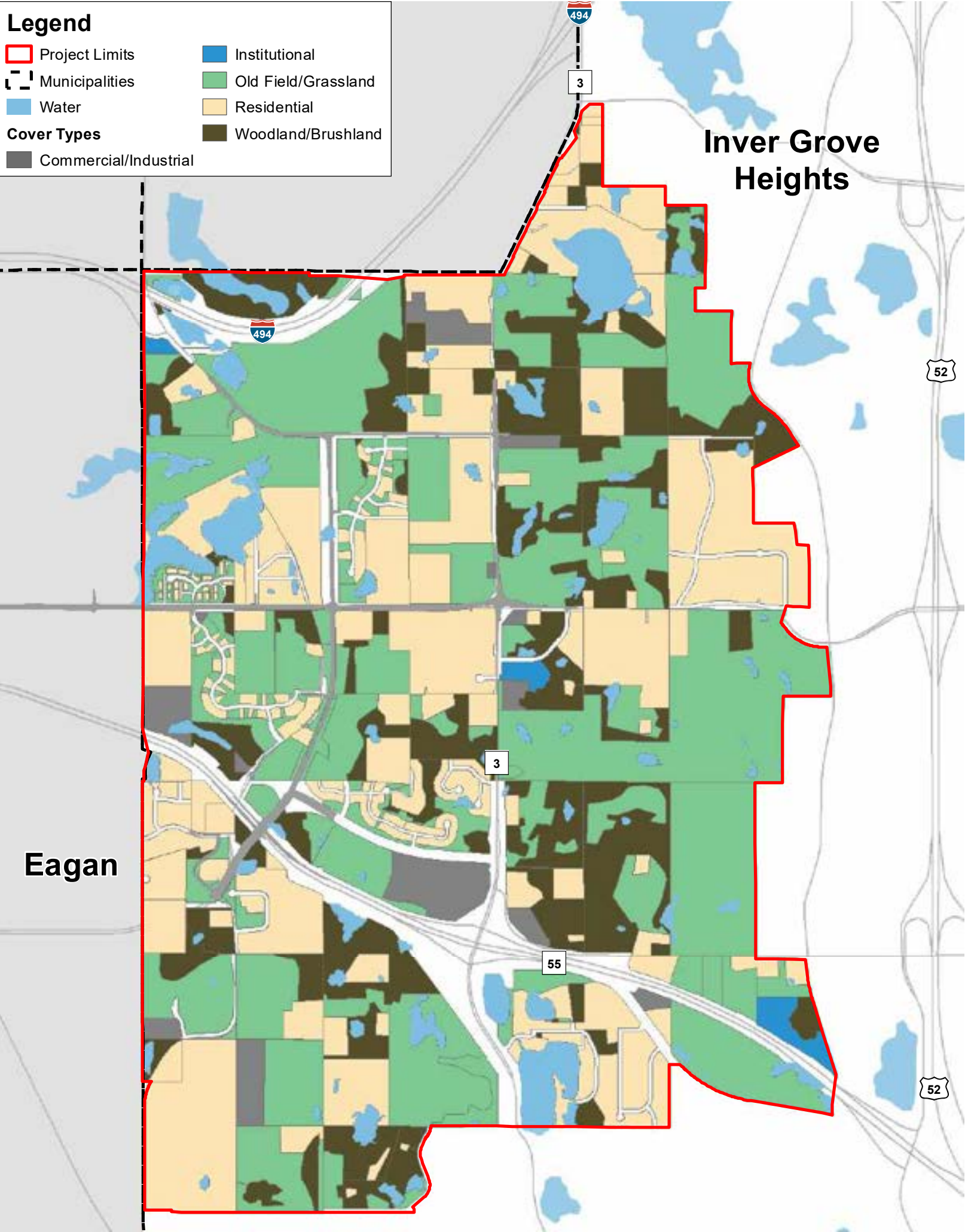
Institutional

Old Field/Grassland

Residential

Woodland/Brushland

Commercial/Industrial



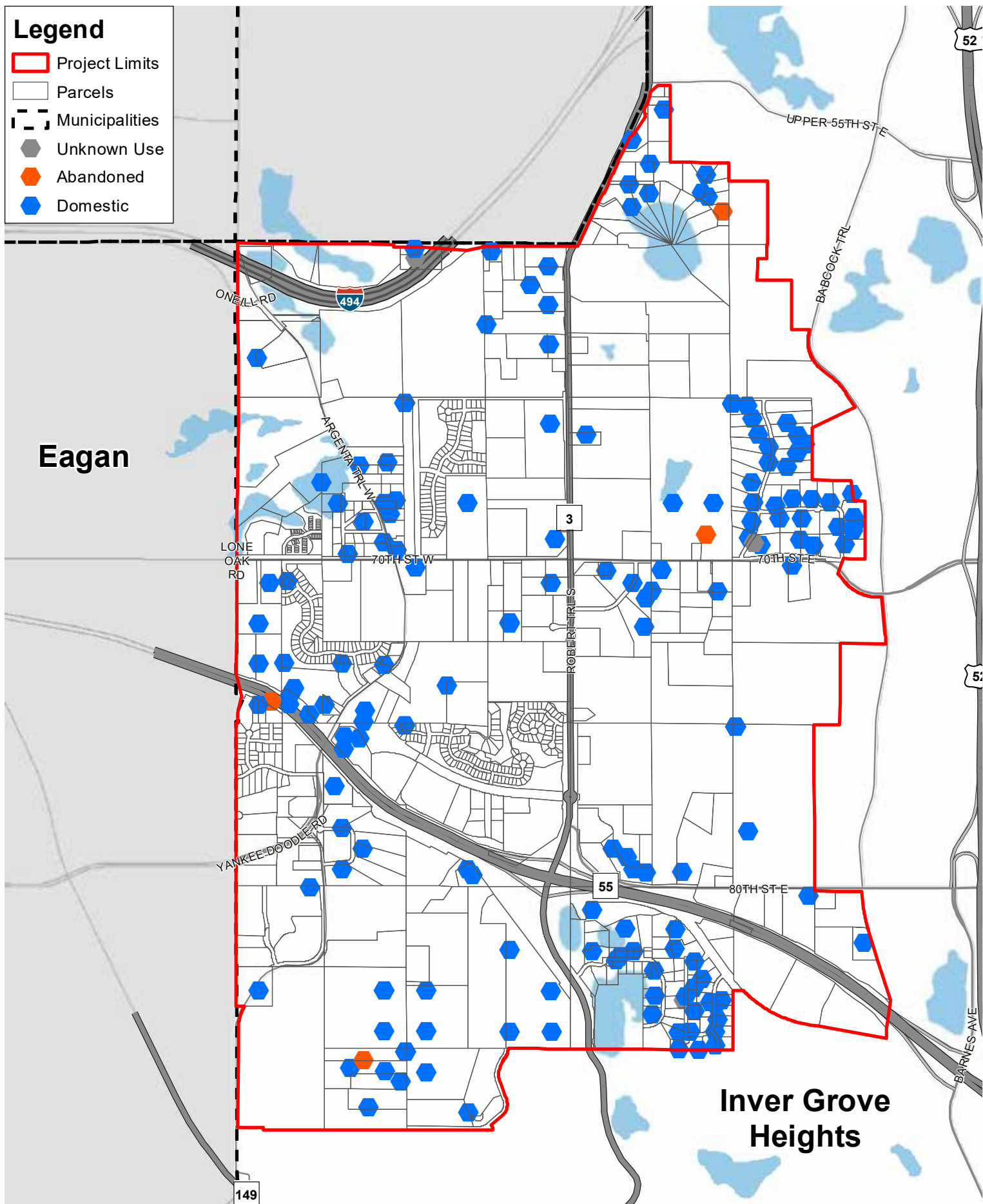
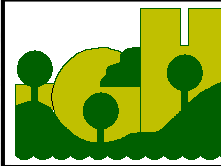
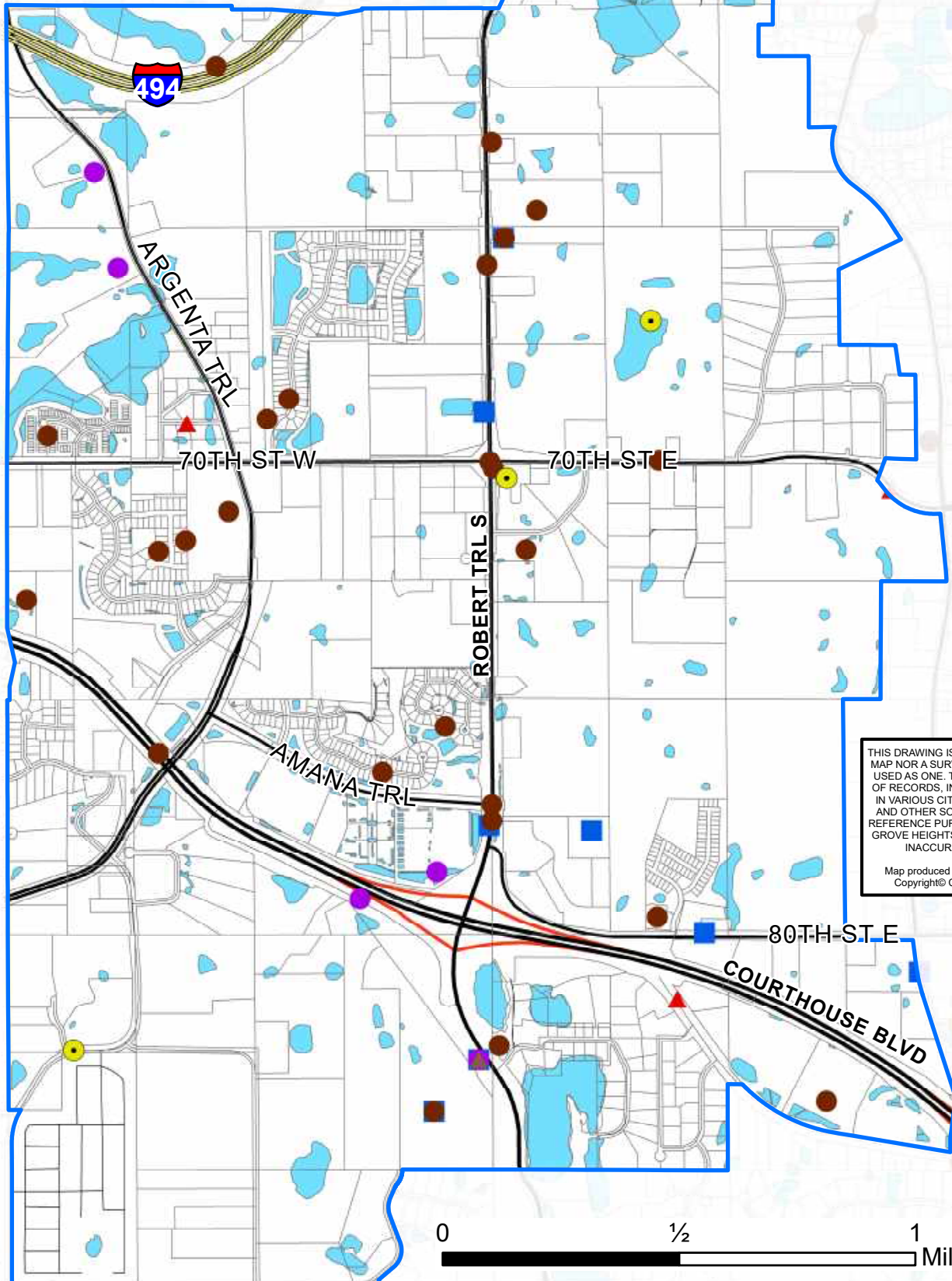


Figure 8. MPCA Site Types Tracked

- | | |
|--|--|
|  Multiple Programs |  Pollution Prevention |
|  Air Quality |  Solid Waste |
|  Environmental Review |  Stormwater |
|  Feedlots |  SSTS |
|  Hazardous Waste |  Tanks |
|  Investigation and Cleanup |  Water Quality |



**City of
Inver Grove Heights**
Northwest Area
MPCA Sites of Interest



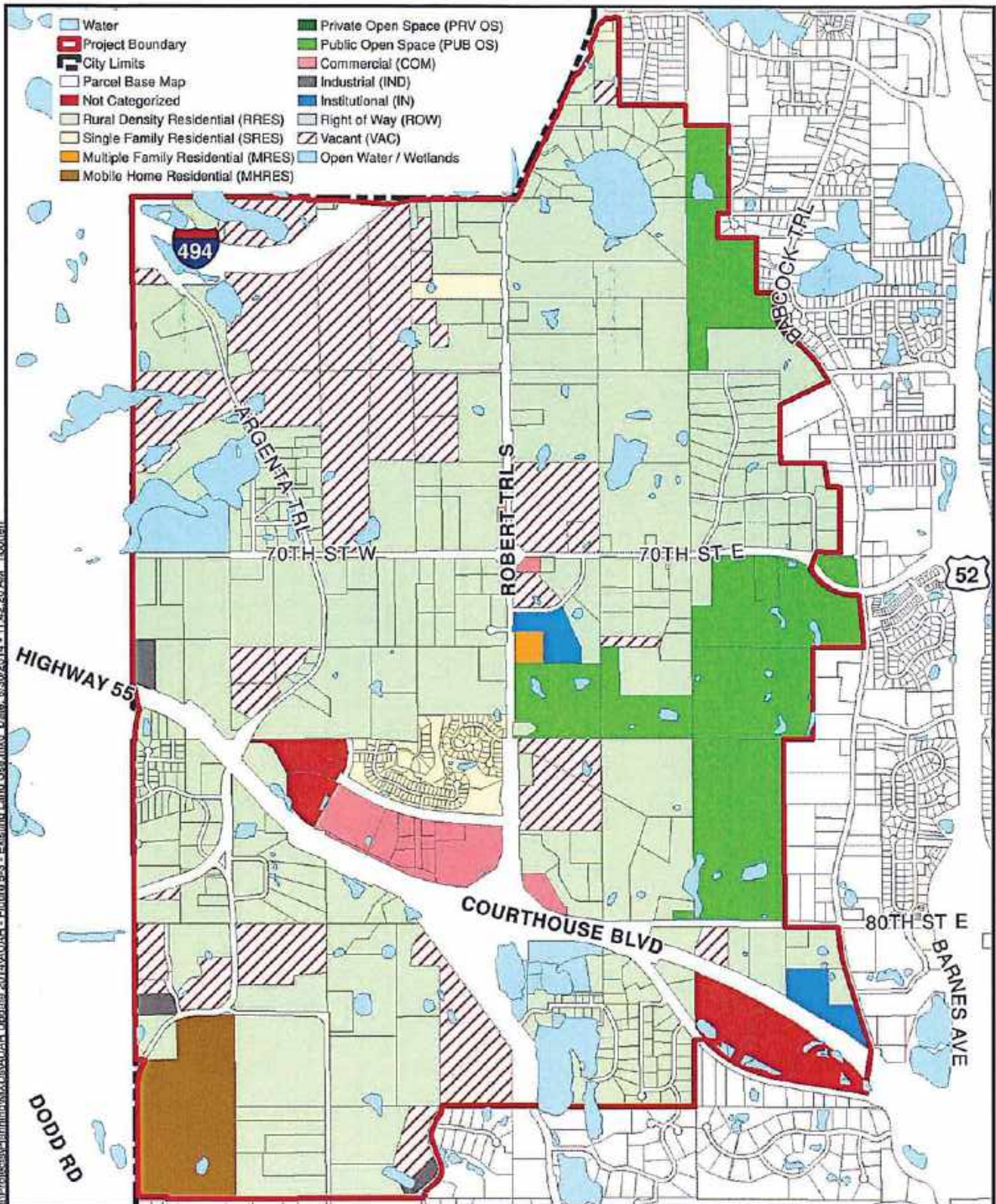
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	A	B	C	D	E	F	G	H	I	J
NORTHWEST AREA INFRASTRUCTURE UPDATES (2014-2019)										
	SWD 1/10/2020									
	PROJECT NO.	PROJECT NAME	FEDERAL	STATE	COUNTY	STREET	STORM	SEWER	WATER	NOTES
2										
3										
4	2013-04	Interchange at I-494 and re-aligned Argenta Trail (CSAH 63)	X	X	X					
5	2014-11	Argenta Trail/T.H. 55 Improvements		X	X	X				
6	2014-13	Northwest Area Utility Extension - Argenta Trail Alignment						X		
7	2015-03	65th Street Construction (between T.H. 3 and Argenta Trail)			X	X	X		X	
8	2015-08	70th Street (from Eagan border to T.H. 3)			X		X			16-04, 16-05, 16-19
9	2015-10	NWA Trunk Utility Improvements - Argenta District (Alverno Avenue to Blackstone Vista Development)					X	X	X	
10	2015-11	NWA 70th Street Lift Station - Argenta District						X		
11	2015-12	NWA Trunk Watermain Improvements - 65th Street Loop (Phase I) Argenta Trail to Babcock Trail							X	STUDY
12	2015-13	NWA Trunk Utility Improvements - Argenta District (70th Street Lift Station to Blackstone Ridge Development)						X	X	
13	2015-16	Trunk Utilities, Argenta Trail to Blackstone Ridge						X	X	
14	2015-19	NWA Robert Watershed Corridor								
15	2015-20	NWA Trunk Utility Improvements - Robert District						X	X	
16	2016-04	Argenta Trail (Amana Trail to 70th Street) - NWA				X	X			15-08
17	2016-05	Argenta Trail (70th Street to 65th Street) - NWA				X	X			15-08
18	2016-08	Trunk Highway 3 / 70th Street Intersection Improvements (Roundabout)		X	X		X	X	X	
19	2016-09	60th Street Area Reconstruction					X	X		
20	2016-16	TH 55/Argenta Trail Interchange		X	X		X	X		
21	2016-19	65th Street Construction (between T.H. 3 and Babcock Trail)				X	X			STUDY
22	2016-21	Trail along Babcock Trail (between Upper 55th and Hwy 494)			X					
23	2017-02	NWA Trunk Watermain Improvements - 65th Street Loop (Phase II of 2015-12) Hwy 3 to Harmon Park							X	
24	2017-03	NWA Trunk Watermain Improvements - 65th Street Loop (Phase III of 2015-12) Hwy 3 to Blackstone Ridge							X	
25	2017-04	Water Resources Management Plan 4th Generation Update						X		
26	2017-24	T.H. 3 Intersection Improvements for the 65th Street Project		X		X	X		X	
27	2018-02	80th Street Sanitary Sewer Improvements (Robert District)							X	
28	2018-03	NWA Trunk Watermain Improvements - 65th Street Loop (Phase IV of 2015-12) from Argate Trail to Alverno Lane							X	
29	2018-16	Municipal Water Supply Well Field Analysis								STUDY
30	2018-17	Regional Road System Visioning Study Update								STUDY
31	2018-19	New Argenta Trail from Amana Trail to Existing Argenta Trail			X		X			15-08, 16-04, 16-05

ATTACHMENT B: 2014 AUAR UPDATE FIGURES

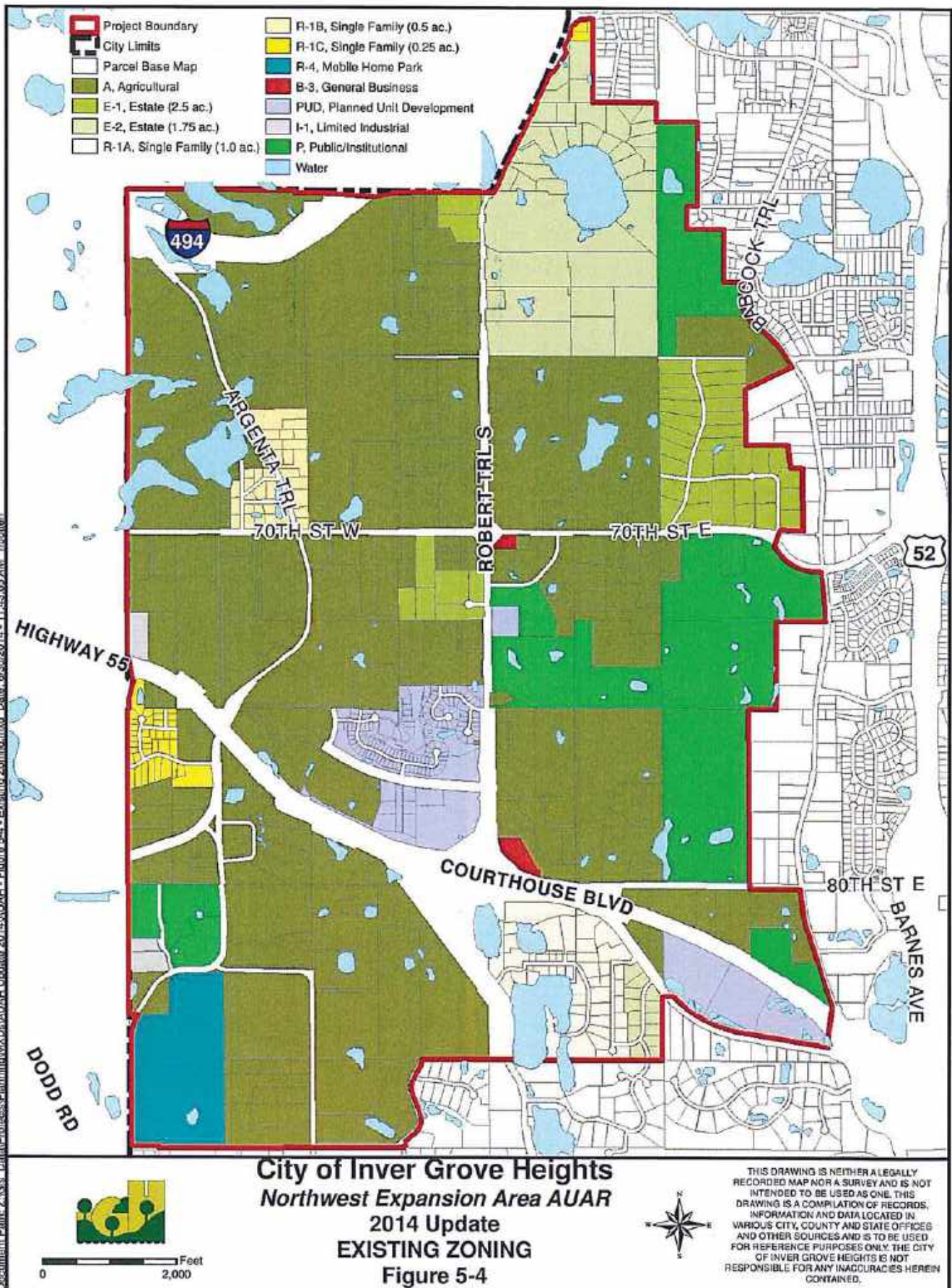
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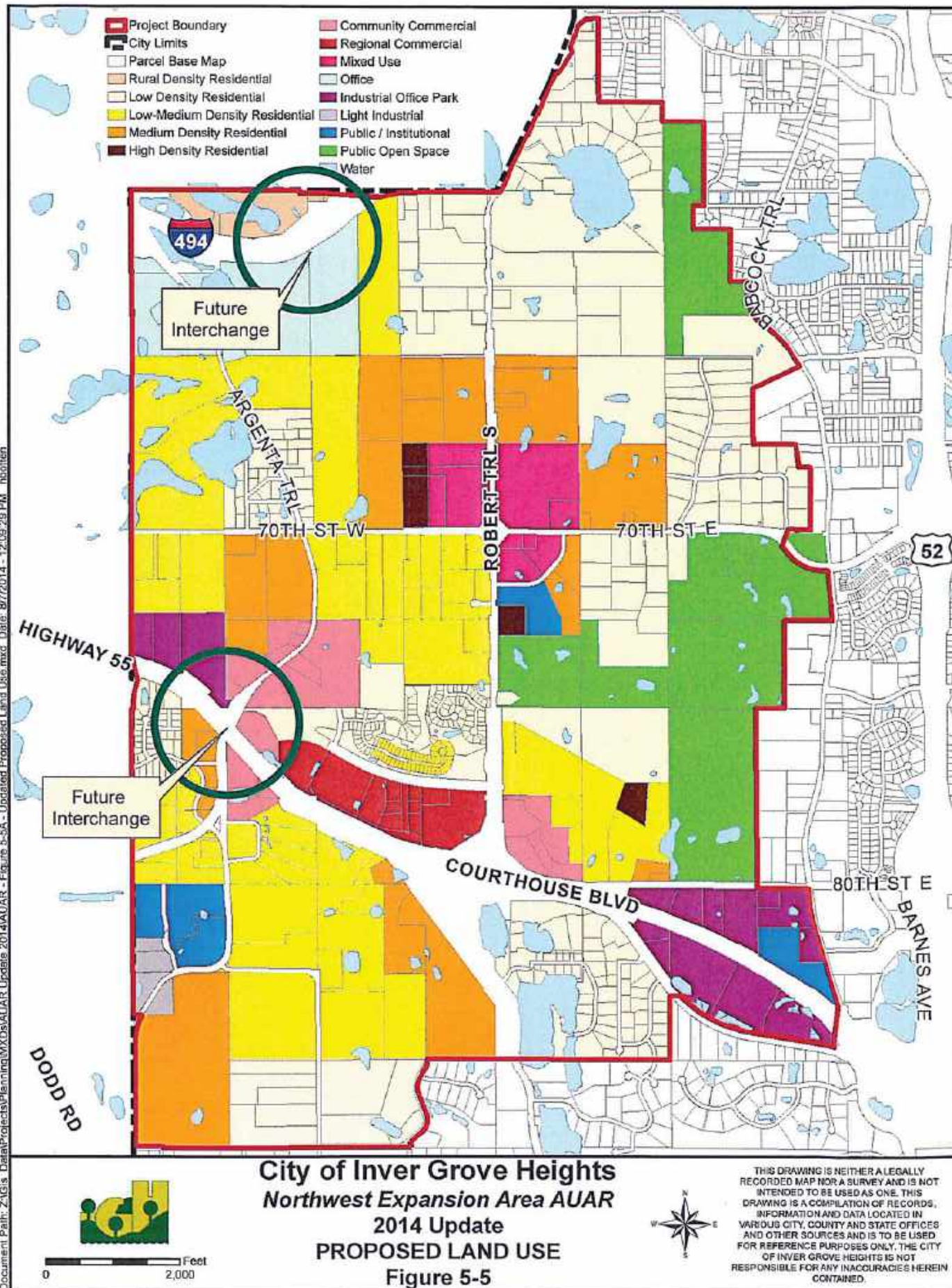


City of Inver Grove Heights
Northwest Expansion Area AUAR
2014 Update
EXISTING LAND USE
Figure 5-3

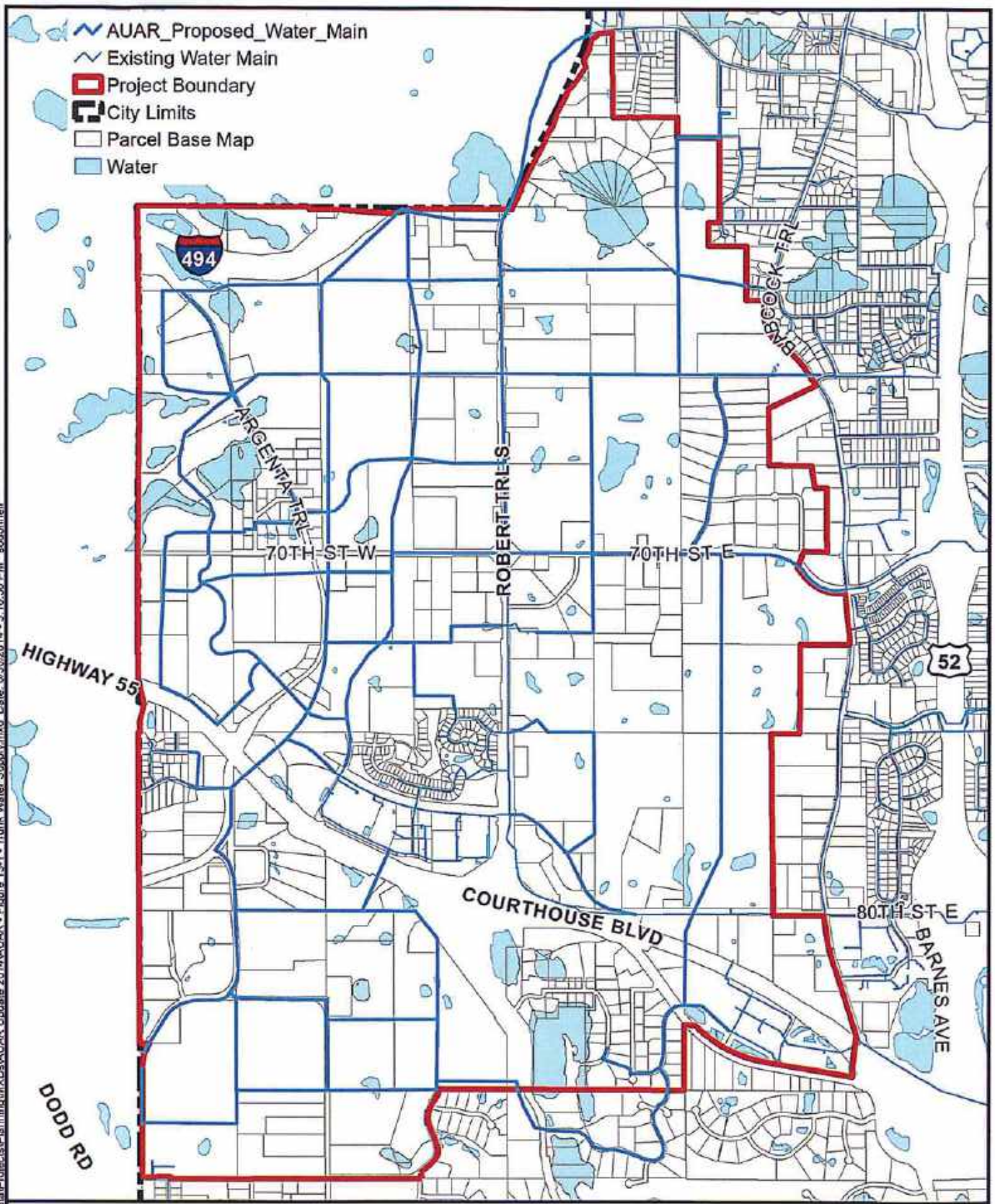


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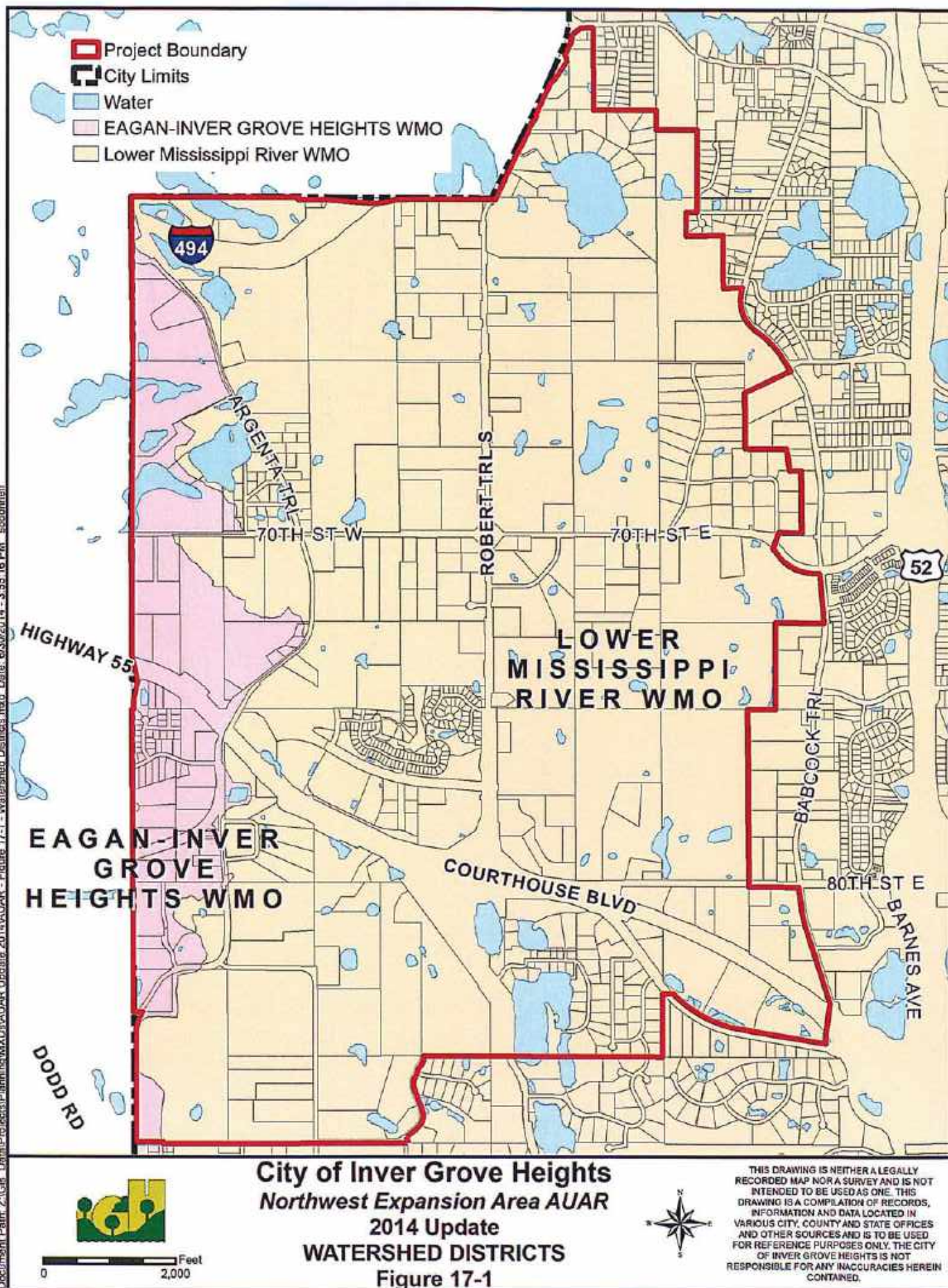
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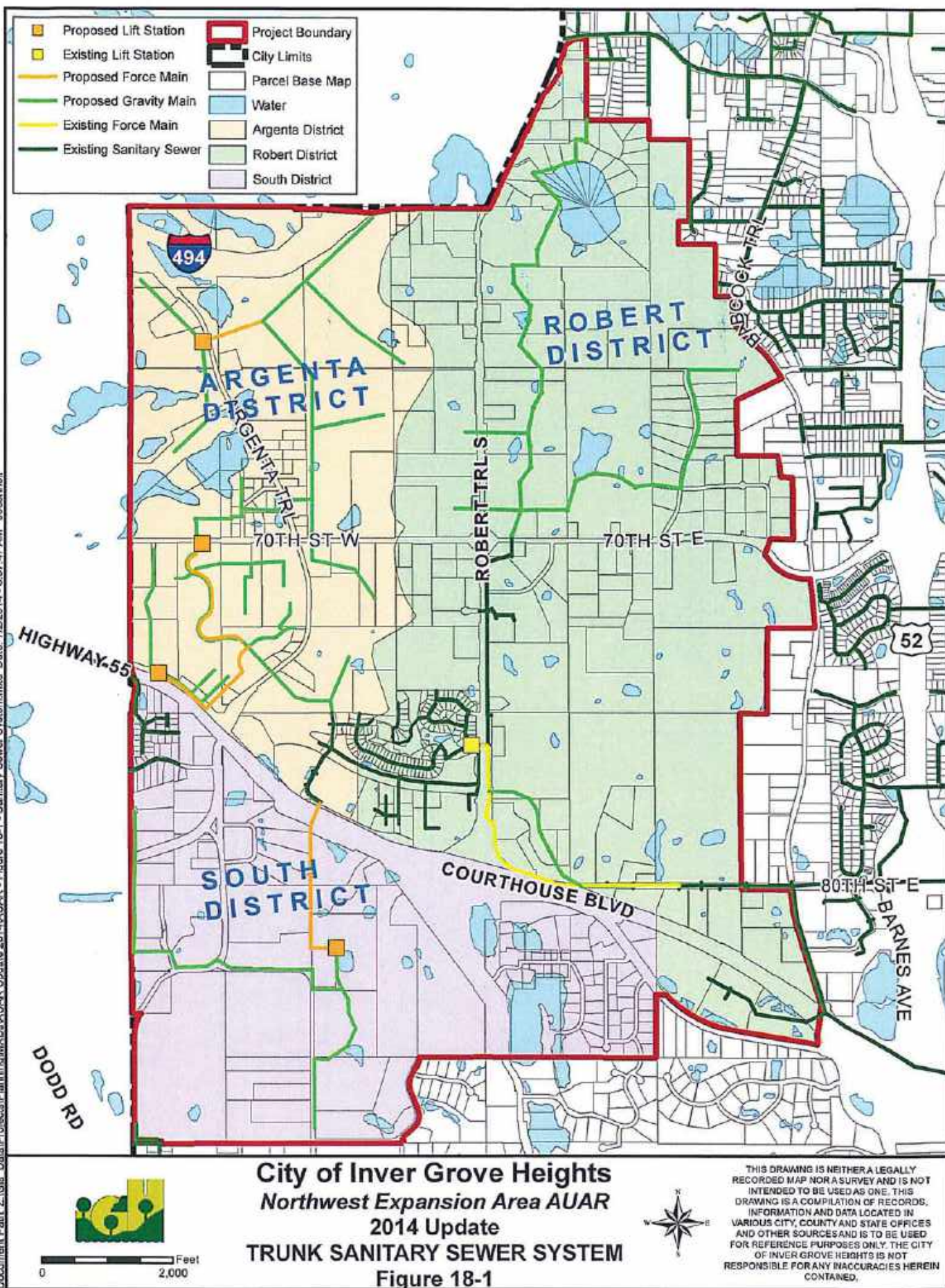


City of Inver Grove Heights
Northwest Expansion Area AUAR
2014 Update
TRUNK WATER SUPPLY
Figure 13-1

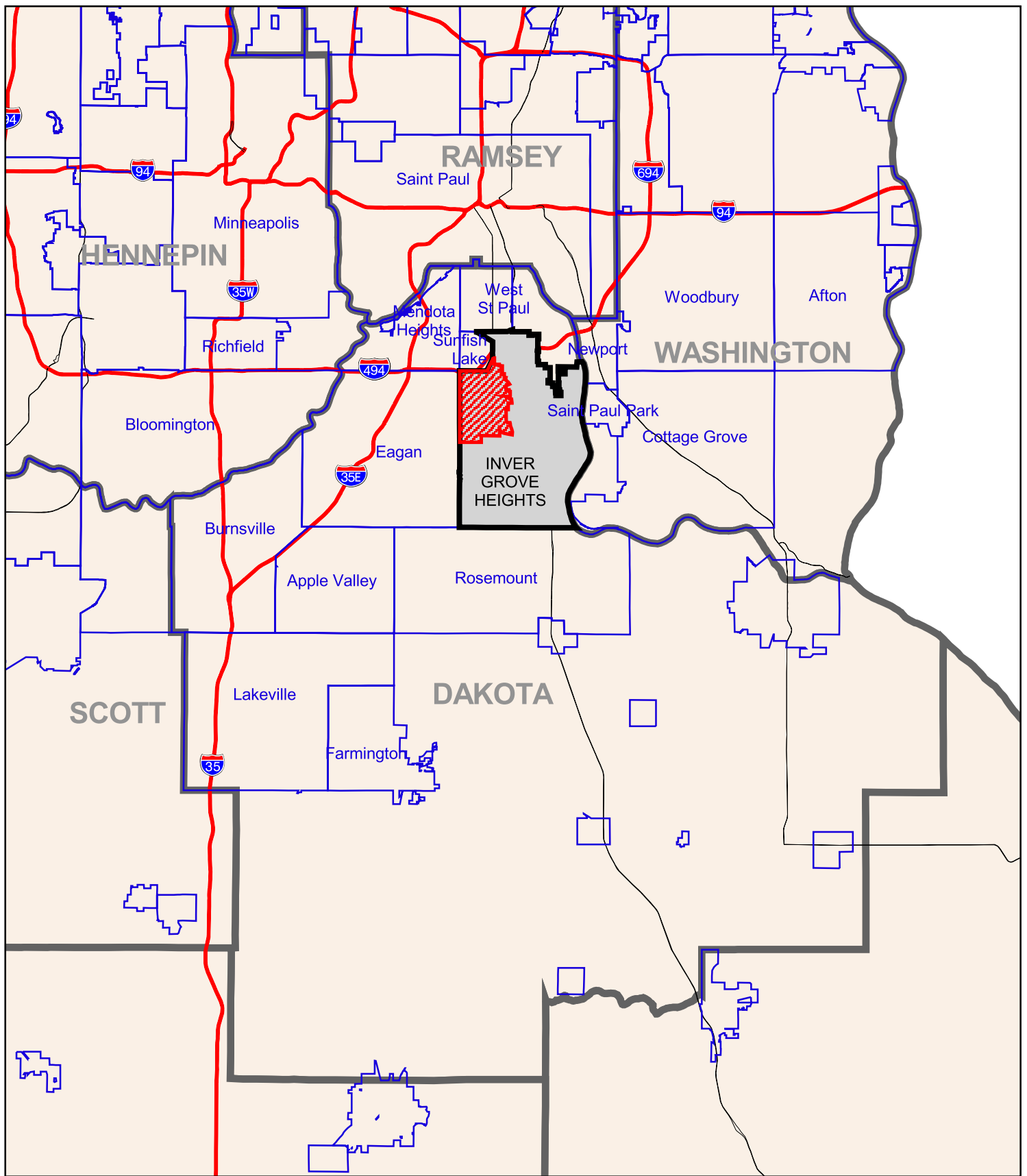
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ATTACHMENT C: 2007 AUAR UPDATE FIGURES



March 2005

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City of Inver Grove Heights

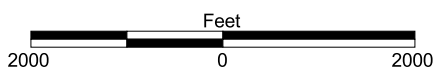
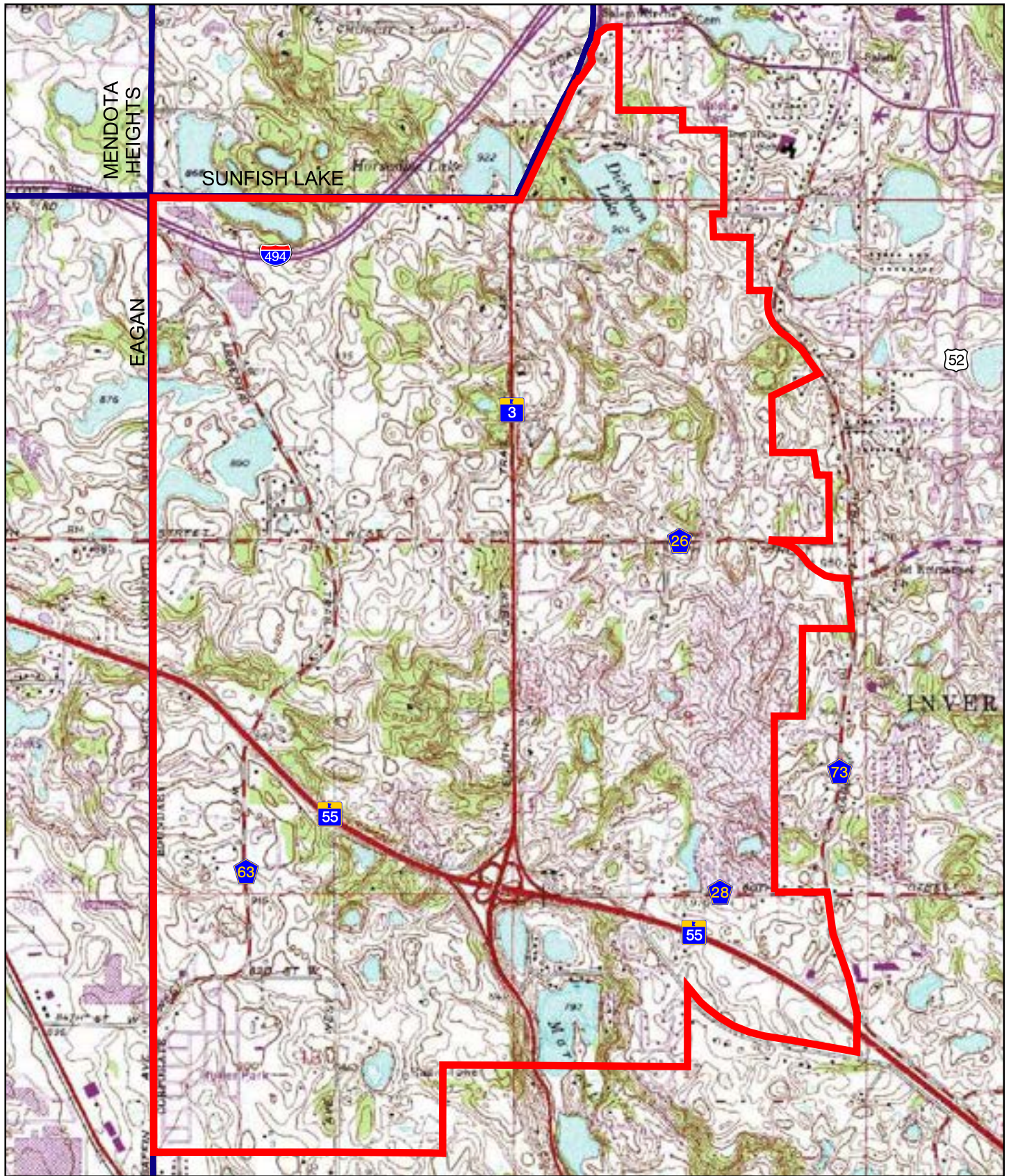
*Northwest Expansion
Area AUAR*

PROJECT LOCATION

Figure 5-1



	Project Boundary
	Inver Grove Heights
	County Boundaries



March 2005

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City of Inver Grove Heights

*Northwest Expansion
Area AUAR*

PROJECT BOUNDARY

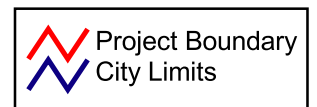


Figure 5-2

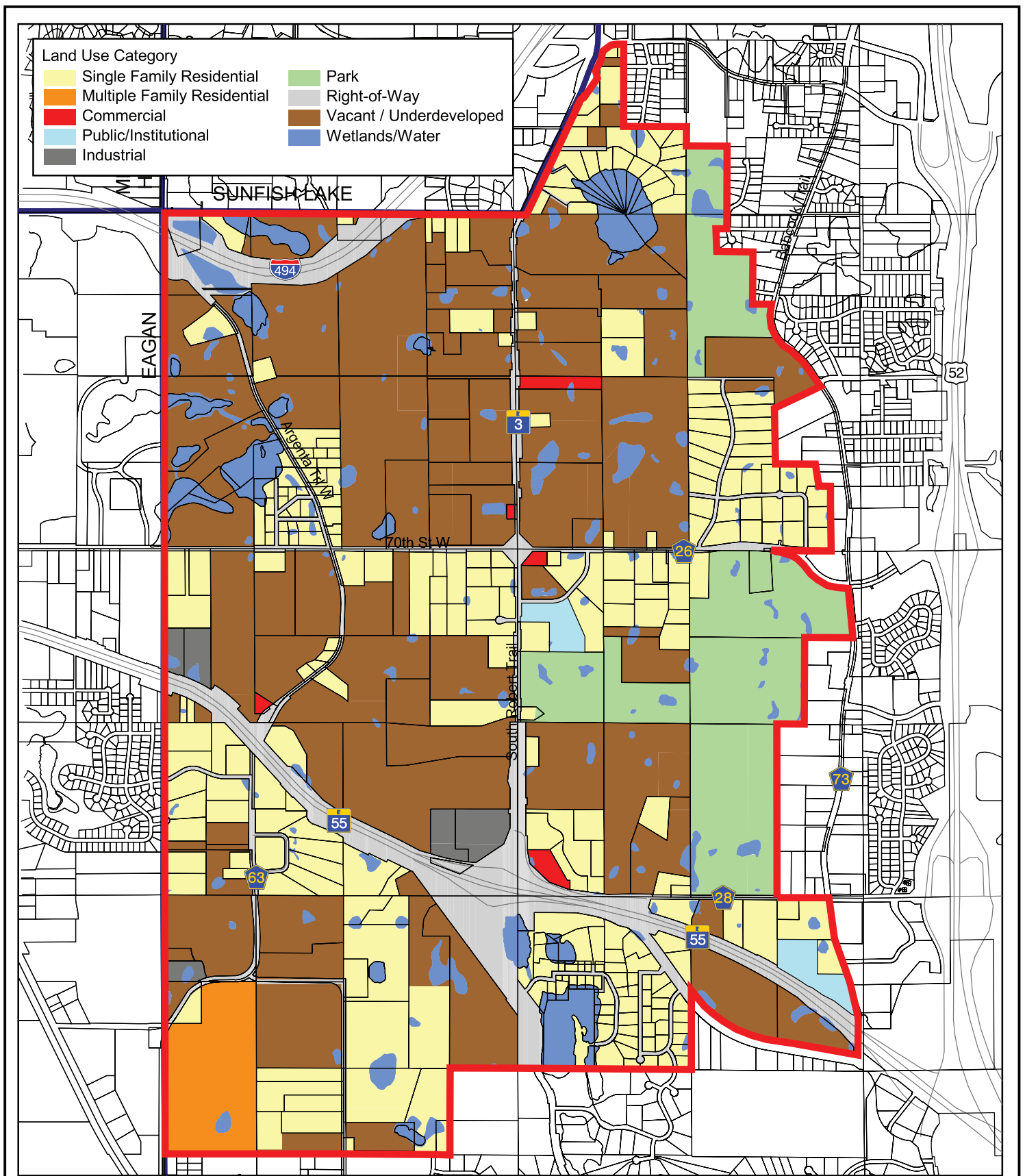
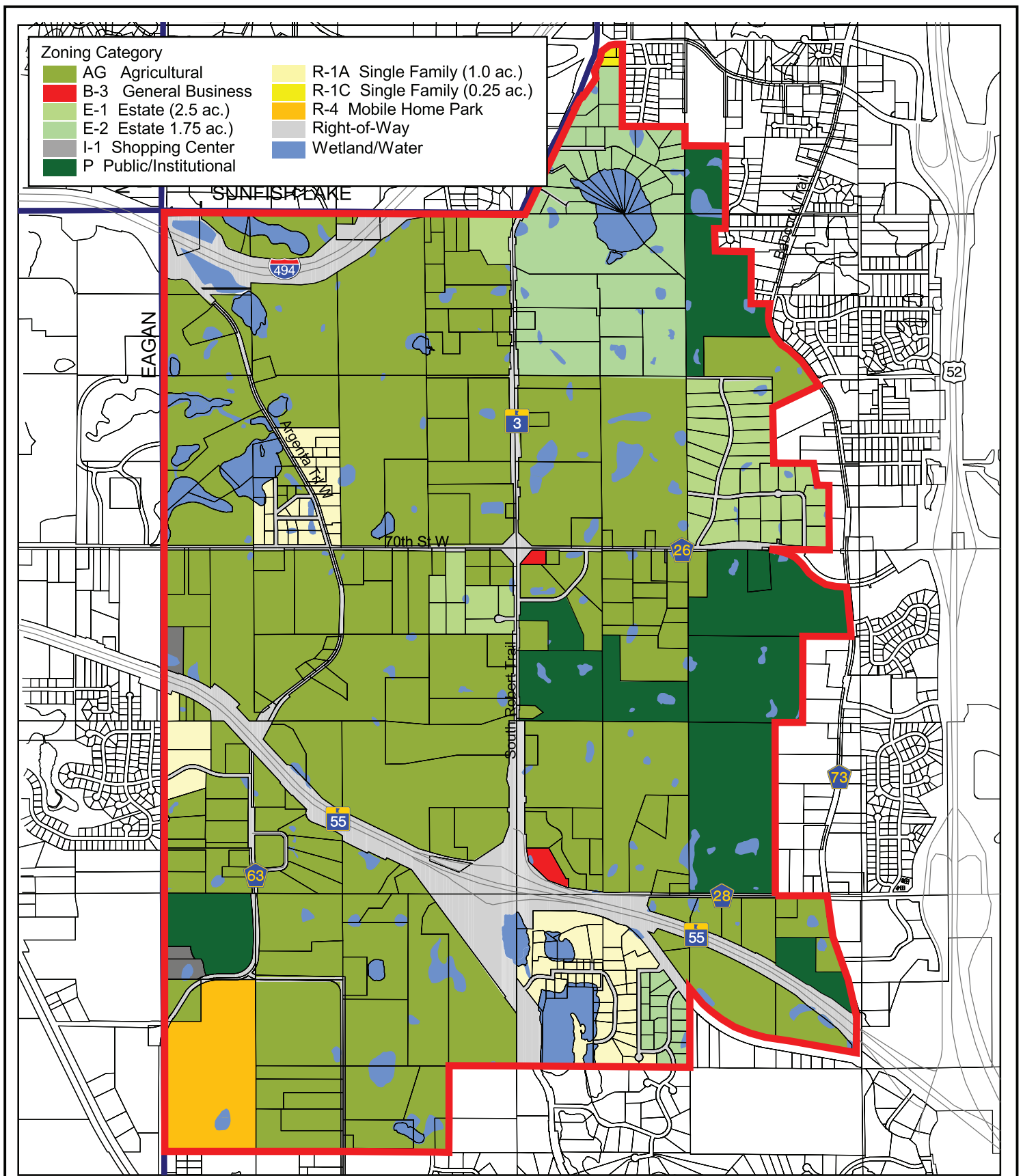


Figure 5-3





Feet
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March 2005

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City of Inver Grove Heights

*Northwest Expansion
Area AUAR*

EXISTING ZONING

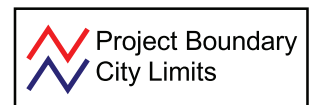
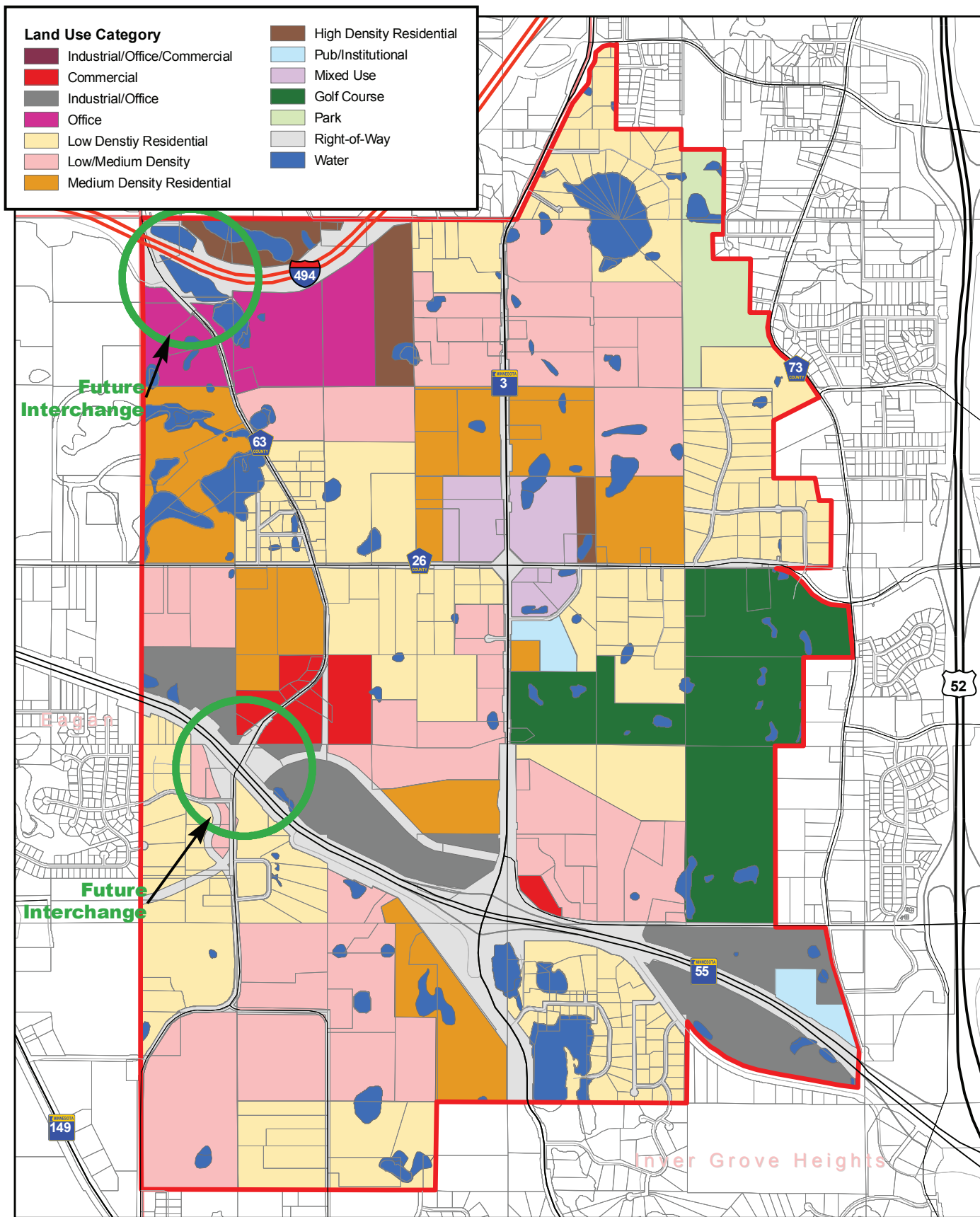
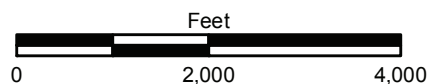


Figure 5-4



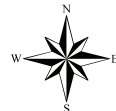
City of Inver Grove Heights
Northwest Expansion
Area AUAR



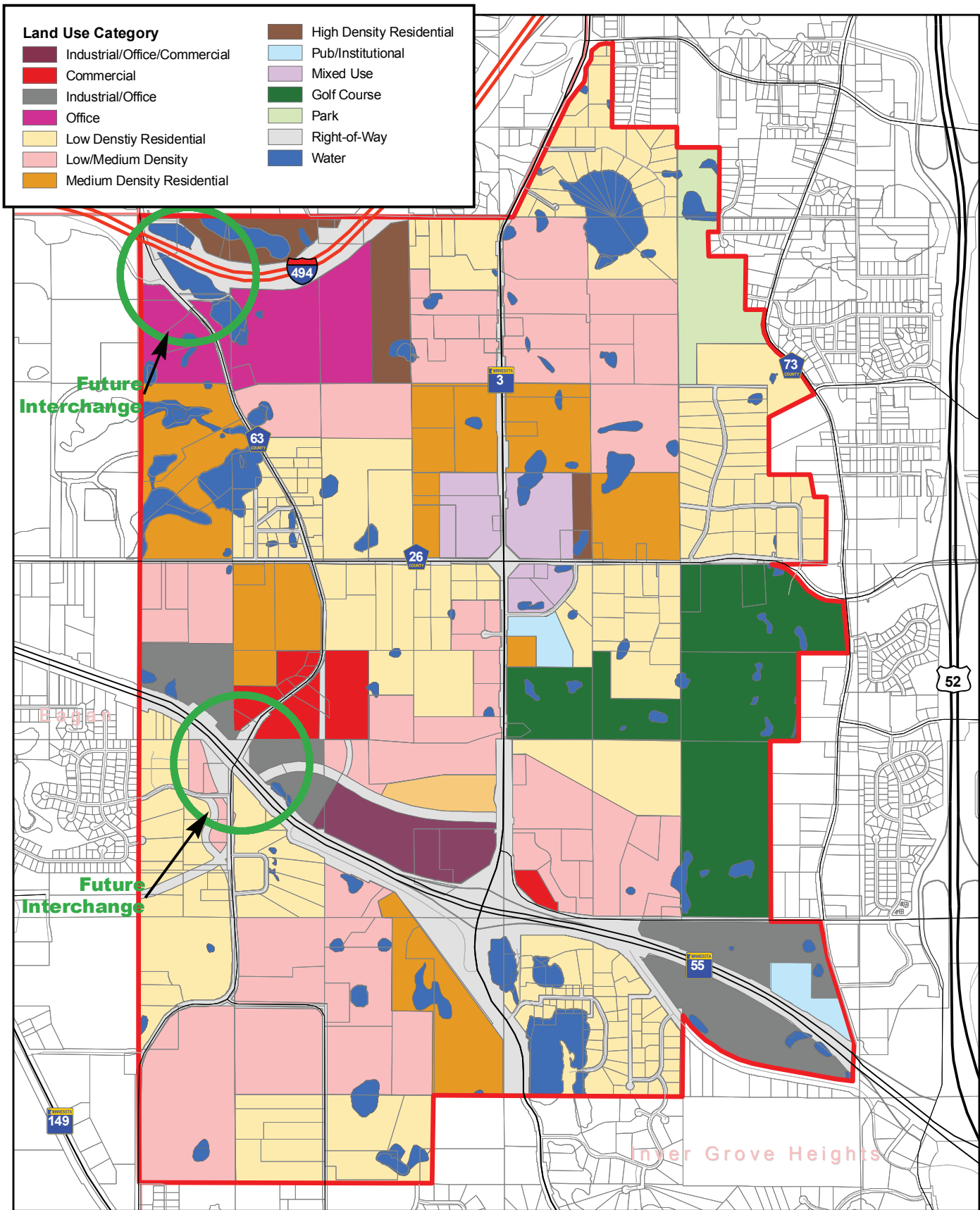
August 2007

PROPOSED LAND USE

Figure 5-5



- Northwest Expansion Area
- Municipality
- Parcel



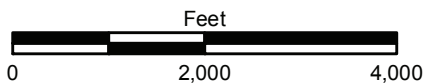
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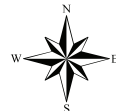
City of Inver Grove Heights
Northwest Expansion
Area AUAR

**UPDATED PROPOSED
LAND USE**

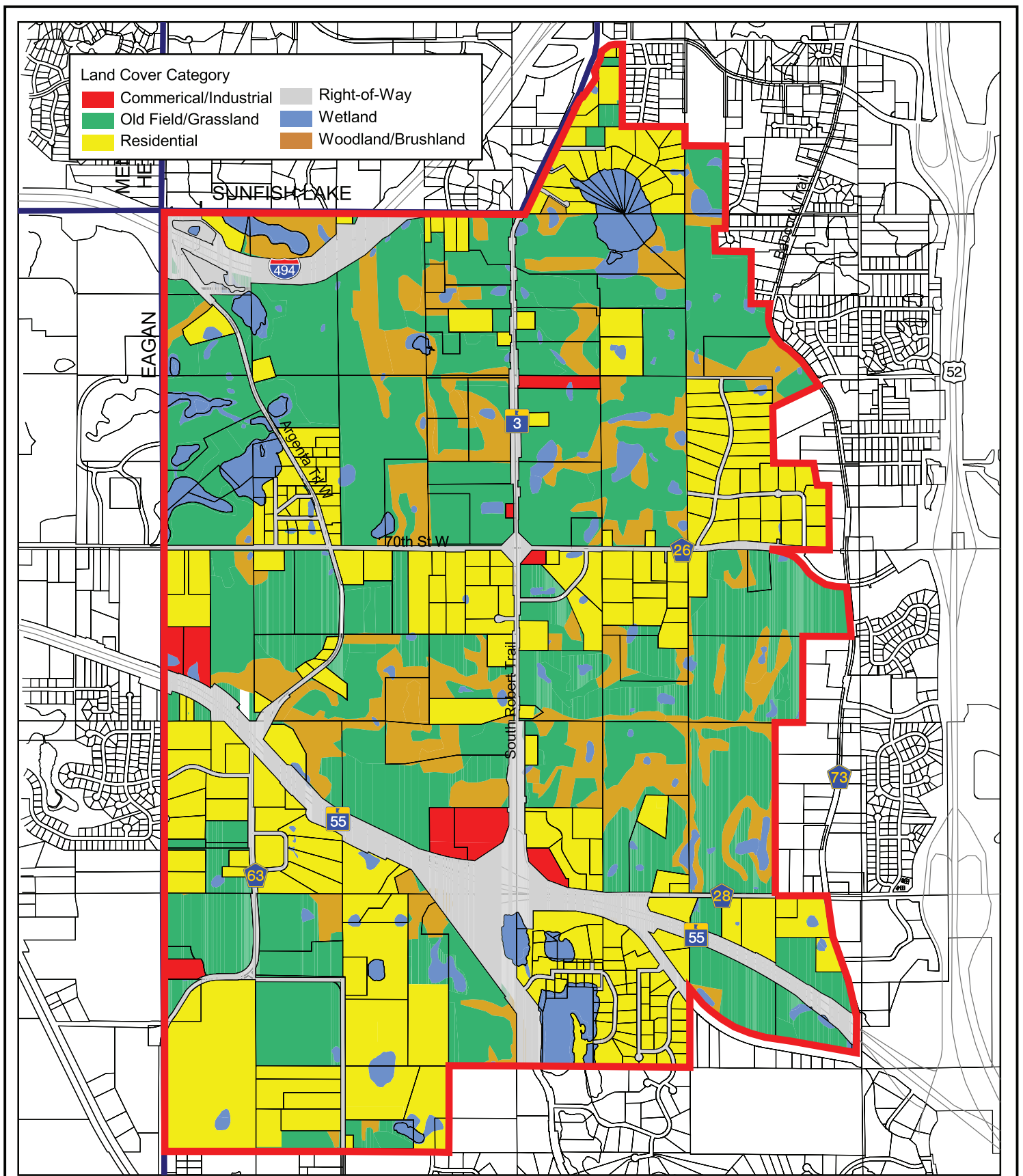
Figure 5-5A



August 2007



- Northwest Expansion Area
- Municipality
- Parcel



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City of Inver Grove Heights

Northwest Expansion
Area AUAR

LAND COVER

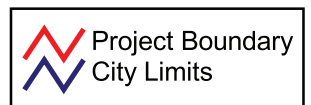
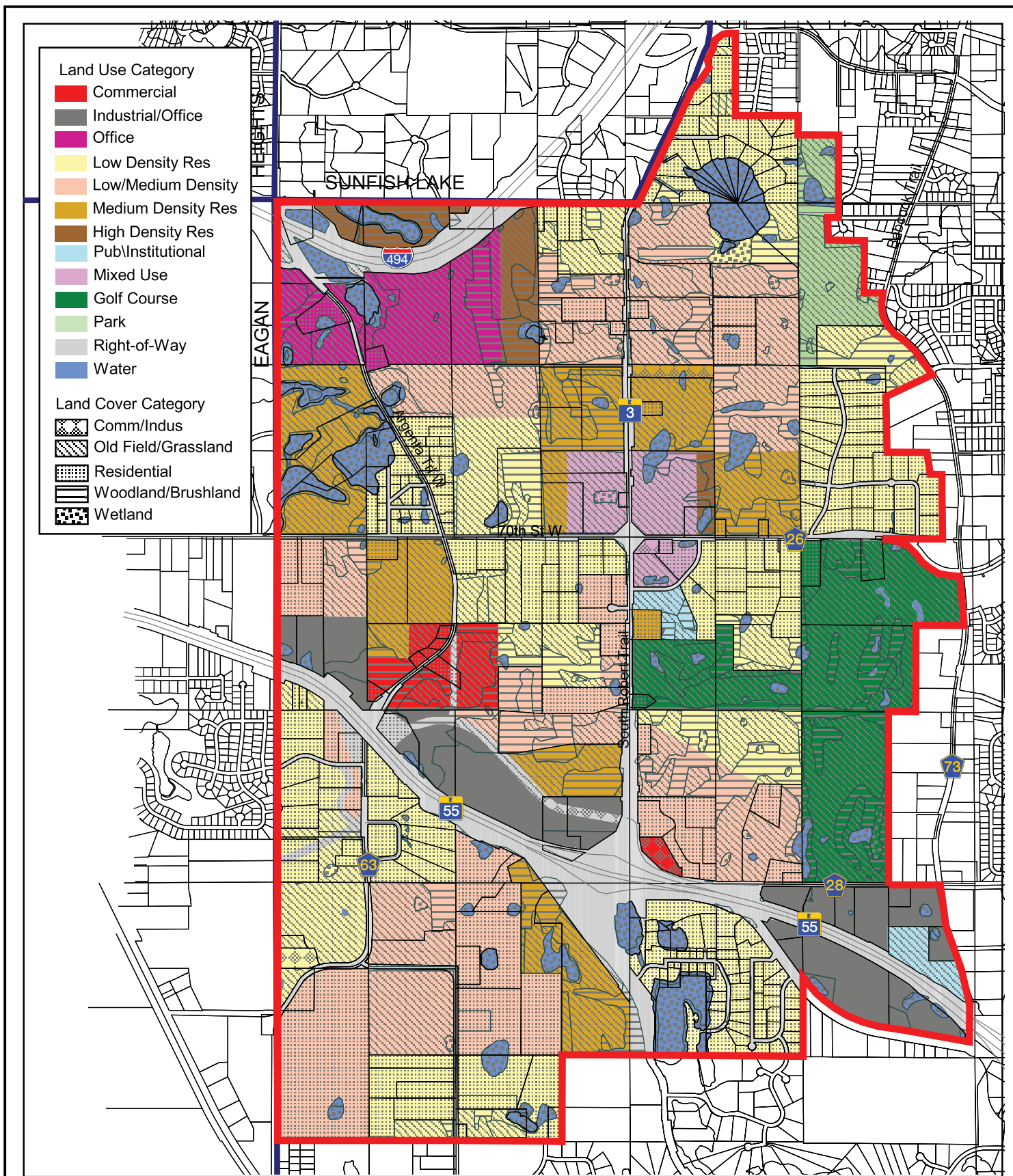


Figure 10-1



March 2005

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City of Inver Grove Heights

Northwest Expansion
Area AUAR

LAND COVER AND PROPOSED LAND USE

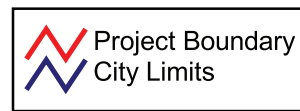
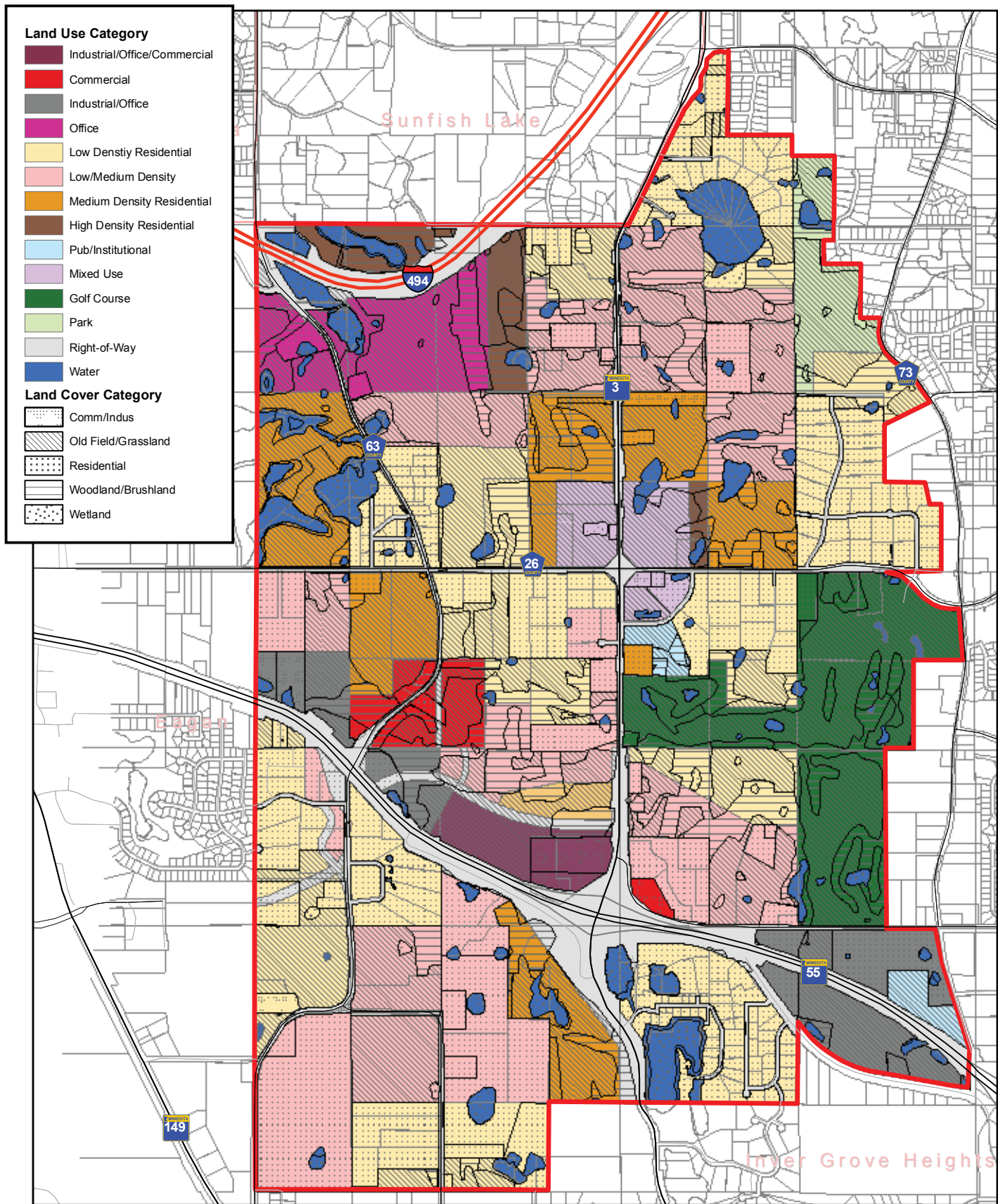


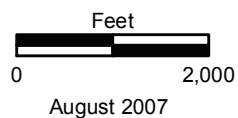
Figure 10-2



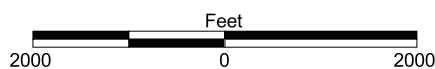
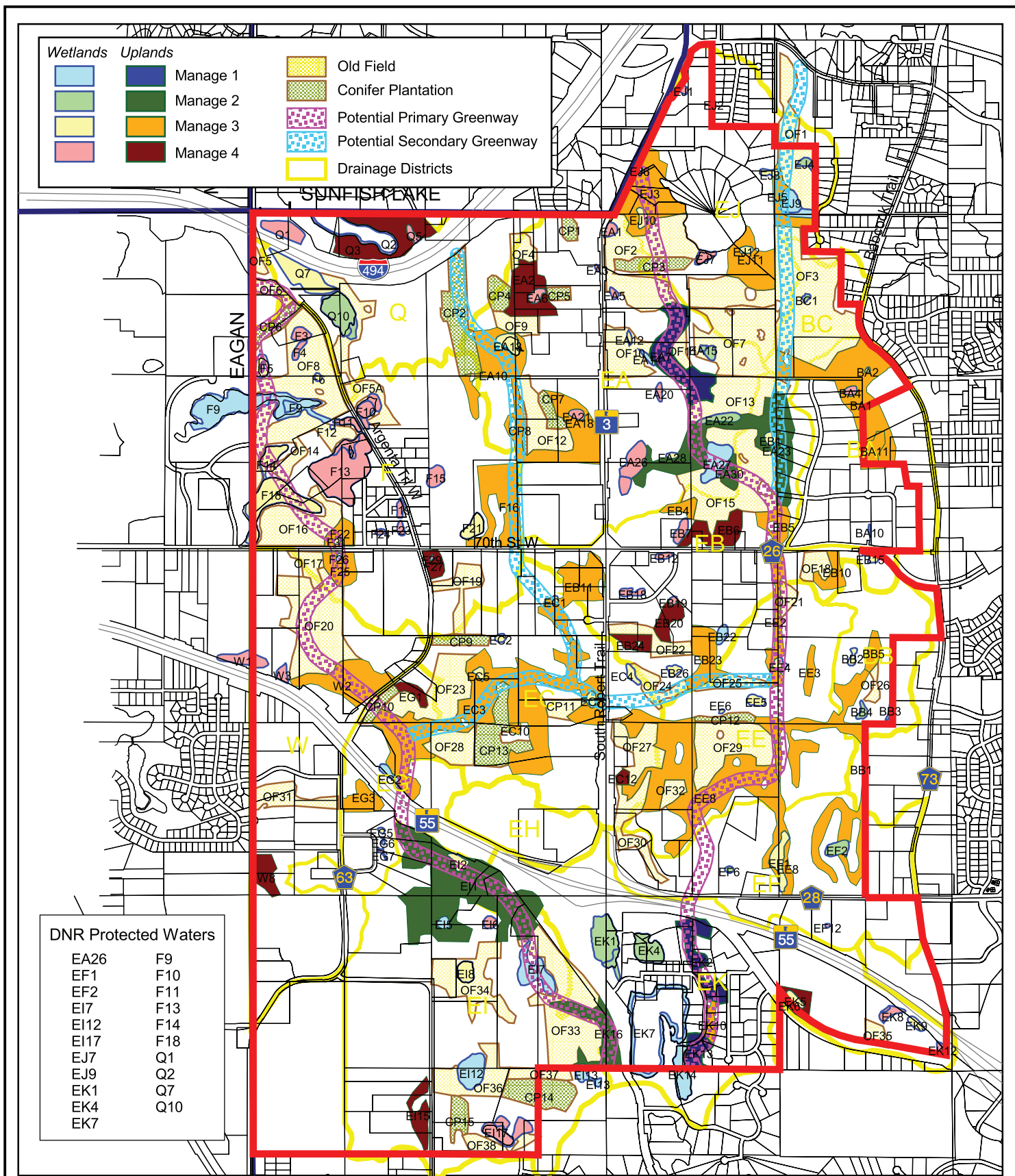
City of Inver Grove Heights
Northwest Expansion
Area AUAR

LANDCOVER AND UPDATED PROPOSED LAND USE

Figure 10-2A



- Northwest Expansion Area
- Municipality
- Parcel



March 2005

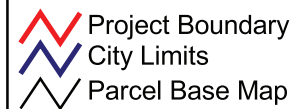
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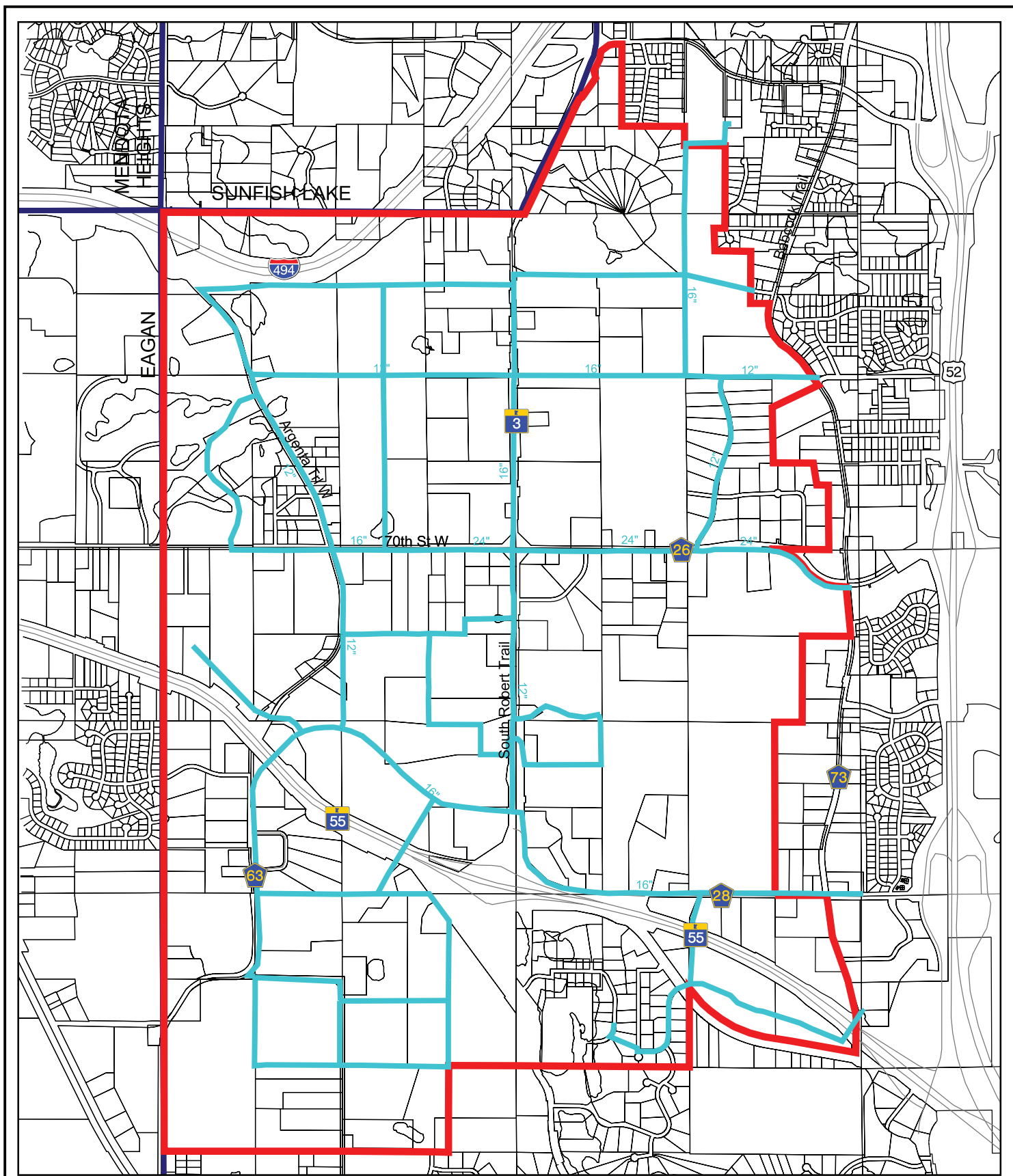
City of Inver Grove Heights

Northwest Expansion Area AUAR

Wetland and Upland Management Classification

Figure 10-3





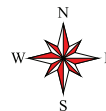
March 2005

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City of Inver Grove Heights

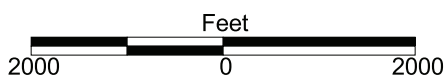
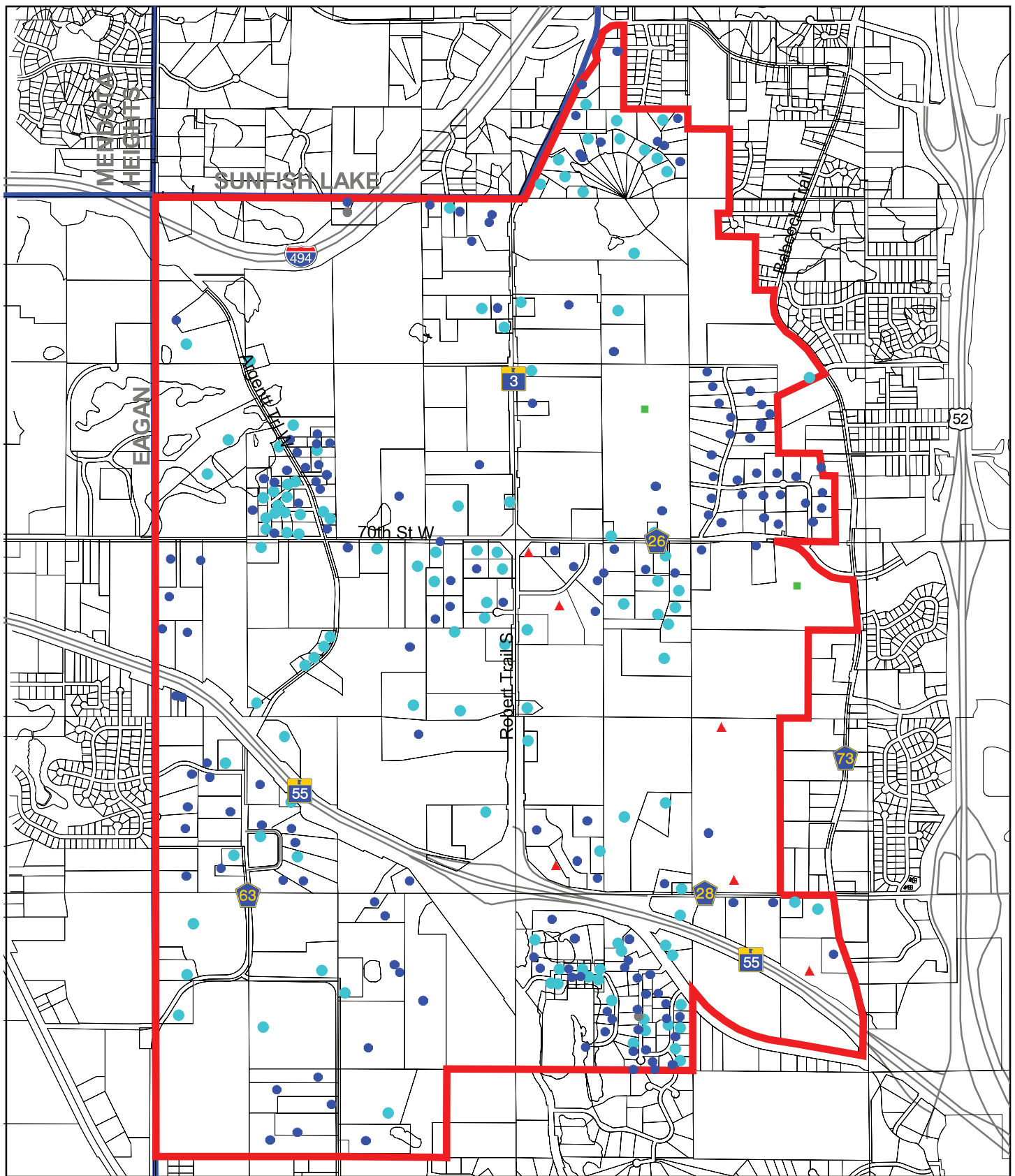
*Northwest Expansion
Area AUAR*

TRUNK WATER SUPPLY



- Proposed Water Main
- Project Boundary
- City Limits

Figure 13-1



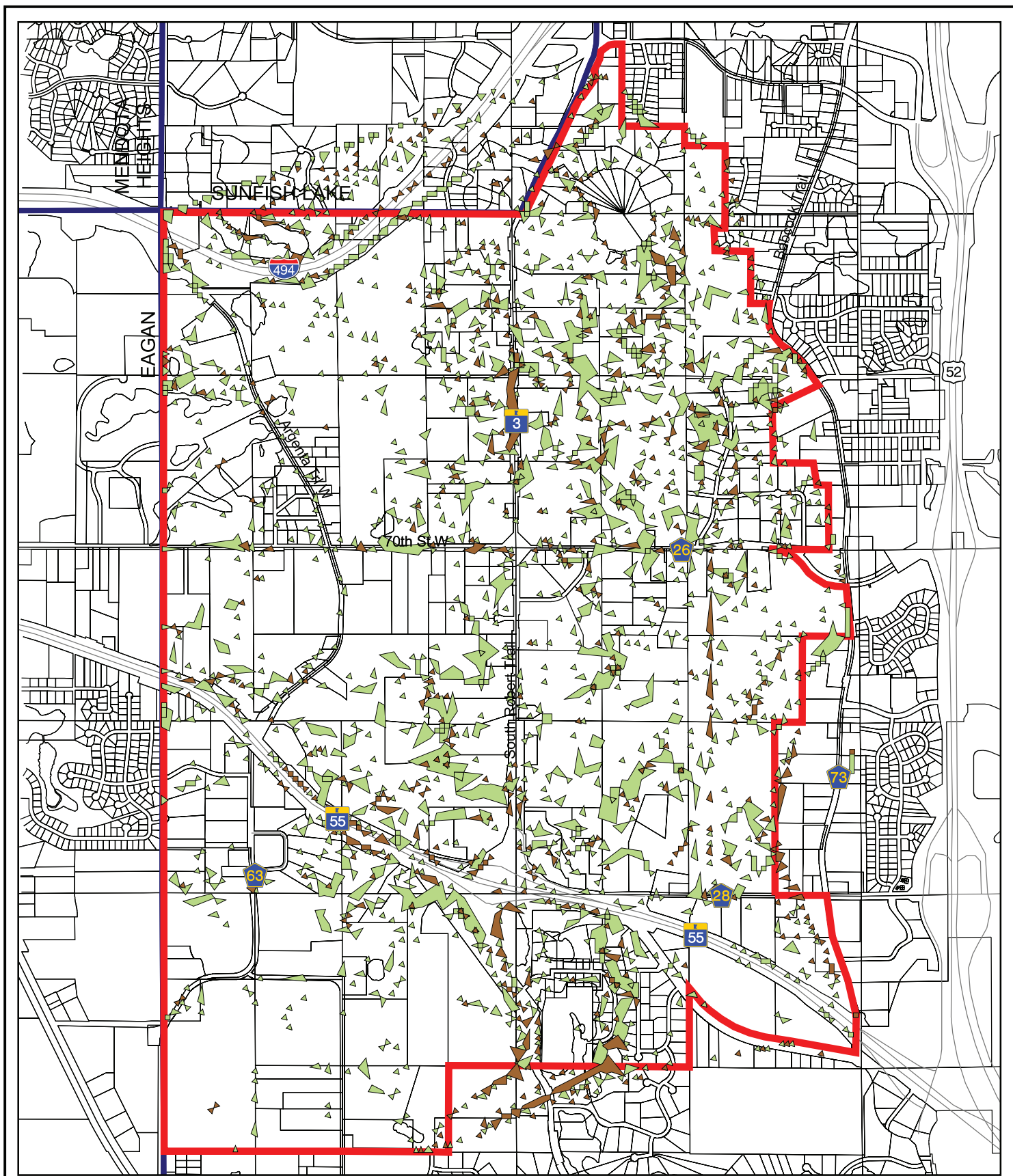
City of Inver Grove Heights **Northwest Expansion** **Area AUAR**

POSSIBLE WELL LOCATIONS

Figure 13-2



- County Well Index
- Domestic
- Irrigation
- Public supply, non-community, transient
- Unknown use
- Assumed Well Sites
- Project Boundary
- City Boundary
- Parcel Base Map



Bonestroo
Rosene
Anderlik &
Associates
Engineers & Architects



Feet
2000 0 2000

March 2005

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City of Inver Grove Heights

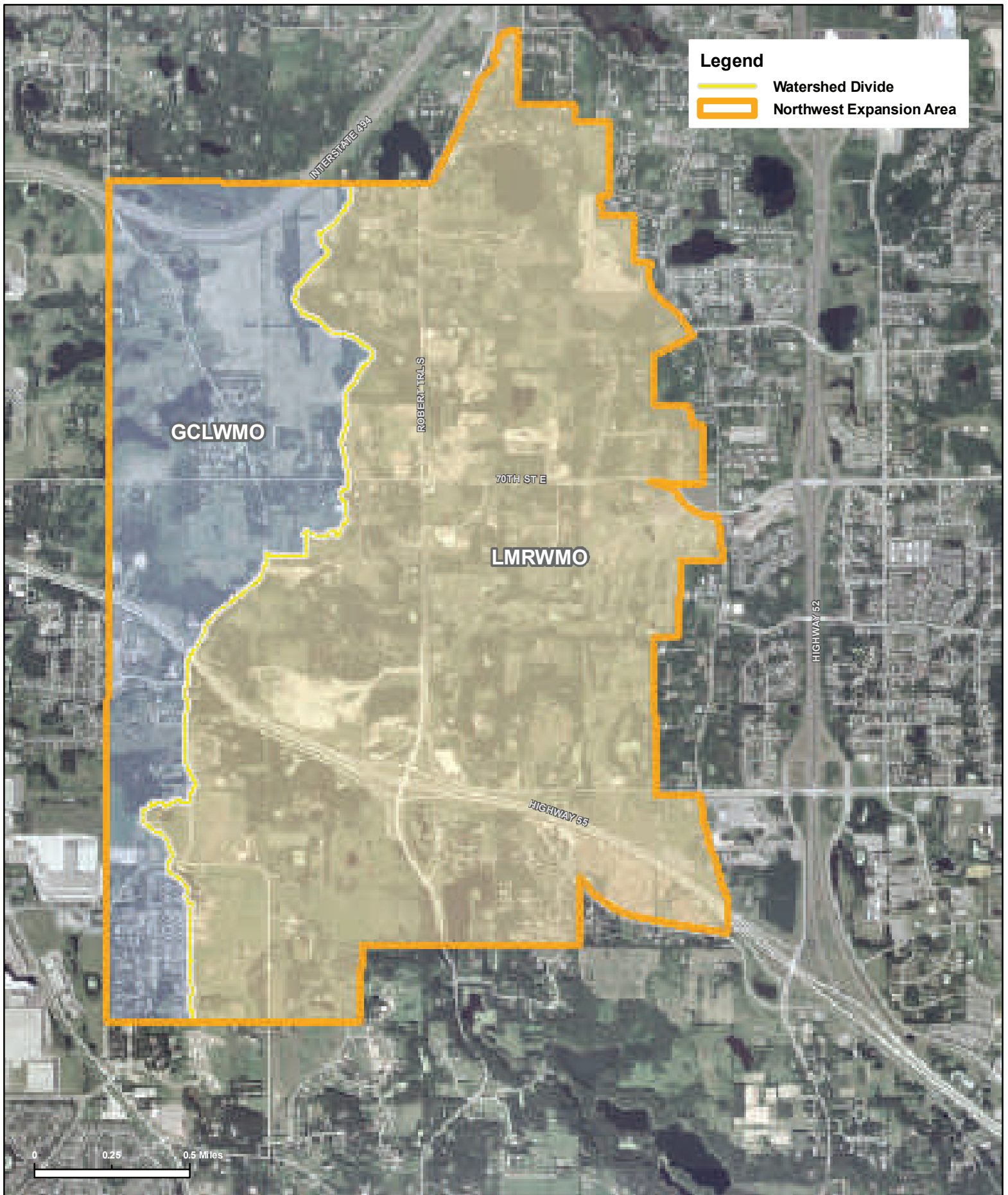
Northwest Expansion
Area AUAR

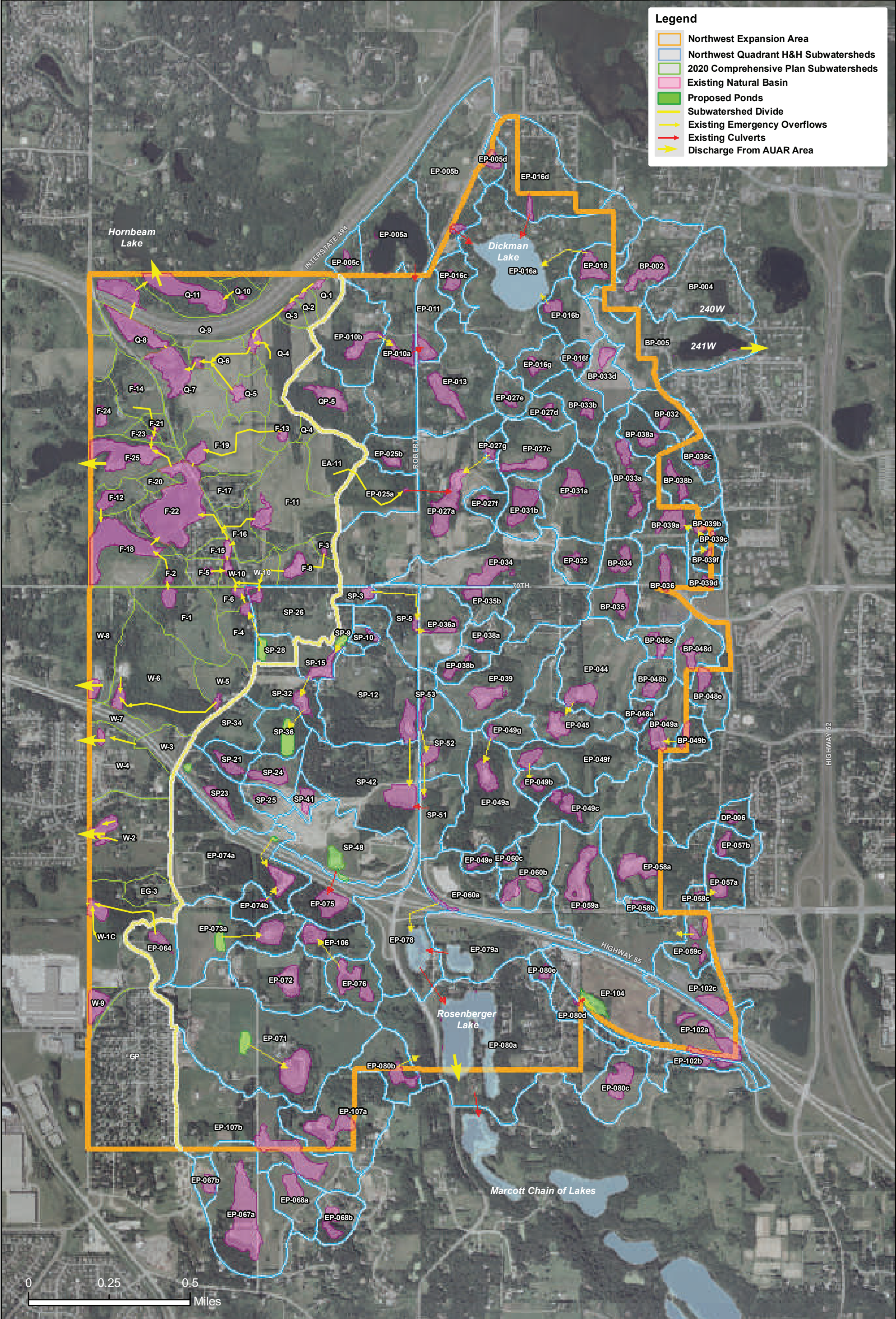
STEEP SLOPES

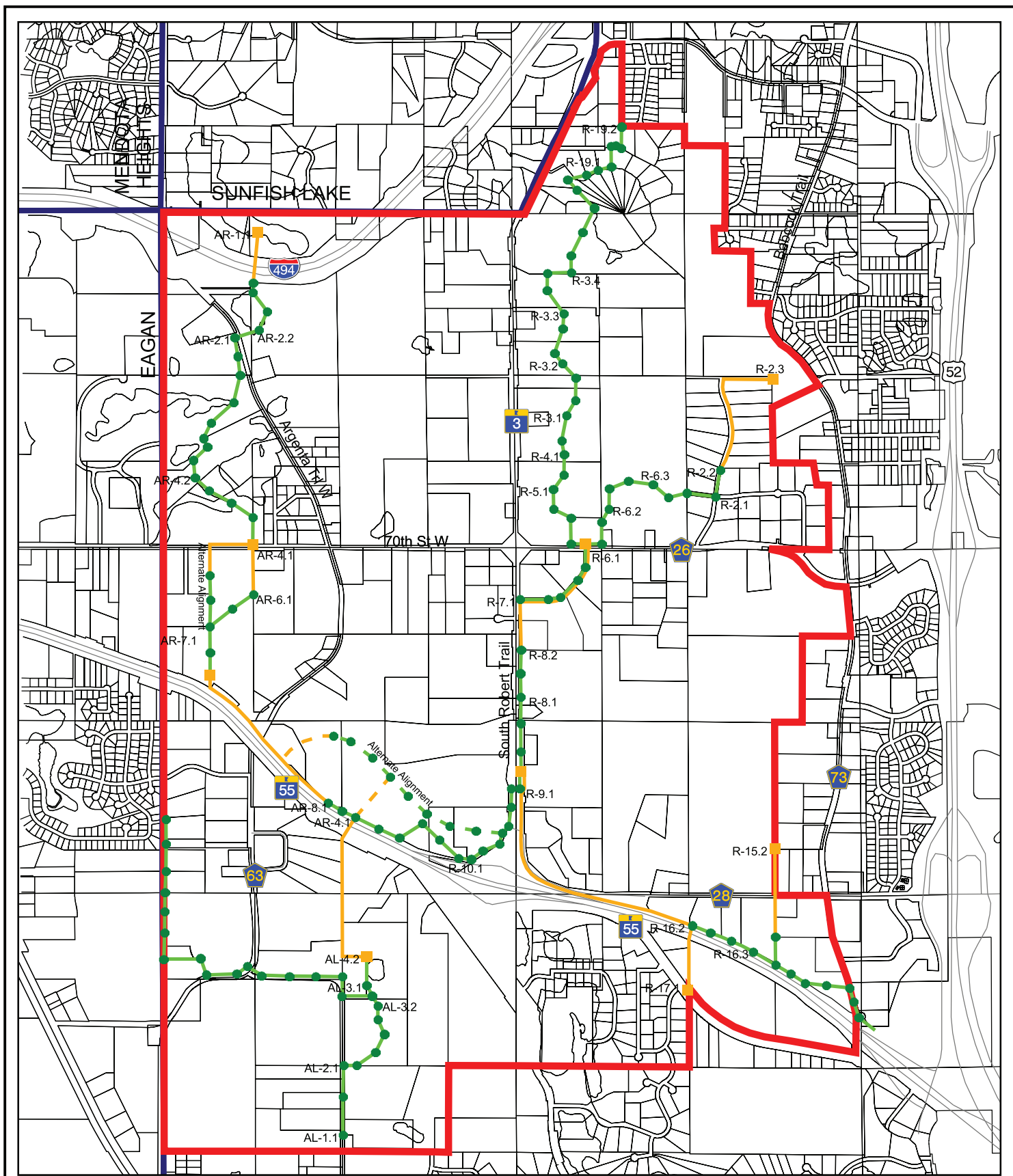
Figure 16-1



- Slope + 20%
- Slopes 12% - 20%
- Project Boundary
- City Limits
- Parcel Base Map







Feet
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March 2005

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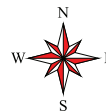
City of Inver Grove Heights

Northwest Expansion

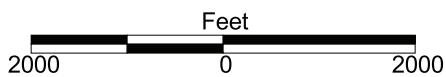
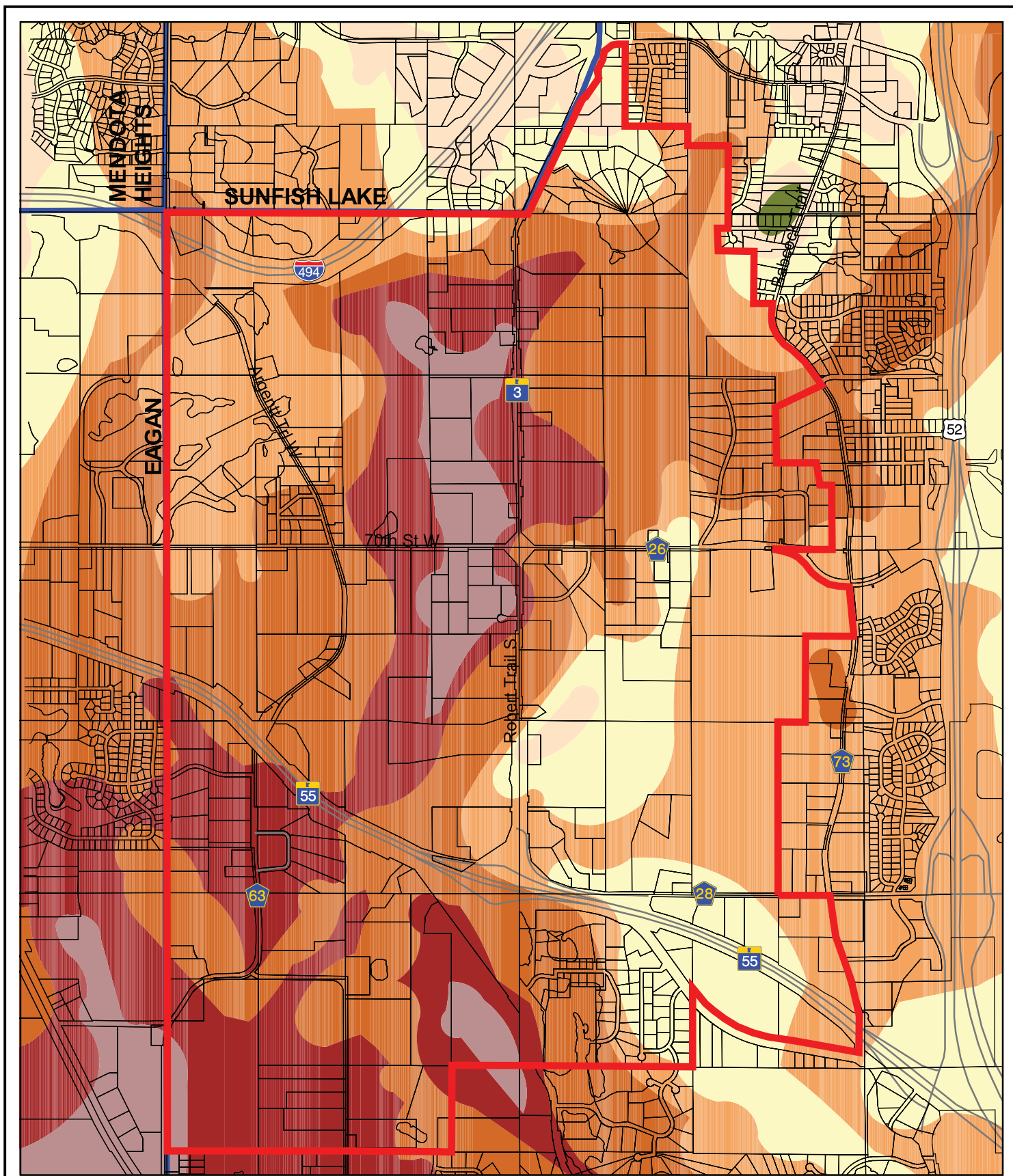
Area AUAR

SANITARY SEWER SYSTEM

Figure 18-1



- Proposed Manhole
- Proposed Lift Station
- Proposed Sanitary Pipe
- Proposed Forcemain
- Project Boundary
- City Limits



Inver Grove Heights **Northwest Expansion** **Area AUAR**

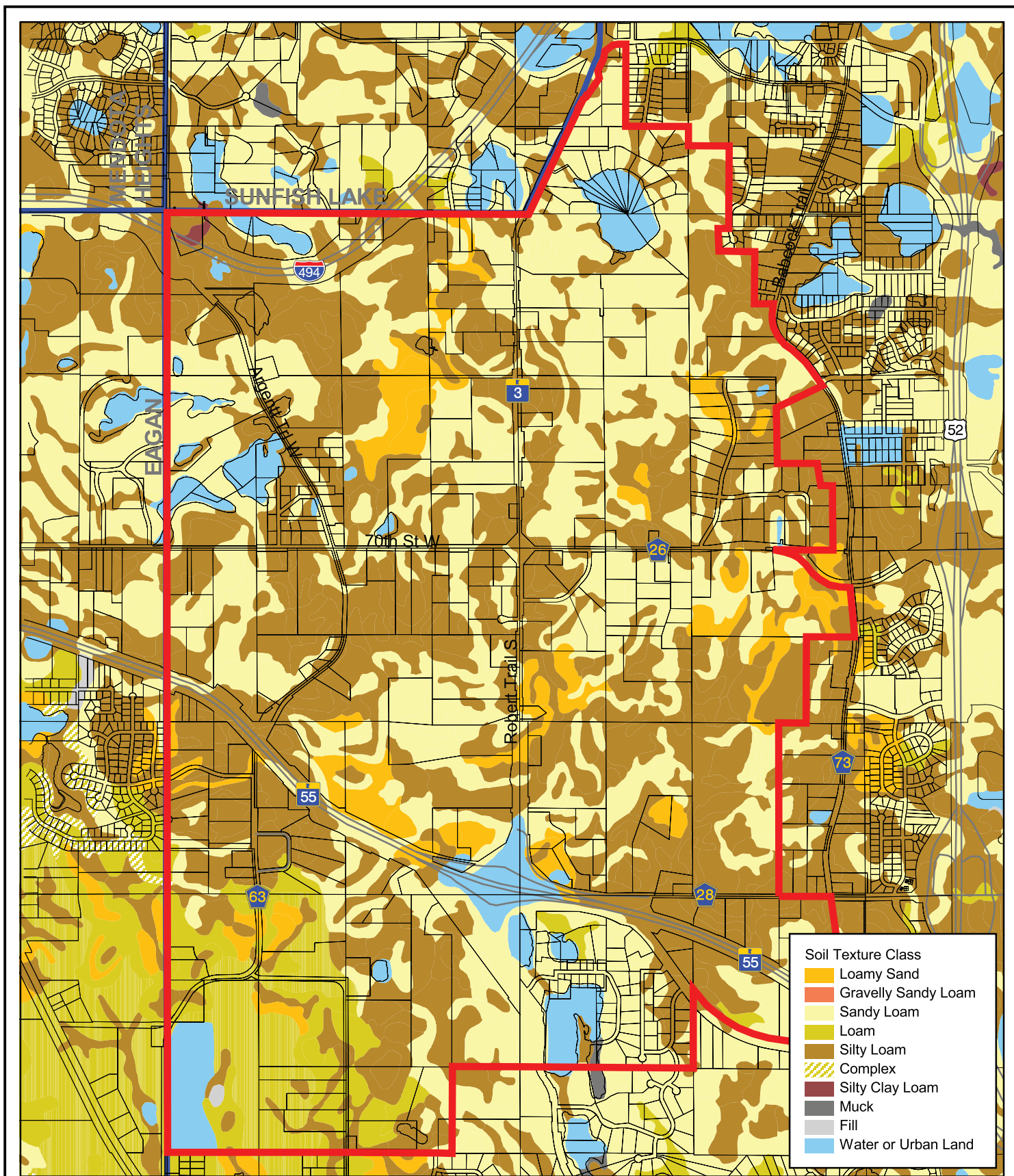
DEPTH TO BEDROCK

Figure 19-1

Depth to Bedrock		
0-50	301-350	Study Area Boundary
101-150	351-400	City Boundary
151-200	401-500	Parcel Base Map
201-250	51-100	
251-300	Over_500	

March 2005

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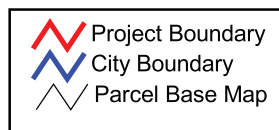
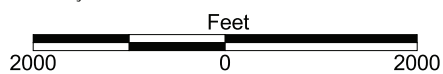


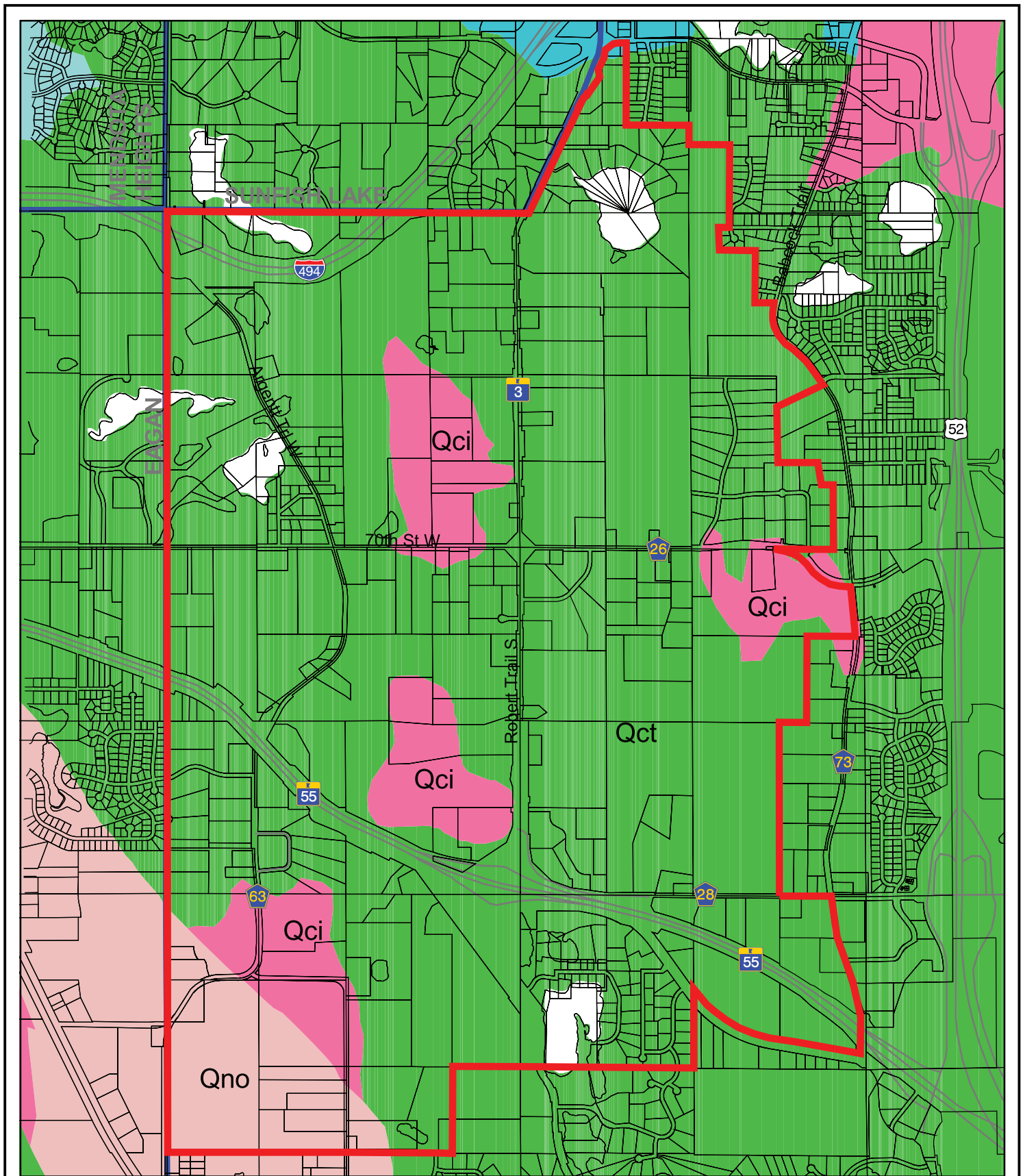
City of Inver Grove Heights

Northwest Expansion
Area AUAR

SOILS

Figure 19-3





City of Inver Grove Heights

Northwest Expansion Area AUAR

SURFICIAL GEOLOGY

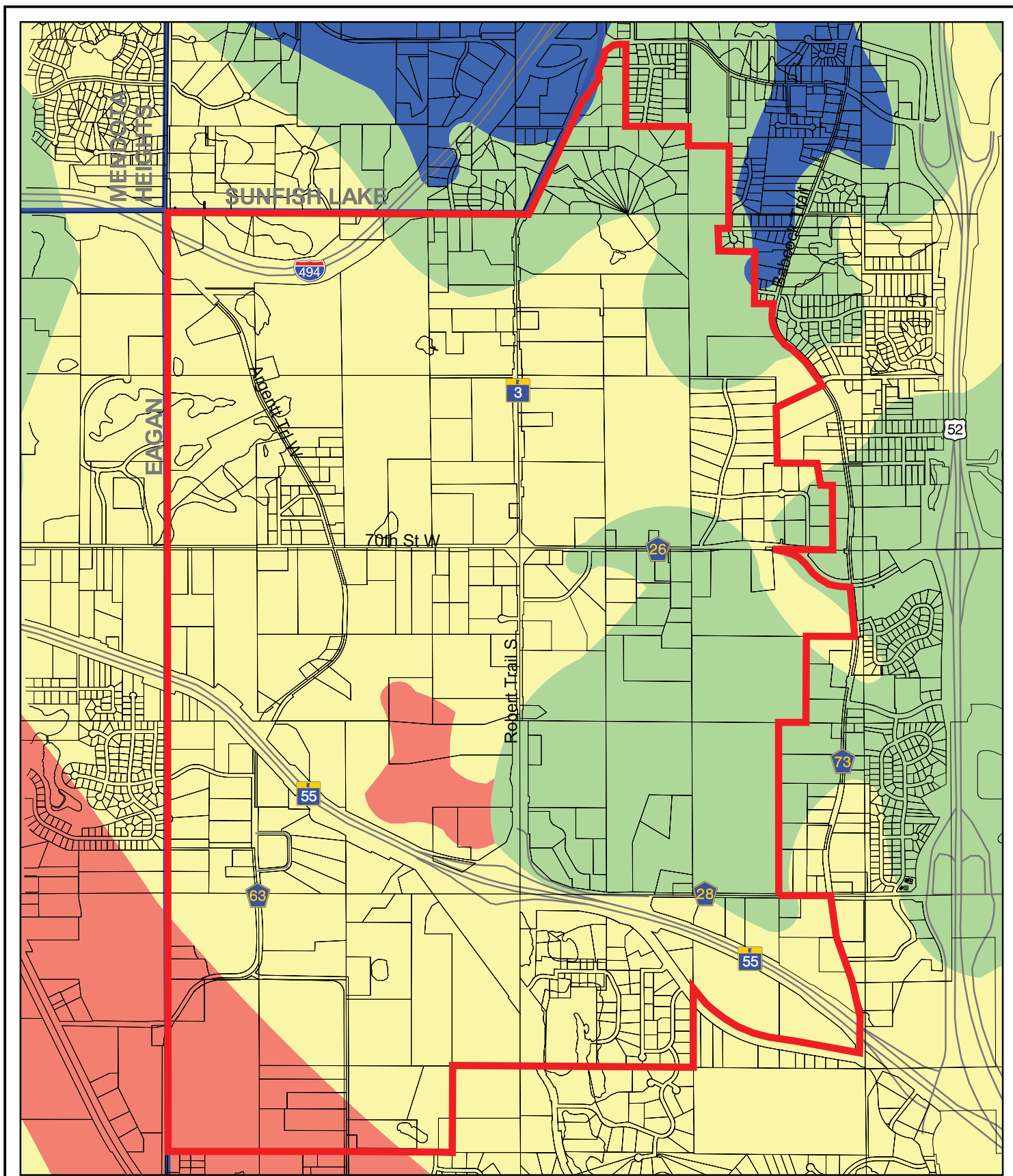
Figure 19-4

- Surficial Geology
- Qci - Lake sand and silt, Cromwell Fm.
 - Qco - Outwash, Cromwell Fm.
 - Qci - Ice-contact deposits, Cromwell Fm.
 - Qct - Till, Cromwell Fm.
 - Project Boundary
 - City Boundary
 - Parcel Base Map

Feet
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March 2005

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**Bonestroo
Rosene
Anderlik &
Associates**
Engineers & Architects



Feet

2000 0 2000

City of Inver Grove Heights **Northwest Expansion** **Area AUAR**

SENSITIVITY TO AQUIFER



Sensitivity Ratings

- Moderate
- High/Moderate
- Low/Moderate
- Very Low
- Project Boundary
- City Boundary
- Parcel Base Map

March 2005

Figure 19-5

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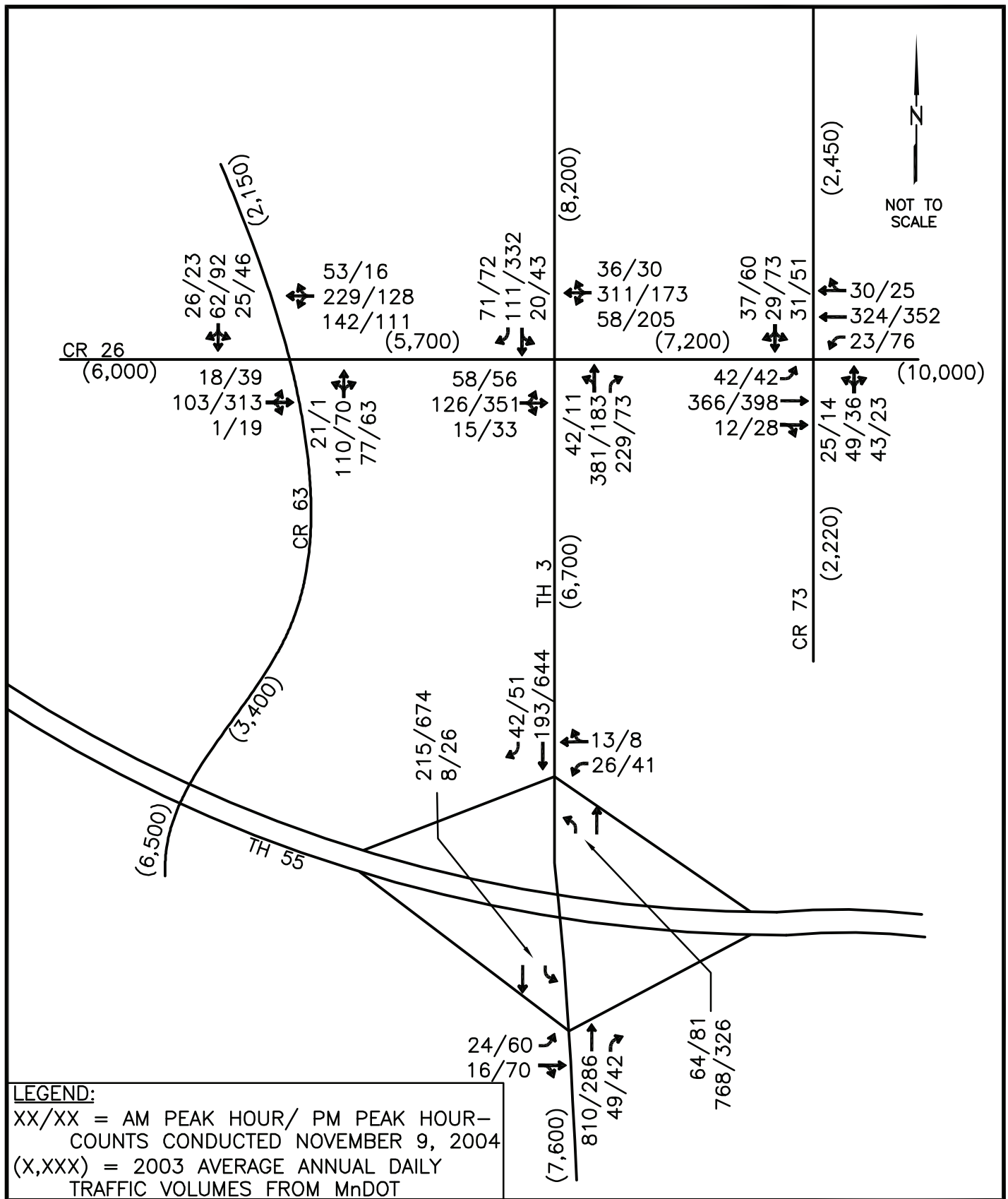


FIGURE 21-2

EXISTING GEOMETRY AND TRAFFIC VOLUMES INVER GROVE HEIGHTS AUAR

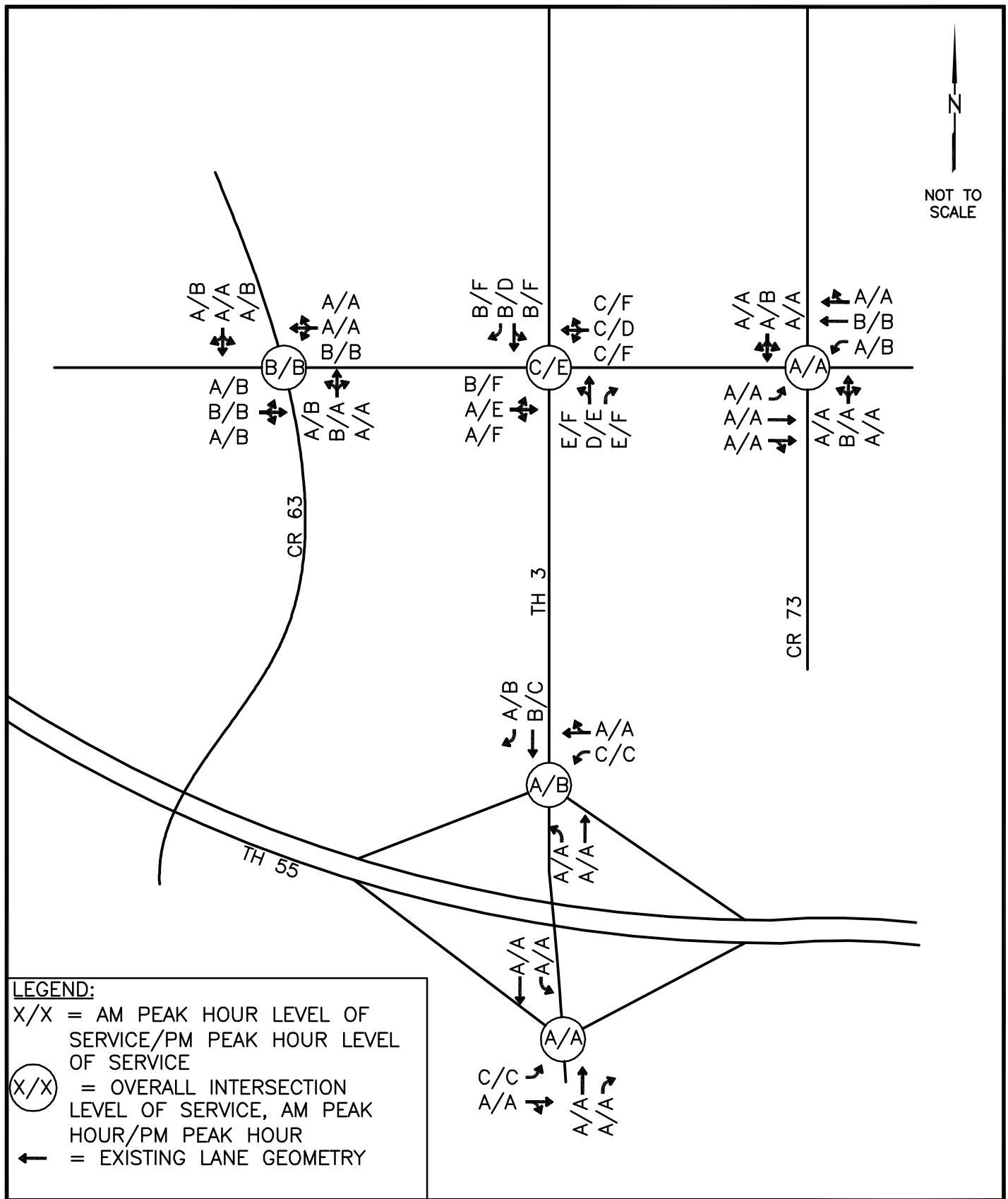


FIGURE 21-3

EXISTING CONDITIONS LEVEL OF SERVICE
 INVER GROVE HEIGHTS AUAR

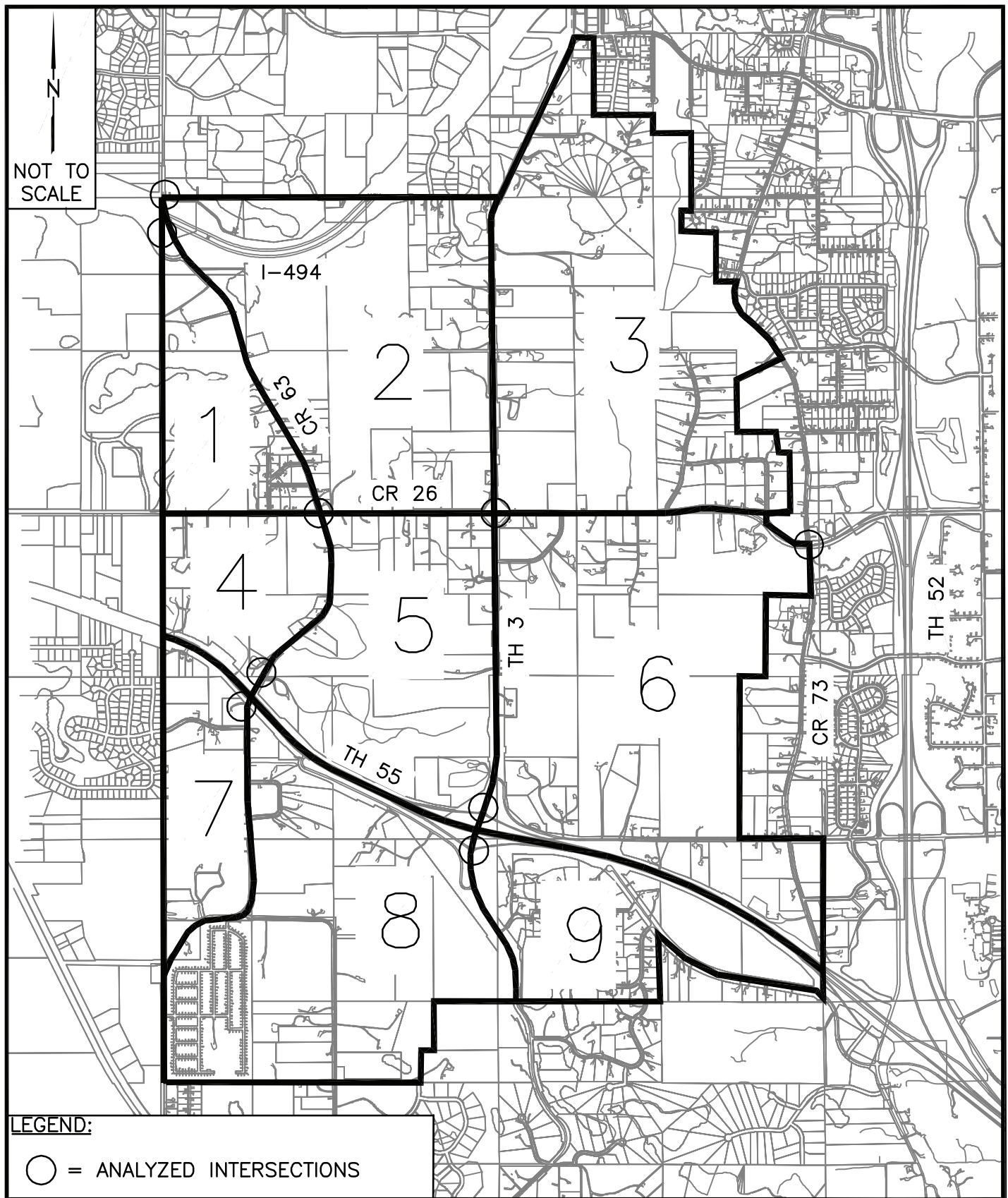


FIGURE 21-4

TRAFFIC ANALYSIS ZONES
INVER GROVE HEIGHTS AUAR

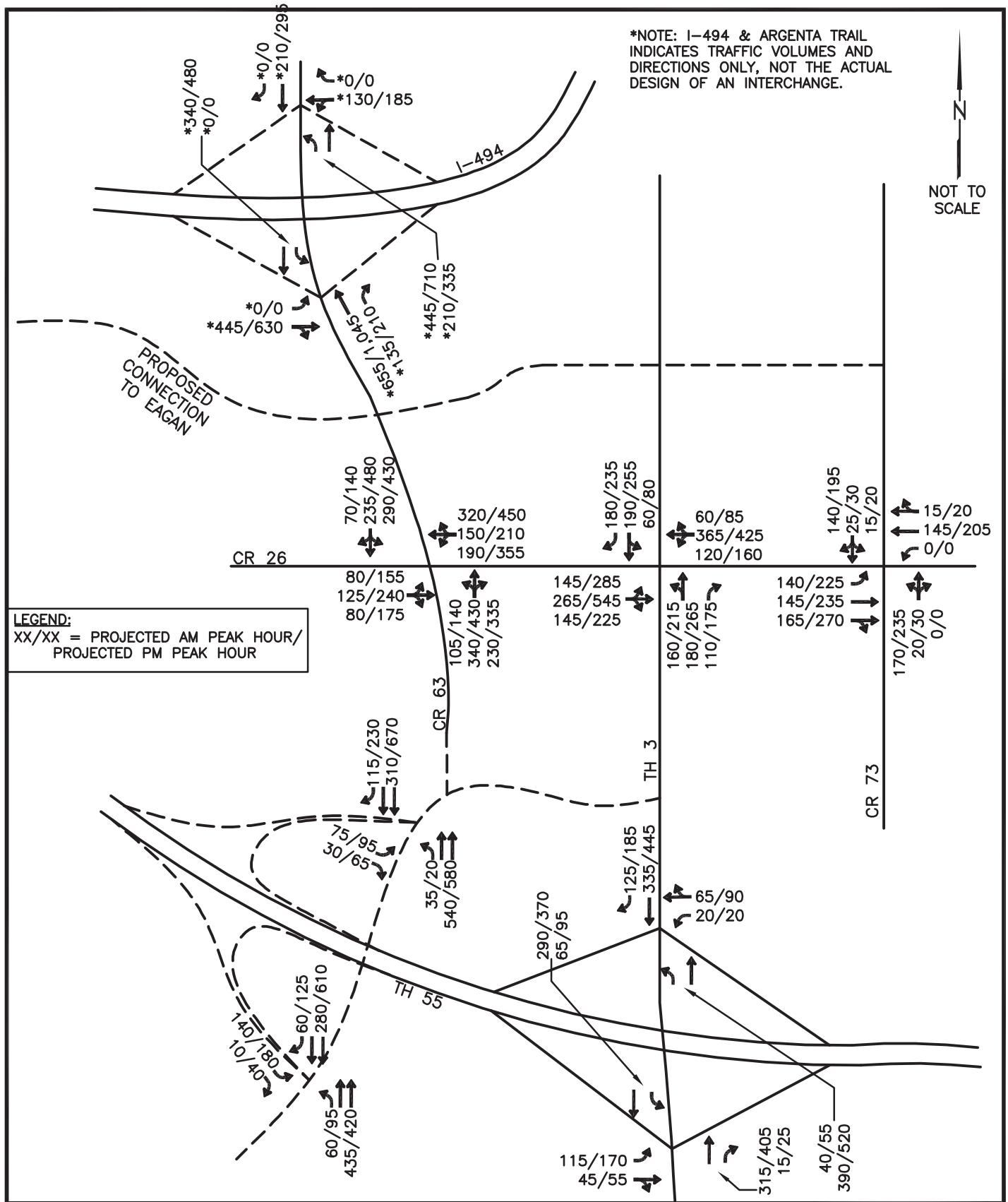
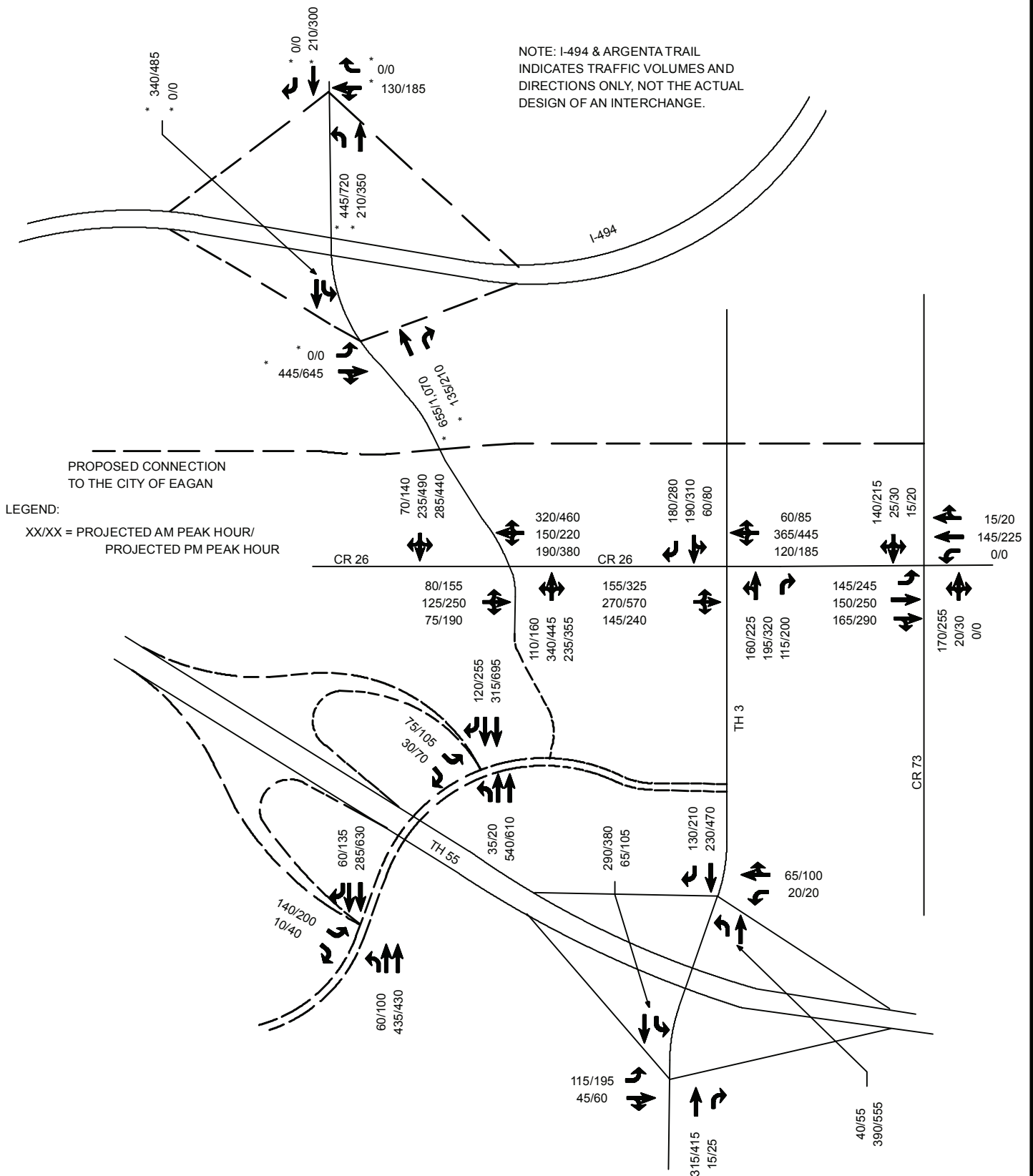


FIGURE 21-5

PROJECTED DEVELOPMENT VOLUMES INVER GROVE HEIGHTS AUAR



City of Inver Grove Heights
Northwest Expansion
Area AUAR
Updated
Projected Development Volumes

August 2007

Figure 21-5A



NOT TO SCALE

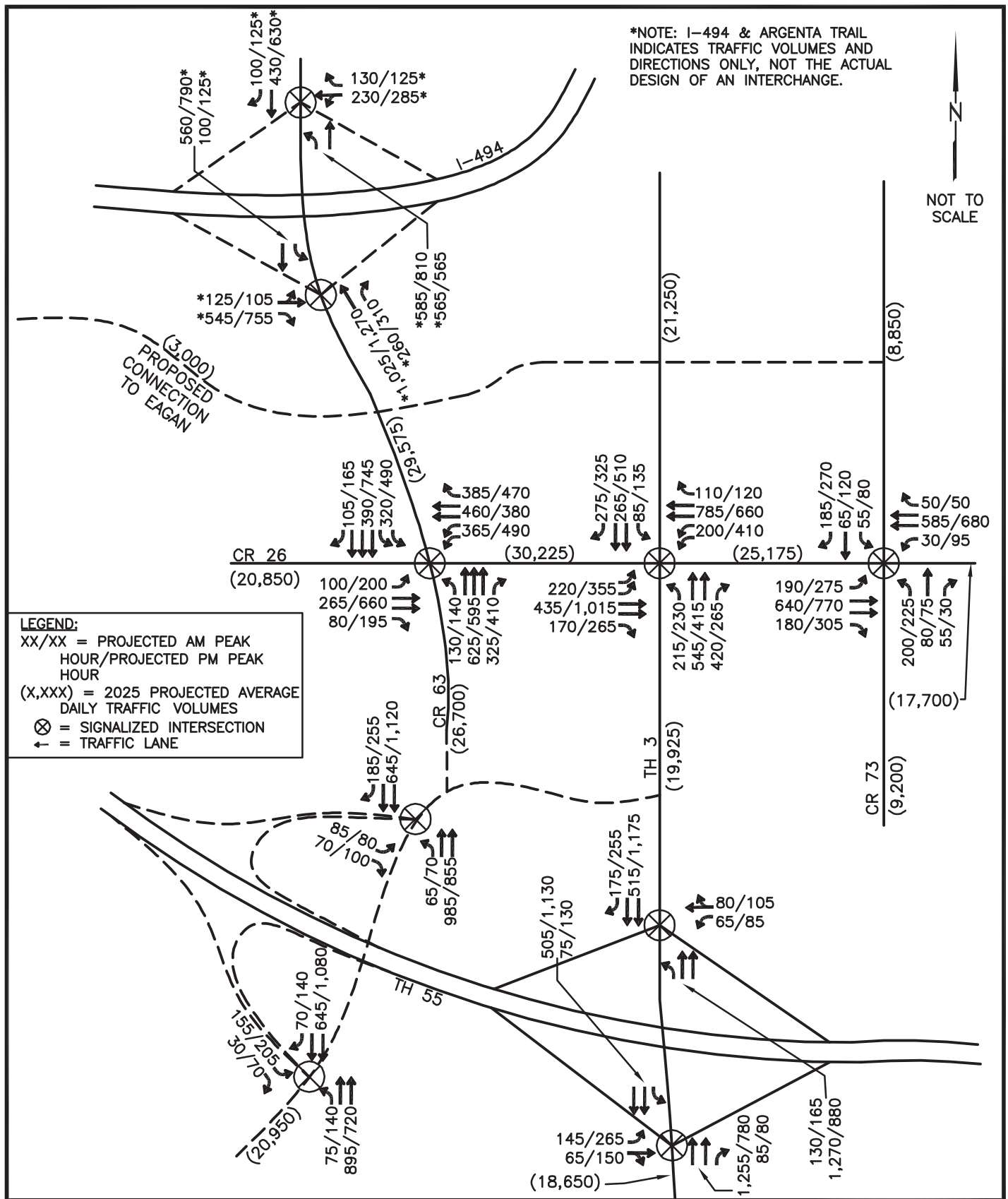
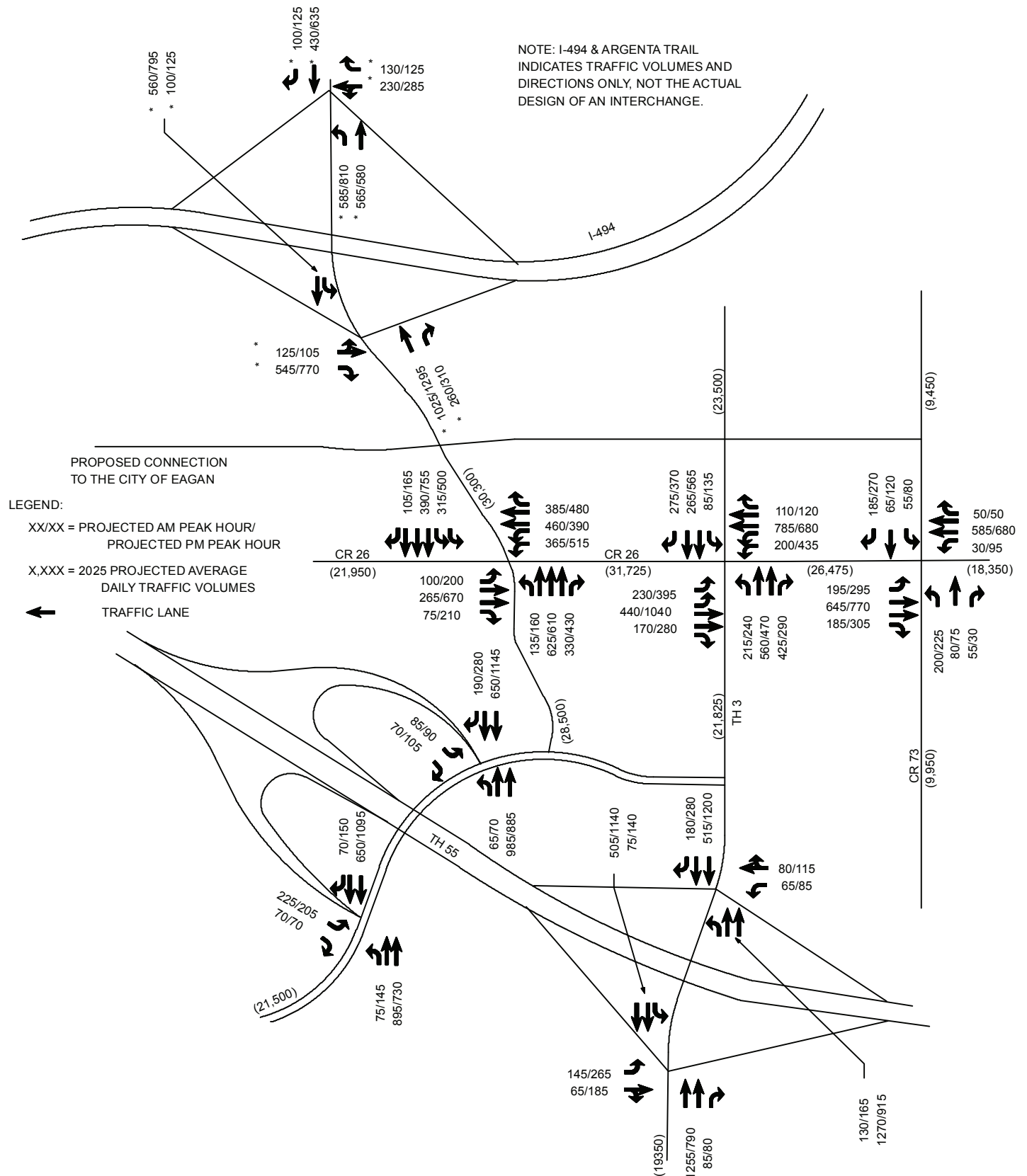


FIGURE 21-6

2025 VOLUMES AND PROPOSED GEOMETRY INVER GROVE HEIGHTS AUAR



City of Inver Grove Heights
 Northwest Expansion
 Area AUAR
 Updated
 2025 Volumes &
 Proposed Geometry
 Figure 21-6A



NOT TO SCALE

August 2007

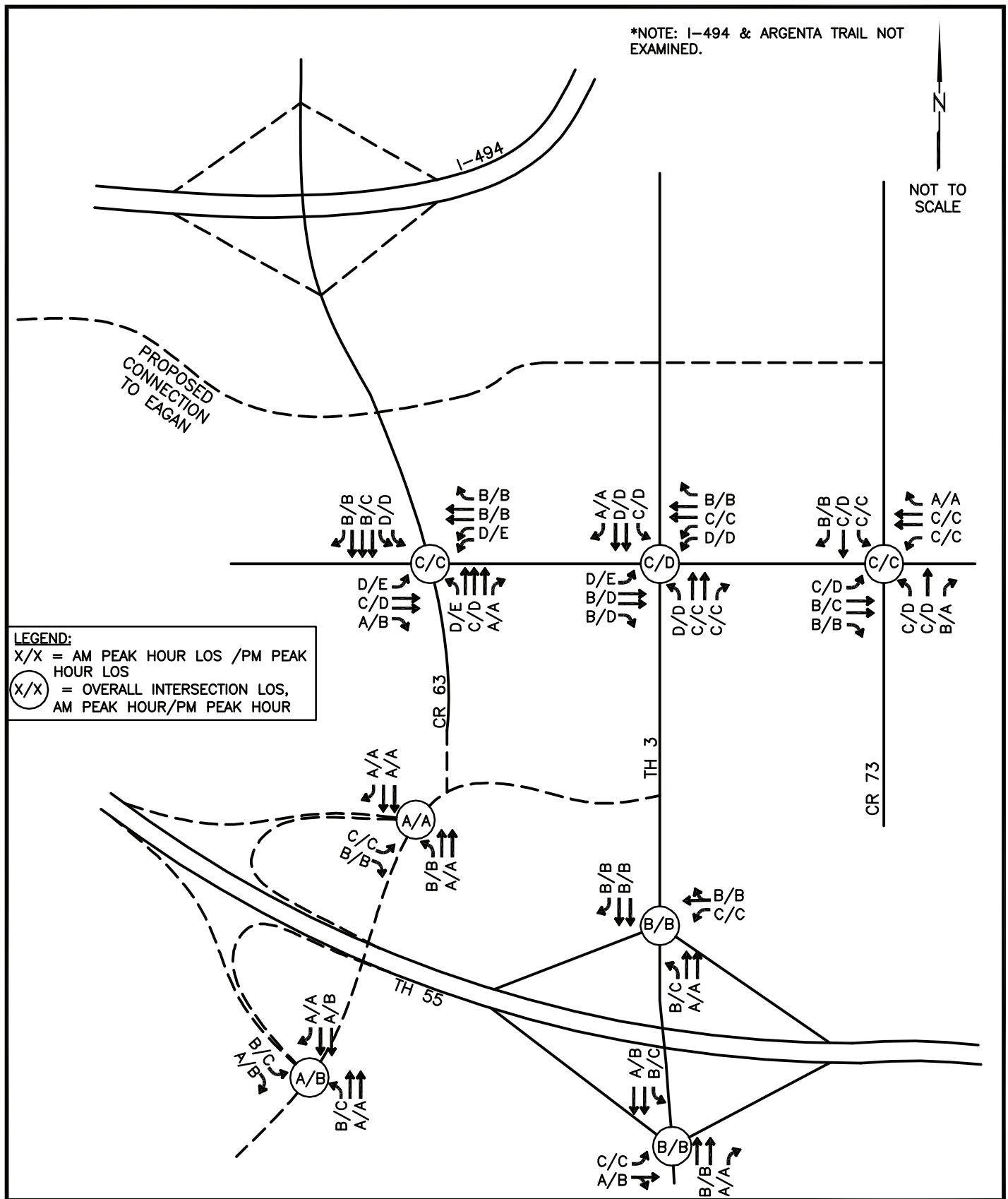


FIGURE 21-7

2025 PROPOSED LEVEL OF SERVICE INVER GROVE HEIGHTS AUAR

-10-

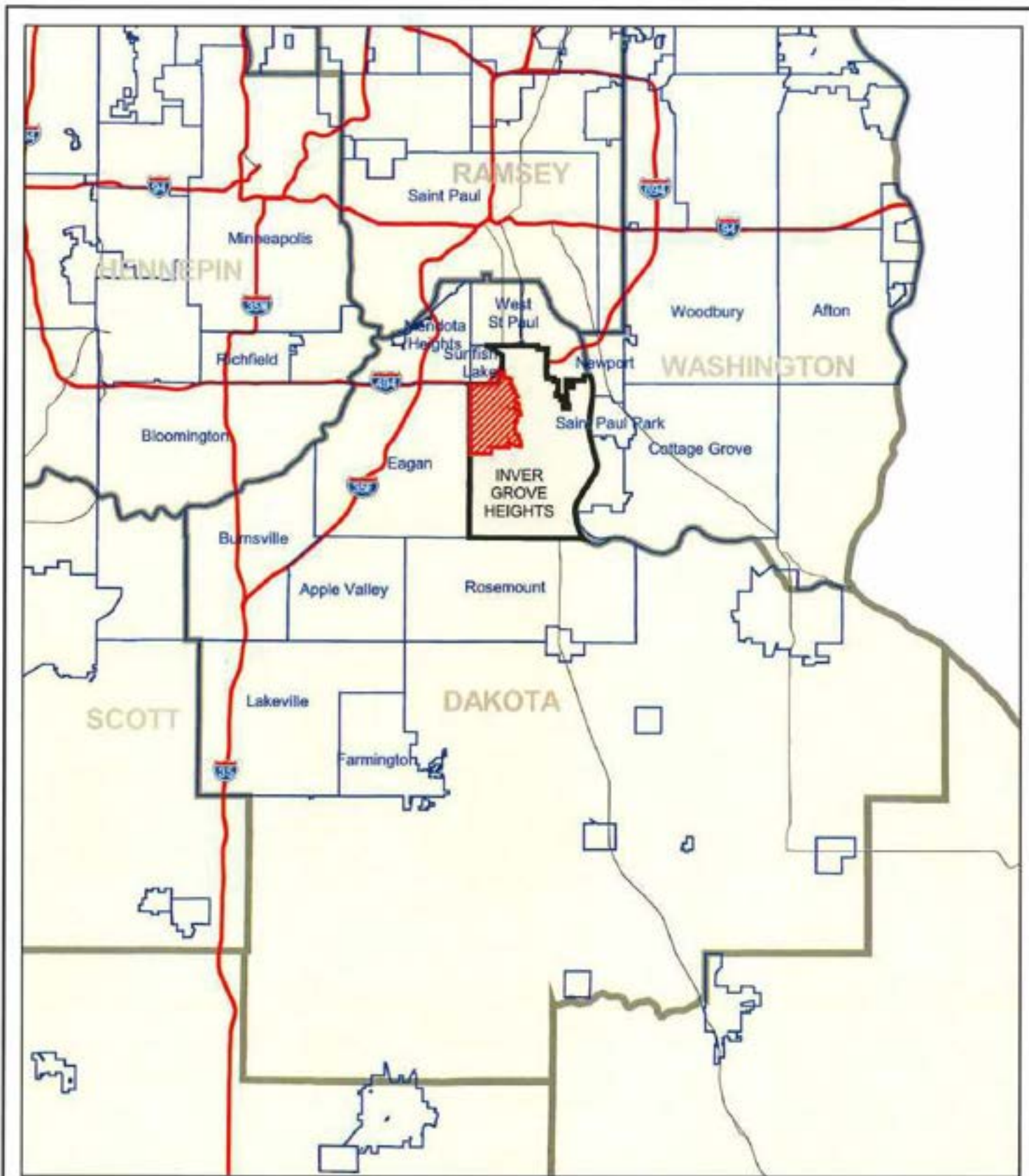


FIGURE 25

LOCATIONS INVENTORIED FOR HISTORIC STRUCTURES

(Excerpt from USGS Topographic Quadrangle for Inver Grove Heights, MN)

ATTACHMENT D: 2005 AUAR FIGURES



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March 2005

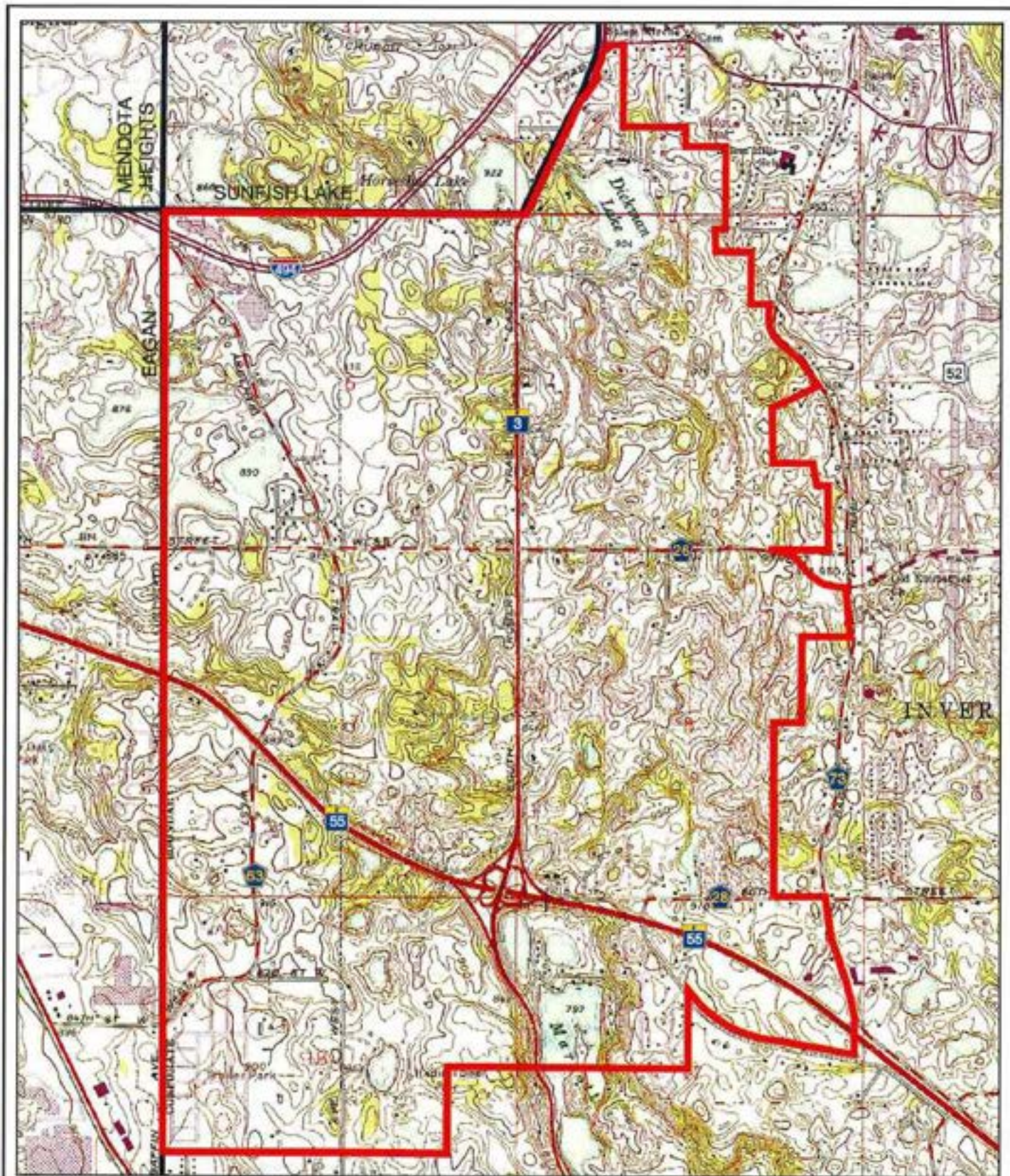
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City of Inver Grove Heights
Northwest Expansion
Area AUAR
PROJECT LOCATION

Figure 5-1



- Project Boundary
- Inver Grove Heights
- County Boundaries



Feet
2000 0 2000

March 2005

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City of Inver Grove Heights
Northwest Expansion
Area AUAR
PROJECT BOUNDARY

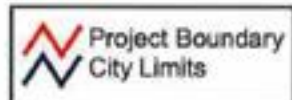
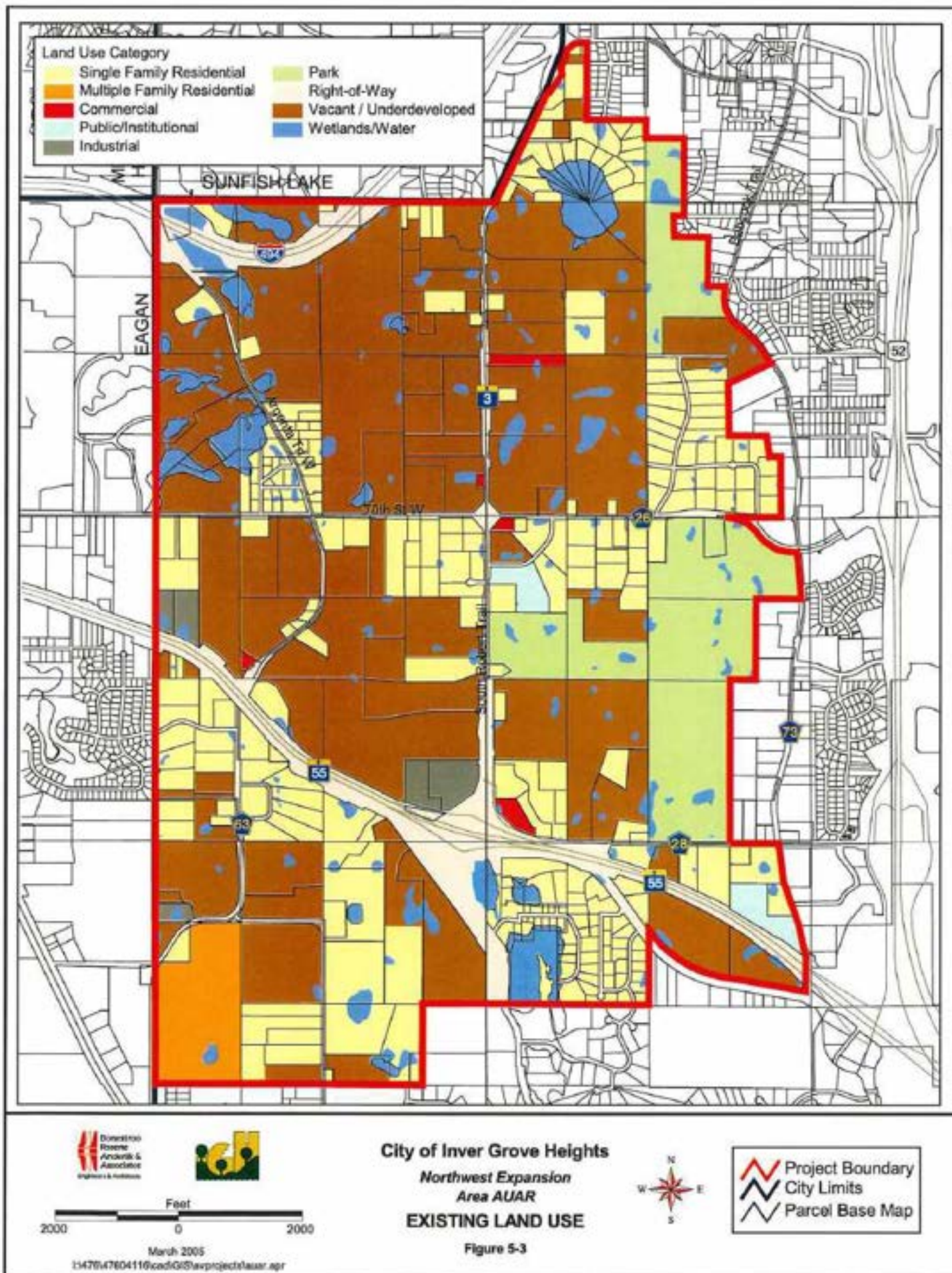
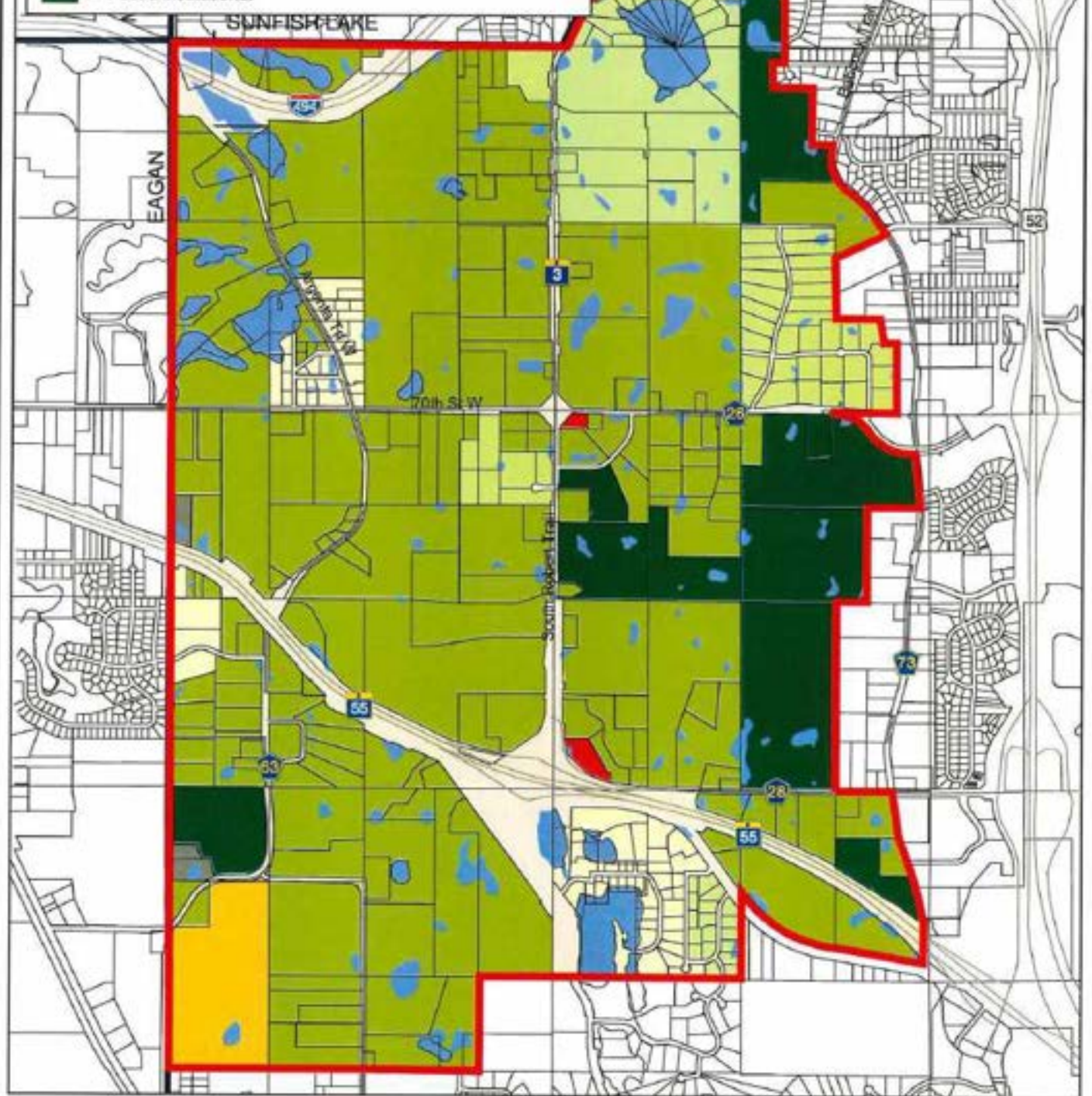


Figure 5-2



Zoning Category

- | | |
|--|---|
|  AG Agricultural |  R-1A Single Family (1.0 ac.) |
|  B-3 General Business |  R-1C Single Family (0.25 ac.) |
|  E-1 Estate (2.5 ac.) |  R-4 Mobile Home Park |
|  E-2 Estate 1.75 ac.) |  Right-of-Way |
|  I-1 Shopping Center |  Wetland/Water |
|  P Public/Institutional | |



City of Inver Grove Heights

*Northwest Expansion
Area AUAR*

EXISTING ZONING

Figure 5-4

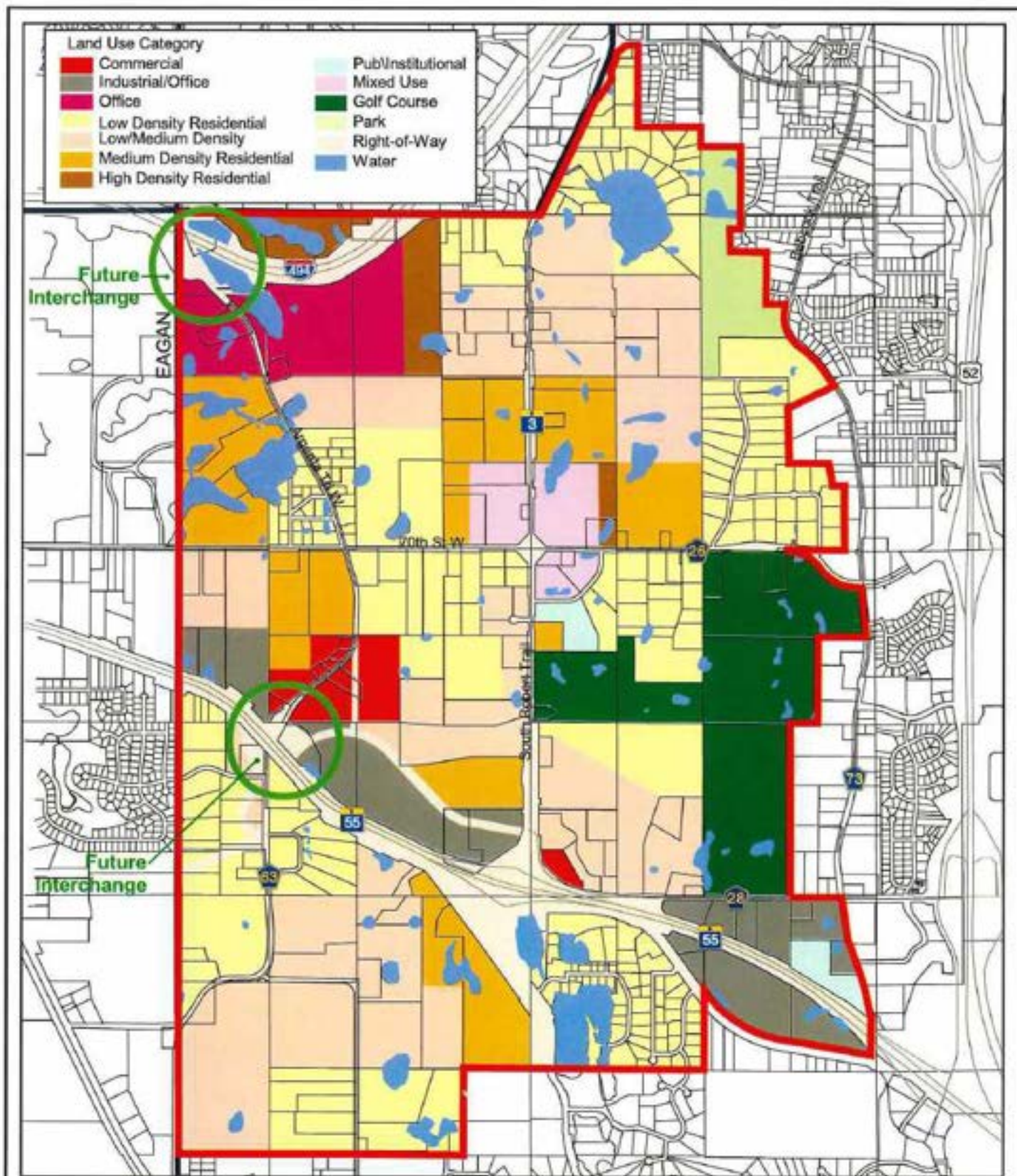


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 Project Boundary
 City Limits



Feet
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March 2005

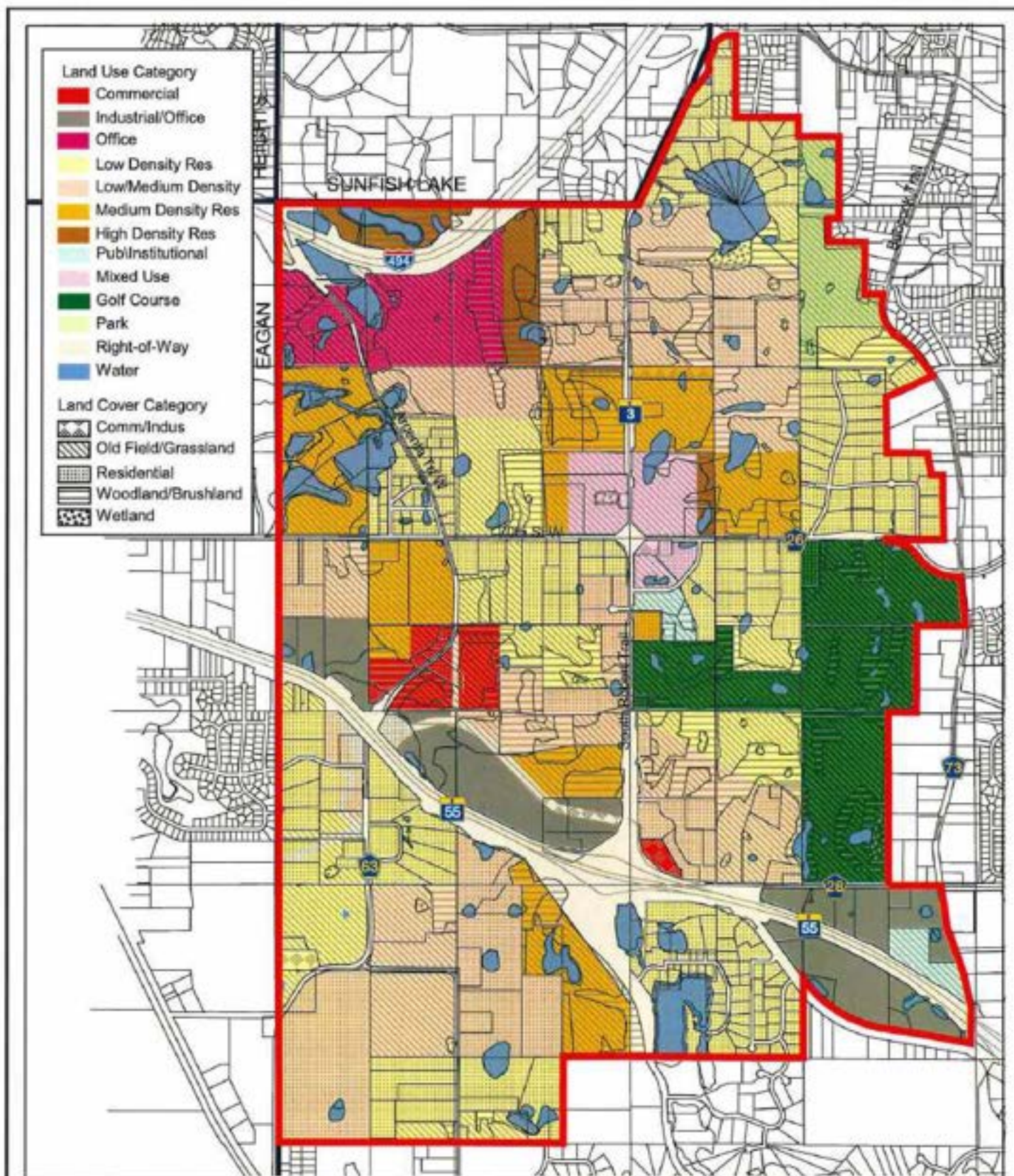
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City of Inver Grove Heights
Northwest Expansion
Area AUAR
PROPOSED LAND USE



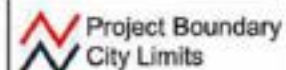
Project Boundary
 City Limits
 Parcel Base Map

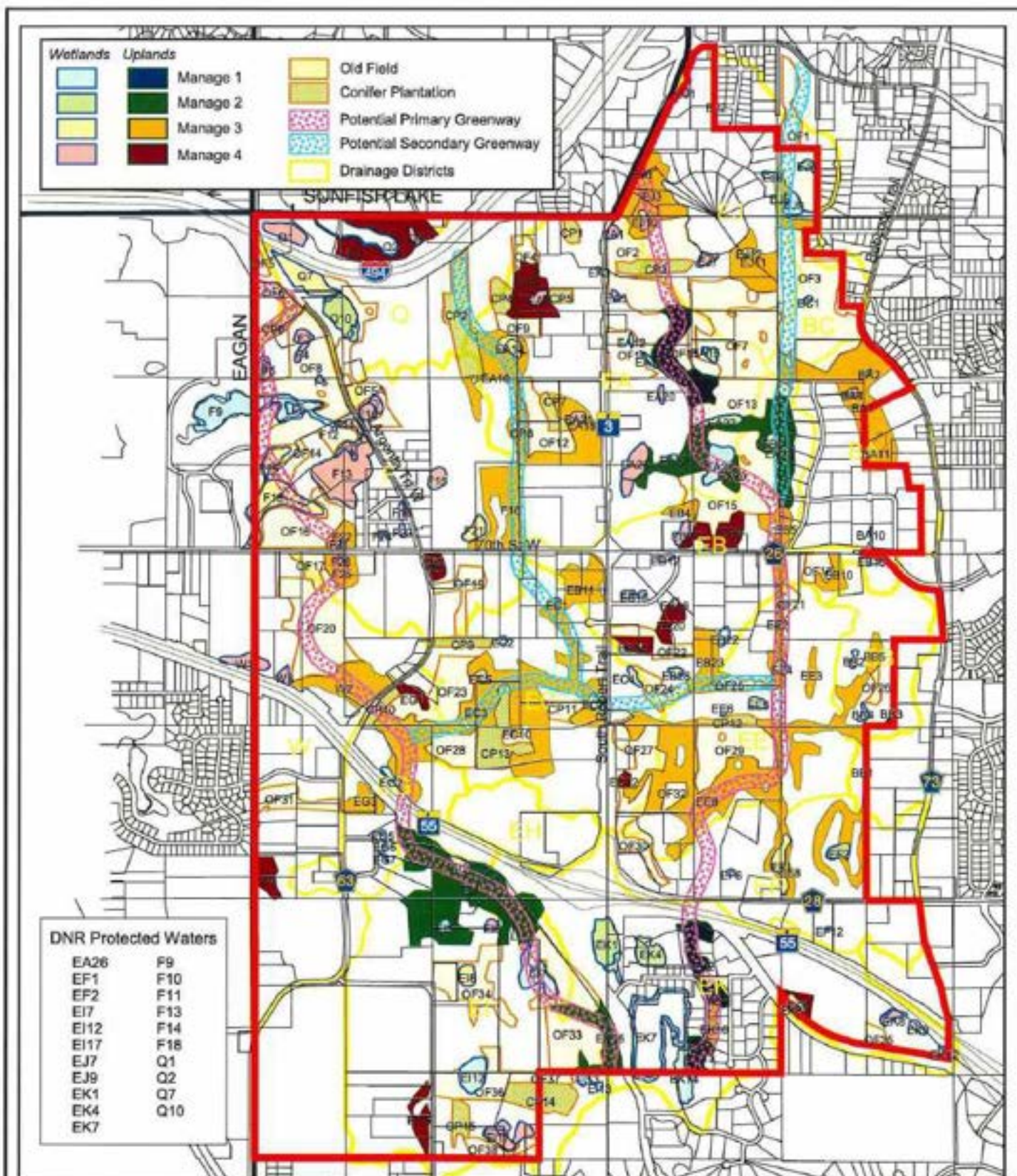
Figure 5-5



March 2005

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March 2005

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City of Inver Grove Heights

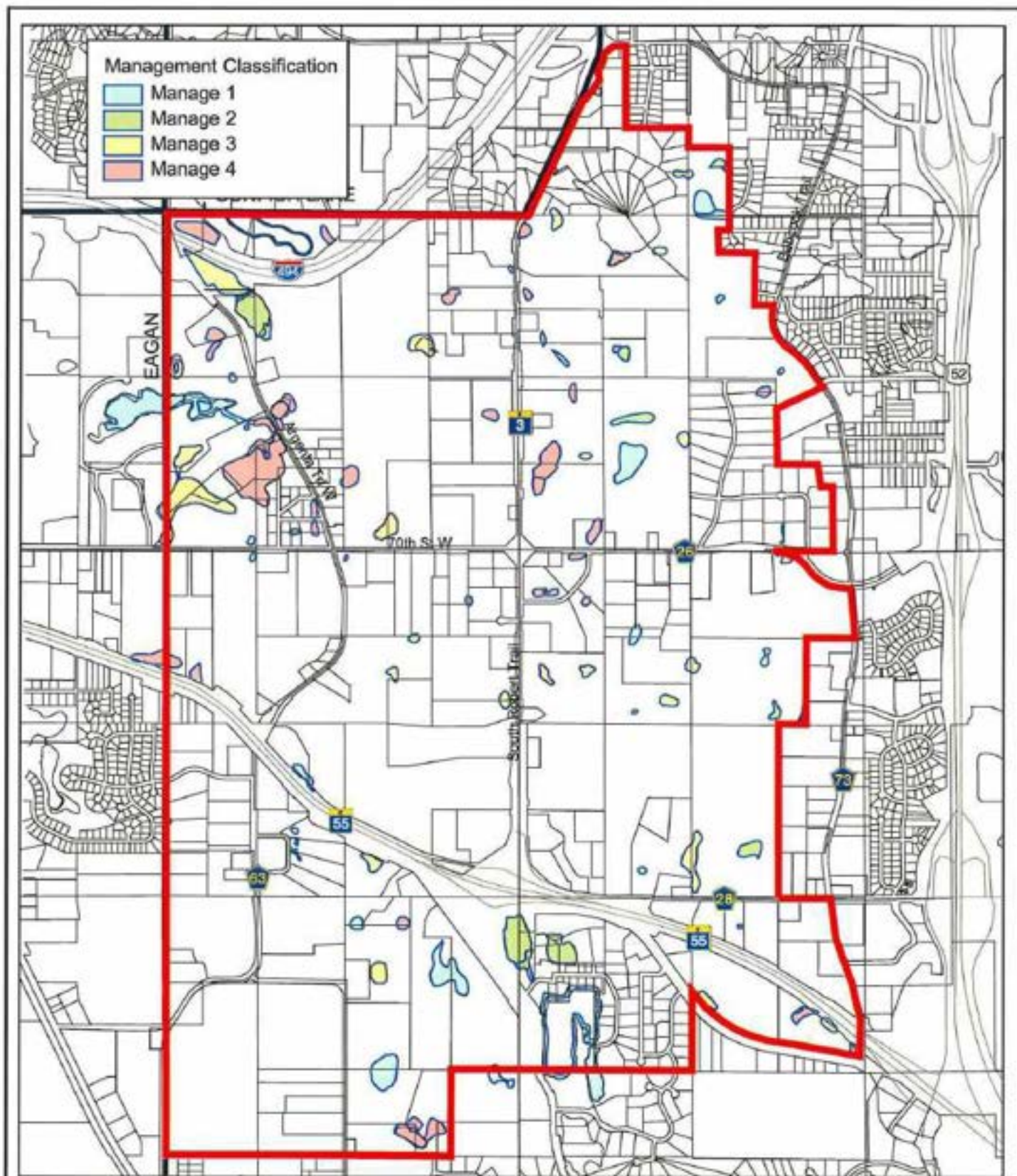
Northwest Expansion
Area AUAR

Wetland and Upland Management Classification

Figure 10-3



Project Boundary
City Limits
Parcel Base Map

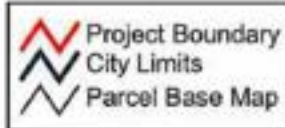


City of Inver Grove Heights

Northwest Expansion
Area AUAR

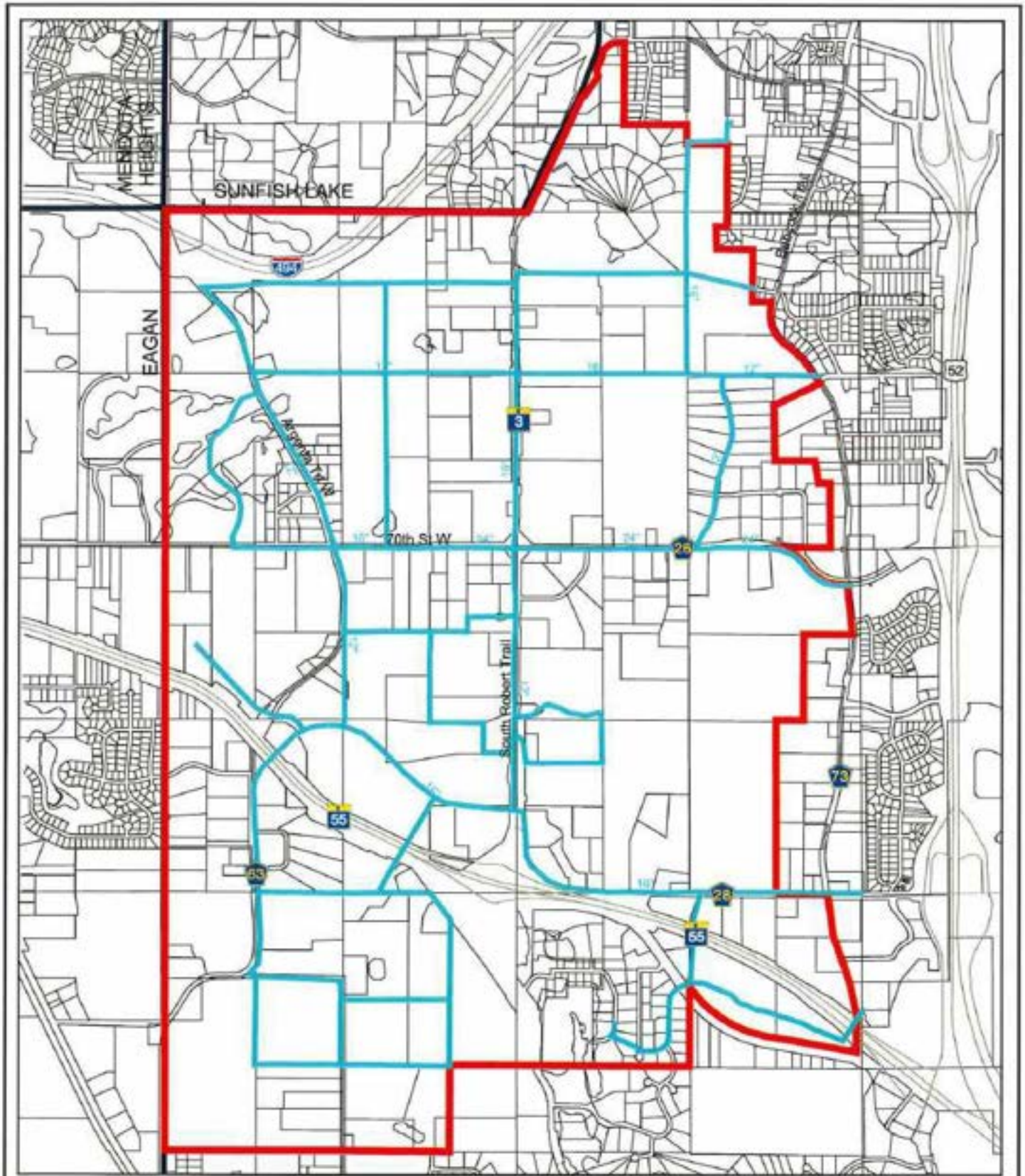
WETLAND MANAGEMENT CLASSIFICATIONS

Figure 12-1



March 2005

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City of Inver Grove Heights
Northwest Expansion
Area AUAR
TRUNK WATER SUPPLY

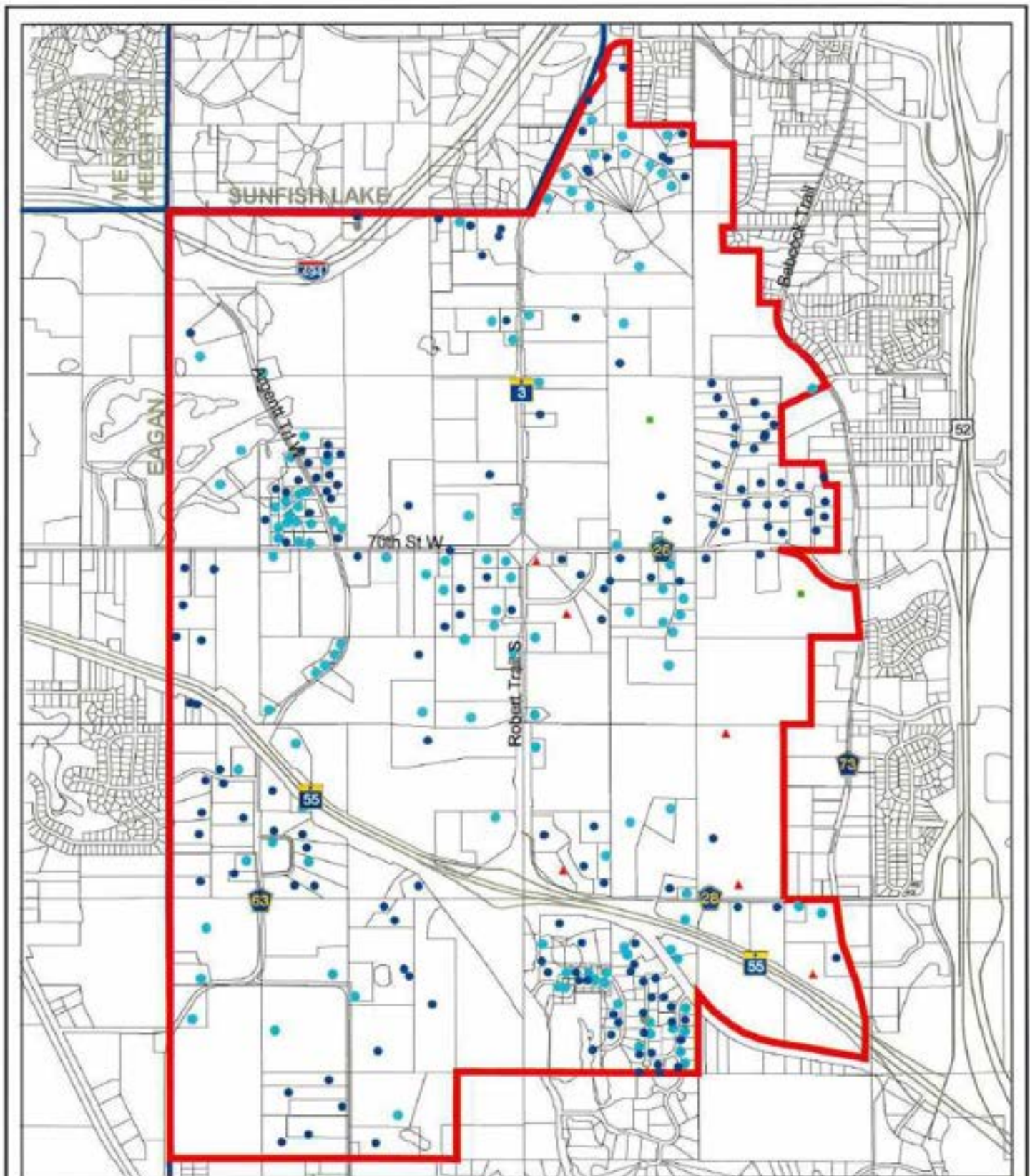


-  Proposed Water Main
-  Project Boundary
-  City Limits

Feet
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March 2005
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Figure 13-1



City of Inver Grove Heights
Northwest Expansion
Area AUAR

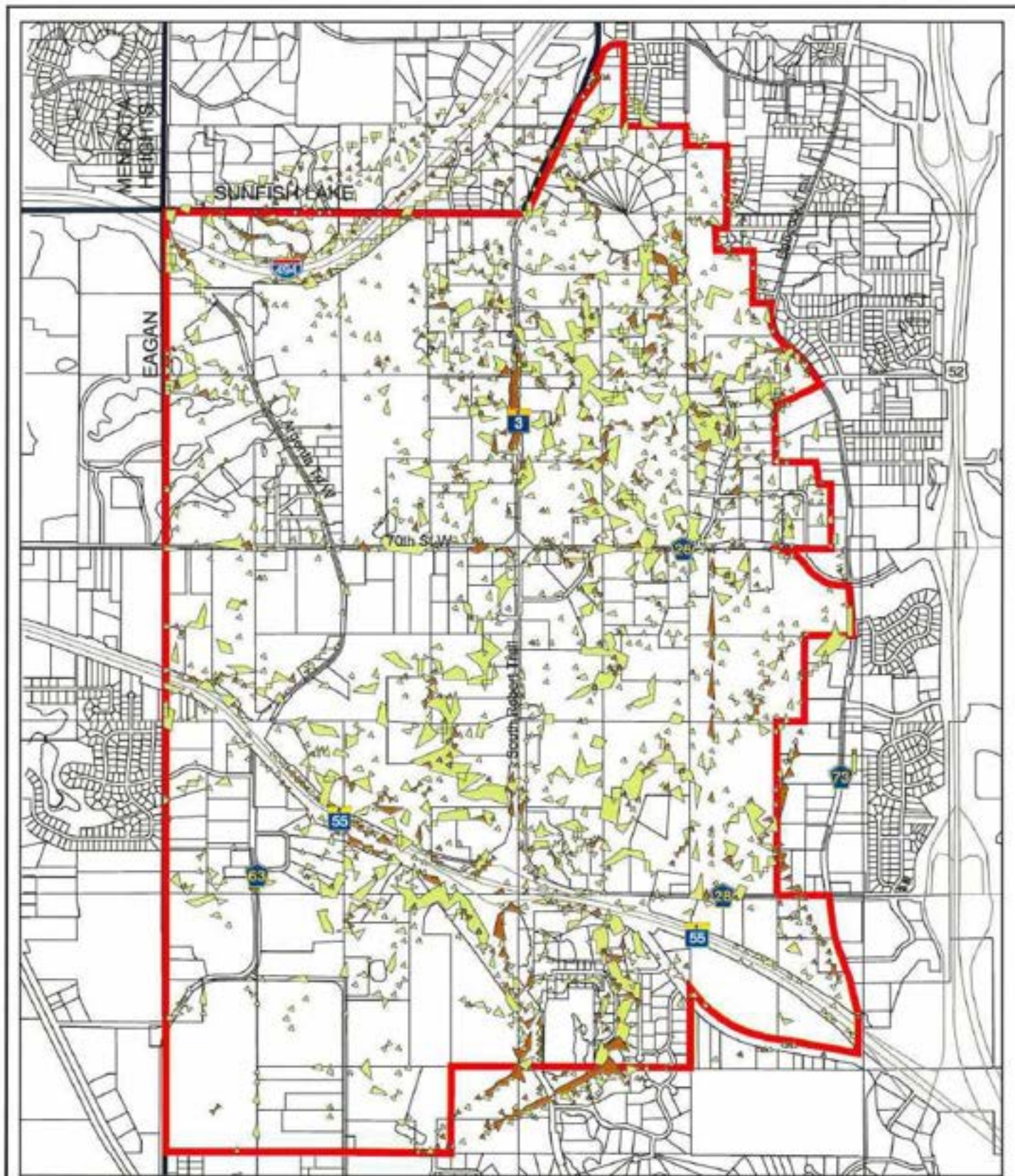
POSSIBLE WELL LOCATIONS

Figure 13-2



- County Well Index**
- Domestic
 - Irrigation
 - ▲ Public supply, non-community, transient
 - Unknown use
 - Assumed Well Sites
- Legend**
- Project Boundary
 - City Boundary
 - Parcel Base Map

Feet
 2000 0 2000



City of Inver Grove Heights
Northwest Expansion
Area AUAR
STEEP SLOPES

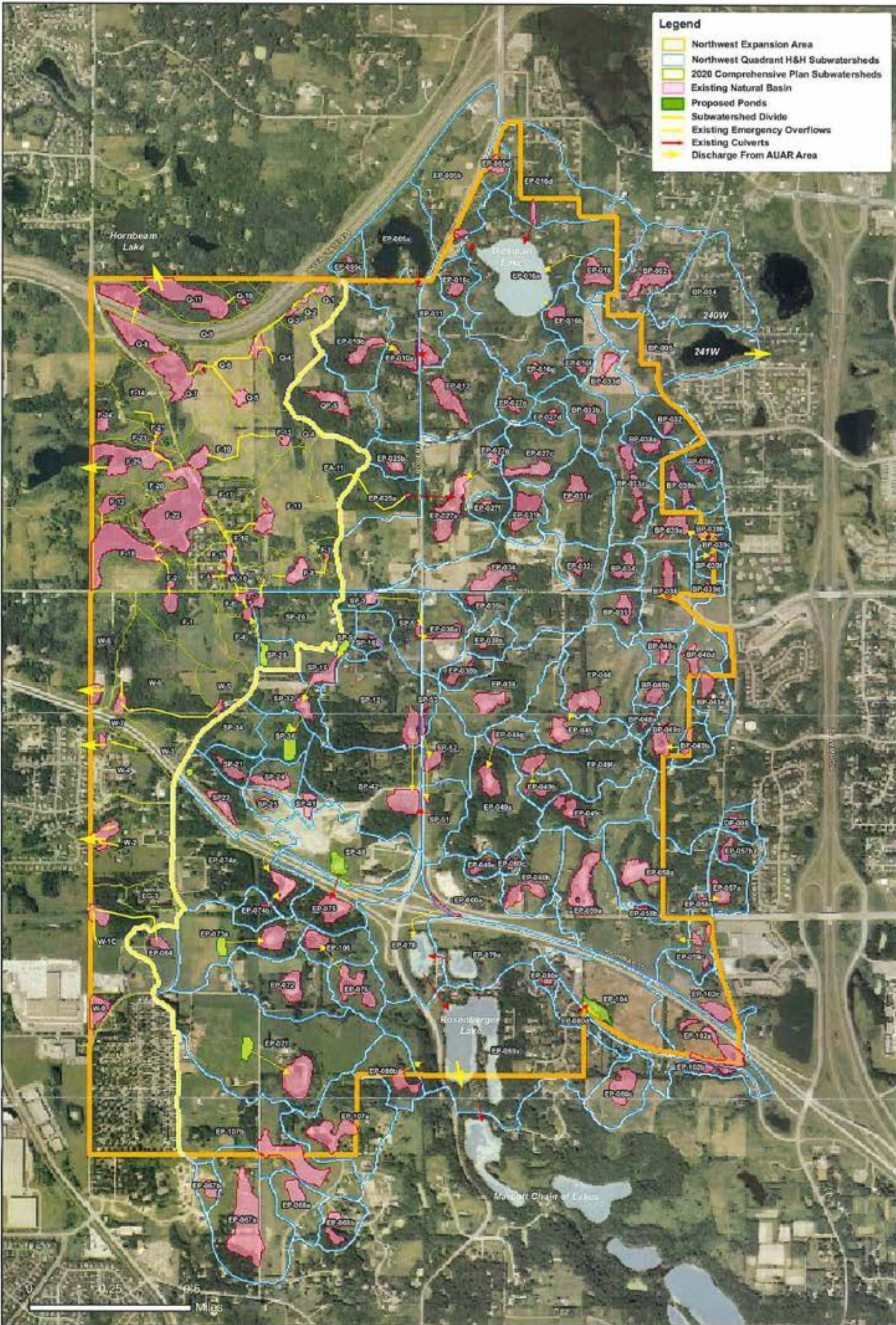
Figure 15-1

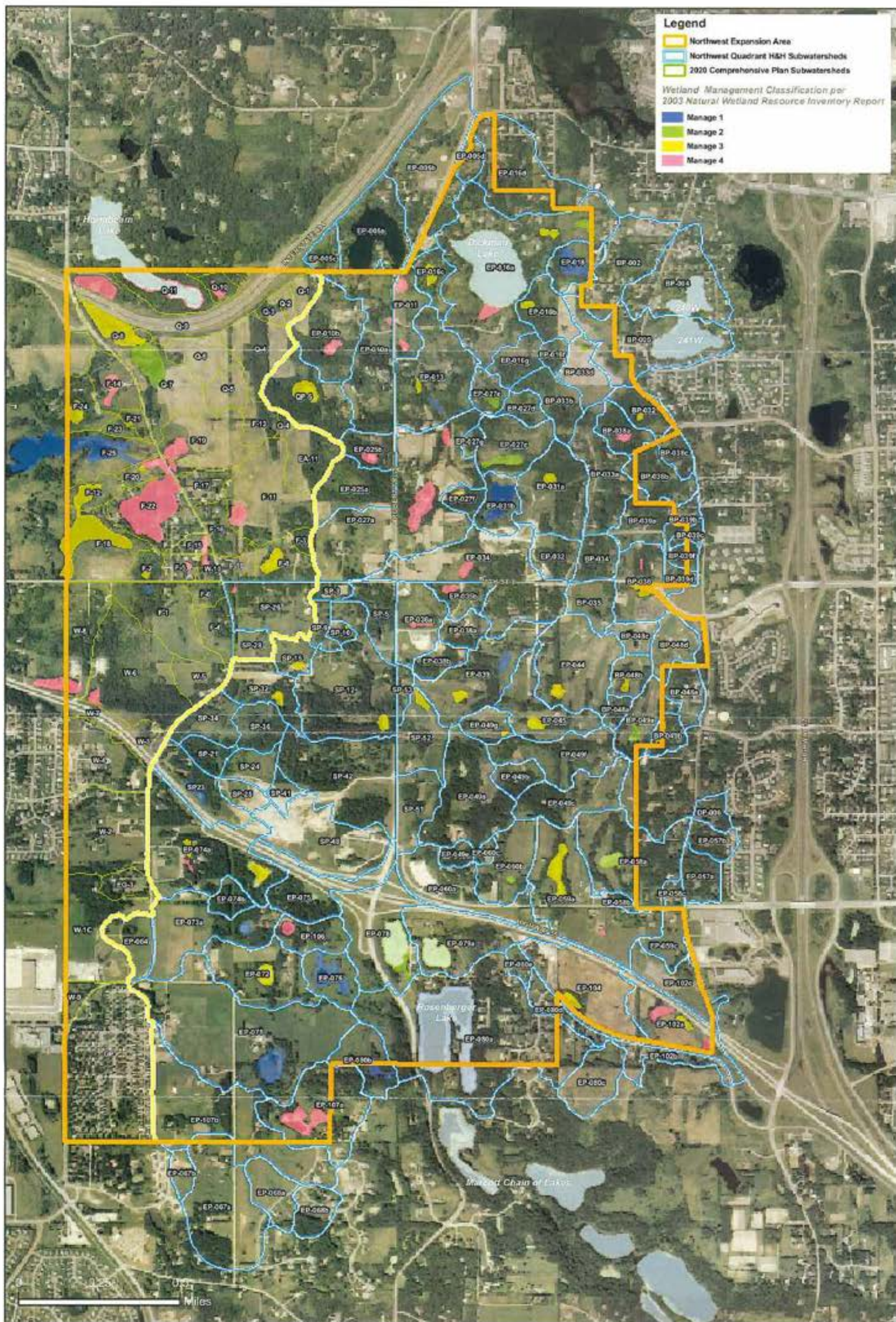


- Slope + 20%
- Slopes 12% - 20%
- Project Boundary
- City Limits
- Parcel Base Map

Foot
 2000 0 2000

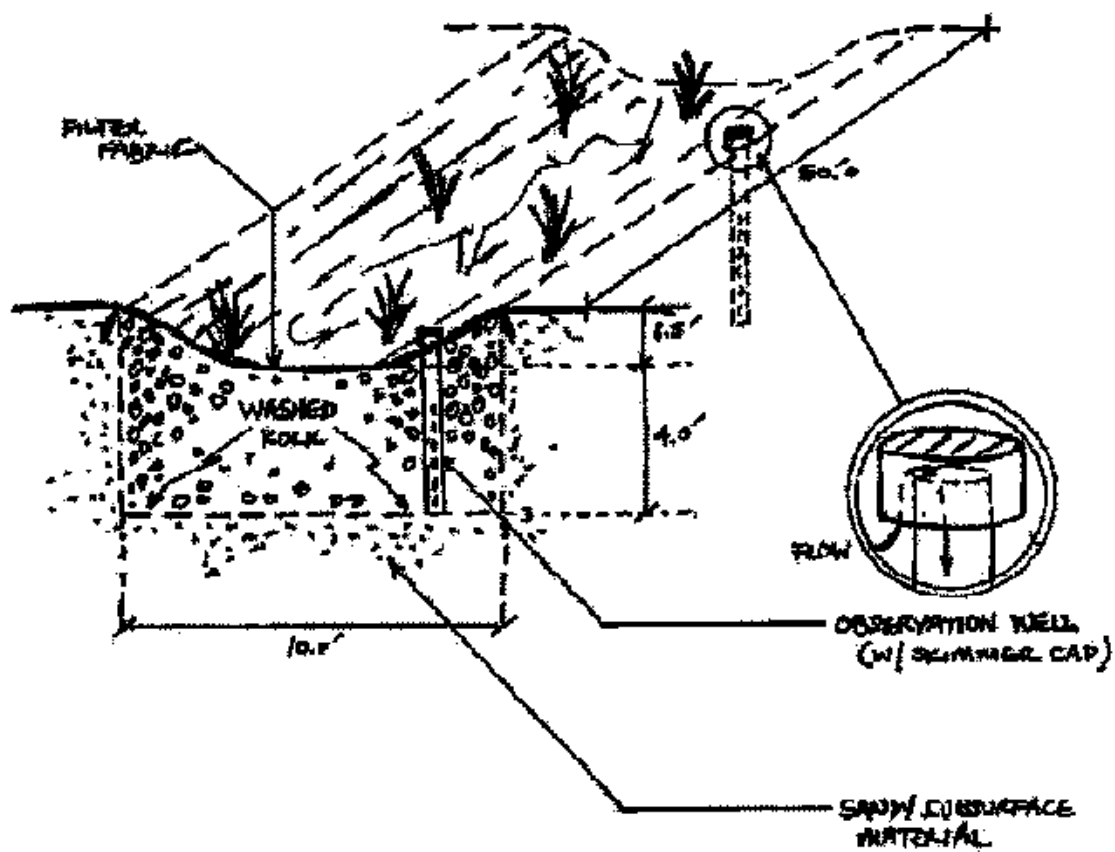
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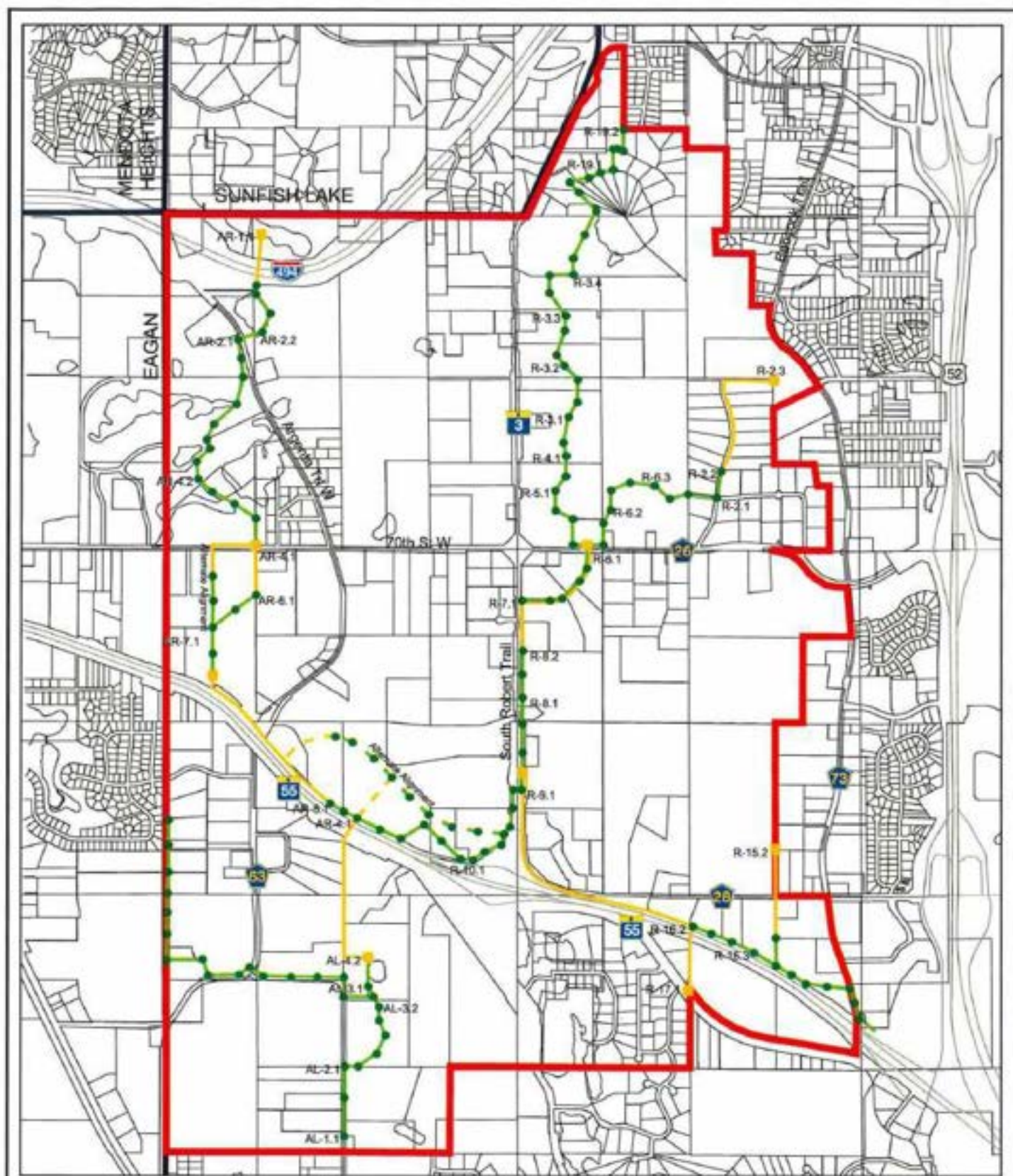




**Northwest Expansion Area
Wetland Management Classification**







City of Inver Grove Heights
Northwest Expansion
Area AUAR

SANITARY SEWER SYSTEM

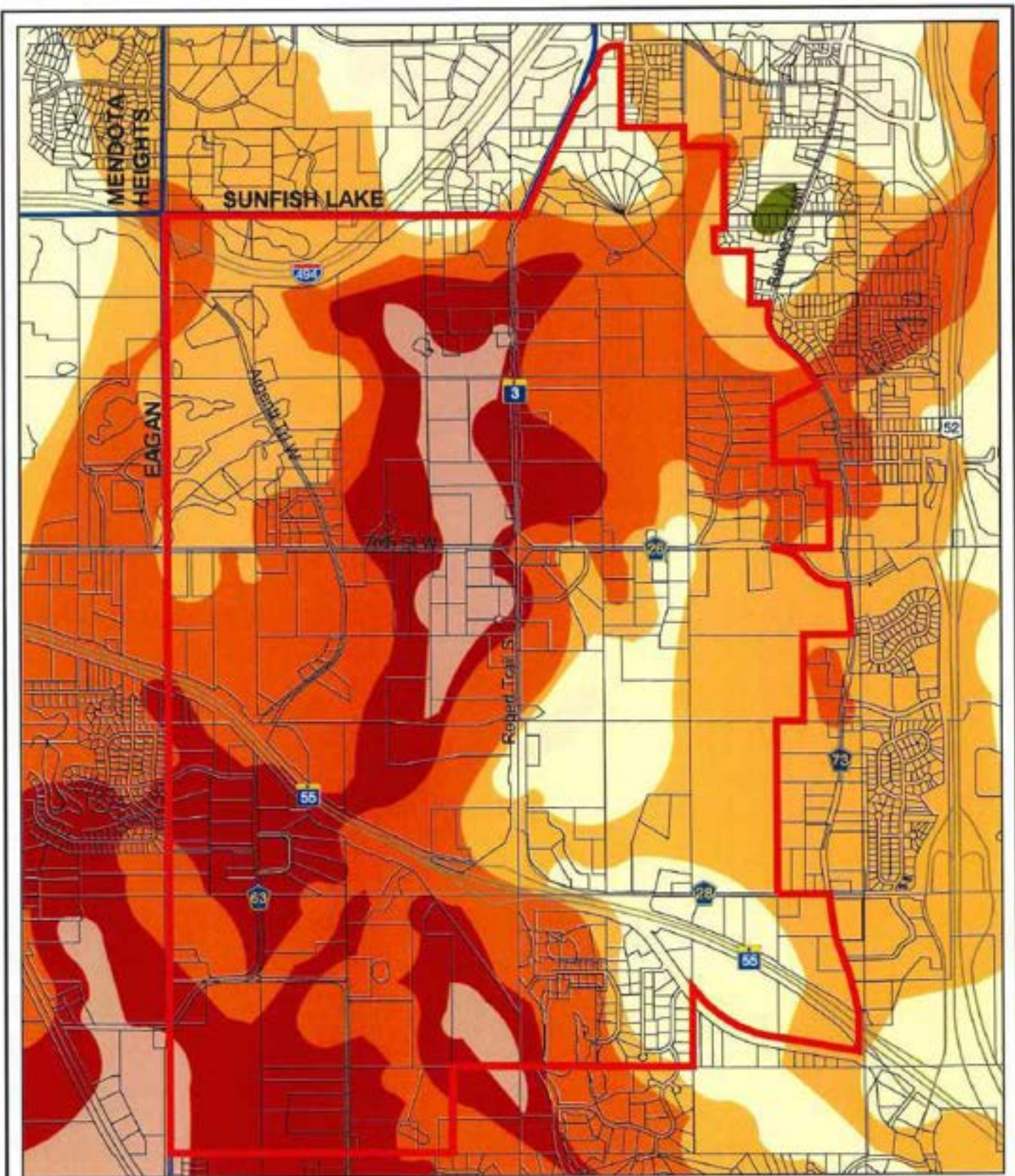
Figure 18-1



- Proposed Manhole
- Proposed Lift Station
- ~ Proposed Sanitary Pipe
- ~ Proposed Forcemain
- ~ Project Boundary
- ~ City Limits

Feet
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March 2005
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Feet
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**Inver Grove Heights
Northwest Expansion
Area AUAR**

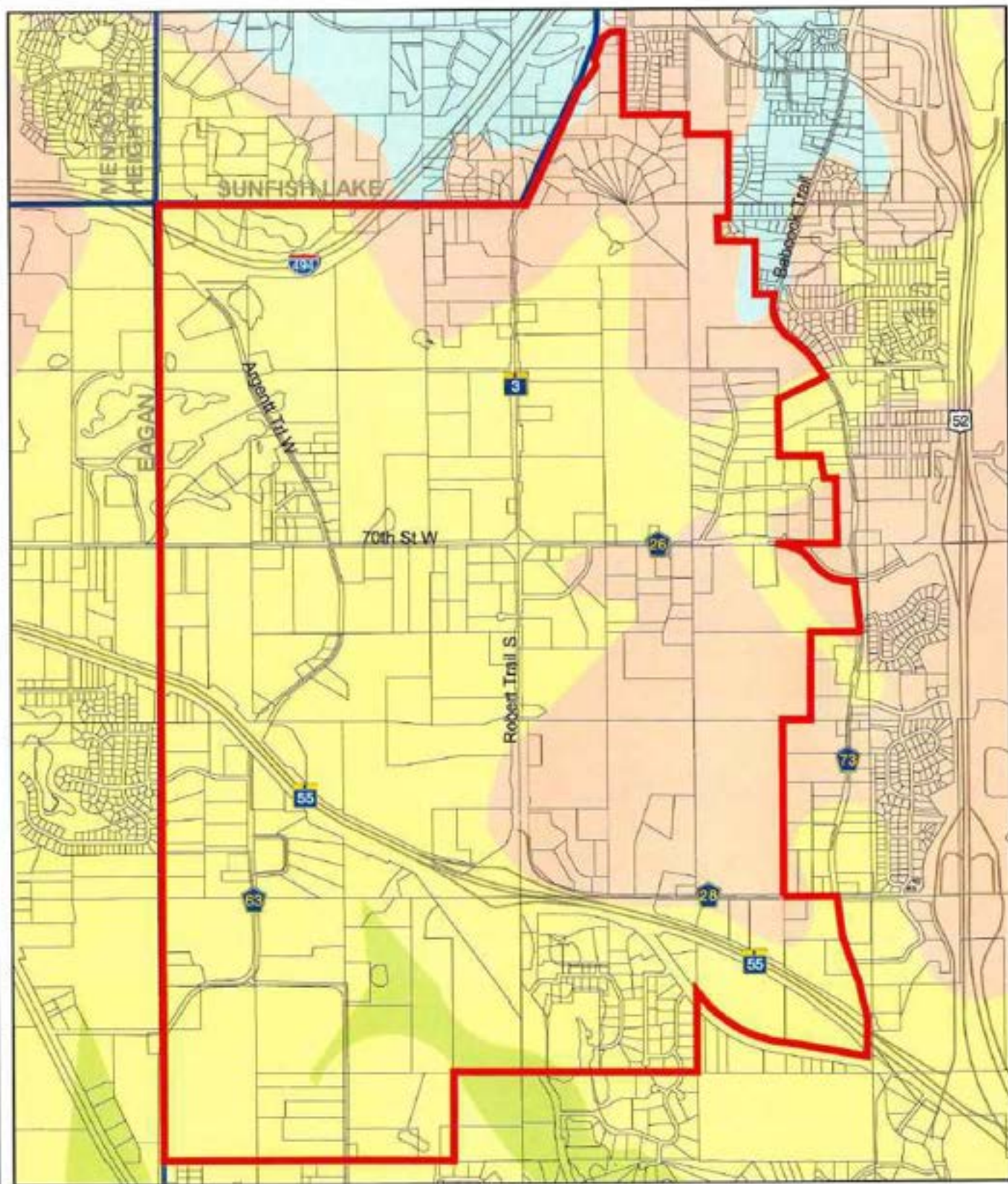
DEPTH TO BEDROCK

Figure 19-1

Depth to Bedrock

0-50	301-350
101-150	351-400
151-200	401-500
201-250	51-100
251-300	Over_500

Study Area Boundary
City Boundary
Parcel Base Map



Feet
2000 0 2000

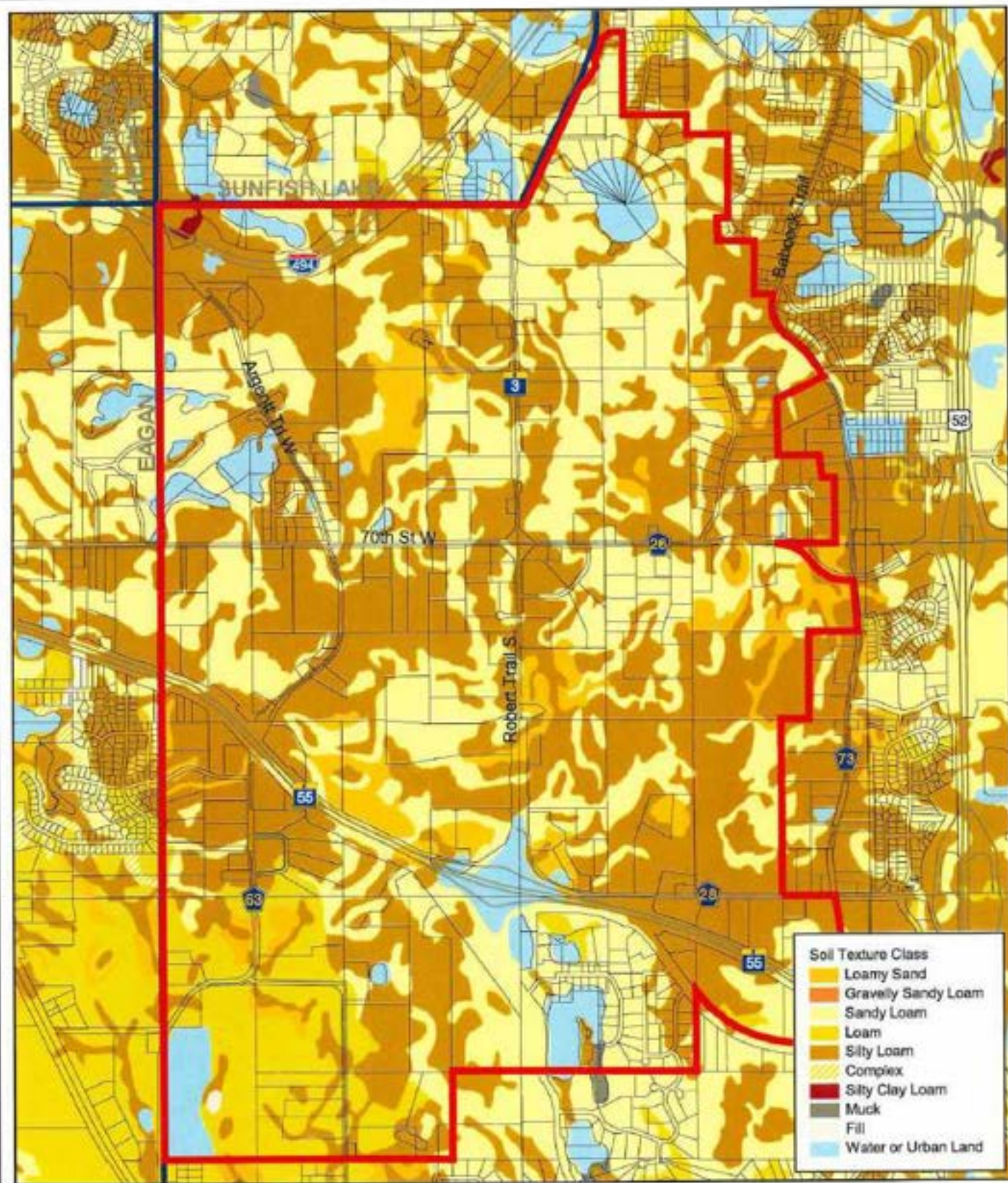
City of Inver Grove Heights
Northwest Expansion
Area AUAR

BEDROCK GEOLOGY

Figure 19-2



- Bedrock Geology**
- Plattville & Glenwood Foss.
 - St. Peter Sandstone
 - Prairie du Chien Group
 - Jordan Sandstone
- Project Boundary**
- City Boundary**
- Parcel Base Map**



City of Inver Grove Heights
Northwest Expansion
Area AUAR

SOILS

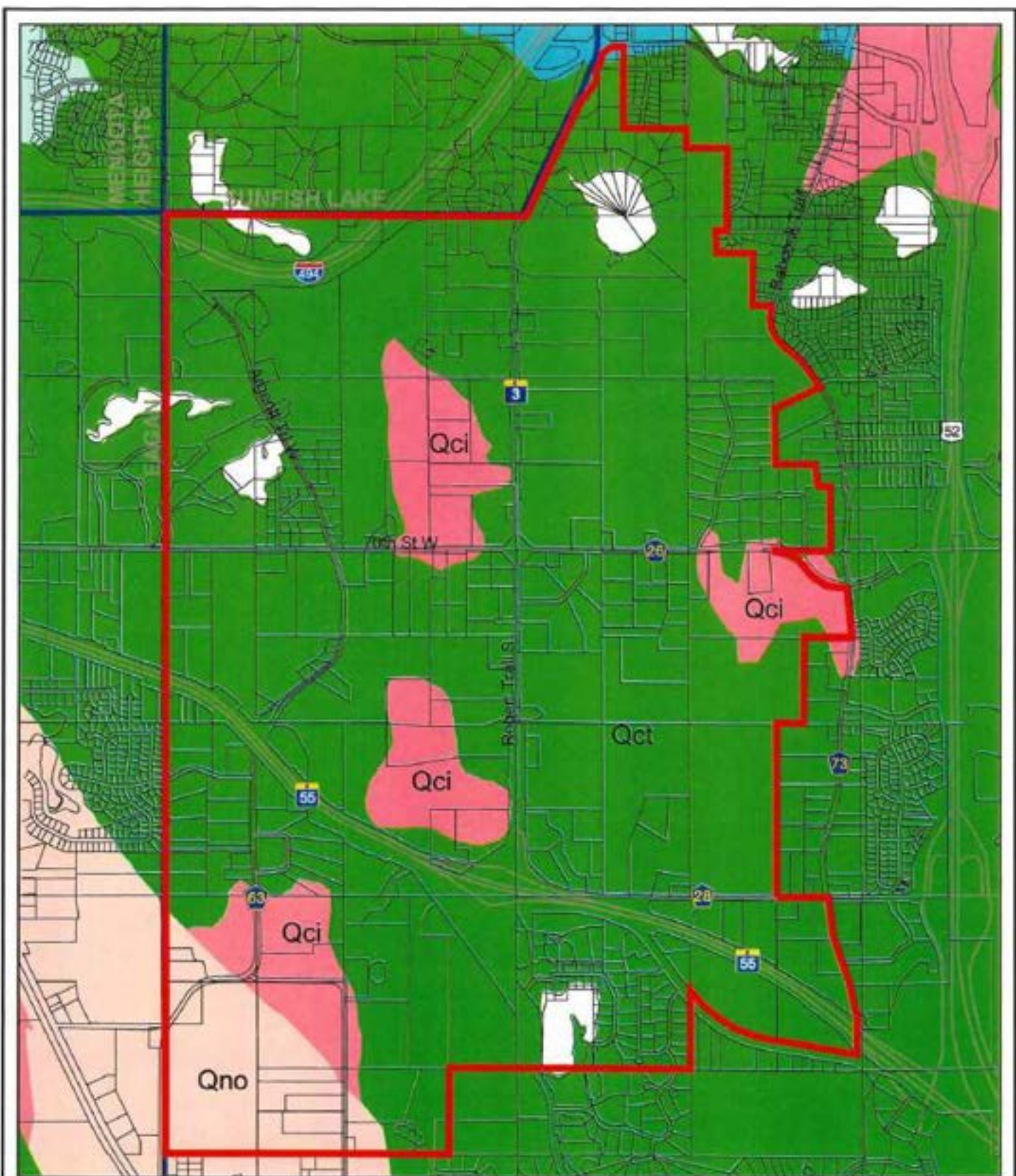
Figure 19-3

Feet
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March 2005

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Feet
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City of Inver Grove Heights
Northwest Expansion
Area AUAR

SURFICIAL GEOLOGY

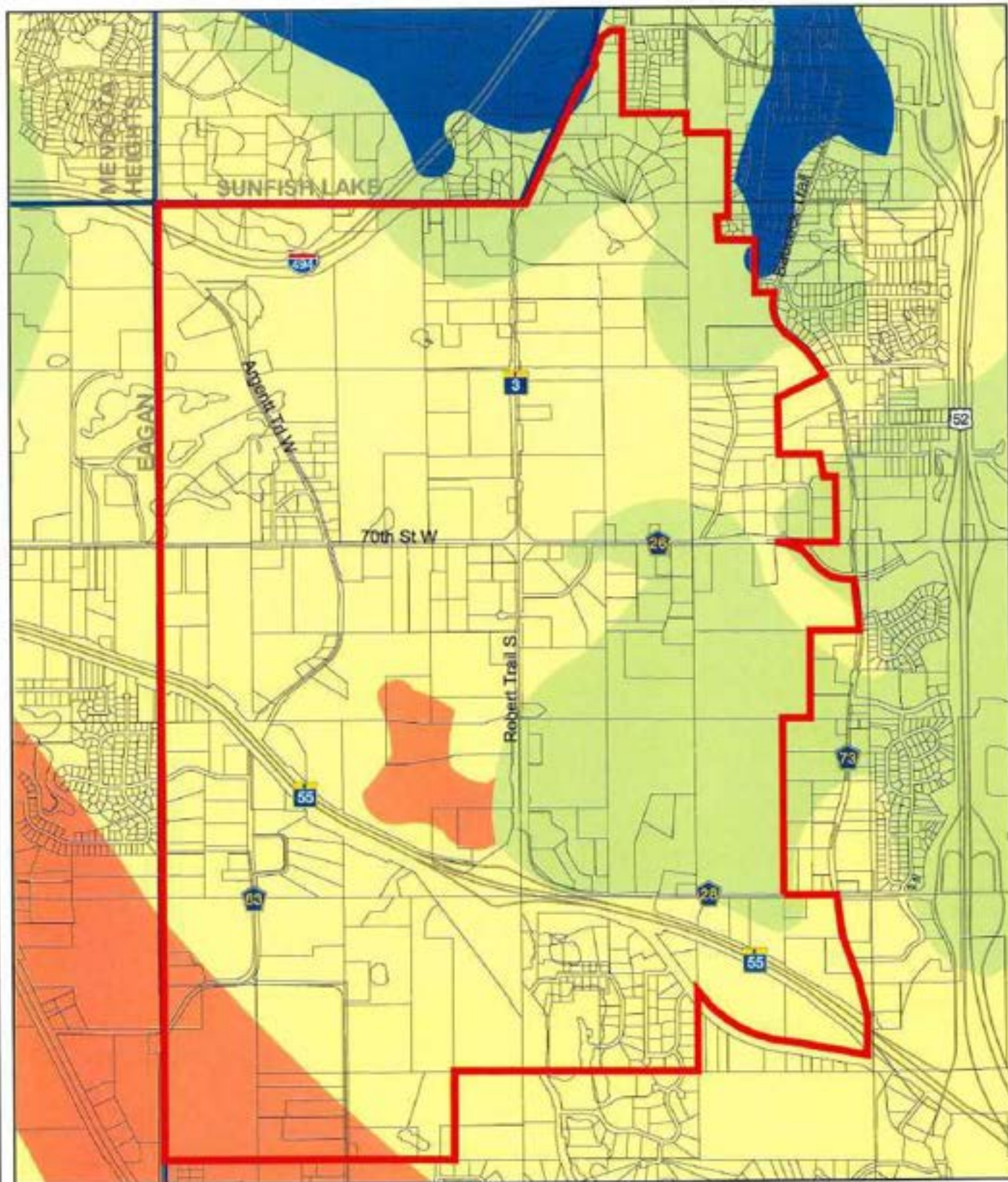
Figure 19-4



- Surficial Geology**
- Qci - Lake sand and silt, Cromwell Fm.
 - Qco - Outwash, Cromwell Fm.
 - Qci - Ice-contact deposits, Cromwell Fm.
 - Qct - Tilt, Cromwell Fm.
 - Project Boundary
 - City Boundary
 - Parcel Base Map

March 2005

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City of Inver Grove Heights
Northwest Expansion
Area AUAR

SENSITIVITY TO AQUIFER

Figure 19-5



Sensitivity Ratings	
Yellow	Moderate
Orange	High/Moderate
Light Green	Low/Moderate
Dark Blue	Very Low
Red Line	Project Boundary
Blue Line	City Boundary
Thin Grey Line	Parcel Base Map

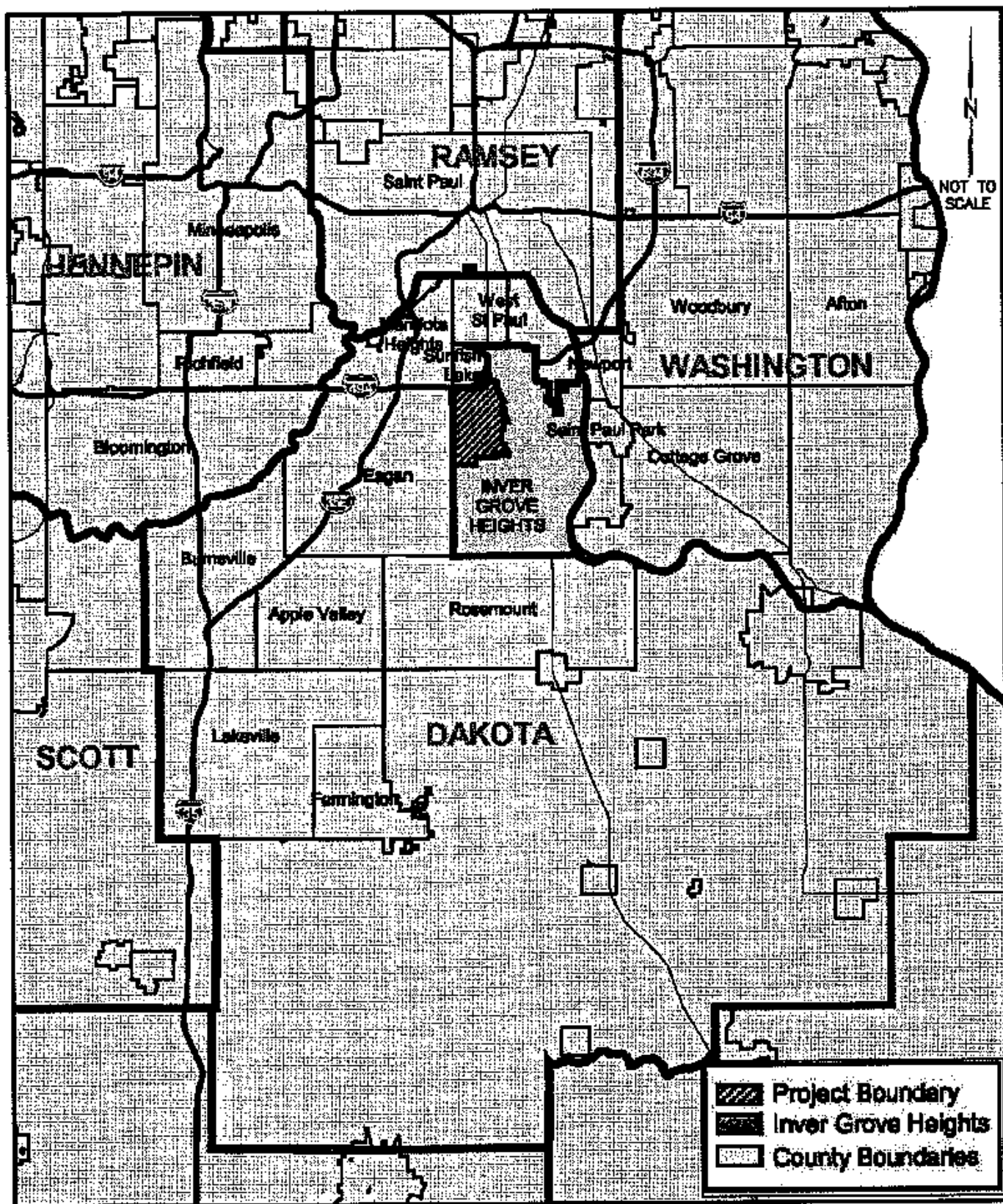


FIGURE 21-1

LOCATION MAP
INVER GROVE HEIGHTS AUAR

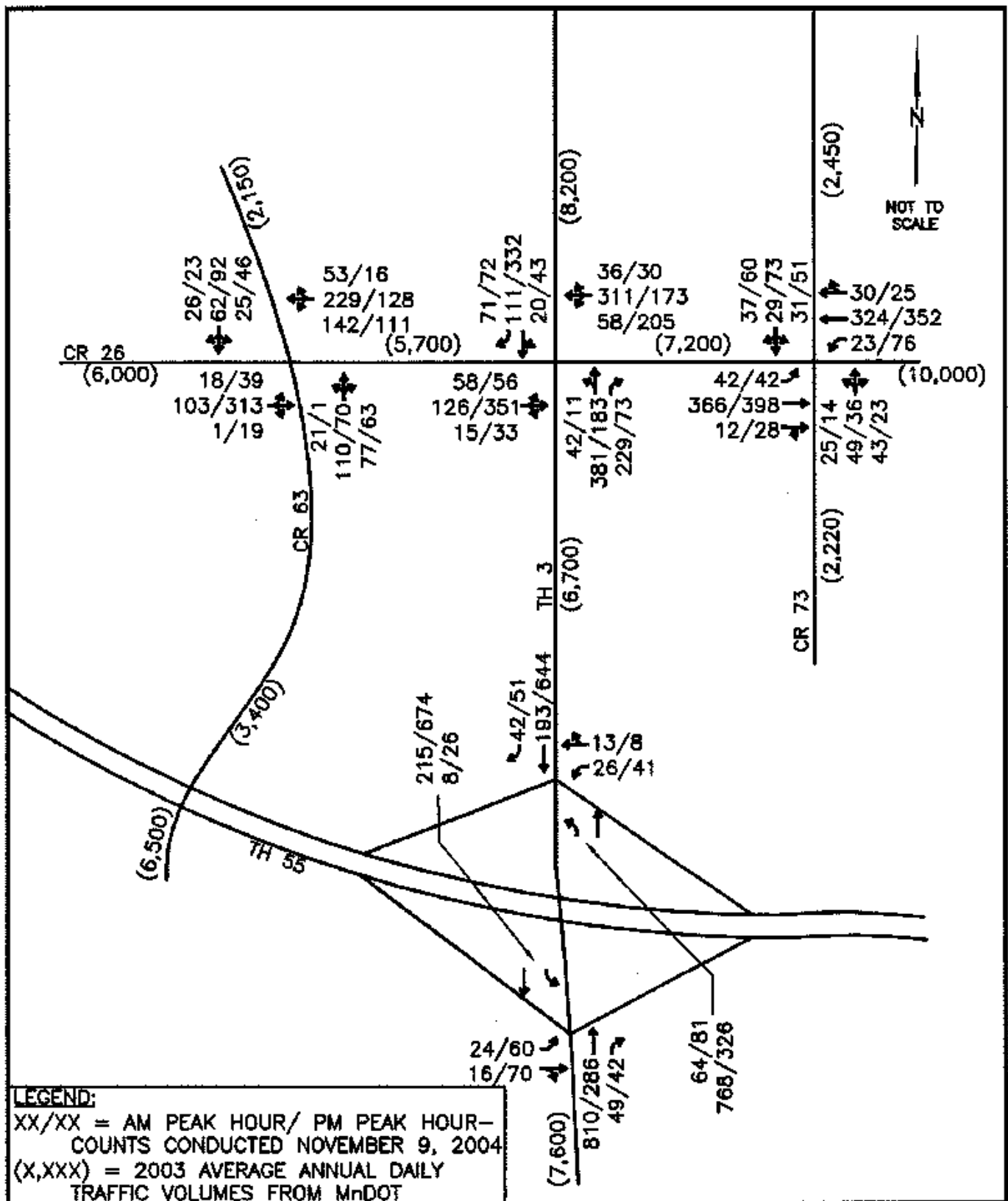


FIGURE 21-2

EXISTING GEOMETRY AND TRAFFIC VOLUMES INVER GROVE HEIGHTS AUAR



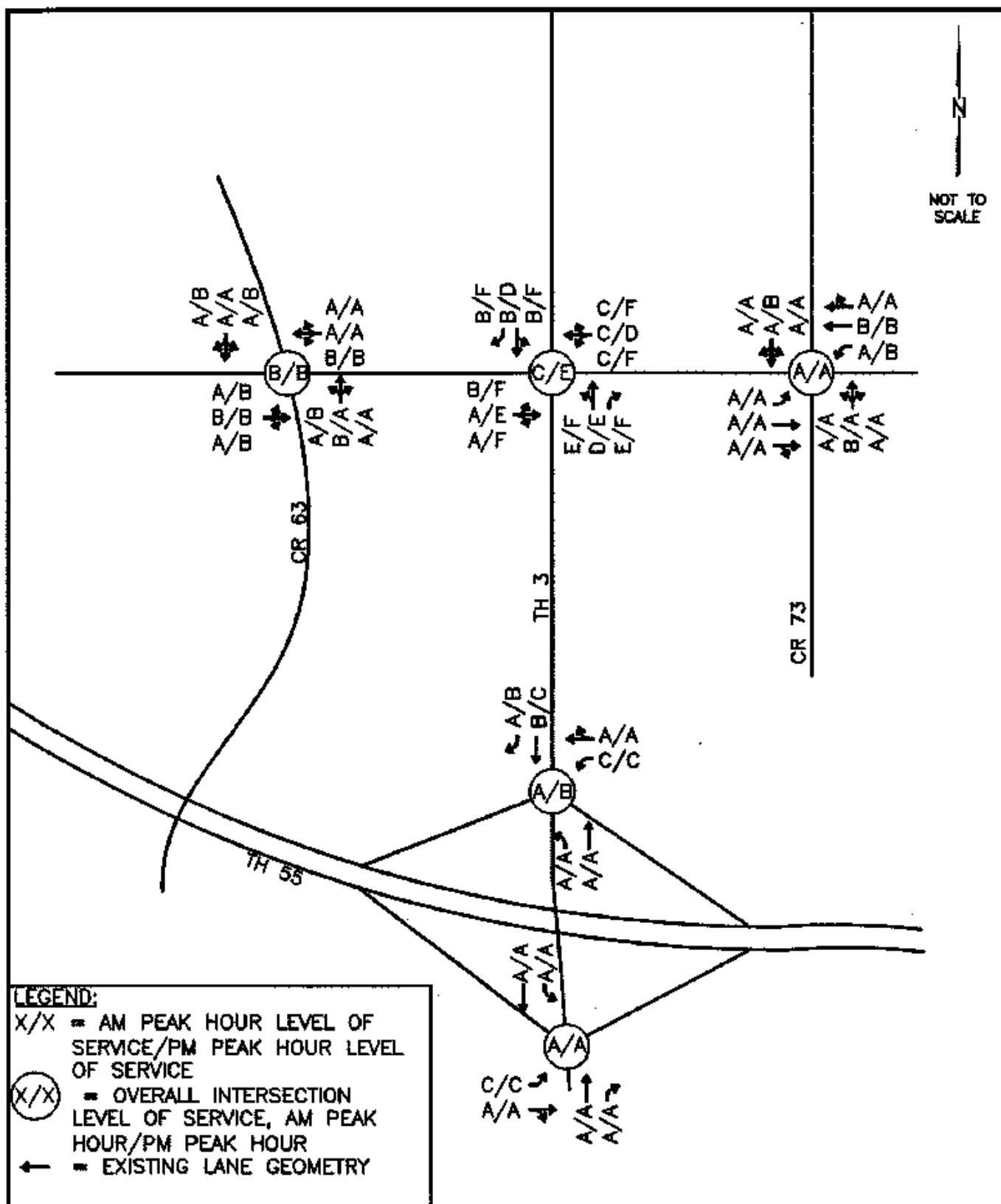


FIGURE 21-3

EXISTING CONDITIONS LEVEL OF SERVICE
INVER GROVE HEIGHTS AUAR

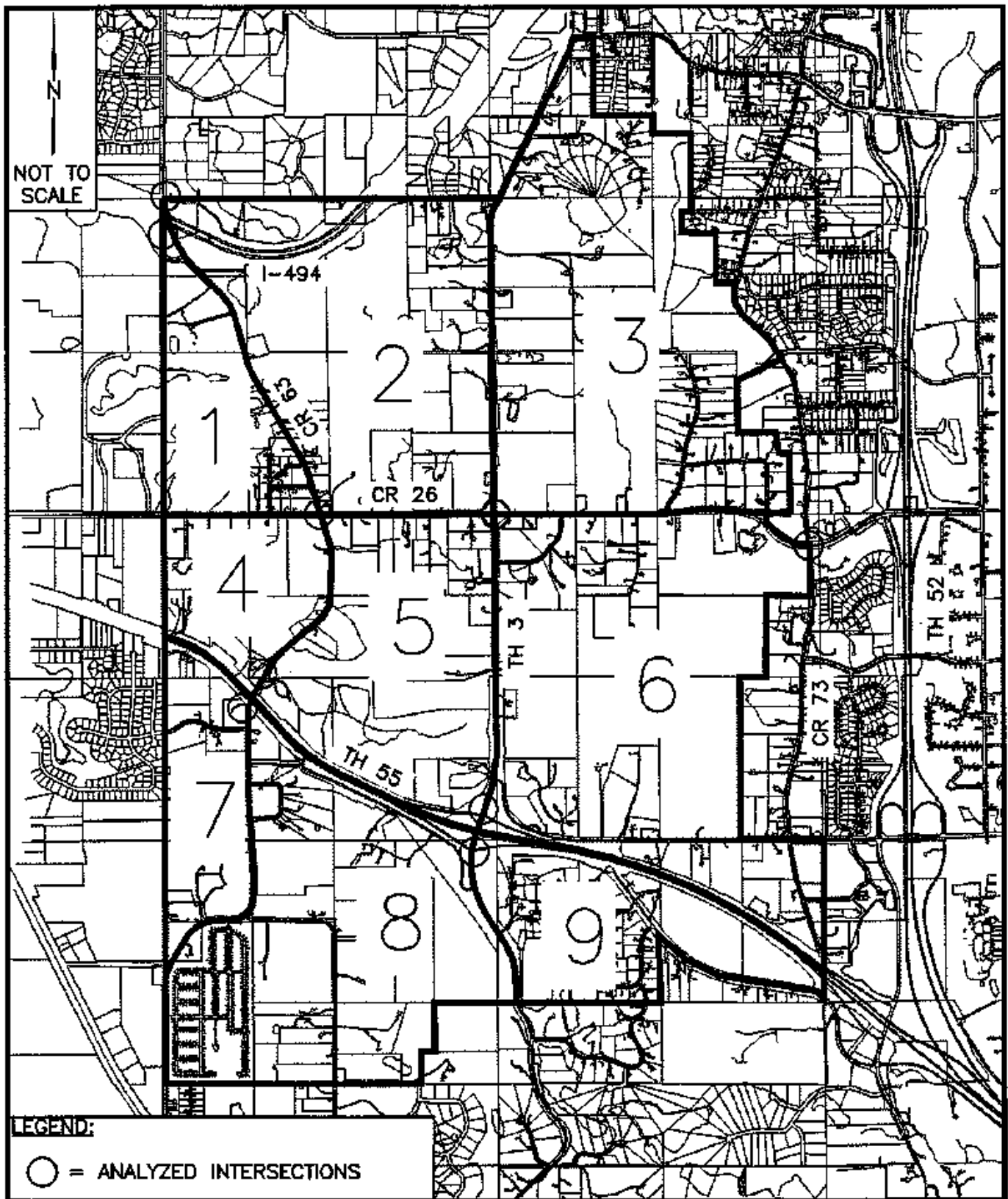


FIGURE 21-4
TRAFFIC ANALYSIS ZONES
INVER GROVE HEIGHTS AUAR

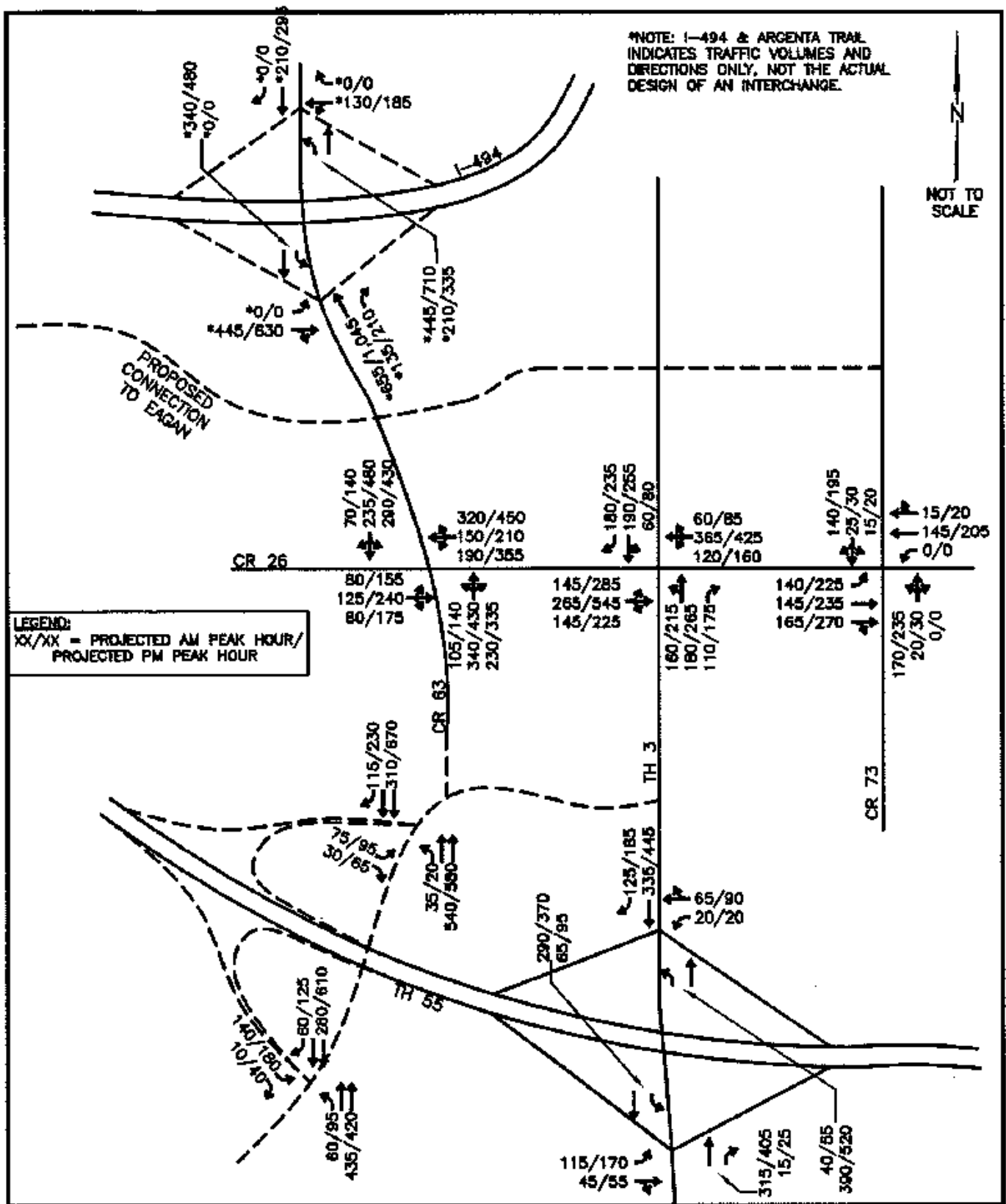


FIGURE 21-5
PROJECTED DEVELOPMENT VOLUMES
INVER GROVE HEIGHTS AUAR

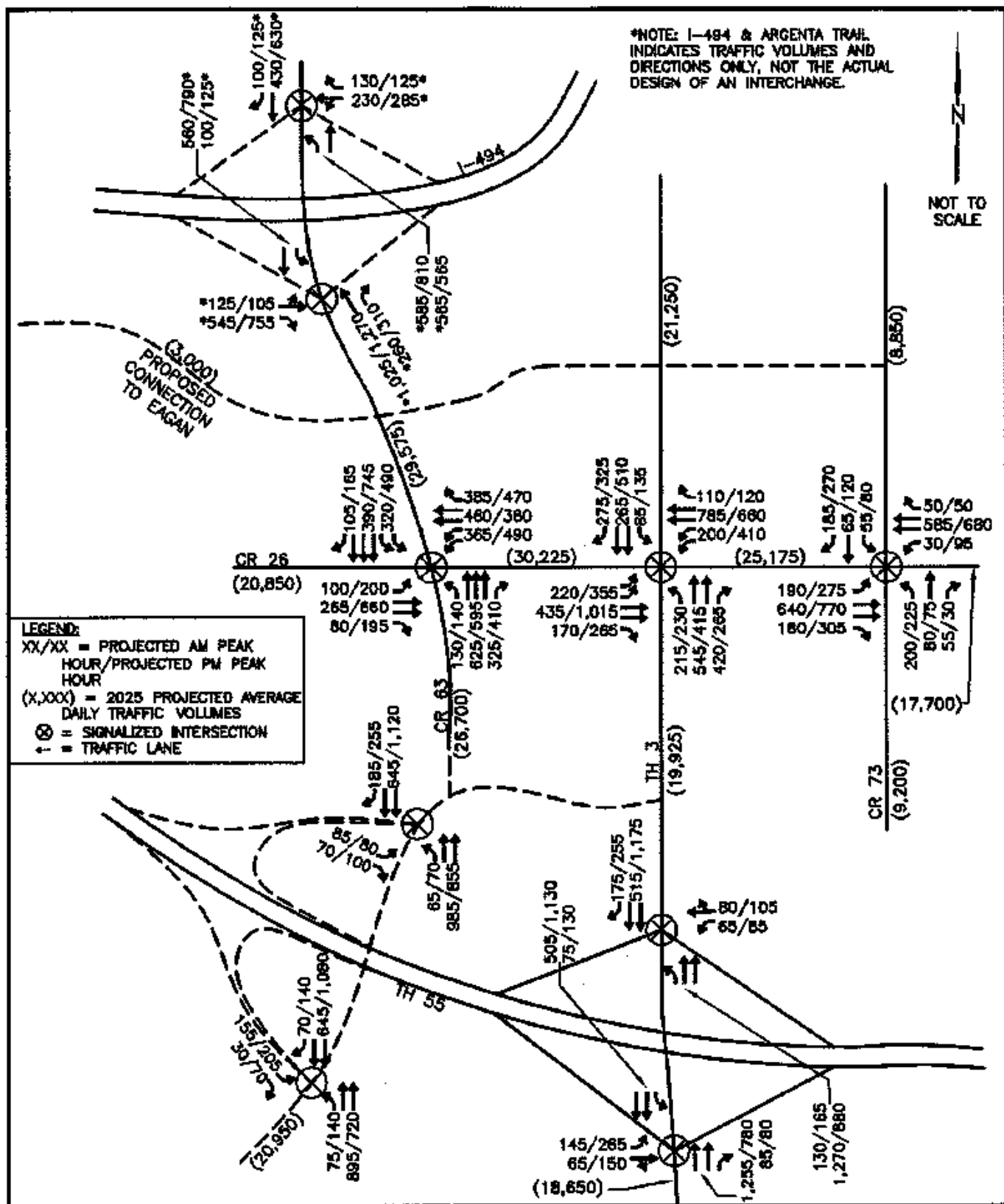


FIGURE 21-6

2025 VOLUMES AND PROPOSED GEOMETRY INVER GROVE HEIGHTS AUAR

-10-



FIGURE 25

LOCATIONS INVENTORIED FOR HISTORIC STRUCTURES

(Excerpt from USGS Topographic Quadrangle for Inver Grove Heights, MN)

ATTACHMENT E: RESPONSE TO AGENCY COMMENTS

1. Introduction

Pursuant to Minnesota Rules, part 4410.3610, subpart 7, this AUAR update was available for a comment period of 10 business days. Comments were submitted by following agencies during the public comment period that ended on March 16th, 2020.

- Minnesota Pollution Control Agency
- Minnesota State Historic Preservation Office
- Minnesota Office of State Archaeologist
- Dakota County Physical Development
- Metropolitan Council
- Minnesota Department of Natural Resources

No objections were filed by state agencies or the Metropolitan Council. The Northwest Expansion Area AUAR will remain valid for an additional five years from the date of adoption of the AUAR Update by the City of Inver Grove Heights.

2. Minnesota Pollution Control Agency

Comment	Response
Please note that the AUAR Update was completed using an outdated version of the Environmental Assessment Worksheet (EAW) form. It would be helpful if the AUAR Update used the new form to ensure that the information discussed is relevant to current regulations and issues.	Thank you for your comment. The old form was used to be consistent with previous documents completed for the AUAR and AUAR updates. The information provided in this document was reviewed to confirm relevancy to current regulations and issues.
This section indicates that a Clean Water Act (CWA) Section 404 Permit from the U.S. Army Corps of Engineers (USACE) for project related wetland impacts may be necessary. Please be aware that if a USACE Section 404 Individual Permit is required for any project activity, then an MPCA CWA Section 401 Water Quality Certification or waiver must also be obtained as part of the permitting process. The Section 401 Water Quality Certification ensures that the activity will comply with the state water quality standards. Any conditions required within the MPCA 401 Certificate are then incorporated into the USACE 404 Permit. You can find additional information about the MPCA's 401 Certification process at: https://www.pca.state.mn.us/water/clean-water-act-section-401-water-quality-certifications or by contacting Bill Wilde at 651-757-2825 or William.wilde@state.mn.us.	Thank you for your comment. A Section 401 Certification has been added to the Permits and Approvals table.
The MPCA appreciates the Project proposer's discussion of noise, and would like to clarify a point made in the 2005 AUAR and carried forward in Section 24 of the AUAR Update. On page 79, and again on page 80, in reference to the residential noise-based receptor standards, there is a line that reads "[n]ew residential developments are exempt from this standard if the buildings have year-round climate control and meet minimum construction standards for noise level attenuation." This is a paraphrase of the exceptions listed in Minn. R. ch. 7030.0050 subp. 3, but it misses the mark slightly in application. Minn. R. ch. 7030.0050 subp. 3 allows exceptions for receptors that fall under Noise Area Classification (NAC) 1; the exceptions would mean that a laxer	Thank you for your comment. As proposed projects move forward, the RGU will review the proposed projects to confirm they are in compliance with City noise ordinances and state standards as outlined in Minn. Rules Ch 7030.0050.

Comment	Response
standard (NAC 2 or 3) could be applied to a NAC 1 receptor under certain conditions. These conditions include the two listed in the original AUAR, plus a third that was not - namely, that "the building has no areas or accommodations that are intended for outdoor activities." This is an important third clause that is necessary for an exception to be applicable to a NAC 1 receptor, like new residences constructed as part of a new mixed-use area. Further, the exceptions listed in 7030.0050 subp. 3 do not exempt any new receptors from any part of the noise rules - they simply allow NAC 2 or 3 standards to be applied to a NAC 1 receptor. A separate rule - Minn. R. ch. 7030.0080 - could allow a variance (potentially, an exemption) from the noise rules if necessary. As specific Project plans are created for the AUAR area, we encourage the Project proposer to follow up with, and expand on, the mitigation tactics listed on page 111. Considering both modeling and monitoring showed an exceedance in the area in 2005, we would also encourage additional monitoring, as needed, to help further identify potential mitigation techniques. For noise related questions, please contact Fawkes Steinwand at 651-757-2327 or Fawkes.Steinwand@state.mn.us	
We appreciate the opportunity to review this Project. Please be aware that this letter does not constitute approval by the MPCA of any or all elements of the Project for the purpose of pending or future permit action(s) by the MPCA. Ultimately, it is the responsibility of the Project proposer to secure any required permits and to comply with any requisite permit conditions. If you have any questions concerning our review of this AUAR Update, please contact me by email at Karen.kromar@state.mn.us or by telephone at 651-757-2508.	Comment noted. All proposed projects within the AUAR study area will be subject to obtaining the appropriate permits and approvals.

3. Minnesota State Historic Preservation Office

Comment	Response
Thank you for the opportunity to review this AUAR Update. According to our records, the State Historic Preservation Office has not reviewed the original 2005 AUAR nor the subsequent updates. We don't have a copy of the Cultural Resource Study conducted by Archaeologist Research Services for the original AUAR, which is referenced in Question #25 of the current Update. Please send a copy of the Cultural Resource Study so that we may continue our review.	Thank you for your comment. A copy of the Cultural Resource Study was sent to the MN SHPO office for review. In reviewing the previous AUAR documentation, it appears a letter was issued on October 13, 1999 for the review of the original report.

4. Minnesota Office of State Archaeologist

Comment	Response
As noted in the AUAR document, Archaeological Research Services (ARS) prepared a literature review and conducted a Phase I archaeological survey targeting areas in a lacustrine setting. According to the AUAR, landowner permission for an archaeological survey was not granted for some of the targeted parcels, for example a parcel on a small peninsula in Marcott Lake noted in the updated AUAR document (pg. 82). Therefore I recommend a qualified archaeologist conduct a survey in parcels where permission was not previously granted to determine if development could damage unrecorded archaeological sites.	Thank you for your comment. Any future development in areas that were not previously surveyed would be required to comply with all federal, state, and local rules and regulations regarding archaeological resources. If cultural resources are encountered during construction, Unanticipated Discoveries protocol will be followed.

5. Dakota County Physical Development Department

Comment	Response
The AUAR update does not indicate an increase in overall vehicle trips for the northwest area but does identify land use changes within the update. Dakota County will work with the City of Inver Grove Heights to account for these proposed land use changes in the update of the Regional Roadway System Visioning Study, scheduled to be completed in 2020.	Thank you for your comment. The City looks forward to working with the County on the update to the Regional Roadway System Visioning Study in 2020.
The AUAR update includes a number of references to the importance of infiltrating water within the Northwest Expansion Area's landlocked basins. Dakota County policies support protecting infiltration areas from contamination and using infiltration to recharge groundwater aquifers.	Thank you for your comment.

6. Metropolitan Council

Comment	Response
Item 21 -Traffic (Russ Owen, 651-602-1724) On Page 72 and 73, the document discusses the County Road 63 and I-494 Interchange. Although this interchange has been approved through MnDOT and the Council, it should be noted there is no funding for this interchange. The AUAR needs to include language that states no funds are available for this infrastructure project.	Thank you for your comment. A statement has been added that no funds are currently available for this infrastructure project.
Item 21 -Traffic (Todd Graham, 651-602-1322) Development expectations (land uses) by Transportation Analysis Zone (TAZ) are discussed on pages 69-70. In total, AUAR table 21-2 counts 7,054 housing units, 2.79 million square feet of commercial and office space, and 97 acres planned for industrial development. Council staff interpret this as a build-out scenario, with development extending significantly after 2040 and this is more development than is	Thank you for your comment. The City will coordinate with the Council regarding TAZs and the City's household and population forecast.

Comment	Response
forecasted to the year 2040. Council staff recommend this clarification be included in the AUAR's discussion of traffic modeling. A set of TAZ forecast allocations was prepared by the City with its 2040 Comprehensive Plan (2040 Plan). As the City pursues development in the Northwest Expansion Area, Council staff advise that the City resolve discrepancies between the 2040 Plan and the AUAR. Most notably, TAZs #470 and #490 in the 2040 Plan are assigned more households than would ever be expected per the AUAR (see AUAR zones #6 and #4 respectively). Council staff's recommendation is that 2040 households and population in the City's forecast allocation table in the 2040 Plan be adjusted. The City can communicate its changes through correspondence to the Council, separate from any action on the AUAR; please contact Council staff to discuss.	
Item 6- Municipal Water System (Lanya Ross 651-602-1803) The discussion of the municipal water supply system (beginning on page 12) summarizes the Inver Grove Heights municipal water supply system and studies, construction, and other relevant activities that have occurred over the timespan of the AUAR. In 2005, the AUAR reported that the City currently operates six municipal supply wells and that additional wells are planned. However, post-2005 AUAR updates in this discussion do not mention any additional wells being added. This is in contrast to information provided on page 33 of the AUAR update, which notes that Well No. 9 was added in 2007. Additionally, the MOH records seven municipal supplies wells for the City of Inver Grove Heights. This is also consistent with information reported in Table 6 of the City's local water supply plan, which was approved by the DNR on February 24, 2020. Please correct the AUAR update to contain accurate information about the number and capacity of municipal wells. The AUAR update discussion of the municipal water supply system (beginning on page 12) does not mention that the City of Inver Grove Heights updated their local water supply plan in 2019, which was approved by the DNR in a letter to the City dated February 24, 2020. Please correct the AUAR update to include information about the updated local water supply plan. For example, verify that the information in the AUAR update is consistent with table 12 of the local water supply plan (details	Thank you for your comment. The AUAR update was prepared in advance of the City receiving the DNR letter approving the local supply plan. Information from the local supply plan has been added to the AUAR update.

Comment	Response
about planned infrastructure changes that should be consistent with information discussed in the AUAR update).	

7. Minnesota Department of Natural Resources

Comment	Response
Page 7, Proposed Development; Page 13, Stormwater System. Stormwater management and design features should be used to prevent sediment and pollutants from degrading natural wetland and waterbody basins. Will stormwater ponds and infiltration basins be used in the northwestern part of the project area where commercial and high density residential development are proposed? No stormwater features are depicted on any figures after 2005, and none in the NW area. Industrial development in the southeastern part of the project area will also need stormwater management to prevent impact to Minnesota Biologically Significant Sites and DNR Native Plant Communities located in wetlands south of the project area. It would be helpful to update 2019 figures to show proposed stormwater management, and current features that have already been built.	Thank you for your comment. Stormwater Management will be approached by each proposed development in the AUAR study area and will designed to meet the needs of the proposed projects. The City will work with the project proposers to develop stormwater management strategies that meet federal, state, and local requirements and take into effect the surrounding environment.
Page 16, Cumulative Development Totals. The amount of proposed Commercial and Office/Industrial development has decreased significantly from 2014 to 2019. Is this change reflected in increased residential development or natural areas and green space? Or, do these numbers not include areas that have already been developed?	Thank you for your comment. The development densities have been reduced based on changes to the 2040 Comprehensive Plan.
Page 19, Cover Types (a). All figures should be updated to show current conditions. NWI mapped wetlands do not appear to have been updated since 2007. Waterbody and wetland basins should reflect recent NWI updates.	Thank you for your comment. Wetlands identified in the figures are consistent with the City's Surface Water Management Plan.

Comment	Response
4. Page 19-20, 24, Table 10-1 Cover Types, and Natural Resource Inventory. Why is there a decrease in wetland area (267 acres to 190 acres) with this proposed AUAR update? This contradicts stated goals of maintaining a “no net loss of wetlands in the study area” (page 100). It does not appear that a new wetland delineation has been conducted or that wetland types have been updated since 2005. This section states that some changes to the natural resources inventory have occurred, but does not identify these changes. Page 20 refers to Figure 6 in Attachment A, which only identifies wetlands as “water,” but does not identify type. Wetland delineations are typically considered current for five years, and current conditions should be evaluated before development proceeds.	Thank you for your comment. The City will require the project proposers to delineate all wetlands within the project limits prior to development. The wetlands identified in the AUAR were consistent with the inventories completed by the City.
Page 25, Wildlife Resources. Even with a license (LA-965), a letter of concurrence from the DNR Natural Heritage Inventory System is required. This letter should be obtained and attached to the AUAR.	Thank you for your comment. The information hasn't changed with no new records for species identified from previous updates. Concurrence has been requested and will be retained in the project file.
Page 27, Physical Impacts on Water Resources. It would be helpful to have a figure showing the location of the stormwater features discussed in this section.	Thank you for your comment. All regional basins are shown in the stormwater manual for the northwest expansion area which is available on the City's website.
Page 29-30, 53, Wetlands. The Wetland Management Classifications used throughout the AUAR may be out of date with current standards regarding the use of wetlands (even degraded wetlands) for stormwater treatment. The Minnesota Stormwater Manual states, “The National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit prohibits further degradation of wetlands with new untreated stormwater discharges or significant expansions of existing untreated discharges from new impervious surfaces to wetlands. There may be limited situations or projects where wetlands may be used for stormwater treatment if there are no prudent and feasible alternatives to providing BMPs in upland areas. In these cases, permits can be issued if the full wetland mitigation sequence (avoid, minimize and mitigate) has been satisfied and completed according to MPCA Water Quality Standards in Minn. R. 7050.0186.”	Thank you for your comment. The proposed developments will be required to comply with all currently federal, state, and local rules and regulations including requirements for wetlands.

Comment	Response
Page 46, Basin Infiltration Rates. Stormwater infiltration basin failure is a well-documented issue within Minnesota. In order to increase the likelihood of success, an infiltration test should be performed at each site to verify infiltration rates. Construction BMP's should be followed and any excavation should be in a manner that maintains soil structure in an un-smeared and un-compacted condition. We recommend that no grading activities within infiltration basins be performed when the soil moisture content at the depth of excavation is below the plastic limit. Please review these 2018 standards and procedures recommended by MnDOT to improve infiltration basin performance.	Thank you for your comment. The project proposers will be required to comply with all federal, state, and local standards and requirements.
Page 46, Rainfall Events. Please note that large-scale storm event frequency and annual precipitation in Minnesota have increased over the last 10 years, which may require modification to stormwater BMP's based on previous precipitation and storm frequency averages.	Thank you for your comment. Your comment has been noted.
Page 99, Fish, Wildlife, and Sensitive Resources. Euphorbia esula (leafy spurge) has been documented extensively along MNTH 3 within the last year. Please consider including the management of invasive species in development plans along this roadway in order to limit its spread.	Thank you for your comment. Recommendations of invasive species management will be discussed with project proposers to limit spread of invasive species.
For the sake of clarity, it would be helpful for future reviewers to only include what information is applicable to the current update rather than showing each change to the AUAR since 2005.	Thank you for your comment. Your comment has been noted.



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Performance monitoring of constructed floating wetlands: Treating stormwater runoff during the construction phase of an urban residential development

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HIGHLIGHTS

- This study investigates stormwater treatment efficiencies of large scale Constructed Floating Wetlands (CFWs).
- CFWs received stormwater runoff from a residential construction site.
- Significant removal of total suspended solids from construction runoff.
- Low TN and TP influent concentrations had high impact on CFW performance.
- Spatial composite sampling from multiple locations would improve monitoring accuracy.

GRAPHICAL ABSTRACT



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ABSTRACT

In the context of climate change and global trend towards greenfield urbanisation, stormwater and transported pollutants are expected to increase, impairing receiving environments. Constructed floating wetlands (CFWs) can improve stormwater retention pond performance. However, performance data are currently largely restricted to mesocosm experiments, limiting design enhancement fit for field implementation. The present 12-month field study aims to fill part of these gaps by identifying limitations and necessary design improvements for CFWs on a large retention pond/lake. Water in a 2.6-ha lake receiving stormwater from a 45-ha urban area under development in subtropical Queensland, Australia, was recirculated during dry weather periods to minimise algal growth and the risks of blooms. Pollutant removal efficiencies of two full-scale CFWs were evaluated during storm events and dry weather periods as a function of inlet and outlet pollutant concentrations, flow and rainfall. Inlet TSS and TN concentrations in runoff during the construction phase of the development exceeded required water quality limits while TP inflow concentrations were low and often below the detection limit. Median pollutant load reduction efficiencies during storm-events were – 20 % TSS, – 2 % TN and 22 % TP at CFW1 and 51 % TSS, 3 % TN and 17 % TP at CFW2, respectively. TSS and TN concentration removal efficiencies at CFW1 were low and highly variable, partly due to low inlet concentrations, high flow velocities and short hydraulic retention times (<1 day). However, CFW1 significantly reduced TSS concentrations during dry weather periods. In contrast, CFW2 significantly reduced TSS concentrations during both storm events and during inter-event periods. This study highlights treatment limitations associated to the operational conditions of CFWs at

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field-scale not identifiable in a mesocosm-scale study. Further research is necessary to investigate treatment performance of CFWs during the operational phase of the development with higher nutrient levels.

1. Introduction

Urban watersheds are typically characterized by highly impervious areas generating pollutant laden stormwater runoff that contributes to eutrophication and ecosystem degradation when discharged untreated into receiving water bodies (Malaviya and Singh, 2012; Andrés-Doménech et al., 2018). Best Management Practices (BMPs) are stormwater quality and quantity control measures that aim to minimise negative impacts on the receiving waters (Fletcher et al., 2015). For example, Surface Flow Constructed Wetlands (SFCWs) and bioretention filters are widely used BMPs for stormwater treatment in Australia. SFCWs require 4–8 % of the catchment area to meet pollutant load reduction targets set by the Australian regulators, while bioretention filters require 1–2 % (Water by Design, 2010). Since available land area is limited in urban settlements, land acquisition can be a major cost component of an urban BMP (Lynch et al., 2015). Furthermore, SFCWs show limited tolerance of extended periods of elevated water levels, which can result in a progressive decline in vegetation health (Headley and Tanner, 2012). Therefore, SFCWs typically require flow bypass channels to divert flood waters without treatment during peak storm events, to protect the macrophyte zone from scouring and vegetation damage (Department of Planning and Local Government (DPLG), 2010; Water by Design, 2014).

Constructed Floating Wetlands (CFWs) are an alternative BMP and consist of a floating structure planted with emergent macrophytes. Their buoyancy allows them to adjust to large water-level variations associated with heavy rainfall events (Headley and Tanner, 2012). Plant roots grow through the buoyant structure into the water column where they hydroponically take up nutrients and pollutants (Schwammberger et al., 2019). Over time, the roots form a dense network that provides a large surface area for biofilm growth (Tanner et al., 2011; Winston et al., 2013). Roots and biofilm enable adsorption, absorption and incorporation of pollutants into plant tissue (Headley and Tanner, 2012; Lynch et al., 2015). The roots also provide resistance to flow and reduce water velocity, thus promoting physical filtration and settling of suspended solids (Tanner et al., 2011; Headley and Tanner, 2012; Winston et al., 2013). CFWs are passive, low maintenance and operationally simple water treatment solutions that require no additional land area. They are suitable for new and retrofit installations (Headley and Tanner, 2012). During the early construction phase of greenfield developments, they can control erosion and sediment drift when installed on sedimentation ponds.

Numerous studies on CFWs have emerged especially in the last 15 years, most of them conducted at mesocosm scale with only few focusing on stormwater treatment (Pavlineri et al., 2017). Since the results of mesocosm studies are often not transferable to field installations, full-scale experiments have been identified as a major research need (Colares et al., 2020; Sharma et al., 2021). While good removal efficiencies have been obtained for small-scale systems (Colares et al., 2020), field-scale behaviour, implementation practicability, operation and associated performance of CFW systems is largely missing in the literature. To date, there are still no established design guidelines for optimal coverage, flow distribution, or configuration of CFWs in ponds or basins, and reliable estimates of their performance cannot yet be made (Headley and Tondera, 2019).

This 12-month field study investigated the benefits of implementing two large-scale CFWs (2088 m² total area) during the construction phase of an urban settlement in subtropical Queensland, Australia. The specific aims of the study were to: (1) evaluate the treatment performance of the CFWs during storm-events, and (2) during dry weather periods for total suspended solids (TSS), total nitrogen (TN) and total phosphorus (TP). It was hypothesised that the CFWs would significantly reduce these pollutant

concentrations. The results of the study will identify limitations and necessary design improvements for more effective implementation at field scale.

2. Materials and methods

2.1. Experimental site

The experimental site was part of a large urban residential development, designated “Parklakes 2” at Bli Bli (26°35'S, 153°01'E), Queensland, Australia. Originally, stormwater runoff generated by the urban development was planned to be treated by a 2.6-ha SFCW. This required drainage infrastructure and a 400 m long concrete channel to divert flows around the SFCW during peak storm events. The CFW approach was chosen since the flow bypass structure required for a SFCW could be eliminated, resulting in construction cost savings of approximately AUD\$ 1 million. Furthermore, the CFWs had the potential to improve water quality already at the beginning of the construction works, while water quality improvement by a SFCW would not have been realised until 60 % of the estate would have been developed due to the long plant establishment pre-commissioning period. Two CFWs with a total area of 2088 m² were installed in a newly constructed 2.6-ha lake to treat stormwater runoff during the construction phase of a 45-ha urban development (CFWs = 0.46 % of the catchment area) (Fig. 1). The first constructed floating wetland (CFW1) was 11.5 m long × 92.0 m wide and had a total area of 1058 m². It received stormwater runoff during the construction phase of a 32-ha urban catchment of which 18-ha discharged into a basin upstream of the lake, and 14-ha directly at the corners of CFW1 (Fig. 1). The second constructed floating wetland (CFW2) was 32.0 m long × 32.2 m wide and had a total area of 1030 m². CFW2 received untreated runoff from a 13-ha urban catchment in addition to treated stormwater runoff from CFW1 after passing through an open-water section of the lake between the two CFWs.

The lake was aligned along prevailing winds to promote even wind mixing and reduce stratification (Mackay, 2008). To this effect, the lake had a flat bottom and an operational water depth of 1.65 m beneath both CFWs and 3.0 m at the open water areas. Flows in constructed lakes with a surface area > 0.2 % of the catchment area, as in the current study (0.76 %), are often too small to maintain a hydraulic residence time ≤ 20 days (Mackay, 2008), increasing the risk of algae blooms. Therefore, lake water (total volume of the lake was 94,730 m³) was recirculated during dry weather conditions at a nominal flow rate of 4736.5 m³ d⁻¹ (110 L s⁻¹) for 12 h d⁻¹, to maintain a residence time ≤ 20 days. The recirculation intake was located at a downstream pond which received stormwater runoff from a 6-ha catchment that had been pre-treated by a bioretention basin, and weir-controlled runoff from the lake (Fig. 1). Lake water was pumped to the upstream basin, from where recirculated flow entered the lake by a DN350 mm culvert (Fig. 1).

The study commenced 12 months after the installation of the CFWs, when the urban development was 60 % complete (Fig. 1). At this time, the south-western (20-ha) and central (7-ha) sub-catchments of the development were under construction with erosion and sediment control measures in place. Stormwater runoff from roads, roofs and impervious areas was collected and conveyed via an underground drainage network and discharged into the upstream basin and the lake (Fig. 1). The lake water level was subject to variations during storm events and reached a depth beneath the CFWs of 2.38 m for 4 exceedances per year (EY), 3.05 m for 1 EY and 5.17 m for 0.01 EY. The lake edge was planted with macrophytes to prevent public access and stabilize the lake embankments. Both CFWs effectively spanned the entire width of the lake at normal water depth to minimise potential short-circuiting and direct stormwater runoff through their



Fig. 1. Aerial view of the “Parklakes 2” development, with two constructed floating wetlands, CFW1 and CFW2, installed in a 2.6 ha lake treating stormwater runoff from a 45-ha urban development area (Nearmap, 17. Feb. 2017).

root networks. The submerged macrophytes at the water's edge also provided resistance to flow and limited short-circuiting between the water edge and the CFWs.

CFW1 and CFW2 comprised 115 and 112 CFW modules (Biohaven®, Floating Island International, Shepherd, MT), respectively. Each module was 4.0 m long $\times$ 2.3 m wide $\times$ 0.2 m high. The CFW modules were made of four horizontal layers (each layer 50 mm thickness) of non-woven, recycled, polypropylene and polyester fibrous matrix injected with a non-degradable marine-based polyurethane foam to provide buoyancy. Each of the CFW modules had 40 vertical holes (150 mm deep $\times$ 100 mm diameter) and each hole was planted with two tall, native sedge plants (*Carex appressa*) in December 2015, resulting in a planting density of 8.7 plants m^{-2} . The *C. appressa* plants were raised in 115-mL tubes containing potting mix that consisted of 75 % mulch and 25 % soil (v:v). Shoot height was between 200 and 250 mm at the time of planting. Both CFWs were covered in nylon netting (15 mm mesh size) to protect the plants from predation by birds until the plants were established after 3 months (Schwammberger et al., 2019).

2.2. Storm event sampling and analysis

Sampling at the Parklakes 2 site began in December 2016, 12 months after the CFWs were planted, and continued for one year. Two automatic water samplers (ISCO® GLS, Teledyne Instruments Inc., Lincoln, NE) connected to polyethylene hoses (10 mm internal diameter) were installed on the upstream (inlet) and downstream (outlet) edges of CFW1 (Fig. 2a) and CFW2 (Fig. 2b), respectively. Open ends of the sampling hoses were located at 0.30 m below water level in vertically slotted pipes (1.0 m length, 0.1 m diameter) to prevent plant roots from growing into the sampling area. The top of the pipe was closed with a screw lid to limit interaction with the atmosphere and provide shading from sunlight.

Inlet and outlet autosamplers at CFW1 were in line with a DN350 mm culvert that was discharging lake water mixed with runoff during storm events (“stormwater runoff”), and recirculated flow during dry weather

from the upstream basin into the lake (Fig. 2a). The distance between the culvert and the upstream edge of CFW1 was 8.0 m to allow flow to distribute across the width of the CFW. This distance was reduced to 4.0 m in December 2016, after the CFW has been repositioned due to modification of the anchoring system. The reduced distance resulted in higher flow velocities in the sampling area than anticipated (Fig. 2a).

The autosamplers were controlled by a data logger (CR800 Series, Campbell Scientific Australia, Garbutt, QLD) to collect flow volume-weighted composite water samples during storm events. An ultrasonic flowmeter (Starflow QSD, Unidata Pty Ltd., Perth, WA) was installed in a DN300 mm drainage pipe (Inflow 2) from a 3740 m^2 road area catchment (Fig. 2a). Storm event sampling started when a tipping-bucket rain gauge (H-3401, YSI Water Log, Yellow Springs, OH) recorded ≥ 2 mm rainfall in 30 min and the flowmeter simultaneously recorded flows $\geq 0.5 \text{ L s}^{-1}$ (Fig. 2a). A programmable relay controller (KTA-223 Relayduino, Ocean Controls, Seaford, VIC) triggered the autosamplers with a time delay between the upstream and downstream samplers to account for the hydraulic retention time (HRT) of stormwater beneath the CFWs. A fluorescent dye (Rhodamine WT, Fisher Scientific, Leicestershire, UK) was added at the culvert upstream of CFW1 and at inflow 5 upstream of CFW2 (Fig. 2b) during a wet weather event to estimate the time for inflow reaching the upstream autosampler at each CFW and the hydraulic retention time beneath the CFW. Autosamplers collected water samples with a time delay of 20 s at the inlet and 60 s at the outlet of CFW1 and 180 s at the inlet and 300 s at the outlet of CFW2. Each autosampler collected 200 mL subsamples at 3000 L flow intervals during storm events until flow dropped below 0.5 L s^{-1} for >60 min, which then stopped the sampling procedure. Flow volume-weighted composite water samples were collected according to standard methods (APHA, 2005) and sent to a National Association of Testing Authorities (NATA) in Australia accredited laboratory for analysis of TSS, TN and TP. A predetermined sampling protocol (Stormwater Australia, 2018) was used to identify qualifying storm events and provide CFW stormwater treatment performance evaluation (Table 1s).

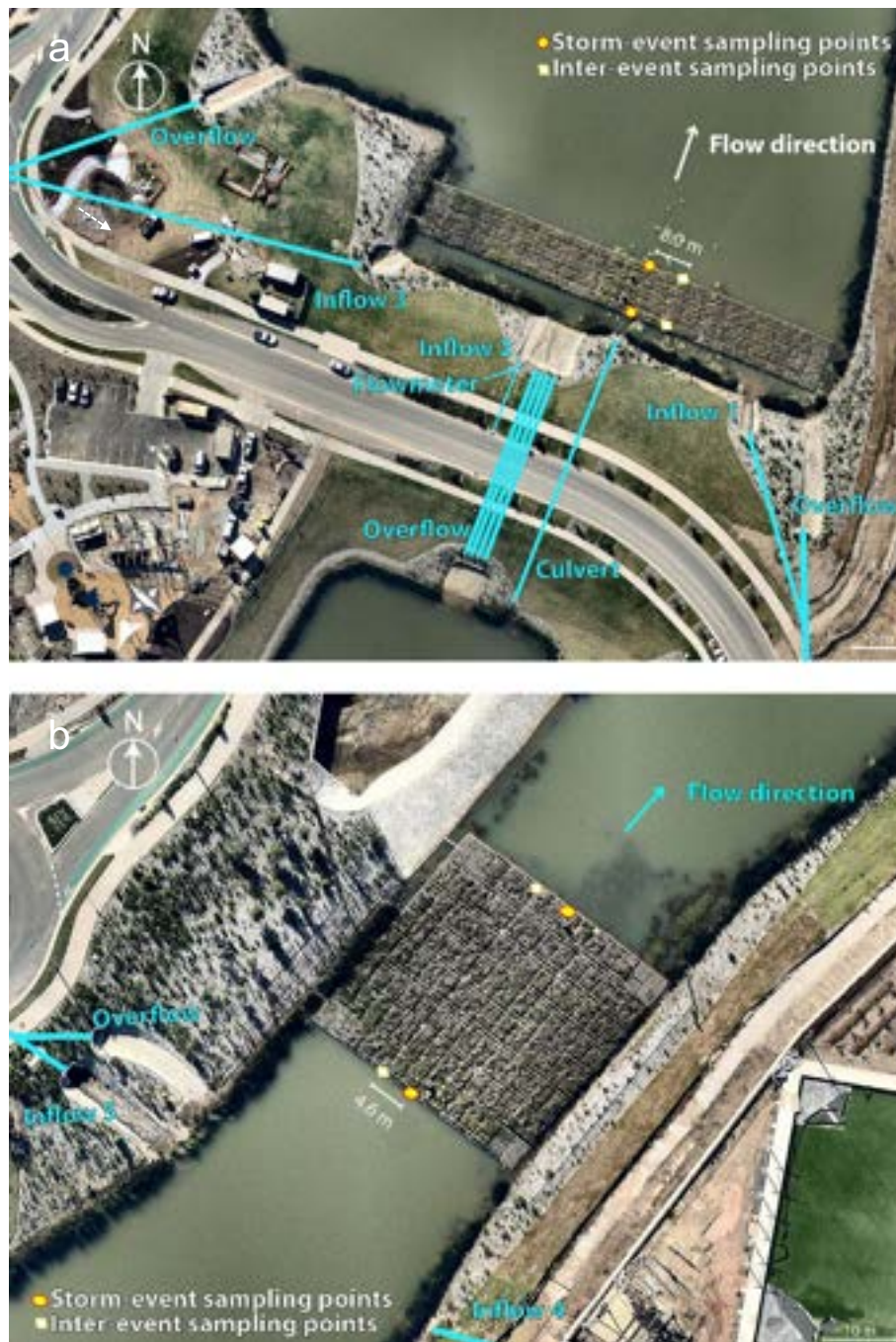


Fig. 2. Aerial view of stormwater inlets and (a) the first constructed floating wetland, CFW1, and (b) the second constructed floating wetland, CFW2, with storm-event sampling equipment and inter-event sampling locations (Nearmap, 31. May 2017).

2.3. Inter-event sampling and analysis

Water grab samples were collected weekly or biweekly at the inlet and outlet of both CFWs during inter-event periods with varying antecedent dry days (ADD). Inlet and outlet inter-event water sample locations were parallel to storm event sample locations with a distance of 8.0 m at CFW1 (Fig. 2a), and 4.2 m at CFW2 (Fig. 2b). Water grab samples were always collected at 9 am using a 1 L bailer (BioBailer®, Environmental Service Products, Rockledge, FL), sampling the first 100 cm of the water column. The water was preserved at -18°C in PE bottles until analysis using standard methods (APHA, 2005) for TSS, TN and TP (Table 1s).

2.4. Data analysis

The average hydraulic loading rate (HLR) for each CFW was calculated by extrapolating the recorded flow on the different sub-catchments (Fig. 1) during qualified storm events using Eq. (1):

$$HLR = \sum \frac{A_i CD_i V_{FM}}{A_{FM} CD_{FM}} \times \frac{1}{A_{CFW}} \quad (1)$$

where:

HLR = Hydraulic loading rate ($\text{m}^3 \text{m}^{-2} \text{d}^{-1}$)
 A_i = Drainage area of sub-catchment i (m^2)

CD_i = Coefficient of discharge for sub-catchment i (dimensionless)
 V_{FM} = Volume of flow recorded by flowmeter ($m^3 d^{-1}$)
 A_{FM} = Drainage area of flowmeter (m^2)
 CD_{FM} = Coefficient of discharge for flowmeter drainage area (dimensionless)
 A_{CFW} = CFW area (m^2)

The water quality analysis result of each flow volume-weighted composite water sample gave the event mean concentration (EMC) equivalent to Eq. (2) (Stormwater Australia, 2018):

$$EMC = \frac{\sum_{i=1}^n V_i C_i}{\sum_{i=1}^n V_i} \quad (2)$$

where:

EMC = Event mean concentration ($g m^{-3}$)
 V_i = Volume of flow during period i (L)
 C_i = Concentration associated with period i ($g m^{-3}$)
 n = Number of aliquots collected during a storm event

The water quality result of the inter-event grab sample gave the inter-event pollutant concentration (IEC). Inter-event grab samples were distinguished by the time period between sample collection and storm events to account for wet or dry weather conditions. Grab samples collected with a precedent dry period of ≤ 6 days were considered as wet weather samples, while samples collected with a precedent dry period of > 6 days were considered as dry weather samples. Days with recorded rainfall $< 5 mm d^{-1}$ were considered as dry.

The areal pollutant loading rate (ALR) was calculated for storm events considering the total flow each CFW received from the different catchments (Fig. 1) and during inter-event sampling when lake water was recirculated for 12 h per day (Eq. (3)).

$$ALR = HLR \times (EMC \text{ or } IEC) \quad (3)$$

where:

ALR = Areal loading rate during events or inter-events ($g m^{-2} d^{-1}$)
 EMC = Event mean concentration ($g m^{-3}$)
 IEC = Inter-event concentration ($g m^{-3}$)

The Concentration Removal Efficiency (CRE) was calculated to determine the reduction in pollutant concentration for each storm event and each inter-event (Eq. (4)).

$$CRE = \left(\frac{EMC_{in} - EMC_{out}}{EMC_{in}} \text{ or } \frac{IEC_{in} - IEC_{out}}{IEC_{in}} \right) \times 100 \quad (4)$$

where:

CRE = Pollutant concentration removal efficiency (%)
 EMC_{in} = Event mean concentration or inter-event concentration at the inlet ($g m^{-3}$)
 EMC_{out} = Event mean concentration or inter-event concentration at the outlet ($g m^{-3}$)
 IEC_{in} = Inter-event concentration at the inlet ($g m^{-3}$)
 IEC_{out} = Inter-event concentration at the outlet ($g m^{-3}$)

The areal pollutant removal rate (ARR) was calculated as the difference between the ALR at the inlet and outlet (Eq. (5)).

$$ARR = ALR_{in} - ALR_{out} \quad (5)$$

where:

ARR = Areal removal rate during events or inter-events ($g m^{-2} d^{-1}$)
 ALR_{in} = Areal loading rate during events or inter-events at the inlet ($g m^{-2} d^{-1}$)
 ALR_{out} = Areal loading rate during events or inter-events at the outlet ($g m^{-2} d^{-1}$)

The water treatment performance for the study duration was assessed by the pollutant concentration removal efficiency ratio during storm events (Eq. (6)), inter-event periods (Eq. (7)) and the pollutant load reduction efficiency (Eq. (8)), which was then compared against the annual mean target pollutant load reductions required for developments in South East Queensland (SEQ).

$$ER = \frac{Mean \text{ or } Median EMC_{in} - Mean \text{ or } Median EMC_{out}}{Mean \text{ or } Median EMC_{in}} \times 100 \quad (6)$$

$$ER = \frac{Mean \text{ or } Median IEC_{in} - Mean \text{ or } Median IEC_{out}}{Mean IEC_{in}} \times 100 \quad (7)$$

$$LRE = \frac{Mean \text{ or } Median ALR_{in} - Mean \text{ or } Median ALR_{out}}{Mean \text{ or } Median ALR_{in}} \times 100 \quad (8)$$

where:

ER = Pollutant concentration removal efficiency ratio (%)
 LRE = Pollutant load reduction efficiency (%)

2.5. Statistical analysis

Inlet and outlet EMCs and IECs of each CFW were compared to determine if differences were significant using SPSS Statistics v.21 (IBM Corporation). Inlet and outlet EMC and IEC data of each CFW were tested for normality using the Shapiro–Wilk test. If data were normally distributed, a paired sample t -test was performed. Otherwise, a Wilcoxon Signed-Rank test was used. Means are reported with standard deviations, medians are reported with first and third percentiles (25th – 75th) and differences were regarded as significant at $p < 0.05$. Several water samples had TN and TP concentrations below the limit of detection (LOD) and were replaced with the LOD.

In addition to the CFWs in this study, water quality and treatment performance metrics were calculated using the data reported by Borne (2013) and Borne (unpublished data) for a 50 m^2 CFW treating highway runoff in Auckland, New Zealand, and by Nichols et al. (2016) for a 101 m^2 CFW treating urban stormwater runoff in the same region (SEQ). The CFWs in both studies (Borne et al., 2013; Nichols et al., 2016) also spanned the entire width of the water body and used automatic water samplers to collect composite samples during storm events for 12 months. Data were tested for normality (Shapiro–Wilk test) and equality of variances (Levene's test) before analysis by 1-way analysis of variance (ANOVA) comparing EMCs, CREs, HLRs, ALRs and ARR of this study to previous studies. Post-hoc Tukey's Honestly Significant Difference (HSD) tests were performed only when significant differences among the water quality treatment performance metrics were detected by ANOVA. If data were non-parametric, a Kruskal–Wallis test was performed followed by a Mann–Whitney U test, but only when significant differences among water quality treatment performance metrics were detected. Since CFW performance metrics are often presented as means in literature, those are presented in addition to medians in this study.

3. Results and discussion

Measured total annual rainfall (1386 mm) was similar to median annual rainfall (1410 mm) recorded over the past 23 years at the Sunshine Coast Airport weather station (26°60'S, 153°09'E) located 7.5 km east of the project site (BoM, 2019). Storm events occurred primarily in autumn, spring and early summer during which 22 qualified storm events were sampled (Fig. 1s). In late March 2017, the study site was impacted by remnants of tropical cyclone Debbie (BoM, 2018). Hence, the total rainfall recorded at the project site in March 2017 was much higher than median historical records (Table 2s). More rainfall was also recorded during spring and early summer (October to December, southern hemisphere), whereas rainfall in mid-summer (January and February), winter and early spring (April to September) were much lower than median historical records for the same

Table 1
Mean ($\bar{x} \pm SD$) and median ($\bar{x}$ (Q1 – Q3)) hydraulic loading rate (HLR), event mean concentration (EMC), areal loading rate (ALR), areal reduction rate (ARR), concentration reduction efficiency (CRE), pollutant removal efficiency ratio (ER) and areal load reduction efficiency (LRE) at two constructed floating wetlands, CFW1 and CFW2, during storm events compared to those calculated from data reported in previous studies. Means ($\pm SD$) or medians (Q1 – Q3) with different letters are significantly different (ANOVA or Kruskal-Wallis, $p < 0.05$, $n = 9-20$).

Reference	Events	HLR ($m^3 m^{-2} d^{-1}$)	EMC In ($g m^{-3}$)	EMC Out ($g m^{-3}$)	CRE (%)	ER (%)	ALR ($g m^{-2} d^{-1}$)	ARR ($g m^{-2} d^{-1}$)	LRE (%)
		$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$
TSS									
This study, CFW1	20	4.5 (2.3–7.3) ab	41 (22–53) a	50 (19–73)	–17 $\pm$ 45	–19 (–54–24) a	–22	125 (69–321) a	–23 (–117–17) a
This study, CFW2	20	5.9 (3.0–9.5) a	48 (22–79) a	25 (15–48)	40 $\pm$ 26	38 (27–56) b	49	243 (124–498) a	74 (22–206) b
Borne (2013) ^b	17	2.6 (2.0–4.0) b	30 (24–51) a	15 (9–16)	55 $\pm$ 24	59 (33–71) b	61	93 (53–190) a	47 (32–88) b
Nichols et al. (2016)	10 ^c	3.6 (2.8–5.3) ab	44 (20–218) a	23 (16–28)	42 $\pm$ 58	56 (36–81) b	81	116 (82–206) a	56 (19–100) b
TN									
This study, CFW1	20	4.5 (2.3–7.3) ab	0.51 (0.39–0.68) a	0.61 (0.28–0.80)	–7 $\pm$ 53	1 (–19–20) a	–1	2.90 (1.08–4.64) a	0.02 (–0.58–0.38) a
This study, CFW2	20	5.9 (3.0–9.5) a	0.59 (0.31–0.71) a	0.51 (0.40–0.72)	0 $\pm$ 16	0 (–7–10) a	3	3.83 (1.13–5.22) a	0.00 (–0.11–0.41) a
Borne (2013) ^b	17	2.6 (2.0–4.0) b	0.99 (0.81–1.30) b	0.71 (0.61–0.95)	25 $\pm$ 25	27 (14–42) b	30	3.02 (1.77–3.70) a	0.67 (0.20–1.15) a
Nichols et al. (2016)	10 ^c	3.6 (2.8–5.3) ab	1.10 (0.85–1.35) b	0.95 (0.70–1.53)	1 $\pm$ 68	22 (–46–53) ab	17	3.63 (2.23–7.80) a	0.15 (–2.23–2.10) a
TP									
This study, CFW1	20	4.5 (2.3–7.3) ab	0.06 (0.05–0.08) a	0.06 (0.05–0.07)	4 $\pm$ 21	0 (0–11) a	13	0.37 (0.13–0.45) a	0.00 (0.00–0.01) a
This study, CFW2	20	5.9 (3.0–9.5) a	0.05 (0.05–0.07) a	0.05 (0.04–0.06)	6 $\pm$ 13	0 (0–11) a	8	0.36 (0.17–0.57) a	0.00 (0.00–0.03) a
Borne (2013) ^b	17	2.6 (2.0–4.0) b	0.09 (0.07–0.13) b	0.05 (0.04–0.08)	42 $\pm$ 23	40 (27–61) b	49	0.18 (0.15–0.32) a	0.10 (0.05–0.15) b
Nichols et al. (2016)	10 ^c	3.6 (2.8–5.3) ab	0.06 (0.04–0.13) ab	0.04 (0.03–0.07)	26 $\pm$ 50	33 (0–58) ab	52	0.26 (0.11–0.33) a	0.03 (0.00–0.12) ab

^a Mean ($\bar{x} \pm SD$) of HLR, EMC In and EMC Out in Table 5a.

^b Flow volume during storm events (Borne, unpublished data).

^c Flow data for 9 storm events available.

periods (Table 2s). Inter-event water samples were collected on 23 days in weekly (March to April) and bi-weekly (May to December) intervals (Fig. 1s).

3.1. Stormwater runoff and baseflow characteristics

Storm events were highly variable in terms of duration, rainfall depths and rainfall intensities with HLRs of both CFWs ranging between 1.3 and 24.0 $m^3 m^{-2} d^{-1}$ (Table 3s). Median (25th – 75th percentile) HLRs were 4.5 (2.3–7.3) $m^3 m^{-2} d^{-1}$ at CFW1 and 5.9 (3.0–9.5) $m^3 m^{-2} d^{-1}$ at CFW2, which were comparable to those at the 50 m^2 CFW treating highway runoff (Borne, unpublished data) and at the 101 m^2 CFW treating urban stormwater (Nichols et al., 2016) (Table 1). Given the rainfall patterns, inter-event water samples were collected at days with varying precedent dry weather periods when lake water was recirculated producing HLRs of 3.5 $m^3 m^{-2} d^{-1}$ at CFW1 and 3.6 $m^3 m^{-2} d^{-1}$ at CFW2.

Inlet and outlet TSS, TN and TP EMCs (Table 3s) were generally low and below typical mean EMCs (151 $mg L^{-1}$ TSS, 1.82 $mg L^{-1}$ TN, 0.34 $mg L^{-1}$ TP) of stormwater runoff from urban residential areas in Queensland (Healthy Land and Water, 2018). TSS EMCs were expected to be higher given that barren ground was often exposed during construction activities within the catchment. Inlet TSS EMCs at both CFWs did not differ significantly from those reported by Borne (2013) and Nichols et al. (2016), while inlet TN EMCs at both CFWs were lower than those reported in previous studies (Table 1). Inlet TP EMCs at both CFWs were close to the LOD (0.05 $mg L^{-1}$ TP) and lower than those reported by Borne (2013) but did not differ significantly from those recorded by Nichols et al. (2016) (Table 1).

TSS, TN and TP ALRs in both this study and previous studies (Borne, 2013; Nichols et al., 2016) were highly variable, which was evident by the large ALR interquartile range (Table 1). Despite low TN and TP EMCs at the inlet of both CFWs, the mean ALRs during storm events (2.91 to 3.67 $g m^{-2} d^{-1}$ TN; 0.36 to 0.44 $g m^{-2} d^{-1}$ TP) were comparable to CFW mesocosm studies on combined sewer overflow (1.78 $g m^{-2} d^{-1}$ TN and 0.18 $g m^{-2} d^{-1}$ TP; van de Moortel et al., 2010 in Headley and Tanner, 2012) or primary treated sewerage (2.20 to 5.30 $g m^{-2} d^{-1}$ TN and 0.29 to 0.84 $g m^{-2} d^{-1}$ TP; Boonsong and Chansiri, 2008 in Headley and Tanner, 2012). Thus, TN and TP loading of CFWs for stormwater treatment applications can be significant due to exposure to relatively large runoff volumes in proportion to the CFW area (i.e., high HLR) even when TN and TP concentrations in stormwater runoff are low as in the current study.

Inlet and outlet TSS, TN and TP concentrations at both CFWs exceeded the site-specific limits (40 $mg L^{-1}$ TSS; 0.50 $mg L^{-1}$ TN; 0.05 $mg L^{-1}$ TP) during or after storm-events, while pollutant concentrations were below those limits during dry weather periods (Fig. 3). Wet weather IECs after storm events (< 6 ADD) were similar to EMCs but generally higher than dry weather IECs (≥ 6 ADD) (Table 3s, Table 4s). Total IEC were higher for TSS but lower for TN and TP (Table 2), compared to typical mean baseflow concentrations (10 $mg L^{-1}$ TSS, 1.58 $mg L^{-1}$ TN, 0.11 $mg L^{-1}$ TP) in urban residential areas in Queensland (Healthy Land and Water, 2018).

3.2. Stormwater treatment performance of CFW1

Low stormwater TSS, TN and TP influent concentrations in this study had a high impact on the CFW performance metrics because low pollutant concentrations are in general more difficult to reduce than higher values (Strecker et al., 2001). Wirtz et al. (2023) also observed low removal efficiencies when comparing two retention basins retrofitted with CFWs treating highway runoff with low pollutant concentrations. Further, a meta-analysis on eight large-scale studies (including data from this study) identified inflow concentrations as the third most important parameter among predictor variables for removal efficiency for TN and TSS (Tirpak et al., 2022). The TN inlet concentrations in this study (median EMC = 0.51 $g m^{-3}$) were even lower than the background concentration of 1.0 $g m^{-3}$ commonly observed in constructed wetland systems resulting

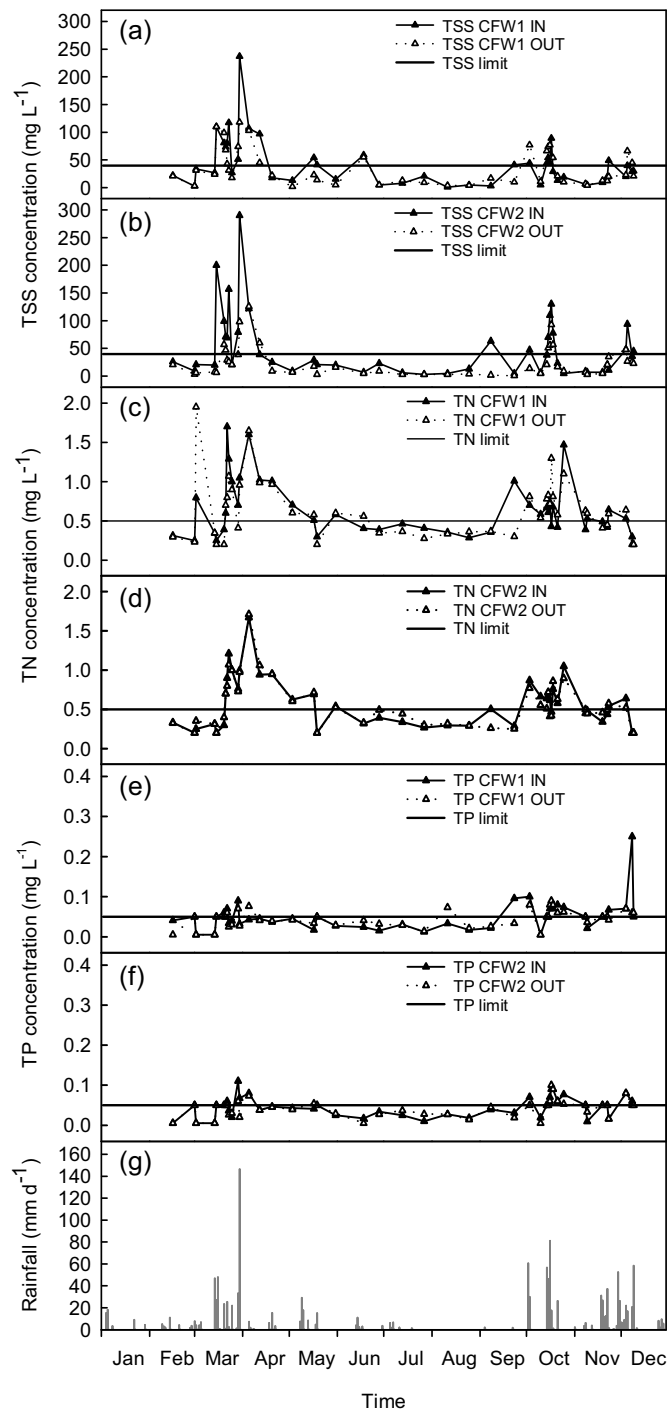


Fig. 3. Inlet and outlet pollutant concentrations during storm-event (event mean concentrations) and inter-event water sampling (grab samples) at two constructed floating wetlands, CFW1 and CFW2, and site-specific pollutant limits, for (a-b) total suspended solids (TSS), (c-d) total nitrogen (TN), and (e-f) total phosphorus (TP), with (g) daily rainfall over the 12-month monitoring period.

from the inputs of internally produced organic N from biota (Kadlec and Wallace, 2009). At such low starting concentrations, the law of diminishing returns applies, meaning that very large wetlands are required to achieve further concentration reductions. This situation is further exacerbated when low inlet concentrations are combined with relatively high hydraulic loading rates, as in the current study. This is demonstrated by comparing with the stormwater treatment study of Borne (2013), where the CFW received a lower median HLR of $2.6 \text{ m}^3 \text{ m}^{-2} \text{ d}^{-1}$ (compared to $4.5 \text{ m}^3 \text{ m}^{-2} \text{ d}^{-1}$ for CFW1) combined with an inlet EMC of 0.99 g m^{-3}

which was approx. Twice the median inlet EMC of 0.51 g m^{-3} for CFW1 (Table 1). Despite the two systems receiving very similar TN loading rates (median ALR of $3.0 \text{ g m}^{-2} \text{ d}^{-1}$ for Borne (2013) vs. $2.9 \text{ g m}^{-2} \text{ d}^{-1}$ for CFW1), the median TN CRE for the CFW in Borne's study was 27 % compared to only 1 % for CFW1. Consequently, the low TN CRE for CFW1 was partially a result of low inlet EMCs (close to the LOD) combined with relatively high HLRs.

CFW1 showed no significant differences between median EMC_{in} and EMC_{out} for TSS, TN and TP during storm events (Fig. 4). Pollutant CREs were highly variable between individual rainfall events, which was evident by the large interquartile range around the median CRE (Table 1). Negative median ERs and LREs for TSS and TN indicate that EMCs at the outlet of CFW1 were often higher than at the inlet (Table 3s, Table 1). Median LRE of 22 % for TP showed that even a small change in concentrations can have a large impact on the calculated CFW performance metrics, given that there was no net TP removal (median ER 0 %) and most TP EMCs were close to, or at the LOD (Table 3s, Table 1).

Stormwater runoff partially had to pass the upstream basin before reaching the inlet autosampler at CFW1. Thus, stormwater runoff from the sub-catchments was diluted in the receiving basin upstream of the lake, and sedimentation of particles likely reduced the TSS loads and particle bound nutrients led to lower TSS EMCs than expected. In the study of Schwammberger et al. (2017), pollutant EMCs and median CREs of 0 % (−40 % to 20 %) for TSS, −4 % (−5 % to 14 %) for TN and 0 % (0 % to 27 %) for TP were also found to be low when urban stormwater runoff initially flowed through 70 m of open water, being directed by baffle walls, before reaching the CFW. Pollutant EMCs then increased after relocating the CFW to an upstream stormwater inflow, resulting in significant TSS and TP reductions with a median CRE of 56 % (36 % to 81 %) for TSS, 22 % (−46 % to 53 %) for TN and 33 % (0 % to 58 %) for TP during 10 storm events (Table 1; Nichols et al., 2016). In the current study, the location of the two automatic water samplers were along the central axis of CFW1 aligned with the culvert fed from the upstream basin. This led most likely to an under-estimate of the pollutant load entering the CFW from inflow 1 and inflow 2, which did not receive any pre-treatment.

The proximity of CFW1 to the lake embankment (Fig. 2a) presumably resulted in much higher localised HLRs for areas close to inflows of the culvert than the median HLRs calculated for the entire CFW surface area. High flow velocities created by water exiting the culvert were visually observed at the inlet and outlet of CFW1 during storm events. The 11.5 m long CFW1 located 4 m from the exit of the culvert was not long enough to sufficiently reduce flow velocities and create the pseudo-laminar flow necessary to allow suspended particles to settle during storm events. High flow velocities likely led to resuspension of particles attached to the dense root network, resulting in higher TSS concentrations at the outlet than at the inlet of CFW1. Furthermore, the flow of recirculated water on days without storm events could have formed preferential flow channels within the dense root network beneath CFW1, resulting in reduced pollutant treatment during storm events (Farjood et al., 2015). Thus, CFWs need to be located at a suitable distance from stormwater inflows to allow flow velocities to decrease, and better mix and distribute inflows across the width of the CFW. Such an optimisation of hydraulic efficiency and HRT would allow treatment processes to occur. This highlights the importance of considering the overall design of the drainage inputs, lake structure and CFW elements in an integrated way to improve the treatment efficiency. For comparison, a one-year field study in New Zealand monitored the treatment performance of a 9.75 m long x 5.2 m wide (50 m^2) CFW installed in a stormwater pond (Borne et al., 2013). Stormwater runoff had to pass a forebay and a v-notch weir before reaching the CFW, which likely allowed the flow to pass the CFW more uniformly (Borne et al., 2013). The authors showed that the CFW, which had a similar length compared to CFW1 but lower operational depth underneath the CFW (0.75 m versus 1.65 m in this study) favouring TSS entrapment, was able to significantly reduce TSS, TN, and TP concentrations in stormwater runoff with median CRE of 59 % (33 % – 71 %) for TSS, 27 % (14 % – 42 %) for TN and 40 % (27 % – 61 %) for TP (Table 1). Further, Borne et al. (2013) had a control pond without a CFW

Table 2
Mean ($\bar{x} \pm SD$) and median ($\tilde{x}$ (Q1 – Q3)) inter-event pollutant concentration (IEC) at the inlet (In) and outlet (Out), pollutant concentration removal efficiency (CRE), pollutant removal efficiency ratio (ER) or areal load reduction efficiency (LRE), areal pollutant loading rate (ALR) and areal pollutant reduction rate (ARR) of two constructed floating wetlands, CFW1 and CFW2, during wet and dry weather conditions under operation of the recirculation system.

Condition	IEC In		IEC Out		CRE		ER = LRE		ALR		ARR	
	$(g\ m^{-3})$		$(g\ m^{-3})$		(%)		(%)		$(g\ m^{-2}\ d^{-1})$		$(g\ m^{-2}\ d^{-1})$	
	$\bar{x}$	$\tilde{x}$	$\bar{x}$	$\tilde{x}$	$\bar{x}$	$\tilde{x}$	$\bar{x}$	$\tilde{x}$	$\bar{x}$	$\tilde{x}$	$\bar{x}$	$\tilde{x}$
TSS	Wet	70 ± 68	54 (19–102)	40 ± 38	21 ± 55	47 (5–56)	42	57	246 ± 241	191 (65–360)	104 ± 144	32 (9–147)
	CFW1	16 ± 13	14 (5–23)	12 ± 9	–42 ± 168	10 (–16–60)	26	32	57 ± 46	49 (18–82)	15 ± 39	7 (–3–36)
	CFW1	42 ± 54	21 (7–52)	26 ± 30	–12 ± 129	20 (2–57)	39	19	148 ± 192	74 (23–182)	57 ± 111	14 (2–72)
	Wet	63 ± 91	25 (7–81)	36 ± 42	0 ± 88	29 (–29–61)	44	28	230 ± 330	91 (25–292)	100 ± 249	7 (–15–49)
	CFW2	18 ± 16	17 (6–22)	7 ± 6	49 ± 29	55 (22–70)	61	70	65 ± 59	60 (21–78)	40 ± 60	16 (10–45)
	CFW2	40 ± 67	20 (7–28)	21 ± 32	26 ± 68	40 (18–65)	48	60	144 ± 241	73 (24–100)	69 ± 176	15 (5–47)
TN	Wet	0.92 ± 0.41	1.01 (0.56–1.17)	0.87 ± 0.34	0 ± 18	4 (–8–8)	5	5	3.24 ± 1.47	3.57 (1.96–4.13)	0.16 ± 0.52	0.14 (–0.21–0.25)
	CFW1	0.47 ± 0.22	0.39 (0.35–0.52)	0.38 ± 0.11	11 ± 24	6 (–3–17)	19	10	1.68 ± 0.77	1.38 (1.24–1.84)	0.32 ± 0.76	0.07 (–0.04–0.34)
	CFW1	0.70 ± 0.39	0.56 (0.39–1.01)	0.63 ± 0.35	6 ± 21	5 (–3–13)	10	–3	2.46 ± 1.39	1.96 (1.39–3.57)	0.24 ± 0.64	0.12 (–0.06–0.32)
	Wet	0.87 ± 0.38	0.94 (0.61–1.02)	0.85 ± 0.38	2 ± 9	0 (–4–10)	2	4	3.14 ± 1.38	3.41 (2.19–3.70)	0.07 ± 0.30	0.00 (–0.13–0.27)
	CFW2	0.37 ± 0.12	0.33 (0.29–0.42)	0.37 ± 0.11	–4 ± 23	0 (–15–3)	–1	0	1.34 ± 0.44	1.18 (1.05–1.51)	–0.01 ± 0.33	0.00 (–0.17–0.05)
	CFW2	0.61 ± 0.37	0.50 (0.32–0.82)	0.60 ± 0.36	–1 ± 18	0 (–7–6)	1	2	2.20 ± 1.34	1.81 (1.16–2.94)	0.03 ± 0.32	0.00 (–0.13–0.13)
TP	Wet	0.04 ± 0.02	0.03 (0.02–0.05)	0.04 ± 0.02	–16 ± 65	0 (–75–17)	–2	–33	0.13 ± 0.07	0.11 (0.07–0.16)	0.00 ± 0.07	0.00 (–0.05–0.04)
	CFW1	0.03 ± 0.03	0.03 (0.02–0.03)	0.03 ± 0.02	–6 ± 55	0 (–13–5)	14	–20	0.11 ± 0.09	0.09 (0.06–0.11)	0.01 ± 0.09	0.00 (–0.01–0.01)
	CFW1	0.03 ± 0.02	0.03 (0.02–0.04)	0.03 ± 0.02	–10 ± 59	0 (–50–17)	5	0	0.12 ± 0.08	0.11 (0.07–0.14)	0.01 ± 0.08	0.00 (–0.04–0.04)
	Wet	0.04 ± 0.02	0.04 (0.02–0.06)	0.03 ± 0.02	2 ± 73	13 (0–44)	19	25	0.15 ± 0.09	0.15 (0.07–0.22)	0.03 ± 0.07	0.04 (0.00–0.04)
	CFW2	0.02 ± 0.01	0.03 (0.01–0.03)	0.03 ± 0.01	–15 ± 62	0 (–6–0)	–7	0	0.09 ± 0.04	0.11 (0.04–0.11)	–0.01 ± 0.03	0.00 (–0.01–0.00)
	CFW2	0.03 ± 0.02	0.03 (0.02–0.04)	0.03 ± 0.02	–7 ± 66	0 (0–29)	9	0	0.12 ± 0.08	0.11 (0.07–0.15)	0.01 ± 0.05	0.00 (0.00–0.04)

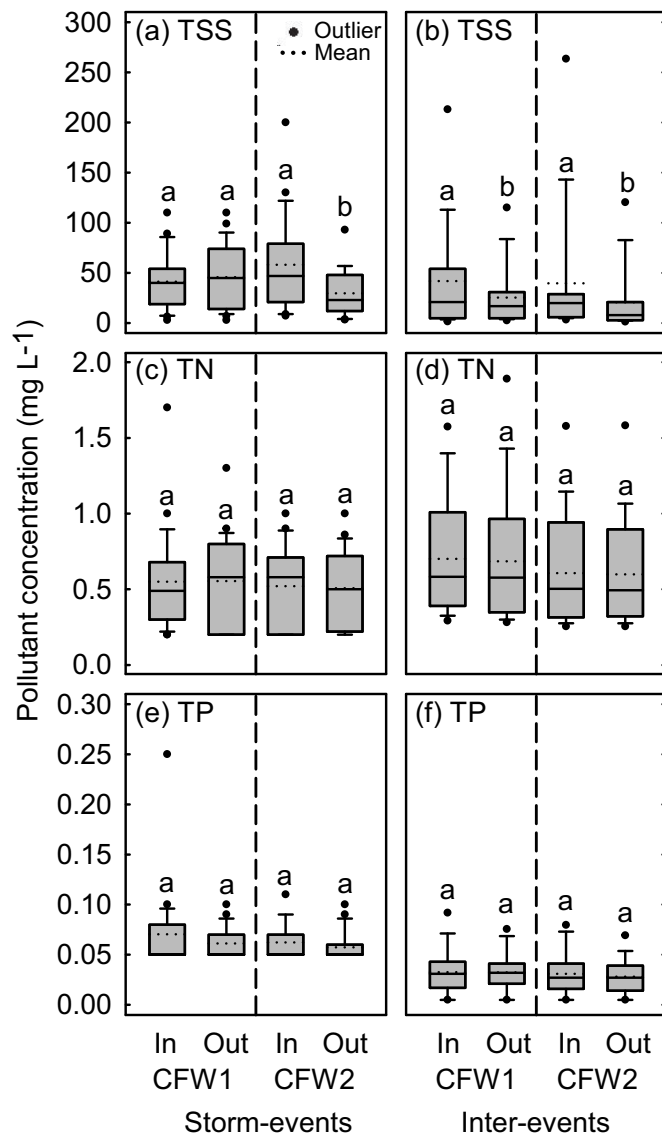


Fig. 4. Box and Whisker plots for storm event samples (left) and inter-event water samples (right) at the inlet (In) and outlet (Out) of two Constructed Floating Wetlands, CFW1 and CFW2, for (a–b) total suspended solids (TSS), (c–d) total nitrogen (TN), and (e–f) total phosphorus (TP). The limit of detection (LOD) for TSS (1.0 mg L^{-1}) and TN (0.20 mg L^{-1}) was identical for storm-event and inter-event samples, while the LOD for TP was 0.05 mg L^{-1} for storm events and 0.005 mg L^{-1} for inter-event water samples.

to compare removal efficiencies. In contrast, the research site of the current study did not allow for controls and, therefore, the stormwater treatment performance relates to the treatment by the lake in addition to the CFWs. It is difficult to compare results directly because of differences in the two research sites, HLRs, HRTs, stormwater characteristics, climate conditions and sampling methodology. In future research, we recommend adding additional autosamplers to the inlet and outlet at both corners of CFW1 (in line with inflow 1 and inflow 3, Fig. 2a) to monitor the stormwater treatment efficiency under limited pre-treatment and dilution effects and to obtain a more representative evaluation of the pollutant treatment performance of CFW1.

Median TSS concentrations for inter-event water sampling were lower at the outlet than at the inlet of CFW1, while median inlet and outlet TN and TP concentrations did not differ significantly (Fig. 4). TSS IECs were higher during wet than dry weather conditions with median TSS CREs of 47 % (5 % – 56 %) and 10 % (– 16 % – 60 %), respectively (Table 2). Inter-event CREs for TSS suggest that the dense root network beneath

CFW1 acted as a barrier to the passage of TSS when not directly impacted by high flow velocities from the adjacent culvert during storm events. Tanner and Headley (2011) found that planted CFW mesocosms removed significantly more fine suspended solids than unplanted CFWs or open water ponds, concluding that the roots and associated biofilms beneath the CFW play an important role in trapping finer particles in stormwater.

3.3. Stormwater treatment performance of CFW2

Median TSS EMCs at the outlet of CFW2 were lower than at the inlet while median TN and TP EMCs did not differ significantly (Fig. 4). Median TSS CRE at CFW2 was 38 % (27 % – 56 %) which corresponded to a median TSS ER of 48 % and a median TSS LRE of 51 % (Table 1). Lower TSS EMCs at the outlet than at the inlet indicate that the long root system of *C. appressa* plants with mean 90 percentile root length of $1.21\text{--}1.04 \text{ m}$ and mean maximum root length of $1.84\text{--}2.19 \text{ m}$ enhanced settling and entrapment of particles (Schwammberger et al., 2020). The long dense root network (Schwammberger et al., 2019) most certainly provided resistance to flow resulting in enhanced mixing and a more uniform flow distribution across the width of the CFW, which, in turn, enhanced sedimentation of suspended particles over the 30 m length of CFW2. However, short-circuiting of stormwater flow around the edges of CFW2 was observed during heavy storm events (Fig. 5). Short-circuiting along the mostly fortified (concreted) edge of the lake demonstrated the importance of a dense macrophyte zone at the water edge, to provide resistance to flow and to force stormwater runoff through the dense root network beneath the CFW. However, no reduction in TN and TP concentrations occurred during storm events at CFW2 (Table 1). Given that the reduction in nutrient concentrations in CW systems is often found to follow first-order kinetics (i.e., exponential decay), long retention times would be required to further reduce concentrations close to zero or relatively low background concentrations (Kadlec and Wallace, 2009). Thus, continuation of storm-event monitoring is necessary after completion of the construction phase, when TN and TP concentrations in the stormwater runoff are expected to increase.

This is the first study on a CFW installed in a newly constructed lake which required a recirculation system to mitigate the risks of algal blooms during dry weather conditions in subtropical Queensland, Australia (Mackay, 2008). Median TSS CRE for inter-event samples was 40 % (18 % – 65 %) with TSS removal mainly occurring during dry weather periods (Table 2). Results agree with findings of Tanner and Headley (2011), who reported turbidity reduction in planted CFWs under quiescent batch-loaded conditions. However, no TN and TP removal occurred during inter-event periods (Fig. 4). Similar to the treatment in SFCW with emergent plants, TN removal in CFWs depends on various factors including HRT, temperature, stormwater characteristics (Kadlec, 2012) and plant uptake. Given the recirculation pump rate of $4736.5 \text{ m}^3 \text{ d}^{-1}$ and assuming a uniform cross-sectional flow, the volume of water beneath CFW2 (1573 m^3) was replaced three times a day during inter-event periods. This is much less than the HRT > 2 days recommended for SFCWs (Water by Design, 2010) and the HRT > 4 days recommended for TN removal from stormwater runoff in SFCWs (Tondera et al., 2018). Sukias et al. (2010) found significant pollutant removal by CFWs treating eutrophic lake water with inlet pollutant concentrations of $1.1\text{--}1.9 \text{ g m}^{-3}$ TN and $0.17\text{--}0.20 \text{ g m}^{-3}$ TP with an HRT of 7 days (Headley and Tanner, 2012). In contrast, no significant TN removal from stormwater runoff was recorded in this study and in the study of Nichols et al. (2016) that had HRTs < 1 day. However, Borne et al. (2013) reported significant TN removal from stormwater runoff by the CFW that also had HRTs < 1 day, but only during the warmest months (late spring to end autumn) and with a water surface coverage by the CFW of 50 %. The water surface coverage of the lake by the two CFWs in the current study was only 8 % which might have been insufficient to meet the annual pollutant load reduction targets. Further research is needed to investigate the TSS, TN and TP treatment performance with higher HRTs achieved by varying the operation period or pump rate of the recirculation system.



Fig. 5. Visual observation of untreated stormwater runoff short circuiting at the edge of the second constructed floating wetland, CFW2.

3.4. Storm event monitoring and hydraulic retention time

Removal efficiencies of TSS, TN and TP from stormwater runoff by CFWs are highly dependent on the HRT (McAndrew and Ahn, 2017) as pollutant entrapment, sedimentation, microbial denitrification and assimilation into plant biomass require reduced flow velocities within the root network. Flow volume-weighted composite water sampling aims to prevent transit time delay errors that occur when sampling is done at shorter or longer time intervals than the actual HRT (Kadlec and Wallace, 2009). However, the water sample methodology to collect flow volume-weighted composite water samples differed among previous CFW field studies. Borne et al. (2013) and Winston et al. (2013) evaluated the treatment performance of a pond with CFWs by installing autosamplers at the inlet and outlet of the pond. Each autosampler was connected to an individual flowmeter at the inlet and outlet pipe of the pond, thus monitoring the actual HRT and preventing transit time delay errors. In contrast, Nichols et al. (2016) and the current study monitored the treatment performance of the water volume covered by CFWs in larger field installations. Autosamplers were installed at the upstream and downstream CFW edges to collect flow volume-weighted composite water samples according to flow measured in an inlet pipe. Consequently, samples were not weighted according to flow at the upstream and downstream edge of the CFWs, and the actual HRT between the samplers was likely not accurately considered. Individual flowmeters in horizontal pipe sections beneath each autosampler at the upstream and downstream CFW edge could be a viable option to prevent transit time delay errors and improve the storm event monitoring methodology for large-scale CFW installations.

Sampling at the upstream and downstream CFW edges, rather than sampling at the inlet and outlet pipes of a water body, is affected by the hydraulic flow regime through the CFW and open water zones. Full-scale tracer experiments on CFWs have shown that stormwater entering the leading edge of the root zone is decelerated and deflected away from the root zone, resulting in stormwater exiting predominantly at the bottom of the lake and underneath the root zone (Xavier et al., 2018). In another study, short-circuiting underneath the roots rather than flow through the root network was reported during tracer experiments on CFWs, with an actual HRT of 3.2 days in contrast to a calculated HRT of 9.2 days (Sukias et al., 2010). Therefore, the sample locations and water depth at the upstream and downstream CFW edge need to be carefully considered for representative storm-event monitoring. If the stormwater runoff was exiting the CFW predominantly at the bottom of the root zone, only a portion of treated stormwater runoff might have been

captured by the downstream autosamplers (sampling at 0.30 m below water surface) in the current study. Further, wind might have caused mixing and surface currents opposite to the flow direction, which could have resulted in sampling lake water downstream of the CFWs rather than treated stormwater runoff. Therefore, it is recommended in future experiments to determine the flow pathways between inlet and outlet sampling points beneath the CFWs by tracer techniques in combination with hydrodynamic modelling, before choosing the location and sampling depth of upstream and downstream autosamplers (Kadlec and Wallace, 2009; Khan et al., 2013). Since the hydraulic flow regime beneath the CFW largely depends on the root network that is growing and changing with time, tracer tests should ideally be repeated in regular intervals over the study duration. Further, single point water sampling increases the risk that samples are not representative of the “average” water composition passing beneath the CFWs, especially, if there are several inflows as for CFW 1. Spatial composite sampling from multiple locations would improve the accuracy of pollutant removal efficiency evaluation for CFWs, even if technically and logistically challenging.

3.5. Comparison with other treatment techniques

Currently, the BMPs suggested for stormwater treatment associated with large developments in Southeast Queensland are SFCWs and bioretention filters (Water by Design, 2010). For the stormwater treatment of a 45-ha urban development, a SFCW with a surface area of 1.8-ha to 3.6-ha or bioretention filters with a surface area of 0.45-ha to 0.9-ha would be necessary (Water by Design, 2010). As initially stated, the original planning foresaw a 2.6-ha SFCW, which was replaced with an urban lake and relatively small CFWs (total area of 2088 m² or 12.5 % of the required SFCW area) for stormwater treatment. In a comparison of international treatment facilities, Tondera et al. (2018) showed large differences in removal efficiencies for TN and TP in SFCWs and found no correlations between design, climate, and wetland maturation. There is no comparative study on the water treatment efficiencies of SFCWs, biofilters and CFWs. Further, there are no design guidelines for CFWs, and the study reported here is the first trial of large-scale CFWs in a lake treating urban stormwater runoff. Mean TN and TP ALRs of both CFWs in this study were comparable to previous CFW studies (Borne, 2013; Nichols et al., 2016) treating stormwater runoff (Table 1). While previous studies showed significant CREs for TN (Borne, 2013; Nichols et al., 2016) and TP (Borne, 2013), this was not the case in this study for TN and TP at both CFWs. This suggests that the CFW design in this study, specifically

CFW1, needs to be optimised to increase the active CFW treatment area and to improve the removal of targeted TSS, TN and TP, e.g., by rearranging CFW1. Further research is necessary to determine flow pathways beneath CFWs, assess optimal HRTs and CFW surface coverage ratio of the lake to meet the annual target pollutant load reductions required for BMPs in SEQ.

4. Conclusions

This is the first study to investigate large-scale CFWs for treating stormwater runoff during the construction phase of a greenfield urban development. The study evaluated the treatment performance of a lake section with CFWs (1) during storm-events; and (2) during dry weather periods. Average pollutant inflow concentrations in the mixed stormwater were low and had a high impact on the CFW performance metrics. No significant pollutant reductions were found during storm-events at the 11.5 m long CFW1 due to low pollutant concentrations in influent water, high flow velocities created by a nearby culvert, low hydraulic retention times in the root regions and difficulties to assess representative samples of inlet and outlet flows. In contrast, CFW1 showed significant TSS removal during dry weather periods with low flow velocities generated by the recirculation system. The 32.0 m long CFW2 showed significant TSS removal during storm-events and dry weather periods, but no significant reductions for TN and TP due to low influent concentrations. Despite low inflow pollutant concentrations, both CFWs were heavily loaded with TSS, TN and TP as a result of the high hydraulic loading rates during storm events. This study demonstrated that CFWs significantly reduce TSS concentration from construction runoff. However, under such loading conditions (high hydraulic load and very low inlet concentrations), substantially larger areas of CFWs relative to the flow rate and catchment area would be required to lower the areal loading rates. Therefore, this study highlights important treatment limitations associated to the operational conditions of CFWs at field scale that would not have arisen from a mesocosm scale study. The associated design recommendations are thought to contribute a first step towards improved implementation of CFWs at field scale. Further research is necessary to investigate the treatment performance of CFWs during the operational phase of the development when nutrient levels are expected to be higher. CFD modelling and tracer experiments were identified as useful methods to validate and improve storm event monitoring methodology and CFW design configuration.

CRedit authorship contribution statement

Peter F. Schwammberger: Conceptualization, Methodology, Software, Validation, Formal analysis, Data curation, Writing – original draft, Writing – review & editing, Visualization. **Katharina Tondera:** Conceptualization, Data curation, Writing – review & editing. **Tom R. Headley:** Data curation, Writing – review & editing. **Karine E. Borne:** Data curation, Writing – review & editing. **Catherine M. Yule:** Writing – review & editing. **Neil W. Tindale:** Conceptualization, Data curation, Writing – review & editing.

Data availability

Data will be made available on request.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.scitotenv.2022.161107>.

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Nutrient uptake by constructed floating wetland plants during the construction phase of an urban residential development

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HIGHLIGHTS

- We examined growth and nutrient uptake by plants in constructed floating wetlands.
- Root growth of *Carex appressa* was extensive at 12 and 16 months after planting.
- Large amounts of nutrients were removed from stormwater.
- Aluminium, copper, iron and manganese were concentrated in or on the roots.
- Constructed floating wetlands offer multiple benefits for stormwater treatment.

GRAPHICAL ABSTRACT



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ABSTRACT

This study investigated plant growth, nutrient partitioning and total nutrient uptake by tall sedge (*Carex appressa*) plants in two large-scale Constructed Floating Wetlands (CFW1 and CFW2). These CFWs were installed to treat stormwater runoff discharging into a newly-constructed 2.6-ha lake during the construction phase of a 45-ha residential development. Nutrient concentrations of *C. appressa* shoot above the mat, biomass within the mat, and roots below the mat were analysed 0, 12 and 16 months after planting. Extensive root growth was evident after 12 and 16 months. Some nutrients (nitrogen, phosphorus, sulphur) were distributed almost evenly among the above-, within-, and below-mat components, while others (aluminium, copper, iron, manganese) were concentrated in or on the roots. Given the low concentrations of nutrients within the water column, large amounts of nutrients were removed from stormwater by the plants. Total nitrogen uptake was 20.20 ± 2.88 kg in CFW1 and 15.00 ± 2.07 kg in CFW2 over the 16-month study period. Total potassium uptake was 12.59 ± 1.64 kg in CFW1 and 7.20 ± 1.56 kg in CFW2. Phosphorus uptake was low as a consequence of low phosphorus availability in the water. High aluminium, iron and manganese concentrations were found in the roots, demonstrating that *C. appressa* removed and sequestered large quantities of these water pollutants from urban stormwater runoff. For example, total aluminium uptake was 7.82 ± 1.73 kg in CFW1 and 5.62 ± 0.75 kg in CFW2. This study demonstrated multiple benefits of CFWs for stormwater treatment in the early stages of an urban development.

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1. Introduction

Urbanisation is typically associated with the creation of large areas of impervious surface that accumulate pollutants from human activity and prevent the infiltration of stormwater runoff into the subsoil (Ladislas et al., 2015). Stormwater runoff is, therefore, retained in greater volumes and this can mobilise accumulated contaminants and transport them to downstream receiving waters (Ladislas et al., 2015; Schwammberger et al., 2016). Stormwater Best Management Practices (BMPs) have been developed to minimise negative impacts on the natural water cycle and these are categorised using a variety of terms including: Water Sensitive Urban Design (WSUD), Sustainable Urban Drainage Systems (SUDS), Stormwater Control Measures (SCMs), Low Impact Development (LID) and Green Infrastructure (GI) (Fletcher et al., 2015).

Constructed Floating Wetlands (CFWs) are a newly emerging BMP that consist of a buoyant structure planted with macrophytes (Fig. 1). The plant roots grow directly into the water column and the roots and root hairs provide a large surface area for biofilm growth (Stewart et al., 2008; Tanner et al., 2011; Winston et al., 2013). The root network and biofilm physically filter and trap suspended solids (Headley and Tanner, 2007) and make pollutants available for adsorption, absorption and incorporation into plant tissue (Headley and Tanner, 2011; Lynch et al., 2015). CFWs are designed to mimic the pollutant removal processes of natural floating marshes and islands (Tanner et al., 2012; Walker et al., 2017).

CFWs can be installed in most open-water bodies (Chang et al., 2012) and can be retrofitted into stormwater retention ponds or urban lakes (Winston et al., 2013; Borne et al., 2014; Hartshorn et al., 2016; Walker et al., 2017). CFWs provide a passive, low-maintenance and operationally simple water-treatment solution that enhances

habitat, recreational and aesthetic values within the urban landscape (Knight et al., 2001; Rousseau et al., 2008; Lee and Li, 2009; Headley and Tanner, 2011). Their buoyancy also allows them to adjust to large water-level variations associated with heavy-rainfall events that can be problematic for other BMPs.

CFW plants acquire nutrients for growth directly from the water column (Headley and Tanner, 2006; Vymazal, 2007). However, nutrient concentrations in stormwater runoff can be low and this may limit plant growth (Wang et al., 2014). In these circumstances, CFW plants may allocate more resources to below-ground tissue, increase their root length and produce thinner roots to increase the area from which to scavenge nutrients (Marschner, 1995; Williamson et al., 2001). Plant nutrient uptake may also vary temporally in CFWs because of variable nutrient availability in the water column below the CFW, which largely depends on nutrient laden stormwater runoff. Total nutrient uptake by the CFW plant biomass represents the amount of nutrient removed from the water body (Güsewell and Koerselman, 2002). The total amount of nutrients removed from water by the plants, and the distribution of nutrients in different plant components, can be quantified and this can assist in optimising shoot-harvesting strategies to remove nutrients permanently from the CFW water body (Wang et al., 2014). However, there is currently little understanding of the partitioning of biomass and nutrients between the aerial and water-column components of CFWs.

This study investigated growth of, and nutrient uptake by, *Carex appressa* plants in two CFWs during the construction phase of a green-field urban development in subtropical Queensland, Australia. *Carex appressa* was selected because it is a locally native species that has been shown to be effective for CFWs in this region (Walker et al., 2017). The total area of the CFW treatment system was 2088 m², which was the largest CFW installation in the world in 2018 to treat

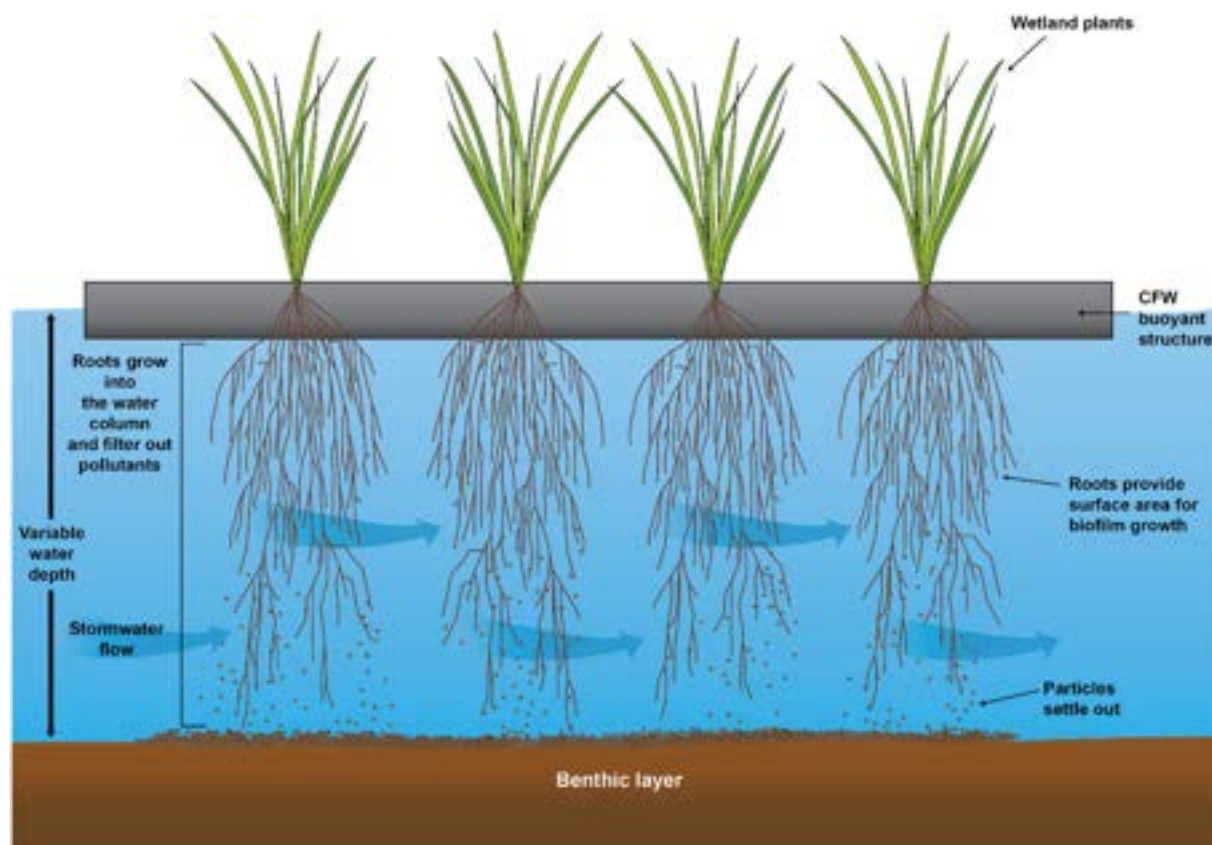


Fig. 1. Schematic of a constructed floating wetland consisting of a buoyant structure planted with wetland plants whose roots filter pollutants and provide a surface for biofilm growth.

stormwater runoff from an urban development. It was also the first time that CFWs had been used as the primary stormwater treatment system for pollutant removal from an urban development. The aims of the study were to: (1) determine how much plant biomass was contained above the CFW mat relative to the amounts contained within and below the CFW mat; (2) identify nutrients that were partitioned in disproportionate amounts between the three different biomass components; and (3) quantify total nutrient uptake by the CFW vegetation over a 16-month period that spanned two summers. The results of the study will allow better management of CFWs, including informing shoot-harvesting strategies to maximise nutrient removal from urban stormwater runoff.

2. Materials and methods

2.1. Study site

Two CFWs were installed and planted in a newly constructed 2.6-ha lake in the early construction stages of a 45-ha urban development, “Parklakes 2”, at Bli Bli (26°35'S, 153°01'E) in Queensland, Australia, in December 2015 (Fig. 2). The first wetland (CFW1) was 11.5 m long × 92.0 m wide and had a total area of 1058 m² (Fig. 3). It received stormwater runoff from a 32-ha catchment. The second wetland (CFW2) was 32.0 m long × 32.2 m wide, had a total area of 1030 m², and was installed downstream of CFW1 (Fig. 3). CFW2 received untreated runoff from a 13-ha catchment, in addition to treated stormwater runoff from CFW1. Both CFWs spanned the entire width of the lake to minimise potential short-circuiting and to direct stormwater runoff through their root networks. The operational water depth beneath both CFWs was 1.65 m.

CFW1 and CFW2 comprised 115 and 112 CFW modules (Biohaven®, Floating Island International, Shepherd, MT), respectively. Each module was 4.0 m long × 2.3 m wide × 0.2 m high. The CFW modules were made of four horizontal layers (each layer 50-mm thickness) of non-woven, recycled, polyethylene terephthalate (PET) fibrous matrix injected with a non-degradable marine-based polyurethane foam (“marine-grade foam”) to provide buoyancy.

Each of the study CFW modules had 40 plant holes (150 mm deep × 100 mm diameter). Two *Carex appressa* plants were planted in each hole, which produced a planting density of 8.7 plants/m². The *C. appressa* plants were raised in 115-mL tubes containing potting mix that consisted of 75% mulch and 25% soil (v:v). Shoot height was between 200 and 250 mm at the time of planting. Both CFWs were covered in nylon netting (15 mm mesh size) to protect the plants from predation by birds until the plants were established after 3 months.

2.2. Water sampling and analysis

Water samples were collected, according to standard methods of the American Public Health Association (APHA, 2005), upstream and downstream of each CFW at 1, 4, 7, 10, 13 and 16 months after planting in December 2015 (Fig. 3). Samples were sent to a NATA (National Association of Water Testing Authorities in Australia) accredited laboratory for analysis. Water samples were analysed for total nitrogen (TN), ammonia (NH₃), nitrate (NO₃⁻), total phosphorus (TP), orthophosphate (PO₄³⁻), aluminium (Al) and iron (Fe) concentrations.

2.3. Initial sampling and nutrient analysis of plants and potting mix

To assess the plant nutrient uptake from stormwater runoff during the first 12 and 16 months after planting, five of the *C. appressa* plants from the initial tubestock batch were analysed to determine a mean representative biomass and plant nutrient baseline, which was then subtracted from the mean biomass and nutrient content at 12 and 16 months after planting (Fig. 2a). The nutrients in the potting mix were assumed conservatively to be utilised fully by the plants and

were, therefore, included in the nutrient baseline. The five tubestock plants were separated from their potting mix, washed gently in water, and dissected into shoots and roots. The individual shoot, root and potting mix samples were dried at 70 °C for 7 d, weighed, and then ground to a homogeneous powder in preparation for nutrient analysis.

Nitrogen (N) concentrations were determined by combustion analysis (TruSpec®, LECO Corporation, St. Joseph, MI). Phosphorus (P), potassium (K), aluminium (Al), boron (B), calcium (Ca), copper (Cu), iron (Fe), magnesium (Mg), manganese (Mn), sodium (Na), sulphur (S) and zinc (Zn) concentrations were determined by inductively coupled plasma–atomic emission spectroscopy (Vista Pro®, Varian Incorporation, Palo Alto, CA). The nutrient content (NCT) in each plant part and the potting mix was then calculated using Eq. (1):

$$\text{NCT} = C \times m \quad (1)$$

where:

NCT = Nutrient content (g)

C = Concentration (g kg⁻¹)

m = Biomass (kg)

2.4. Plant sampling and nutrient analysis at 12 months after planting

Biomass and nutrient concentrations of the plants were determined in December 2016 at the beginning of the second summer at 12 months after planting (Fig. 2b). At that time, the installation of a new anchoring system required replacement of 16 CFW modules, i.e. two CFW modules at each corner of both CFWs. This offered the opportunity to dissect the removed CFW modules to determine the within-mat biomass component, which had not been investigated in previous studies (Tanner and Headley, 2011; Borne et al., 2013; Winston et al., 2013).

Two plant holes were selected at each corner of both CFWs (total of 16 plant holes and 32 plants) to be representative of the CFW-module plant population and to be in an area with average water depth of 1.65 m (Fig. 3). The plant holes were located at a maximum possible distance from the sloped lake embankment to exclude plants that were possibly rooted in, and acquiring nutrients from, the benthic layer. Two plant holes, including plants and sections of the surrounding CFW mat, were removed from one CFW module at each corner of both CFWs to determine average plant growth, biomass and nutrient content. Each of the removed mat sections was dissected from the CFW module at sufficient distance from the selected plant holes to prevent damage to the roots within and beneath the mat. The roots were then disentangled gently from the adjoining root network before lifting the CFW module sections from the water (Fig. 4a). The CFW module sections and plants were transported carefully to the laboratory for analysis.

In the laboratory, the two plants in each hole were partitioned into their above-mat portion (‘shoots’) and below-mat portion (‘roots’). The CFW mat sections containing the plant holes were then carefully separated from the other parts of the mat and the marine-grade foam. Marine-grade foam surrounded each plant hole at varying distances between 5 and 20 cm from the plants and it constituted a barrier to horizontal root growth. This allowed for better quantification of the within-mat biomass as the marine-grade foam prevented intertwining of roots from adjacent plant holes. Biomass within the mat (‘mat biomass’) was determined by extracting plant material carefully from each mat layer using tweezers.

The biomass of the two plants in each plant hole could not be distinguished from each other and so the shoot-, root-, and mat-biomass samples for each hole were treated as being from a single plant during this procedure (Fig. 4b). The plant biomass samples were then weighed and processed for nutrient analysis using the methods outlined in Section 2.3. However, biomass and nutrient

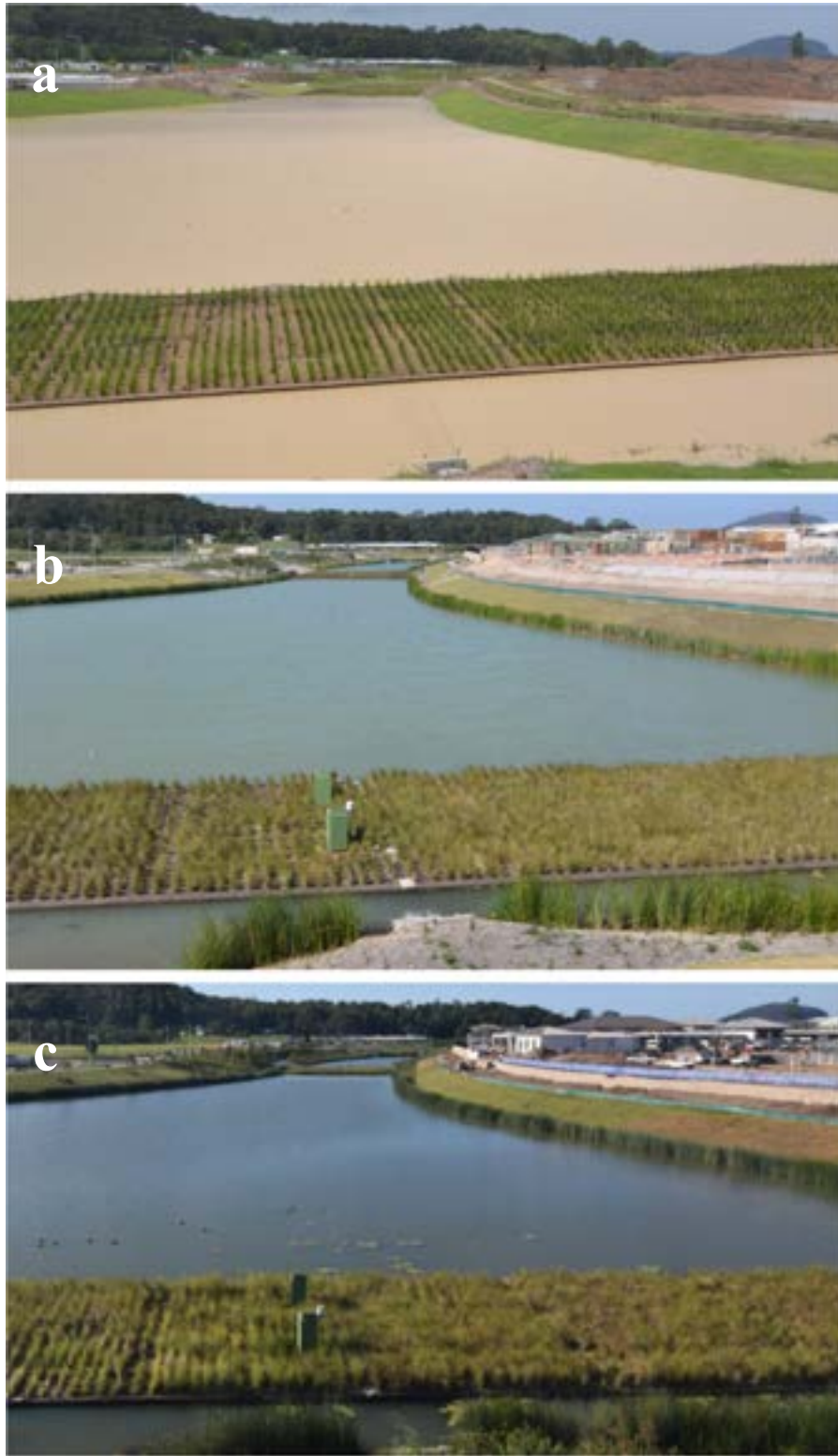


Fig. 2. Constructed floating wetlands (CFWs) containing *Carex appressa* plants: (a) CFW1 immediately after installation and planting in December 2015; (b) CFW1 at 12 months after installation; (c) CFW1 at 16 months after installation. CFW2 is further along the lake in the background of each photograph.

results for the two plants were then halved to provide an average value per individual plant.

The total increase in wetland vegetation biomass at 12 months after planting ($M_{CFW, total}$) was calculated for each CFW by subtracting the average initial biomass of the tubestock plants ($M_{tubestock}$) from the average plant biomass at 12 months after

planting (M_{plant}), and multiplying this by the total number of plants on each wetland (Eq. (2)):

$$M_{CFW, total} = (M_{plant} - M_{tubestock}) * n_{CFW} \quad (2)$$

where:

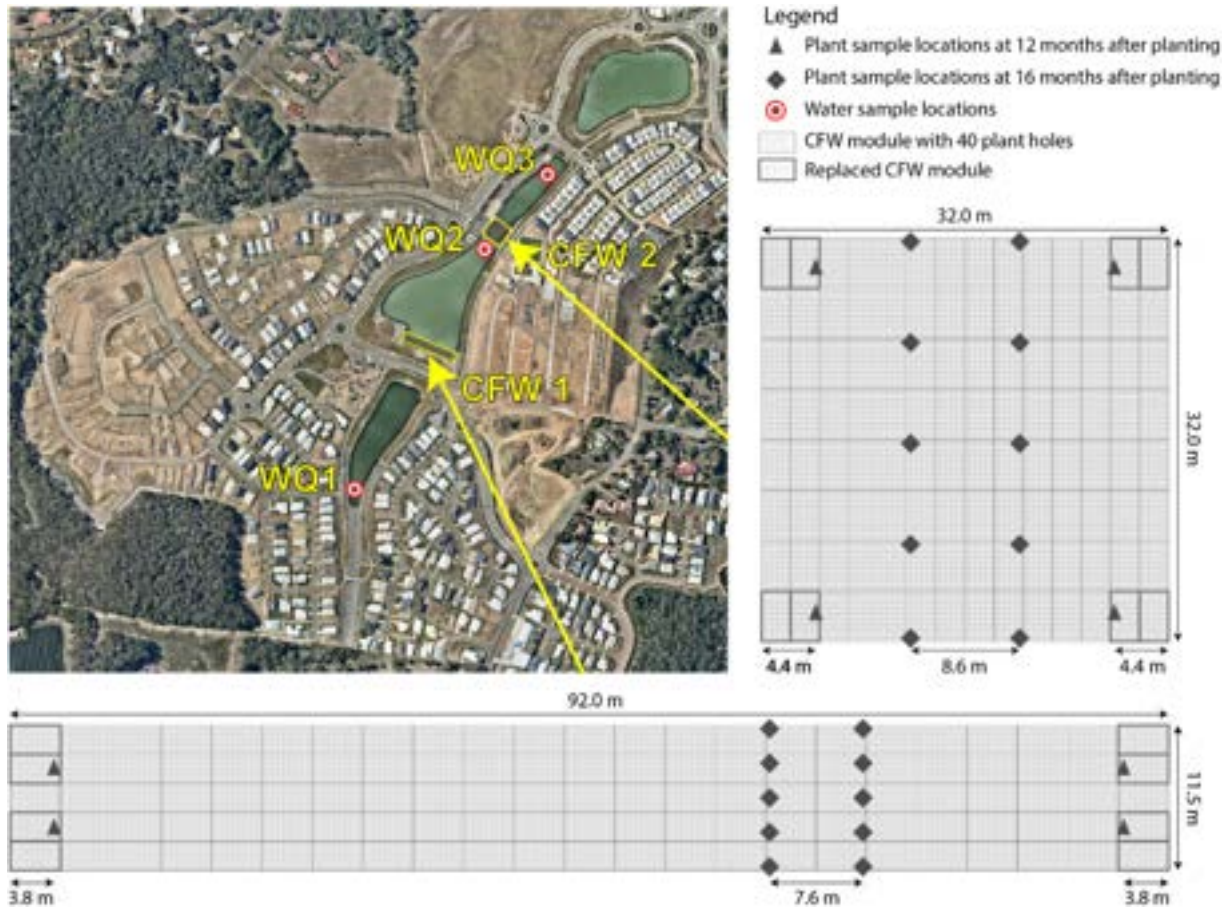


Fig. 3. Aerial view of two constructed floating wetlands, CFW1 and CFW2, consisting of 115 and 112 CFW modules, respectively, with each module having 40 holes that each contain two *Carex appressa* plants. The eight CFW modules removed at 12 months after installation, and the location of the plants within each of these modules that were dissected into above-mat, within-mat and below-mat biomass, are indicated by dark rectangles and triangles, respectively. The locations of plants dissected into above- and below mat biomass at 16 months after installation are indicated by diamonds. Water samples were collected upstream and downstream of each CFW at 1, 4, 7, 10, 13 and 16 months after planting.

$M_{CFW, total}$ = Total biomass increase of each CFW (g)

M_{plant} = Mean plant biomass (g)

$M_{tubestock}$ = Mean tubestock plant biomass (g)

n_{CFW} = Total number of plants on each CFW

$k_{CFW, total}$ = Nutrient uptake per square meter ($g\ m^{-2}$)

$NCT_{CFW, total}$ = Total nutrient uptake of each CFW (g)

A_{CFW} = Area of CFW (m^2)

The total nutrient uptake by the plants of each CFW at 12 months after planting ($NCT_{CFW, total}$) was calculated by subtracting the average nutrient content in the initial tubestock plants and the potting mix ($NCT_{tubestock}$) from the average plant nutrient content at 12 months after planting (NCT_{plant}), and multiplying this by the total number of plants on each wetland (Eq. (3)):

$$NCT_{CFW, total} = (NCT_{plant} - NCT_{tubestock}) * n_{CFW} \quad (3)$$

where:

$NCT_{CFW, total}$ = Total nutrient uptake of each CFW (g).

NCT_{plant} = Mean plant nutrient content (g).

$NCT_{tubestock}$ = Mean tubestock plant nutrient content (g).

n_{CFW} = Total number of plants on each CFW.

The nutrient uptake per square meter ($k_{CFW, total}$) by *C. appressa* plants in each of the two CFWs was then calculated (Eq. (4)):

$$k_{CFW, total} = \frac{NCT_{CFW, total}}{A_{CFW}} \quad (4)$$

where:

2.5. Plant sampling and nutrient analysis at 16 months after installation

To determine the plant nutrient uptake at the end of two summers, above-mat and below-mat biomass were harvested 16 months after planting (early May 2017, mid-autumn) (Fig. 2c) and analysed for nutrient concentrations. Shoots and roots of 20 plants (10 plant holes) were dissected from above and below the mat along two parallel transects, each of five plant holes, per CFW (Fig. 3), using similar methods to those described in Section 2.3. Biomass could not be removed from the floating mat in situ, and so the within-mat biomass and nutrient content of each plant at 16 months after planting ($M_{mat, 16}$) were calculated by extrapolating the mean proportion of biomass or nutrient content in the mat-biomass at 12 months after planting ($w_{mat, 12}$) (Eq. (5)):

$$M_{mat, 16} = \sum_{i=1}^n \frac{(M_{i, shoots, 16} + M_{i, roots, 16}) * w_{mat, 12}}{1 - w_{mat, 12}} \quad (5)$$

$$w_{mat, 12} = \frac{1}{n} \left(\sum_{j=1}^n \frac{M_{j, mat, 12}}{M_{j, shoots, 12} + M_{j, mat, 12} + M_{j, roots, 12}} \right)$$

where:

$M_{mat, 16}$ = Mean mass or nutrient content in the mat biomass at 16 months after planting (g),



Fig. 4. (a) Part of a constructed floating wetland (CFW) module, lifted from the water, showing *Carex appressa* plants at 12 months after planting; (b) plant separated into its above-mat (top), within-mat (middle) and below-mat (bottom) components.

M_i = Mass or nutrient content in the shoots and roots at 16 months after planting for i number of samples (g),

$w_{mat,12}$ = Mean proportion of biomass or nutrient content in the mat-biomass at 12 months after planting,

M_j = Mass or nutrient content in shoots, mat-biomass or roots 12 months after planting for j number of samples (g),

n = Total number of samples collected on each CFW at 12 or 16 months after planting.

The total biomass growth, nutrient uptake, and nutrient uptake per square meter of the wetland vegetation at 16 months after planting were then calculated for both CFWs using Eqs. (2), (3) and (4).

2.6. Statistical analysis

Nutrient concentration data were analysed by 1-way analysis of variance (ANOVA) using SPSS Statistics v.21 (IBM Corporation), comparing

nutrient concentrations in either shoots or roots at 0, 12 and 16 months after planting within each of the CFWs. Post-hoc Tukey's Honestly Significant Difference (HSD) tests were performed only when significant differences were detected by ANOVA. Means are reported with standard errors and differences were regarded as significant at $p < 0.05$.

3. Results

3.1. Water sampling

Mean TN concentrations were $0.73 \pm 0.19 \text{ mg L}^{-1}$ upstream of the CFWs, $0.55 \pm 0.18 \text{ mg L}^{-1}$ downstream of CFW1 and $0.62 \pm 0.16 \text{ mg L}^{-1}$ downstream of CFW2 over the 16-month monitoring period (Fig. 5). Mean NH_3 concentrations were $0.06 \pm 0.03 \text{ mg L}^{-1}$ upstream of the CFWs and $0.02 \pm 0.01 \text{ mg L}^{-1}$ downstream of each CFW. Several water samples had NH_3 concentrations below the limit of detection (LOD) of 0.01 mg L^{-1} and so these measures were replaced with the LOD to be conservative. Mean NO_3^- concentrations were $0.37 \pm 0.12 \text{ mg L}^{-1}$ upstream of the CFWs, $0.36 \pm 0.14 \text{ mg L}^{-1}$ downstream of CFW1 and $0.35 \pm 0.14 \text{ mg L}^{-1}$ downstream of CFW2. Mean TP concentrations were $0.06 \pm 0.01 \text{ mg L}^{-1}$, and PO_4^{3-} concentrations were at the LOD of 0.05 mg L^{-1} for all sampling points. Mean Al concentrations were 2.69 ± 1.90 , 2.58 ± 1.22 and $2.35 \pm 1.13 \text{ mg L}^{-1}$, and

mean Fe concentrations were 2.73 ± 1.89 , 2.44 ± 1.18 and $2.23 \pm 1.10 \text{ mg L}^{-1}$ upstream of CFW1, between the CFWs, and downstream of CFW2, respectively.

3.2. Plant biomass above, within, and below the buoyant mat

Plant dry mass at 12 months after planting was almost-evenly distributed between the above-mat shoots and below-mat roots (Table 1). In addition, average dry biomass within the mat at 12 months after planting was $69 \pm 7 \text{ g}$ in CFW1 and $73 \pm 11 \text{ g}$ in CFW2, which equated to $40 \pm 1\%$ and $34 \pm 4\%$ of total plant biomass in CFW1 and CFW2, respectively (Table 1). These proportions, determined from modules that were opportunistically harvested at the CFW corners, were then used to estimate the total biomass of plants along the more-representative central transects of the CFWs at 16 months after planting.

Biomass was partitioned almost evenly between above- and below-mat components at 16 months after planting, with above-mat:below-mat biomass ratios of 1.07 ± 0.15 in CFW1 and 1.03 ± 0.09 in CFW2 at 16 months after planting (Table 1). The roots reached deeply into the water column, with average 90th-percentile root length on each plant of $1.19 \pm 0.07 \text{ m}$ in CFW1 and $1.33 \pm 0.08 \text{ m}$ in CFW2 and an average maximum root length of $2.01 \pm 0.14 \text{ m}$ in CFW1 and $2.19 \pm 0.13 \text{ m}$ in CFW2 at 16 months after planting (Table 1).

3.3. Nutrient concentrations in plant components

Shoot N concentrations at 16 months after planting did not differ significantly from those in the tubestock, while root N concentrations of CFW1 were higher than those in the tubestock (Table 2). The shoot and root concentrations of P, K, S, Cu and Mg declined over the 16-month monitoring period while shoot and root Al concentrations increased. Shoot Ca concentrations declined over the 16 months but root Ca concentrations did not decline significantly. Shoot Fe and Mn concentrations at 16 months after planting did not differ significantly from initial levels in CFW1 or CFW2, but increased root Fe concentrations were evident in CFW2 at 16 months after planting. Root Mn concentrations increased over the 16-month monitoring period in both CFWs. Shoot Na concentrations declined by 16 months after planting, whereas root Na concentrations did not differ significantly from initial levels (Table 2).

Nutrient partitioning between shoot, mat and root biomass at 16 months after planting was similar to that at 12 months after planting (Figs. 6 and 7). N, K, S and B were contained mostly in the shoot and mat biomass, while P, Ca, Mg and Na were more evenly distributed between shoots, mat biomass, and roots (Figs. 6 and 7). Al, Fe and Mn were contained predominantly in the roots, Cu was held mostly in the mat biomass and roots, and Zn was held mostly in the mat biomass (Fig. 7).

3.4. Total plant nutrient uptake by the CFW vegetation

Nutrient contents of individual plants at 16 months after planting in both CFWs were high for N ($1.75\text{--}2.27 \text{ g}$), K ($0.84\text{--}1.40 \text{ g}$) and Ca ($0.70\text{--}0.97 \text{ g}$) but low for P ($0.105\text{--}0.134 \text{ g}$), considering the low nutrient concentrations in the water (Table 3). The two CFWs removed high amounts of N (35.20 kg), K (19.79 kg) and Ca (12.21 kg) but lower amounts of P (1.98 kg) from stormwater (Table 4), which equated to nutrient uptake of $15\text{--}19 \text{ g m}^{-2}$ N, $0.8\text{--}1.1 \text{ g m}^{-2}$ P, $7\text{--}12 \text{ g m}^{-2}$ K and $5\text{--}7 \text{ g m}^{-2}$ Ca during the 16-month CFW operation period (Table 5).

The individual plants also contained high amounts of Al ($0.66\text{--}0.88 \text{ g}$), Fe ($0.41\text{--}0.44 \text{ g}$) and Mn ($0.15\text{--}0.32 \text{ g}$), which were predominantly contained in the root biomass (Table 3). High amounts of Al (13.44 kg), Fe (5.38 kg) and Mn (4.26 kg) were contained in the *C. appressa* plants across both CFWs (Table 4). Nutrient uptake from stormwater by the CFW vegetation equated to $5.5\text{--}7.4 \text{ g m}^{-2}$ Al,

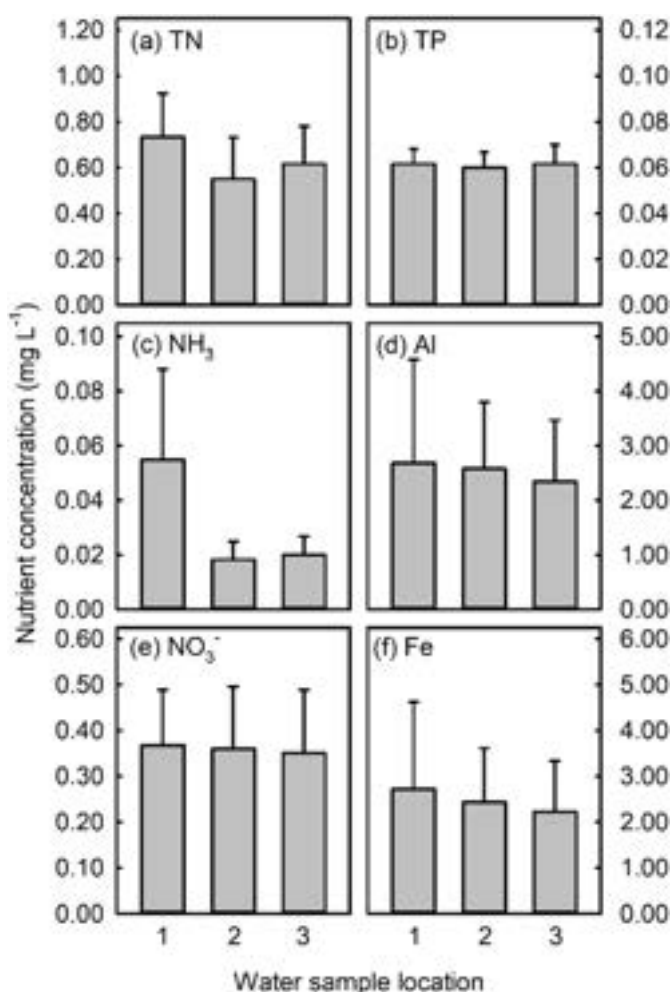


Fig. 5. Mean ($\pm$ SE) concentrations of (a) total nitrogen (TN), (b) total phosphorus (TP), (c) ammonia (NH_3), (d) aluminium (Al), (e) nitrate (NO_3^-) and (f) iron (Fe) in water samples collected monthly from 1 to 16 months after planting at three locations relative to two constructed floating wetlands (CFWs) containing *Carex appressa* plants: (1) upstream of CFW1, (2) between CFW1 and CFW2, and (3) downstream of CFW2.

Table 1
Mean ($\pm$ SE) individual dry mass, height, lengths, growth rate, and above-mat:below-mat biomass ratio of *Carex appressa* plants, and total plant dry mass in each of two constructed floating wetlands, CFW1 and CFW2, at 0, 12 or 16 months after planting.

CFW	Above-mat				(Potting mix)/within-mat		Below-mat				Individual plant mass (g)	Biomass ratio (above-mat:below-mat)	Total CFW plant mass (t)
	Shoot mass	90th percentile shoot height	Max. shoot height	Shoot growth	Mass	Percentage	Root mass	90th percentile root length	Max. root length	Root growth			
	(g)	(m)	(m)	(g m ⁻²)	(g)	(%)	(g)	(m)	(m)	(g m ⁻²)			
0 months after planting (n = 5)													
	1.5 ± 0.2	0.20 ± 0.00	0.25 ± 0.00	–	(22.1 ± 0.4) ^a	–	0.9 ± 0.1	–	–	–	2.3 ± 0.3	1.72 ± 0.16	–
12 months after planting (n = 16)													
CFW1	51 ± 4	0.65 ± 0.05	0.94 ± 0.05	432 ± 37	69 ± 7	40 ± 1	54 ± 8	1.10 ± 0.09	1.93 ± 0.17	458 ± 66	174 ± 17	1.07 ± 0.16	1.37 ± 0.16
CFW2	73 ± 8	0.86 ± 0.04	1.20 ± 0.07	619 ± 69	73 ± 11	34 ± 4	71 ± 10	1.34 ± 0.09	2.46 ± 0.20	606 ± 87	217 ± 20	1.09 ± 0.09	1.72 ± 0.18
16 months after planting (n = 20)													
CFW1	57 ± 6	0.85 ± 0.02	1.19 ± 0.03	482 ± 52	80 ± 10 ^b	–	65 ± 11	1.19 ± 0.07	2.01 ± 0.14	549 ± 92	202 ± 26	1.07 ± 0.15	1.63 ± 0.23
CFW2	61 ± 6	0.82 ± 0.06	1.09 ± 0.08	517 ± 55	62 ± 7 ^b	–	61 ± 7	1.33 ± 0.08	2.19 ± 0.13	521 ± 65	184 ± 20	1.03 ± 0.09	1.43 ± 0.18

^a Mass of potting mix.

^b Calculated within-mat biomass.

Table 2
Nutrient concentrations of shoots, within-mat biomass, roots and potting mix of *Carex appressa* plants at 0, 12 or 16 months after planting in each of two constructed floating wetlands, CFW1 and CFW2. Means ($\pm$ SE) marked with an asterisk (*) are significantly different from the corresponding mean at 0 months after planting (ANOVA and Tukey's HSD test, $p < 0.05$, $n = 5-20$).

CFW	Nutrient	N	P	K	Ca	S	Al	Cu	Fe	Mn	Mg	Na	Zn	B
		%	%	%	%	%	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
0 months after planting (n = 5)														
	Shoots	1.14 ± 0.04	0.229 ± 0.020	1.48 ± 0.06	0.56 ± 0.02	0.171 ± 0.011	0.01 ± 0.00	17.3 ± 1.2	313 ± 89	178 ± 10	2770 ± 64	1060 ± 78	28 ± 2	16 ± 1
	Roots	0.71 ± 0.04	0.105 ± 0.006	0.66 ± 0.04	0.48 ± 0.04	0.144 ± 0.006	0.05 ± 0.00	43.1 ± 6.5	1353 ± 108	118 ± 3	3444 ± 258	1377 ± 126	89 ± 6	26 ± 3
	Potting mix	0.25 ± 0.04	0.031 ± 0.007	0.04 ± 0.00	0.87 ± 0.13	0.059 ± 0.006	0.14 ± 0.01	34.9 ± 4.4	5822 ± 938	166 ± 14	1786 ± 188	81 ± 8	50 ± 7	14 ± 1
12 months after planting (n = 16)														
CFW1	Shoots	0.75 ± 0.03*	0.040 ± 0.003*	0.73 ± 0.04*	0.35 ± 0.01*	0.132 ± 0.007*	0.09 ± 0.01*	3.5 ± 0.3*	466 ± 47	222 ± 17	1306 ± 76*	1640 ± 95*	47 ± 5*	24 ± 3
	Mat	0.86 ± 0.05	0.049 ± 0.004	0.44 ± 0.04	0.40 ± 0.03	0.178 ± 0.015	0.31 ± 0.05	13.1 ± 1.4	1692 ± 196	180 ± 21	1573 ± 129	1377 ± 67	234 ± 43	20 ± 3
	Roots	0.65 ± 0.05	0.042 ± 0.001*	0.28 ± 0.01*	0.59 ± 0.02	0.111 ± 0.004*	1.17 ± 0.17*	18.5 ± 1.9*	6621 ± 1144*	1577 ± 83	1810 ± 116*	1642 ± 76	112 ± 51	10 ± 2*
CFW2	Shoots	0.96 ± 0.05	0.038 ± 0.003*	0.74 ± 0.06*	0.37 ± 0.02*	0.128 ± 0.009*	0.10 ± 0.01*	4.2 ± 0.3*	491 ± 44	224 ± 41	1239 ± 56*	1142 ± 130	49 ± 6*	28 ± 3*
	Mat	1.04 ± 0.04	0.060 ± 0.006	0.49 ± 0.04	0.39 ± 0.02	0.186 ± 0.008	0.23 ± 0.03	19.7 ± 3.0	1416 ± 108	175 ± 9	1693 ± 97	1387 ± 179	522 ± 133	22 ± 3
	Roots	0.78 ± 0.02	0.037 ± 0.002*	0.42 ± 0.05*	0.48 ± 0.04	0.106 ± 0.005*	1.04 ± 0.15*	18.7 ± 3.7*	5570 ± 981*	1196 ± 178*	1942 ± 130*	2071 ± 163*	32 ± 4*	9 ± 4*
16 months after planting (n = 20)														
CFW1	Shoots	1.18 ± 0.07	0.060 ± 0.004*	1.01 ± 0.07*	0.30 ± 0.01*	0.140 ± 0.003*	0.09 ± 0.01*	4.8 ± 0.2*	538 ± 63	189 ± 9	1641 ± 67*	601 ± 38*	43 ± 2*	29 ± 4
	Roots	0.93 ± 0.05*	0.062 ± 0.008*	0.50 ± 0.03*	0.78 ± 0.13	0.122 ± 0.006*	0.98 ± 0.14*	22.2 ± 3.9*	4532 ± 622	3870 ± 615*	2127 ± 126*	1087 ± 60	38 ± 3	18 ± 5
CFW2	Shoots	1.11 ± 0.12	0.044 ± 0.004*	0.55 ± 0.08*	0.32 ± 0.02*	0.125 ± 0.007*	0.06 ± 0.01*	5.9 ± 1.5*	394 ± 40	199 ± 21	1278 ± 101*	493 ± 94*	47 ± 3*	18 ± 2
	Roots	0.71 ± 0.06	0.052 ± 0.005*	0.33 ± 0.03*	0.57 ± 0.05	0.112 ± 0.006*	0.83 ± 0.06*	16.3 ± 2.0*	5120 ± 295*	2050 ± 185*	1961 ± 59*	1086 ± 64	28 ± 1*	12 ± 2*

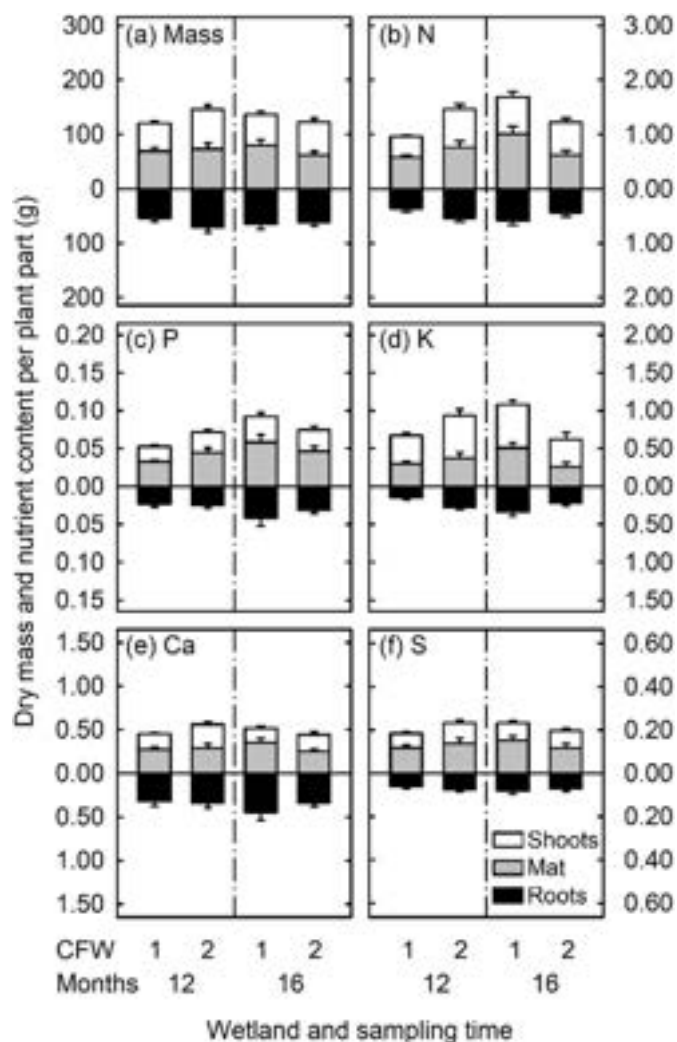


Fig. 6. Mean (+SE) dry mass and nutrient content in each plant component of *Carex appressa* in constructed floating wetlands, CFW1 and CFW2, at 12 and 16 months after planting: (a) biomass; (b) nitrogen (N); (c) phosphorus (P); (d) potassium (K); (e) calcium (Ca); and (f) sulphur (S).

2.5–2.7 g m⁻² Fe and 1.3–2.8 g m⁻² Mn during the 16-month period (Table 5).

4. Discussion

This study aimed to: (1) determine how much plant biomass was contained above the CFW mat relative to the amounts contained within and below the CFW mat; (2) identify nutrients that were partitioned in disproportionate amounts between the three different biomass components; and (3) quantify total nutrient uptake by the CFW vegetation. Plant dry biomass was approximately equally distributed between the above-mat shoots, within-mat biomass, and below-mat roots. Nitrogen, K, S and B were contained predominantly in the shoot and mat biomass. Phosphorus, Ca, Mg and Na were approximately equally distributed among the three plant components, whereas most Al, Fe and Mn were contained in the below-mat roots. Phosphorus concentrations in both shoots and roots were lower than in the original tubestock, presumably because of very low P concentrations in the lake water. Total P accumulation by the two CFWs was 1.98 kg. In contrast, the two CFWs removed large amounts of N (35.20 kg), K (19.79 kg) and Ca (12.21 kg) as well as high amounts of Al (13.44 kg), Fe (5.38 kg) and Mn (4.26 kg) from the lake water. These results demonstrate the value of CFWs in removing nutrients, including metallic nutrients, from urban stormwater runoff.

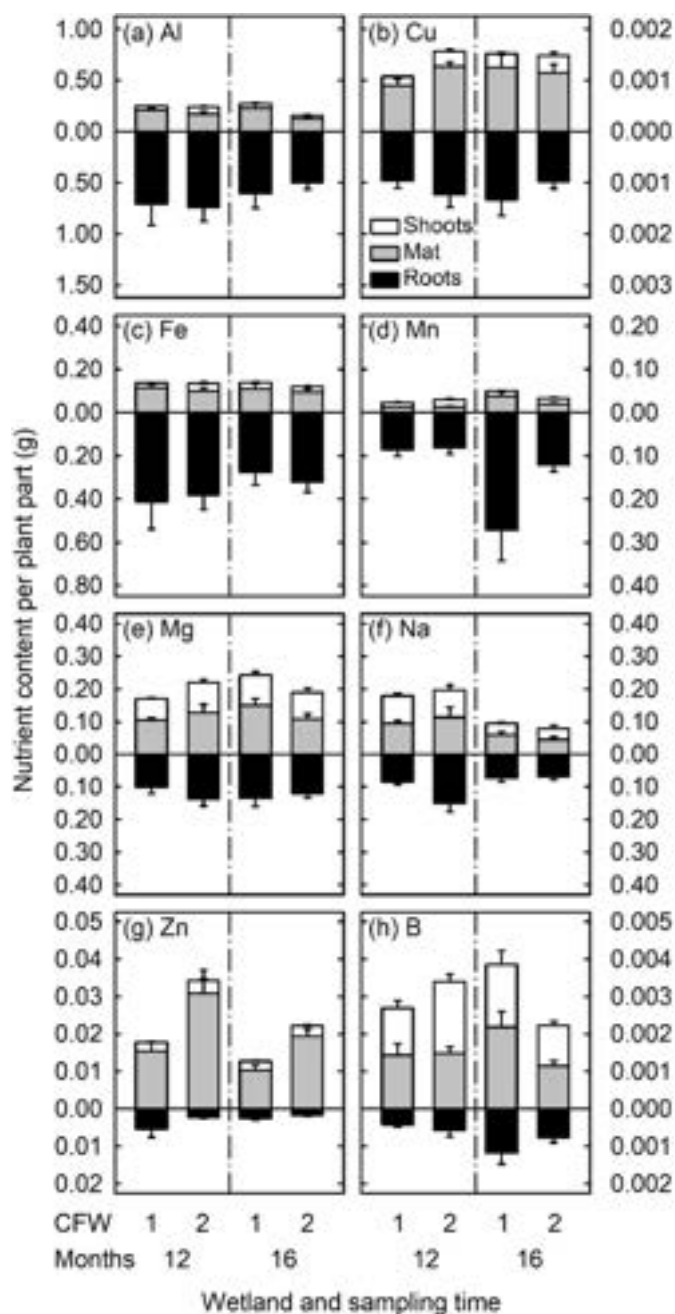


Fig. 7. Mean (+SE) nutrient content in each plant component of *Carex appressa* in constructed floating wetlands, CFW1 and CFW2, at 12 and 16 months after planting: (a) aluminium (Al); (b) copper (Cu); (c) iron (Fe); (d) manganese (Mn); (e) magnesium (Mg); (f) sodium (Na); (g) zinc (Zn); and (h) boron (B).

4.1. Plant biomass

Carex appressa plants in this study allocated a relatively high percentage of their biomass to the below-mat roots. One of the mechanisms by which plants adjust to abiotic stress is to allocate biomass to those organs that are involved in acquiring the scarcest resources (Ågren and Franklin, 2003; Trueman et al., 2013a). Allocation of a greater proportion of biomass to the root system is a common plant response to N or P deficiency (Marschner, 1995; Hermans et al., 2006; Franco et al., 2011). *Phragmites australis*, *Typha orientalis*, *Cyperus alternifolius*, *Thalia dealbata* and *Arundo donax* plants have all had increasing biomass allocation to roots at increasing distances from the water inlet of a horizontal subsurface-flow constructed-wetland (HSSF

Table 3Mean ($\pm$ SE) nutrient contents of individual *Carex appressa* plants at 12 and 16 months after planting in two constructed floating wetlands, CFW1 and CFW2.

Nutrient	N	P	K	Ca	S	Al	Cu	Fe	Mn	Mg	Na	Zn	B
CFW	g	g	g	g	g	g	mg	g	g	g	g	mg	mg
12 months after planting (n = 16)													
CFW1	1.32 $\pm$ 0.11	0.076 $\pm$ 0.007	0.82 $\pm$ 0.07	0.77 $\pm$ 0.09	0.25 $\pm$ 0.02	0.95 $\pm$ 0.21	2.04 $\pm$ 0.26	0.55 $\pm$ 0.13	0.11 $\pm$ 0.02	0.27 $\pm$ 0.02	0.26 $\pm$ 0.02	23.16 $\pm$ 4.12	3.11 $\pm$ 0.26
CFW2	2.00 $\pm$ 0.17	0.097 $\pm$ 0.010	1.21 $\pm$ 0.13	0.90 $\pm$ 0.09	0.31 $\pm$ 0.03	0.98 $\pm$ 0.16	2.80 $\pm$ 0.24	0.52 $\pm$ 0.07	0.11 $\pm$ 0.02	0.36 $\pm$ 0.04	0.35 $\pm$ 0.05	36.49 $\pm$ 6.43	3.96 $\pm$ 0.27
16 months after planting (n = 20)													
CFW1	2.27 $\pm$ 0.31	0.134 $\pm$ 0.023	1.40 $\pm$ 0.18	0.97 $\pm$ 0.15	0.31 $\pm$ 0.04	0.88 $\pm$ 0.19	2.85 $\pm$ 0.57	0.41 $\pm$ 0.08	0.32 $\pm$ 0.08	0.38 $\pm$ 0.05	0.17 $\pm$ 0.02	15.16 $\pm$ 1.99	5.02 $\pm$ 0.96
CFW2	1.75 $\pm$ 0.22	0.105 $\pm$ 0.016	0.84 $\pm$ 0.17	0.79 $\pm$ 0.09	0.27 $\pm$ 0.04	0.66 $\pm$ 0.08	2.46 $\pm$ 0.33	0.44 $\pm$ 0.06	0.15 $\pm$ 0.02	0.31 $\pm$ 0.04	0.15 $\pm$ 0.03	23.93 $\pm$ 2.35	2.99 $\pm$ 0.33

Table 4Total nutrient uptake by 9200 and 8960 *Carex appressa* plants in each of two constructed floating wetlands, CFW1 and CFW2, at 12 and 16 months after planting.

Nutrient	N	P	K	Ca	S	Al	Cu	Fe	Mn	Mg	Na	Zn	B
CFW	kg	kg	kg	kg	kg	kg	g	kg	kg	kg	kg	kg	g
12 months after planting (n = 16)													
CFW1	11.40 $\pm$ 0.98	0.60 $\pm$ 0.06	7.19 $\pm$ 0.66	5.20 $\pm$ 0.80	2.11 $\pm$ 0.19	8.49 $\pm$ 1.95	11.01 $\pm$ 2.36	3.86 $\pm$ 1.21	0.97 $\pm$ 0.14	2.06 $\pm$ 0.23	2.38 $\pm$ 0.22	0.20 $\pm$ 0.04	25.45 $\pm$ 2.41
CFW2	17.26 $\pm$ 1.50	0.77 $\pm$ 0.09	10.50 $\pm$ 1.13	6.22 $\pm$ 0.84	2.60 $\pm$ 0.30	8.47 $\pm$ 1.39	18.04 $\pm$ 2.25	3.47 $\pm$ 0.67	0.96 $\pm$ 0.16	2.77 $\pm$ 0.37	3.06 $\pm$ 0.45	0.32 $\pm$ 0.06	32.34 $\pm$ 2.42
16 months after planting (n = 20)													
CFW1	20.20 $\pm$ 2.88	1.13 $\pm$ 0.21	12.59 $\pm$ 1.64	7.01 $\pm$ 1.37	2.73 $\pm$ 0.40	7.82 $\pm$ 1.73	18.47 $\pm$ 5.29	2.62 $\pm$ 0.75	2.91 $\pm$ 0.76	3.05 $\pm$ 0.49	1.49 $\pm$ 0.22	0.13 $\pm$ 0.02	43.01 $\pm$ 8.80
CFW2	15.00 $\pm$ 2.07	0.85 $\pm$ 0.15	7.20 $\pm$ 1.56	5.20 $\pm$ 0.81	2.24 $\pm$ 0.38	5.62 $\pm$ 0.75	14.51 $\pm$ 2.92	2.76 $\pm$ 0.57	1.35 $\pm$ 0.18	2.34 $\pm$ 0.39	1.27 $\pm$ 0.26	0.20 $\pm$ 0.02	23.65 $\pm$ 2.94

Table 5
Total nutrient uptake per unit area by *Carex appressa* plants in each of two constructed floating wetlands, CFW1 and CFW2, at 12 and 16 months after planting.

Nutrient	N	P	K	Ca	S	Al	Cu	Fe	Mn	Mg	Na	Zn	B
CFW	g m ⁻²	g m ⁻²	g m ⁻²	g m ⁻²	g m ⁻²	g m ⁻²	mg m ⁻²	g m ⁻²	g m ⁻²	g m ⁻²	g m ⁻²	g m ⁻²	mg m ⁻²
12 months after planting (n = 16)													
CFW1	10.78 ± 0.93	0.56 ± 0.06	6.80 ± 0.62	4.92 ± 0.75	1.99 ± 0.18	8.03 ± 1.85	10.41 ± 2.23	3.65 ± 1.14	0.91 ± 0.13	1.95 ± 0.21	2.25 ± 0.21	0.19 ± 0.04	24.07 ± 2.28
CFW2	16.76 ± 1.45	0.75 ± 0.09	10.20 ± 1.10	6.04 ± 0.81	2.52 ± 0.29	8.22 ± 1.35	17.06 ± 2.12	3.37 ± 0.65	0.93 ± 0.16	2.69 ± 0.36	2.97 ± 0.44	0.31 ± 0.06	31.40 ± 2.35
16 months after planting (n = 20)													
CFW1	19.01 ± 2.73	1.07 ± 0.20	11.91 ± 1.55	6.63 ± 1.29	2.58 ± 0.38	7.39 ± 1.64	17.47 ± 5.00	2.48 ± 0.71	2.75 ± 0.71	2.89 ± 0.46	1.41 ± 0.21	0.12 ± 0.02	40.68 ± 8.32
CFW2	14.56 ± 2.01	0.82 ± 0.14	6.99 ± 1.52	5.05 ± 0.79	2.17 ± 0.37	5.46 ± 0.73	14.09 ± 2.83	2.68 ± 0.56	1.31 ± 0.17	2.27 ± 0.38	1.24 ± 0.26	0.20 ± 0.02	22.96 ± 2.85

CW) that was treating polluted lake water containing higher nutrient concentrations than the current study (Vincent et al., 2018). Mean above-ground:below-ground biomass ratios of those species were approximately 5.0 at the water inlet (7.45–9.84 mg L⁻¹ TN; 0.22–1.85 mg L⁻¹ TP), decreasing to 1.0 with declining water nutrient concentrations over the 13-m length of the HSSF CW (0.40–2.50 mg L⁻¹ TN; 0.04–0.25 mg L⁻¹ TP) (Vincent et al., 2018). The allocation of a high proportion of biomass to the roots of *C. appressa* in this study was likely due to low nutrient availability in the urban lake water.

Plants in CFWs acquire nutrients solely from the water column when, as in the current study, the roots are not embedded in the lake sediments. Mean dry-weather nutrient concentrations in the lake water were much lower (0.55–0.73 mg L⁻¹ for TN, 0.06 mg L⁻¹ for TP) than typical concentrations (1.5 mg L⁻¹ TN and 0.11 mg L⁻¹ TP) for dry-weather conditions in urban areas of southeast Queensland, Australia (Fletcher et al., 2004). The high root biomass allocation and root length of *C. appressa* in the CFWs indicate that this species was well adapted to low-N or low-P conditions and it displayed typical plant responses to low nutrient availability in the urban lake water. *C. virgata* plants in previous CFW studies (Sukias et al., 2010; Tanner and Headley, 2011; Borne et al., 2013) allocated a higher biomass proportion to the shoots, rather than the roots, in water with higher nutrient availability (Table 6). In contrast, *C. stricta* plants allocated a lower proportion of biomass to the shoots in CFWs that were treating stormwater runoff with higher nutrient concentrations (Winston et al., 2013) (Table 6). Biomass partitioning to shoots and roots differs among *Carex* species, and this partitioning may be affected by differences in environmental characteristics, plant age, and field versus laboratory conditions (Trueman et al., 2013a; Winston et al., 2013).

The extensive root growth of *C. appressa* in low-nutrient water has potential benefits for the removal and immobilisation of suspended solids, which are often contained at high levels in stormwater runoff from construction sites (Perkins et al., 2017). Suspended solid concentrations in the stormwater runoff have been monitored during storm events and these will be reported in a subsequent paper. Pollutants in urban stormwater runoff are mainly associated with suspended particles (Wang et al., 2018; Rügner et al., 2019). CFWs enhance the settling and entrapment of particulates and bound pollutants by reducing flow velocities and physically filtering those particulates (Vaillant et al., 2003; Headley and Tanner, 2011; Borne et al., 2015).

4.2. Nutrient concentrations and nutrient contents

Nitrogen, P and K concentrations in the above-mat biomass (0.75–0.96% N, 0.038–0.040% P and 0.73–0.74% K) and below-mat biomass (0.65–0.78% N, 0.037–0.042% P and 0.28–0.42% K) of *C. appressa* at 12 months after planting reflected the low dry-weather nutrient concentrations in the lake water. Nitrogen, P and K concentrations of *C. virgata* at 12 months after planting in CFWs that treated artificial stormwater or stormwater runoff with higher nutrient concentrations were higher in both the above- and below-mat biomass (1.10% N, 0.17% P, 2.0% K; 1.46% N, 0.19% P; K n/a) and below-mat biomass (0.80% N, 0.06% P, 1.6% K; 2.22% N, 0.13% P; K n/a) (Tanner and Headley, 2011; Borne, 2013) than in the current study. Nitrogen, P and K concentrations in above-mat biomass and below-mat biomass of *C. stricta* at 19 months after planting in CFWs that were treating stormwater runoff with higher nutrient concentrations (Winston et al., 2013) were similar to those in the current study. Low P concentrations in above- and below-mat biomass of *C. stricta* (Winston et al., 2013) suggest that P availability for plant uptake was limited despite higher TN concentrations in stormwater runoff than in the current study. The differences between nutrient concentrations in the current and previous studies suggest that nutrient concentrations in CFW plants are positively correlated with nutrient availability in the water. Further research is needed to investigate changes in plant nutrient

Table 6
Mean dry mass, length, above-mat:below-mat biomass ratio of *Carex appressa*, *C. virgata* and *C. stricta* plants in constructed floating wetlands, and mean nutrient concentrations in stormwater runoff.

Reference	Study type	Country	Plant species	Time after planting (months)	Shoot mass (g)	Root mass (g)	90th percentile root length (m)	Max. root length (m)	Biomass ratio (above-mat:below-mat)	TN water conc. (mg L ⁻¹)	TP water conc. (mg L ⁻¹)
Current study	Field	Australia	<i>C. appressa</i>	12	51–73	54–71	1.10–1.34	1.93–2.46	1.07–1.09	0.55–0.73	0.06
Sukias et al. (2010)	Mesocosm	New Zealand	<i>C. virgata</i>	12	402	160	0.67–0.70	0.90	2.5	2.08	0.07
Tanner and Headley (2011)	Mesocosm	New Zealand	<i>C. virgata</i>	12	57	13	0.28	0.57	7.0	n/a	0.96–1.36
Borne et al. (2013)	Field/pond	New Zealand	<i>C. virgata</i>	12	82	12	0.64	0.91	4.4	1.00–1.20	0.09
Winston et al. (2013)	Field/DOT pond ^a	USA	<i>C. stricta</i>	19	191	221	0.75 ^b	n/a	0.9	0.60–1.25 ^c	0.13–0.18 ^c
Winston et al. (2013)	Field/Museum pond	USA	<i>C. stricta</i>	19	71.7	195	0.75 ^b	n/a	0.4	0.45–1.25 ^c	0.04–0.18 ^c

^a DOT = Department of Transportation.

^b Approximate root length.

^c Median concentration.

concentrations with increasing nutrient availability in stormwater runoff when the residential setting is fully developed and operational.

Nitrogen, P and K in this study and a previous study (Winston et al., 2013) were almost-equally distributed between above- and below-mat biomass while, in other studies, a higher proportion of N, P and K was allocated to the above-mat shoots (Tanner and Headley, 2011; Borne et al., 2013). This suggests that CFW plants in water with higher nutrient concentrations and availability allocate a higher proportion of N, P and K to the shoots (Tanner and Headley, 2011; Borne et al., 2013), which could be removed permanently by harvesting. In contrast, CFW plants in water with low nutrient concentrations or nutrient availability allocate a lower proportion of N, P and K to the shoots and allocate more biomass to the roots for nutrient scavenging. Phosphorus concentrations and contents in both components of *C. appressa* plants were much lower than those of *C. virgata* (Tanner and Headley, 2011; Borne, 2014). Plants only take up P directly in orthophosphate forms (Vance et al., 2003), which were below the LOD ($\text{PO}_4^{3-} < 0.05 \text{ mg L}^{-1}$) in all water samples collected during the 16-month monitoring period. Soil washed from exposed ground during storm events causes stormwater runoff from construction sites to contain high levels of suspended solids (Perkins et al., 2017). Most P in soils is present as insoluble organic forms or inorganic phosphates, which are not directly available to plants due to their affinity to cations such as Ca^{2+} , Mg^{2+} , Fe^{2+} , Fe^{3+} and Al^{3+} (Hinsinger, 2001). In oxidised conditions, phosphorus is adsorbed to Fe^{3+} compounds while, in anoxic conditions, Fe^{3+} is reduced to Fe^{2+} and, subsequently, both iron and adsorbed PO_4^{3-} return into solution (Søndergaard et al., 2003). Phosphorus adsorption to Al^{3+} is not redox-sensitive and, therefore, PO_4^{3-} is adsorbed to Al^{3+} when sediments turn anoxic (Rydin and Welch, 1998). In shallow lakes, the whole water column is usually oxygenated, which also establishes an oxygenated surface layer of the sediment with a high capacity to bind phosphorus (Søndergaard et al., 2003). High Fe and Al concentrations in the shallow lake water in the current study suggest enhanced P adsorption to the sediments or suspended particles, making P unavailable for plant uptake.

High concentrations and contents of Al, Fe, and Mn in the roots, but not the shoots, suggest that *C. appressa* excluded these metals from being transported across the endodermis into the vascular stream (Baker, 1981; Sebastian and Prasad, 2016). However, it remains unclear whether Al, Fe and Mn were accumulated mainly at the root epidermis or in the root cortex. Low P and high Fe concentrations in the water enhance the formation of iron plaque at the root epidermis due to oxygen release by the plant roots (Hu et al., 2005; Kobayashi and Nishizawa, 2012). Iron plaque provides a large surface area and has a high adsorption capacity for heavy metals (Batty et al., 2000; Machado et al., 2005). The formation of Fe plaque on wetland plant roots is known to be influenced by $\text{Fe}^{2+}/\text{Mn}^{2+}$ availability, redox potential and radial-oxygen loss-rate of roots (Weiss et al., 2003). Iron plaque could influence plant uptake of heavy metals and could act as a barrier or buffer, depending on the amount of iron plaque on the root surface (Liu et al., 2004, 2011). The low P concentrations in the water and high Fe and Mn contents in the roots suggest that iron plaque may have formed on the roots of *C. appressa*.

4.3. Nutrient uptake

Total P accumulation by the two CFWs was 1.98 kg at 16 months after planting. The two CFWs removed larger amounts of N (35.30 kg), K (19.79 kg) and Ca (12.21 kg) and surprisingly high amounts of Al (13.44 kg), Fe (5.38 kg) and Mn (4.26 kg) from the lake water. Nitrogen, P and K uptake of *C. appressa* at 12 months after planting ($11\text{--}17 \text{ g m}^{-2} \text{ N}$, $0.6\text{--}0.8 \text{ g m}^{-2} \text{ P}$ and $7\text{--}10 \text{ g m}^{-2} \text{ K}$) and 16 months after planting ($15\text{--}19 \text{ g m}^{-2} \text{ N}$, $0.8\text{--}1.1 \text{ g m}^{-2} \text{ P}$ and $7\text{--}12 \text{ g m}^{-2} \text{ K}$) were much lower than those of *C. virgata* at 12 months after planting in previous mesocosm studies ($30\text{--}77 \text{ g m}^{-2} \text{ N}$, $3.4\text{--}5.0 \text{ g m}^{-2} \text{ P}$ and $56\text{--}105 \text{ g m}^{-2} \text{ K}$) and field studies ($26\text{--}37 \text{ g m}^{-2} \text{ N}$ and $1.4\text{--}2.6 \text{ g m}^{-2}$

P; 20–36 g m⁻² K) (Sukias et al., 2010; Tanner and Headley, 2011; Borne et al., 2013; Winston et al., 2013; Borne, 2014). The higher N, P and K uptake in previous studies could be due, in part, to higher planting densities of 41 plants m⁻² (Tanner and Headley, 2011) and 17 plants m⁻² (Borne et al., 2013) compared with 8.7 plants m⁻² in the current study. Higher uptake could also be related to higher shoot or root biomass (Sukias et al., 2010; Winston et al., 2013) than in the current study (Table 6). CFW plants in the current study also competed with a whole range of biota in the large lake ecosystem for nutrients while competition for nutrients by CFW plants was limited in previous studies conducted in a 32.8 m³ shipping container (Sukias et al., 2010), 0.71 m³ mesocosm tanks (Tanner and Headley, 2011) and a 75 m³ section of pond (Borne et al., 2013). The amounts of nutrients quantified in the within-mat biomass in the current study suggest that previous studies (Sukias et al., 2010; Tanner and Headley, 2011; Borne et al., 2013; Winston et al., 2013; Borne, 2014) underestimated nutrient uptake rates because they sampled only the above-mat and below-mat biomass components.

The total uptake of Al, Fe and Mn in both wetlands demonstrated that CFWs can be highly effective at metal scavenging. Al, Fe and Mn were predominantly associated with the below-mat root biomass, which is consistent with other studies that found that metals are associated primarily with the roots (Tanner, 1996; Qian et al., 1999; Trueman et al., 2013b). No previous studies have investigated Al, Fe and Mn distribution within CFWs. These metals may have been adsorbed to, rather than absorbed by, the root biomass of *C. appressa*. Gentle washing in the laboratory did not remove these nutrients from the root system and so they were likely to have been bound, at least temporarily, to the CFW. In addition to nutrient adsorption and absorption, these plant roots potentially enhance settling and entrapment of suspended solids and provide a large surface area for the growth of bacteria that contribute to the removal of nutrients from the lake water (Stewart et al., 2008; Chang et al., 2012; Winston et al., 2013; Borne et al., 2015).

5. Conclusion

This is the first study to investigate large-scale CFWs for treating stormwater runoff during the construction phase of a greenfield urban development. The study: (1) determined how much biomass was contained above the CFW mat relative to the amounts contained within and below the CFW mat; (2) identified nutrients that were partitioned in disproportionate amounts between the three different biomass components; and (3) quantified total plant nutrient uptake by CFWs installed in an urban lake with low pollutant concentrations. *Carex appressa* plants displayed extensive root growth and an approximately-equal biomass distribution between the three plant components, resulting in a relatively low above-mat:below-mat biomass ratio. Extensive root growth may be an adaptation to low nutrient availability in the lake water, providing a larger area for scavenging of in-demand plant nutrients such as nitrogen, phosphorus and potassium. This study demonstrated that CFWs remove large amounts of nutrients from stormwater runoff by plant uptake relative to the low nutrient concentrations in the lake water and that they should be considered as a method for stormwater treatment during the early construction stages of urban developments when nutrient availability is limited. *C. appressa* plants accumulated high amounts of aluminium, iron and manganese in their below-mat biomass. Therefore, this study showed that a previously undervalued benefit of CFWs may be their capacity to remove metal pollutants from urban stormwater runoff. High partitioning of biomass into root growth potentially increases the stormwater treatment effectiveness of CFWs by filtering particulates and enhancing the settling of particulates through reduced flow velocities during storm events.

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Nitrate production and availability in residential soils

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Abstract. The rapid increase in residential land area in the United States has raised concern about water pollution associated with nitrogen fertilizers. Nitrate (NO_3^-) is the form of reactive N that is most susceptible to leaching and runoff; thus, a more thorough understanding of nitrification and NO_3^- availability is needed if we are to accurately predict the consequences of residential expansion for water quality. In particular, there have been few assessments of how the land use history, housing density, and age of residential soils influence NO_3^- pools and fluxes, especially at depth. In this study, we used 1 m deep soil cores to evaluate potential net nitrification and mineralization, microbial respiration and biomass, and soil NO_3^- and NH_4^+ pools in 32 residential home lawns that differed by previous land use and age, but had similar soil types. These were compared to eight forested reference sites with similar soils. Our results suggest that a change to residential land use has increased pools and production of reactive N, which has clear implications for water quality in the region. However, the results contradict the common assumption that NO_3^- production and availability is dramatically higher in residential soils than in forests in general. While net nitrification ($128.6 \pm 15.5 \text{ mg}\cdot\text{m}^{-2}\cdot\text{d}^{-1}$ vs. $4.7 \pm 2.3 \text{ mg}\cdot\text{m}^{-2}\cdot\text{d}^{-1}$; mean $\pm$ SE) and exchangeable NO_3^- ($3.8 \pm 0.5 \text{ g}/\text{m}^2$ vs. $0.7 \pm 0.3 \text{ g}/\text{m}^2$) were significantly higher in residential soils than in forest soils in this study, these measures of NO_3^- production and availability were still notably low, comparable to deciduous forest stands in other studies. A second unexpected result was that current homeowner management practices were not predictive of NO_3^- availability or production. This may reflect the transient availability of inorganic N after fertilizer application. Higher housing density and a history of agricultural land use were predictors of greater NO_3^- availability in residential soils. If these factors are good predictors across a wider range of sites, they may be useful indicators of NO_3^- availability and leaching and runoff potential at the landscape scale.

Key words: development; forest; land use; lawn fertilization; nitrate; nitrogen; residential land; soil; turfgrass; urban areas.

INTRODUCTION

Between 1982 and 1997 the amount of urbanized land in the United States increased by almost 50% (Fulton et al. 2001). In the Chesapeake Bay watershed of the United States, developed land area is expected to increase an additional 80% by 2030 if current trends continue, consuming 5% of wetlands, 14% of forests, and 23% of agricultural lands (Goetz et al. 2004). There is no doubt that urban areas are growing in size and importance; however, we are only beginning to under-

stand how the process of urbanization influences ecosystem dynamics (Kaye et al. 2006).

The most visible changes that accompany urbanization are increased impervious surface area (e.g., buildings, roads, and sidewalks) and replacement of natural vegetation or agricultural fields with lawns. Impervious surfaces in the United States are estimated to cover an area nearly the size of Ohio (Elvidge et al. 2004), and the area in lawns is estimated to be even larger (163 800 km^2), and continues to grow rapidly (Milesi et al. 2005). In the state of Maryland, which encompasses our study area, >10% of the terrestrial surface area is covered by lawns (based on Milesi et al. 2005).

The rapid increase in residential land area has raised concern about water pollution associated with fertilizers and pesticides used for lawn establishment and maintenance (Gold et al. 1988, 1990, Morton et al. 1988, Petrovic 1990, Milesi et al. 2005). This concern is heightened in areas that receive high levels of atmo-

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spheric nitrogen (N) deposition. However, recent studies suggest that urban watersheds have a high capacity for N retention, indicating that there are strong sinks for N within these watersheds (Baker et al. 2001, Groffman et al. 2004, Wollheim et al. 2005, Easton and Petrovic 2008).

We will need a better understanding of N cycling in urban ecosystems if we are to accurately predict the consequences of residential expansion for water quality. In particular, we will need to understand how land use history, spatial patterns of development, and land management practices influence rates of nitrification, nitrate (NO_3^-) consumption, and NO_3^- losses. We will also need a better understanding of soil N dynamics at depth, where the uncertainty is greater still (Galbraith et al. 1999, Pouyat et al. 2006), because most N cycling work in developed areas has focused on the upper 10–15 cm of soil. It is clear that land management practices have the potential to influence nitrogen cycling in turfgrasses (Petrovic 1990, Frank et al. 2006), but the influence of development patterns on N cycling (high-density urban development vs. low-density exurban development) is unknown and potentially important given that exurban development is the dominant driver of land use change in the United States (Goetz et al. 2004). Land use history may also influence biogeochemical cycling in residential areas. For instance, Raciti et al. (2011) found evidence for C and N accumulation over time in residential soils that were previously in agriculture, but did not find this same pattern of increasing C and N concentration at sites that were forested prior to being developed. There is also a need to better understand N cycling at depth in residential systems (e.g., beyond the first 10–15 cm) given societal concerns about NO_3^- leaching from residential areas (Gold et al. 1990, Petrovic 1990, Milesi et al. 2005).

In this study, we evaluated nitrification and NO_3^- availability in 1 m deep soil cores from 32 residential home lawns and eight forested reference sites with similar soils. The work was part of U.S. National Science Foundation-funded long-term ecological research (LTER) in the Baltimore metropolitan area (Pickett et al. 2008). Soil profile characteristics and soil C and N pools from this sampling are discussed in Raciti et al. (2011). Here, we investigated the effects of land use history, housing density, housing age, and management practices on net nitrification and the availability of NO_3^- for leaching and runoff. A more thorough understanding of nitrification and NO_3^- availability will be crucial for explaining the extraordinarily high variability in measured N losses from residential and turfgrass systems, which range from nearly zero to >50% of applied N (see review by Petrovic 1990). We hypothesized that NO_3^- availability and net nitrification would be (1) greater and more variable in residential soils than forest soils, (2) greater in residential soils that were formerly in agriculture than those formerly in

forest, and (3) particularly great in residential soils that are fertilized and irrigated.

METHODS

Site description

Soil cores were obtained from 32 residential and 8 forest sites in the Baltimore, Maryland, USA metropolitan area. This area has a temperate climate with warm, humid summers (1220 cooling degree-days), cold winters (4720 heating degree-days) and mean annual precipitation of ~1060 mm distributed relatively evenly throughout the year (NCDC 2009). The residential sites were mostly within the Gwynns Falls Watershed (39°15' N, 76°30' W and ~17 km²), which has a population of 356 000 people, with subwatershed densities ranging from 2200 to 19 400 persons/km² (Law et al. 2004). Forest soil cores were taken from permanent forest plots of the Baltimore Ecosystem Study (BES) LTER, which have been described in detail elsewhere (Groffman et al. 2006, 2009). These remnant forests are >100 years old, with soils that were comparable in type and texture to those underlying the residential areas of our study (NRCS 1976, 1998).

Residential site selection

To aid the site selection process we used neighborhoods in the Baltimore City metropolitan area that have been mapped using HERCULES, a high-resolution land cover classification system designed to assist in the study of human-ecological systems (Cadenasso et al. 2007). Using HERCULES and additional data sources, we identified residential sites that were similar except for single factors that we hypothesized to be important predictors of ecosystem dynamics. These factors included land use history (agriculture and forest, $n = 10$ and $n = 22$), housing density (low and medium/high, $n = 9$ and $n = 23$), and housing age (4 to 58 years old, mean = 33 years, $n = 32$). Housing age was acquired from the Maryland Property View database (Maryland Department of Planning 2007). Prior land use was determined based on land use change maps developed by integrating aerial photos from 1938, 1957, 1971, and 1999 into a geographic information system (Wehling 2001). Once residential parcels meeting the predefined criteria were identified, we sent mailings to property owners chosen at random from each of the factor groups with the goal of recruiting 40 property owners for a three-year study (of which this work is a part). We had recruited 32 property owners at the time soil cores were obtained. A yard management survey of the homeowners was used to assign sites to classes of fertilizer application (yes or no) and irrigation (yes or no).

Sample collection

Soil coring took place over a one-month period during the summer of 2007. For residential sites, we overlaid a grid onto a map of each property and randomly chose two locations for coring. Locations

beneath impervious surfaces (buildings, walkways, driveways) or within close proximity to belowground pipes and power lines were excluded and another random location identified. Undisturbed 1-m soil cores were extracted from each of these locations using a 3.3 cm diameter soil corer. Cores were enclosed in plastic sleeves with end caps, put into coolers, and transported to the laboratory where they were stored at 4°C until they could be processed (typically within 3–4 days). Coring in the forested reference plots followed a similar procedure, with two replicate cores taken from random locations at each site. In total, 80 intact soil cores were collected from 32 residential properties and eight forest sites.

Sample processing

Photographs were taken of each soil core, followed by a visual inspection to determine horizon depths and Munsell color. Soil cores were also inspected for obvious signs of disturbance such as buried horizons, lithologic discontinuities, or human artifacts less than the diameter of the core. Cores were divided into four soil depth intervals (0–10, 10–30, 30–70, and 70–100 cm), and sorted to remove coarse roots and rocks (>2 mm). The roots and rocks were dried at 105°C, weighed, and set aside. Rock volume was estimated from mass and an assumed density of 2.7 g/cm³ (Hillel 1998). Subsamples of soil from each depth interval were homogenized and analyzed for soil dry mass and percentage of moisture (48 h at 105°C). Bulk density (BD) was calculated as $BD = (\text{total dry mass} - \text{rock mass}) / (\text{total volume} - \text{rock volume})$. Soil texture was measured by the hydrometer method (Gee and Bauder 1986). Total C and N were measured by flash-combustion/oxidation using a Thermo Finnigan Flash EA 1112 elemental analyzer (Thermo Fisher Scientific, Waltham, Massachusetts, USA). Subsamples of homogenized soil from each depth interval were set aside to determine (1) initial KCl exchangeable NO_3^- and NH_4^+ , (2) net nitrification, net mineralization, and basal respiration, and (3) microbial biomass C and N.

Exchangeable inorganic N (NO_3^- , NH_4^+) was extracted from ~10 g (dry mass) of soil with 40 mL of 2 mol/L KCl. Samples were agitated for 60 minutes at 200 rpm on an orbital shaker table and then left undisturbed for two hours. The supernatant liquid from each sample was then collected and filtered through Whatman number 42 filter paper (Whatman Incorporated, Florham Park, New Jersey, USA) into nalgene bottles. Samples were analyzed colorimetrically for NO_3^- and NH_4^+ concentration using a Lachat Flow Injection Analyzer (Lachat Instruments, Loveland, Colorado, USA).

Rates of potential net N mineralization, nitrification, and respiration were measured in a 10-day laboratory incubation of soils at room temperature. (For detailed methods, consult Groffman et al. [1999]). Soils (25 g per incubation) were placed in 946-mL glass jars with lids

fitted with septa for gas sampling. After 10 days, the headspace of the jars was sampled by syringe, and the gas samples were analyzed for carbon dioxide (CO_2) by thermal conductivity gas chromatography. Inorganic N was extracted as described above. Mineralization was calculated as the accumulation of total inorganic N, nitrification was calculated as the accumulation of NO_3^- , and respiration was calculated as the accumulation of CO_2 over the course of the 10-day incubation.

Microbial biomass C and N were measured using the chloroform fumigation-incubation method (Jenkinson and Powlson 1976). Field moist soils (25 g) were fumigated to lyse microbial cells in the samples. The fumigated samples were then inoculated with fresh soil, allowing microorganisms to regrow using the dead cells as substrate. The flushes of CO_2 and 2 mol/L KCl-extractable inorganic N (NH_4^+ and NO_3^-) released by the cells during the incubation were assumed to be proportional to the C and N in the microbial biomass of the original sample. A proportionality constant (0.45) was used to calculate biomass C from the CO_2 flush, which was measured by thermal conductivity gas chromatography. Inorganic N flush data were not corrected with a proportionality constant.

STATISTICAL ANALYSIS

We used separate multivariate analysis of variance (MANOVA) tests to test for the main effects of housing age, housing density, and land use history on individual response variables, including microbial biomass C and N, total soil C and N, bulk density, net nitrification, net N mineralization, exchangeable NO_3^- and exchangeable NH_4^+ , with appropriate transformations to meet assumptions of normality. Housing age was a continuous variable, while housing density, depth, and land use history were categorical variables. Regression analysis was used to test for possible linear or curvilinear relationships between the variables. A two-tailed *t* test was used to test for whole-core (normalized by soil mass) differences between residential and forest soils in net nitrification, net mineralization, and respiration. Repeated-measures ANOVA was used to test for differences between residential and forest soils across depth intervals. We used separate *t* tests to test for the effects of fertilizer application (yes or no) and irrigation (yes or no) on net nitrification, net N mineralization, and exchangeable NO_3^- and NH_4^+ in residential soils. Because few homeowners regularly watered, we were unable to test for interaction effects between fertilizer application and irrigation. All statistical analyses were performed using SAS JMP version 8 statistical software (SAS Institute 2009).

Nitrogen mass balance

We used the results of this study and previous studies at BES to create a N mass balance for residential and forest sites that included most inorganic N inputs, losses, pool sizes, and transformations (Table 1). Inorganic N

TABLE 1. Nitrogen mass balance for residential lawns in the Baltimore, Maryland, USA metropolitan area.

Nitrogen parameters	Residential	Forest	Source
N inputs			
Atmospheric deposition (kg N·ha ⁻¹ ·yr ⁻¹)	11.2	11.2	Groffman et al. (2004)
Fertilizer (kg N·ha ⁻¹ ·yr ⁻¹)	83.5	0	Law et al. (2004)
N losses			
Leaching (kg N·ha ⁻¹ ·yr ⁻¹)	14.1	4.4	Groffman et al. (2009)
N ₂ O (kg N·ha ⁻¹ ·yr ⁻¹)	<1	<1	Groffman et al. (2009)
NO₃⁻ production			
Net NO ₃ ⁻ production (kg N·ha ⁻¹ ·yr ⁻¹)	469.4	17.1	this study (potential net nitrification)
Gross NO ₃ ⁻ production (kg N·ha ⁻¹ ·yr ⁻¹)	13 870	5256	Raciti et al. (2008)
NO₃⁻ consumption			
Gross NO ₃ ⁻ consumption (kg N·ha ⁻¹ ·yr ⁻¹)	13 432	4453	Raciti et al. (2008)
Pool size			
Exchangeable NO ₃ ⁻ (kg N/ha)	37.7	7.0	this study
Pool turnover			
NO ₃ ⁻ turnover rate (days)	0.16	0.23	Raciti et al. (2008)
N sequestration			
N accumulation in soil organic matter (kg N·ha ⁻¹ ·yr ⁻¹)	83.0	NA	Raciti et al. (2011) (residential sites with agricultural land use history)

inputs included estimates of atmospheric deposition (Groffman et al. 2004) and fertilizer application (Law et al. 2004). Inorganic N losses included NO₃⁻ and NH₄⁺ leaching losses and gaseous N₂O fluxes (Groffman et al. 2009). NO₃⁻ pool turnover time and gross rates of NO₃⁻ production and consumption were measured for forest and residential plots by Raciti and colleagues (2008). NO₃⁻ pool sizes, potential net production, and potential net consumption were measured in this study as previously described.

RESULTS

Net nitrification, Net N mineralization, and basal respiration

Whole-core net nitrification rates, normalized by soil mass to 1 m depth, were significantly higher in the residential soils than the forest soils (128.6 ± 15.5 mg·m⁻²·d⁻¹ vs. 4.7 ± 2.3 mg·m⁻²·d⁻¹ [mean $\pm$ SE], $P < 0.001$; Fig. 1a). Net nitrification rates were also significantly higher in residential soils at all individual depth intervals down to 1 m ($P < 0.01$) on a per gram of soil basis (Fig. 2a).

Among residential soils, net nitrification rates were significantly correlated with microbial biomass N, net mineralization, total soil N, and total soil C ($P < 0.01$, except microbial biomass C with $P = 0.03$). Basal respiration, microbial biomass C, land use history, housing age, and housing density were not significant predictors of net nitrification in residential soils. Regression analysis revealed a significant linear relationship between microbial biomass N and net nitrification ($R^2 = 0.51$, $P < 0.01$ Fig. 3a); net mineralization and net nitrification ($R^2 = 0.64$, $P < 0.01$, Fig. 3b); and total soil N and net nitrification ($R^2 = 0.48$, $P < 0.01$, Fig. 3c) in residential soils.

Whole-core net N mineralization rates were significantly higher in residential soils than forest soils (123.5 ± 21.2 mg·m⁻²·d⁻¹ vs. 8.2 ± 16.9 mg·m⁻²·d⁻¹, $P < 0.001$, Fig. 1b). When measured on a per gram of dry soil basis, net N mineralization was significantly higher in residential soils at the 10–30 cm depth interval, but differences between residential and forest soils were not significant at other depth intervals (Fig. 2b). Among the other factors we measured, only total soil N was a significant predictor of net N mineralization ($P < 0.001$) in residential soils. There was a significant linear relationship between total soil N and net N mineralization ($R^2 = 0.60$, $P < 0.001$, Fig. 3d).

Whole-core basal respiration rates were not significantly different between residential and forest soils ($P = 0.23$, Fig. 1c). When comparing rates at individual depth intervals, only the 10–30 cm depth interval had significantly higher respiration rates in residential soils than forest soils ($P < 0.01$, Fig. 2c).

KCl exchangeable NO₃⁻ and NH₄⁺

At the whole-core level, KCl exchangeable NO₃⁻ was significantly higher in residential soils than forest soils (3.8 ± 0.5 g/m² vs. 0.7 ± 0.3 g/m², $P < 0.001$; Fig. 1d). Exchangeable NO₃⁻ was higher in residential soils at all individual depth intervals ($P < 0.01$; Fig. 2d). Exchangeable NH₄⁺ was not significantly different between residential and forest soils at the whole-core level ($P = 0.53$, Fig. 1e); however, it was significantly lower in residential soils at the 0–10 cm depth interval (3.5 ± 0.7 g/m² vs. 8.1 ± 1.2 g/m², $P < 0.01$; Fig. 2e), with no significant differences at other depth intervals.

Among residential soils, land use history (former forest or agriculture) and housing density were significant predictors of KCl exchangeable NO₃⁻ (land use

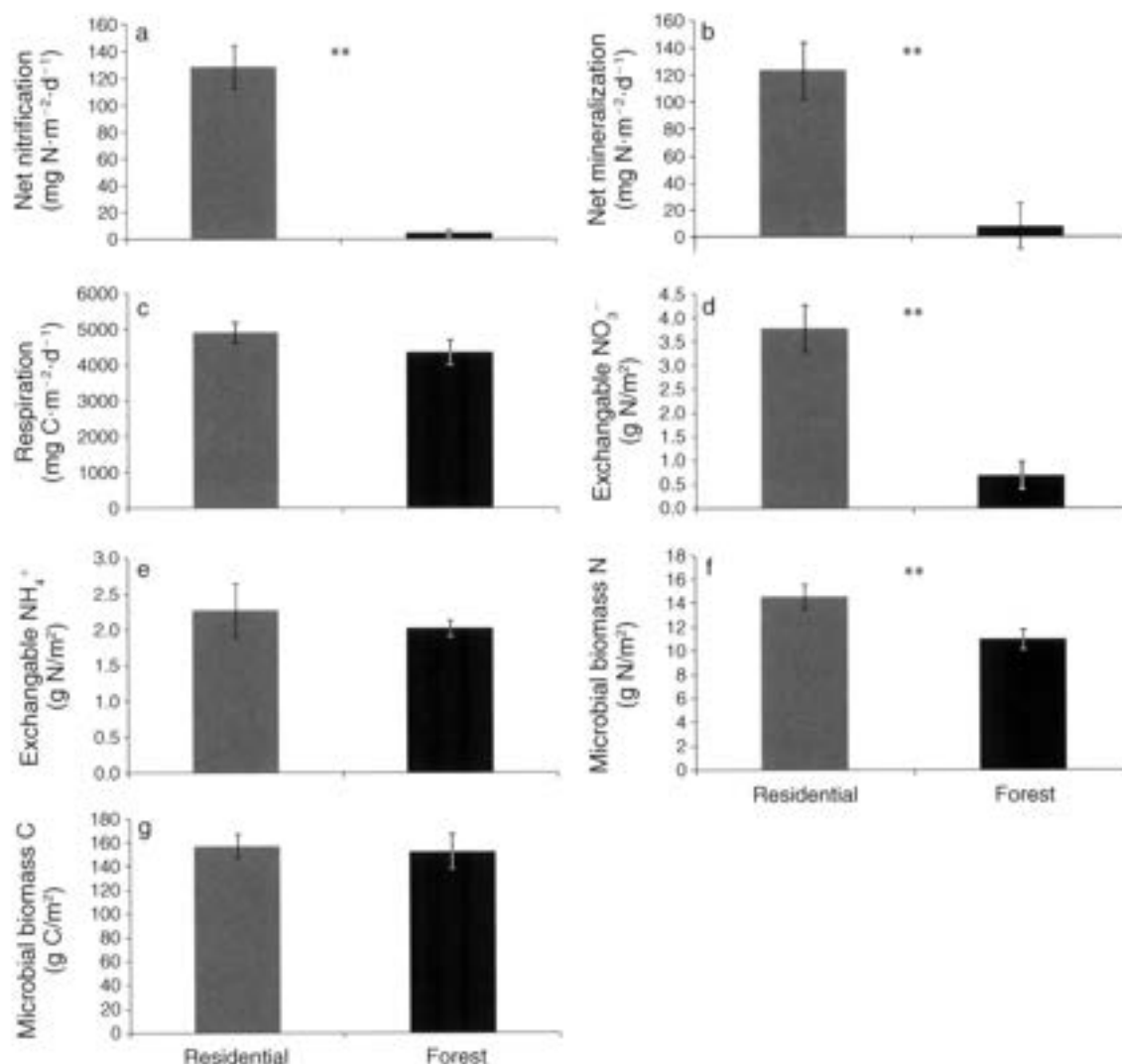


FIG. 1. Comparison of soil parameters between residential lawn and forest soils at 0–100 cm depth (residential sites $n = 32$; forest sites, $n = 8$) in Baltimore, Maryland, USA. Error bars represent $\pm$ SE.

** $P < 0.01$.

history, $P < 0.001$; housing density, $P < 0.01$). Residential sites that had higher housing density or were formerly in agriculture were more likely to have higher concentrations of KCl exchangeable NO_3^- when other experimental factors were taken into account. None of the experimental factors was a significant predictor of exchangeable NH_4^+ among residential sites.

Microbial biomass C and N

Microbial biomass N at the whole-core level was higher in residential soils than forest soils ($P < 0.01$; Fig. 1f); however, microbial biomass C was not significantly different between the land use types ($P = 0.80$; Fig. 1g). Microbial biomass N was significantly higher in residential soils at the 30–70 cm and 70–100 cm depth intervals ($P < 0.01$; Fig. 2f), and microbial biomass C was significantly higher in residential soils at the 10–30

cm and 30–70 cm depth intervals ($P < 0.01$; Fig. 2g). While the differences in microbial biomass C and N were statistically significant, the differences were generally small. Land use history was a significant predictor of microbial biomass N among soils at residential sites ($P < 0.01$). Residential sites that were formerly in agriculture had higher microbial biomass N. Among the factors that we tested, there were no significant predictors of microbial biomass C. The overall microbial biomass C:N ratio was lower in residential soils than forest soils (10.8 ± 0.4 vs. 13.8 ± 0.5 ; mean $\pm$ SE).

Yard management

A survey of the homeowners in our study (S. M. Raciti, P. M. Groffman, J. C. Jenkins, R. V. Pouyat, T. J. Fahey, S. T. A. Pickett, and M. L. Cadenasso, unpublished data) revealed that half of our homeowners

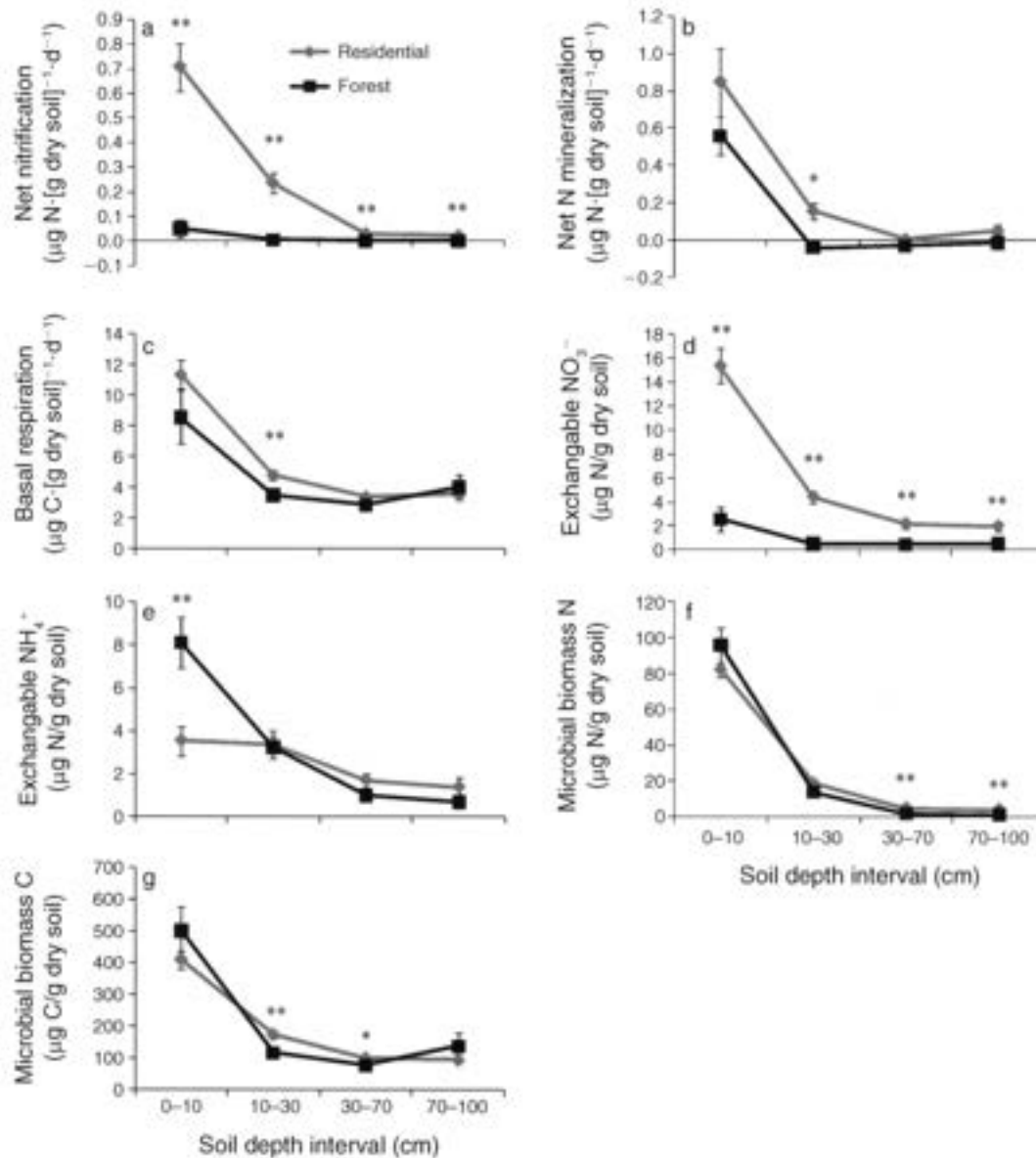


FIG. 2. Comparison of soil parameters between residential lawn and forest soils across four depth intervals: 0–10 cm, 10–30 cm, 30–70 cm, and 70–100 cm (residential sites, $n = 32$; forest sites, $n = 8$). Error bars represent $\pm$ SE.

* $P < 0.05$; ** $P < 0.01$.

applied fertilizer or had it applied for them; only one-quarter irrigated. Fertilizer application and irrigation were not significant predictors of net nitrification, net mineralization, exchangeable NO_3^- , or exchangeable NH_4^+ . Our survey covers recent management practices, so the effects of past management cannot be accounted for.

Nitrogen mass balance

We estimated a N mass balance for residential and forest sites using the results of this experiment combined with the results of previous experiments at BES. (See Table 1 for complete mass balance data and associated

references.) On average, residential sites have received greater N inputs than forest sites ($94.7 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ vs. $11.2 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ [Law et al. 2004, Groffman et al. 2004]) and had higher N leaching losses ($14.1 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ vs. $4.4 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ [Groffman et al. 2009]). Gross and potential net rates of NO_3^- production and consumption were higher in residential sites than forest sites ($13\,870 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ vs. $4453 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ and $469.4 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ vs. $17.1 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$), as were pool sizes of exchangeable NO_3^- (37.7 kg N/ha vs. 7.0 kg N/ha). Turnover rates for NO_3^- pools were rapid in both systems (0.16 and 0.23 d for residential and forest, respectively [Raciti et al. 2008]).

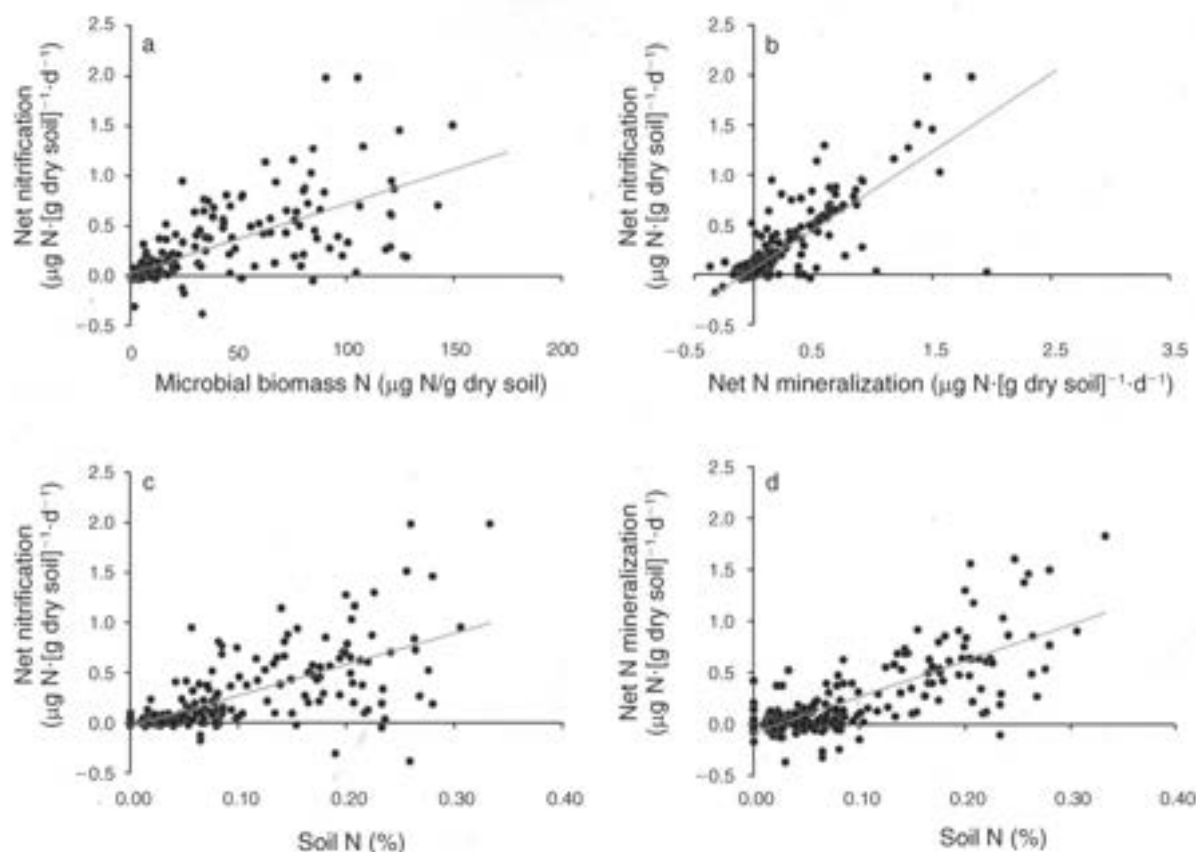


FIG. 3. Nitrogen dynamics in residential lawn soils: (a–c) regressions of net nitrification against microbial biomass N, net N mineralization, and total soil N, respectively; and (d) regression of net N mineralization against total soil N at four depth intervals (0–10 cm, 10–30 cm, 30–70 cm, and 70–100 cm; for residential sites, $n = 32$).

Estimated rates of N sequestration in residential systems (Raciti et al. 2011) were similar in magnitude to fertilizer N inputs (Law et al. 2004). N_2O fluxes from Baltimore lawns suggest that $<1 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ is lost in this form (Groffman et al. 2009). Total gaseous N losses from residential soils (particularly N_2 flux) are not well quantified, but we are addressing this in a follow-up study.

DISCUSSION

Predictors of NO_3^- production and availability

Net nitrification and exchangeable NO_3^- (a proxy for NO_3^- availability) were significantly higher in residential sites than forested reference sites (Figs. 1a, d and 2a, d), which may be a cause for concern with regard to runoff and leaching potential. However, it should be noted that the values we measured in residential soils were quite low overall and within the range measured elsewhere for deciduous forests. For instance, Verchot and colleagues (2001) measured higher net nitrification rates under beech and maple stands in the Catskills of New York State than we measured in our residential sites in Baltimore ($2.2 \pm 0.7 \mu\text{g N} \cdot \text{g dry soil}^{-1} \cdot \text{d}^{-1}$ (beech; mean $\pm$ SE) and $2.5 \pm 1.4 \mu\text{g N} \cdot \text{g dry soil}^{-1} \cdot \text{d}^{-1}$ (maple)

vs. $0.7 \pm 0.1 \mu\text{g N} \cdot \text{g dry soil}^{-1} \cdot \text{d}^{-1}$ for 0–10 cm residential soils). Exchangeable NO_3^- pools were also similar between the residential sites in this study and the Catskills beech and maple stands. Verchot and colleagues (2001) also studied oak-dominated stands in the Catskills that had particularly low net nitrification and available NO_3^- , similar to the oak-dominated forest sites in this study (Groffman et al. 2006). There is increasing evidence that certain tree species (particularly oaks) are associated with low net rates of NO_3^- production and availability (e.g., Verchot et al. 2001, Lovett et al. 2004) which may help to explain the very low rates of net nitrification and pools of exchangeable NO_3^- that we observed in our forest sites. Thus, the land use effect that we observed may have as much to do with low rates of activity in our forest sites as with high rates in our residential sites. Still, the composition of the forested sites is representative of the Baltimore metro area (Brush et al. 1980, Groffman et al. 2006), and the results suggest that residential land use change has increased pools and production of reactive N, which has implications for water quality in the region (Boesch et al. 2001, Galloway et al. 2003).

Among residential sites, there were several significant, positive predictors of net nitrification, including micro-

bial biomass N, net mineralization, and total soil N. These factors are indicative of a dynamic microbial population with access to large pools of soil organic matter and N, so it is unsurprising to see higher rates of net nitrification associated with them. The lower C:N ratio of microbial biomass in residential soils may also be indicative of a more active N cycling community in residential soils, while the relatively high C:N ratio of forest microbial biomass, combined with near zero (or negative) net nitrification may indicate suppressed nitrification (Lovett et al. 2004). We might expect a negative correlation between microbial biomass C and nitrification, as this variable can serve as an index of microbial demand for N. However, while microbial biomass N was a strong predictor of net nitrification, microbial biomass C was not.

Higher housing density and agricultural land use history were predictors of greater NO_3^- availability in residential soils. The association of greater NO_3^- availability on former agricultural sites may be a legacy effect of soil disturbance, a history of fertilizer addition, or these sites may be inherently more N rich than formerly forested sites. These former agricultural sites also tended to be higher in total soil N (see Raciti et al. 2011). Higher housing density may be an indicator of greater site disturbance, which is known to increase NO_3^- availability and loss (Vitousek et al. 1979). If these trends hold across a larger sample of residential sites, they may be useful indicators of N leaching or runoff potential in developed watersheds.

Surprisingly, fertilizer addition and irrigation were not significant predictors of available NO_3^- . This may reflect our study design, which does not account for historic management practices, and also the transient availability of inorganic N after fertilization application. In addition, we were unable to obtain accurate fertilizer application rates from the homeowners in our study, and used a binary factor (fertilized/unfertilized) in our analysis. This binary factor may have contributed to a lack of significant associations between fertilizer use and NO_3^- availability. Moderate fertilizer application rates have been associated with an increased capacity to sequester N in some studies (e.g., Bijoor et al. 2008, Groffman et al. 2009). Further, turfgrass studies have shown that lawns have a high capacity to sequester N, though that capacity is dependent upon a host of factors and may be overwhelmed by very high fertilizer application rates (see reviews by Petrovic 1990 and Easton and Petrovic 2008). In a ^{15}N tracer study, Raciti et al. (2008) found that when a pulse of ^{15}N -labeled NO_3^- was added to Baltimore area lawns, it was rapidly incorporated or retained in microbial biomass, fine roots, aboveground vegetation biomass, thatch, and soil organic matter. They found that for simulated atmospheric deposition events, overall ^{15}N retention was similar (and possibly higher) in lawns than in forested reference sites. Soil type may also play an important role in N cycling and retention. For instance, sandy soils may

be more susceptible to NO_3^- leaching losses (Sharma et al. 1996). The loamy soils at our study sites appear to be generally well drained (Raciti et al. 2011), but are not coarse textured, and may thus be less susceptible to NO_3^- runoff and leaching losses than others soil types.

Other environmental factors, such as soil moisture and temperature, may play a role in variable NO_3^- production and availability both among residential sites and between residential and forest sites. Soil temperatures are consistently higher in grass plots than forest plots, particularly in the summer months (Groffman et al. 2009, Savva et al. 2010), but there were no consistent differences in soil moisture among our plots. Residential soils may thus have higher rates of decomposition and microbial activity than forest soils, which can deplete soil C levels and increase N availability (Hart et al. 1994). This increase in decomposition and C loss, along with fertilizer inputs in at least some of our sites, likely lead to changes in microbial community composition, increases in microbial biomass N, and decreases in microbial C:N, and produced the high nitrification rates that we observed in residential sites relative to the forest sites.

We measured significantly greater net nitrification and NO_3^- availability in residential soils, compared to forest soils, at depths as great as 1 m (Fig. 2a, d). This NO_3^- is below the rooting zone for many cool-season turfgrasses, which suggests a greater likelihood of leaching. However, some species of turfgrass in our study area can be deeply rooted (e.g., Kentucky bluegrass, *Poa pratensis* [Wu 1985]) and studies of water use in turfgrasses have shown that some species are capable of drawing on deeper water sources and even of hydraulic lift (Carroll 1989, Huang 1999). There was also evidence of greater microbial biomass C and N at depth in residential soils (Fig. 2f, g), which can provide another active pathway for NO_3^- sequestration.

Nitrogen mass balance

We estimated a nitrogen mass balance for our residential sites to gain a better understanding of how NO_3^- production and availability compared to N inputs, losses, and internal cycling. (See Table 1 for complete budget and list of sources.) One striking finding is that pools of available NO_3^- are quite large (37.7 kg N/ha) relative to N inputs (11.2 kg N·ha⁻¹·yr⁻¹ and 83.5 kg N·ha⁻¹·yr⁻¹ for atmospheric deposition and fertilizer application, respectively) and outputs (14.1 kg N·ha⁻¹·yr⁻¹ as leaching). Potential net NO_3^- production (469.4 kg N·ha⁻¹·yr⁻¹) was an order of magnitude larger still, although caution must be exercised in extrapolating this rate to an annual basis. These NO_3^- pools and fluxes seem large, but represent only a small fraction of total N cycling in the system. Gross rates of NO_3^- production (13 870 kg N·ha⁻¹·yr⁻¹) and consumption (13 432 kg N·ha⁻¹·yr⁻¹) were orders of magnitude larger than the available NO_3^- pool, so it is not surprising that turnover of this pool was rapid (less than four hours) and leaching losses comparatively small. It is clear that

residential soils can support rapid N processing and significant N retention, but further study will be necessary if we are to better understand which processes (e.g., plant uptake, microbial uptake, nitrification, denitrification) are most important for N retention and how we can manage residential systems for better environmental performance.

CONCLUSIONS

Our results suggest that residential land use change has increased pools and production of reactive N, which has clear implications for water quality in the region. However, the results contradict some common assumptions about residential soils. While net nitrification and exchangeable NO_3^- were significantly higher in residential soils than forest soils, these measures of NO_3^- production and availability were still notably low, comparable to deciduous forest stands in other studies. A second unexpected result was that current homeowner management practices did not predict NO_3^- availability or production, which may reflect the transient availability of inorganic N after fertilizer application in these dynamic soil ecosystems or merely the limitations of this study. Housing density and land use history were significant predictors of NO_3^- availability in residential soils. If these factors prove to be predictive across a wider range of sites, they may be useful indicators of NO_3^- availability, leaching, and runoff potential at the landscape scale. Finally, the N mass balance makes it clear that residential soils can support rapid processing and retention of N inputs. Further research will be necessary to understand which N cycling processes are most important for N retention in residential ecosystems and how we can manage them to minimize their impact on the environment.

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Nitrate production and availability in residential soils

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Nitrate production and availability in residential soils

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Abstract. The rapid increase in residential land area in the United States has raised concern about water pollution associated with nitrogen fertilizers. Nitrate (NO_3^-) is the form of reactive N that is most susceptible to leaching and runoff; thus, a more thorough understanding of nitrification and NO_3^- availability is needed if we are to accurately predict the consequences of residential expansion for water quality. In particular, there have been few assessments of how the land use history, housing density, and age of residential soils influence NO_3^- pools and fluxes, especially at depth. In this study, we used 1 m deep soil cores to evaluate potential net nitrification and mineralization, microbial respiration and biomass, and soil NO_3^- and NH_4^+ pools in 32 residential home lawns that differed by previous land use and age, but had similar soil types. These were compared to eight forested reference sites with similar soils. Our results suggest that a change to residential land use has increased pools and production of reactive N, which has clear implications for water quality in the region. However, the results contradict the common assumption that NO_3^- production and availability is dramatically higher in residential soils than in forests in general. While net nitrification ($128.6 \pm 15.5 \text{ mg}\cdot\text{m}^{-2}\cdot\text{d}^{-1}$ vs. $4.7 \pm 2.3 \text{ mg}\cdot\text{m}^{-2}\cdot\text{d}^{-1}$; mean $\pm$ SE) and exchangeable NO_3^- ($3.8 \pm 0.5 \text{ g}/\text{m}^2$ vs. $0.7 \pm 0.3 \text{ g}/\text{m}^2$) were significantly higher in residential soils than in forest soils in this study, these measures of NO_3^- production and availability were still notably low, comparable to deciduous forest stands in other studies. A second unexpected result was that current homeowner management practices were not predictive of NO_3^- availability or production. This may reflect the transient availability of inorganic N after fertilizer application. Higher housing density and a history of agricultural land use were predictors of greater NO_3^- availability in residential soils. If these factors are good predictors across a wider range of sites, they may be useful indicators of NO_3^- availability and leaching and runoff potential at the landscape scale.

Key words: development; forest; land use; lawn fertilization; nitrate; nitrogen; residential land; soil; turfgrass; urban areas.

INTRODUCTION

Between 1982 and 1997 the amount of urbanized land in the United States increased by almost 50% (Fulton et al. 2001). In the Chesapeake Bay watershed of the United States, developed land area is expected to increase an additional 80% by 2030 if current trends continue, consuming 5% of wetlands, 14% of forests, and 23% of agricultural lands (Goetz et al. 2004). There is no doubt that urban areas are growing in size and importance; however, we are only beginning to under-

stand how the process of urbanization influences ecosystem dynamics (Kaye et al. 2006).

The most visible changes that accompany urbanization are increased impervious surface area (e.g., buildings, roads, and sidewalks) and replacement of natural vegetation or agricultural fields with lawns. Impervious surfaces in the United States are estimated to cover an area nearly the size of Ohio (Elvidge et al. 2004), and the area in lawns is estimated to be even larger (163 800 km^2), and continues to grow rapidly (Milesi et al. 2005). In the state of Maryland, which encompasses our study area, >10% of the terrestrial surface area is covered by lawns (based on Milesi et al. 2005).

The rapid increase in residential land area has raised concern about water pollution associated with fertilizers and pesticides used for lawn establishment and maintenance (Gold et al. 1988, 1990, Morton et al. 1988, Petrovic 1990, Milesi et al. 2005). This concern is heightened in areas that receive high levels of atmo-

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spheric nitrogen (N) deposition. However, recent studies suggest that urban watersheds have a high capacity for N retention, indicating that there are strong sinks for N within these watersheds (Baker et al. 2001, Groffman et al. 2004, Wollheim et al. 2005, Easton and Petrovic 2008).

We will need a better understanding of N cycling in urban ecosystems if we are to accurately predict the consequences of residential expansion for water quality. In particular, we will need to understand how land use history, spatial patterns of development, and land management practices influence rates of nitrification, nitrate (NO_3^-) consumption, and NO_3^- losses. We will also need a better understanding of soil N dynamics at depth, where the uncertainty is greater still (Galbraith et al. 1999, Pouyat et al. 2006), because most N cycling work in developed areas has focused on the upper 10–15 cm of soil. It is clear that land management practices have the potential to influence nitrogen cycling in turfgrasses (Petrovic 1990, Frank et al. 2006), but the influence of development patterns on N cycling (high-density urban development vs. low-density exurban development) is unknown and potentially important given that exurban development is the dominant driver of land use change in the United States (Goetz et al. 2004). Land use history may also influence biogeochemical cycling in residential areas. For instance, Raciti et al. (2011) found evidence for C and N accumulation over time in residential soils that were previously in agriculture, but did not find this same pattern of increasing C and N concentration at sites that were forested prior to being developed. There is also a need to better understand N cycling at depth in residential systems (e.g., beyond the first 10–15 cm) given societal concerns about NO_3^- leaching from residential areas (Gold et al. 1990, Petrovic 1990, Milesi et al. 2005).

In this study, we evaluated nitrification and NO_3^- availability in 1 m deep soil cores from 32 residential home lawns and eight forested reference sites with similar soils. The work was part of U.S. National Science Foundation-funded long-term ecological research (LTER) in the Baltimore metropolitan area (Pickett et al. 2008). Soil profile characteristics and soil C and N pools from this sampling are discussed in Raciti et al. (2011). Here, we investigated the effects of land use history, housing density, housing age, and management practices on net nitrification and the availability of NO_3^- for leaching and runoff. A more thorough understanding of nitrification and NO_3^- availability will be crucial for explaining the extraordinarily high variability in measured N losses from residential and turfgrass systems, which range from nearly zero to >50% of applied N (see review by Petrovic 1990). We hypothesized that NO_3^- availability and net nitrification would be (1) greater and more variable in residential soils than forest soils, (2) greater in residential soils that were formerly in agriculture than those formerly in

forest, and (3) particularly great in residential soils that are fertilized and irrigated.

METHODS

Site description

Soil cores were obtained from 32 residential and 8 forest sites in the Baltimore, Maryland, USA metropolitan area. This area has a temperate climate with warm, humid summers (1220 cooling degree-days), cold winters (4720 heating degree-days) and mean annual precipitation of ~1060 mm distributed relatively evenly throughout the year (NCDC 2009). The residential sites were mostly within the Gwynns Falls Watershed (39°15' N, 76°30' W and ~17 km²), which has a population of 356 000 people, with subwatershed densities ranging from 2200 to 19 400 persons/km² (Law et al. 2004). Forest soil cores were taken from permanent forest plots of the Baltimore Ecosystem Study (BES) LTER, which have been described in detail elsewhere (Groffman et al. 2006, 2009). These remnant forests are >100 years old, with soils that were comparable in type and texture to those underlying the residential areas of our study (NRCS 1976, 1998).

Residential site selection

To aid the site selection process we used neighborhoods in the Baltimore City metropolitan area that have been mapped using HERCULES, a high-resolution land cover classification system designed to assist in the study of human-ecological systems (Cadenasso et al. 2007). Using HERCULES and additional data sources, we identified residential sites that were similar except for single factors that we hypothesized to be important predictors of ecosystem dynamics. These factors included land use history (agriculture and forest, $n = 10$ and $n = 22$), housing density (low and medium/high, $n = 9$ and $n = 23$), and housing age (4 to 58 years old, mean = 33 years, $n = 32$). Housing age was acquired from the Maryland Property View database (Maryland Department of Planning 2007). Prior land use was determined based on land use change maps developed by integrating aerial photos from 1938, 1957, 1971, and 1999 into a geographic information system (Wehling 2001). Once residential parcels meeting the predefined criteria were identified, we sent mailings to property owners chosen at random from each of the factor groups with the goal of recruiting 40 property owners for a three-year study (of which this work is a part). We had recruited 32 property owners at the time soil cores were obtained. A yard management survey of the homeowners was used to assign sites to classes of fertilizer application (yes or no) and irrigation (yes or no).

Sample collection

Soil coring took place over a one-month period during the summer of 2007. For residential sites, we overlaid a grid onto a map of each property and randomly chose two locations for coring. Locations

beneath impervious surfaces (buildings, walkways, driveways) or within close proximity to belowground pipes and power lines were excluded and another random location identified. Undisturbed 1-m soil cores were extracted from each of these locations using a 3.3 cm diameter soil corer. Cores were enclosed in plastic sleeves with end caps, put into coolers, and transported to the laboratory where they were stored at 4°C until they could be processed (typically within 3–4 days). Coring in the forested reference plots followed a similar procedure, with two replicate cores taken from random locations at each site. In total, 80 intact soil cores were collected from 32 residential properties and eight forest sites.

Sample processing

Photographs were taken of each soil core, followed by a visual inspection to determine horizon depths and Munsell color. Soil cores were also inspected for obvious signs of disturbance such as buried horizons, lithologic discontinuities, or human artifacts less than the diameter of the core. Cores were divided into four soil depth intervals (0–10, 10–30, 30–70, and 70–100 cm), and sorted to remove coarse roots and rocks (>2 mm). The roots and rocks were dried at 105°C, weighed, and set aside. Rock volume was estimated from mass and an assumed density of 2.7 g/cm³ (Hillel 1998). Subsamples of soil from each depth interval were homogenized and analyzed for soil dry mass and percentage of moisture (48 h at 105°C). Bulk density (BD) was calculated as $BD = (\text{total dry mass} - \text{rock mass}) / (\text{total volume} - \text{rock volume})$. Soil texture was measured by the hydrometer method (Gee and Bauder 1986). Total C and N were measured by flash-combustion/oxidation using a Thermo Finnigan Flash EA 1112 elemental analyzer (Thermo Fisher Scientific, Waltham, Massachusetts, USA). Subsamples of homogenized soil from each depth interval were set aside to determine (1) initial KCl exchangeable NO_3^- and NH_4^+ , (2) net nitrification, net mineralization, and basal respiration, and (3) microbial biomass C and N.

Exchangeable inorganic N (NO_3^- , NH_4^+) was extracted from ~10 g (dry mass) of soil with 40 mL of 2 mol/L KCl. Samples were agitated for 60 minutes at 200 rpm on an orbital shaker table and then left undisturbed for two hours. The supernatant liquid from each sample was then collected and filtered through Whatman number 42 filter paper (Whatman Incorporated, Florham Park, New Jersey, USA) into nalgene bottles. Samples were analyzed colorimetrically for NO_3^- and NH_4^+ concentration using a Lachat Flow Injection Analyzer (Lachat Instruments, Loveland, Colorado, USA).

Rates of potential net N mineralization, nitrification, and respiration were measured in a 10-day laboratory incubation of soils at room temperature. (For detailed methods, consult Groffman et al. [1999]). Soils (25 g per incubation) were placed in 946-mL glass jars with lids

fitted with septa for gas sampling. After 10 days, the headspace of the jars was sampled by syringe, and the gas samples were analyzed for carbon dioxide (CO_2) by thermal conductivity gas chromatography. Inorganic N was extracted as described above. Mineralization was calculated as the accumulation of total inorganic N, nitrification was calculated as the accumulation of NO_3^- , and respiration was calculated as the accumulation of CO_2 over the course of the 10-day incubation.

Microbial biomass C and N were measured using the chloroform fumigation-incubation method (Jenkinson and Powlson 1976). Field moist soils (25 g) were fumigated to lyse microbial cells in the samples. The fumigated samples were then inoculated with fresh soil, allowing microorganisms to regrow using the dead cells as substrate. The flushes of CO_2 and 2 mol/L KCl-extractable inorganic N (NH_4^+ and NO_3^-) released by the cells during the incubation were assumed to be proportional to the C and N in the microbial biomass of the original sample. A proportionality constant (0.45) was used to calculate biomass C from the CO_2 flush, which was measured by thermal conductivity gas chromatography. Inorganic N flush data were not corrected with a proportionality constant.

STATISTICAL ANALYSIS

We used separate multivariate analysis of variance (MANOVA) tests to test for the main effects of housing age, housing density, and land use history on individual response variables, including microbial biomass C and N, total soil C and N, bulk density, net nitrification, net N mineralization, exchangeable NO_3^- and exchangeable NH_4^+ , with appropriate transformations to meet assumptions of normality. Housing age was a continuous variable, while housing density, depth, and land use history were categorical variables. Regression analysis was used to test for possible linear or curvilinear relationships between the variables. A two-tailed *t* test was used to test for whole-core (normalized by soil mass) differences between residential and forest soils in net nitrification, net mineralization, and respiration. Repeated-measures ANOVA was used to test for differences between residential and forest soils across depth intervals. We used separate *t* tests to test for the effects of fertilizer application (yes or no) and irrigation (yes or no) on net nitrification, net N mineralization, and exchangeable NO_3^- and NH_4^+ in residential soils. Because few homeowners regularly watered, we were unable to test for interaction effects between fertilizer application and irrigation. All statistical analyses were performed using SAS JMP version 8 statistical software (SAS Institute 2009).

Nitrogen mass balance

We used the results of this study and previous studies at BES to create a N mass balance for residential and forest sites that included most inorganic N inputs, losses, pool sizes, and transformations (Table 1). Inorganic N

TABLE 1. Nitrogen mass balance for residential lawns in the Baltimore, Maryland, USA metropolitan area.

Nitrogen parameters	Residential	Forest	Source
N inputs			
Atmospheric deposition (kg N·ha ⁻¹ ·yr ⁻¹)	11.2	11.2	Groffman et al. (2004)
Fertilizer (kg N·ha ⁻¹ ·yr ⁻¹)	83.5	0	Law et al. (2004)
N losses			
Leaching (kg N·ha ⁻¹ ·yr ⁻¹)	14.1	4.4	Groffman et al. (2009)
N ₂ O (kg N·ha ⁻¹ ·yr ⁻¹)	<1	<1	Groffman et al. (2009)
NO₃⁻ production			
Net NO ₃ ⁻ production (kg N·ha ⁻¹ ·yr ⁻¹)	469.4	17.1	this study (potential net nitrification)
Gross NO ₃ ⁻ production (kg N·ha ⁻¹ ·yr ⁻¹)	13 870	5256	Raciti et al. (2008)
NO₃⁻ consumption			
Gross NO ₃ ⁻ consumption (kg N·ha ⁻¹ ·yr ⁻¹)	13 432	4453	Raciti et al. (2008)
Pool size			
Exchangeable NO ₃ ⁻ (kg N/ha)	37.7	7.0	this study
Pool turnover			
NO ₃ ⁻ turnover rate (days)	0.16	0.23	Raciti et al. (2008)
N sequestration			
N accumulation in soil organic matter (kg N·ha ⁻¹ ·yr ⁻¹)	83.0	NA	Raciti et al. (2011) (residential sites with agricultural land use history)

inputs included estimates of atmospheric deposition (Groffman et al. 2004) and fertilizer application (Law et al. 2004). Inorganic N losses included NO₃⁻ and NH₄⁺ leaching losses and gaseous N₂O fluxes (Groffman et al. 2009). NO₃⁻ pool turnover time and gross rates of NO₃⁻ production and consumption were measured for forest and residential plots by Raciti and colleagues (2008). NO₃⁻ pool sizes, potential net production, and potential net consumption were measured in this study as previously described.

RESULTS

Net nitrification, Net N mineralization, and basal respiration

Whole-core net nitrification rates, normalized by soil mass to 1 m depth, were significantly higher in the residential soils than the forest soils (128.6 ± 15.5 mg·m⁻²·d⁻¹ vs. 4.7 ± 2.3 mg·m⁻²·d⁻¹ [mean ± SE], $P < 0.001$; Fig. 1a). Net nitrification rates were also significantly higher in residential soils at all individual depth intervals down to 1 m ($P < 0.01$) on a per gram of soil basis (Fig. 2a).

Among residential soils, net nitrification rates were significantly correlated with microbial biomass N, net mineralization, total soil N, and total soil C ($P < 0.01$, except microbial biomass C with $P = 0.03$). Basal respiration, microbial biomass C, land use history, housing age, and housing density were not significant predictors of net nitrification in residential soils. Regression analysis revealed a significant linear relationship between microbial biomass N and net nitrification ($R^2 = 0.51$, $P < 0.01$ Fig. 3a); net mineralization and net nitrification ($R^2 = 0.64$, $P < 0.01$, Fig. 3b); and total soil N and net nitrification ($R^2 = 0.48$, $P < 0.01$, Fig. 3c) in residential soils.

Whole-core net N mineralization rates were significantly higher in residential soils than forest soils (123.5 ± 21.2 mg·m⁻²·d⁻¹ vs. 8.2 ± 16.9 mg·m⁻²·d⁻¹, $P < 0.001$, Fig. 1b). When measured on a per gram of dry soil basis, net N mineralization was significantly higher in residential soils at the 10–30 cm depth interval, but differences between residential and forest soils were not significant at other depth intervals (Fig. 2b). Among the other factors we measured, only total soil N was a significant predictor of net N mineralization ($P < 0.001$) in residential soils. There was a significant linear relationship between total soil N and net N mineralization ($R^2 = 0.60$, $P < 0.001$, Fig. 3d).

Whole-core basal respiration rates were not significantly different between residential and forest soils ($P = 0.23$, Fig. 1c). When comparing rates at individual depth intervals, only the 10–30 cm depth interval had significantly higher respiration rates in residential soils than forest soils ($P < 0.01$, Fig. 2c).

KCl exchangeable NO₃⁻ and NH₄⁺

At the whole-core level, KCl exchangeable NO₃⁻ was significantly higher in residential soils than forest soils (3.8 ± 0.5 g/m² vs. 0.7 ± 0.3 g/m², $P < 0.001$; Fig. 1d). Exchangeable NO₃⁻ was higher in residential soils at all individual depth intervals ($P < 0.01$; Fig. 2d). Exchangeable NH₄⁺ was not significantly different between residential and forest soils at the whole-core level ($P = 0.53$, Fig. 1e); however, it was significantly lower in residential soils at the 0–10 cm depth interval (3.5 ± 0.7 g/m² vs. 8.1 ± 1.2 g/m², $P < 0.01$; Fig. 2e), with no significant differences at other depth intervals.

Among residential soils, land use history (former forest or agriculture) and housing density were significant predictors of KCl exchangeable NO₃⁻ (land use

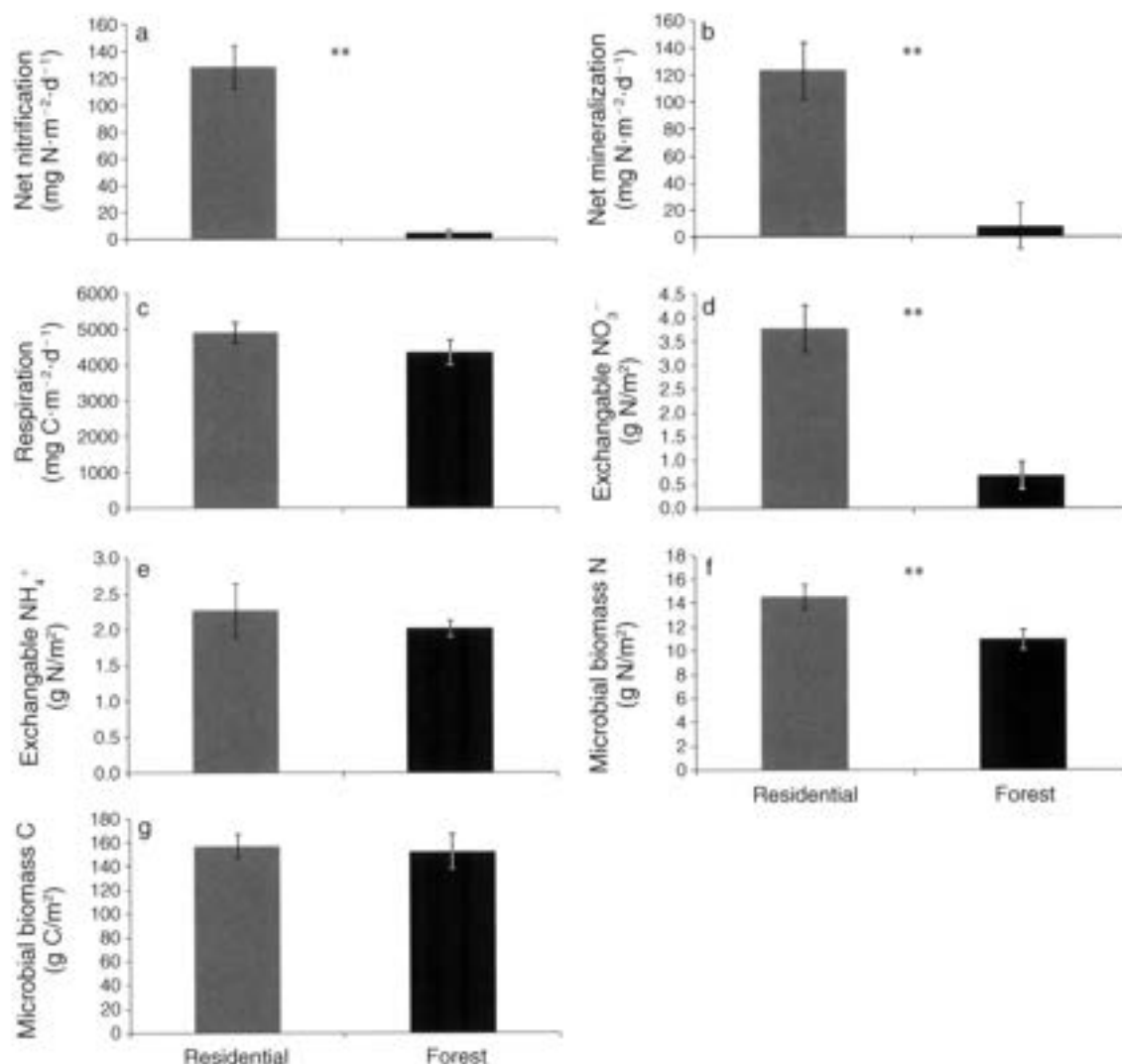


FIG. 1. Comparison of soil parameters between residential lawn and forest soils at 0–100 cm depth (residential sites $n = 32$; forest sites, $n = 8$) in Baltimore, Maryland, USA. Error bars represent $\pm$ SE.

** $P < 0.01$.

history, $P < 0.001$; housing density, $P < 0.01$). Residential sites that had higher housing density or were formerly in agriculture were more likely to have higher concentrations of KCl exchangeable NO₃⁻ when other experimental factors were taken into account. None of the experimental factors was a significant predictor of exchangeable NH₄⁺ among residential sites.

Microbial biomass C and N

Microbial biomass N at the whole-core level was higher in residential soils than forest soils ($P < 0.01$; Fig. 1f); however, microbial biomass C was not significantly different between the land use types ($P = 0.80$; Fig. 1g). Microbial biomass N was significantly higher in residential soils at the 30–70 cm and 70–100 cm depth intervals ($P < 0.01$; Fig. 2f), and microbial biomass C was significantly higher in residential soils at the 10–30

cm and 30–70 cm depth intervals ($P < 0.01$; Fig. 2g). While the differences in microbial biomass C and N were statistically significant, the differences were generally small. Land use history was a significant predictor of microbial biomass N among soils at residential sites ($P < 0.01$). Residential sites that were formerly in agriculture had higher microbial biomass N. Among the factors that we tested, there were no significant predictors of microbial biomass C. The overall microbial biomass C:N ratio was lower in residential soils than forest soils (10.8 ± 0.4 vs. 13.8 ± 0.5 ; mean $\pm$ SE).

Yard management

A survey of the homeowners in our study (S. M. Raciti, P. M. Groffman, J. C. Jenkins, R. V. Pouyat, T. J. Fahey, S. T. A. Pickett, and M. L. Cadenasso, unpublished data) revealed that half of our homeowners

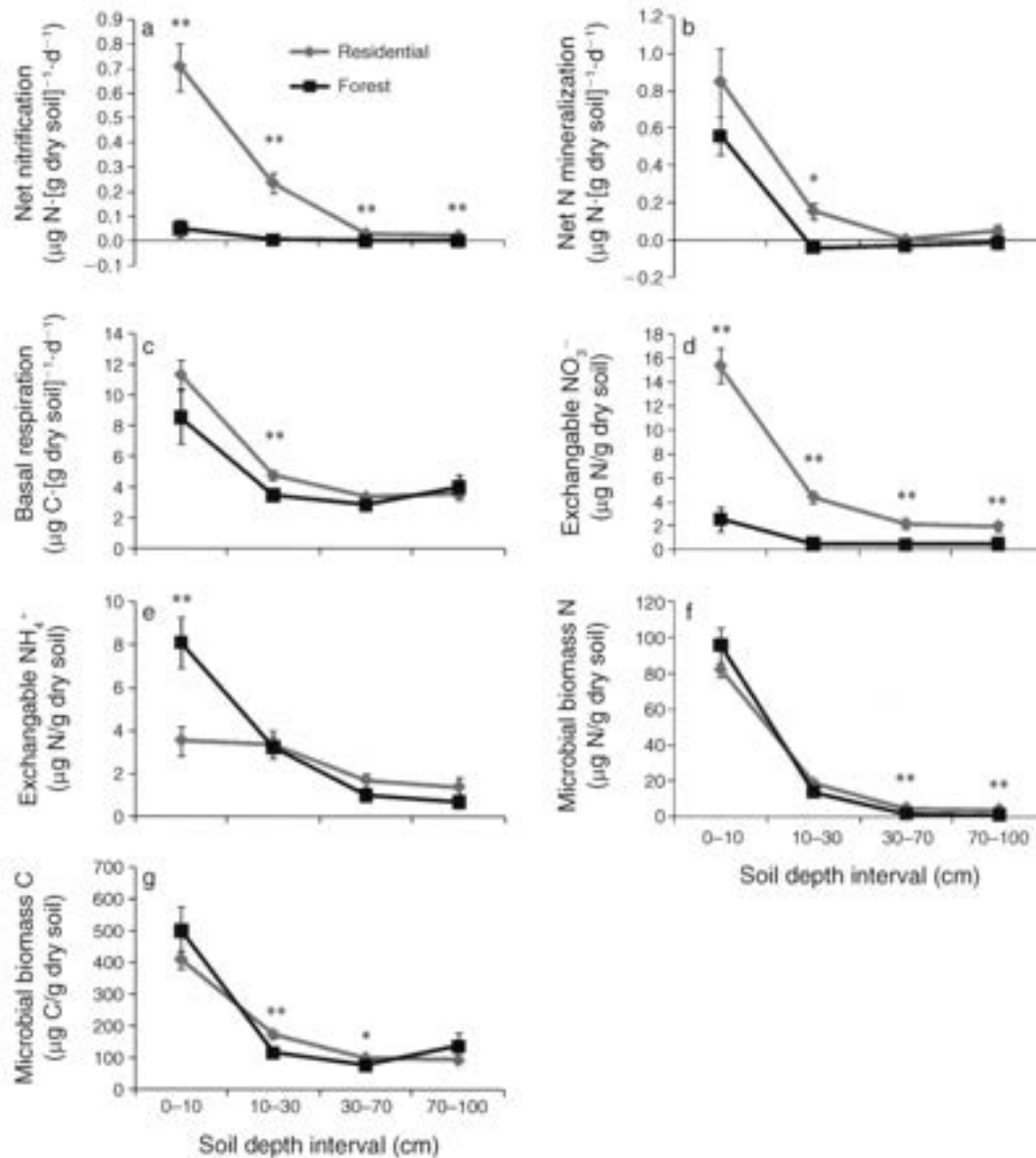


FIG. 2. Comparison of soil parameters between residential lawn and forest soils across four depth intervals: 0–10 cm, 10–30 cm, 30–70 cm, and 70–100 cm (residential sites, $n = 32$; forest sites, $n = 8$). Error bars represent $\pm$ SE.

* $P < 0.05$; ** $P < 0.01$.

applied fertilizer or had it applied for them; only one-quarter irrigated. Fertilizer application and irrigation were not significant predictors of net nitrification, net mineralization, exchangeable NO_3^- , or exchangeable NH_4^+ . Our survey covers recent management practices, so the effects of past management cannot be accounted for.

Nitrogen mass balance

We estimated a N mass balance for residential and forest sites using the results of this experiment combined with the results of previous experiments at BES. (See Table 1 for complete mass balance data and associated

references.) On average, residential sites have received greater N inputs than forest sites ($94.7 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ vs. $11.2 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ [Law et al. 2004, Groffman et al. 2004]) and had higher N leaching losses ($14.1 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ vs. $4.4 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ [Groffman et al. 2009]). Gross and potential net rates of NO_3^- production and consumption were higher in residential sites than forest sites ($13\,870 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ vs. $4453 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ and $469.4 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ vs. $17.1 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$), as were pool sizes of exchangeable NO_3^- (37.7 kg N/ha vs. 7.0 kg N/ha). Turnover rates for NO_3^- pools were rapid in both systems (0.16 and 0.23 d for residential and forest, respectively [Raciti et al. 2008]).

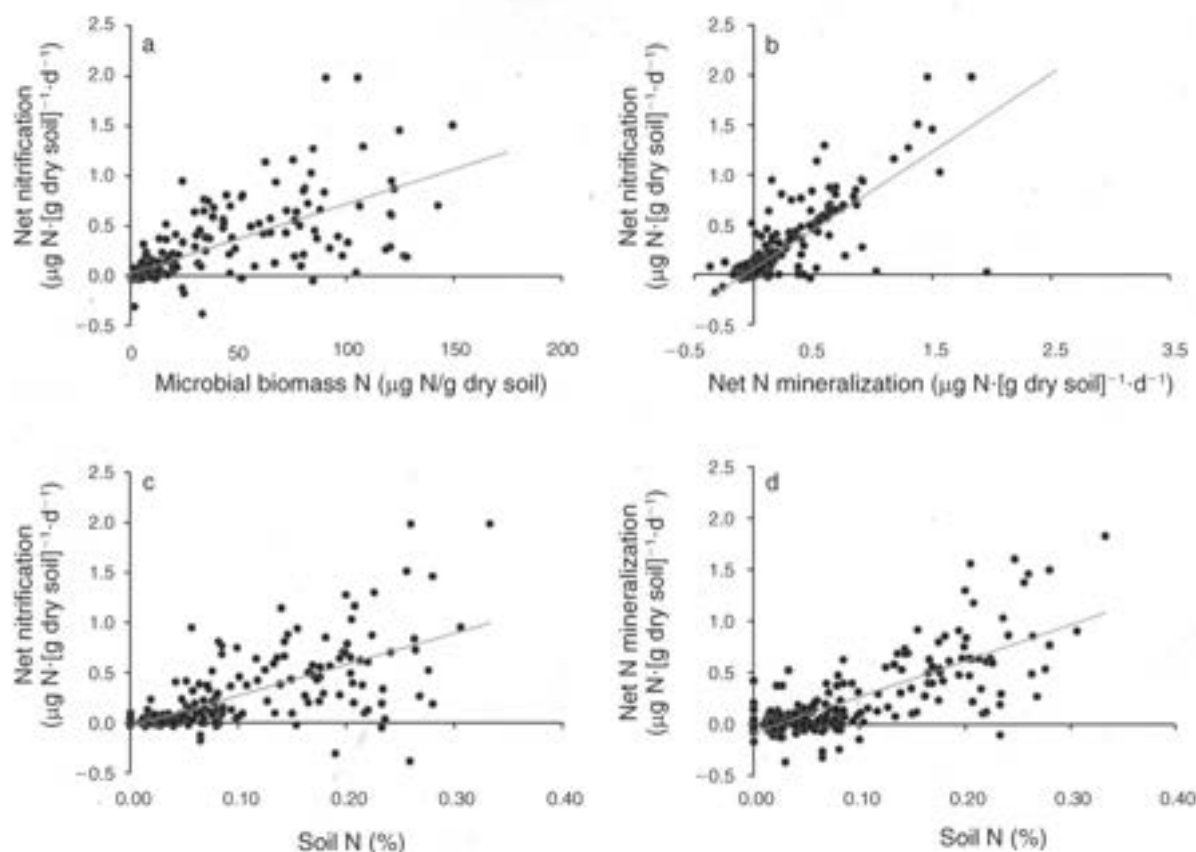


FIG. 3. Nitrogen dynamics in residential lawn soils: (a–c) regressions of net nitrification against microbial biomass N, net N mineralization, and total soil N, respectively; and (d) regression of net N mineralization against total soil N at four depth intervals (0–10 cm, 10–30 cm, 30–70 cm, and 70–100 cm; for residential sites, $n = 32$).

Estimated rates of N sequestration in residential systems (Raciti et al. 2011) were similar in magnitude to fertilizer N inputs (Law et al. 2004). N_2O fluxes from Baltimore lawns suggest that $<1 \text{ kg N} \cdot \text{ha}^{-1} \cdot \text{yr}^{-1}$ is lost in this form (Groffman et al. 2009). Total gaseous N losses from residential soils (particularly N_2 flux) are not well quantified, but we are addressing this in a follow-up study.

DISCUSSION

Predictors of NO_3^- production and availability

Net nitrification and exchangeable NO_3^- (a proxy for NO_3^- availability) were significantly higher in residential sites than forested reference sites (Figs. 1a, d and 2a, d), which may be a cause for concern with regard to runoff and leaching potential. However, it should be noted that the values we measured in residential soils were quite low overall and within the range measured elsewhere for deciduous forests. For instance, Verchot and colleagues (2001) measured higher net nitrification rates under beech and maple stands in the Catskills of New York State than we measured in our residential sites in Baltimore ($2.2 \pm 0.7 \mu\text{g N} \cdot \text{g dry soil}^{-1} \cdot \text{d}^{-1}$ (beech; mean $\pm$ SE) and $2.5 \pm 1.4 \mu\text{g N} \cdot \text{g dry soil}^{-1} \cdot \text{d}^{-1}$ (maple)

vs. $0.7 \pm 0.1 \mu\text{g N} \cdot \text{g dry soil}^{-1} \cdot \text{d}^{-1}$ for 0–10 cm residential soils). Exchangeable NO_3^- pools were also similar between the residential sites in this study and the Catskills beech and maple stands. Verchot and colleagues (2001) also studied oak-dominated stands in the Catskills that had particularly low net nitrification and available NO_3^- , similar to the oak-dominated forest sites in this study (Groffman et al. 2006). There is increasing evidence that certain tree species (particularly oaks) are associated with low net rates of NO_3^- production and availability (e.g., Verchot et al. 2001, Lovett et al. 2004) which may help to explain the very low rates of net nitrification and pools of exchangeable NO_3^- that we observed in our forest sites. Thus, the land use effect that we observed may have as much to do with low rates of activity in our forest sites as with high rates in our residential sites. Still, the composition of the forested sites is representative of the Baltimore metro area (Brush et al. 1980, Groffman et al. 2006), and the results suggest that residential land use change has increased pools and production of reactive N, which has implications for water quality in the region (Boesch et al. 2001, Galloway et al. 2003).

Among residential sites, there were several significant, positive predictors of net nitrification, including micro-

bial biomass N, net mineralization, and total soil N. These factors are indicative of a dynamic microbial population with access to large pools of soil organic matter and N, so it is unsurprising to see higher rates of net nitrification associated with them. The lower C:N ratio of microbial biomass in residential soils may also be indicative of a more active N cycling community in residential soils, while the relatively high C:N ratio of forest microbial biomass, combined with near zero (or negative) net nitrification may indicate suppressed nitrification (Lovett et al. 2004). We might expect a negative correlation between microbial biomass C and nitrification, as this variable can serve as an index of microbial demand for N. However, while microbial biomass N was a strong predictor of net nitrification, microbial biomass C was not.

Higher housing density and agricultural land use history were predictors of greater NO_3^- availability in residential soils. The association of greater NO_3^- availability on former agricultural sites may be a legacy effect of soil disturbance, a history of fertilizer addition, or these sites may be inherently more N rich than formerly forested sites. These former agricultural sites also tended to be higher in total soil N (see Raciti et al. 2011). Higher housing density may be an indicator of greater site disturbance, which is known to increase NO_3^- availability and loss (Vitousek et al. 1979). If these trends hold across a larger sample of residential sites, they may be useful indicators of N leaching or runoff potential in developed watersheds.

Surprisingly, fertilizer addition and irrigation were not significant predictors of available NO_3^- . This may reflect our study design, which does not account for historic management practices, and also the transient availability of inorganic N after fertilization application. In addition, we were unable to obtain accurate fertilizer application rates from the homeowners in our study, and used a binary factor (fertilized/unfertilized) in our analysis. This binary factor may have contributed to a lack of significant associations between fertilizer use and NO_3^- availability. Moderate fertilizer application rates have been associated with an increased capacity to sequester N in some studies (e.g., Bijoor et al. 2008, Groffman et al. 2009). Further, turfgrass studies have shown that lawns have a high capacity to sequester N, though that capacity is dependent upon a host of factors and may be overwhelmed by very high fertilizer application rates (see reviews by Petrovic 1990 and Easton and Petrovic 2008). In a ^{15}N tracer study, Raciti et al. (2008) found that when a pulse of ^{15}N -labeled NO_3^- was added to Baltimore area lawns, it was rapidly incorporated or retained in microbial biomass, fine roots, aboveground vegetation biomass, thatch, and soil organic matter. They found that for simulated atmospheric deposition events, overall ^{15}N retention was similar (and possibly higher) in lawns than in forested reference sites. Soil type may also play an important role in N cycling and retention. For instance, sandy soils may

be more susceptible to NO_3^- leaching losses (Sharma et al. 1996). The loamy soils at our study sites appear to be generally well drained (Raciti et al. 2011), but are not coarse textured, and may thus be less susceptible to NO_3^- runoff and leaching losses than others soil types.

Other environmental factors, such as soil moisture and temperature, may play a role in variable NO_3^- production and availability both among residential sites and between residential and forest sites. Soil temperatures are consistently higher in grass plots than forest plots, particularly in the summer months (Groffman et al. 2009, Savva et al. 2010), but there were no consistent differences in soil moisture among our plots. Residential soils may thus have higher rates of decomposition and microbial activity than forest soils, which can deplete soil C levels and increase N availability (Hart et al. 1994). This increase in decomposition and C loss, along with fertilizer inputs in at least some of our sites, likely lead to changes in microbial community composition, increases in microbial biomass N, and decreases in microbial C:N, and produced the high nitrification rates that we observed in residential sites relative to the forest sites.

We measured significantly greater net nitrification and NO_3^- availability in residential soils, compared to forest soils, at depths as great as 1 m (Fig. 2a, d). This NO_3^- is below the rooting zone for many cool-season turfgrasses, which suggests a greater likelihood of leaching. However, some species of turfgrass in our study area can be deeply rooted (e.g., Kentucky bluegrass, *Poa pratensis* [Wu 1985]) and studies of water use in turfgrasses have shown that some species are capable of drawing on deeper water sources and even of hydraulic lift (Carroll 1989, Huang 1999). There was also evidence of greater microbial biomass C and N at depth in residential soils (Fig. 2f, g), which can provide another active pathway for NO_3^- sequestration.

Nitrogen mass balance

We estimated a nitrogen mass balance for our residential sites to gain a better understanding of how NO_3^- production and availability compared to N inputs, losses, and internal cycling. (See Table 1 for complete budget and list of sources.) One striking finding is that pools of available NO_3^- are quite large (37.7 kg N/ha) relative to N inputs (11.2 kg N·ha⁻¹·yr⁻¹ and 83.5 kg N·ha⁻¹·yr⁻¹ for atmospheric deposition and fertilizer application, respectively) and outputs (14.1 kg N·ha⁻¹·yr⁻¹ as leaching). Potential net NO_3^- production (469.4 kg N·ha⁻¹·yr⁻¹) was an order of magnitude larger still, although caution must be exercised in extrapolating this rate to an annual basis. These NO_3^- pools and fluxes seem large, but represent only a small fraction of total N cycling in the system. Gross rates of NO_3^- production (13 870 kg N·ha⁻¹·yr⁻¹) and consumption (13 432 kg N·ha⁻¹·yr⁻¹) were orders of magnitude larger than the available NO_3^- pool, so it is not surprising that turnover of this pool was rapid (less than four hours) and leaching losses comparatively small. It is clear that

residential soils can support rapid N processing and significant N retention, but further study will be necessary if we are to better understand which processes (e.g., plant uptake, microbial uptake, nitrification, denitrification) are most important for N retention and how we can manage residential systems for better environmental performance.

CONCLUSIONS

Our results suggest that residential land use change has increased pools and production of reactive N, which has clear implications for water quality in the region. However, the results contradict some common assumptions about residential soils. While net nitrification and exchangeable NO_3^- were significantly higher in residential soils than forest soils, these measures of NO_3^- production and availability were still notably low, comparable to deciduous forest stands in other studies. A second unexpected result was that current homeowner management practices did not predict NO_3^- availability or production, which may reflect the transient availability of inorganic N after fertilizer application in these dynamic soil ecosystems or merely the limitations of this study. Housing density and land use history were significant predictors of NO_3^- availability in residential soils. If these factors prove to be predictive across a wider range of sites, they may be useful indicators of NO_3^- availability, leaching, and runoff potential at the landscape scale. Finally, the N mass balance makes it clear that residential soils can support rapid processing and retention of N inputs. Further research will be necessary to understand which N cycling processes are most important for N retention in residential ecosystems and how we can manage them to minimize their impact on the environment.

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Nutrient uptake by constructed floating wetland plants during the construction phase of an urban residential development

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HIGHLIGHTS

- We examined growth and nutrient uptake by plants in constructed floating wetlands.
- Root growth of *Carex appressa* was extensive at 12 and 16 months after planting.
- Large amounts of nutrients were removed from stormwater.
- Aluminium, copper, iron and manganese were concentrated in or on the roots.
- Constructed floating wetlands offer multiple benefits for stormwater treatment.

GRAPHICAL ABSTRACT



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ABSTRACT

This study investigated plant growth, nutrient partitioning and total nutrient uptake by tall sedge (*Carex appressa*) plants in two large-scale Constructed Floating Wetlands (CFW1 and CFW2). These CFWs were installed to treat stormwater runoff discharging into a newly-constructed 2.6-ha lake during the construction phase of a 45-ha residential development. Nutrient concentrations of *C. appressa* shoot above the mat, biomass within the mat, and roots below the mat were analysed 0, 12 and 16 months after planting. Extensive root growth was evident after 12 and 16 months. Some nutrients (nitrogen, phosphorus, sulphur) were distributed almost evenly among the above-, within-, and below-mat components, while others (aluminium, copper, iron, manganese) were concentrated in or on the roots. Given the low concentrations of nutrients within the water column, large amounts of nutrients were removed from stormwater by the plants. Total nitrogen uptake was 20.20 ± 2.88 kg in CFW1 and 15.00 ± 2.07 kg in CFW2 over the 16-month study period. Total potassium uptake was 12.59 ± 1.64 kg in CFW1 and 7.20 ± 1.56 kg in CFW2. Phosphorus uptake was low as a consequence of low phosphorus availability in the water. High aluminium, iron and manganese concentrations were found in the roots, demonstrating that *C. appressa* removed and sequestered large quantities of these water pollutants from urban stormwater runoff. For example, total aluminium uptake was 7.82 ± 1.73 kg in CFW1 and 5.62 ± 0.75 kg in CFW2. This study demonstrated multiple benefits of CFWs for stormwater treatment in the early stages of an urban development.

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1. Introduction

Urbanisation is typically associated with the creation of large areas of impervious surface that accumulate pollutants from human activity and prevent the infiltration of stormwater runoff into the subsoil (Ladislas et al., 2015). Stormwater runoff is, therefore, retained in greater volumes and this can mobilise accumulated contaminants and transport them to downstream receiving waters (Ladislas et al., 2015; Schwammberger et al., 2016). Stormwater Best Management Practices (BMPs) have been developed to minimise negative impacts on the natural water cycle and these are categorised using a variety of terms including: Water Sensitive Urban Design (WSUD), Sustainable Urban Drainage Systems (SUDS), Stormwater Control Measures (SCMs), Low Impact Development (LID) and Green Infrastructure (GI) (Fletcher et al., 2015).

Constructed Floating Wetlands (CFWs) are a newly emerging BMP that consist of a buoyant structure planted with macrophytes (Fig. 1). The plant roots grow directly into the water column and the roots and root hairs provide a large surface area for biofilm growth (Stewart et al., 2008; Tanner et al., 2011; Winston et al., 2013). The root network and biofilm physically filter and trap suspended solids (Headley and Tanner, 2007) and make pollutants available for adsorption, absorption and incorporation into plant tissue (Headley and Tanner, 2011; Lynch et al., 2015). CFWs are designed to mimic the pollutant removal processes of natural floating marshes and islands (Tanner et al., 2012; Walker et al., 2017).

CFWs can be installed in most open-water bodies (Chang et al., 2012) and can be retrofitted into stormwater retention ponds or urban lakes (Winston et al., 2013; Borne et al., 2014; Hartshorn et al., 2016; Walker et al., 2017). CFWs provide a passive, low-maintenance and operationally simple water-treatment solution that enhances

habitat, recreational and aesthetic values within the urban landscape (Knight et al., 2001; Rousseau et al., 2008; Lee and Li, 2009; Headley and Tanner, 2011). Their buoyancy also allows them to adjust to large water-level variations associated with heavy-rainfall events that can be problematic for other BMPs.

CFW plants acquire nutrients for growth directly from the water column (Headley and Tanner, 2006; Vymazal, 2007). However, nutrient concentrations in stormwater runoff can be low and this may limit plant growth (Wang et al., 2014). In these circumstances, CFW plants may allocate more resources to below-ground tissue, increase their root length and produce thinner roots to increase the area from which to scavenge nutrients (Marschner, 1995; Williamson et al., 2001). Plant nutrient uptake may also vary temporally in CFWs because of variable nutrient availability in the water column below the CFW, which largely depends on nutrient laden stormwater runoff. Total nutrient uptake by the CFW plant biomass represents the amount of nutrient removed from the water body (Güsewell and Koerselman, 2002). The total amount of nutrients removed from water by the plants, and the distribution of nutrients in different plant components, can be quantified and this can assist in optimising shoot-harvesting strategies to remove nutrients permanently from the CFW water body (Wang et al., 2014). However, there is currently little understanding of the partitioning of biomass and nutrients between the aerial and water-column components of CFWs.

This study investigated growth of, and nutrient uptake by, *Carex appressa* plants in two CFWs during the construction phase of a green-field urban development in subtropical Queensland, Australia. *Carex appressa* was selected because it is a locally native species that has been shown to be effective for CFWs in this region (Walker et al., 2017). The total area of the CFW treatment system was 2088 m², which was the largest CFW installation in the world in 2018 to treat

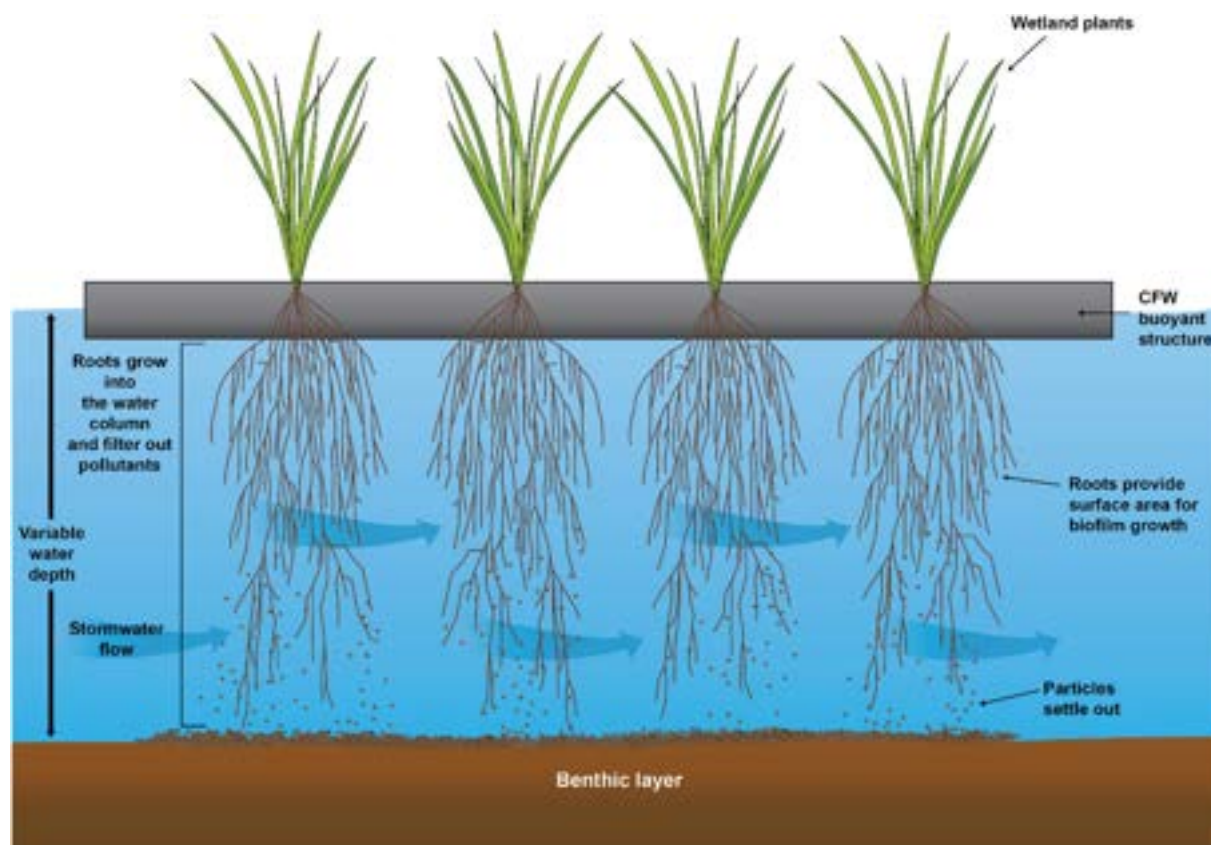


Fig. 1. Schematic of a constructed floating wetland consisting of a buoyant structure planted with wetland plants whose roots filter pollutants and provide a surface for biofilm growth.

stormwater runoff from an urban development. It was also the first time that CFWs had been used as the primary stormwater treatment system for pollutant removal from an urban development. The aims of the study were to: (1) determine how much plant biomass was contained above the CFW mat relative to the amounts contained within and below the CFW mat; (2) identify nutrients that were partitioned in disproportionate amounts between the three different biomass components; and (3) quantify total nutrient uptake by the CFW vegetation over a 16-month period that spanned two summers. The results of the study will allow better management of CFWs, including informing shoot-harvesting strategies to maximise nutrient removal from urban stormwater runoff.

2. Materials and methods

2.1. Study site

Two CFWs were installed and planted in a newly constructed 2.6-ha lake in the early construction stages of a 45-ha urban development, “Parklakes 2”, at Bli Bli (26°35'S, 153°01'E) in Queensland, Australia, in December 2015 (Fig. 2). The first wetland (CFW1) was 11.5 m long × 92.0 m wide and had a total area of 1058 m² (Fig. 3). It received stormwater runoff from a 32-ha catchment. The second wetland (CFW2) was 32.0 m long × 32.2 m wide, had a total area of 1030 m², and was installed downstream of CFW1 (Fig. 3). CFW2 received untreated runoff from a 13-ha catchment, in addition to treated stormwater runoff from CFW1. Both CFWs spanned the entire width of the lake to minimise potential short-circuiting and to direct stormwater runoff through their root networks. The operational water depth beneath both CFWs was 1.65 m.

CFW1 and CFW2 comprised 115 and 112 CFW modules (Biohaven®, Floating Island International, Shepherd, MT), respectively. Each module was 4.0 m long × 2.3 m wide × 0.2 m high. The CFW modules were made of four horizontal layers (each layer 50-mm thickness) of non-woven, recycled, polyethylene terephthalate (PET) fibrous matrix injected with a non-degradable marine-based polyurethane foam (“marine-grade foam”) to provide buoyancy.

Each of the study CFW modules had 40 plant holes (150 mm deep × 100 mm diameter). Two *Carex appressa* plants were planted in each hole, which produced a planting density of 8.7 plants/m². The *C. appressa* plants were raised in 115-mL tubes containing potting mix that consisted of 75% mulch and 25% soil (v:v). Shoot height was between 200 and 250 mm at the time of planting. Both CFWs were covered in nylon netting (15 mm mesh size) to protect the plants from predation by birds until the plants were established after 3 months.

2.2. Water sampling and analysis

Water samples were collected, according to standard methods of the American Public Health Association (APHA, 2005), upstream and downstream of each CFW at 1, 4, 7, 10, 13 and 16 months after planting in December 2015 (Fig. 3). Samples were sent to a NATA (National Association of Water Testing Authorities in Australia) accredited laboratory for analysis. Water samples were analysed for total nitrogen (TN), ammonia (NH₃), nitrate (NO₃⁻), total phosphorus (TP), orthophosphate (PO₄³⁻), aluminium (Al) and iron (Fe) concentrations.

2.3. Initial sampling and nutrient analysis of plants and potting mix

To assess the plant nutrient uptake from stormwater runoff during the first 12 and 16 months after planting, five of the *C. appressa* plants from the initial tubestock batch were analysed to determine a mean representative biomass and plant nutrient baseline, which was then subtracted from the mean biomass and nutrient content at 12 and 16 months after planting (Fig. 2a). The nutrients in the potting mix were assumed conservatively to be utilised fully by the plants and

were, therefore, included in the nutrient baseline. The five tubestock plants were separated from their potting mix, washed gently in water, and dissected into shoots and roots. The individual shoot, root and potting mix samples were dried at 70 °C for 7 d, weighed, and then ground to a homogeneous powder in preparation for nutrient analysis.

Nitrogen (N) concentrations were determined by combustion analysis (TruSpec®, LECO Corporation, St. Joseph, MI). Phosphorus (P), potassium (K), aluminium (Al), boron (B), calcium (Ca), copper (Cu), iron (Fe), magnesium (Mg), manganese (Mn), sodium (Na), sulphur (S) and zinc (Zn) concentrations were determined by inductively coupled plasma–atomic emission spectroscopy (Vista Pro®, Varian Incorporation, Palo Alto, CA). The nutrient content (NCT) in each plant part and the potting mix was then calculated using Eq. (1):

$$\text{NCT} = C \times m \quad (1)$$

where:

NCT = Nutrient content (g)

C = Concentration (g kg⁻¹)

m = Biomass (kg)

2.4. Plant sampling and nutrient analysis at 12 months after planting

Biomass and nutrient concentrations of the plants were determined in December 2016 at the beginning of the second summer at 12 months after planting (Fig. 2b). At that time, the installation of a new anchoring system required replacement of 16 CFW modules, i.e. two CFW modules at each corner of both CFWs. This offered the opportunity to dissect the removed CFW modules to determine the within-mat biomass component, which had not been investigated in previous studies (Tanner and Headley, 2011; Borne et al., 2013; Winston et al., 2013).

Two plant holes were selected at each corner of both CFWs (total of 16 plant holes and 32 plants) to be representative of the CFW-module plant population and to be in an area with average water depth of 1.65 m (Fig. 3). The plant holes were located at a maximum possible distance from the sloped lake embankment to exclude plants that were possibly rooted in, and acquiring nutrients from, the benthic layer. Two plant holes, including plants and sections of the surrounding CFW mat, were removed from one CFW module at each corner of both CFWs to determine average plant growth, biomass and nutrient content. Each of the removed mat sections was dissected from the CFW module at sufficient distance from the selected plant holes to prevent damage to the roots within and beneath the mat. The roots were then disentangled gently from the adjoining root network before lifting the CFW module sections from the water (Fig. 4a). The CFW module sections and plants were transported carefully to the laboratory for analysis.

In the laboratory, the two plants in each hole were partitioned into their above-mat portion (‘shoots’) and below-mat portion (‘roots’). The CFW mat sections containing the plant holes were then carefully separated from the other parts of the mat and the marine-grade foam. Marine-grade foam surrounded each plant hole at varying distances between 5 and 20 cm from the plants and it constituted a barrier to horizontal root growth. This allowed for better quantification of the within-mat biomass as the marine-grade foam prevented intertwining of roots from adjacent plant holes. Biomass within the mat (‘mat biomass’) was determined by extracting plant material carefully from each mat layer using tweezers.

The biomass of the two plants in each plant hole could not be distinguished from each other and so the shoot-, root-, and mat-biomass samples for each hole were treated as being from a single plant during this procedure (Fig. 4b). The plant biomass samples were then weighed and processed for nutrient analysis using the methods outlined in Section 2.3. However, biomass and nutrient

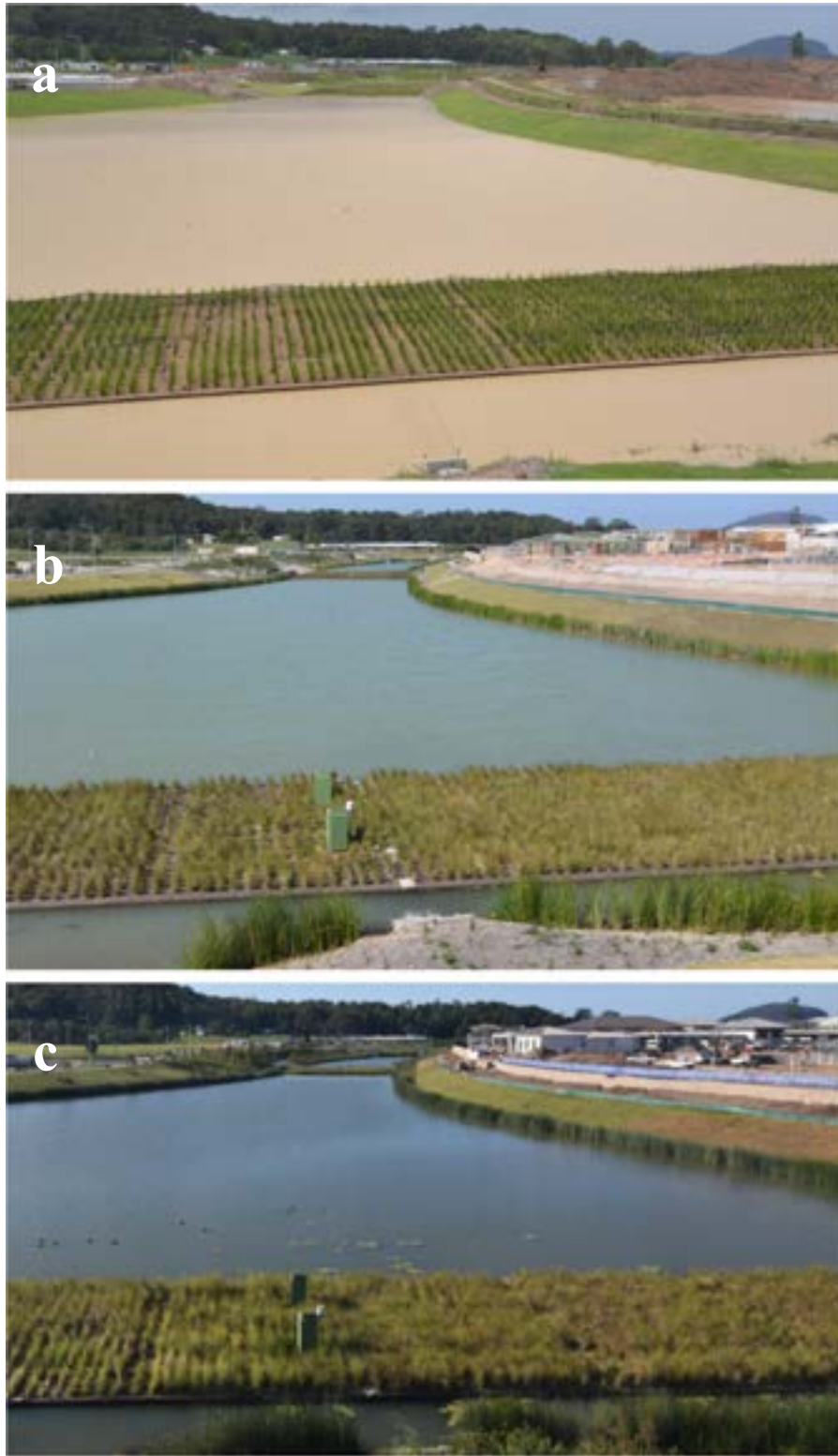


Fig. 2. Constructed floating wetlands (CFWs) containing *Carex appressa* plants: (a) CFW1 immediately after installation and planting in December 2015; (b) CFW1 at 12 months after installation; (c) CFW1 at 16 months after installation. CFW2 is further along the lake in the background of each photograph.

results for the two plants were then halved to provide an average value per individual plant.

The total increase in wetland vegetation biomass at 12 months after planting ($M_{CFW, total}$) was calculated for each CFW by subtracting the average initial biomass of the tubestock plants ($M_{tubestock}$) from the average plant biomass at 12 months after

planting (M_{plant}), and multiplying this by the total number of plants on each wetland (Eq. (2)):

$$M_{CFW, total} = (M_{plant} - M_{tubestock}) * n_{CFW} \quad (2)$$

where:

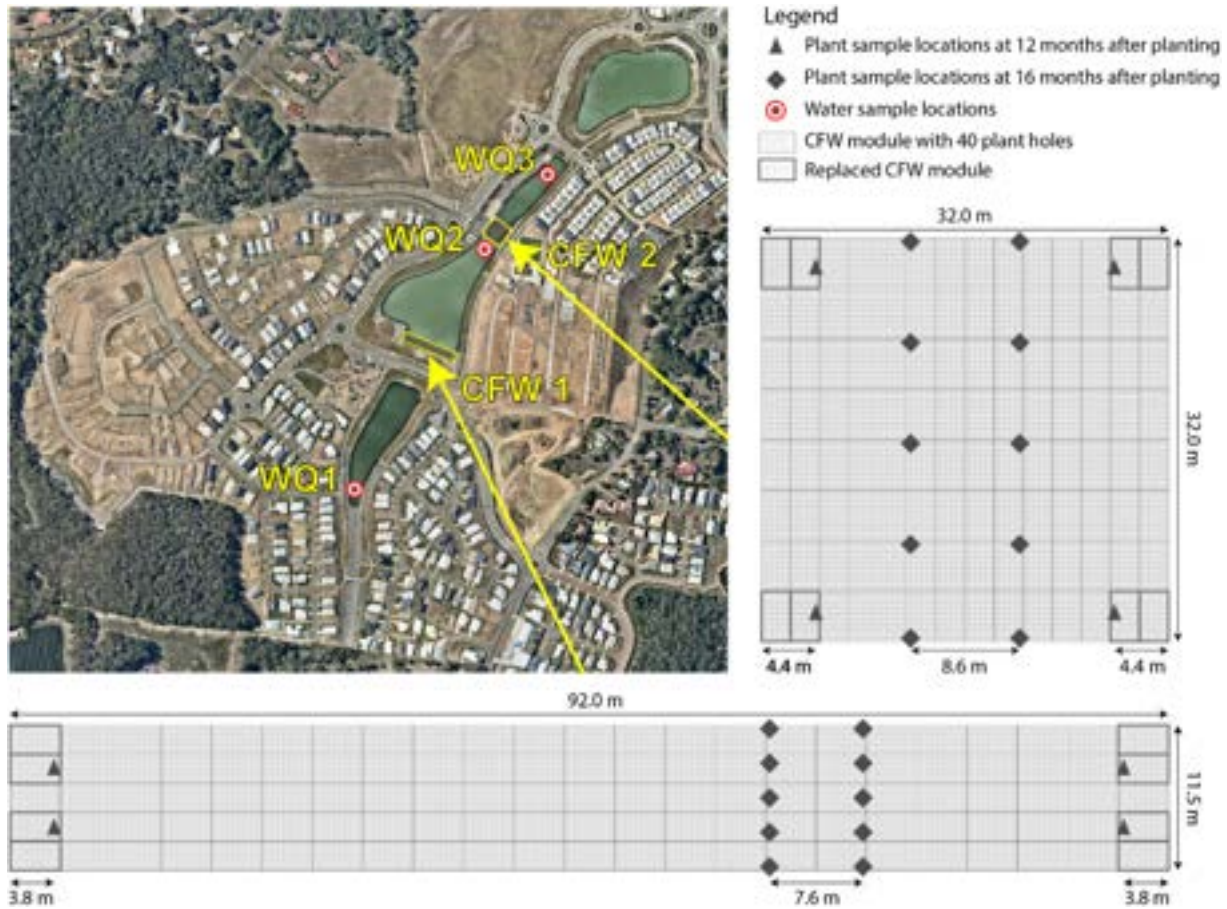


Fig. 3. Aerial view of two constructed floating wetlands, CFW1 and CFW2, consisting of 115 and 112 CFW modules, respectively, with each module having 40 holes that each contain two *Carex appressa* plants. The eight CFW modules removed at 12 months after installation, and the location of the plants within each of these modules that were dissected into above-mat, within-mat and below-mat biomass, are indicated by dark rectangles and triangles, respectively. The locations of plants dissected into above- and below mat biomass at 16 months after installation are indicated by diamonds. Water samples were collected upstream and downstream of each CFW at 1, 4, 7, 10, 13 and 16 months after planting.

$M_{CFW, total}$ = Total biomass increase of each CFW (g)

M_{plant} = Mean plant biomass (g)

$M_{tubestock}$ = Mean tubestock plant biomass (g)

n_{CFW} = Total number of plants on each CFW

$k_{CFW, total}$ = Nutrient uptake per square meter ($g\ m^{-2}$)

$NCT_{CFW, total}$ = Total nutrient uptake of each CFW (g)

A_{CFW} = Area of CFW (m^2)

The total nutrient uptake by the plants of each CFW at 12 months after planting ($NCT_{CFW, total}$) was calculated by subtracting the average nutrient content in the initial tubestock plants and the potting mix ($NCT_{tubestock}$) from the average plant nutrient content at 12 months after planting (NCT_{plant}), and multiplying this by the total number of plants on each wetland (Eq. (3)):

$$NCT_{CFW, total} = (NCT_{plant} - NCT_{tubestock}) * n_{CFW} \quad (3)$$

where:

$NCT_{CFW, total}$ = Total nutrient uptake of each CFW (g).

NCT_{plant} = Mean plant nutrient content (g).

$NCT_{tubestock}$ = Mean tubestock plant nutrient content (g).

n_{CFW} = Total number of plants on each CFW.

The nutrient uptake per square meter ($k_{CFW, total}$) by *C. appressa* plants in each of the two CFWs was then calculated (Eq. (4)):

$$k_{CFW, total} = \frac{NCT_{CFW, total}}{A_{CFW}} \quad (4)$$

where:

2.5. Plant sampling and nutrient analysis at 16 months after installation

To determine the plant nutrient uptake at the end of two summers, above-mat and below-mat biomass were harvested 16 months after planting (early May 2017, mid-autumn) (Fig. 2c) and analysed for nutrient concentrations. Shoots and roots of 20 plants (10 plant holes) were dissected from above and below the mat along two parallel transects, each of five plant holes, per CFW (Fig. 3), using similar methods to those described in Section 2.3. Biomass could not be removed from the floating mat in situ, and so the within-mat biomass and nutrient content of each plant at 16 months after planting ($M_{mat, 16}$) were calculated by extrapolating the mean proportion of biomass or nutrient content in the mat-biomass at 12 months after planting ($w_{mat, 12}$) (Eq. (5)):

$$M_{mat, 16} = \sum_{i=1}^n \frac{(M_{i, shoots, 16} + M_{i, roots, 16}) * w_{mat, 12}}{1 - w_{mat, 12}} \quad (5)$$

$$w_{mat, 12} = \frac{1}{n} \left(\sum_{j=1}^n \frac{M_{j, mat, 12}}{M_{j, shoots, 12} + M_{j, mat, 12} + M_{j, roots, 12}} \right)$$

where:

$M_{mat, 16}$ = Mean mass or nutrient content in the mat biomass at 16 months after planting (g),



Fig. 4. (a) Part of a constructed floating wetland (CFW) module, lifted from the water, showing *Carex appressa* plants at 12 months after planting; (b) plant separated into its above-mat (top), within-mat (middle) and below-mat (bottom) components.

M_i = Mass or nutrient content in the shoots and roots at 16 months after planting for i number of samples (g),

$w_{mat,12}$ = Mean proportion of biomass or nutrient content in the mat-biomass at 12 months after planting,

M_j = Mass or nutrient content in shoots, mat-biomass or roots 12 months after planting for j number of samples (g),

n = Total number of samples collected on each CFW at 12 or 16 months after planting.

The total biomass growth, nutrient uptake, and nutrient uptake per square meter of the wetland vegetation at 16 months after planting were then calculated for both CFWs using Eqs. (2), (3) and (4).

2.6. Statistical analysis

Nutrient concentration data were analysed by 1-way analysis of variance (ANOVA) using SPSS Statistics v.21 (IBM Corporation), comparing

nutrient concentrations in either shoots or roots at 0, 12 and 16 months after planting within each of the CFWs. Post-hoc Tukey's Honestly Significant Difference (HSD) tests were performed only when significant differences were detected by ANOVA. Means are reported with standard errors and differences were regarded as significant at $p < 0.05$.

3. Results

3.1. Water sampling

Mean TN concentrations were $0.73 \pm 0.19 \text{ mg L}^{-1}$ upstream of the CFWs, $0.55 \pm 0.18 \text{ mg L}^{-1}$ downstream of CFW1 and $0.62 \pm 0.16 \text{ mg L}^{-1}$ downstream of CFW2 over the 16-month monitoring period (Fig. 5). Mean NH_3 concentrations were $0.06 \pm 0.03 \text{ mg L}^{-1}$ upstream of the CFWs and $0.02 \pm 0.01 \text{ mg L}^{-1}$ downstream of each CFW. Several water samples had NH_3 concentrations below the limit of detection (LOD) of 0.01 mg L^{-1} and so these measures were replaced with the LOD to be conservative. Mean NO_3^- concentrations were $0.37 \pm 0.12 \text{ mg L}^{-1}$ upstream of the CFWs, $0.36 \pm 0.14 \text{ mg L}^{-1}$ downstream of CFW1 and $0.35 \pm 0.14 \text{ mg L}^{-1}$ downstream of CFW2. Mean TP concentrations were $0.06 \pm 0.01 \text{ mg L}^{-1}$, and PO_4^{3-} concentrations were at the LOD of 0.05 mg L^{-1} for all sampling points. Mean Al concentrations were 2.69 ± 1.90 , 2.58 ± 1.22 and $2.35 \pm 1.13 \text{ mg L}^{-1}$, and

mean Fe concentrations were 2.73 ± 1.89 , 2.44 ± 1.18 and $2.23 \pm 1.10 \text{ mg L}^{-1}$ upstream of CFW1, between the CFWs, and downstream of CFW2, respectively.

3.2. Plant biomass above, within, and below the buoyant mat

Plant dry mass at 12 months after planting was almost-evenly distributed between the above-mat shoots and below-mat roots (Table 1). In addition, average dry biomass within the mat at 12 months after planting was $69 \pm 7 \text{ g}$ in CFW1 and $73 \pm 11 \text{ g}$ in CFW2, which equated to $40 \pm 1\%$ and $34 \pm 4\%$ of total plant biomass in CFW1 and CFW2, respectively (Table 1). These proportions, determined from modules that were opportunistically harvested at the CFW corners, were then used to estimate the total biomass of plants along the more-representative central transects of the CFWs at 16 months after planting.

Biomass was partitioned almost evenly between above- and below-mat components at 16 months after planting, with above-mat:below-mat biomass ratios of 1.07 ± 0.15 in CFW1 and 1.03 ± 0.09 in CFW2 at 16 months after planting (Table 1). The roots reached deeply into the water column, with average 90th-percentile root length on each plant of $1.19 \pm 0.07 \text{ m}$ in CFW1 and $1.33 \pm 0.08 \text{ m}$ in CFW2 and an average maximum root length of $2.01 \pm 0.14 \text{ m}$ in CFW1 and $2.19 \pm 0.13 \text{ m}$ in CFW2 at 16 months after planting (Table 1).

3.3. Nutrient concentrations in plant components

Shoot N concentrations at 16 months after planting did not differ significantly from those in the tubestock, while root N concentrations of CFW1 were higher than those in the tubestock (Table 2). The shoot and root concentrations of P, K, S, Cu and Mg declined over the 16-month monitoring period while shoot and root Al concentrations increased. Shoot Ca concentrations declined over the 16 months but root Ca concentrations did not decline significantly. Shoot Fe and Mn concentrations at 16 months after planting did not differ significantly from initial levels in CFW1 or CFW2, but increased root Fe concentrations were evident in CFW2 at 16 months after planting. Root Mn concentrations increased over the 16-month monitoring period in both CFWs. Shoot Na concentrations declined by 16 months after planting, whereas root Na concentrations did not differ significantly from initial levels (Table 2).

Nutrient partitioning between shoot, mat and root biomass at 16 months after planting was similar to that at 12 months after planting (Figs. 6 and 7). N, K, S and B were contained mostly in the shoot and mat biomass, while P, Ca, Mg and Na were more evenly distributed between shoots, mat biomass, and roots (Figs. 6 and 7). Al, Fe and Mn were contained predominantly in the roots, Cu was held mostly in the mat biomass and roots, and Zn was held mostly in the mat biomass (Fig. 7).

3.4. Total plant nutrient uptake by the CFW vegetation

Nutrient contents of individual plants at 16 months after planting in both CFWs were high for N ($1.75\text{--}2.27 \text{ g}$), K ($0.84\text{--}1.40 \text{ g}$) and Ca ($0.70\text{--}0.97 \text{ g}$) but low for P ($0.105\text{--}0.134 \text{ g}$), considering the low nutrient concentrations in the water (Table 3). The two CFWs removed high amounts of N (35.20 kg), K (19.79 kg) and Ca (12.21 kg) but lower amounts of P (1.98 kg) from stormwater (Table 4), which equated to nutrient uptake of $15\text{--}19 \text{ g m}^{-2}$ N, $0.8\text{--}1.1 \text{ g m}^{-2}$ P, $7\text{--}12 \text{ g m}^{-2}$ K and $5\text{--}7 \text{ g m}^{-2}$ Ca during the 16-month CFW operation period (Table 5).

The individual plants also contained high amounts of Al ($0.66\text{--}0.88 \text{ g}$), Fe ($0.41\text{--}0.44 \text{ g}$) and Mn ($0.15\text{--}0.32 \text{ g}$), which were predominantly contained in the root biomass (Table 3). High amounts of Al (13.44 kg), Fe (5.38 kg) and Mn (4.26 kg) were contained in the *C. appressa* plants across both CFWs (Table 4). Nutrient uptake from stormwater by the CFW vegetation equated to $5.5\text{--}7.4 \text{ g m}^{-2}$ Al,

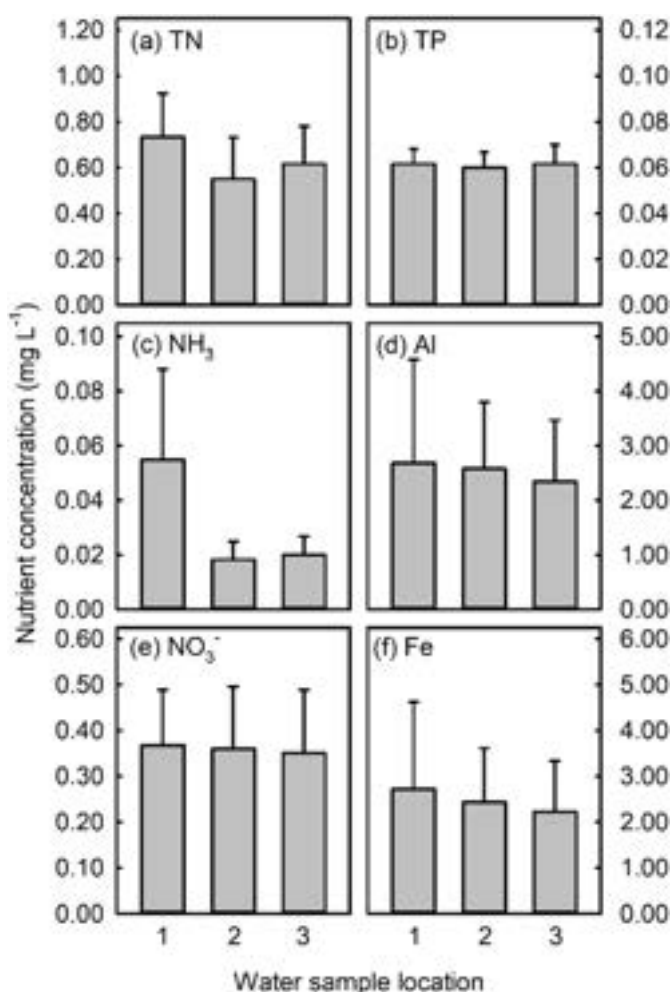


Fig. 5. Mean ($\pm$ SE) concentrations of (a) total nitrogen (TN), (b) total phosphorus (TP), (c) ammonia (NH_3), (d) aluminium (Al), (e) nitrate (NO_3^-) and (f) iron (Fe) in water samples collected monthly from 1 to 16 months after planting at three locations relative to two constructed floating wetlands (CFWs) containing *Carex appressa* plants: (1) upstream of CFW1, (2) between CFW1 and CFW2, and (3) downstream of CFW2.

Table 1
Mean ($\pm$ SE) individual dry mass, height, lengths, growth rate, and above-mat:below-mat biomass ratio of *Carex appressa* plants, and total plant dry mass in each of two constructed floating wetlands, CFW1 and CFW2, at 0, 12 or 16 months after planting.

CFW	Above-mat				(Potting mix)/within-mat		Below-mat				Individual plant mass (g)	Biomass ratio (above-mat:below-mat)	Total CFW plant mass (t)
	Shoot mass	90th percentile shoot height	Max. shoot height	Shoot growth	Mass	Percentage	Root mass	90th percentile root length	Max. root length	Root growth			
	(g)	(m)	(m)	(g m ⁻²)	(g)	(%)	(g)	(m)	(m)	(g m ⁻²)			
0 months after planting (n = 5)													
	1.5 ± 0.2	0.20 ± 0.00	0.25 ± 0.00	–	(22.1 ± 0.4) ^a	–	0.9 ± 0.1	–	–	–	2.3 ± 0.3	1.72 ± 0.16	–
12 months after planting (n = 16)													
CFW1	51 ± 4	0.65 ± 0.05	0.94 ± 0.05	432 ± 37	69 ± 7	40 ± 1	54 ± 8	1.10 ± 0.09	1.93 ± 0.17	458 ± 66	174 ± 17	1.07 ± 0.16	1.37 ± 0.16
CFW2	73 ± 8	0.86 ± 0.04	1.20 ± 0.07	619 ± 69	73 ± 11	34 ± 4	71 ± 10	1.34 ± 0.09	2.46 ± 0.20	606 ± 87	217 ± 20	1.09 ± 0.09	1.72 ± 0.18
16 months after planting (n = 20)													
CFW1	57 ± 6	0.85 ± 0.02	1.19 ± 0.03	482 ± 52	80 ± 10 ^b	–	65 ± 11	1.19 ± 0.07	2.01 ± 0.14	549 ± 92	202 ± 26	1.07 ± 0.15	1.63 ± 0.23
CFW2	61 ± 6	0.82 ± 0.06	1.09 ± 0.08	517 ± 55	62 ± 7 ^b	–	61 ± 7	1.33 ± 0.08	2.19 ± 0.13	521 ± 65	184 ± 20	1.03 ± 0.09	1.43 ± 0.18

^a Mass of potting mix.

^b Calculated within-mat biomass.

Table 2
Nutrient concentrations of shoots, within-mat biomass, roots and potting mix of *Carex appressa* plants at 0, 12 or 16 months after planting in each of two constructed floating wetlands, CFW1 and CFW2. Means ($\pm$ SE) marked with an asterisk (*) are significantly different from the corresponding mean at 0 months after planting (ANOVA and Tukey's HSD test, $p < 0.05$, $n = 5-20$).

CFW	Nutrient	N	P	K	Ca	S	Al	Cu	Fe	Mn	Mg	Na	Zn	B
		%	%	%	%	%	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
0 months after planting (n = 5)														
	Shoots	1.14 ± 0.04	0.229 ± 0.020	1.48 ± 0.06	0.56 ± 0.02	0.171 ± 0.011	0.01 ± 0.00	17.3 ± 1.2	313 ± 89	178 ± 10	2770 ± 64	1060 ± 78	28 ± 2	16 ± 1
	Roots	0.71 ± 0.04	0.105 ± 0.006	0.66 ± 0.04	0.48 ± 0.04	0.144 ± 0.006	0.05 ± 0.00	43.1 ± 6.5	1353 ± 108	118 ± 3	3444 ± 258	1377 ± 126	89 ± 6	26 ± 3
	Potting mix	0.25 ± 0.04	0.031 ± 0.007	0.04 ± 0.00	0.87 ± 0.13	0.059 ± 0.006	0.14 ± 0.01	34.9 ± 4.4	5822 ± 938	166 ± 14	1786 ± 188	81 ± 8	50 ± 7	14 ± 1
12 months after planting (n = 16)														
CFW1	Shoots	0.75 ± 0.03*	0.040 ± 0.003*	0.73 ± 0.04*	0.35 ± 0.01*	0.132 ± 0.007*	0.09 ± 0.01*	3.5 ± 0.3*	466 ± 47	222 ± 17	1306 ± 76*	1640 ± 95*	47 ± 5*	24 ± 3
	Mat	0.86 ± 0.05	0.049 ± 0.004	0.44 ± 0.04	0.40 ± 0.03	0.178 ± 0.015	0.31 ± 0.05	13.1 ± 1.4	1692 ± 196	180 ± 21	1573 ± 129	1377 ± 67	234 ± 43	20 ± 3
	Roots	0.65 ± 0.05	0.042 ± 0.001*	0.28 ± 0.01*	0.59 ± 0.02	0.111 ± 0.004*	1.17 ± 0.17*	18.5 ± 1.9*	6621 ± 1144*	1577 ± 83	1810 ± 116*	1642 ± 76	112 ± 51	10 ± 2*
CFW2	Shoots	0.96 ± 0.05	0.038 ± 0.003*	0.74 ± 0.06*	0.37 ± 0.02*	0.128 ± 0.009*	0.10 ± 0.01*	4.2 ± 0.3*	491 ± 44	224 ± 41	1239 ± 56*	1142 ± 130	49 ± 6*	28 ± 3*
	Mat	1.04 ± 0.04	0.060 ± 0.006	0.49 ± 0.04	0.39 ± 0.02	0.186 ± 0.008	0.23 ± 0.03	19.7 ± 3.0	1416 ± 108	175 ± 9	1693 ± 97	1387 ± 179	522 ± 133	22 ± 3
	Roots	0.78 ± 0.02	0.037 ± 0.002*	0.42 ± 0.05*	0.48 ± 0.04	0.106 ± 0.005*	1.04 ± 0.15*	18.7 ± 3.7*	5570 ± 981*	1196 ± 178*	1942 ± 130*	2071 ± 163*	32 ± 4*	9 ± 4*
16 months after planting (n = 20)														
CFW1	Shoots	1.18 ± 0.07	0.060 ± 0.004*	1.01 ± 0.07*	0.30 ± 0.01*	0.140 ± 0.003*	0.09 ± 0.01*	4.8 ± 0.2*	538 ± 63	189 ± 9	1641 ± 67*	601 ± 38*	43 ± 2*	29 ± 4
	Roots	0.93 ± 0.05*	0.062 ± 0.008*	0.50 ± 0.03*	0.78 ± 0.13	0.122 ± 0.006*	0.98 ± 0.14*	22.2 ± 3.9*	4532 ± 622	3870 ± 615*	2127 ± 126*	1087 ± 60	38 ± 3	18 ± 5
CFW2	Shoots	1.11 ± 0.12	0.044 ± 0.004*	0.55 ± 0.08*	0.32 ± 0.02*	0.125 ± 0.007*	0.06 ± 0.01*	5.9 ± 1.5*	394 ± 40	199 ± 21	1278 ± 101*	493 ± 94*	47 ± 3*	18 ± 2
	Roots	0.71 ± 0.06	0.052 ± 0.005*	0.33 ± 0.03*	0.57 ± 0.05	0.112 ± 0.006*	0.83 ± 0.06*	16.3 ± 2.0*	5120 ± 295*	2050 ± 185*	1961 ± 59*	1086 ± 64	28 ± 1*	12 ± 2*

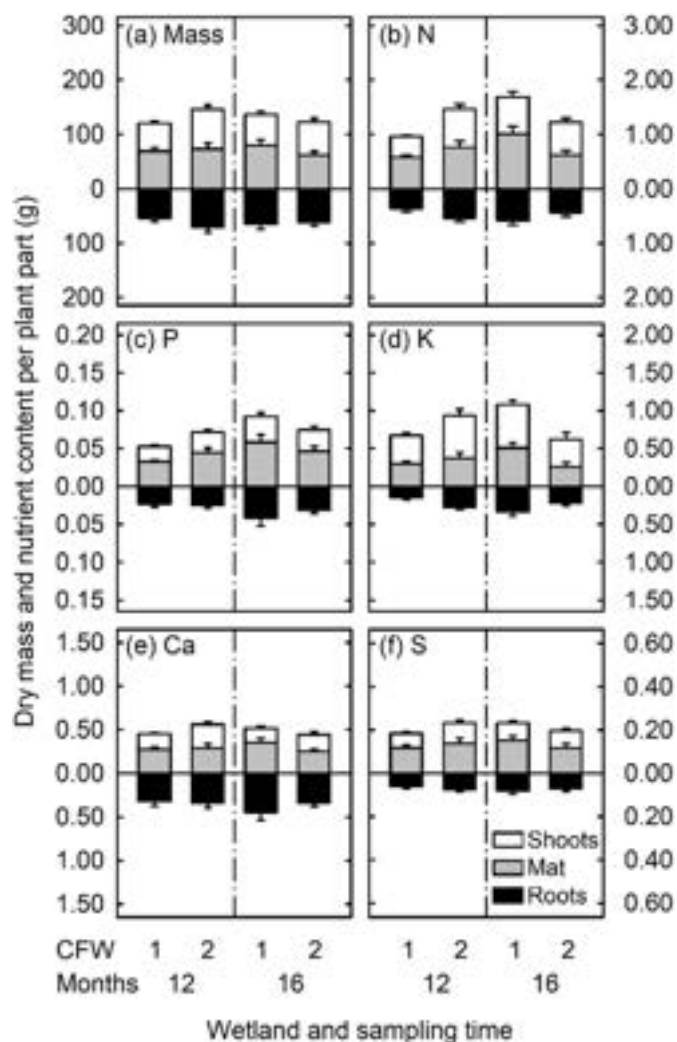


Fig. 6. Mean (+SE) dry mass and nutrient content in each plant component of *Carex appressa* in constructed floating wetlands, CFW1 and CFW2, at 12 and 16 months after planting: (a) biomass; (b) nitrogen (N); (c) phosphorus (P); (d) potassium (K); (e) calcium (Ca); and (f) sulphur (S).

2.5–2.7 g m⁻² Fe and 1.3–2.8 g m⁻² Mn during the 16-month period (Table 5).

4. Discussion

This study aimed to: (1) determine how much plant biomass was contained above the CFW mat relative to the amounts contained within and below the CFW mat; (2) identify nutrients that were partitioned in disproportionate amounts between the three different biomass components; and (3) quantify total nutrient uptake by the CFW vegetation. Plant dry biomass was approximately equally distributed between the above-mat shoots, within-mat biomass, and below-mat roots. Nitrogen, K, S and B were contained predominantly in the shoot and mat biomass. Phosphorus, Ca, Mg and Na were approximately equally distributed among the three plant components, whereas most Al, Fe and Mn were contained in the below-mat roots. Phosphorus concentrations in both shoots and roots were lower than in the original tubestock, presumably because of very low P concentrations in the lake water. Total P accumulation by the two CFWs was 1.98 kg. In contrast, the two CFWs removed large amounts of N (35.20 kg), K (19.79 kg) and Ca (12.21 kg) as well as high amounts of Al (13.44 kg), Fe (5.38 kg) and Mn (4.26 kg) from the lake water. These results demonstrate the value of CFWs in removing nutrients, including metallic nutrients, from urban stormwater runoff.

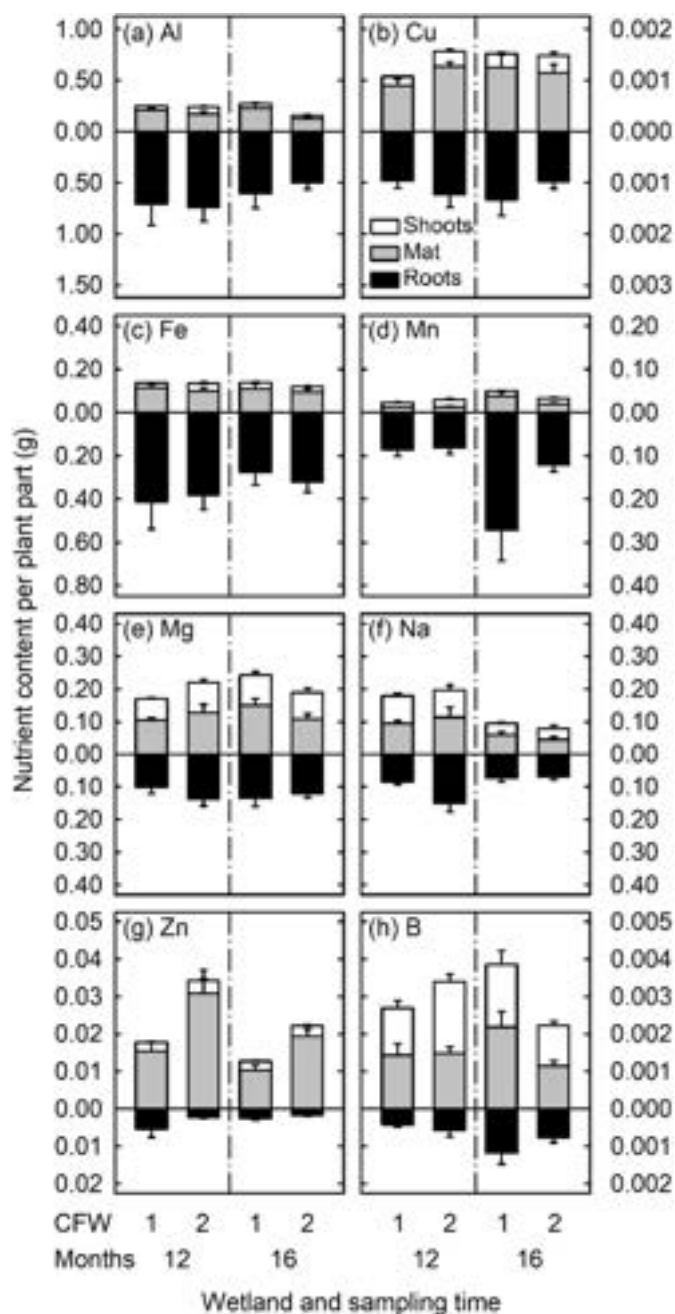


Fig. 7. Mean (+SE) nutrient content in each plant component of *Carex appressa* in constructed floating wetlands, CFW1 and CFW2, at 12 and 16 months after planting: (a) aluminium (Al); (b) copper (Cu); (c) iron (Fe); (d) manganese (Mn); (e) magnesium (Mg); (f) sodium (Na); (g) zinc (Zn); and (h) boron (B).

4.1. Plant biomass

Carex appressa plants in this study allocated a relatively high percentage of their biomass to the below-mat roots. One of the mechanisms by which plants adjust to abiotic stress is to allocate biomass to those organs that are involved in acquiring the scarcest resources (Ågren and Franklin, 2003; Trueman et al., 2013a). Allocation of a greater proportion of biomass to the root system is a common plant response to N or P deficiency (Marschner, 1995; Hermans et al., 2006; Franco et al., 2011). *Phragmites australis*, *Typha orientalis*, *Cyperus alternifolius*, *Thalia dealbata* and *Arundo donax* plants have all had increasing biomass allocation to roots at increasing distances from the water inlet of a horizontal subsurface-flow constructed-wetland (HSSF

Table 3Mean ($\pm$ SE) nutrient contents of individual *Carex appressa* plants at 12 and 16 months after planting in two constructed floating wetlands, CFW1 and CFW2.

Nutrient	N	P	K	Ca	S	Al	Cu	Fe	Mn	Mg	Na	Zn	B
CFW	g	g	g	g	g	g	mg	g	g	g	g	mg	mg
12 months after planting (n = 16)													
CFW1	1.32 $\pm$ 0.11	0.076 $\pm$ 0.007	0.82 $\pm$ 0.07	0.77 $\pm$ 0.09	0.25 $\pm$ 0.02	0.95 $\pm$ 0.21	2.04 $\pm$ 0.26	0.55 $\pm$ 0.13	0.11 $\pm$ 0.02	0.27 $\pm$ 0.02	0.26 $\pm$ 0.02	23.16 $\pm$ 4.12	3.11 $\pm$ 0.26
CFW2	2.00 $\pm$ 0.17	0.097 $\pm$ 0.010	1.21 $\pm$ 0.13	0.90 $\pm$ 0.09	0.31 $\pm$ 0.03	0.98 $\pm$ 0.16	2.80 $\pm$ 0.24	0.52 $\pm$ 0.07	0.11 $\pm$ 0.02	0.36 $\pm$ 0.04	0.35 $\pm$ 0.05	36.49 $\pm$ 6.43	3.96 $\pm$ 0.27
16 months after planting (n = 20)													
CFW1	2.27 $\pm$ 0.31	0.134 $\pm$ 0.023	1.40 $\pm$ 0.18	0.97 $\pm$ 0.15	0.31 $\pm$ 0.04	0.88 $\pm$ 0.19	2.85 $\pm$ 0.57	0.41 $\pm$ 0.08	0.32 $\pm$ 0.08	0.38 $\pm$ 0.05	0.17 $\pm$ 0.02	15.16 $\pm$ 1.99	5.02 $\pm$ 0.96
CFW2	1.75 $\pm$ 0.22	0.105 $\pm$ 0.016	0.84 $\pm$ 0.17	0.79 $\pm$ 0.09	0.27 $\pm$ 0.04	0.66 $\pm$ 0.08	2.46 $\pm$ 0.33	0.44 $\pm$ 0.06	0.15 $\pm$ 0.02	0.31 $\pm$ 0.04	0.15 $\pm$ 0.03	23.93 $\pm$ 2.35	2.99 $\pm$ 0.33

Table 4Total nutrient uptake by 9200 and 8960 *Carex appressa* plants in each of two constructed floating wetlands, CFW1 and CFW2, at 12 and 16 months after planting.

Nutrient	N	P	K	Ca	S	Al	Cu	Fe	Mn	Mg	Na	Zn	B
CFW	kg	kg	kg	kg	kg	kg	g	kg	kg	kg	kg	kg	g
12 months after planting (n = 16)													
CFW1	11.40 $\pm$ 0.98	0.60 $\pm$ 0.06	7.19 $\pm$ 0.66	5.20 $\pm$ 0.80	2.11 $\pm$ 0.19	8.49 $\pm$ 1.95	11.01 $\pm$ 2.36	3.86 $\pm$ 1.21	0.97 $\pm$ 0.14	2.06 $\pm$ 0.23	2.38 $\pm$ 0.22	0.20 $\pm$ 0.04	25.45 $\pm$ 2.41
CFW2	17.26 $\pm$ 1.50	0.77 $\pm$ 0.09	10.50 $\pm$ 1.13	6.22 $\pm$ 0.84	2.60 $\pm$ 0.30	8.47 $\pm$ 1.39	18.04 $\pm$ 2.25	3.47 $\pm$ 0.67	0.96 $\pm$ 0.16	2.77 $\pm$ 0.37	3.06 $\pm$ 0.45	0.32 $\pm$ 0.06	32.34 $\pm$ 2.42
16 months after planting (n = 20)													
CFW1	20.20 $\pm$ 2.88	1.13 $\pm$ 0.21	12.59 $\pm$ 1.64	7.01 $\pm$ 1.37	2.73 $\pm$ 0.40	7.82 $\pm$ 1.73	18.47 $\pm$ 5.29	2.62 $\pm$ 0.75	2.91 $\pm$ 0.76	3.05 $\pm$ 0.49	1.49 $\pm$ 0.22	0.13 $\pm$ 0.02	43.01 $\pm$ 8.80
CFW2	15.00 $\pm$ 2.07	0.85 $\pm$ 0.15	7.20 $\pm$ 1.56	5.20 $\pm$ 0.81	2.24 $\pm$ 0.38	5.62 $\pm$ 0.75	14.51 $\pm$ 2.92	2.76 $\pm$ 0.57	1.35 $\pm$ 0.18	2.34 $\pm$ 0.39	1.27 $\pm$ 0.26	0.20 $\pm$ 0.02	23.65 $\pm$ 2.94

Table 5
Total nutrient uptake per unit area by *Carex appressa* plants in each of two constructed floating wetlands, CFW1 and CFW2, at 12 and 16 months after planting.

Nutrient	N	P	K	Ca	S	Al	Cu	Fe	Mn	Mg	Na	Zn	B
CFW	g m ⁻²	g m ⁻²	g m ⁻²	g m ⁻²	g m ⁻²	g m ⁻²	mg m ⁻²	g m ⁻²	g m ⁻²	g m ⁻²	g m ⁻²	g m ⁻²	mg m ⁻²
12 months after planting (n = 16)													
CFW1	10.78 ± 0.93	0.56 ± 0.06	6.80 ± 0.62	4.92 ± 0.75	1.99 ± 0.18	8.03 ± 1.85	10.41 ± 2.23	3.65 ± 1.14	0.91 ± 0.13	1.95 ± 0.21	2.25 ± 0.21	0.19 ± 0.04	24.07 ± 2.28
CFW2	16.76 ± 1.45	0.75 ± 0.09	10.20 ± 1.10	6.04 ± 0.81	2.52 ± 0.29	8.22 ± 1.35	17.06 ± 2.12	3.37 ± 0.65	0.93 ± 0.16	2.69 ± 0.36	2.97 ± 0.44	0.31 ± 0.06	31.40 ± 2.35
16 months after planting (n = 20)													
CFW1	19.01 ± 2.73	1.07 ± 0.20	11.91 ± 1.55	6.63 ± 1.29	2.58 ± 0.38	7.39 ± 1.64	17.47 ± 5.00	2.48 ± 0.71	2.75 ± 0.71	2.89 ± 0.46	1.41 ± 0.21	0.12 ± 0.02	40.68 ± 8.32
CFW2	14.56 ± 2.01	0.82 ± 0.14	6.99 ± 1.52	5.05 ± 0.79	2.17 ± 0.37	5.46 ± 0.73	14.09 ± 2.83	2.68 ± 0.56	1.31 ± 0.17	2.27 ± 0.38	1.24 ± 0.26	0.20 ± 0.02	22.96 ± 2.85

CW) that was treating polluted lake water containing higher nutrient concentrations than the current study (Vincent et al., 2018). Mean above-ground:below-ground biomass ratios of those species were approximately 5.0 at the water inlet (7.45–9.84 mg L⁻¹ TN; 0.22–1.85 mg L⁻¹ TP), decreasing to 1.0 with declining water nutrient concentrations over the 13-m length of the HSSF CW (0.40–2.50 mg L⁻¹ TN; 0.04–0.25 mg L⁻¹ TP) (Vincent et al., 2018). The allocation of a high proportion of biomass to the roots of *C. appressa* in this study was likely due to low nutrient availability in the urban lake water.

Plants in CFWs acquire nutrients solely from the water column when, as in the current study, the roots are not embedded in the lake sediments. Mean dry-weather nutrient concentrations in the lake water were much lower (0.55–0.73 mg L⁻¹ for TN, 0.06 mg L⁻¹ for TP) than typical concentrations (1.5 mg L⁻¹ TN and 0.11 mg L⁻¹ TP) for dry-weather conditions in urban areas of southeast Queensland, Australia (Fletcher et al., 2004). The high root biomass allocation and root length of *C. appressa* in the CFWs indicate that this species was well adapted to low-N or low-P conditions and it displayed typical plant responses to low nutrient availability in the urban lake water. *C. virgata* plants in previous CFW studies (Sukias et al., 2010; Tanner and Headley, 2011; Borne et al., 2013) allocated a higher biomass proportion to the shoots, rather than the roots, in water with higher nutrient availability (Table 6). In contrast, *C. stricta* plants allocated a lower proportion of biomass to the shoots in CFWs that were treating stormwater runoff with higher nutrient concentrations (Winston et al., 2013) (Table 6). Biomass partitioning to shoots and roots differs among *Carex* species, and this partitioning may be affected by differences in environmental characteristics, plant age, and field versus laboratory conditions (Trueman et al., 2013a; Winston et al., 2013).

The extensive root growth of *C. appressa* in low-nutrient water has potential benefits for the removal and immobilisation of suspended solids, which are often contained at high levels in stormwater runoff from construction sites (Perkins et al., 2017). Suspended solid concentrations in the stormwater runoff have been monitored during storm events and these will be reported in a subsequent paper. Pollutants in urban stormwater runoff are mainly associated with suspended particles (Wang et al., 2018; Rügner et al., 2019). CFWs enhance the settling and entrapment of particulates and bound pollutants by reducing flow velocities and physically filtering those particulates (Vaillant et al., 2003; Headley and Tanner, 2011; Borne et al., 2015).

4.2. Nutrient concentrations and nutrient contents

Nitrogen, P and K concentrations in the above-mat biomass (0.75–0.96% N, 0.038–0.040% P and 0.73–0.74% K) and below-mat biomass (0.65–0.78% N, 0.037–0.042% P and 0.28–0.42% K) of *C. appressa* at 12 months after planting reflected the low dry-weather nutrient concentrations in the lake water. Nitrogen, P and K concentrations of *C. virgata* at 12 months after planting in CFWs that treated artificial stormwater or stormwater runoff with higher nutrient concentrations were higher in both the above- and below-mat biomass (1.10% N, 0.17% P, 2.0% K; 1.46% N, 0.19% P; K n/a) and below-mat biomass (0.80% N, 0.06% P, 1.6% K; 2.22% N, 0.13% P; K n/a) (Tanner and Headley, 2011; Borne, 2013) than in the current study. Nitrogen, P and K concentrations in above-mat biomass and below-mat biomass of *C. stricta* at 19 months after planting in CFWs that were treating stormwater runoff with higher nutrient concentrations (Winston et al., 2013) were similar to those in the current study. Low P concentrations in above- and below-mat biomass of *C. stricta* (Winston et al., 2013) suggest that P availability for plant uptake was limited despite higher TN concentrations in stormwater runoff than in the current study. The differences between nutrient concentrations in the current and previous studies suggest that nutrient concentrations in CFW plants are positively correlated with nutrient availability in the water. Further research is needed to investigate changes in plant nutrient

Table 6
Mean dry mass, length, above-mat:below-mat biomass ratio of *Carex appressa*, *C. virgata* and *C. stricta* plants in constructed floating wetlands, and mean nutrient concentrations in stormwater runoff.

Reference	Study type	Country	Plant species	Time after planting (months)	Shoot mass (g)	Root mass (g)	90th percentile root length (m)	Max. root length (m)	Biomass ratio (above-mat:below-mat)	TN water conc. (mg L ⁻¹)	TP water conc. (mg L ⁻¹)
Current study	Field	Australia	<i>C. appressa</i>	12	51–73	54–71	1.10–1.34	1.93–2.46	1.07–1.09	0.55–0.73	0.06
Sukias et al. (2010)	Mesocosm	New Zealand	<i>C. virgata</i>	12	402	160	0.67–0.70	0.90	2.5	2.08	0.07
Tanner and Headley (2011)	Mesocosm	New Zealand	<i>C. virgata</i>	12	57	13	0.28	0.57	7.0	n/a	0.96–1.36
Borne et al. (2013)	Field/pond	New Zealand	<i>C. virgata</i>	12	82	12	0.64	0.91	4.4	1.00–1.20	0.09
Winston et al. (2013)	Field/DOT pond ^a	USA	<i>C. stricta</i>	19	191	221	0.75 ^b	n/a	0.9	0.60–1.25 ^c	0.13–0.18 ^c
Winston et al. (2013)	Field/Museum pond	USA	<i>C. stricta</i>	19	71.7	195	0.75 ^b	n/a	0.4	0.45–1.25 ^c	0.04–0.18 ^c

^a DOT = Department of Transportation.

^b Approximate root length.

^c Median concentration.

concentrations with increasing nutrient availability in stormwater runoff when the residential setting is fully developed and operational.

Nitrogen, P and K in this study and a previous study (Winston et al., 2013) were almost-equally distributed between above- and below-mat biomass while, in other studies, a higher proportion of N, P and K was allocated to the above-mat shoots (Tanner and Headley, 2011; Borne et al., 2013). This suggests that CFW plants in water with higher nutrient concentrations and availability allocate a higher proportion of N, P and K to the shoots (Tanner and Headley, 2011; Borne et al., 2013), which could be removed permanently by harvesting. In contrast, CFW plants in water with low nutrient concentrations or nutrient availability allocate a lower proportion of N, P and K to the shoots and allocate more biomass to the roots for nutrient scavenging. Phosphorus concentrations and contents in both components of *C. appressa* plants were much lower than those of *C. virgata* (Tanner and Headley, 2011; Borne, 2014). Plants only take up P directly in orthophosphate forms (Vance et al., 2003), which were below the LOD ($\text{PO}_4^{3-} < 0.05 \text{ mg L}^{-1}$) in all water samples collected during the 16-month monitoring period. Soil washed from exposed ground during storm events causes stormwater runoff from construction sites to contain high levels of suspended solids (Perkins et al., 2017). Most P in soils is present as insoluble organic forms or inorganic phosphates, which are not directly available to plants due to their affinity to cations such as Ca^{2+} , Mg^{2+} , Fe^{2+} , Fe^{3+} and Al^{3+} (Hinsinger, 2001). In oxidised conditions, phosphorus is adsorbed to Fe^{3+} compounds while, in anoxic conditions, Fe^{3+} is reduced to Fe^{2+} and, subsequently, both iron and adsorbed PO_4^{3-} return into solution (Søndergaard et al., 2003). Phosphorus adsorption to Al^{3+} is not redox-sensitive and, therefore, PO_4^{3-} is adsorbed to Al^{3+} when sediments turn anoxic (Rydin and Welch, 1998). In shallow lakes, the whole water column is usually oxygenated, which also establishes an oxygenated surface layer of the sediment with a high capacity to bind phosphorus (Søndergaard et al., 2003). High Fe and Al concentrations in the shallow lake water in the current study suggest enhanced P adsorption to the sediments or suspended particles, making P unavailable for plant uptake.

High concentrations and contents of Al, Fe, and Mn in the roots, but not the shoots, suggest that *C. appressa* excluded these metals from being transported across the endodermis into the vascular stream (Baker, 1981; Sebastian and Prasad, 2016). However, it remains unclear whether Al, Fe and Mn were accumulated mainly at the root epidermis or in the root cortex. Low P and high Fe concentrations in the water enhance the formation of iron plaque at the root epidermis due to oxygen release by the plant roots (Hu et al., 2005; Kobayashi and Nishizawa, 2012). Iron plaque provides a large surface area and has a high adsorption capacity for heavy metals (Batty et al., 2000; Machado et al., 2005). The formation of Fe plaque on wetland plant roots is known to be influenced by $\text{Fe}^{2+}/\text{Mn}^{2+}$ availability, redox potential and radial-oxygen loss-rate of roots (Weiss et al., 2003). Iron plaque could influence plant uptake of heavy metals and could act as a barrier or buffer, depending on the amount of iron plaque on the root surface (Liu et al., 2004, 2011). The low P concentrations in the water and high Fe and Mn contents in the roots suggest that iron plaque may have formed on the roots of *C. appressa*.

4.3. Nutrient uptake

Total P accumulation by the two CFWs was 1.98 kg at 16 months after planting. The two CFWs removed larger amounts of N (35.30 kg), K (19.79 kg) and Ca (12.21 kg) and surprisingly high amounts of Al (13.44 kg), Fe (5.38 kg) and Mn (4.26 kg) from the lake water. Nitrogen, P and K uptake of *C. appressa* at 12 months after planting (11–17 g m⁻² N, 0.6–0.8 g m⁻² P and 7–10 g m⁻² K) and 16 months after planting (15–19 g m⁻² N, 0.8–1.1 g m⁻² P and 7–12 g m⁻² K) were much lower than those of *C. virgata* at 12 months after planting in previous mesocosm studies (30–77 g m⁻² N, 3.4–5.0 g m⁻² P and 56–105 g m⁻² K) and field studies (26–37 g m⁻² N and 1.4–2.6 g m⁻²

P; 20–36 g m⁻² K) (Sukias et al., 2010; Tanner and Headley, 2011; Borne et al., 2013; Winston et al., 2013; Borne, 2014). The higher N, P and K uptake in previous studies could be due, in part, to higher planting densities of 41 plants m⁻² (Tanner and Headley, 2011) and 17 plants m⁻² (Borne et al., 2013) compared with 8.7 plants m⁻² in the current study. Higher uptake could also be related to higher shoot or root biomass (Sukias et al., 2010; Winston et al., 2013) than in the current study (Table 6). CFW plants in the current study also competed with a whole range of biota in the large lake ecosystem for nutrients while competition for nutrients by CFW plants was limited in previous studies conducted in a 32.8 m³ shipping container (Sukias et al., 2010), 0.71 m³ mesocosm tanks (Tanner and Headley, 2011) and a 75 m³ section of pond (Borne et al., 2013). The amounts of nutrients quantified in the within-mat biomass in the current study suggest that previous studies (Sukias et al., 2010; Tanner and Headley, 2011; Borne et al., 2013; Winston et al., 2013; Borne, 2014) underestimated nutrient uptake rates because they sampled only the above-mat and below-mat biomass components.

The total uptake of Al, Fe and Mn in both wetlands demonstrated that CFWs can be highly effective at metal scavenging. Al, Fe and Mn were predominantly associated with the below-mat root biomass, which is consistent with other studies that found that metals are associated primarily with the roots (Tanner, 1996; Qian et al., 1999; Trueman et al., 2013b). No previous studies have investigated Al, Fe and Mn distribution within CFWs. These metals may have been adsorbed to, rather than absorbed by, the root biomass of *C. appressa*. Gentle washing in the laboratory did not remove these nutrients from the root system and so they were likely to have been bound, at least temporarily, to the CFW. In addition to nutrient adsorption and absorption, these plant roots potentially enhance settling and entrapment of suspended solids and provide a large surface area for the growth of bacteria that contribute to the removal of nutrients from the lake water (Stewart et al., 2008; Chang et al., 2012; Winston et al., 2013; Borne et al., 2015).

5. Conclusion

This is the first study to investigate large-scale CFWs for treating stormwater runoff during the construction phase of a greenfield urban development. The study: (1) determined how much biomass was contained above the CFW mat relative to the amounts contained within and below the CFW mat; (2) identified nutrients that were partitioned in disproportionate amounts between the three different biomass components; and (3) quantified total plant nutrient uptake by CFWs installed in an urban lake with low pollutant concentrations. *Carex appressa* plants displayed extensive root growth and an approximately-equal biomass distribution between the three plant components, resulting in a relatively low above-mat:below-mat biomass ratio. Extensive root growth may be an adaptation to low nutrient availability in the lake water, providing a larger area for scavenging of in-demand plant nutrients such as nitrogen, phosphorus and potassium. This study demonstrated that CFWs remove large amounts of nutrients from stormwater runoff by plant uptake relative to the low nutrient concentrations in the lake water and that they should be considered as a method for stormwater treatment during the early construction stages of urban developments when nutrient availability is limited. *C. appressa* plants accumulated high amounts of aluminium, iron and manganese in their below-mat biomass. Therefore, this study showed that a previously undervalued benefit of CFWs may be their capacity to remove metal pollutants from urban stormwater runoff. High partitioning of biomass into root growth potentially increases the stormwater treatment effectiveness of CFWs by filtering particulates and enhancing the settling of particulates through reduced flow velocities during storm events.

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Performance monitoring of constructed floating wetlands: Treating stormwater runoff during the construction phase of an urban residential development

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HIGHLIGHTS

- This study investigates stormwater treatment efficiencies of large scale Constructed Floating Wetlands (CFWs).
- CFWs received stormwater runoff from a residential construction site.
- Significant removal of total suspended solids from construction runoff.
- Low TN and TP influent concentrations had high impact on CFW performance.
- Spatial composite sampling from multiple locations would improve monitoring accuracy.

GRAPHICAL ABSTRACT



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ABSTRACT

In the context of climate change and global trend towards greenfield urbanisation, stormwater and transported pollutants are expected to increase, impairing receiving environments. Constructed floating wetlands (CFWs) can improve stormwater retention pond performance. However, performance data are currently largely restricted to mesocosm experiments, limiting design enhancement fit for field implementation. The present 12-month field study aims to fill part of these gaps by identifying limitations and necessary design improvements for CFWs on a large retention pond/lake. Water in a 2.6-ha lake receiving stormwater from a 45-ha urban area under development in subtropical Queensland, Australia, was recirculated during dry weather periods to minimise algal growth and the risks of blooms. Pollutant removal efficiencies of two full-scale CFWs were evaluated during storm events and dry weather periods as a function of inlet and outlet pollutant concentrations, flow and rainfall. Inlet TSS and TN concentrations in runoff during the construction phase of the development exceeded required water quality limits while TP inflow concentrations were low and often below the detection limit. Median pollutant load reduction efficiencies during storm-events were – 20 % TSS, – 2 % TN and 22 % TP at CFW1 and 51 % TSS, 3 % TN and 17 % TP at CFW2, respectively. TSS and TN concentration removal efficiencies at CFW1 were low and highly variable, partly due to low inlet concentrations, high flow velocities and short hydraulic retention times (<1 day). However, CFW1 significantly reduced TSS concentrations during dry weather periods. In contrast, CFW2 significantly reduced TSS concentrations during both storm events and during inter-event periods. This study highlights treatment limitations associated to the operational conditions of CFWs at

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field-scale not identifiable in a mesocosm-scale study. Further research is necessary to investigate treatment performance of CFWs during the operational phase of the development with higher nutrient levels.

1. Introduction

Urban watersheds are typically characterized by highly impervious areas generating pollutant laden stormwater runoff that contributes to eutrophication and ecosystem degradation when discharged untreated into receiving water bodies (Malaviya and Singh, 2012; Andrés-Doménech et al., 2018). Best Management Practices (BMPs) are stormwater quality and quantity control measures that aim to minimise negative impacts on the receiving waters (Fletcher et al., 2015). For example, Surface Flow Constructed Wetlands (SFCWs) and bioretention filters are widely used BMPs for stormwater treatment in Australia. SFCWs require 4–8 % of the catchment area to meet pollutant load reduction targets set by the Australian regulators, while bioretention filters require 1–2 % (Water by Design, 2010). Since available land area is limited in urban settlements, land acquisition can be a major cost component of an urban BMP (Lynch et al., 2015). Furthermore, SFCWs show limited tolerance of extended periods of elevated water levels, which can result in a progressive decline in vegetation health (Headley and Tanner, 2012). Therefore, SFCWs typically require flow bypass channels to divert flood waters without treatment during peak storm events, to protect the macrophyte zone from scouring and vegetation damage (Department of Planning and Local Government (DPLG), 2010; Water by Design, 2014).

Constructed Floating Wetlands (CFWs) are an alternative BMP and consist of a floating structure planted with emergent macrophytes. Their buoyancy allows them to adjust to large water-level variations associated with heavy rainfall events (Headley and Tanner, 2012). Plant roots grow through the buoyant structure into the water column where they hydroponically take up nutrients and pollutants (Schwammberger et al., 2019). Over time, the roots form a dense network that provides a large surface area for biofilm growth (Tanner et al., 2011; Winston et al., 2013). Roots and biofilm enable adsorption, absorption and incorporation of pollutants into plant tissue (Headley and Tanner, 2012; Lynch et al., 2015). The roots also provide resistance to flow and reduce water velocity, thus promoting physical filtration and settling of suspended solids (Tanner et al., 2011; Headley and Tanner, 2012; Winston et al., 2013). CFWs are passive, low maintenance and operationally simple water treatment solutions that require no additional land area. They are suitable for new and retrofit installations (Headley and Tanner, 2012). During the early construction phase of greenfield developments, they can control erosion and sediment drift when installed on sedimentation ponds.

Numerous studies on CFWs have emerged especially in the last 15 years, most of them conducted at mesocosm scale with only few focusing on stormwater treatment (Pavlineri et al., 2017). Since the results of mesocosm studies are often not transferable to field installations, full-scale experiments have been identified as a major research need (Colares et al., 2020; Sharma et al., 2021). While good removal efficiencies have been obtained for small-scale systems (Colares et al., 2020), field-scale behaviour, implementation practicability, operation and associated performance of CFW systems is largely missing in the literature. To date, there are still no established design guidelines for optimal coverage, flow distribution, or configuration of CFWs in ponds or basins, and reliable estimates of their performance cannot yet be made (Headley and Tondera, 2019).

This 12-month field study investigated the benefits of implementing two large-scale CFWs (2088 m² total area) during the construction phase of an urban settlement in subtropical Queensland, Australia. The specific aims of the study were to: (1) evaluate the treatment performance of the CFWs during storm-events, and (2) during dry weather periods for total suspended solids (TSS), total nitrogen (TN) and total phosphorus (TP). It was hypothesised that the CFWs would significantly reduce these pollutant

concentrations. The results of the study will identify limitations and necessary design improvements for more effective implementation at field scale.

2. Materials and methods

2.1. Experimental site

The experimental site was part of a large urban residential development, designated “Parklakes 2” at Bli Bli (26°35'S, 153°01'E), Queensland, Australia. Originally, stormwater runoff generated by the urban development was planned to be treated by a 2.6-ha SFCW. This required drainage infrastructure and a 400 m long concrete channel to divert flows around the SFCW during peak storm events. The CFW approach was chosen since the flow bypass structure required for a SFCW could be eliminated, resulting in construction cost savings of approximately AUD\$ 1 million. Furthermore, the CFWs had the potential to improve water quality already at the beginning of the construction works, while water quality improvement by a SFCW would not have been realised until 60 % of the estate would have been developed due to the long plant establishment pre-commissioning period. Two CFWs with a total area of 2088 m² were installed in a newly constructed 2.6-ha lake to treat stormwater runoff during the construction phase of a 45-ha urban development (CFWs = 0.46 % of the catchment area) (Fig. 1). The first constructed floating wetland (CFW1) was 11.5 m long × 92.0 m wide and had a total area of 1058 m². It received stormwater runoff during the construction phase of a 32-ha urban catchment of which 18-ha discharged into a basin upstream of the lake, and 14-ha directly at the corners of CFW1 (Fig. 1). The second constructed floating wetland (CFW2) was 32.0 m long × 32.2 m wide and had a total area of 1030 m². CFW2 received untreated runoff from a 13-ha urban catchment in addition to treated stormwater runoff from CFW1 after passing through an open-water section of the lake between the two CFWs.

The lake was aligned along prevailing winds to promote even wind mixing and reduce stratification (Mackay, 2008). To this effect, the lake had a flat bottom and an operational water depth of 1.65 m beneath both CFWs and 3.0 m at the open water areas. Flows in constructed lakes with a surface area > 0.2 % of the catchment area, as in the current study (0.76 %), are often too small to maintain a hydraulic residence time ≤ 20 days (Mackay, 2008), increasing the risk of algae blooms. Therefore, lake water (total volume of the lake was 94,730 m³) was recirculated during dry weather conditions at a nominal flow rate of 4736.5 m³ d⁻¹ (110 L s⁻¹) for 12 h d⁻¹, to maintain a residence time ≤ 20 days. The recirculation intake was located at a downstream pond which received stormwater runoff from a 6-ha catchment that had been pre-treated by a bioretention basin, and weir-controlled runoff from the lake (Fig. 1). Lake water was pumped to the upstream basin, from where recirculated flow entered the lake by a DN350 mm culvert (Fig. 1).

The study commenced 12 months after the installation of the CFWs, when the urban development was 60 % complete (Fig. 1). At this time, the south-western (20-ha) and central (7-ha) sub-catchments of the development were under construction with erosion and sediment control measures in place. Stormwater runoff from roads, roofs and impervious areas was collected and conveyed via an underground drainage network and discharged into the upstream basin and the lake (Fig. 1). The lake water level was subject to variations during storm events and reached a depth beneath the CFWs of 2.38 m for 4 exceedances per year (EY), 3.05 m for 1 EY and 5.17 m for 0.01 EY. The lake edge was planted with macrophytes to prevent public access and stabilize the lake embankments. Both CFWs effectively spanned the entire width of the lake at normal water depth to minimise potential short-circuiting and direct stormwater runoff through their



Fig. 1. Aerial view of the “Parklakes 2” development, with two constructed floating wetlands, CFW1 and CFW2, installed in a 2.6 ha lake treating stormwater runoff from a 45-ha urban development area (Nearmap, 17. Feb. 2017).

root networks. The submerged macrophytes at the water's edge also provided resistance to flow and limited short-circuiting between the water edge and the CFWs.

CFW1 and CFW2 comprised 115 and 112 CFW modules (Biohaven®, Floating Island International, Shepherd, MT), respectively. Each module was 4.0 m long $\times$ 2.3 m wide $\times$ 0.2 m high. The CFW modules were made of four horizontal layers (each layer 50 mm thickness) of non-woven, recycled, polypropylene and polyester fibrous matrix injected with a non-degradable marine-based polyurethane foam to provide buoyancy. Each of the CFW modules had 40 vertical holes (150 mm deep $\times$ 100 mm diameter) and each hole was planted with two tall, native sedge plants (*Carex appressa*) in December 2015, resulting in a planting density of 8.7 plants m^{-2} . The *C. appressa* plants were raised in 115-mL tubes containing potting mix that consisted of 75 % mulch and 25 % soil (v:v). Shoot height was between 200 and 250 mm at the time of planting. Both CFWs were covered in nylon netting (15 mm mesh size) to protect the plants from predation by birds until the plants were established after 3 months (Schwammberger et al., 2019).

2.2. Storm event sampling and analysis

Sampling at the Parklakes 2 site began in December 2016, 12 months after the CFWs were planted, and continued for one year. Two automatic water samplers (ISCO® GLS, Teledyne Instruments Inc., Lincoln, NE) connected to polyethylene hoses (10 mm internal diameter) were installed on the upstream (inlet) and downstream (outlet) edges of CFW1 (Fig. 2a) and CFW2 (Fig. 2b), respectively. Open ends of the sampling hoses were located at 0.30 m below water level in vertically slotted pipes (1.0 m length, 0.1 m diameter) to prevent plant roots from growing into the sampling area. The top of the pipe was closed with a screw lid to limit interaction with the atmosphere and provide shading from sunlight.

Inlet and outlet autosamplers at CFW1 were in line with a DN350 mm culvert that was discharging lake water mixed with runoff during storm events (“stormwater runoff”), and recirculated flow during dry weather

from the upstream basin into the lake (Fig. 2a). The distance between the culvert and the upstream edge of CFW1 was 8.0 m to allow flow to distribute across the width of the CFW. This distance was reduced to 4.0 m in December 2016, after the CFW has been repositioned due to modification of the anchoring system. The reduced distance resulted in higher flow velocities in the sampling area than anticipated (Fig. 2a).

The autosamplers were controlled by a data logger (CR800 Series, Campbell Scientific Australia, Garbutt, QLD) to collect flow volume-weighted composite water samples during storm events. An ultrasonic flowmeter (Starflow QSD, Unidata Pty Ltd., Perth, WA) was installed in a DN300 mm drainage pipe (Inflow 2) from a 3740 m^2 road area catchment (Fig. 2a). Storm event sampling started when a tipping-bucket rain gauge (H-3401, YSI Water Log, Yellow Springs, OH) recorded ≥ 2 mm rainfall in 30 min and the flowmeter simultaneously recorded flows $\geq 0.5 L s^{-1}$ (Fig. 2a). A programmable relay controller (KTA-223 Relayduino, Ocean Controls, Seaford, VIC) triggered the autosamplers with a time delay between the upstream and downstream samplers to account for the hydraulic retention time (HRT) of stormwater beneath the CFWs. A fluorescent dye (Rhodamine WT, Fisher Scientific, Leicestershire, UK) was added at the culvert upstream of CFW1 and at inflow 5 upstream of CFW2 (Fig. 2b) during a wet weather event to estimate the time for inflow reaching the upstream autosampler at each CFW and the hydraulic retention time beneath the CFW. Autosamplers collected water samples with a time delay of 20 s at the inlet and 60 s at the outlet of CFW1 and 180 s at the inlet and 300 s at the outlet of CFW2. Each autosampler collected 200 mL subsamples at 3000 L flow intervals during storm events until flow dropped below $0.5 L s^{-1}$ for >60 min, which then stopped the sampling procedure. Flow volume-weighted composite water samples were collected according to standard methods (APHA, 2005) and sent to a National Association of Testing Authorities (NATA) in Australia accredited laboratory for analysis of TSS, TN and TP. A predetermined sampling protocol (Stormwater Australia, 2018) was used to identify qualifying storm events and provide CFW stormwater treatment performance evaluation (Table 1s).

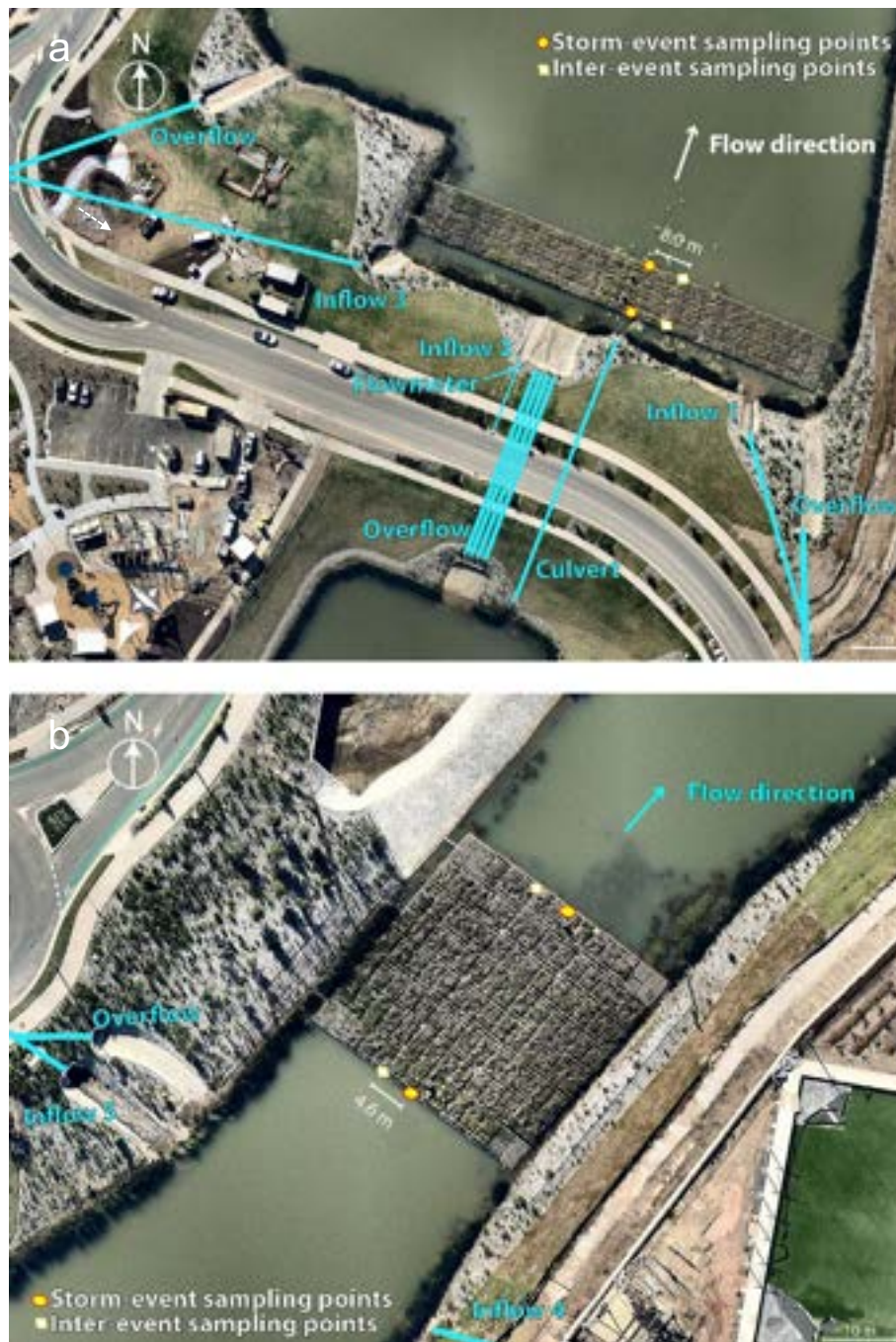


Fig. 2. Aerial view of stormwater inlets and (a) the first constructed floating wetland, CFW1, and (b) the second constructed floating wetland, CFW2, with storm-event sampling equipment and inter-event sampling locations (Nearmap, 31. May 2017).

2.3. Inter-event sampling and analysis

Water grab samples were collected weekly or biweekly at the inlet and outlet of both CFWs during inter-event periods with varying antecedent dry days (ADD). Inlet and outlet inter-event water sample locations were parallel to storm event sample locations with a distance of 8.0 m at CFW1 (Fig. 2a), and 4.2 m at CFW2 (Fig. 2b). Water grab samples were always collected at 9 am using a 1 L bailer (BioBailer®, Environmental Service Products, Rockledge, FL), sampling the first 100 cm of the water column. The water was preserved at -18°C in PE bottles until analysis using standard methods (APHA, 2005) for TSS, TN and TP (Table 1s).

2.4. Data analysis

The average hydraulic loading rate (HLR) for each CFW was calculated by extrapolating the recorded flow on the different sub-catchments (Fig. 1) during qualified storm events using Eq. (1):

$$HLR = \sum \frac{A_i CD_i V_{FM}}{A_{FM} CD_{FM}} \times \frac{1}{A_{CFW}} \quad (1)$$

where:

HLR = Hydraulic loading rate ($\text{m}^3 \text{m}^{-2} \text{d}^{-1}$)
 A_i = Drainage area of sub-catchment i (m^2)

CD_i = Coefficient of discharge for sub-catchment i (dimensionless)
 V_{FM} = Volume of flow recorded by flowmeter ($m^3 d^{-1}$)
 A_{FM} = Drainage area of flowmeter (m^2)
 CD_{FM} = Coefficient of discharge for flowmeter drainage area (dimensionless)
 A_{CFW} = CFW area (m^2)

The water quality analysis result of each flow volume-weighted composite water sample gave the event mean concentration (EMC) equivalent to Eq. (2) (Stormwater Australia, 2018):

$$EMC = \frac{\sum_{i=1}^n V_i C_i}{\sum_{i=1}^n V_i} \quad (2)$$

where:

EMC = Event mean concentration ($g m^{-3}$)
 V_i = Volume of flow during period i (L)
 C_i = Concentration associated with period i ($g m^{-3}$)
 n = Number of aliquots collected during a storm event

The water quality result of the inter-event grab sample gave the inter-event pollutant concentration (IEC). Inter-event grab samples were distinguished by the time period between sample collection and storm events to account for wet or dry weather conditions. Grab samples collected with a precedent dry period of ≤ 6 days were considered as wet weather samples, while samples collected with a precedent dry period of > 6 days were considered as dry weather samples. Days with recorded rainfall $< 5 mm d^{-1}$ were considered as dry.

The areal pollutant loading rate (ALR) was calculated for storm events considering the total flow each CFW received from the different catchments (Fig. 1) and during inter-event sampling when lake water was recirculated for 12 h per day (Eq. (3)).

$$ALR = HLR \times (EMC \text{ or } IEC) \quad (3)$$

where:

ALR = Areal loading rate during events or inter-events ($g m^{-2} d^{-1}$)
 EMC = Event mean concentration ($g m^{-3}$)
 IEC = Inter-event concentration ($g m^{-3}$)

The Concentration Removal Efficiency (CRE) was calculated to determine the reduction in pollutant concentration for each storm event and each inter-event (Eq. (4)).

$$CRE = \left(\frac{EMC_{in} - EMC_{out}}{EMC_{in}} \text{ or } \frac{IEC_{in} - IEC_{out}}{IEC_{in}} \right) \times 100 \quad (4)$$

where:

CRE = Pollutant concentration removal efficiency (%)
 EMC_{in} = Event mean concentration or inter-event concentration at the inlet ($g m^{-3}$)
 EMC_{out} = Event mean concentration or inter-event concentration at the outlet ($g m^{-3}$)
 IEC_{in} = Inter-event concentration at the inlet ($g m^{-3}$)
 IEC_{out} = Inter-event concentration at the outlet ($g m^{-3}$)

The areal pollutant removal rate (ARR) was calculated as the difference between the ALR at the inlet and outlet (Eq. (5)).

$$ARR = ALR_{in} - ALR_{out} \quad (5)$$

where:

ARR = Areal removal rate during events or inter-events ($g m^{-2} d^{-1}$)
 ALR_{in} = Areal loading rate during events or inter-events at the inlet ($g m^{-2} d^{-1}$)
 ALR_{out} = Areal loading rate during events or inter-events at the outlet ($g m^{-2} d^{-1}$)

The water treatment performance for the study duration was assessed by the pollutant concentration removal efficiency ratio during storm events (Eq. (6)), inter-event periods (Eq. (7)) and the pollutant load reduction efficiency (Eq. (8)), which was then compared against the annual mean target pollutant load reductions required for developments in South East Queensland (SEQ).

$$ER = \frac{Mean \text{ or } Median EMC_{in} - Mean \text{ or } Median EMC_{out}}{Mean \text{ or } Median EMC_{in}} \times 100 \quad (6)$$

$$ER = \frac{Mean \text{ or } Median IEC_{in} - Mean \text{ or } Median IEC_{out}}{Mean IEC_{in}} \times 100 \quad (7)$$

$$LRE = \frac{Mean \text{ or } Median ALR_{in} - Mean \text{ or } Median ALR_{out}}{Mean \text{ or } Median ALR_{in}} \times 100 \quad (8)$$

where:

ER = Pollutant concentration removal efficiency ratio (%)
 LRE = Pollutant load reduction efficiency (%)

2.5. Statistical analysis

Inlet and outlet EMCs and IECs of each CFW were compared to determine if differences were significant using SPSS Statistics v.21 (IBM Corporation). Inlet and outlet EMC and IEC data of each CFW were tested for normality using the Shapiro–Wilk test. If data were normally distributed, a paired sample t -test was performed. Otherwise, a Wilcoxon Signed-Rank test was used. Means are reported with standard deviations, medians are reported with first and third percentiles (25th – 75th) and differences were regarded as significant at $p < 0.05$. Several water samples had TN and TP concentrations below the limit of detection (LOD) and were replaced with the LOD.

In addition to the CFWs in this study, water quality and treatment performance metrics were calculated using the data reported by Borne (2013) and Borne (unpublished data) for a 50 m^2 CFW treating highway runoff in Auckland, New Zealand, and by Nichols et al. (2016) for a 101 m^2 CFW treating urban stormwater runoff in the same region (SEQ). The CFWs in both studies (Borne et al., 2013; Nichols et al., 2016) also spanned the entire width of the water body and used automatic water samplers to collect composite samples during storm events for 12 months. Data were tested for normality (Shapiro–Wilk test) and equality of variances (Levene's test) before analysis by 1-way analysis of variance (ANOVA) comparing EMCs, CREs, HLRs, ALRs and ARR of this study to previous studies. Post-hoc Tukey's Honestly Significant Difference (HSD) tests were performed only when significant differences among the water quality treatment performance metrics were detected by ANOVA. If data were non-parametric, a Kruskal–Wallis test was performed followed by a Mann–Whitney U test, but only when significant differences among water quality treatment performance metrics were detected. Since CFW performance metrics are often presented as means in literature, those are presented in addition to medians in this study.

3. Results and discussion

Measured total annual rainfall (1386 mm) was similar to median annual rainfall (1410 mm) recorded over the past 23 years at the Sunshine Coast Airport weather station (26°60'S, 153°09'E) located 7.5 km east of the project site (BoM, 2019). Storm events occurred primarily in autumn, spring and early summer during which 22 qualified storm events were sampled (Fig. 1s). In late March 2017, the study site was impacted by remnants of tropical cyclone Debbie (BoM, 2018). Hence, the total rainfall recorded at the project site in March 2017 was much higher than median historical records (Table 2s). More rainfall was also recorded during spring and early summer (October to December, southern hemisphere), whereas rainfall in mid-summer (January and February), winter and early spring (April to September) were much lower than median historical records for the same

Table 1
Mean ($\bar{x} \pm SD$) and median ($\bar{x}$ (Q1 – Q3)) hydraulic loading rate (HLR), event mean concentration (EMC), areal loading rate (ALR), areal reduction rate (ARR), concentration reduction efficiency (CRE), pollutant removal efficiency ratio (ER) and areal load reduction efficiency (LRE) at two constructed floating wetlands, CFW1 and CFW2, during storm events compared to those calculated from data reported in previous studies. Means ($\pm SD$) or medians (Q1 – Q3) with different letters are significantly different (ANOVA or Kruskal-Wallis, $p < 0.05$, $n = 9-20$).

Reference	Events	HLR	EMC In	EMC Out	CRE	ER	ALR	ARR	LRE		
		(m ³ m ⁻² d ⁻¹)	(g m ⁻³)	(g m ⁻³)	(%)	(%)	(g m ⁻² d ⁻¹)	(g m ⁻² d ⁻¹)			
		$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$		
TSS											
This study, CFW1	20	4.5 (2.3–7.3) ab	41 (22–53) a	50 (19–73)	–17 ± 45	–19 (–54–24) a	–22	270 ± 431	125 (69–321) a	–23 (–117–17) a	–14
This study, CFW2	20	5.9 (3.0–9.5) a	48 (22–79) a	25 (15–48)	40 ± 26	38 (27–56) b	49	559 ± 1031	243 (124–498) a	74 (22–206) b	62
Borne (2013) ^b	17	2.6 (2.0–4.0) b	30 (24–51) a	15 (9–16)	55 ± 24	59 (33–71) b	61	115 ± 73	93 (53–190) a	47 (32–88) b	51
Nichols et al. (2016)	10 ^c	3.6 (2.8–5.3) ab	44 (20–218) a	23 (16–28)	42 ± 58	56 (36–81) b	81	432 ± 723	116 (82–206) a	56 (19–100) b	81
TN											
This study, CFW1	20	4.5 (2.3–7.3) ab	0.51 (0.39–0.68) a	0.61 (0.28–0.80)	–7 ± 53	1 (–19–20) a	–1	2.91 ± 2.01	2.90 (1.08–4.64) a	0.02 (–0.58–0.38) a	–4
This study, CFW2	20	5.9 (3.0–9.5) a	0.59 (0.31–0.71) a	0.51 (0.40–0.72)	0 ± 16	0 (–7–10) a	3	3.67 ± 2.55	3.83 (1.13–5.22) a	0.00 (–0.11–0.41) a	4
Borne (2013) ^b	17	2.6 (2.0–4.0) b	0.99 (0.81–1.30) b	0.71 (0.61–0.95)	25 ± 25	27 (14–42) b	30	3.60 ± 2.55	3.02 (1.77–3.70) a	0.67 (0.20–1.15) a	26
Nichols et al. (2016)	10 ^c	3.6 (2.8–5.3) ab	1.10 (0.85–1.35) b	0.95 (0.70–1.53)	1 ± 68	22 (–46–53) ab	17	5.53 ± 4.68	3.63 (2.23–7.80) a	0.15 (–2.23–2.10) a	19
TP											
This study, CFW1	20	4.5 (2.3–7.3) ab	0.06 (0.05–0.08) a	0.06 (0.05–0.07)	4 ± 21	0 (0–11) a	13	0.36 ± 0.26	0.37 (0.13–0.45) a	0.00 (0.00–0.01) a	10
This study, CFW2	20	5.9 (3.0–9.5) a	0.05 (0.05–0.07) a	0.05 (0.04–0.06)	6 ± 13	0 (0–11) a	8	0.44 ± 0.34	0.36 (0.17–0.57) a	0.00 (0.00–0.03) a	9
Borne (2013) ^b	17	2.6 (2.0–4.0) b	0.09 (0.07–0.13) b	0.05 (0.04–0.08)	42 ± 23	40 (27–61) b	49	0.33 ± 0.31	0.18 (0.15–0.32) a	0.10 (0.05–0.15) b	37
Nichols et al. (2016)	10 ^c	3.6 (2.8–5.3) ab	0.06 (0.04–0.13) ab	0.04 (0.03–0.07)	26 ± 50	33 (0–58) ab	52	0.36 ± 0.42	0.26 (0.11–0.33) a	0.03 (0.00–0.12) ab	57

^a Mean ($\bar{x} \pm SD$) of HLR, EMC In and EMC Out in Table 5a.

^b Flow volume during storm events (Borne, unpublished data).

^c Flow data for 9 storm events available.

periods (Table 2s). Inter-event water samples were collected on 23 days in weekly (March to April) and bi-weekly (May to December) intervals (Fig. 1s).

3.1. Stormwater runoff and baseflow characteristics

Storm events were highly variable in terms of duration, rainfall depths and rainfall intensities with HLRs of both CFWs ranging between 1.3 and 24.0 $m^3 m^{-2} d^{-1}$ (Table 3s). Median (25th – 75th percentile) HLRs were 4.5 (2.3–7.3) $m^3 m^{-2} d^{-1}$ at CFW1 and 5.9 (3.0–9.5) $m^3 m^{-2} d^{-1}$ at CFW2, which were comparable to those at the 50 m^2 CFW treating highway runoff (Borne, unpublished data) and at the 101 m^2 CFW treating urban stormwater (Nichols et al., 2016) (Table 1). Given the rainfall patterns, inter-event water samples were collected at days with varying precedent dry weather periods when lake water was recirculated producing HLRs of 3.5 $m^3 m^{-2} d^{-1}$ at CFW1 and 3.6 $m^3 m^{-2} d^{-1}$ at CFW2.

Inlet and outlet TSS, TN and TP EMCs (Table 3s) were generally low and below typical mean EMCs (151 $mg L^{-1}$ TSS, 1.82 $mg L^{-1}$ TN, 0.34 $mg L^{-1}$ TP) of stormwater runoff from urban residential areas in Queensland (Healthy Land and Water, 2018). TSS EMCs were expected to be higher given that barren ground was often exposed during construction activities within the catchment. Inlet TSS EMCs at both CFWs did not differ significantly from those reported by Borne (2013) and Nichols et al. (2016), while inlet TN EMCs at both CFWs were lower than those reported in previous studies (Table 1). Inlet TP EMCs at both CFWs were close to the LOD (0.05 $mg L^{-1}$ TP) and lower than those reported by Borne (2013) but did not differ significantly from those recorded by Nichols et al. (2016) (Table 1).

TSS, TN and TP ALRs in both this study and previous studies (Borne, 2013; Nichols et al., 2016) were highly variable, which was evident by the large ALR interquartile range (Table 1). Despite low TN and TP EMCs at the inlet of both CFWs, the mean ALRs during storm events (2.91 to 3.67 $g m^{-2} d^{-1}$ TN; 0.36 to 0.44 $g m^{-2} d^{-1}$ TP) were comparable to CFW mesocosm studies on combined sewer overflow (1.78 $g m^{-2} d^{-1}$ TN and 0.18 $g m^{-2} d^{-1}$ TP; van de Moortel et al., 2010 in Headley and Tanner, 2012) or primary treated sewerage (2.20 to 5.30 $g m^{-2} d^{-1}$ TN and 0.29 to 0.84 $g m^{-2} d^{-1}$ TP; Boonsong and Chansiri, 2008 in Headley and Tanner, 2012). Thus, TN and TP loading of CFWs for stormwater treatment applications can be significant due to exposure to relatively large runoff volumes in proportion to the CFW area (i.e., high HLR) even when TN and TP concentrations in stormwater runoff are low as in the current study.

Inlet and outlet TSS, TN and TP concentrations at both CFWs exceeded the site-specific limits (40 $mg L^{-1}$ TSS; 0.50 $mg L^{-1}$ TN; 0.05 $mg L^{-1}$ TP) during or after storm-events, while pollutant concentrations were below those limits during dry weather periods (Fig. 3). Wet weather IECs after storm events (< 6 ADD) were similar to EMCs but generally higher than dry weather IECs (≥ 6 ADD) (Table 3s, Table 4s). Total IEC were higher for TSS but lower for TN and TP (Table 2), compared to typical mean baseflow concentrations (10 $mg L^{-1}$ TSS, 1.58 $mg L^{-1}$ TN, 0.11 $mg L^{-1}$ TP) in urban residential areas in Queensland (Healthy Land and Water, 2018).

3.2. Stormwater treatment performance of CFW1

Low stormwater TSS, TN and TP influent concentrations in this study had a high impact on the CFW performance metrics because low pollutant concentrations are in general more difficult to reduce than higher values (Strecker et al., 2001). Wirtz et al. (2023) also observed low removal efficiencies when comparing two retention basins retrofitted with CFWs treating highway runoff with low pollutant concentrations. Further, a meta-analysis on eight large-scale studies (including data from this study) identified inflow concentrations as the third most important parameter among predictor variables for removal efficiency for TN and TSS (Tirpak et al., 2022). The TN inlet concentrations in this study (median EMC = 0.51 $g m^{-3}$) were even lower than the background concentration of 1.0 $g m^{-3}$ commonly observed in constructed wetland systems resulting

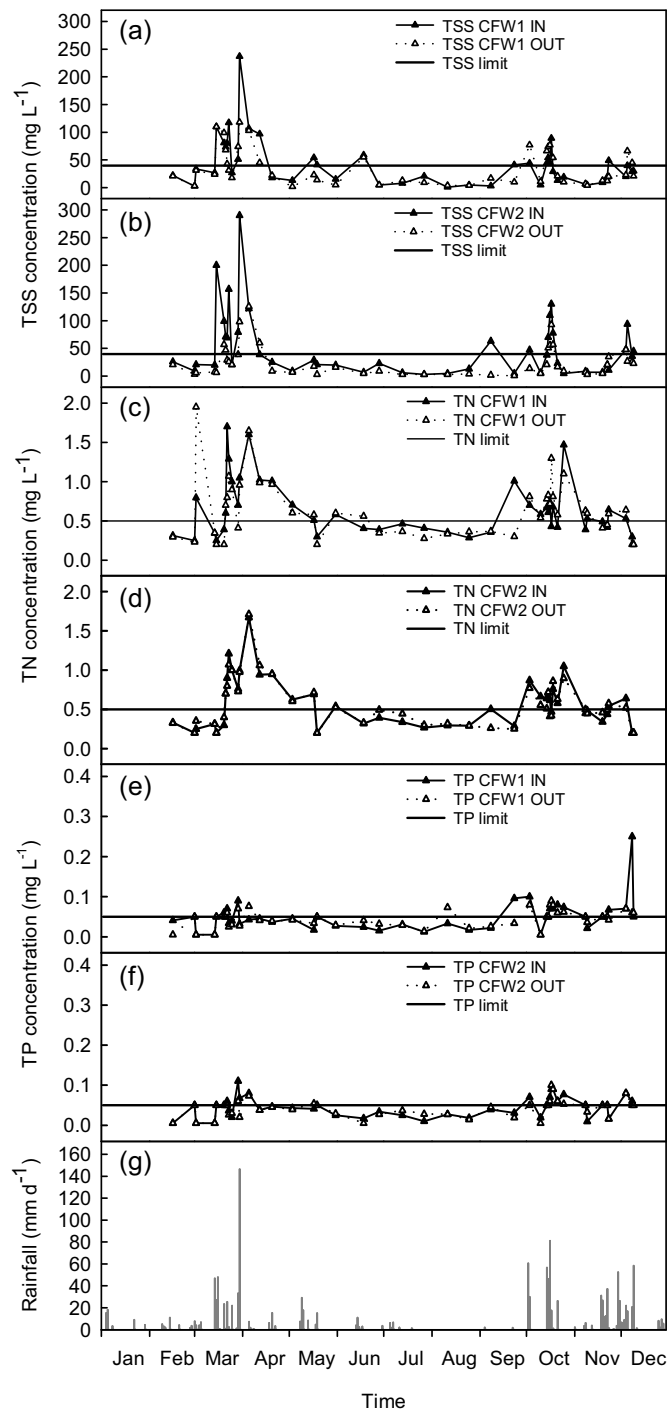


Fig. 3. Inlet and outlet pollutant concentrations during storm-event (event mean concentrations) and inter-event water sampling (grab samples) at two constructed floating wetlands, CFW1 and CFW2, and site-specific pollutant limits, for (a-b) total suspended solids (TSS), (c-d) total nitrogen (TN), and (e-f) total phosphorus (TP), with (g) daily rainfall over the 12-month monitoring period.

from the inputs of internally produced organic N from biota (Kadlec and Wallace, 2009). At such low starting concentrations, the law of diminishing returns applies, meaning that very large wetlands are required to achieve further concentration reductions. This situation is further exacerbated when low inlet concentrations are combined with relatively high hydraulic loading rates, as in the current study. This is demonstrated by comparing with the stormwater treatment study of Borne (2013), where the CFW received a lower median HLR of $2.6 \text{ m}^3 \text{ m}^{-2} \text{ d}^{-1}$ (compared to $4.5 \text{ m}^3 \text{ m}^{-2} \text{ d}^{-1}$ for CFW1) combined with an inlet EMC of 0.99 g m^{-3}

which was approx. Twice the median inlet EMC of 0.51 g m^{-3} for CFW1 (Table 1). Despite the two systems receiving very similar TN loading rates (median ALR of $3.0 \text{ g m}^{-2} \text{ d}^{-1}$ for Borne (2013) vs. $2.9 \text{ g m}^{-2} \text{ d}^{-1}$ for CFW1), the median TN CRE for the CFW in Borne's study was 27 % compared to only 1 % for CFW1. Consequently, the low TN CRE for CFW1 was partially a result of low inlet EMCs (close to the LOD) combined with relatively high HLRs.

CFW1 showed no significant differences between median EMC_{in} and EMC_{out} for TSS, TN and TP during storm events (Fig. 4). Pollutant CREs were highly variable between individual rainfall events, which was evident by the large interquartile range around the median CRE (Table 1). Negative median ERs and LREs for TSS and TN indicate that EMCs at the outlet of CFW1 were often higher than at the inlet (Table 3s, Table 1). Median LRE of 22 % for TP showed that even a small change in concentrations can have a large impact on the calculated CFW performance metrics, given that there was no net TP removal (median ER 0 %) and most TP EMCs were close to, or at the LOD (Table 3s, Table 1).

Stormwater runoff partially had to pass the upstream basin before reaching the inlet autosampler at CFW1. Thus, stormwater runoff from the sub-catchments was diluted in the receiving basin upstream of the lake, and sedimentation of particles likely reduced the TSS loads and particle bound nutrients led to lower TSS EMCs than expected. In the study of Schwammberger et al. (2017), pollutant EMCs and median CREs of 0 % (−40 % to 20 %) for TSS, −4 % (−5 % to 14 %) for TN and 0 % (0 % to 27 %) for TP were also found to be low when urban stormwater runoff initially flowed through 70 m of open water, being directed by baffle walls, before reaching the CFW. Pollutant EMCs then increased after relocating the CFW to an upstream stormwater inflow, resulting in significant TSS and TP reductions with a median CRE of 56 % (36 % to 81 %) for TSS, 22 % (−46 % to 53 %) for TN and 33 % (0 % to 58 %) for TP during 10 storm events (Table 1; Nichols et al., 2016). In the current study, the location of the two automatic water samplers were along the central axis of CFW1 aligned with the culvert fed from the upstream basin. This led most likely to an under-estimate of the pollutant load entering the CFW from inflow 1 and inflow 2, which did not receive any pre-treatment.

The proximity of CFW1 to the lake embankment (Fig. 2a) presumably resulted in much higher localised HLRs for areas close to inflows of the culvert than the median HLRs calculated for the entire CFW surface area. High flow velocities created by water exiting the culvert were visually observed at the inlet and outlet of CFW1 during storm events. The 11.5 m long CFW1 located 4 m from the exit of the culvert was not long enough to sufficiently reduce flow velocities and create the pseudo-laminar flow necessary to allow suspended particles to settle during storm events. High flow velocities likely led to resuspension of particles attached to the dense root network, resulting in higher TSS concentrations at the outlet than at the inlet of CFW1. Furthermore, the flow of recirculated water on days without storm events could have formed preferential flow channels within the dense root network beneath CFW1, resulting in reduced pollutant treatment during storm events (Farjood et al., 2015). Thus, CFWs need to be located at a suitable distance from stormwater inflows to allow flow velocities to decrease, and better mix and distribute inflows across the width of the CFW. Such an optimisation of hydraulic efficiency and HRT would allow treatment processes to occur. This highlights the importance of considering the overall design of the drainage inputs, lake structure and CFW elements in an integrated way to improve the treatment efficiency. For comparison, a one-year field study in New Zealand monitored the treatment performance of a 9.75 m long x 5.2 m wide (50 m^2) CFW installed in a stormwater pond (Borne et al., 2013). Stormwater runoff had to pass a forebay and a v-notch weir before reaching the CFW, which likely allowed the flow to pass the CFW more uniformly (Borne et al., 2013). The authors showed that the CFW, which had a similar length compared to CFW1 but lower operational depth underneath the CFW (0.75 m versus 1.65 m in this study) favouring TSS entrapment, was able to significantly reduce TSS, TN, and TP concentrations in stormwater runoff with median CRE of 59 % (33 % – 71 %) for TSS, 27 % (14 % – 42 %) for TN and 40 % (27 % – 61 %) for TP (Table 1). Further, Borne et al. (2013) had a control pond without a CFW

Table 2
Mean ($\bar{x} \pm SD$) and median ($\tilde{x}$ (Q1 – Q3)) inter-event pollutant concentration (IEC) at the inlet (In) and outlet (Out), pollutant concentration removal efficiency (CRE), pollutant removal efficiency ratio (ER) or areal load reduction efficiency (LRE), areal pollutant loading rate (ALR) and areal pollutant reduction rate (ARR) of two constructed floating wetlands, CFW1 and CFW2, during wet and dry weather conditions under operation of the recirculation system.

Condition	IEC In		IEC Out		CRE		ER = LRE		ALR		ARR	
	$(g\ m^{-3})$		$(g\ m^{-3})$		(%)		(%)		$(g\ m^{-2}\ d^{-1})$		$(g\ m^{-2}\ d^{-1})$	
	$\bar{x}$	$\tilde{x}$	$\bar{x}$	$\tilde{x}$	$\bar{x}$	$\tilde{x}$	$\bar{x}$	$\tilde{x}$	$\bar{x}$	$\tilde{x}$	$\bar{x}$	$\tilde{x}$
TSS	Wet	70 ± 68	54 (19–102)	40 ± 38	21 ± 55	47 (5–56)	42	57	246 ± 241	191 (65–360)	104 ± 144	32 (9–147)
	CFW1	16 ± 13	14 (5–23)	12 ± 9	–42 ± 168	10 (–16–60)	26	32	57 ± 46	49 (18–82)	15 ± 39	7 (–3–36)
	CFW1	42 ± 54	21 (7–52)	26 ± 30	–12 ± 129	20 (2–57)	39	19	148 ± 192	74 (23–182)	57 ± 111	14 (2–72)
	Wet	63 ± 91	25 (7–81)	36 ± 42	0 ± 88	29 (–29–61)	44	28	230 ± 330	91 (25–292)	100 ± 249	7 (–15–49)
	CFW2	18 ± 16	17 (6–22)	7 ± 6	49 ± 29	55 (22–70)	61	70	65 ± 59	60 (21–78)	40 ± 60	16 (10–45)
	CFW2	40 ± 67	20 (7–28)	21 ± 32	26 ± 68	40 (18–65)	48	60	144 ± 241	73 (24–100)	69 ± 176	15 (5–47)
TN	Wet	0.92 ± 0.41	1.01 (0.56–1.17)	0.87 ± 0.34	0 ± 18	4 (–8–8)	5	5	3.24 ± 1.47	3.57 (1.96–4.13)	0.16 ± 0.52	0.14 (–0.21–0.25)
	CFW1	0.47 ± 0.22	0.39 (0.35–0.52)	0.38 ± 0.11	11 ± 24	6 (–3–17)	19	10	1.68 ± 0.77	1.38 (1.24–1.84)	0.32 ± 0.76	0.07 (–0.04–0.34)
	CFW1	0.70 ± 0.39	0.56 (0.39–1.01)	0.63 ± 0.35	6 ± 21	5 (–3–13)	10	–3	2.46 ± 1.39	1.96 (1.39–3.57)	0.24 ± 0.64	0.12 (–0.06–0.32)
	Wet	0.87 ± 0.38	0.94 (0.61–1.02)	0.85 ± 0.38	2 ± 9	0 (–4–10)	2	4	3.14 ± 1.38	3.41 (2.19–3.70)	0.07 ± 0.30	0.00 (–0.13–0.27)
	CFW2	0.37 ± 0.12	0.33 (0.29–0.42)	0.37 ± 0.11	–4 ± 23	0 (–15–3)	–1	0	1.34 ± 0.44	1.18 (1.05–1.51)	–0.01 ± 0.33	0.00 (–0.17–0.05)
	CFW2	0.61 ± 0.37	0.50 (0.32–0.82)	0.60 ± 0.36	–1 ± 18	0 (–7–6)	1	2	2.20 ± 1.34	1.81 (1.16–2.94)	0.03 ± 0.32	0.00 (–0.13–0.13)
TP	Wet	0.04 ± 0.02	0.03 (0.02–0.05)	0.04 ± 0.02	–16 ± 65	0 (–75–17)	–2	–33	0.13 ± 0.07	0.11 (0.07–0.16)	0.00 ± 0.07	0.00 (–0.05–0.04)
	CFW1	0.03 ± 0.03	0.03 (0.02–0.03)	0.03 ± 0.02	–6 ± 55	0 (–13–5)	14	–20	0.11 ± 0.09	0.09 (0.06–0.11)	0.01 ± 0.09	0.00 (–0.01–0.01)
	CFW1	0.03 ± 0.02	0.03 (0.02–0.04)	0.03 ± 0.02	–10 ± 59	0 (–50–17)	5	0	0.12 ± 0.08	0.11 (0.07–0.14)	0.01 ± 0.08	0.00 (–0.04–0.04)
	Wet	0.04 ± 0.02	0.04 (0.02–0.06)	0.03 ± 0.02	2 ± 73	13 (0–44)	19	25	0.15 ± 0.09	0.15 (0.07–0.22)	0.03 ± 0.07	0.04 (0.00–0.04)
	CFW2	0.02 ± 0.01	0.03 (0.01–0.03)	0.03 ± 0.01	–15 ± 62	0 (–6–0)	–7	0	0.09 ± 0.04	0.11 (0.04–0.11)	–0.01 ± 0.03	0.00 (–0.01–0.00)
	CFW2	0.03 ± 0.02	0.03 (0.02–0.04)	0.03 ± 0.02	–7 ± 66	0 (0–29)	9	0	0.12 ± 0.08	0.11 (0.07–0.15)	0.01 ± 0.05	0.00 (0.00–0.04)

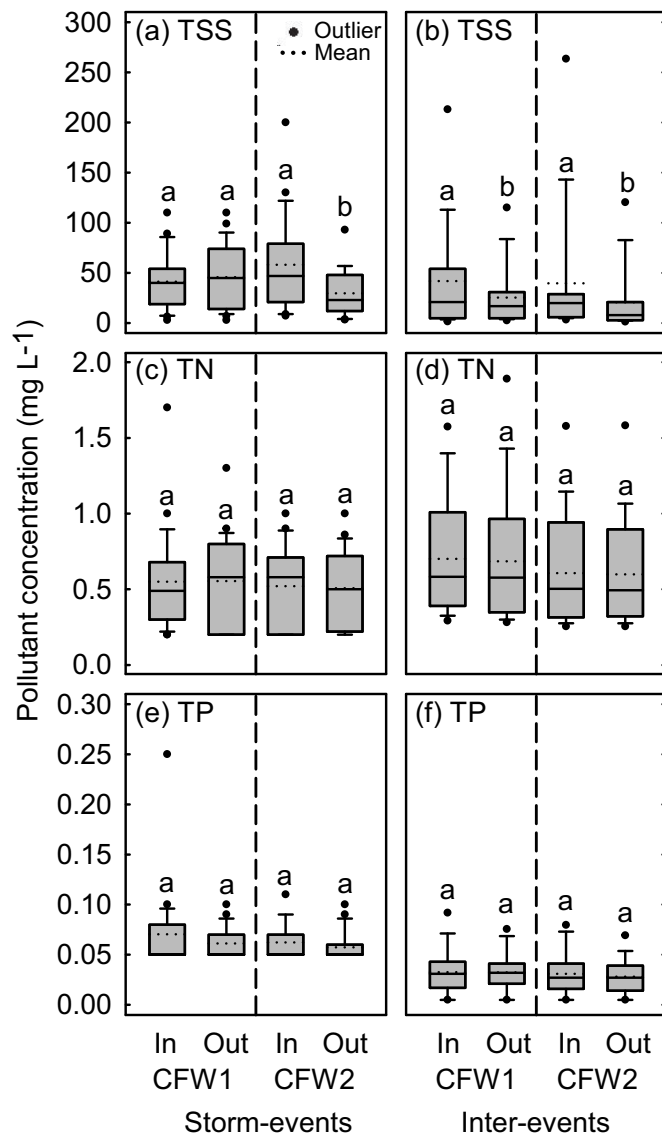


Fig. 4. Box and Whisker plots for storm event samples (left) and inter-event water samples (right) at the inlet (In) and outlet (Out) of two Constructed Floating Wetlands, CFW1 and CFW2, for (a–b) total suspended solids (TSS), (c–d) total nitrogen (TN), and (e–f) total phosphorus (TP). The limit of detection (LOD) for TSS (1.0 mg L^{-1}) and TN (0.20 mg L^{-1}) was identical for storm-event and inter-event samples, while the LOD for TP was 0.05 mg L^{-1} for storm events and 0.005 mg L^{-1} for inter-event water samples.

to compare removal efficiencies. In contrast, the research site of the current study did not allow for controls and, therefore, the stormwater treatment performance relates to the treatment by the lake in addition to the CFWs. It is difficult to compare results directly because of differences in the two research sites, HLRs, HRTs, stormwater characteristics, climate conditions and sampling methodology. In future research, we recommend adding additional autosamplers to the inlet and outlet at both corners of CFW1 (in line with inflow 1 and inflow 3, Fig. 2a) to monitor the stormwater treatment efficiency under limited pre-treatment and dilution effects and to obtain a more representative evaluation of the pollutant treatment performance of CFW1.

Median TSS concentrations for inter-event water sampling were lower at the outlet than at the inlet of CFW1, while median inlet and outlet TN and TP concentrations did not differ significantly (Fig. 4). TSS IECs were higher during wet than dry weather conditions with median TSS CREs of 47 % (5 % – 56 %) and 10 % (– 16 % – 60 %), respectively (Table 2). Inter-event CREs for TSS suggest that the dense root network beneath

CFW1 acted as a barrier to the passage of TSS when not directly impacted by high flow velocities from the adjacent culvert during storm events. Tanner and Headley (2011) found that planted CFW mesocosms removed significantly more fine suspended solids than unplanted CFWs or open water ponds, concluding that the roots and associated biofilms beneath the CFW play an important role in trapping finer particles in stormwater.

3.3. Stormwater treatment performance of CFW2

Median TSS EMCs at the outlet of CFW2 were lower than at the inlet while median TN and TP EMCs did not differ significantly (Fig. 4). Median TSS CRE at CFW2 was 38 % (27 % – 56 %) which corresponded to a median TSS ER of 48 % and a median TSS LRE of 51 % (Table 1). Lower TSS EMCs at the outlet than at the inlet indicate that the long root system of *C. appressa* plants with mean 90 percentile root length of $1.21\text{--}1.04 \text{ m}$ and mean maximum root length of $1.84\text{--}2.19 \text{ m}$ enhanced settling and entrapment of particles (Schwammberger et al., 2020). The long dense root network (Schwammberger et al., 2019) most certainly provided resistance to flow resulting in enhanced mixing and a more uniform flow distribution across the width of the CFW, which, in turn, enhanced sedimentation of suspended particles over the 30 m length of CFW2. However, short-circuiting of stormwater flow around the edges of CFW2 was observed during heavy storm events (Fig. 5). Short-circuiting along the mostly fortified (concreted) edge of the lake demonstrated the importance of a dense macrophyte zone at the water edge, to provide resistance to flow and to force stormwater runoff through the dense root network beneath the CFW. However, no reduction in TN and TP concentrations occurred during storm events at CFW2 (Table 1). Given that the reduction in nutrient concentrations in CW systems is often found to follow first-order kinetics (i.e., exponential decay), long retention times would be required to further reduce concentrations close to zero or relatively low background concentrations (Kadlec and Wallace, 2009). Thus, continuation of storm-event monitoring is necessary after completion of the construction phase, when TN and TP concentrations in the stormwater runoff are expected to increase.

This is the first study on a CFW installed in a newly constructed lake which required a recirculation system to mitigate the risks of algal blooms during dry weather conditions in subtropical Queensland, Australia (Mackay, 2008). Median TSS CRE for inter-event samples was 40 % (18 % – 65 %) with TSS removal mainly occurring during dry weather periods (Table 2). Results agree with findings of Tanner and Headley (2011), who reported turbidity reduction in planted CFWs under quiescent batch-loaded conditions. However, no TN and TP removal occurred during inter-event periods (Fig. 4). Similar to the treatment in SFCW with emergent plants, TN removal in CFWs depends on various factors including HRT, temperature, stormwater characteristics (Kadlec, 2012) and plant uptake. Given the recirculation pump rate of $4736.5 \text{ m}^3 \text{ d}^{-1}$ and assuming a uniform cross-sectional flow, the volume of water beneath CFW2 (1573 m^3) was replaced three times a day during inter-event periods. This is much less than the HRT > 2 days recommended for SFCWs (Water by Design, 2010) and the HRT > 4 days recommended for TN removal from stormwater runoff in SFCWs (Tondera et al., 2018). Sukias et al. (2010) found significant pollutant removal by CFWs treating eutrophic lake water with inlet pollutant concentrations of $1.1\text{--}1.9 \text{ g m}^{-3}$ TN and $0.17\text{--}0.20 \text{ g m}^{-3}$ TP with an HRT of 7 days (Headley and Tanner, 2012). In contrast, no significant TN removal from stormwater runoff was recorded in this study and in the study of Nichols et al. (2016) that had HRTs < 1 day. However, Borne et al. (2013) reported significant TN removal from stormwater runoff by the CFW that also had HRTs < 1 day, but only during the warmest months (late spring to end autumn) and with a water surface coverage by the CFW of 50 %. The water surface coverage of the lake by the two CFWs in the current study was only 8 % which might have been insufficient to meet the annual pollutant load reduction targets. Further research is needed to investigate the TSS, TN and TP treatment performance with higher HRTs achieved by varying the operation period or pump rate of the recirculation system.



Fig. 5. Visual observation of untreated stormwater runoff short circuiting at the edge of the second constructed floating wetland, CFW2.

3.4. Storm event monitoring and hydraulic retention time

Removal efficiencies of TSS, TN and TP from stormwater runoff by CFWs are highly dependent on the HRT (McAndrew and Ahn, 2017) as pollutant entrapment, sedimentation, microbial denitrification and assimilation into plant biomass require reduced flow velocities within the root network. Flow volume-weighted composite water sampling aims to prevent transit time delay errors that occur when sampling is done at shorter or longer time intervals than the actual HRT (Kadlec and Wallace, 2009). However, the water sample methodology to collect flow volume-weighted composite water samples differed among previous CFW field studies. Borne et al. (2013) and Winston et al. (2013) evaluated the treatment performance of a pond with CFWs by installing autosamplers at the inlet and outlet of the pond. Each autosampler was connected to an individual flowmeter at the inlet and outlet pipe of the pond, thus monitoring the actual HRT and preventing transit time delay errors. In contrast, Nichols et al. (2016) and the current study monitored the treatment performance of the water volume covered by CFWs in larger field installations. Autosamplers were installed at the upstream and downstream CFW edges to collect flow volume-weighted composite water samples according to flow measured in an inlet pipe. Consequently, samples were not weighted according to flow at the upstream and downstream edge of the CFWs, and the actual HRT between the samplers was likely not accurately considered. Individual flowmeters in horizontal pipe sections beneath each autosampler at the upstream and downstream CFW edge could be a viable option to prevent transit time delay errors and improve the storm event monitoring methodology for large-scale CFW installations.

Sampling at the upstream and downstream CFW edges, rather than sampling at the inlet and outlet pipes of a water body, is affected by the hydraulic flow regime through the CFW and open water zones. Full-scale tracer experiments on CFWs have shown that stormwater entering the leading edge of the root zone is decelerated and deflected away from the root zone, resulting in stormwater exiting predominantly at the bottom of the lake and underneath the root zone (Xavier et al., 2018). In another study, short-circuiting underneath the roots rather than flow through the root network was reported during tracer experiments on CFWs, with an actual HRT of 3.2 days in contrast to a calculated HRT of 9.2 days (Sukias et al., 2010). Therefore, the sample locations and water depth at the upstream and downstream CFW edge need to be carefully considered for representative storm-event monitoring. If the stormwater runoff was exiting the CFW predominantly at the bottom of the root zone, only a portion of treated stormwater runoff might have been

captured by the downstream autosamplers (sampling at 0.30 m below water surface) in the current study. Further, wind might have caused mixing and surface currents opposite to the flow direction, which could have resulted in sampling lake water downstream of the CFWs rather than treated stormwater runoff. Therefore, it is recommended in future experiments to determine the flow pathways between inlet and outlet sampling points beneath the CFWs by tracer techniques in combination with hydrodynamic modelling, before choosing the location and sampling depth of upstream and downstream autosamplers (Kadlec and Wallace, 2009; Khan et al., 2013). Since the hydraulic flow regime beneath the CFW largely depends on the root network that is growing and changing with time, tracer tests should ideally be repeated in regular intervals over the study duration. Further, single point water sampling increases the risk that samples are not representative of the “average” water composition passing beneath the CFWs, especially, if there are several inflows as for CFW 1. Spatial composite sampling from multiple locations would improve the accuracy of pollutant removal efficiency evaluation for CFWs, even if technically and logistically challenging.

3.5. Comparison with other treatment techniques

Currently, the BMPs suggested for stormwater treatment associated with large developments in Southeast Queensland are SFCWs and bioretention filters (Water by Design, 2010). For the stormwater treatment of a 45-ha urban development, a SFCW with a surface area of 1.8-ha to 3.6-ha or bioretention filters with a surface area of 0.45-ha to 0.9-ha would be necessary (Water by Design, 2010). As initially stated, the original planning foresaw a 2.6-ha SFCW, which was replaced with an urban lake and relatively small CFWs (total area of 2088 m² or 12.5 % of the required SFCW area) for stormwater treatment. In a comparison of international treatment facilities, Tondera et al. (2018) showed large differences in removal efficiencies for TN and TP in SFCWs and found no correlations between design, climate, and wetland maturation. There is no comparative study on the water treatment efficiencies of SFCWs, biofilters and CFWs. Further, there are no design guidelines for CFWs, and the study reported here is the first trial of large-scale CFWs in a lake treating urban stormwater runoff. Mean TN and TP ALRs of both CFWs in this study were comparable to previous CFW studies (Borne, 2013; Nichols et al., 2016) treating stormwater runoff (Table 1). While previous studies showed significant CREs for TN (Borne, 2013; Nichols et al., 2016) and TP (Borne, 2013), this was not the case in this study for TN and TP at both CFWs. This suggests that the CFW design in this study, specifically

CFW1, needs to be optimised to increase the active CFW treatment area and to improve the removal of targeted TSS, TN and TP, e.g., by rearranging CFW1. Further research is necessary to determine flow pathways beneath CFWs, assess optimal HRTs and CFW surface coverage ratio of the lake to meet the annual target pollutant load reductions required for BMPs in SEQ.

4. Conclusions

This is the first study to investigate large-scale CFWs for treating stormwater runoff during the construction phase of a greenfield urban development. The study evaluated the treatment performance of a lake section with CFWs (1) during storm-events; and (2) during dry weather periods. Average pollutant inflow concentrations in the mixed stormwater were low and had a high impact on the CFW performance metrics. No significant pollutant reductions were found during storm-events at the 11.5 m long CFW1 due to low pollutant concentrations in influent water, high flow velocities created by a nearby culvert, low hydraulic retention times in the root regions and difficulties to assess representative samples of inlet and outlet flows. In contrast, CFW1 showed significant TSS removal during dry weather periods with low flow velocities generated by the recirculation system. The 32.0 m long CFW2 showed significant TSS removal during storm-events and dry weather periods, but no significant reductions for TN and TP due to low influent concentrations. Despite low inflow pollutant concentrations, both CFWs were heavily loaded with TSS, TN and TP as a result of the high hydraulic loading rates during storm events. This study demonstrated that CFWs significantly reduce TSS concentration from construction runoff. However, under such loading conditions (high hydraulic load and very low inlet concentrations), substantially larger areas of CFWs relative to the flow rate and catchment area would be required to lower the areal loading rates. Therefore, this study highlights important treatment limitations associated to the operational conditions of CFWs at field scale that would not have arisen from a mesocosm scale study. The associated design recommendations are thought to contribute a first step towards improved implementation of CFWs at field scale. Further research is necessary to investigate the treatment performance of CFWs during the operational phase of the development when nutrient levels are expected to be higher. CFD modelling and tracer experiments were identified as useful methods to validate and improve storm event monitoring methodology and CFW design configuration.

CRedit authorship contribution statement

Peter F. Schwammberger: Conceptualization, Methodology, Software, Validation, Formal analysis, Data curation, Writing – original draft, Writing – review & editing, Visualization. **Katharina Tondera:** Conceptualization, Data curation, Writing – review & editing. **Tom R. Headley:** Data curation, Writing – review & editing. **Karine E. Borne:** Data curation, Writing – review & editing. **Catherine M. Yule:** Writing – review & editing. **Neil W. Tindale:** Conceptualization, Data curation, Writing – review & editing.

Data availability

Data will be made available on request.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

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More than 20 highly
dedicated individuals
meeting weekly since
August 2022;
researching and
identifying non-
partisan election
reform strategies for
Anoka County

PRESENTERS PROFILES

- Derek Lind—Ramsey, financial analyst
- Brenda Miller—Columbus, election judge, occ. Therapist,
- Paul Berndt—Coon Rapids, Manufacturing engineering
- Joe Richardson—Andover, election judge, power/energy in
- Lori Mahowald—Coon Rapids, election judge, operations,

Other Contributors

- Scott Coggins—Andover, election judge, IT & eLearning,
- Troy Cooper—Ramsey, financial services IT mgt. & small
- Jeannie Erickson—Coon Rapids, election judge, 30 yrs. A
- Lisa Henrickson—Linwood Twp., election judge, 37 yrs. st
- Gary Kemmetmueller—Coon Rapids, electronics technolo
- Robert Kirchner—Coon Rapids, 40 yrs., local gov't admin.
- Richard Klabecek—Oak Grove, applied math/manufactu
- Jonathan Liebsch—Ham Lake, election judge, software de
- Sue Peterson—Ham Lake, election judge
- Channing Stowell—East Bethel, M.I.T. Sloan School trainee
- Davin Tormanen—Vadnais Heights, 25 yrs. electronics tec
- Pam Weber—Andover, election judge, physical therapist

ANOKA COUNTY, MINNESOTA
ANOKA COUNTY ELECTION INTEGRITY TEAM (ACEIT)
(as of 10/7/2024)

Summary of Post-Election Review Requests

<u>Municipality</u>	<u>ACEIT Presentation</u>	<u>Municipal PER Passed</u>	<u>Precinct Scope</u>
Oak Grove	1/29/2024	4/29/2024	4 of 4
Nowthen	2/13/2024		
Ham Lake	3/4/2024	8/19/2024	1 of 6
Ramsey	4/23/2024	6/11/2024	6 of 9
East Bethel	5/29/2024	9/9/2024	1 of 3
Linwood	8/20/2024	9/10/2024	2 of 2
Anoka	9/3/2024	9/16/2024	2 of 8
Columbus	9/4/2024	9/25/2024	1 of 1
Coon Rapids	9/10/2024		
St. Francis	9/26/2024		
Lino Lakes	10/7/2024		
TOTAL			17 of 33

List of Resolutions to Terminate Poll Pad Use

Oak Grove	9/30/2024
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The Oak Grove Way

Last updated on Oct 1, 2024

City Council Opts OUT of Electronic Poll Pads

After [the April 29, 2024 decision](#) to **expand hand counting** during the upcoming Anoka County post election audit (mid-November 2024), the Oak Grove City Council tonight (September 30, 2024) made another decision in favor of simple and open elections: **by passing a resolution to opt OUT of using electronic poll pads.**

These KNOWiNK systems are not certified federally (only by MNSOS) and are connected to the internet during the election—sometimes throughout election day, which is why documentaries like *Let My People Go* have referred to them as the eyes and ears, capable of monitoring and *modifying* election data. Much is known about KNOWiNK now, but already in 2016, during the pitch to his municipality, a computer savvy mayor of a Hennepin-County municipality showed the product's vulnerability by hacking into the KNOWiNK poll pad within five minutes.

Cities that opt out will be able to use the always-available paper poll books to check-in voters—these paper poll books are already required by statute to be present at precincts.

What remains a concern for those interested in elections where voter rolls, voters, ballots, and tallies are verified, is **the problem of mail-in absentee ballots** which *could* get sent to voters on the voter rolls that are inactive. Once in the system, these ballots—despite being illegitimate—could become legal ballots. It is possible that initiatives like Guarding the Ballot (Minn Stat 209.05) could be a limited defense against such ballots, for any candidate regardless of party wishing to pursue that approach.

But for the moment, **the Oak Grove way, to 1) expand the hand count audit, and 2) remove electronic poll pads**, are both welcome steps from those advocating a return to locally-controlled, locally-managed, and locally-verified election systems and processes.

By Erik van Mechelen
MNSOS Candidate 2022
Writer of *[S]elections in Minnesota*

The Mystery Remains Unsolved...

- Post election reviews (PER), Minn Stat §206.89 are supposed to review ALL ballots
- Former Dakota County Elections Manager Andy Lokken sent below to Attorney Jane Volz shortly after 2020 PER
- Andy Lokken later said the tallies didn't match because the absentee ballots weren't available
- The absentee ballots were available for the previous 4 precincts in the PER (but not for Precinct 4950 - West St. Paul W-2 P-2)
- This certificate was also submitted and is public record in a Petition to State Board of Elections in 2020

Precinct: 4950 - WEST ST PAUL W-2 P-2						Dakota County
Office: U.S. President & Vice President						
Candidate Name	¹ Total Votes	² Total Hand- Counted Votes	³ Total Unadjusted Difference *	⁴ Total Explained Difference	⁵ Total Adjusted Difference	Explanation
Donald J. Trump and Michael R. Pence	376	193	185	1	184	0 PP: voter intent
Joseph R. Biden and Kamala Harris	912	247	669	2	667	0 PP: voter intent
Roque "Rocky" De La Fuente and Darcy Richardson	1	1	0	0	0	0
Howie Hawkins and Angela Walker	1	1	0	0	0	0
Kanye West and Michelle Tidball	3	1	2	0	2	0
Brock Pierce and Karla Ballard	4	2	2	0	2	0
Gloria La Riva and Leonard Peltier	2	1	1	0	1	0
Alyson Kennedy and Malcolm Jarrett	0	0	0	0	0	0
Jo Jorgensen and Jeremy "Spike" Cohen	10	8	2	0	2	0
BLANK FOR OFFICE	4	5	1	1	0	0 PP: voter intent
OVER / DEFECTIVE FOR OFFICE	7	4	3	3	0	0 PP: voter intent
WRITE-IN**	7	2	5	0	5	0
Totals	1327	485	870	7	863	0
Final Results	Difference of not more than 0.5%					0%
						ACCEPTABLE

65%

?

* Total Unadjusted Difference is the sum of Unadjusted Difference for polling place votes and Unadjusted Difference for absentee/mail ballot votes. It will not always equal the difference between Total Votes and Total Hand Counted Votes.

and all your consideration in every matter
thought &

HI I'm Sandy Honerbrink of 2318 75th St E, I G H.

Do you verify and balance your bank statement each month? WHY

Do you count your change at the Dairy Queen when you buy a malt? WHY

Do you double check your VISA purchases on your billing Statement each month? WHY

Well I know I do because you know that thing go wrong. Some errors are type-O's and some are fraud. Everyone knows that there is some fraudulent Voters and that computers are only as good as the programmer. We are human and we all drop the ball sometimes. We the people of I G H are asking that you the elected officials - to double check our ballots by hand counting and verifying the total in the programmed machines. I have worked in Accounts Payable for 30 years. I double check everything. I double check my 401K, my payroll check, my vacation, my bank statement, My Master Card, All my medical bills, my change at the Dairy Queen, and all my purchase on my receipts. I find error in everything. Just last month I had to 2 fraud charges of \$75 each on my Master Card. I wouldn't have found it if I didn't double check all my charges, with all my receipts, every month. This election is every 4 years and we All want verification of our ballots. We the people of I G H all want the correct count and the correct person in the correct office. So let us hand count the ballots and verify the machine and ~~appentive~~ totals.

Verisy

*Thanks for All
your hard work*