CITY OF NORTH OAKS

Regular City Council Meeting City Council Meeting
Thursday, July 16, 2026
6:00 PM, City Council Chambers are at 100 Village Center Drive, Room 150, North Oaks, MN 55127

MEETING AGENDA

Remote Access - *One or more members of the City Council may attend the meeting via interactive technology and others will participate in person in Council Chambers (Community Room, 100 Village Center Drive, Suite 150, North Oaks, MN) during the meeting. Members of the public are welcome to attend. Any person wishing to monitor the meeting electronically from a remote location may do so by calling the following Zoom meeting videoconference number: 1-312-626-6799, Webinar ID: 851 5235 3794 or by joining the meeting via the following link: https://us02web.zoom.us/j/85152353794.*

1. **Call to Order**

2, **Roll Call**

3. **Pledge of Allegiance**

4. **Citizen Comments** - *Members of the public are invited to make comments to the Council during the public comments section. Up to four minutes shall be allowed for each speaker. No action will be taken by the Council on items raised during the public comment period unless the item appears as an agenda item for action.*

5. **Approval of Agenda**

6. **Consent Agenda** - *These are items that are considered routine and can be acted upon with one vote.*

6a. Licenses for Approval:
Arborists:1-2 Tree Lawn & Landscape

Mechanical: Comfort by Design; Easco Plumbing Heating & Air; Genz Ryan Plumbing and Heating Co.; Majestic Custom Heating & Air; North State Mechanical LLC; O'Boys Heating & Air; Spriggs Mechanical Inc.; The Fireplace Guys; The Snelling Company

6b. Approval of 6.11.2026 and 7.1.2026 City Council Minutes
6.11.2026 Council minutes Draft.pdf

7.1.2026 Council minutes Draft.pdf

6c. Resolution approving conditional use permit for a sign for a property located at 100 Village Center Drive
BN REV 2026-07-16 CC PACKET 100 Village Center Drive.pdf

6d. Resolution approving variance for septic system for a property located at 2 Crocus Lane
2026-07-16 CC PACKET 2 Crocus Lane.pdf

6e. Approval of City Financials
EFT: 1305E-1322E Checks: 16297-16335
Check Register Summary.pdf

July Check Register.pdf

July 2026 Budget Actuals.pdf

July 2026 Financial Charts.pdf

7. Petitions, Requests & Communications - *Deputy Craig Lydon Report*

7a. Deputy Lydon - Monthly Public Safety Report
JUNno26.pdf

8. Unfinished Business

9. New Business

9a. Discussion and possible action on amending annual meeting calendar

9b. Discussion and possible action on NOHOA roadside vegetation policy
Roadside Vegetation Management Policy .pdf

Vegetation Management Diagram 060526.pdf

9c. Discussion and possible action on purchasing generator for Public Works

9d. Discussion and Possible action on future City Hall Lease and City Hall/NOHOA office space options

9e. Convene in closed session to discuss pending litigation regarding 2025 System Statement appeal, pursuant to Minn. Stat. § 13D.05, subd. 3(b

9f. Discussion and possible action on proposed settlement stipulation regarding 2025 System Statement appeal
Stipulation_of_Settlement_North_Oaks_Met Council.pdf

10. Council Member Reports

11. City Administrator Reports

12. City Attorney Reports

13. Miscellaneous

13a. City Forester Report
June in Review.pdf

14. Adjournment - *The next meeting of the City Council is Thursday August 13th, 2026.*

North Oaks City Council
Meeting Minutes
North Oaks City Council Chambers
June 11, 2026

1. CALL TO ORDER

Mayor Wolter called the meeting to order at 7:00 p.m.

2. ROLL CALL

Present: Mayor Krista Wolter, Councilors Mark Azman, Andrew Gaspard, Sara Shah and Grover Sayre
Staff Present: Administrator Kevin Kress, Attorney Bridget Nason, City Engineer Jupe Hale, and City Planner John Uphoff (remote)
Others Present: NineNorth Videographer Kenny Ronan
A quorum was declared present.

3. PLEDGE OF ALLEGIANCE

Mayor Wolter led the Council in the Pledge of Allegiance.

4. CITIZEN COMMENTS

- Susan Alderness, 15 Oriole Lane, lived in North Oaks for 8 years, but husband grew up here. Very interested in recent news articles on City sewer and water discussions and hopeful to keep residents informed and conversation going. Was surprised to read that 150 properties still have cesspools. Wondered if grandfathered in or if initiatives can be taken to get them on septic.

5. APPROVAL OF AGENDA

MOTION by Azman, seconded by Shah, to approve the agenda.
Motion carried unanimously.

6. CONSENT AGENDA

6a. Approval of Licenses:
Arborist: Aaron Boyd's Tree Service LLC
Mechanical: Air Craft Mechanical LLP; Craig's Heating and Air; Northland Mechanical Contractors Inc;
Summit Heating & Air Conditioning
General Contractor: Construction Results Corporation
6b. Approval of City Financials
EFT: 1281e-1292e
Checks: 16260 – 16292
6c. Approval of meeting minutes of 5.14.2026 City Council Meeting
6d. Approval of Resolution 1595 Supporting Establishment of Ramsey County Economic Development Commission
6e. Approval of Hill Farm Fest Liquor License

MOTION by Azman, seconded by Shah, as amended with the inclusion of the Hill Farm Fest Liquor license.
Motion carried unanimously.

7. PETITIONS REQUESTS & COMMUNICATIONS

7a. Deputy Lydon summarized activity from the past month:

- Has noted a lot of tree damage out there with storm clean up. There were recent Flock successes. At the end of last month there were 3 arrests made in the 20 block of Hay Camp, which involved performing a high risk stop using data from Flock.
- Yesterday, a stolen vehicle off Centerville Road entered community. LRP Flock picked up the alert and they were arrested coming out of the East Oaks entrance. There were several firearms found in vehicle as well.
- Recent public dumping at beach, citizen took images and were able use images, and Flock to identify the person. Citations will be issued soon.
- Has had contact with e-bike users to inform them of regulations of age, helmet requirements, and license required for various type of power bikes.
- Illegal fishing continues to be active in the City. CSO officers have been used to help curb the issue. Today found a few adults that were not residents, they were trespassed and licenses entered into Flock. If they come back Flock will trigger, and they will be arrested.
- Lydon will look at getting information in North Oaks Newspaper regarding e-bike requirements. Safety is the primary concern with the speed of e-bikes, kids don't have the training and won't be as safe as need be which is a safety concern. City will also push it out on eblast when City gets the electronic information to share with residents.
- Wolter mentioned the Centerville Road stolen car incident all happened extremely quickly. Sheriff patrol cars took position in the entrances and then sent unmarked cars into North Oaks to look for it. He noted that it took a few minutes to set up entrances but then were able to find them and they were compliant when arrested at the East Oaks exit.
- Shah asked Lydon how the speeding looks in the community with more bikers on the roads this summer. Shah asked for additional focus on speed enforcement. Lydon mentioned that residents are encouraged to let him know where the hot speeding spots are. She noted that North Oaks Road speeding is a consistent complaint, as well as Hay Camp and Pleasant Lake Road. Lydon noted that safety is his priority so he's happy to switch up on occasion. Wolter mentioned by the Golf Course is also a good spot for speed enforcement.

7b. Nine North Internet Franchise Broadband Update

- Mike Bradley, a lawyer at Bradley Werner, represents Nine North and the North Suburban Cable commission for 20+ years. Nine North is the providing cable/video support for North Oaks Council and Planning Commission public meetings.
- He was in attendance to share a new development in broadband franchising law. There is a new opportunity for local governments to franchise for cable commission companies. Potential benefits include:

    - Nonexclusive franchise, broadband franchise, compliance with City code, equal access to broadband, open access service provider franchise requirement, 15-year term, reasonable buildout timeframe within the City, annual meetings of City, Commission and provider to review ongoing access.
- A franchise is authorization from a local government entity to a company to use the public rights of way to provide services to area residents.
- If the City decided to franchise, it would ensure all residents have equal access to broadband service. Reasonable buildout time period within the City. Some residents still do not have broadband to home.
- Other benefits: good customer service provisions with someone to call for help, disabled and senior discount of no less than 10%, franchise fee is for use of the property.
- The benefits in the first broadband franchise are far superior to permitting.
- He is requesting the City gives approval to allow broadband. He clarified that this would be a non-exclusive franchise. Other competition would still be there, but the City franchise would be required to comply with all local laws, do repairs, etc. These are wired lines fiber to the homes, not wireless.
- Kress noted that our City of North Oaks is different in that we do not have public roads, and NOHOA has easements and right-a-ways. So those easement rights would need to go through NOHOA. No action taken.

8. UNFINISHED BUSINESS

No unfinished business.

9. NEW BUSINESS

9a. Public Hearing - Discussion and possible action on Ordinance amending the 2026 Fee Schedule for water/sewer utility rates. Review of rate study analysis from Ehlers

- Jeanne Vogt from Ehlers Financial noted that the last City Council meeting they presented the utility rate study for sewer and water with a new proposed rate structure. Highlights: cohesive rate structure across City, promotes conservation, balances who uses and who pays for the system, balances between fixed and variable costs of the system. Both funds are healthy and set the stage for future capital projects.
- For residential water - Single rates structure for all North Oaks Rate Payers, a single base rate of $72.41, plus a three tier water consumption rate. Tier 1 accounts for essential usage up to 20,000 gallons. Tier 2 is 20,000 – 90,000 gallons which typically include irrigation and car washing. Tier 3 targets usage of 90K and more and would effect those who should be conserving more.
- Commercial water has a 2 tier rate structure: Tier 1 is up to 90,000 gallons and Tier 2 over 90,000 gallons.
- No tiering recommended for commercial irrigation since non-essential.

- For Sewer: proposed base fee of $50.14 per quarter for all sewer users, with $5.60 per 1,000 gallons for both residential and commercial. Average water consumption is 15,000 per quarter, so we have calculated "sewer only users" an additional flat $84.00.
- Fixed costs of system include items such as public works staff, insurance infrastructure repairs. The consumption charges are to cover the water / sewer usage flow charges the City receives from White Bear Township and Shoreview.
- Future Capital projects:
    - In the Water fund: $25,500 hydrant painting, and a placeholder of $25,000 in 2025 and 2027 for unexpected expenses.
    - For sewer fund: – 2027 - $50,000 for a used generator. There are 5 lift stations which need in maintenance – in 2027 repair 3 lift stations at 100,000 a piece. In 2030, repair 4th at $100,000 and 2031 repair 5th at $100,000.
- Additional Operating expenses – included $30K shared expense for on-call wages in 2026, $60K share expense for 2027 and beyond. 121% increase in MCES charges for sewer in 2027 – this is a Met Council increase.
- For lift station repairs in future: Recommend internal loans between water and sewer funds as are a common practice in cities. City would pay itself back and include interest rate to recoup lost investment income internally, instead of a bond.
- Currently not recommending rate increases in water for 2027.
- Next steps: 1) discussion/ approve new rate structure for 2nd Quarter water/sewer rate structure. 2) Recommend 1 year look back 3) continue conversations with NOHOA on street and capital projects.
- Gaspard happy to see a consolidated rate structure and look at what costs might be ahead of us. He would like additional information on the billing breakdown for expenses year over year and what makes that up. He also asked for a 2024 vs. 2025 estimated change year over year. Gaspard also asked if could get a 2024 vs. 2025 charge breakdown between the 2 sides of the city. Jeanne mentioned that White Bear township revenue & expenses have changed due to North Oaks taking over the billing and maintenance for all infrastructure. Jeanne noted that she can provide that data for Shoreview side only, as we don't have access to White Bear township utility data.

MOTION by Azman, seconded by Shah, to open the public hearing at 7:58 p.m.
Motion carried unanimously.

- There were no comments for the public hearing.

MOTION by Sayre, seconded by Azman, to close the public hearing at
Motion carried unanimously.

- Kress noted that will need to factor in White Bear Township and Shoreview rate increases at the beginning of the year, in addition to the annual look back.

MOTION by Gaspard, seconded by Sayre, to approve Ordinance 158 2026 Fee Schedule and Resolution 1596.
Motion carried unanimously.

9b. Discussion and possible action on amending the City's annual meeting calendar

- Kress noted he would like to change the July City Council meeting to the following week July 16th at 6 p.m. to allow time for packet preparation.
- Would like to conduct a workshop to discuss City Hall lease on Wednesday July 1st at 5:00 p.m.
- For September would also like to look at September meeting to discuss budget workshop, as there is a deadline for workshop. Target September 23rd at 6:00 p.m. with primary objective of budget discussion to set ceiling.

MOTION by Azman, seconded by Gaspard, to Amend annual meeting council as discussed with Council workshop on July 1st at 5 p.m., the next regular Council meeting shifted to July 16th at 6:00 p.m. and September Council meeting on the 23rd at 6:00 p.m.
Motion carried unanimously.

10. COUNCIL MEMBER REPORTS

- Gaspard stated that the NOHOA Natural Environment committee (NEC) has commissioned an environmental study for the City, with focus on NOHOA on land, and how to manage it going forward and improving habitat. This is 10% of all the land in North Oaks. Will have community outreach sessions.
- Sayre noted that the independent North Oaks Foundation fund has been launched and is raising funds. The foundation may choose to donate funds to assist in water quality analysis, or the quiet train horn initiative. He has also been gathering data on future of City Hall.
- Wolter reminded all citizens to wear light colors when out walking and biking on the roads.
- Shah stated they are in final stages of monitoring plans for Pleasant Lake task force. May see VLAWMO and Regional Water and Barr consultants taking samples on the lake for a fall report. She thanked the foundation for the rapid response in providing funds to make up the shortfall in the monitoring phase.
- Azman stated the new fire station is looking good. The Building Official issued temporary Certificate of Occupancy today and they will begin moving in as they complete the final issues. Currently putting in epoxy flooring, lighting and more. Will begin moving equipment from the Turtle Lake station on Monday and finishing tech items. Next week equipment will be moved from Station 140 on Victoria Street which is being decommissioned. The plan is to be up and running at the new main station by July 4th. Soft opening in July, with a more public opening at the end of July/early August. The project expects to come in under budget and on time.

11. CITY ADMINISTRATOR REPORTS

- Engineer Jupe Hale mentioned the road committee had a lot of debate on policy recommendation for clearing of roadsides. He had noted a different larger width on roadsides and corners for safety than what is being put forth by NOHOA. The NOHOA

recommendation has a smaller width and maintains legacy trees. He will put together the official recommendations, so it is available. The fire department has asked for 16 feet height cleared over the road (to allow for weight of branches to drop and not catch their 14 feet high trucks. The NOHOA proposed policy states 16 height, with 8 feet high section within 5 feet off pavement. Wolter would like to see Fire Department weigh in on the policy now that it has been drafted.

- The NOHOA recommendation will be brought to NOHOA Board in August.
- Hale recommendation was 16 feet high and 10 feet back. 5 feet of mowed off road with 5 feet bale out destination. i.e. 16 x 10 feet. If City adopts safety standards it reduces City liability and increases safety.
- Wolter mentioned that Mark Houge, North Oaks Company, had felt that North Oaks is more like a National park which has a 9-foot standard.
- Administrator Kress also noted that electrical lines are a big concern, especially with trees down and power outages. Xcel has noted that it is difficult to work in North Oaks and how much money is spent doing maintenance and repairs. Kress mentioned the City needs to push a lot harder on Xcel to bury the lines, and suggests escalating a meeting with Xcel. Kress will work with attorney, North Oaks Company, to see if can get a good contact. It was noted that NOHOA President Andrew Hawkins may have a good contact.
- Azman noted that he was more inclined to take a more measured approach of 6-8 feet back and 16 feet up, and keep legacy trees. He is concerned that Engineers more aggressive position is representing City, but he's on a more conservative view. Shah would like to review with all key players involved. NOHOA has the lead since they have easement rights, the City does not. The policy would ask homeowners to clear brush and effect trees which could be difficult. The City abatement process is very long and difficult.
- Hale noted that his license requires him to make recommendations on safety. He will plan to provide his recommendations to the City Council, but then the Council can make own statement from there to NOHOA.
- Kress noted that this topic could be added to the July 1st Council workshop for discussion. City can put together own visuals and recommendations.
- Hale also mentioned feedback on speed signs has been presented to road committee. Received a favorable bid on this and 2-3 have the signs in hand and ready to install. It is already budgeted and lower than expected.
- Kress noted they are close to signing off on Charley Lake Condominium Association well turn over agreement.
- Administrator Kress working with NOC to split road section by the Centerville Road roundabout to create 2 RLS, so they can be owned by 2 two diff parties. There is another parcel on Gilfillan that is 2 lots, looking to combine into 1 RLS which would create the buildable lot. They are 2 non-conforming lots - the logical thing to do is to combine into 1. No process to do this. Third parcel is by the Charley Lake Townhome well to split parcel. Requested Council approval to do this administratively.
- He noted that recycling event on Saturday June 27th could use Councilor assistance between 8 – Noon.
- Kress provided brief status updates on: LPR Contracts; 1400 seedlings distributed; 35 brush pick up homes; Save dates: NOGC Fireworks 6/13, Recycling Day 6/27, Night to Unite 8/4, Farm fest 9/13.

12. CITY ATTORNEY REPORTS

- Attorney Nason no report.

13. MISCELLANEOUS

13a. City Forester Report

- May report included in meeting packet.

14. ADJOURNMENT

The next regular meeting of the City Council will be July 16, 2026 at 6:00 p.m.

MOTION by Gaspard, seconded by Azman, to adjourn meeting at 8:55 p.m. Motion carried unanimously.

_____ _____

Kevin Kress, City Administrator Krista Wolter, Mayor

Date approved_____

North Oaks City Council
Meeting Minutes
North Oaks City Council Chambers
July 1, 2026

1. CALL TO ORDER

Mayor Wolter called the meeting to order at 5:00 p.m.

2. ROLL CALL

Present: Mayor Krista Wolter, Councilors Mark Azman, Andrew Gaspard, Sara Shah and Grover Sayre
Staff Present: Administrator Kevin Kress, Attorney Bridget Nason, City Planner Kendra Lindahl
Others Present: Guest – Steve Chirhart with TaTonka Real Estate Advisors
A quorum was declared present.

3. PLEDGE OF ALLEGIANCE

Mayor Wolter led the Council in the Pledge of Allegiance.

4. APPROVAL OF AGENDA

MOTION by Gaspard, seconded by Shah, to approve the agenda.
Motion carried unanimously.

5. NEW BUSINESS

5a. Discussion and possible action future City Hall Lease and City Hall office space

- Steve Chirhart with TaTonka Real Estate Advisors has been meeting with City Hall Task force for the past year to review options for City Hall/NOHOA office staff. The task force includes City Administrator, Councilors Azman and Sayre, 2 NOHOA Board members, and City staff.
- He compiled a presentation on the current City Hall/NOHOA office lease and potential future options. The presentation is included in the meeting agenda packet.
- Summary of what areas have been researched for City Hall:
    - All commercial parcels in the entire Village center area
    - Reviewed Cherokee Bank, Walgreen's agreements which had no future plans to move or close.
    - The vacant parking lot at the end of 100 Village Center Drive was not big enough to building necessary square footage with the required parking spaces.
    - At the current building, in the last 9 month, landlord has completed lease's in both lower level and upper level open space, which has filled formerly open spaces.
    - Other options – West Rec and East Rec, however that is not desired as would bring public traffic on private roads into community.

  - There is a piece of land on Hodgson Road between Incarnation Church and Chippewa Middle School. Would need negotiation with both parties.
  - In the far Northeast corner was the Tria professional building – 1st floor banquet space, and 2nd floor North Oaks Company (NOC) and Michel construction. The company was open to discuss, however location furthest from the front community for both public and contractors. NOC also owns as daycare center, but too tight on parking required for a City Hall.
  - There is the new Wilkinson Waters Development north of Rapp Farm, which is technically is Lino Lakes, but City would need to annex land.
  - On Centerville Road, in front of Hill farm condo's a vacant lot.
  - There are single story options at 200 Village Center and 400 Village Center. The dermatology center has outgrown in the 400 Village Center building adjacent to Walgreens, and will be moving out Feb. 2027.

- The Task Force has determined focus should be on retail village center corner as the forefront of the Community, a commercial area with exterior access for the public.
- Benefit – closer to Hodgson Road / Village Center Area should be focus.
- In the current City Hall lease, there is 4888 square feet. The space on 2nd floor has been remodeled but office space is tight, with people without office/desk space. There is a 5-year renewal option, however landlord is still not willing to allow City to hold elections in the Community Room. The landlord is not willing to discuss the next 5 years after that.
- In the 400 Village Center Drive building: Total 4713 sq feet with office on 1 side, with a shared conference room, breakroom, storage with NOHOA. Conference chambers would be across the hall – with secondary small conference room off the chambers. Visitors would access the City Hall from the exterior of building through main floor. NOHOA entrance from within interior hall of building.
- Council entrance would be off main hall lobby, with public chambers, and an exterior door for handicap accessible.
- Financial model: 5-year lease with current lease vs. with 5-year lease at 400 building. On behalf of the City, Chirhart has been through 4 rounds of negotiations with Pratt (the owner of the 400 Village Center building) to come up with rates for a potential move to the 400 Village Center building. Base rent $15.50 with 3% escalation. There is a 10 year lease requirement. $70 per foot tenant allowance for building. Our build out is estimated at $85 per foot. There is 6 month of rate abatement – net rent and tax and operating cost. The 6 month abatement comes out about to cover the shortfall to offset the construction costs. Due to the current 4288 sq. feet increasing to 4713 sq. feet, cost will be larger. The current operating costs are slightly less than the 200 and 400 building, primarily because the buildings are fully occupied and the tax valuation noted accordingly. Now that 100 has increased its tenant occupancy, the tax value

will likely go up as well. Pratt has given us a right of 1st offer if they decide to sell the building. They have also offered the 1st right of refusal if there is any room in the building that becomes open.

- The cost of the build out has been estimated working with City staff on our current requirements– and feels that the $85 per square foot is a good estimate.
- This gives option to meet office needs for City and NOHOA, but none of the site allow for expansion into public works garage or anything. If we were to build a building ourselves for 5,000 square foot that meets office needs, could also cover our storage and public works needs. A build to suit opportunity brings those 2 together. Need to project a 15 – 20 year plan on our long-term strategic needs.
- For new construction – mid/low high range projection is $285 per sq. foot. Land cost: would need about an acre of land to give a 5000 building with required parking ratio and a 1,500 square foot expansion. All in with land could be $1,686,000 - $2,500,000 on the upper side. $22.40, - $34.08 per square foot at the higher range WITHOUT land. The City might have opportunity to be property tax exempt for land.
- Owning will be more expensive up front, but after 20 years it will be paid for. Just operating costs. After 20 years debt service will be retired, and occupancy costs will be operating costs and maintenance repairs only. Our net costs go down to $12.30 - $18.72.
- Chirhart reviewed chart with a cost comparison of lease vs. own.
- Still pay tax and operating for all 3 locations 100 Village Center Drive, 400 Village Center Drive, and Building to suit. Could possibly be land tax exempt.
- Next Steps and dates: Existing Lease expires May 2027. Requires 180 day notice if want to accept 5 year renewal. Lease agreement must be done and agreed upon 30 prior to lease expiration. Bottom line, must make that decision by 11/30/2026 if staying in current building for another 5 years. Elections would not be allowed here during that period.
- If go to 400 Village Center, the Dermatology office lease expires 2/28/2027. 90 days construction window would need to start immediately on March 1, for us to be in by May 2027 when our current lease expires. It would be tight, but possible.
- Would need 120 day timeframe if make decision to stay which is November 2026. Would want final bid with finishes if decide to move forward with a move to 400 building. Lease vs. build to suit: if there were an option to buy existing building that would fall in the middle. The answer to possible sale of existing 100 Village Center building to City has been hard no.
- Comparison of costs if sizes are equal at 4,712 RSF for both leased buildings – it's a bit more over the 1st five years to move, but overall it is about the same.
- The decision is what is best fit for the City long term, as lease rates are comparable. The Pratt landlord is a friendly and easy to work with, however it is a 10 years commitment.

- If build to suit, a 24-month lead time is recommended to complete the planning process with an anticipated construction schedule of 12-14 months being desirable.
- Mayor Wolter thanked Mr. Chirhart for the thorough detailed analysis, looking at all the options.
- Sayre noted that he has worked together with Steve over many years, his expertise in the Commercial real estate industry is incredible. He has investigated all the options and condensed into a simplest form.
- Chirhart noted that that City is tight on existing space – we are short 2 offices currently. The new space provides the additional staff space. There is not much more room for negotiation at the 400 building.
- Shah asked about the public works component which is new since the task force research started.
- Kress noted that neither 100 or 400 is going to accommodate any truck space or garage. The options only address staff space.
- A space that might work is a field at Southpoint park. Exterior access, build to suit, want all staff to be in the same building – include City Staff, public works, and NOHOA. NOHOA owns the Southpointe property and would need to sell a small portion of the property to the City. That would accommodate future strategic growth.
- Councilor Sayre noted the easy fix for staff is right down the road at 400 Village Center, however still nomads and will be paying someone else a lot of lease money for another 10 years. What happens after that? If want to build, it's going to cost more – but it works long term for the City. Should City leadership be thinking long term for the long-term benefit later. No longer nomads. If possible, feels as leaders, Council decision to go long term.
- Mayor Wolter stated if moving and renting again, would rather not have that extra 5 year duration, and do a long term fix.
- Councilor Shah doesn't feel leasing fits long term. We don't have control and throwing money out the window. Doesn't like that we don't have a solution for public works. It is not going away so prudent to address it.
- Councilor Gaspard feels that public works is a different space than City Hall. The current office market is distressed in other segments, but not in North Oaks which is very limited in office space. May be difficult to negotiate much on lease, and there is not a current option to purchase a building in our area.
- Chirhart commented that if need to find a 3,000 foot bay for public works, may be more cost effective to build in Shoreview or Roseville at a lower price.
- Chirhart noted that we realistically have 60 days to make decision on 400 Village center before they put in on the market. He anticipates the space would be taken quickly.

- Planning Commission Chair Dave Cremons noted that timing of the dermatology departure is very fortunate to find that space in a tight market. The research scope was initially not to include public works. Concerned about what neighbors would accept as commercial storage facility in the Southpointe field area.
- Alan Hummel from NOHOA stated that he appreciates the opportunity part to be part of the task force discussions. NOHOA Executive Director Amanda Mason noted that the space at 400 is tight, but doable. They agree that West Rec and East Rec is not an accommodating option, Southpointe would be taken to the NOHOA board for consideration for discussion. Wasn't sure if would need to go to a member vote or just NOHOA board. They have maintenance center, doesn't know if there is an additional room at Mel's to add on a garage for our City needs. NOHOA staff have options to work remotely temporarily if needed for a short period of time. They would take City decision to the NOHOA board for discussion.
- Azman favors the ownership route. Feels like leasing at 400 building is a shoehorn option and would be stuck for 10 years. Feels can make it architecturally pleasant for all. Perhaps stay in current space for 5 years, and get a chance to see if something could work with NOHOA during that period. Tends to favor a long-term ownership position.
- Wolter mentioned the land next door closer to 96 would help ease resident concerns adjacent to field. We are all in favor of sharing office and meeting space with NOHOA. Feels like long term solution for City and noted that a lot of things get pushed down the road. Planning wisely can help save the residents dollars over time.
- Shah noted we are 75 years down the road as a City, we are fully built out, and we still don't have a City Hall. Want to plan for 30-40 years. Is swaying to the ownership route.
- Azman noted that worth having discussions with NOHOA re: Mel's services and their long-term needs and whether bring into staff.
- Wolter would love to have maintenance facility off that space, wonders if can do something together.
- Chirhart noted that if stay in current lease, City is making decision to build to suit. If can get a bond, that would be huge cost benefit.
- Wolter noted that with just 5 years here, would need to move right into planning for a build.
- Public Works Director Triemert noted it makes sense to put roots in ground and see fit going forward. Will always have utilities and maintain. A City garage space removes current Public works items from own garage at home, and appreciates having the conversation on what that looks like going forward. Public Works might need additional staffing help and where does that go.
- Gaspard asked if possible to sublet if City moves to the 400 building and decides later to go a different direction. Chirhart stated that sublet is an option at the 400 building

however sublease would need to be in current space as built out to our specifications, otherwise there would be additional funds required to adapt the space for a sub-tenant. Gaspard felt that leasing allows for more dynamic flexible needs since there are so many unknown factors. Gaspard noted that we need a space for City staff and for public to come. Leasing allows flexibility, but agreed that need to make the decision sooner rather than later.

- Sayre noted that our City is not looking to "grow" as a large expansion, pretty set on space requirements. Need to space forecast ahead of time.
- Wolter noted it is a waste of resident's dollars to rent.
- Sayre noted next steps: NOHOA land, can't just sit on it without researching further. Would like to perhaps have a closed-door session on our legal rights for purchasing.
- Chirthart notes that we need to make decision in next month & ½.
- Administrator Kress noted he cannot think of any City that does own their City Hall building.
- Council will discuss again at the next 7/16 meeting.
- Sayre noted that we have a great city built by past leaders, feels like may be time to build own house.
- City Clerk Stephanie Marty noted that we have done this for many years, leasing uses resident's money – nothing there to show for it. There are other current costs that could potentially be offset with own space such as our recycling bin storage fee. The 400 Village Center building lease would be another temporary solution.
- Kress noted importance of being open-minded as continue discussions.

6. **CITY ADMINISTRATOR REPORTS**

- No report.

7. ADJOURNMENT

The next regular meeting of the City Council will be July 16th at 6:00 p.m.

MOTION by Gaspard, seconded by Shah, to adjourn meeting at 6:40 p.m. Motion carried unanimously.

_____ _____

Kevin Kress, City Administrator Krista Wolter, Mayor

Date approved_____

CITY OF NorthOaks
Building on a tradition of innovation

PLANNING REPORT

TO: North Oaks City Council

FROM: Kendra Lindahl and John Uphoff, City Planners
Kevin Kress, City Administrator
Bridget McCauley Nason, City Attorney
Jupe Hale, City Engineer

DATE: July 16, 2026

RE: Conditional Use Permit at 100 Village Center Drive (city file 26-6)

Date Application Submitted	April 8, 2026
Date Application Determined Complete:	April 13, 2026
Planning Commission Meeting Date:	July 1, 2026
City Council Meeting Date:	July 16, 2026
60-day Review Date:	June 7, 2026
120-day Review Date:	August 6, 2026

REQUEST

Spectrum Sign Systems, Inc. has requested approval of a Conditional Use Permit for the installation of a 66.4 square foot illuminated tenant wall sign on the west elevation of the existing building. This item was originally scheduled for a public hearing at the May 28th Planning Commission meeting, which was cancelled. The public hearing notice was reposted for the July 1st meeting.

PLANNING COMMISSION REVIEW

On July 1, the Planning Commission voted unanimously to recommend approval of the request. Other than the applicant, there was no one present to speak on this item.

BACKGROUND

This site is currently developed with a two-story multi-tenant office building.

Zoning and Land Use

This 3.067 -acre property is guided Commercial and is zoned Commercial/Service District (CS).

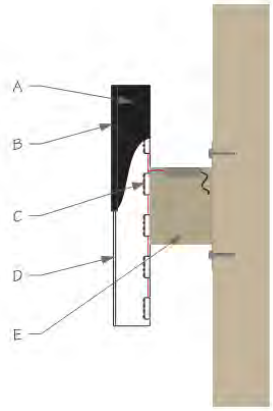


Figure 1 - Subject Parcel

PLANNING ANALYSIS

The applicant is requesting approval of a CUP to allow a 66.4 square foot wall sign on the west side of the building.





Furnish and Install (1) 38.25" x 250" LED Face Illuminated Raceway Mount Channel Letter Set (66.4 SF)

A. 3" Deep ALuminum Returns Finished Black
B. 1" Black Trim Cap
C. High Intensity White LEDs
D. White Acrylic Face Decorated with First Surface 3M Perforated Black Vinyl
E. Aluminum Raceway Painted SW 7711 Pueblo
-Attached to Wall with Lag Bolts at Stud Locations

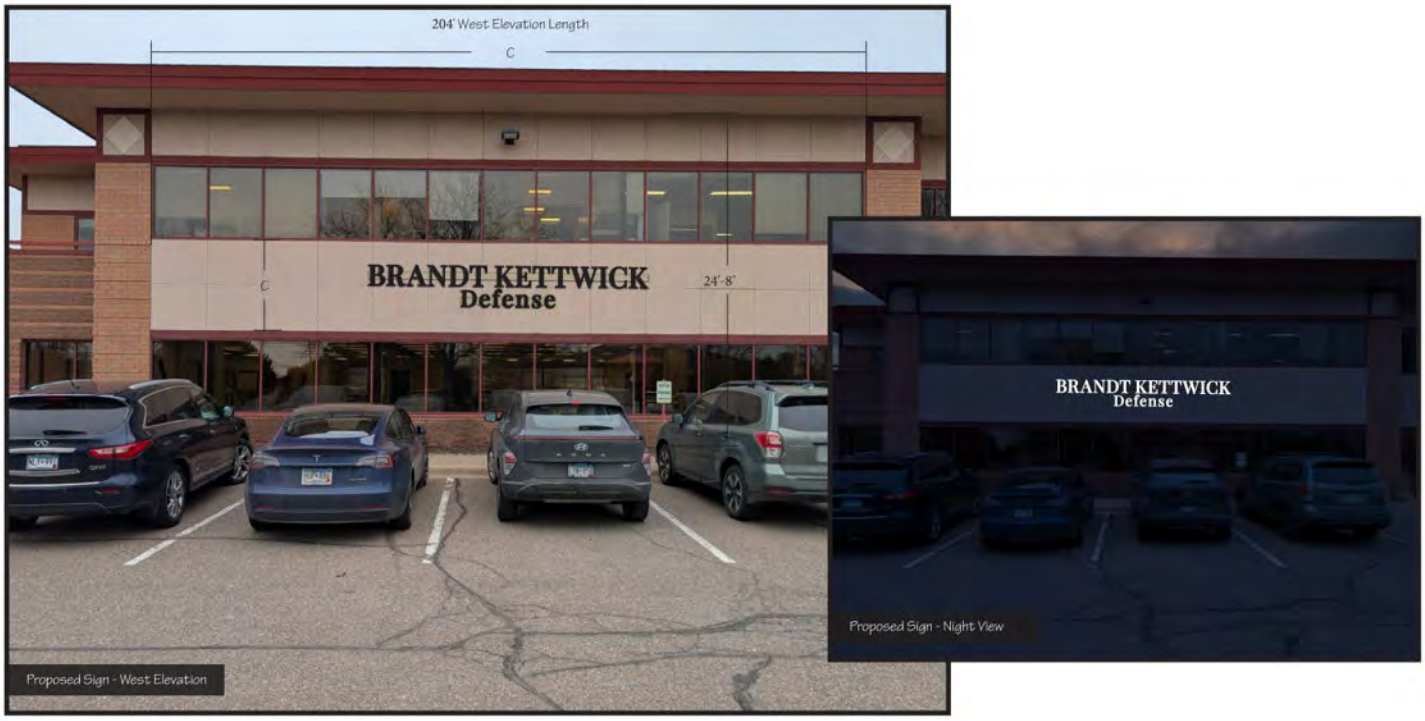


Figure 2 - Sign Specs

Section 151.058(M) of the City Code allows multiple-tenant retail building signage as a conditional use, subject to the factors set forth in Section 151.050(D)(4) and Section 151.058(M)(3) of the City Code. In addition, the proposed sign is subject to the general conditional use requirements in Section 151.076(C). Specifically, the City Code requires compliance with the following:

(a) Signage will be limited to tenant marquees on the road and street side of the building, depicting only the name of the tenant. Building signs advertising products are prohibited;

Complies. The sign is located on the tenant marquee, depicts only the name of the tenant, is on the street side of the building and does not advertise products that are prohibited.

(b) Lettering size will be limited to individual letters, 2 feet in height for all upper case and lower-case letter combinations, with a 2.5 foot maximum for upper case text including ascenders and descenders;

Complies. The letter size is a maximum of 18.875 inches in height.

(c) Tenant signage is limited to only the store front area occupied by the tenant;

Complies. The tenant signage is proposed for the store front area occupied by the tenant.

(d) All tenant signs will correspond to the sign plan submitted by the builder/owner, which will contain consistent materials and illumination for all signage;

Complies. The tenant sign is replacing a sign that was already in place and contains consistent materials and illumination.

(e) The height of the sign or device does not exceed the height of the principal structure or the structure to which it is affixed;

Complies. The height of the sign does not exceed the height of the structure to which it is affixed.

(f) The architectural style and design shall not be so dissimilar to the surrounding buildings or area so as to adversely impact other land;

Complies. The architectural style and design is not dissimilar to the surrounding buildings or area.

(g) There are no moving or flashing parts and any illumination shall be in compliance with Section 151.031 of the City Code;

Complies. There are no moving or flashing parts and the illumination is in compliance with Section 151.031 of the City Code.

(h) The sign or device is permanently fixed to the land or to a building or structure;

Complies. The sign in permanently fixed to the building.

(i) The sign or device is not a billboard and is associated with the principal use of the land;

Complies. The sign is not a billboard and is associated with the principal use of the land.

The general conditional use permit standards have been met. Section 151.076 of the Code states, “The purpose of this section is to provide the city with a reasonable degree of discretion in determining the effect of certain designated uses upon the general welfare, public health, and safety.”

The Planning Commission shall consider the effect of the proposed conditional use and whether additional requirements may be necessary to reduce any adverse effects. Consideration shall be given to, among other things, the following factors:

(1) Relationship of the proposed conditional use to the Comprehensive Plan;

The proposed sign does not change the use of the property.

(2) The nature of the land and adjacent land or building where the use is to be located;

The proposed sign does not change the nature of the land or adjacent land.

(3) Whether the use will in any way depreciate the area in which it is proposed;

The proposed sign will not depreciate the area.

(4) The effect upon traffic into and from the land and on adjoining roads, streets, and highways;

The proposed sign will not affect traffic into and from the land on the adjoining roads, streets, and highways.

(5) Whether the use would disrupt the reasonable use and enjoyment of other land in the neighborhood;

The proposed sign will not disrupt the reasonable use and enjoyment of other land in the neighborhood.

(6) Whether adequate utilities, roads, streets, and other facilities exist or will be available in the near future;

Adequate utilities, roads, streets and other facilities exist on the property.

(7) Whether the proposed conditional use conforms to all of the provisions of this chapter;

The proposed sign conforms to all of the provisions of Section 151.058 of the City Code.

(8) The effect upon natural drainage patterns onto and from the site;

The proposed sign does not affect the natural drainage patterns onto and from the site.

(9) Whether the proposed use will be detrimental to or endanger the public health, safety, comfort, convenience, or general welfare of the neighborhood or the city;

The proposed sign is not detrimental to, nor does it endanger the public health, safety, comfort, convenience or general welfare of the neighborhood or the city.

(10) Whether the proposed use would create additional requirements at public cost for public facilities and services and whether or not the use will be detrimental to the economic welfare of the neighborhood or city; and

The proposed sign will not create additional requirements at public cost for public facilities or services and will not be detrimental to the economic welfare of the neighborhood or city.

(11) Whether the proposed use is environmentally sound and will not involve uses, activities, processes, materials, equipment, and conditions of operation that will be detrimental to any persons, land, or the general welfare because of excessive production of traffic, noise, smoke, fumes, wastes, toxins, glare, or odors;

The proposed sign will not involve uses, activities, processes, materials, equipment, and conditions of operation that will be detrimental to any persons, land, or the general welfare because of excessive production of traffic, noise, smoke, fumes, wastes, toxins, glare, or odors.

Attached for reference:

Exhibit A:	Location Map
Exhibit B:	Applicant Narrative dated April 8, 2026
Exhibit C:	Sign Plans received April 8, 2026
Exhibit D:	Resolution approving the Conditional Use Permit

ACTION

Move to approve the resolution approving the Conditional Use Permit at 100 Village Center Drive, as recommended by the Planning Commission.


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SPECTRUM
SIGN SYSTEMS

8786 W. 35W Service Drive NE
Blaine, MN 55449
Phone: (763) 432-7447 / Fax: (763) 208-9159
www.spectrum-signs.com

April 8, 2026

City of North Oaks
Attn: Kevin Kress, City Administrator
City Hall
100 Village Center Drive, #230
North Oaks, MN 55127

RE: Conditional Use Permit Application - North Oaks Financial Center – Tenant Wall Sign

Property:	North Oaks Financial Center 100 Village Center Drive, Suite 100 North Oaks, MN 55127
Owners:	NOVC LLC and North Oaks 96 LLC 1625 Energy Park Drive, Suite 100 St. Paul, MN 55108
Owner Contact:	Mary McNellis, St. Croix Real Estate, Inc. (612) 804-8604

To Whom It May Concern:

Spectrum Sign Systems, Inc., as representative for ownership through St. Croix Real Estate, Inc., is applying for a Conditional Use Permit to install one illuminated tenant wall sign on the West elevation of the North Oaks Financial Center building for Brandt Kettwick Defense. The proposed sign is within code allowance.

If you have any questions or require additional information, please contact me at (763) 432-7447 or rick@spectrum-signs.com or Lisa Pelle at lisap@spectrum-signs.com.

Sincerely,

Rick A. Ferraro, President
Spectrum Sign Systems, Inc.

260238J

Brandt Kettwick Defense
North Oaks Financial Center

Contact
Brandt Kettwick Defense
Attn: Nicole Kettwick
2150 3rd Avenue, Suite 210
Anoka, MN 55303

Phone/Email
763-296-9516
nkettwick@bkdefense.com

Jobsite
100 Village Center Drive, Suite 100
North Oaks, MN 55127

Designer
Alex Wasnick

Salesperson
Jeff Nelson

Project Manager
John Damchik

Date
3-17-26
3-25-26

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DRAWING / SUBMITTAL REVIEW

☐ APPROVED

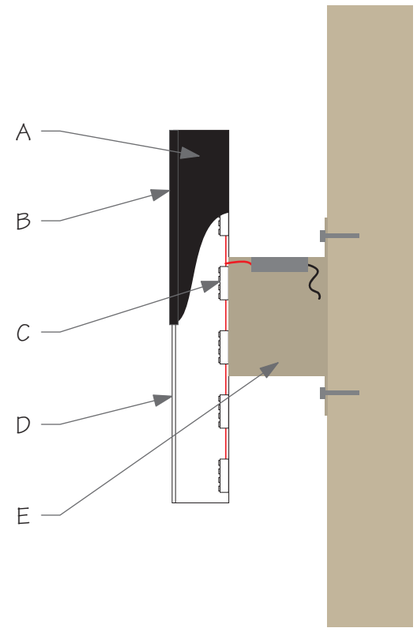
☐ APPROVED WITH CHANGES NOTED

☐ REVISE AND RESUBMIT

BY _____ DATE _____

260238J - St. Croix Real Estate - North Oaks Financial Center





Furnish and Install (1) 38.25" x 250" LED Face Illuminated Raceway Mount Channel Letter Set (66.4 SF)

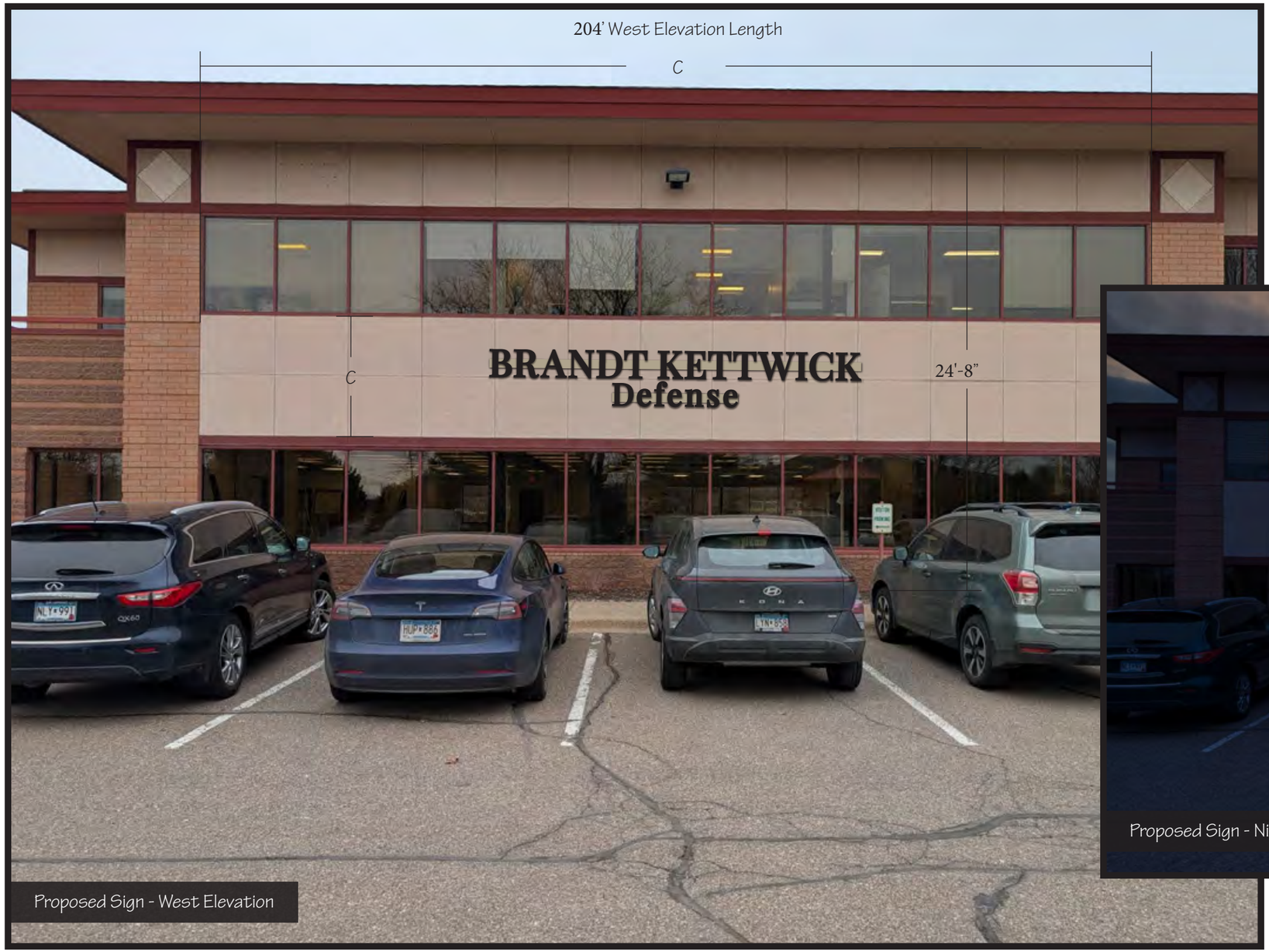
A. 3" Deep ALuminum Returns Finished Black
B. 1" Black Trim Cap
C. High Intensity White LEDs
D. White Acrylic Face Decorated with First Surface 3M Perforated Black Vinyl
E. Aluminum Raceway Painted SW 7711 Pueblo
-Attached to Wall with Lag Bolts at Stud Locations

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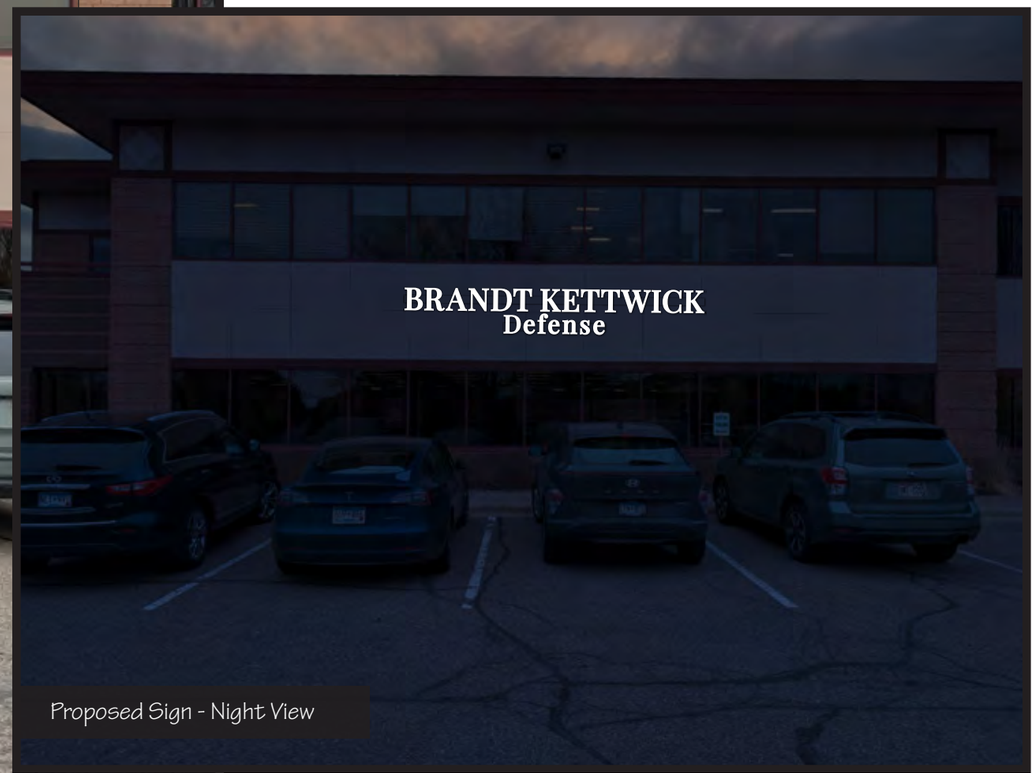
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Customer Approval Date

260238J - St. Croix Real Estate - North Oaks Financial Center



Proposed Sign - West Elevation



Proposed Sign - Night View

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Customer Approval Date

CITY OF NORTH OAKS
RAMSEY COUNTY, MINNESOTA
RESOLUTION NO. ___

RESOLUTION GRANTING CONDITIONAL USE PERMIT TO ALLOW A 66.4 SQUARE FOOT ILLUMINATED TENANT WALL SIGN FOR PROPERTY LOCATED AT 100 VILLAGE CENTER DRIVE

WHEREAS, an application for a Conditional Use Permit has been submitted by Spectrum Sign Systems to allow a 66.4 square foot illuminated tenant wall sign for the real property located at 100 Village Center Drive, Ramsey County, Minnesota, and legally described on the attached **Exhibit A** (the "Property"); and

WHEREAS, a Conditional Use Permit is required for illuminated tenant wall signs; and

WHEREAS, the request has been reviewed against the relevant requirements of North Oaks Zoning Ordinance Sections 151.050, 151.058, and 151.076, regarding the criteria for issuance of a Conditional Use Permit, and meets the minimum standards, is consistent with the Comprehensive Plan, is in conformance with the Zoning Ordinance, and does not have a negative impact on public health, safety, or welfare; and

WHEREAS, a public hearing concerning the application was held before the North Oaks Planning Commission in accordance with Minnesota Statutes, Section 462.357, subd. 3, on July 1, 2026, after which hearing the Planning Commission voted unanimously to recommend approval of the Conditional Use Permit application to the City Council, subject to certain conditions.

NOW, THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF NORTH OAKS that the Conditional Use Permit to allow the installation of a 66.4 square foot illuminated tenant wall sign on the Property is approved subject to the following conditions:

1. The 66.4 square foot illuminated tenant wall sign is approved in accordance with the application submitted on April 8, 2026.

2. The applicant must apply for and obtain a building permit for the illuminated tenant wall sign prior to beginning construction.

BE IT FURTHER RESOLVED that the City Clerk, Deputy City Clerk, or City Attorney are hereby authorized and directed to record a certified copy of this Resolution with the Ramsey County Registrar of Titles.

Adopted by the City Council of the City of North Oaks on this 16th day of July 2026.

By: _____
Krista Wolter
Its: Mayor

Attested:

By: _____
Kevin Kress
Its: City Administrator/City Clerk

EXHIBIT A
LEGAL DESCRIPTION OF PROPERTY

Real property located in Ramsey County, Minnesota legally described as follows:

Lot 7, Block 1, North Oaks Village Center 1st addition

PID: 133023430033

260238J - St. Croix Real Estate - North Oaks Financial Center - Site Map



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Customer Approval Date

CITY OF NorthOaks
Building on a tradition of innovation

PLANNING REPORT

TO: North Oaks City Council

FROM: Kendra Lindahl and John Uphoff, City Planners
Kevin Kress, City Administrator
Bridget McCauley Nason, City Attorney
Chris Uebe, Lead SSTS Inspector
Brian Humpal, SSTS Inspector
Jupe Hale, City Engineer

DATE: July 16, 2026

RE: Septic Variance at 2 Crocus Lane (city file 26-8)

Date Application Submitted	May 26, 2026
Date Application Determined Complete:	June 9, 2026
Planning Commission Meeting Date:	July 1, 2026
City Council Meeting Date:	July 16, 2026
60-day Review Date:	August 4, 2026

REQUEST

Paul Seel has requested approval of a subsurface sewage treatment system (SSTS) variance to allow a 20-foot setback where a minimum of 30 feet is required from the north property line. Specifically, the edge of the septic mound is proposed to be located 10 feet into the setback area. The existing tanks are not being replaced. However, a new underground UV vault is being constructed as part of the replacement. The edge of the UV vault is proposed to be located approximately 10 feet into the setback area. The UV vault is not a tank and is not subject to the setback distance requirements for septic tanks and treatment areas.

The variance would allow the replacement of the failing SSTS at 2 Crocus Lane, which is classified as non-compliant under MPCA Rule 7080.1500, Subp.4(D) due to the lack of three feet of separation. The new system will be a type III/IV At-Grade mound.

PLANNING COMMISSION REVIEW

On July 1, the Planning Commission voted unanimously to recommend approval of the variance application. Other than the septic designer, there was no one present to speak on this item.

BACKGROUND

The site is currently developed with a single-family home. The property is located in the shoreland district of Deep Lake and has a wetland on the northeast portion of the lot.

Zoning and Land Use

The property is guided Low Density residential and is zoned Residential Single Family – Low Density (RSL). The 1.61-acre property is located south of Deep Lake on the corner of Crocus Lane and South Deep Lake Road.

PLANNING ANALYSIS

Chapter 51 of the City Code establishes standards for SSTS. Section 51.03(3) requires a minimum setback of 30 feet from all property lines, wetlands, and the nearest edge of any roadway easement "for all tanks and treatment areas." The tanks and the rock bed mound are closer than 30 feet to the property line, and the closest point of the mound is measured at 20 feet. The existing tanks are not being replaced and are legal, non-conforming structures; therefore, they are not subject to the variance application. The variance request is for a setback of 20 feet where 30 feet is required.



Figure 1- Subject Parcel

The original request in the narrative was to allow a 13.9-foot setback. However, the request was not based on a survey. The City requires all septic variances to be based on a survey, and the applicant had a survey prepared. The survey shows the designer's plan at a 20-foot setback and the Septic Designer's plans must be updated to reflect this setback if the variance is approved.

Variance Standards

Section 51.02(11) of the Code says: “Where conditions prevent the construction, alteration, and/or repair of a sewage treatment system in strict compliance with the requirements of this chapter, the property owner may apply for a variance following the procedures outlined in North Oaks City Code Sections 151.078 & 151.079.”

Section 151.078 of the Zoning Code requires that the following criteria be considered, and a variance only be granted when it is demonstrated that the following standards have all been met:

(1)(a) Their strict enforcement would cause practical difficulties because of circumstances unique to the individual land under consideration, and the variances shall be granted only when it is demonstrated that the actions will be in keeping with the spirit and intent of this chapter.

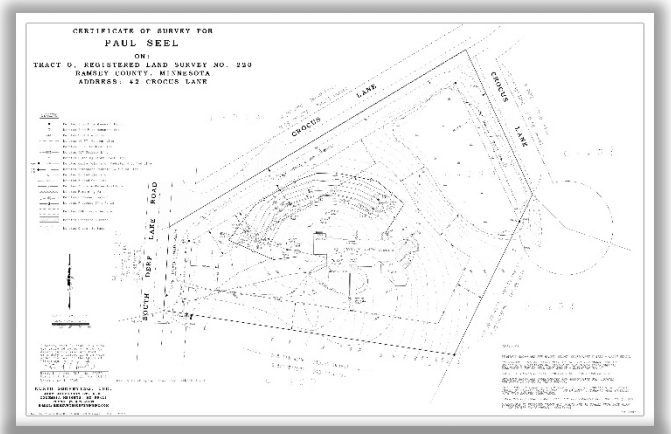


Figure 2- Site Survey

The size, slopes, and shape of the existing lot of record does not have another location for a new septic system on this site and creates a practical difficulty. The lot contains a wetland in the rear, and the location of the wetland, structures, and impervious surfaces make it difficult to find space elsewhere on the lot. The topography of the lot makes placement of a standard septic system difficult.

b) PRACTICAL DIFFICULTIES means the land in question cannot be put to a reasonable use if used under conditions allowed by the official controls, the plight of the land owner is

due to circumstances unique to the land in question which were not created by the land owner, and the variance, if granted, will not alter the essential character of the locality.

The size and shape of the existing lot of record creates a practical difficulty. There is not another location for a new septic on this site. The shape of the lot and location of the wetlands on the lot leave only this location for the replacement septic system. Approving the variance will result in the construction of a new septic system and the abandonment of the non-compliant system. It would not alter the essential character of the locality. Moving the septic system elsewhere on the lot would push it closer to a wetland and would likely also require a setback variance.

(c) Economic considerations alone shall not constitute an undue hardship if reasonable use for the land exists under the terms of this chapter.

The variance requested is to replace a failing septic system. The variance is not based on economic considerations alone.

(d) A variance may not be granted for any use that is not permitted under this chapter for land in the zone where the affected person's land is located.

The variance would allow a new septic system. It would not allow a use that is not permitted by City Code.

(2) Subject to the above, a variance may be granted only in the event that all of the following circumstances exist:

(a) Unique circumstances apply to the which do not generally apply to other land in the same zone or vicinity, and result from lot size or shape, topography, or other circumstances over which the owners of the land have no control;

The circumstances of this site do not apply to other properties in the same zone and are the result of the lot shape, wetlands, and existing conditions on this lot.

(b) The proposed use is reasonable;

The proposed use is reasonable. It will allow replacement of the failing system with a new septic system.

(c) That the unique circumstances do not result from the actions of the applicant;

The circumstances do not result from the action of the applicant. The existing septic system has failed and must be replaced.

(d) That granting the variance requested will not confer on the applicant any special privilege that is denied by this chapter to other lands, structures, or buildings in the same district;

Granting the variance will not confer upon the applicant any special privilege. It will simply allow them to replace their failing system.

(e) That the Variance requested is the minimum variance which would alleviate the practical difficulties;

The variance is the minimum action needed to alleviate the practical difficulties on site. The City septic inspectors have worked closely with the applicant to locate the new system to minimize the required variance.

(f) The proposed variance will not impair an adequate supply of light and air to adjacent land, or substantially increase the congestion of the roads and streets, or increase the danger of fire, or endanger the public safety, or substantially diminish or impair property values within the neighborhood;

The proposed variance will not impair an adequate supply of light and air to adjacent land or substantially increase the congestion of the roads and streets, or increase the danger of fire, or endanger the public safety, or substantially diminish or impair property values within the neighborhood.

(g) At no time after the land became nonconforming was the property under common ownership with contiguous land, the combination of which could have been used to reduce or avoid the nonconformity of the land.

At no time after the land became nonconforming was the property under common ownership with contiguous land, the combination of which could have been used to reduce or avoid the nonconformity of the land.

The City Septic Inspectors have been working with the applicant and their Septic Designer and find the plans meet the intent of the ordinance and recommend approval of the variance.

Attached for reference:

Exhibit A: Location Map

Exhibit B: Site Survey dated June 4, 2026 and revised June 10, 2026
Exhibit C: Septic Design received May 22, 2026
Exhibit D: SSTS Inspector email and example UV vault dated June 23, 2026
Exhibit E: Resolution approving the septic variance

ACTION

Move to approve the resolution approving the septic variance at 2 Crocus Lane, as recommended by the Planning Commission.

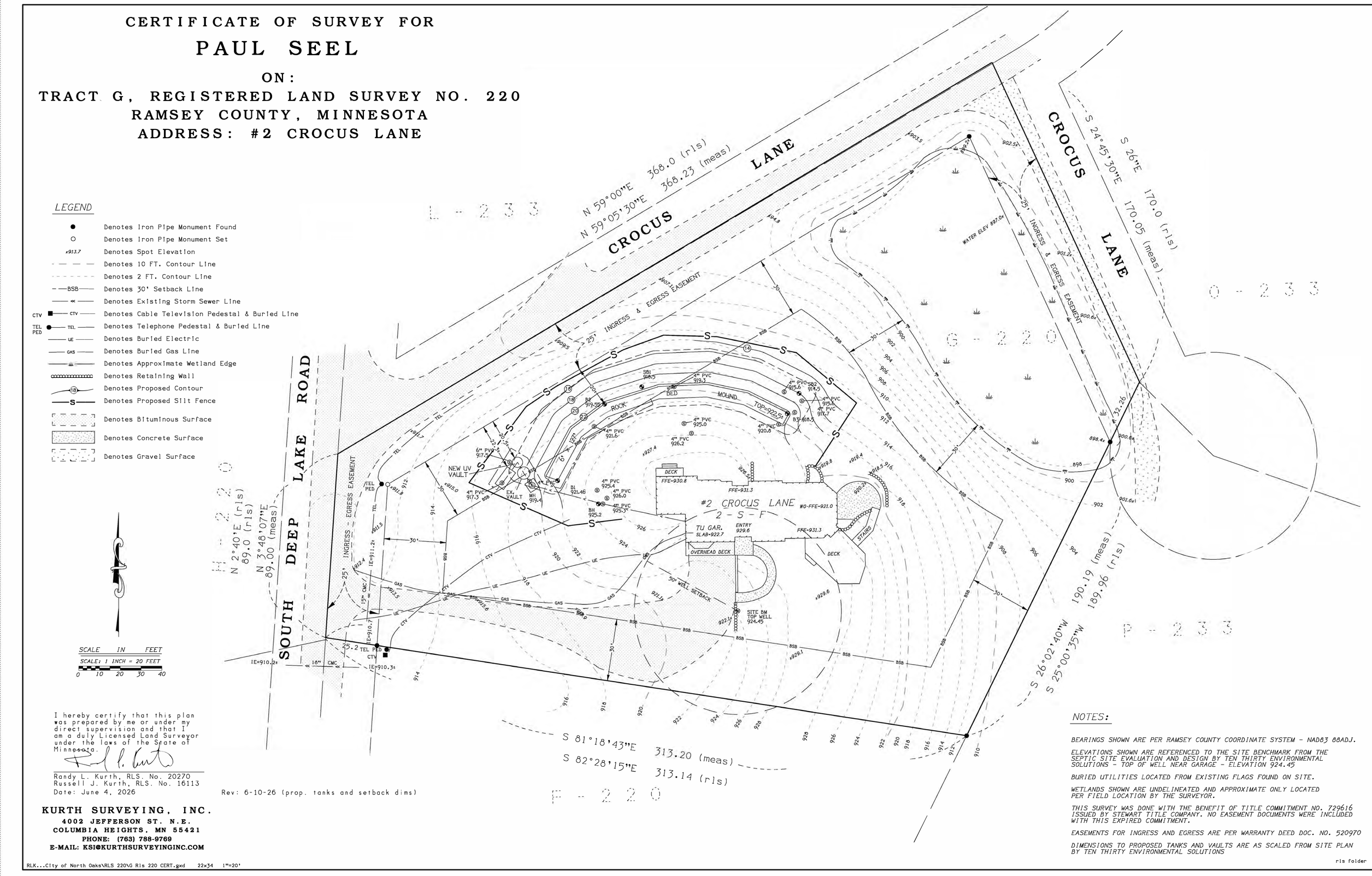


CERTIFICATE OF SURVEY FOR

PAUL SEEL

ON:

TRACT G, REGISTERED LAND SURVEY NO. 220
RAMSEY COUNTY, MINNESOTA
ADDRESS: #2 CROCUS LANE



I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Land Surveyor under the laws of the State of Minnesota.

Randy L. Kurth, RLS. No. 20270
Russell J. Kurth, RLS. No. 16113
Date: June 4, 2026

Rev: 6-10-26 (prop. tanks and setback dims)

KURTH SURVEYING, INC.
4002 JEFFERSON ST. N.E.
COLUMBIA HEIGHTS, MN 55421
PHONE: (763) 788-9769
E-MAIL: KSI@KURTHSURVEYINGINC.COM

NOTES:

BEARINGS SHOWN ARE PER RAMSEY COUNTY COORDINATE SYSTEM - NAD83 88ADJ.

ELEVATIONS SHOWN ARE REFERENCED TO THE SITE BENCHMARK FROM THE SEPTIC SITE EVALUATION AND DESIGN BY TEN THIRTY ENVIRONMENTAL SOLUTIONS - TOP OF WELL NEAR GARAGE - ELEVATION 924.45

BURIED UTILITIES LOCATED FROM EXISTING FLAGS FOUND ON SITE.

WETLANDS SHOWN ARE UNDELINEATED AND APPROXIMATE ONLY LOCATED PER FIELD LOCATION BY THE SURVEYOR.

THIS SURVEY WAS DONE WITH THE BENEFIT OF TITLE COMMITMENT NO. 729616 ISSUED BY STEWART TITLE COMPANY. NO EASEMENT DOCUMENTS WERE INCLUDED WITH THIS EXPIRED COMMITMENT.

EASEMENTS FOR INGRESS AND EGRESS ARE PER WARRANTY DEED DOC. NO. 520970

DIMENSIONS TO PROPOSED TANKS AND VAULTS ARE AS SCALED FROM SITE PLAN BY TEN THIRTY ENVIRONMENTAL SOLUTIONS

rls folder

RLK...City of North Oaks\RLS 220\G Rls 220 CERT.gxd 22x34 1"=20'

Ten Thirty Environmental Solutions

Ten Thirty Environmental Solutions, SBC
1684 132nd Ave NE
Blaine, MN 55449

Regarding Septic Design For Property Located At 2 Crocus Lane

May 20, 2026

Please find the enclosed design for the septic system for the property at 2 Crocus Lane in North Oaks, Minnesota. This design was completed on May 20, 2026 to be in compliance with local and state requirements. This design does not offer a guarantee that it will be permitted by the local permitting authority, however the design was completed using all the applicable resources and knowledge available at the time of the design that would make it in compliance with local and state rules.

An overview of the septic design for a type III/IV At-Grade is shown below with more details in the enclosed design documents.

- Permit design flow of 750 gallons per day (gpd) for a five bedroom home.
- Flow from the home will be collected in the existing 625 gallon trash tank.
- Flow from the existing 625 gallon trash tank will then flow into the existing Multi-Flo - FTB 0.75 pretreatment unit.
    - The Multi-Flo will have a new blower and new socks installed in it and the lid will have a new clasp installed on it as well.
- Flow from the Multi-Flo unit will then flow into a new UV Vault that will be housed in a riser
    - The UV Vault will house two Norweco AT1500 UV bulbs in parallel (each bulb receives half the flow).
- Flow from the UV vault will then flow into the existing 1,250-gallon pump tank.
- The 1,250-gallon pump tank will **time dose** a 127' x 6' rockbed at-grade with one lateral.
    - The berming area will be 141' x 20'.
    - Installer must ensure no water sits behind the at-grade, but that it can flow around it over over the top of it if at-grade is blended into the hill.
    - A Goulds PE41 pump is called for.
    - The pump will have an elapsed time meter, event counter and alarm installed on it (alarm on a separate circuit than the pump).
    - The rockbed will be center fed with 1.5" laterals and 3/16" perfs.
    - Average slope is over 25%, but the berming is shaped to accommodate the property and not spill into the road right of way. This among other reasons is why the system is a type III system.
    - The rockbed area must be dug out to 3' over the entire rockbed area to ensure the old trenches in the area are removed. This is then to be filled with washed mound sand to native/current grade and the at-grade built up from there.
- All trees within 10' of the rockbed area should be cut down to prevent root intrusion into the mound.

- The vegetation on the at-grade should be cut at least twice a year to ensure no trees/woody shrubs are growing on it. This should be done in late spring and late summer to give time for the grass to grow and offer additional insulation in the winter months. It may be mowed more frequently, however twice per year is the minimum.
- The at-grade area must be protected from vehicle traffic.
- Please read the Site/Soil Narrative on the Elevations Page in the attached design documents for a detailed description of the site and proposed system.
- If an iron filter is added the iron filter reject water MUST be diverted out of the septic system.
- Low water usage fixtures (<1.5 gpm) and a front end loading washing machine are recommended for the home to help protect the septic system. See the end of the design for examples of these.

Please protect the soil treatment area from all vehicle traffic as such traffic may damage the area and require a system redesign.

This design does not guarantee the performance of the system, the design is based on available information at the time of the design. In addition in the event the system is not operated in accordance with the management plan the design is not guaranteed.

In order for the system to be installed it must first be permitted by the local regulatory authority. If there are any questions or concerns with the design please do not hesitate to call or email.

Sincerely,

Alex Pepin, Professional Engineer (Lic# 58962) and Advanced Designer (Lic# 4082)
612-248-4281
alex.pepin@tenthirtyenvironmental.com.

Will need variance for setback deviation to Road Right of Way
From 30' down to 13.9'

Map Ramsey



5/13/2026, 6:41:51 PM

Personal Property
Tax Parcels
Cities
County Offices
Contours
2024 Aerial
Red: Band_1
Green: Band_2
Blue: Band_3

1:600

0 37.5 75 150 ft
0 10 20 40 m

Ramsey County
Ramsey County MN

Map Ramsey



5/13/2026, 6:43:26 PM

- Personal Property
- Tax Parcels
- Cities
- County Offices

Easements

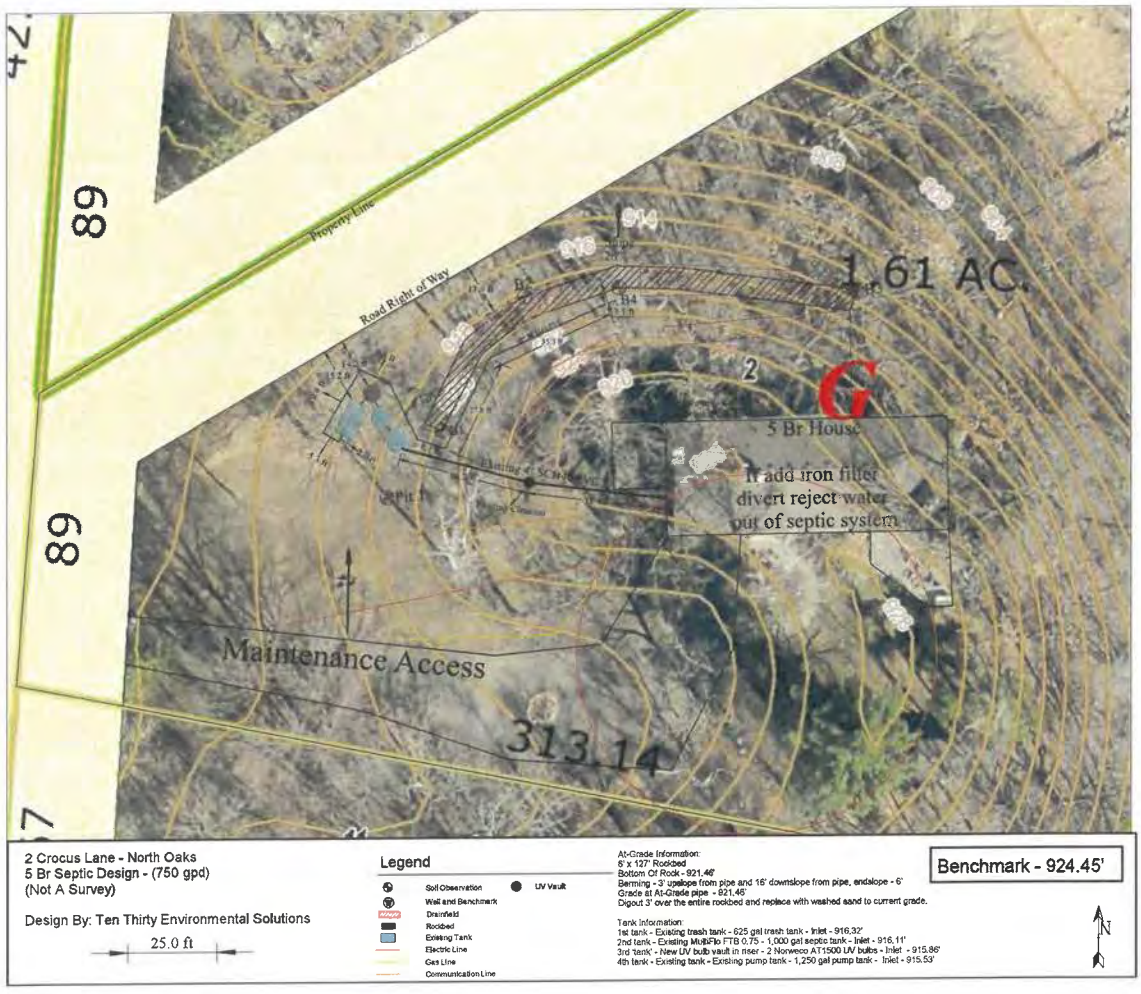
- Misc Easements

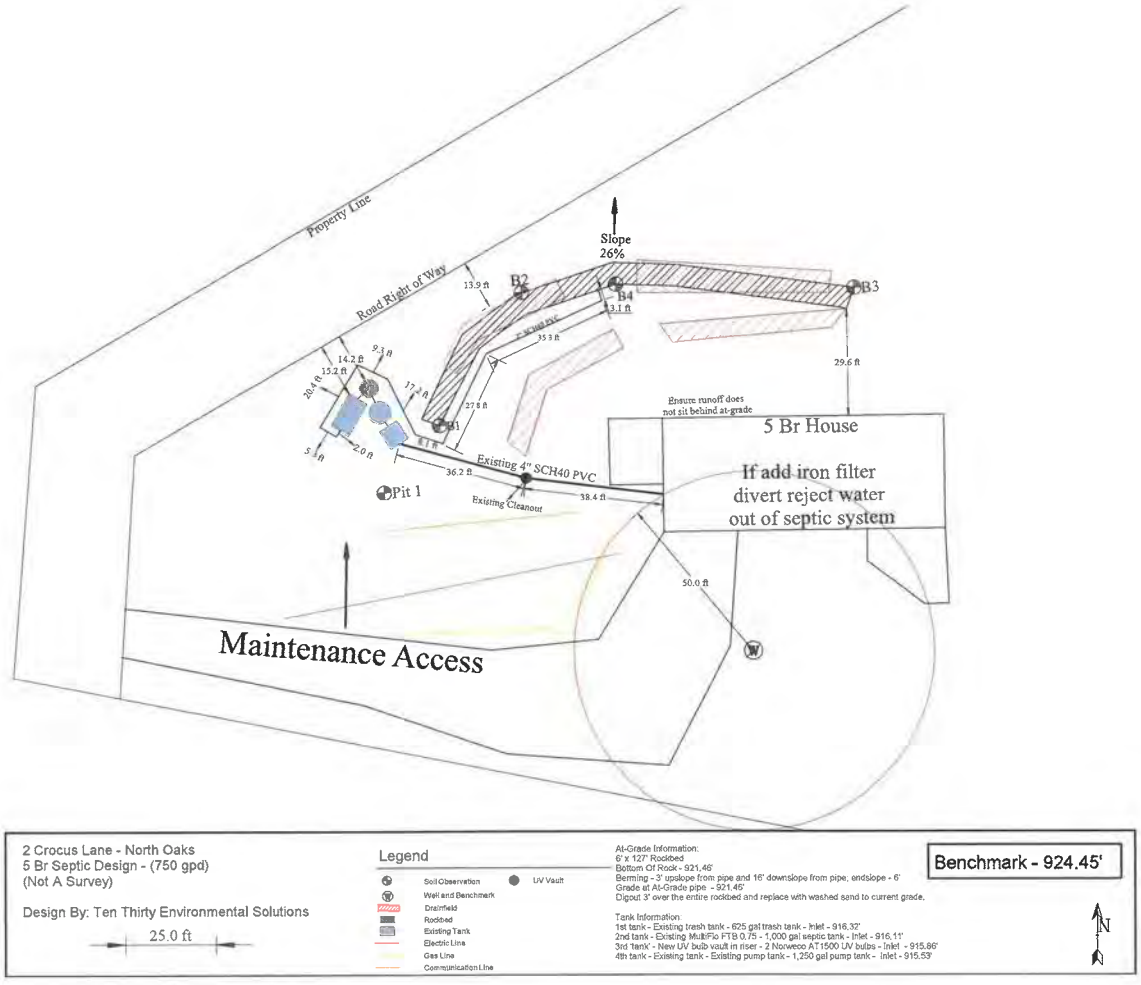
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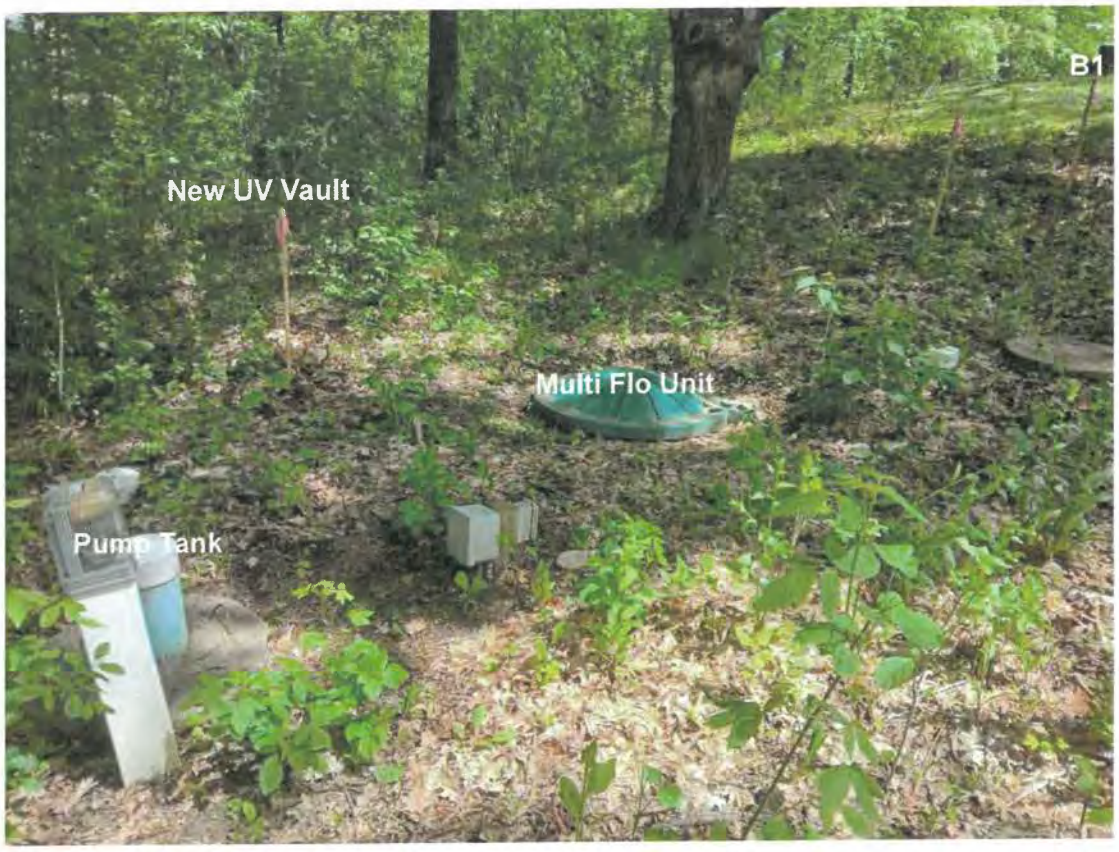
0 37.5 75 150 ft

0 10 20 40 m

Ramsey County
Ramsey County MN


Property Line
Road Right of Way
1.61 AC.
5 Br House
If add iron filter
divert reject water
out of septic system
Maintenance Access
313.14
89
89
2 Crocus Lane - North Oaks
5 Br Septic Design - (750 gpd)
(Not A Survey)
Design By: Ten Thirty Environmental Solutions
25.0 ft
Legend
Soil Observation
UV Vault
Well and Benchmark
Drainfield
Rockbed
Existing Tank
Electric Line
Gas Line
Communication Line
At-Grade Information:
6' x 127' Rockbed
Bottom Of Rock - 921.46'
Berming - 3' upslope from pipe and 16' downslope from pipe, endslope - 6'
Grade at At-Grade pipe - 921.46'
Digout 3' over the entire rockbed and replace with washed sand to current grade.
Tank Information:
1st tank - Existing trash tank - 625 gal trash tank - Inlet - 916.32'
2nd tank - Existing MultiFlo FTB 0.75 - 1,000 gal septic tank - Inlet - 916.11'
3rd 'tank' - New UV bulb vault in riser - 2 Norweco AT1500 UV bulbs - Inlet - 915.86'
4th tank - Existing tank - Exishing pump tank - 1,250 gal pump tank - Inlet - 915.53'
Benchmark - 924.45'
N


Property Line
Road Right of Way
Slope
26%
B1
B2
B3
B4
13.9 ft
3.1 ft
35.3 ft
29.6 ft
14.2 ft
15.2 ft
20.4 ft
9.3 ft
17.4 ft
27.8 ft
5.1 ft
2.0 ft
8.1 ft
36.2 ft
38.4 ft
Pit 1
Existing Cleanout
Existing 4" SCH40 PVC
Ensure runoff does not sit behind at-grade
5 Br House
If add iron filter
divert reject water
out of septic system
50.0 ft
Maintenance Access
2 Crocus Lane - North Oaks
5 Br Septic Design - (750 gpd)
(Not A Survey)
Design By: Ten Thirty Environmental Solutions
25.0 ft
Legend
Soil Observation
Well and Benchmark
Drainfield
Rockbed
Existing Tank
Electric Line
Gas Line
Communication Line
UV Vault
At-Grade Information:
6' x 127' Rockbed
Bottom Of Rock - 921.46'
Berming - 3' upslope from pipe and 16" downslope from pipe; endslope - 6'
Grade at At-Grade pipe - 921.46'
Digout 3' over the entire rockbed and replace with washed sand to current grade.
Tank Information:
1st tank - Existing trash tank - 625 gal trash tank - Inlet - 916.32'
2nd tank - Existing MultiFlo FTB 0.75 - 1,000 gal septic tank - Inlet - 916.11'
3rd tank - New UV bulb vault in riser - 2 Norweco AT1500 UV bulbs - Inlet - 915.86'
4th tank - Existing tank - Existing pump tank - 1,250 gal pump tank - Inlet - 915.53'
Benchmark - 924.45'
N


B1
New UV Vault
Multi Flo Unit
Pump Tank


B1
Trash Tank Inlet


B1
Rockbed Corner


B3
B3
ROCK

Elevations Worksheet Ten Thirty Environmental Solutions

Address 2 Crocus Lane

Location	Elevation	Restriction depth (in)	Restriction Elevation	Separation as Designed	Comments
Grade at B1	921.46	24	**919.46**	2.00	SE corner of rockbed
Grade at B2	919.55	18	**918.05**	3.41	Downslope of rockbed near middle west
Grade at B3	919.17	24	**917.17**	4.29	NE corner of rockbed (downslope corner)
Grade at B4	921.26	17	**919.85**	1.61	Upslope of rockbed near middle east
Grade at current trash tank	919.41				
Inlet at current trash tank	916.32				
Top of Multi - Flo Unit	918.57				All tanks existing. Only additional component is a UV Vault that will be in a riser. Two Norweco AT1500 UV bulbs required in parallel so each bulb gets half the flow.
Inlet at Multi - Flo	916.11				
Grade at new Norweco AT1500 UV Vault in Riser	917.57				
Inlet at UV Vault in Riser	915.86				
Grade at existing pump tank	917.45				
Inlet at existing pump tank	915.53				Static Head
Top of Pump (For 12" pump + 2" pad)	913.11				8.85

Benchmark	Elevation
Top of wellhead	924.45

Soil Treatment Area Type	Native Grade at At-Grade Pipe	Bottom of Rock
At-Grade	921.46	***921.46***

Overall Separation As Designed 1.61

Measured Slope 26.00%

Avg Slope



Soil/Site Narrative

Soil observations completed using a shovel/post hole digger pit down to ~2' and borings after that if necessary. All observations conducted in a manner that allows for the evaluation of soil structures.

Home is a 5 bedroom home. The current septic system has a MultiFlo pretreatment unit but failed the compliance inspection due to separation.

No areas on the site will accommodate a full sized septic system (even with pretreatment) for a 5 Bedroom home and meet the required setbacks to the road right of way and house. An at-grade was attempted closer to the house, but it got too close to the house and was not long enough. A mound was tried in the front lawn area, but the area is not of adequate size and the soil there was severely disturbed. It is more desirable to spread the water out over the site as long as possible than concentrate it all in one area with a small mound; even if that area were not impacted by disturbed soil and utilities. As a result an at-grade is proposed in the area shown on the enclosed site plans. This at-grade meets state standards for setbacks (10' to right of way) and is the same distance from the road right of way as the current drainfield on site.

It is proposed to reuse the MultiFlo FTB-0.75 unit and add UV disinfection after the MutiFlo unit to achieve level A effluent quality.

With redox seen at the shallowest at 17" level A treatment will allow for an at-grade system. With the top 17" consisting of fine sandy loam or loamy fine sand soil the loading rate for level A effluent into these soils is 1.0 gpd/ft2. This requires a total of 750 square feet of treatment area. Because of the severe slope (average of just over 25%) it is desired to spread the effluent out along the hill as much as possible so a contour loading rate of 6 gallons per lineal foot per day is proposed. This requires a 125 foot long at-grade. It is proposed to build a 127' long at grade that is 6' wide, resulting in an area of 762 square feet, which exceeds the required loading for level A effluent into fine sand or fine sandy loam.

The proposed at-grade will be over the existing drainfield. The existing drainfield depth was found to be ranging from 27" to 36" based on site observations. It is possible some trenches may be deeper than this, but a 36" digout is proposed over the entire rockbed area (127' x 6'). The soil does eventually get into a clay loam down lower in the soil profile so care must be taken to construct the system when it is dry; preferably in the late summer (July/August). The soil that is dugout will then be replaced with washed mound sand to current grade. If trenches are encountered deeper than 3' these must be excavated out and the soil replaced with washed sand to current grade. Even though mound sand will be what the effluent encounters over the treatment area the loading rate of fine sand will be maintained to ensure proper area for the water to infiltrate into the soil. There are some concerns with a bathtub effect of the digout, however if the digout is done during dry conditions this will only add to infiltrative surface with a worst case scenario of the water sitting in the heavier clay loam soil and running horizontally under the surface through the sandy loam/fine sand layer over the first 17 inches of the soil profile along the slope. With level A effluent this would still be an acceptable outcome as the water would be properly treated at 12" of depth.

Time dosing is called for. Based on the As-built Brown Wilbert tanks were used with the original system in 2000 and those tank spec sheets were pulled (current tank sizes, but probably close to back in 2000) and those were used in calculating the time dosing float levels.

This system requires ongoing maintenance and service visits by a licensed and certified service provider twice per year with the UV disinfection. Sampling annually is also called for to ensure the wastewater is meeting level A standards and the system is not overloaded.

Preliminary Evaluation Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. Contact Information

v 05.01.2026

Property Owner/Client:	Paul and Nancy Seel	Date Completed:	5/20/2026
Site Address:	2 Crocus Lane, North Oaks, MN 55127	Project ID:	2CRO
Email:	pseel@comcast.net	Phone:	612-701-4231
Mailing Address:		Alt Phone:	
Legal Description:			
Parcel ID:	053022330011	SEC:	TWP: RNG:

2. Flow and General System Information

A. Client-Provided Information

Project Type: ☐ New Construction ☑ Replacement ☐ Expansion ☐ Repair

Project Use: ☑ Residential ☐ Other Establishment:

Residential use: # Bedrooms: 5 Dwelling sq.ft.: 4716 Unfinished sq.ft.:

Adults: 2 # Children: # Teenagers:

In-home business (Y/N): No If yes, describe:

Water-using devices: *(check all that apply)*

☑ Garbage Disposal/Grinder	☐ Dishwasher	☐ Hot Tub*
☐ Sewage pump in basement	☑ Water Softener*	☐ Sump Pump*
☑ Large Bathtub >40 gallons	☐ Iron Filter*	☐ Self-Cleaning Humidifier*
☑ Clothes Washing Machine	☑ High Eff. Furnace*	☐ Other:

* Clear water source - should not go into system

Additional current or future uses: Home currently for sale, so unknown

Anticipated non-domestic waste: None- if add iron filter must divert reject water out of the septic

The above is complete & accurate: ***Client signature & date***

B. Designer-determined Flow and Anticipated Waste Strength Information

Attach additional information as necessary.

Design Flow: 750 GPD Anticipated Waste Type: Residential

Maximum Concentration BOD: 170 mg/L TSS 60 mg/L Oil & Grease 25 mg/L

3. Preliminary Site Information

A. Water Supply Wells

#	Description	Mn. ID#	Well Depth (ft.)	Casing Depth (ft.)	Confining Layer	STA Setback	Source
1	Deep Well	14078	228	185		50'	MN Well Index
2							
3							
4							

Additional Well Information:

Preliminary Evaluation Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

Site within 200' of noncommunity transient well (Y/N)	No	Yes, source:	
Site within a drinking water supply management area (Y/N)	Yes	Yes, source:	
Site in Well Head Protection inner wellhead management zone (Y/N)	Yes	Yes, source:	
Buried water supply pipes within 50 ft of proposed system (Y/N)	No		
Water Supply Pipe Comments:			
B. Site located in a shoreland district/area?	No	Yes, name:	N/A
Elevation of ordinary high water level:	N/A ft	Source:	N/A
Classification: N/A	Tank Setback: N/A ft.	STA Setback:	N/A ft.
C. Site located in a floodplain?	No	Yes, Type(s):	N/A
Floodplain designation/elevation (10 Year):	N/A ft	Source:	N/A
Floodplain designation/elevation (100 Year):	N/A ft	Source:	N/A

D. Property Line Id / Source: ☐ Owner ☐ Survey ☑ County GIS ☐ Plat Map ☐ Other:

E. ID distance of relevant setbacks on map: ☐ Water ☑ Easements ☐ Well(s) ☐ Building(s) ☑ Property Lines ☐ OHWL ☐ Other:

4. Preliminary Soil Profile Information From Web Soil Survey (attach map & description)

Map Units: 454D and 169C Slope Range: 6-25 %

List landforms: See Enclosed map unit descriptions

Landform position(s):

Parent materials:

Depth to Bedrock/Restrictive Feature: in Depth to Watertable: in

Map Unit Ratings

Septic Tank Absorption Field- At-grade:

Septic Tank Absorption Field- Mound:

Septic Tank Absorption Field- Trench:

5. Local Government Unit Information

Name of LGU: City of North Oaks

LGU Contact: Brian Humpal/Chris Uebe

LGU-specific setbacks: 30' to road right of way (need a variance)

LGU-specific design requirements:

LGU-specific installation requirements:

Notes:

Field Evaluation Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. Project Information

v 05.01.2026

Property Owner/Client:	Paul and Nancy Seel	Project ID:	2CRO
Site Address:	2 Crocus Lane, North Oaks, MN 55127	Date Completed:	5/20/2026

2. Utility and Structure Information

Utility Locations Identified ☑ Gopher State One Call # see site map ☐ Any Private Utilities:

Locate and Verify (*see Site Evaluation map*) ☐ Existing Buildings ☐ Improvements ☐ Easements ☐ Setbacks

3. Site Information

Vegetation type(s): Forest Landscape position: Back/ Side Slope

Percent slope: 26.0 % Slope shape: Linear, Convex Slope direction: North

Describe the flooding or run-on potential of site: Need to ensure water does not pond behind at grade

Describe the need for Type III or Type IV system: Not enough area and need to digout drainfield and slope >25%

Note: So type III/IV

Proposed soil treatment area protected? (Y/N): Yes If yes, describe: Staked out in woods

4. General Soils Information

Filled, Compacted, Disturbed areas (Y/N): Yes

If yes, describe: Old drainfield is under the proposed at-grade rockbed. Digout to 3' over the entire area and replace with washed sand to remove the old drainfield components in the proposed area.

Soil observations were conducted in the proposed system location (Y/N): Yes

A soil observation in the most limiting area of the proposed system (Y/N): Yes

Number of soil observations: 4 Soil observation logs attached (Y/N): Yes

Percolation tests performed & attached (Y/N):

5. Phase I. Reporting Information

	Depth		Elevation		
Limiting Condition*:	17	in	**919.85**	ft	**Most Restrictive Depth Identified from List Below*
Periodically saturated soil:	17	in	919.85	ft	Soil Texture: Loamy Fine Sand
Standing water:	-	in		ft	Percolation Rate: min/inch
Bedrock:	-	in		ft	Soil Hyd Loading Rate: 1.00 gpd/sq.ft

Benchmark Elevation: 924.5 ft Elevations and Benchmark on map? (Y/N): Yes

Benchmark Elevation Location: Top of wellhead

Differences between soil survey and field evaluation: More like 169 than 454

Site evaluation issues / comments:

Anticipated construction issues: Must install in late summer to ensure soils are dry (July/August/Early September). Clay loam below sandier soil so must ensure do not smear the soil.

Soil Observation Log

Project ID: 2CRO v 05.01.2026

Client:	Paul and Nancy Seel			Location / Address:	2 Crocus Lane, North Oaks, MN 55127
Soil parent material(s): (Check all that apply)	☑ Outwash	☐ Lacustrine	☐ Loess	☑ Till	☐ Alluvium ☐ Bedrock ☐ Organic Matter ☐ Disturbed/Fill
Landscape Position:	Back/Side Slope	Slope %: 26.0	Slope shape:	Linear, Convex	Flooding/Run-On potential: No
Vegetation:	Forest	Soil survey map units:	454D and 169C		Surface Elevation-Relative to benchmark: 921.46
Date/Time of Day/Weather Conditions:	5/20/2026	12:45PM	Sunny		Limiting Layer Elevation: 919.46
Observation #/Type/Location:	B1	Shovel Pit/Auger	See site map		Depth to Standing Water-inches: -

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
0-8	Loamy Fine Sand	<10%	10YR 3/2				Single grain	Structureless	Loose
8-24	Loamy Fine Sand	<10%	10YR 4/4				Single grain	Structureless	Loose
24-30	Loamy Fine Sand	<10%	10YR 4/4	10YR 5/6	Concentrations	S2	Single grain	Structureless	Loose
				10YR 5/3	Depletions				

Comments: Lots of root/worm channels to EOB (10YR6/3 and 10YR2/1) not redox. Redox at 24".

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Alex Pepin		4082	5/20/2026
(Designer/Inspector)	(Signature)	(License #)	(Date)





B1 - Redox at 24” (right).

Soil Observation Log

Project ID: 2CRO v 05.01.2026

Client:	Paul and Nancy Seel			Location / Address:	2 Crocus Lane, North Oaks, MN 55127
Soil parent material(s): (Check all that apply)	☑ Outwash	☐ Lacustrine	☐ Loess	☑ Till	☐ Alluvium ☐ Bedrock ☐ Organic Matter ☐ Disturbed/Fill
Landscape Position:	Back/Side Slope	Slope %: 26.0	Slope shape:	Linear, Convex	Flooding/Run-On potential: No
Vegetation:	Forest	Soil survey map units:	454D and 169C		Surface Elevation-Relative to benchmark: 919.55
Date/Time of Day/Weather Conditions:	5/20/2026	12:55PM	Sunny		Limiting Layer Elevation: 918.05
Observation #/Type/Location:	B2	Shovel Pit/Auger	See site map		Depth to Standing Water-inches: -

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I-------- Structure----------I Shape	Grade	Consistence
0-7	Loamy Fine Sand	<10%	10YR 3/2				Single grain	Structureless	Loose
7-18	Fine Sandy Loam	<10%	10YR 4/4				Blocky	Moderate	Friable
18-24	Fine Sandy Loam	<10%	10YR 4/4	10YR 5/6 10YR 5/3	Concentrations Depletions	S2	Blocky	Moderate	Friable

Comments: Lots of root/worm channels to EOB (10YR6/3 and 10YR2/1) not redox. Redox at 18".

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Alex Pepin		4082	5/20/2026
(Designer/Inspector)	(Signature)	(License #)	(Date)





B2 - Redox at 18” (right).

Soil Observation Log

Project ID: 2CRO v 05.01.2026

Client:	Paul and Nancy Seel			Location / Address:	2 Crocus Lane, North Oaks, MN 55127
Soil parent material(s): (Check all that apply)	☑ Outwash	☐ Lacustrine	☐ Loess	☑ Till	☐ Alluvium ☐ Bedrock ☐ Organic Matter ☐ Disturbed/Fill
Landscape Position:	Back/Side Slope	Slope %: 26.0	Slope shape:	Linear, Convex	Flooding/Run-On potential: No
Vegetation:	Forest	Soil survey map units:	454D and 169C		Surface Elevation-Relative to benchmark: 919.55
Date/Time of Day/Weather Conditions:	5/20/2026	1:10PM	Sunny		Limiting Layer Elevation: 918.05
Observation #/Type/Location:	B3	Shovel Pit/Auger	See site map		Depth to Standing Water-inches: -

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure Shape	Structure Grade	Structure Consistence
0-8	Loamy Fine Sand	<10%	10YR 3/2				Single grain	Structureless	Loose
8-11	Fine Sandy Loam	<10%	10YR 4/3				Blocky	Moderate	Friable
11-17	Fine Sandy Loam	<10%	10YR 4/4				Blocky	Moderate	Friable
17-24	Clay Loam	<10%	10YR 5/4	10YR 5/6 10YR 5/3	Concentrations Depletions	S2	Blocky	Moderate	Friable

Comments: Lots of root/worm channels to EOB (10YR6/3 and 10YR2/1) not redox. Redox at 17".

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Alex Pepin		4082	5/20/2026
(Designer/Inspector)	(Signature)	(License #)	(Date)





B3 - Redox at 17” (right).

Soil Observation Log

Project ID: 2CRO v 05.01.2026

Client:	Paul and Nancy Seel			Location / Address:	2 Crocus Lane, North Oaks, MN 55127
Soil parent material(s): (Check all that apply)	☑ Outwash	☐ Lacustrine	☐ Loess	☑ Till	☐ Alluvium ☐ Bedrock ☐ Organic Matter ☐ Disturbed/Fill
Landscape Position:	Back/Side Slope	Slope %: 26.0	Slope shape:	Linear, Convex	Flooding/Run-On potential: No
Vegetation:	Forest	Soil survey map units:	454D and 169C		Surface Elevation-Relative to benchmark: 919.55
Date/Time of Day/Weather Conditions:	5/20/2026	1:10PM	Sunny		Limiting Layer Elevation: 918.05
Observation #/Type/Location:	B4	Shovel Pit/Auger	See site map		Depth to Standing Water-inches: -

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure Shape	Structure Grade	Structure Consistence
0-8	Loamy Fine Sand	<10%	10YR 3/2				Single grain	Structureless	Loose
8-19	Fine Sandy Loam	<10%	10YR 4/4				Blocky	Moderate	Friable
19-24	Clay Loam	<10%	10YR 4/4				Blocky	Moderate	Friable
24-28	Clay Loam	<10%	10YR 5/4	10YR 5/6 10YR 5/3	Concentrations Depletions	S2	Blocky	Moderate	Friable

Comments: Lots of root/worm channels to EOB (10YR6/3 and 10YR2/1) not redox. Redox at 24".

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Alex Pepin		4082	5/20/2026
(Designer/Inspector)	(Signature)	(License #)	(Date)



B4 - Redox at 24” (right)

Textures:	
C	Clay
SiC	Silty Clay
SC	Sandy Clay
CL	Clay Loam
SiCL	Silty Clay Loam
SCL	Sandy Clay Loam
Si	Silt
SiL	Silt Loam
L	Loam
SL	Sandy Loam*
LS	Loamy Sand*
S	Sand*

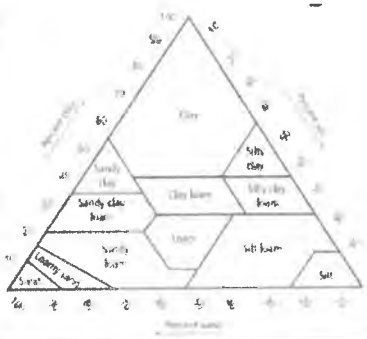
*Sand Modifiers:	
Co	Coarse
M	Medium
F	Fine
VF	Very Fine

Topsoil Indicator(s) of Saturation:

T1. Wetland Vegetation
T2. Depressional Landscape
T3. Organic texture or organic modifiers
T4. N 2.5/ 0 color
T5. Redox features in topsoil
T6. Hydric indicators

Subsoil Indicator(s) of Saturation:

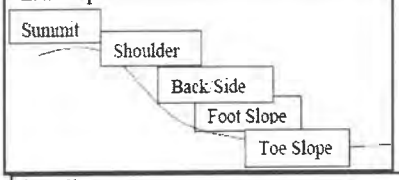
S1. Depleted matrix (value >/=4 and chroma </=2)
S2. Distinct gray or red redox features (any Matrix Hue)
S3. Matrix Hue of 5Y with a chroma </= 3
S4. Matrix Hue of 7.5 YR or redder with faint redox concentrations or redox depletions



Shape:

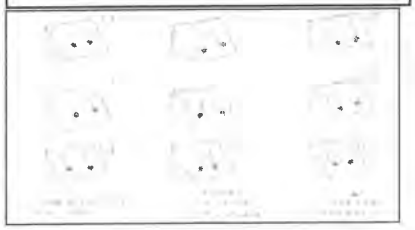
Granular	The peds are approximately spherical or polyhedral and are commonly found in topsoil. These are the small, rounded peds that hang onto roots when soil is turned over.
Platy	The peds are flat and plate like. They are oriented horizontally and are usually overlapping. Platy structure is commonly found in forested areas just below the leaf litter or shallow topsoil.
Blocky	The peds are block-like or polyhedral, and are bounded by flat or slightly rounded surface that are castings of the faces of surrounding peds. Blocky structure is commonly found in the lower topsoil and subsoil.
Prismatic	Flat or slightly rounded vertical faces bound the individual peds. Peds are distinctly longer vertically, and faces are typically casts or molds of adjoining peds. Prismatic structure is commonly found in the lower subsoil.
Single Grain	The structure found in a sandy soil. The individual particles are not held together.
Massive	No observable aggregates, or no orderly arrangement of natural lines of weakness

Landscape Position:



Slope Shape:

Slope shape is described in two directions:
up and down slope (perpendicular to the contour),
and across slope (along the horizontal contour);
e.g. Linear, Convex or LV.



Grade:

Loose	No peds, sandy soil
Weak	Poorly formed, indistinct peds, barely observable in place
Moderate	Well formed, distinct peds, moderately durable and evident, but not distinct in undisturbed soil
Strong	Durable peds that are quite evident in un-displaced soil, adhere weakly to one another, withstand displacement, and become separated when soil is disturbed
Structureless	No Discrete units observable in place or in hand sample

Consistence:

Loose	Intact specimen not available
Very Friable	Very slight force between fingers
Friable	Slight force between fingers
Firm	Moderate force between fingers
Extremely Firm	Moderate force between hands or slight foot pressure
Rigid	Foot pressure

v 05.01.2026

Design Summary Page

MINNESOTA POLLUTION CONTROL AGENCY

1. PROJECT INFORMATION

v 05.01.2026

Property Owner/Client:	Paul and Nancy Seel	Project ID:	2CRO
Site Address:	2 Crocus Lane, North Oaks, MN 55127	Date:	05/20/25
Email Address:	pseel@comcast.net	Phone:	612-701-4231

2. DESIGN FLOW & WASTE STRENGTH

Design Flow: 750 GPD Anticipated Waste Type: Residential

BOD: 170 mg/L TSS: 60 mg/L Oil & Grease: 25 mg/L

Treatment Level: A *Select Treatment Level C for residential septic tank effluent*

3. HOLDING TANK SIZING *Holding Tank Sizing: see 7080.2290*

Code Minimum **Holding Tank** Capacity: _____ Gallons with _____ Tanks or Compartments

Recommended **Holding Tank** Capacity: _____ Gallons with _____ Tanks or Compartments

The holding tank(s) will be: _____ *Existing tank reuse requires a tank integrity assessment*

Type of High Level Alarm: _____

(Alarm Set @ 75% tank capacity measured from inlet to bottom)

Comments: _____

4. SEPTIC TANK SIZING *Septic Tank Sizing: See 7080.1930*

A. Residential dwellings:

Number of Bedrooms (Residential): 5

Code Minimum **Septic Tank** Capacity: 500 Gallons with 1 Tanks or Compartments

Recommended **Septic Tank** Capacity: 625 Gallons with 1 Tanks or Compartments

The septic tank(s) will be: All Existing *Existing tank reuse requires a tank integrity assessment*

Comments: Adding a UV Vault in a Riser, but all other tanks existing and will be reused

Effluent Screen & Alarm (Y/N): No Model/Type: _____

B. Other Establishments:

Waste received by: _____ _____ GPD x _____ Days Hyd. Retention Time

7080 Minimum **Septic Tank** Capacity: _____ Gallons with _____ Tanks or Compartments

Designed **Septic Tank** Capacity: _____ Gallons with _____ Tanks or Compartments

The septic tank(s) will be: _____ *Existing tank reuse requires a tank integrity assessment*

Comments: _____

Effluent Screen & Alarm (Y/N): _____ Model/Type: _____

*** Other Establishments Require Department of Labor and Industry Approval and Inspection for Building Sewer ***

Design Summary Page

MINNESOTA POLLUTION CONTROL AGENCY

5. PUMP TANK SIZING *Sizing: see 7080.2100* *Enter in Pump Tank Tab*

Soil Treatment Dosing Tank				Other Component Dosing Tank:			
Pump Tank Capacity (7080 Minimum):	750 Gal			Pump Tank Capacity (7080 Minimum):	Gal		
Pump Tank Capacity (Designed):	1250 Gal			Pump Tank Capacity (Designed):	Gal		
Pump Req:	18.0 GPM	Total Head	15.4 ft	Pump Req:	GPM	Total Head	ft
Supply Pipe Dia.	2.00 in	Dose Vol:	65.0 gal	Supply Pipe Dia.	in	Dose Vol:	Gal

* Flow measurement device must be incorporated for any system with a pump *

6. SYSTEM AND DISTRIBUTION TYPE

Project ID: 2CRO

Soil Treatment Type:	At-Grade	Distribution Type:	Pressure Distribution-Level
Elevation Benchmark:	924.45 ft	Benchmark Location:	Top of wellhead
MPCA System Type:	III/IV	Distribution Media:	Rock
Type III/IV/V Details:	See site/soil narrative on elevation page		

7. SITE EVALUATION SUMMARY:

Describe Limiting Condition: Redoximorphic Features/Saturated Soils

Layers with >35% Rock Fragments? (yes/no) No If yes, describe below: % rock and layer thickness, amount of soil credit and any additional information for addressing the rock fragments in this design.

Note:

	Depth		Depth		Elevation	
Limiting Condition:	17.0	inches	1.42	ft	919.85	ft
Minimum Req'd Separation:	12	inches	1.00	ft		

Elevations are critical for system compliance.

Mound Minimum Sand Depth: N/A inches

Designed Distribution Media Bottom Elevation*: 921.46 ft Designed Separation: 19.3 inches

*This is the minimum elevation of the bottom of the distribution media for required separation related to the established benchmark

A. Soil Texture:	Loamy Fine Sand		
B. Soil Hyd. Loading Rate:	1.00 GPD/ft^2	C: Percolation Rate:	MPI
D. Contour Loading Rate:	6.0	Note:	
E. Measured Land Slope:	26.0 %	Note:	
Comments:	type III over 25% slope		

8. SOIL TREATMENT AREA DESIGN SUMMARY *Only applicable fields will be filled based on Treatment Area Type*

Trench:

Dispersal Area	sq.ft	Sidewall Depth	in	Trench Width	ft
Total Lineal Feet	ft	No. of Trenches		Code Max. Trench Depth	in
Contour Loading Rate	ft	Minimum Length	ft	Designed Trench Depth	in

Bed:

Dispersal Area	sq.ft	Sidewall Depth	in	Maximum Bed Depth	in
Bed Width	ft	Bed Length	ft	Designed Bed Depth	in

Design Summary Page

MINNESOTA POLLUTION CONTROL AGENCY

Project ID: 2CRO

Mound:

Dispersal Area		sq.ft	Media Length		ft	Media Width		ft
Absorption Width		ft	Clean Sand Lift		ft	Berm Width (0-1%)		ft
Upslope Berm Width		ft	Downslope Berm		ft	Endslope Berm Width		ft
Total System Length		ft	System Width		ft	Contour Loading Rate		gal/ft

At-Grade:

Dispersal Area	762.0	sq.ft	Bed Length	127.0	ft	Bed Width	6.0	ft
Upslope Berm	3.7	ft	Downslope Berm	16.3	ft	Finished Height	1.8	ft
System Length	141.6	ft	Endslope Berm	7.3	ft	System Width	20.0	ft

Level & Equal Pressure Distribution Soil Treatment Area

No. of Laterals	1		Lateral Diameter	1.50	in	Lateral Spacing	3.0	ft
Perforation Spacing	3.0	ft	Perforation Diameter	3/16	in	Drainback Volume	22.3	gal
Min Dose Volume	55.0	gal	Max Dose Volume	187.5	gal	Total Dosing Volume	87.3	gal

Non-Level and Unequal Pressure Distribution Soil Treatment Area

	Elevation (ft)	Pipe Size (in)	Pipe Volume (gal/ft)	Pipe Length (ft)	Perf Size (in)	Spacing (ft)	Spacing (in)
Lateral 1							
Lateral 2							
Lateral 3							
Lateral 4							
Lateral 5							
Lateral 6							

Minimum Dose Volume: _____ gal

Maximum Dose Volume: _____ gal

Total Dosing Volume: _____ gal

9. Organic Loading and Additional Info for HSW or Type IV/V Design - See Organic Loading tab

Organic Loading to Soil Treatment (Based on Waste Strength Data and Organic Loading Design)

A. Organic Loading Based on: _____ B. Minimum required area _____ sq.ft

Technology Strength Reduction (Treatment Level or HSW)

A. Starting Waste Strength _____ Treatment designed to meet: _____

Pretreatment Technology: _____ *Must Meet or Exceed Target Level

Model: _____ Units: _____

Disinfection Technology: _____ *Required for Levels A & B

Model: _____ Units: _____

10. Comments/Special Design Considerations:

MUST read site/soil narrative on elevations page for detailed description of the proposed system and the site. Digout of 3' over the entire rockbed area of the at-grade and replace with washed sand to native/current grade and build at-grade from there. System requires ongoing maitenance by a licensed service provider with two visits per year and annual sampling. A new blower must be installed on the Multiflo unit and new socks to ensure system will operate as efficiently as possible.

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Alex Pepin		4082	5/20/2026
(Designer)	(Signature)	(License #)	(Date)

At-Grade Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. DISPERSAL MEDIA SIZING: Project ID: 2CRO v 05.01.2026

A. Design Flow: 750 GPD C. % Land Slope: 26.0 %

B. Soil Loading Rate: 1.00 GPD/sq.ft D. Contour Loading Rate: 6 GPD/ft

E. Absorption Bed Width = Contour Loading Rate (1D) ÷ Soil Loading Rate (1B) *Cannot exceed 15 feet*

6 GPD/ft ÷ 1.00 GPD/ft = 6.0 ft

F. Absorption Bed Length = Design Flow (1A) ÷ Contour Loading Rate(1D)

750 GPD ÷ 6.00 GPD/ft = 125.0 ft

G. Hydraulic Absorption Bed Area = Design Flow (1A) ÷ Soil Loading Rate (1B)

750 gpd ÷ 1.00 GPD/sq.ft = 750 sq.ft

Optional Upsizing of Dispersal Media Area

H. Larger Area Size or Organic Sizing of Area (see organic loading sheet - 2G) 762 sq.ft

I. Required Bed Area = Greater of Hydraulic (G) or Upsized Bed Area (H) 762 sq.ft

J. Required Bed Length = Required Bed Area (sq.ft)(I.) ÷ Absorption Width(E.) 127.0 ft

J. 1 ***If a longer dispersal media is desired, enter Length(ft):*** ft

K. Type of Distribution Media: Rock

2. BERM SIZING:

A. Determine System Height = Full depth of media + 12" cover)

1. a Rock below pipe + 0.33' (Dia pipe + Rock above pipe (total 4 inches)) **OR**

1. b Registered Media Height (in) + 12" Cover *See product registration information for Media Height*

6 in (Media Depth (in)) 0.50 ft (Media Depth (ft)) + 0.33 ft (if rock 0.33') + 1 ft (1 foot required cover) = 1.8 ft

B. Determine Upslope Berm Width

1. Upslope Multiplier based on percent slope (see Slope Multiplier Table) 2.03

2. On Slopes >1% Upslope Width = Upslope Multiplier (2B1) X System Height (2A)

2.03 X 1.83 ft = 3.71 ft

3. On Slopes <1%, Upslope Width = (0.5 X Absorption Bed Width (1E)) +5 ft

(0.5 X 6.00 ft) + 5 ft = ft

4. Choose B.2 or B.3 depending on slope 3.71 ft

C. Determine Downslope Berm Width

1. Downslope Multiplier based on percent slope (see Table): 8.92

2. Downslope Width = Downslope Multiplier(2C1) X System Height(2A)

8.92 X 1.83 ft = 16.31 ft

3. Absorption Bed Width(1E) + 5 feet =

6.00 ft + 5 = 11.00 ft

4. On slopes >1%, Downslope Berm Width equals greater of C2 and C3 = 16.31 ft

5. On slopes <1%, Downslope Berm Width equals 0.5 X Absorption Bed Width (1E) + 5 feet

(0.5 X 6.00 ft + 5 ft = 8.00 ft

6. Choose C4 or C5 depending on slope: 16.31 ft

D. Endslope Multiplier (Minimum 4.0) | 4.0

E. Endslope Width = Endslope Multiplier(2D) X System Height (2A) (Endslope Minimum of 6 feet)

4.0	X	1.83	ft	=	7.32	ft

F. System Width = The sum of the Upslope Width(2B4) + Downslope Width(2E)

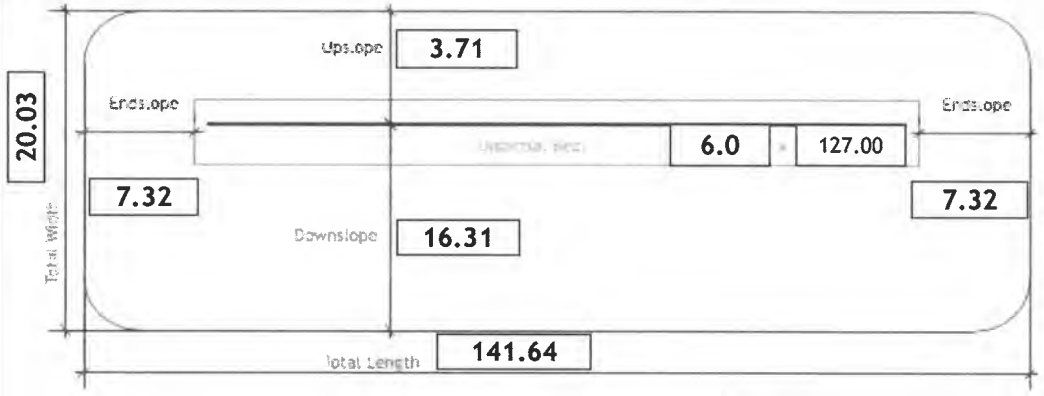
3.71	ft	+	16.31	ft	=	20.03	ft

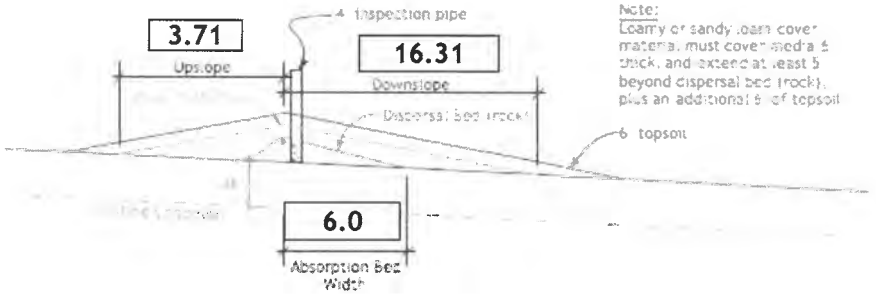
G. System Length = Sum of the Endslope Width(2E) + Absorption Bed Length(1F) + Endslope Width(2E)

7.32	ft	+	127.00	ft	+	7.32	ft	=	141.64	ft

Check registered product information for specific application details and design

3. AT-GRADE DIMENSIONS: (Feet) Project ID: 2CRO





Note: For 0 to 1% slopes, Absorption Width is measured from the pipe and divided equally in both directions. For slopes > 1%, Absorption Width is measured downhill from the pipe.

Elevation based on Benchmark

Required Separation:	12.0 (in)	Elevation Limiting Layer:	919.85 ft
Distribution Media:	Rock	Elevation required Separation:	920.85 ft
Media Depth *Below Pipe*	6.0 (in)	Elevation Distribution Media BTM:	921.46 ft
Manifold Connection:	Center	Lateral Pipe Diameter:	1.50 (in)
Perforation Size:	3/16 (in)	Perforation Spacing:	36 (in)

If Split with Non-Level Pressure Distribution Used: See Non-Level Pressure Distribution Form

4. APPROXIMATE MATERIAL VOLUME CALCULATIONS: Project ID: 2CRO

If rock is used as the distribution media:

A. *Rock Area* = Absorption Bed Length X (Additional rock upslope of lateral + *Absorption Bed Width)*

127.0 ft X (1.0 ft + 6.0 ft) = 889 sq.ft

B. *Rock Volume in Cubic Feet = Rock Area X Depth of Media (Rock) ÷ 2*

889 sq.ft X 0.75 ft ÷ 2 = 333.4 cu.ft

C. ***Rock Volume** in Cubic Yards = Volume in Cubic Feet ÷ 27*

333.4 cu.ft ÷ 27.0 = 12.3 cu.yd

D. Add 20% for constructability: 12.3 cu.yd x 1.2 = **14.8** cu.yd

E. *Loamy or Sandy Loam **Cover Material Volume** :*

Volume in Cubic Feet = System Width X System Length X 1.5 ÷ 2, minus rock volume

20.0 ft X 141.6 ft X 1.5 ÷ 2 - 333.4 cu.ft = 1794.3

F. *Loamy or Sandy Loam Cover Volume in Cubic Yards = Volume in Cubic Feet ÷* by 27

1794.3 cu.ft ÷ 27 = 66.5 cu.yd

G. Add 20% for constructability: 66.5 cu.yd x 1.2 = **79.7** cu.yd

H. **Topsoil Volume** in Cubic Feet = System width X System Length x 0.5

20.0 ft X 141.6 ft X 0.5 = 1418.5 cu.ft

I. *Topsoil Volume in Cubic Yards = Volume in Cubic Feet ÷* by 27

1418.5 cu.ft ÷ 27.0 = 52.5 cu.yd

J. Add 20% for constructability: 52.5 cu.yd X 1.2 = **63.0** cu.yd

Atgrade to be constructed to dimensions in design. This is an estimate of materials needed. Individual construction practices may vary quantities.

5. Comments:

IN addition to the above material volumes (installer to verify) must calculate sand volume for digout and replacement with washed sand. Over entire area 127' x 6' x 3' = 2286 ft3, 85 cubic yards; with 25% safety factor that is 105 cubic yards of sand.

Pressure Distribution Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

Project ID: 2CRO v 05.01.2026

1. Media Bed Width: 6.0 ft
2. Media Bed Length: 127.0 ft
3. Minimum Number of Laterals in system/zone = Rounded up number of [(Media Bed Width(1.) - 4) ÷ 3] + 1.

   [(NA - 4) ÷ 3] + 1 = NA laterals *Does not apply to at-grades*
4. Designer Selected *Number of Laterals*: 1 laterals

   Cannot be less than line 2 (Except in at-grades)



5. Lateral spacing in Bed; *Must be greater than 1 foot and no more than 3 feet*: 3.00 ft
6. *Length of Laterals* = Media Bed Length(2.) - 2 Feet.

   127.0 - 2ft = 125.0 ft *Perforation can not be closer then 1 foot from edge.*
7. Select *Perforation Spacing*: 3.0 ft
8. Determine the *Number of Perforation Spaces*. Divide the *Length of Laterals(6.)* by the *Perforation Spacing* (7.) and round down to the nearest whole number.

   Number of Perforation Spaces = 125.0 ft ÷ 3.0 ft = 41 Spaces
9. *Number of Perforations per Lateral* is equal to 1.0 plus the *Number of Perforation Spaces(8.)*. Check table below to verify the number of perforations per lateral guarantees less than a 10% discharge variation. The value is double with a center manifold.

   Perforations Per Lateral = 41 Spaces + 1 = 42 Perfs. Per Lateral
10. Select *Perforation Diameter Size:* 3/16 in 0.1875
11. *Select Lateral Diameter (See Table)*: 1.50 in
12. Select *Manifold Connection* (End or Center): Center

If Center Manifold Connection the max number of perfs per lateral in the table can be doubled.

Maximum Number of Perforations Per Lateral to Guarantee <10% Discharge Variation

1/4 Inch Perforations

Perforation Spacing (Feet)	Pipe Diameter (Inches)				
	1	1¼	1½	2	3
2	10	13	18	30	60
2½	8	12	16	28	54
3	6	12	16	25	52

7/32 Inch Perforations

Perforation Spacing (Feet)	Pipe Diameter (Inches)				
	1	1¼	1½	2	3
2	11	16	21	34	68
2½	10	14	20	32	64
3	9	14	19	30	60

3/16 Inch Perforations

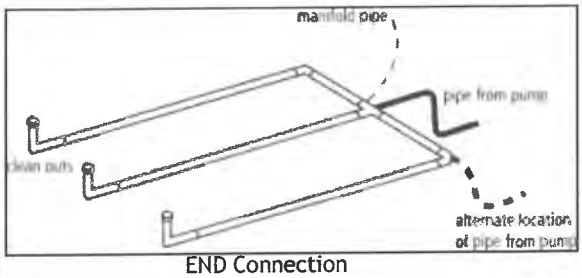
Perforation Spacing (Feet)	Pipe Diameter (Inches)				
	1	1¼	1½	2	3
2	18	28	36	46	87
2½	12	17	24	40	80
3	12	16	22	37	75

1/8 Inch Perforations

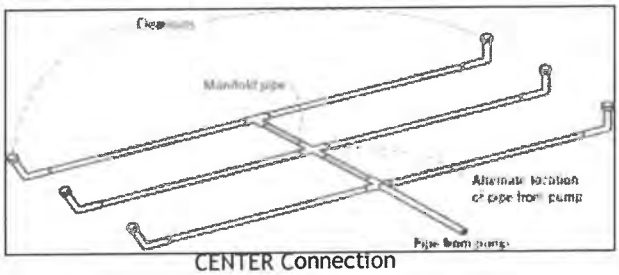
Perforation Spacing (Feet)	Pipe Diameter (Inches)				
	1	1¼	1½	2	3
2	29	33	48	74	149
2½	20	30	41	69	135
3	20	29	38	64	128

Pressure Distribution Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY



END Connection



CENTER Connection

Perf Per Lateral: 42

Perf Per Lateral Equal Split: 21 | 21

OPTIONAL Perf Per Lateral Non-Equal Split*: ____ | ____

* must not exceed maximum number perfs per lateral in table

End Feed Lateral Min Diameter: ____

Center Feed Lateral Min Diameter: ____

13. *Total Number of Perforations* equals the *Number of Perforations per Lateral (9.)* multiplied by the *Number of Perforated Laterals.(4.)*

42 Perf. Per Lat. X 1 Number of Perf. Lat. = 42 Total Number of Perf.

14. Calculate the *Square Feet per Perforation.*

Recommended value is 4-11 ft2 per perforation, Does not apply to At-Grades

a. *Bed Area* = Bed Width (ft)(1.) X Bed Length (ft)(2.)

6.00 ft X 127.00 ft = 762 sq.ft

b. *Square Foot per Perforation = Bed Area (14a)* ÷ by *Total Number of Perfs (13)*

762 sqft ÷ 42 perf = 18 sq.ft/perf

15. Select *Minimum Average Head*: 1.0 ft

16. Select *Perforation Discharge* based on Table: 0.41 GPM per Perf

17. *Flow Rate = Total Number of Perfs(13.) X Perforation Discharge(16.)*

42 Perfs X 0.41 GPM per Perforation = 18.0 GPM

18. *Volume of Liquid Per Foot of Distribution Piping (Table II)*: 0.110 Gallons/ft

19. *Volume of Distribution Piping = Number of Perforated Laterals(4.) X Length of Laterals(6.) X Volume of Liquid Per Foot of Distribution Piping (18.)*

1 X 125.0 ft X 0.110 gal/ft = 13.8 Gallons

20. Minimum Delivered Volume = Volume of Distribution Piping (19.) X 4

13.8 gal X 4 = 55.0 Gallons

21. Maximum Delivered Volume = Design flow x 25%

750 gpd X 25% = 187.5 Gallons

22. Minimum Delivered vs Maximum Delivered evaluation: Volume ratio correct

Perforation Discharge (GPM)				
Head (ft)	Perforation Diameter			
	1/8	5/32	3/16	1/4
1.0'	0.18	0.41	0.56	0.74
1.5	0.22	0.51	0.69	0.9
2.0'	0.26	0.59	0.80	1.04
2.5	0.29	0.66	0.89	1.17
3.0	0.32	0.72	0.98	1.28
4.0'	0.37	0.83	1.13	1.47
5.0'	0.41	0.93	1.26	1.65
1 foot	Dwellings with 1/16 inch to 1/4 inch perforations			
2 feet	Dwellings with 1/8 inch perforations Other establishments and MDTS with 1/16 inch to 1/4 inch perforations			
5 feet	Other establishments and MDTS with 1/8 inch perforations			

Table II
Volume of Liquid in Pipe

Pipe Diameter (inches)	Liquid Per Foot (Gallons)
1	0.045
1.25	0.078
1.5	0.110
2	0.170
3	0.380
4	0.661

Comments/Special Design Considerations:

Basic STA Pump Selection Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. PUMP CAPACITY Project ID: 2CRO v 05.01.2026

Pumping to Gravity or Pressure Distribution: Pressure

A. If pumping to gravity enter the gallon per minute of the pump: _____ GPM *(10 - 45 gpm)*

B. If pumping to a pressurized distribution system: 18.0 GPM

C. Enter pump description: Equalization/Time Dosing

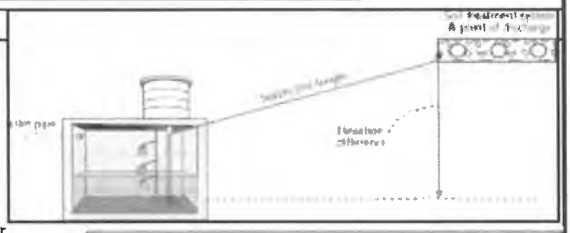
2. HEAD REQUIREMENTS

A. Elevation Difference between pump and point of discharge: 8.9 ft

B. Distribution Head Loss: 5 ft

C. Additional Head Loss*: _____ ft (due to special equipment, etc.)

* Common additional head loss: gate valve = 1 ft each, globe valve = 1.5 ft each, splitter valve = see manufacturers details



Distribution Head Loss	
Gravity Distribution = 0ft	
Pressure Distribution based on Minimum Average Head Value on Pressure Distribution Worksheet:	
Minimum Average Head	**Distribution Head Loss**
1ft	5ft
2ft	6ft
5ft	10ft

Table I. Friction Loss in Plastic Pipe per 100ft

Flow Rate (GPM)	Pipe Diameter (inches) 1	1.25	1.5	2
10	9.1	3.1	1.3	0.3
12	12.8	4.3	1.8	0.4
14	17.0	5.7	2.4	0.6
16	21.8	7.3	3.0	0.7
18		9.1	3.8	0.9
20		11.1	4.6	1.1
25		16.8	6.9	1.7
30		23.5	9.7	2.4
35			12.9	3.2
40			16.5	4.1
45			20.5	5.0
50				6.1
55				7.3
60				8.6
65				10.0
70				11.4
75				13.0
85				16.4
95				20.1

D. 1. Supply Pipe Diameter: 2.0 in

2. Supply Pipe Length: 131 ft

E. **Friction Loss in Plastic Pipe per 100ft** from Table I:

Friction Loss = 0.9 ft per 100ft of pipe

F. Determine *Equivalent Pipe Length* from pump discharge to soil dispersal area discharge point. Estimate by adding 25% to supply pipe length for fitting loss.
Supply Pipe Length X 1.25 = *Equivalent Pipe Length*

131 ft X 1.25 = 163.8 ft

G. Calculate *Supply Friction Loss* by multiplying *Friction Loss Per 100ft(E.)* by the *Equivalent Pipe Length(F.)* and divide by 100.

Supply Friction Loss =

0.9 ft per 100ft X 163.8 ft ÷ 100 = 1.5 ft

H. *Total Head* requirement is the sum of the *Elevation Difference(2A)* + Distribution Head Loss(2B) + Additional Head Loss(2C) + Supply Friction Loss(2G)

9 ft + 5.0 ft + _____ ft + 1.5 ft = 15.4 ft

3. PUMP SELECTION

A pump must be selected to deliver at least **18.0** GPM with at least **15.4** feet of total head.

Comments:

Goulds PE41 pump to be safe. Estimated operating point for time dosing is 33 gpm at 20 feet of head.

STA Dosing Pump Tank Design Worksheet (Time Dose)

MINNESOTA POLLUTION CONTROL AGENCY

Project ID: 2CRO v 05.01.2026

DETERMINE TANK CAPACITY AND DIMENSIONS

1. A. Design Flow: 750 GPD B. Tank Use: Dosing

C. Percentage of Design Flow 60 % 450 Gal Up to 75% design flow is normal for Design percentage

D. Code minimum pump tank capacity: 750 Gal E. Recommended capacity: 1250 Gal

2. A. Tank Manufacturer: Brown Wilbert B. Tank Model: 1250 Pump

C. Capacity from manufacturer: 1251 Gallons

D. Liquid depth of tank from manufacturer: 43.0 inches

E. Gallons per inch: 29.1 Gallons per inch

Note: Design calculations are based on this specific tank. Substituting a different tank model will change the pump float or timer settings. Contact designer if changes are necessary.

DETERMINE DOSING VOLUME

3. *Volume to Cover Pump* (The inlet of pump should be 4 inches from the bottom of the tank & 2 inches covering the pump recommended)

(Pump and block height + 2 inches) X *Gallons Per Inch* (2E)

(12 in + 2 inches) X 29.1 Gallons Per Inch = 407.3 Gallons

4. *Minimum Delivered Volume* = 4 X Volume of Distribution Piping:

-Item 19 of the Pressure Distribution or Item 11 of Non-level 55.0 Gallons (minimum dose) 1.89 inches/dose

5. Calculate *Maximum Pumpout Volume* (25% of Design Flow)

Design Flow: 750 GPD X 0.25 = 187.5 Gallons (maximum dose) 6.44 inches/dose

6. *Select a pumpout volume that meets both Minimum and Maximum:* 65.0 Gallons

7. Calculate *Doses Per Day* = Percentage Design Flow(1C) ÷ *Delivered Volume(6.)*

450 gpd ÷ 65.0 gal = 6.9 *Doses*

8. Calculate Drainback:

A. *Diameter of Supply Pipe* = 2 inches

B. Length of Supply Pipe = 131 feet

C. *Volume of Liquid Per Lineal Foot of Pipe* = 0.170 Gallons/ft

D. *Drainback = Length of Supply Pipe(8B) X Volume of Liquid Per Lineal Foot of Pipe(8C)*

131 ft X 0.170 gal/ft = 22.3 Gallons

9. *Total Dosing Volume = Delivered Volume(6.) + Drainback(8D)*

65.0 gal + 22.3 gal = 87.3 Gallons

10. Working Storage Volume = Tank Volume (2C) - Volume to Cover Pump(3.) - Reserve Capacity (22.)

1251.0 gal - 407.3 gal - 125.1 = 718.6 Gallons

Volume of Liquid in Pipe

Pipe Diameter (inches)	Liquid Per Foot (Gallons)
1	0.045
1.25	0.078
1.5	0.110
2	0.170
3	0.380
4	0.661

11. Required *Flow Rate*:

A. From Pump Curve - **Must verify after Install**: 33 GPM*

B. Calculated GPM = Change in Depth (in) x Gallons Per Inch(2E) / Time Interval in Minutes

in X 29.1 gal/in ÷ min = GPM

12. Select Flow Rate from 11 A or B: 33.0 GPM*

Note: This value must be adjusted after installation based on pump calibration.

STA Dosing Pump Tank Design Worksheet (Time Dose)

MINNESOTA POLLUTION CONTROL AGENCY

NORMAL OPERATION TIMER SETTINGS*

13. Calculate **TIMER ON** setting*:

Total Dosing Volume(9.) ÷ GPM(12.)

87	gal ÷	33.0	gpm =	2.6	Minutes **ON***

HR	MIN	SEC	
0	2.0	38	**ON Time**

14. Calculated **TIMER OFF** setting*:

Minutes Per Day (1440)/*Doses Per Day(7.)* - Minutes On(13.)

1440 min ÷	7	doses/day -	2.6	min =	205.4	Minutes **OFF***

HR	MIN	SEC	
3	25.0	21	**OFF Time**

OPTIONAL PEAK ENABLE DOSING* - ***Designers option for peak flow operation***

15. Peak Percentage of Design Flow [ ] %

16. Peak Pump Volume that meets both Minimum and Maximum Volume [ ] gal + Drainback [22.3] gal

17. Peak Dose Volume [ ] gal

18. Peak TIMER ON [ ] gal ÷ [ ] gpm = [ ] min ON

HR	MIN	SEC	
			Peak ON

**Note: This value must be adjusted after installation based on pump calibration.*

19. Peak TIMER OFF:1440 min ÷ [ ] doses/day - [ ] min On [ ] min Off

HR	MIN	SEC	
			Peak OFF

FLOAT SETTINGS **Alarm and Pump are to be wired on separate circuits and inspected by the electrical inspector**

20. Pump Off Float - Measuring from bottom of tank:

Distance to set Pump Off Float=Gallons to Cover Pump(3.) ÷ Gallons Per Inch(2E):

407	gal ÷	29.1	gal/in =	14.0	inches

Reserve Capacity 125 Gal

Alarm Depth [38.7] in

21. Alarm Float - Measuring from bottom of tank (90% recommended):

Distance to set Alarm Float = Tank Depth(2D) X % of Tank Depth (90% recommended)

43.0	in X	90	% =	38.7	inches

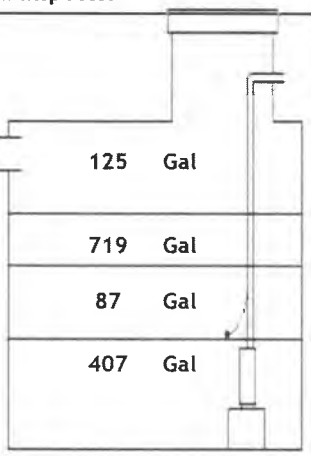
Storage Capacity 719 Gal

Normal Dose Volume 87 Gal

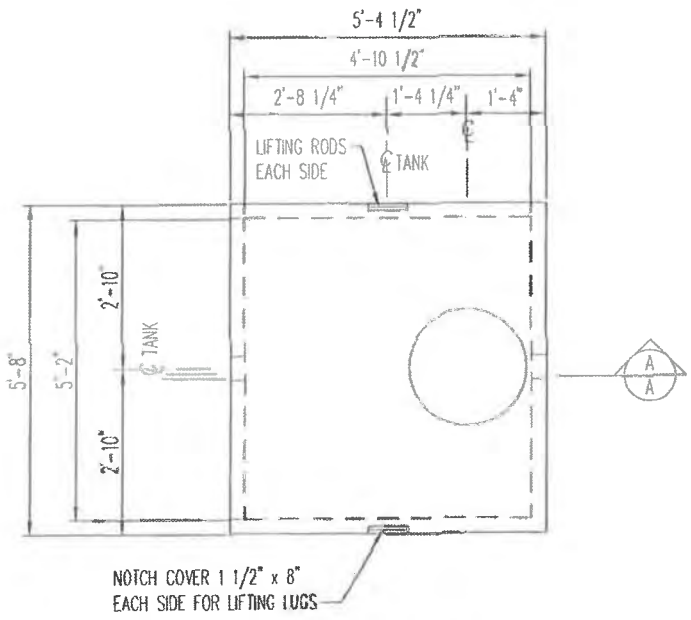
Pump Off [14.0] in

22. Reserve Capacity in gallons = Tank Depth(2D) - Alarm Depth(21.) X Gallons Per Inch(2E)

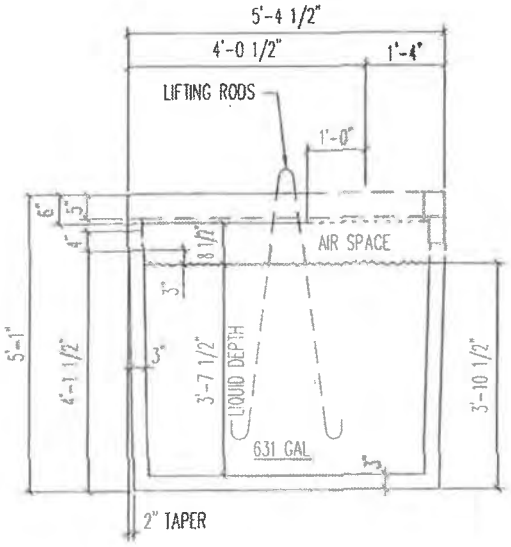
(43.0	in -	38.7	in) X	29.1	=	125.1	gallons



This is the current cut sheet for the 625 Tank installed in 2001



625 GALLON TANK
1/2" = 1'-0"



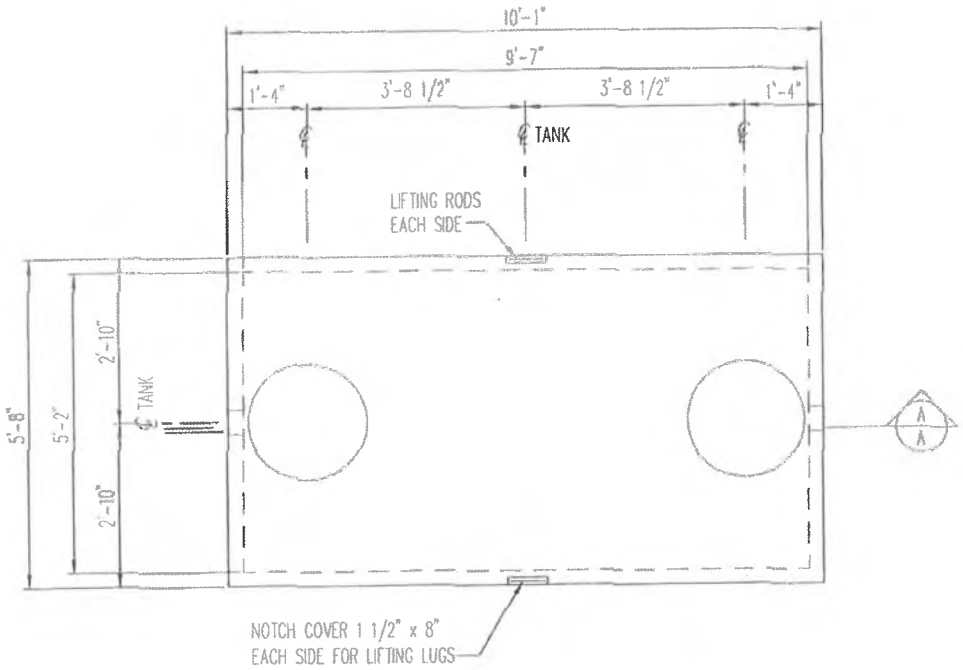
A
A SECTION
1/2" = 1'-0"

NOTE:
1. PROVIDE MINIMUM 1" CLEAR BETWEEN TOP OF BAFFLE AND UNDERSIDE OF LID

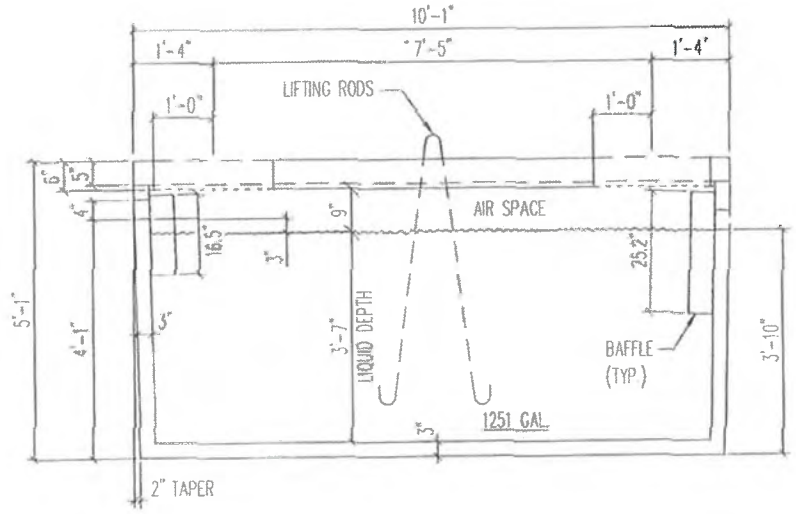
625 GALLON PUMP TANK (625 PT)	Brown Wilbert	WEIGHT=6280# MAX. SOIL COVER= 7'-0"


DANGER:
WARNING:
SAACOR INC. MODEL 3G
ULTRAVIOLET WASTE WATER DISINFECTION UNIT
Ratings: 120 VAC, 50/60 Hz, 0.5 Amp
Replaceable UV Lamp:
For OUTDOOR Use ONLY!

This is the current cut sheet for the 1,250 pump tank installed in 2001



1250 GALLON TANK
1/2" = 1'-0"



A
A · SECTION
1/2" = 1'-0"

NOTE:
1 PROVIDE MINIMUM 1" CLEAR BETWEEN TOP OF BAFFLE AND UNDERSIDE OF LID
2 PUMP TANK (PT) HAS NO OUTLET BAFFLE.

1250 GALLON SEPTIC OR PUMP TANK (1250 ST OR 1250 PT)	Brow Wilbert	WEIGHT=10,800# MAX. SOIL COVER= 7'-0"

xylem
Let's Solve Water

TECHNICAL BROCHURE
BPE R2



PE

SUBMERSIBLE EFFLUENT PUMP

BUILT IN THE USA
ENGINEERED, ASSEMBLED & TESTED

GOULDS WATER TECHNOLOGY
a xylem brand

FEATURES

- Corrosion resistant construction
- Cast iron body
- Thermoplastic impeller and cover
- Upper sleeve and lower heavy duty ball bearing construction
- Motor is permanently lubricated for extended service life
- Powered for continuous operation
- All ratings are within the working limits of the motor
- Quick disconnect power cord, 20' standard length, heavy duty 16/3 SJTW with 115 or 230 volt grounding plug
- Complete unit is heavy duty, portable and compact
- Mechanical seal is carbon, ceramic, BUNA and stainless steel
- Stainless steel fasteners

APPLICATIONS

Specially designed for the following uses:

- Mound Systems
- Effluent/Dosing Systems
- Low Pressure Pipe Systems
- Basement Draining
- Heavy Duty Sump/Dewatering

SPECIFICATIONS

Pump - General:

- Discharge: 1½" NPT
- Temperature: 104°F (40°C) maximum, continuous when fully submerged.
- Solids handling: ½" maximum sphere.
- Automatic models include a float switch.
- Manual models available.
- Pumping range: see performance chart or curve.

PE31 Pump:

- Maximum capacity: 53 GPM
- Maximum head: 25' TDH

PE41 Pump:

- Maximum capacity: 61 GPM
- Maximum head: 29' TDH

PE51 Pump:

- Maximum capacity: 70 GPM
- Maximum head: 37' TDH

MOTOR

General:

- Single phase, 60 Hz, 115 and 230 volts
- Built-in thermal overload protection with automatic reset
- Class B insulation
- Oil-filled design
- High strength carbon steel shaft

PE31 Motor:

- .33 HP, 3000 RPM
- 115 volts
- Shaded pole design

PE41 Motor:

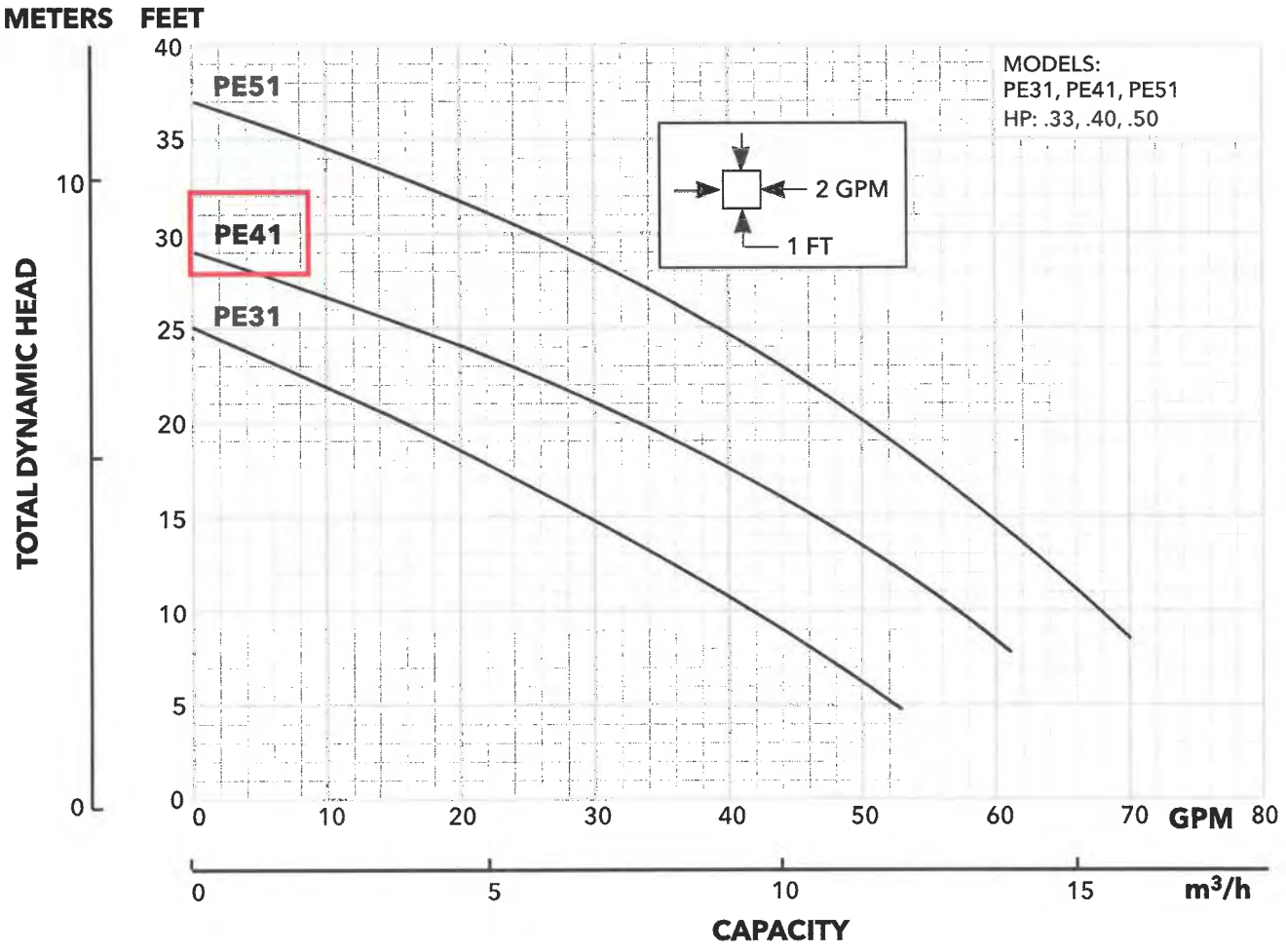
- .40 HP, 3400 RPM
- 115 and 230 volts
- PSC design

PE51 Motor:

- .50 HP, 3400 RPM
- 115 and 230 volts
- PSC design

AGENCY LISTINGS

Tested to UL 778 and CSA 22.2 108 Standards
By Canadian Standards Association
File #LR38549



PUMP INFORMATION

Order No.	HP	Volts	Amps	Minimum Circuit Breaker	Phase	Float Switch Style	Cord Length	Discharge Connection	Minimum Basin Diameter	Maximum Solids Size	Shipping Weight lbs/kg
PE31M	0.33	115	12	20	1	Manual / No Switch	20'	1.5"	18"	.5"	31 / 14.1
PE31P1						Piggyback Float Switch					
PE41M	0.4		7.5	15		Manual / No Switch					
PE41P1						Piggyback Float Switch					
PE42P1		230	3.7	10		Piggyback Float Switch					
PE51M	0.5	115	9.5	20		Manual / No Switch					
PE51P1						Piggyback Float Switch					
PE52M		230	4.7	10		Manual / No Switch					
PE52P1						Piggyback Float Switch					

PERFORMANCE RATINGS

PE31

Total Head (feet of water)	GPM
5	52
10	42
15	29
20	16
25	0

PE41

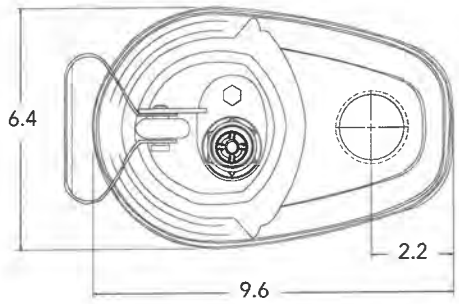
Total Head (feet of water)	GPM
8	61
10	57
15	46
20	33
25	16

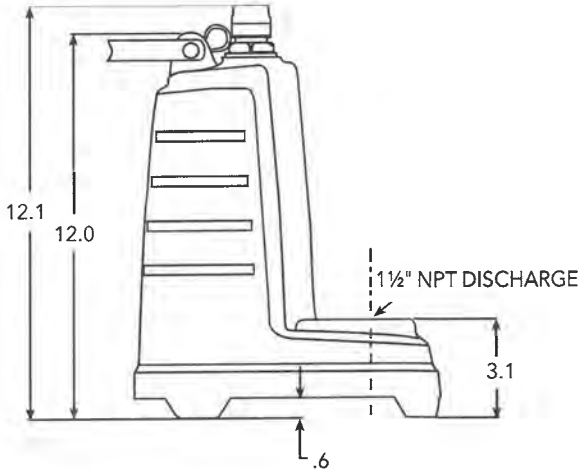
PE51

Total Head (feet of water)	GPM
10	67
15	59
20	50
25	39
30	26
35	8

DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)





xylem
Let's Solve Water

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Seneca Falls, NY 13148
Phone: (866) 325-4210
Fax: (888) 322-5877
www.xylem.com/goulds

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MULTI-FLO

MULTI-FLO WASTEWATER TREATMENT SYSTEMS

OWNER'S MANUAL

Consolidated Treatment Systems, Inc.
1501 Commerce Center Drive
Franklin, OH 45005
937-746-2727
www.multi-flo.com

Revised October 2002

THE MULTI-FLO ONSITE WASTEWATER TREATMENT SYSTEM

CONGRATULATIONS! You are the owner of a complete wastewater treatment system that combines aeration and filtration in one compact unit. Your system is tested and certified under NSF International, ANSI/NSF Standard 40, as a Class I system. The MULTI-FLO system meets the needs for onsite wastewater treatment beyond the capabilities of septic tanks. Like all onsite wastewater treatment alternatives, your MULTI-FLO unit must be operated and maintained in accordance with the Manufacturer's requirements and service provider's instructions. When properly operated and maintained, your unit will produce an effluent that meets all certification requirements.

HOW DOES THE MULTI-FLO OPERATE?

One of the features of the MULTI-FLO is that the entire treatment process takes place within a single tank. Wastewater flows into the tank. An aerator near the bottom draws air in and disperses it. This process transfers oxygen throughout the system. The oxygen, which is dissolved in the water, provides an environment conducive to the growth of aerobic bacteria. These bacteria effectively consume the organic materials. Consider your MULTI-FLO a living organism and treat it as such.

Another feature is the filter "socks," which are suspended in the tank. The "socks" support additional bacteria and strain all effluent before it leaves the unit. Solids are retained in the system. There is no by-pass for solids.

IMPORTANT ITEMS TO REMEMBER

MULTI-FLO units have an initial break-in period of six-to-eight weeks, during which time bacteria establish themselves in the unit. The development of these biological colonies occur naturally with the addition of sanitary wastes, so we recommend you use all your plumbing facilities in a normal manner from initial start-up. You may notice a tendency for the unit to foam from laundry wastes during this period. This is normal, and it should cease by the sixth week. You can help by using moderate amounts of low-sudsing biodegradable detergents.

MULTI-FLO units are designed to treat typical domestic wastewater. Flows from and materials in garage catch basins, storm water drains, sumps, and the like will adversely affect MULTI-FLO operation. Excessive amounts of cleaners, solvents, paints, greases, etc., will lead to a failure and service calls.

The following of these simple rules will decrease or eliminate maintenance problems and prolong the life and efficiency of your unit.

- Maintain a service agreement with an authorized MULTI-FLO service provider.
- Check that your unit's access lid is securely tightened down.
- Check the alarm by pressing the button to activate the light and buzzer on the audio-visual alarm.
- Call your service provider at the first sign of trouble.

- Follow your service provider's advice. He/she is trained to ensure that your unit operates at its maximum efficiency.
- Use low-sudsing, low phosphate biodegradable detergents.
- Contact your service provider if the system is to be used intermittently or if extended periods of non-use is anticipated.
- Keep un-disposable items out of your system. Some examples include but are not limited to: wet strength paper towels, disposable baby diapers, sanitary napkins, rubber and plastic products, rags, grit, and coffee grounds.
- Avoid discharging a water softener backwash into the system.
- Avoid placing grease into your system. Excessive grease will bind the filter socks.
- Do not pour solvents, paints, etc., into your system. These substances will harm the bacteria and plug the filters.
- Always keep your aerator running unless instructed otherwise by your service provider.
- Do not service the unit yourself. Contact your service provider to maintain your MULTI-FLO unit.

ALARM SYSTEM and ALARM CONDITION

Every MULTI-FLO unit comes equipped with an audio-visual alarm system. This alarm should be mounted in a conspicuous location. If an abnormal condition develops, you will be notified with a light and buzzer. Silence the buzzer by pressing the "silence" button on the alarm. If the light should stay on, call your service provider.

Check your audio-visual alarm periodically by holding the "test" button for approximately 10-to-12 seconds or until the light flashes and the buzzer sounds. Push the "Silence" button. Contact your service provider if your "test" button fails to activate the alarm.

If your alarm goes off, there are several steps you can take to determine the possible nature of the malfunction.

1. Is the alarm activated during a non-flow period, i.e., late at night, early morning? If so, the probable cause is the aerator.

2. Is the alarm activated intermittently while washing clothes or taking a shower? If so, filter failure (1–2 weeks) may be impending.

MAINTENANCE PROGRAM

YOUR MULTI-FLO UNIT REQUIRES PERIODIC SERVICING.

Maintenance of your MULTI-FLO is essential to ensure its proper operation and longevity.

During your initial two-year warranty, an authorized service representative will inspect your unit at six-month intervals and make any necessary adjustments to the system. The only exception is for the replacement of "out of warranty" and "physically abused" parts or abuse to the treatment process. Moreover, this warranty will not cover other treatment and dispersal components and devices, such as pre-tanks, drain fields, pump stations, and the like.

For continued service, your service provider will offer an annual service contract at the end of the warranty. Please contact your service provider for details.

In the event a problem arises or service is required, refer to the unit's data plate (located on the alarm and access lid) or the service label for instructions on contacting your closest service provider. Occasional pumping is required, due to accumulation of solids. The pumping cost may not be covered under your maintenance and service program. If you need parts or service, please contact the factory for the name of the service provider nearest you.

Your MULTI-FLO system is designed and intended to treat typical domestic wastewater (i.e., human bodily waste and liquid waste generated by the occupants of dwellings). To insure optimum performance and longevity, do not discharge any type of non-residential wastewater or other high-strength waste, including commercial food service waste, without contacting the manufacturer to determine if this will be acceptable without additional treatment.

IMPORTANT: MULTI-FLO units must be installed and maintained in compliance with all state and local laws and regulations. This includes compliance with all regulations concerning proper effluent disposal and the pumping and disposal of solids and byproducts pumped from the unit.

MULTI-FLO WARRANTY DOES NOT COVER THE COST OF SERVICE CALLS, LABOR, OR MATERIALS REQUIRED DUE TO THE FOLLOWING:

1. Misuse, abuse, or any repair or alteration performed by anyone other than authorized MULTI-FLO personnel

2. Use of components other than authorized MULTI-FLO replacement components.

3. Non-wastewater flows caused by infiltration, storm water connections, leakage from improperly maintained plumbing fixtures, water softener backwash, etc.

4. Failure to maintain electrical power to the treatment system in accordance with the requirements of the Manufacturer or the authorized MULTI-FLO service provider.

5. Disposal into the MULTI-FLO of non-biodegradable materials (i.e., plastics, coffee grounds, etc.) chemicals, solvents, grease, oil, paint, or any other substance, including but not limited to medicines, metals, toxins, volatile substances, and the like that are deleterious to the development and maintenance of the biological treatment process.

6. Short-term or daily wastewater flows to the MULTI-FLO that exceeds the unit's hydraulic or organic design capabilities.

7. Any usage contrary to MULTI-FLO owner's manual and/or the MULTI-FLO representative's recommendations.

MULTI-FLO MODEL SPECIFICATIONS

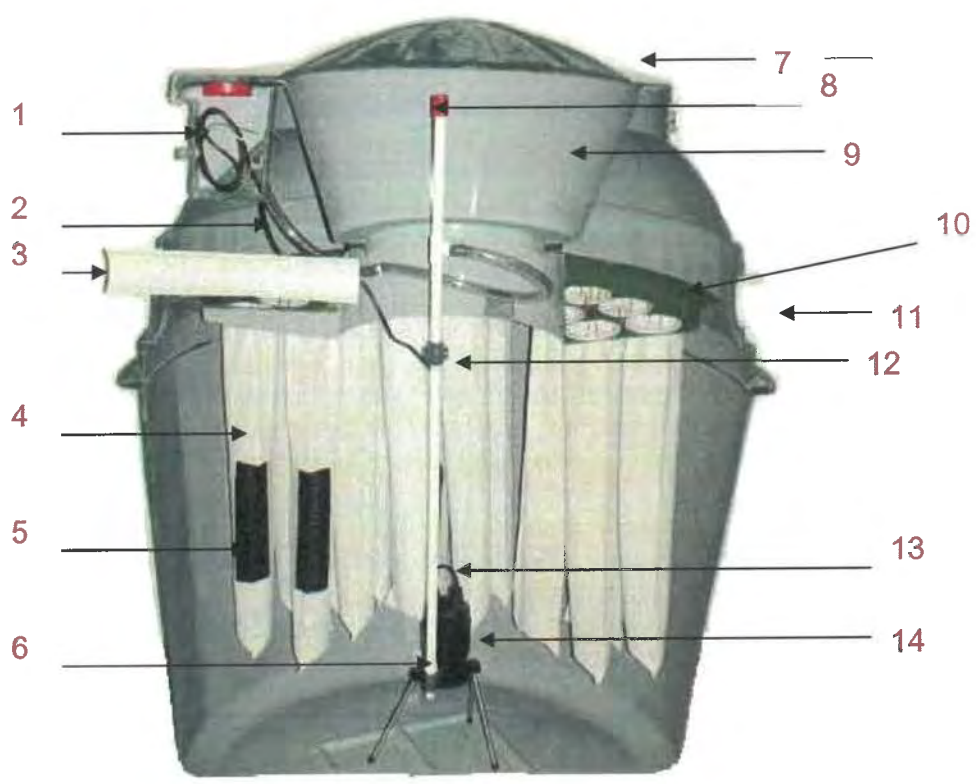
Item	FTB 0.5	FTB 0.6	FTB 0.75	FTB 1.0	FTB 1.5
Treatment (gal/day)	500	600	750	1000	1500
Volume (gal)l	500	600	750	1000	1500
CBOD (lb/day)	1.5	1.5	1.5	3.0	4.5
Diameter (in)	63"	71"	71"	78"	135"x63"
Total Height (in)	86"	86"	90 ¾"	93"	86"
Grade to Inlet Invert (in)	17 ¾"	16 ½"	16"	14 ¾"	17 ¾"
Grade to Outlet Invert (in)	19 ¾"	20"	19 ½"	18 ½"	21"
Excavation Depth (in)	74"	74 ½"	81"	81"	76"
No. of Aerators	1	1	1	2	3
No. of Filters	30	30	30	30	60
Shipping Weight (lb)	380	420	450	580	920
Inlet Invert* (in)	58"	58"	62 ½"	68"	58"
Outlet Invert* (in)	54 ¾"	54 ½"	59"	64 ¼"	54 ¾"
* From Bottom of Excavation – See Drawing					

MULTI-FLO WASTEWATER SYSTEM SPECIFICATIONS

Wastewater Treatment Performance (ANSI/NSF Standard 40 Evaluation)

TEST RESULTS (Mean Results)	INFLUENT (mg/L)	EFFLUENT (mg/L)	REDUCTION (%)
$CBOD_5$	150	5	97
TSS	195	5	98

MULTI-FLO COMPONENTS AND SPECIFICATIONS



Item	Part No.	Description	Qty.
1	A5037	Junction Box & Junction Box Cover	1
2	A9510	Air Tubing from sensor	1
3	A5025	Inlet Pipe	1
4	B5017	Filter	30
5	W49104L	Expander	30
6	A3016	Air Intake Assy.	1
7	A3008	Access Cover Assy.	1
8	A6517	Primary Alarm Sensor Assy.	1
9	A5029	Surge Bowl	1
10	A6002	Spring Ring Retainers	60
11	A5026	Outlet Pipe	1
12	A9516	¾" Union	1
13	A6603-4	Aerator Power Cord	1
14	A10031	Aerator	1

WARRANTY

Consolidated Treatment Systems, Inc., warrants the parts in each aerobic treatment unit to be free from defects in material and workmanship for a period of two (2) years from date of installation for treatment of household wastewater when properly registered with the manufacturer. Consolidated Treatment Systems, Inc., sole obligation under this warranty is as follows: Consolidated Treatment Systems, Inc., shall fulfill this warranty by repairing or exchanging any component part, FOB Factory, that shows evidence of defects, provided said component part has been paid for and is returned through an authorized dealer, transportation prepaid. The warrantee must also notify Consolidated Treatment Systems, Inc., of the defect complained of. There is no informal dispute settlement mechanism available under this LIMITED WARRANTY.

No warranty is made as to the field performance of any unit. This LIMITED WARRANTY applies only to the parts manufactured by Consolidated Treatment Systems, Inc., does not include any portion of the household plumbing, drainage, or installation of disposal system. Components or accessories supplied by Consolidated Treatment Systems, Inc., but manufactured by others, are warranted only to the extent of and by the terms and conditions of the original manufacturer's warranty. In no event shall Consolidated Treatment Systems, Inc., be responsible for delay or damages of any kind or character resulting from, or caused directly or indirectly by, defective components or materials manufactured by others.

Recommendations for special applications will be based on the best available experience of Consolidated Treatment Systems, Inc., and published industry information. Such recommendations do not constitute a warranty of satisfactory performance.

This LIMITED WARRANTY extends to the consumer of the product. As used herein, "consumer" is defined as the purchaser who first uses the unit or the subsequent user(s) for the first 2 years after its initial installation. It is the first user's or servicing dealer's obligation to make known to the subsequent user(s) the terms and conditions of this warranty.

This warranty is a LIMITED WARRANTY and no claim of any nature shall be made against Consolidated Treatment Systems, Inc., unless and until the consumer, or his legal representative, notifies Consolidated Treatment Systems, Inc., in writing of the defect complained of and delivers the product and/or defective part(s), freight prepaid, to the factory or an authorized service station.

Consolidated Treatment Systems, Inc., reserves the right to revise, change, or modify the construction and design of the aerobic treatment units for household wastewater, or any component part or parts thereof, without incurring any obligation to make such changes or modifications in equipment previously sold. Consolidated Treatment Systems, Inc., also reserves the right, in making replacements of component parts under this warranty, to furnish a component part which, in its judgment, is equivalent to the part replaced.

UNDER NO CIRCUMSTANCES WILL CONSOLIDATED TREATMENT SYSTEMS, INC., BE RESPONSIBLE TO THE WARRANTEE FOR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOST PROFITS, LOST INCOME, LABOR CHANGES, DELAYS IN PRODUCTION AND/OR IDLE PRODUCTION, WHICH DAMAGES ARE CAUSED BY A DEFECT IN MATERIAL AND/OR WORKMANSHIP IN ITS PRODUCT OR PARTS. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER EXPRESS OR IMPLIED WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS, AND OF ANY OTHER OBLIGATION ON THE PART OF CONSOLIDATED TREATMENT SYSTEMS, INC. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIAL LEGAL RIGHTS AND YOU MAY HAVE OTHER RIGHTS, WHICH VARY FROM STATE TO STATE.

Recommended Prohibitions in an On-Site System

The following is a collaborative effort of wastewater professionals to list items which can cause on-site treatment systems to operate below their potential. These items are known to have caused failures of on-site treatment systems and must be considered if the waste generated by from a particular site will contain them in excessive quantities. Since excessive is a subjective word, it is highly recommended by NOWRA to share these concerns with a Professional Engineer or Designer to identify a treatment strategy for the particular needs.

Inert Materials: Plastics, Rubber, Souring Pads, Dental Floss, Cigarette Filters, Bandages, Hair, Mop Strings, Lint, Rags, Cloth and Towels do not degrade in an on-site treatment system. Inert Materials will build up solids, and lead to system malfunction, clogging or increased pump out frequency.

Paper Products: Disposable Diapers, Paper Towels, Baby Wipes, Facial Tissues, Moist Toilet Paper are not designed to dissolve in an on-site treatment systems. Excessive Amounts of toilet tissue will not decompose. All can lead to system malfunction, back-up or increased pump out frequency.

Food Wastes: Do not put Animal Fats & Bones, Grease, Coffee Grounds, Citrus & Mellon Rinds, Corn Cobs, Egg Shells, down the sink. Garbage disposal use should limited to waste that cannot be scooped out and thrown in the trash. Spoiled Dairy Products and Yeasts from home Brewery or baking may cause excessive growth of microbes that do not degrade sewage.

Medicines: Do not flush Baby Wipes, Lotion, Scented or Quilted Toilet tissue, Female Sanitary Products, Cotton balls or swabs, Condoms or expired Medicines/Antibiotics. Septic Tank additives generally do more harm than good. Automatic Disinfection Tablets (blue, clear or otherwise) will kill the organisms needed to consume waste.

Chemical & Toxins: Kill the microbes necessary for treatment. Paint, Paint Thinner, Solvents, Volatile Substances, Drain Cleaners, Automatic Fluids, Fuels, Pesticides, Herbicides, Fertilizers, Metals, Disinfectants, Sanitizers, Bleach, Mop water, Excessive use of Household chemicals, and Backwash Water Softener regeneration.

Laundry Practices: On-site systems must process the water as it enters the systems. Laundry should be spread out over the week, not all run at one time. Excessive use of Detergents, especially those containing bleach, can affect system performance. Liquid detergents are recommended over powders. Fabric Softener sheets are recommended over liquid softeners. Bleach should be used sparingly and at half the rate indicated on the container.

Clear Water Waste: From A/C Discharge lines, Floor Drains, Gutters, Whole House Water Treatment Systems Sump Pumps can increase the flow to your treatment systems. These flows can at least disrupt, if not destroy your treatment process.

MULTI~FLO WASTE TREATMENT SYSTEM
GENERAL OPERATIONAL TIPS

UNIT MUST RUN 24 HOURS PER DAY: If leaving residence unoccupied for long periods of time, contact your servicing dealer. Timers should not be installed unless specifically authorized by the servicing dealer.

DETERGENTS: Low sudsing detergents should be used. If powdered detergents are used, only the concentrated forms are recommended. Filler materials used in the "economy size" containers do not dissolve readily. Below are a few suggestions:

Ultra Cheer with advance color guard powder
Liquid Tide with bleach alternative
Ultra ERA liquid
Arm and Hammer Powder with Bleach
Lanosoft (available thru your dealer)

NEVER USE MORE THAN THE MANUFACTURER'S RECOMMENDED AMOUNT OF DETERGENT: If excessive sudsing or foaming occurs during laundry, reduce the amount of detergent used to 1/2 of the recommended amount.

BLEACH: Chlorine bleach should not be used. Oxygen bleaches are recommended. Oxygen bleaches can be used in any form, liquid, powder, or pellets. Most laundry detergents contain sodium perborate or bleach which releases boron as it breaks down. Boron has a bactericidal effect which in excessive quantities could damage your treatment plant so that it is wise to keep bleach levels to a minimum.

DRAIN CLEANERS: Non-caustic biodegradable drain and toilet bowl cleaners are recommended when available. *DO NOT USE TOILET BOWL CLEANERS SUCH AS 2000 FLUSHED; OR DRAINE CLEANERS SUCH AS DRANO.*

GARBAGE DISPOSAL: Care should be taken not to dispose of grease or fat in the disposal. Food scraps should be scraped into the garbage container and not flushed down the disposal.

NEVER flush paper towels, newspapers, wrapping paper, feminine articles, and rags into the system.

NEVER allow large, irregular, intermittent or constant volumes of clear water into the system as with a leaking toilet or faucet. Do not allow the water softener waste discharge line to be connected to the aerobic system.

WASHING MACHINES are responsible for large volumes of water entering the system all at once. This surge of water can hydraulically overload the unit and interfere with the smooth operation of the system. Space washings throughout the week rather than doing several loads in one day.

COOKING OILS AND GREASE are troublemakers. The type of bacteria found in aerobic systems do not live well in solidified grease. *GREASE AND COOKING FATS SHOULD NEVER BE PLACED DOWN ANY DRAINS.*

Under no circumstances should you put any of the following products down the sink, toilets or drains as they will significantly affect the efficiency of your sewage plant: medicines, cooking oil or melted fat, motor oils or other car products, garden chemicals, paints, paint thinners and other solvents.

Please read the owners manual and the conditions of the warranty. Your aerobic system is a biological treatment system designed to achieve a high degree of treatment of domestic sewage. Providing routine maintenance and following the recommendations of the owner's manual and your authorized servicing agent will help insure optimum performance as well eliminate the cost of unnecessary service calls.

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MULTI-FLO

WASTEWATER TREATMENT SYSTEMS

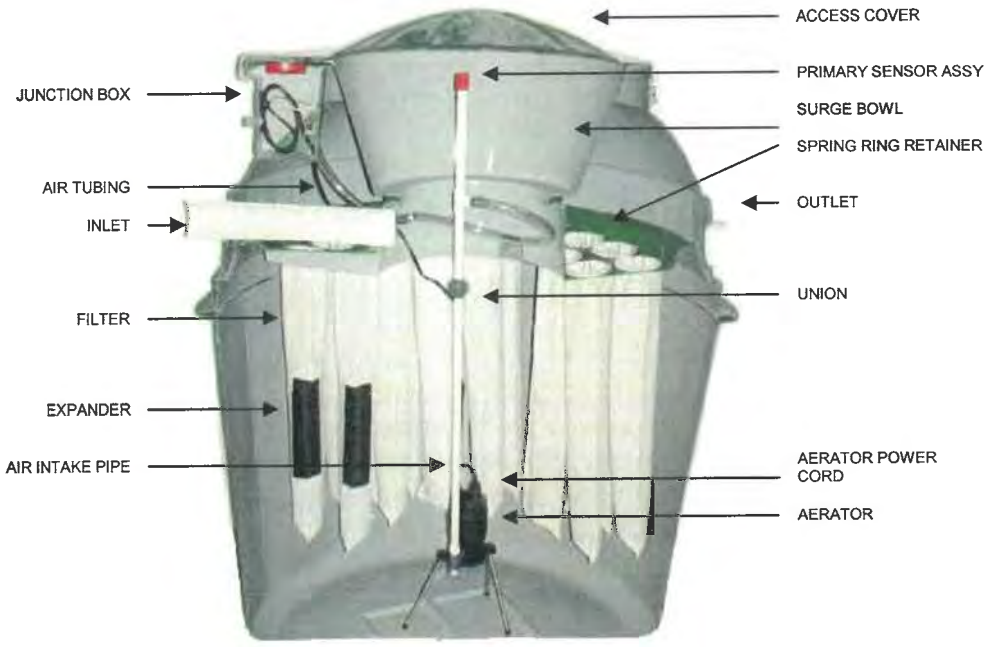
PROCEDURES FOR

ASSEMBLY AND INSTALLATION

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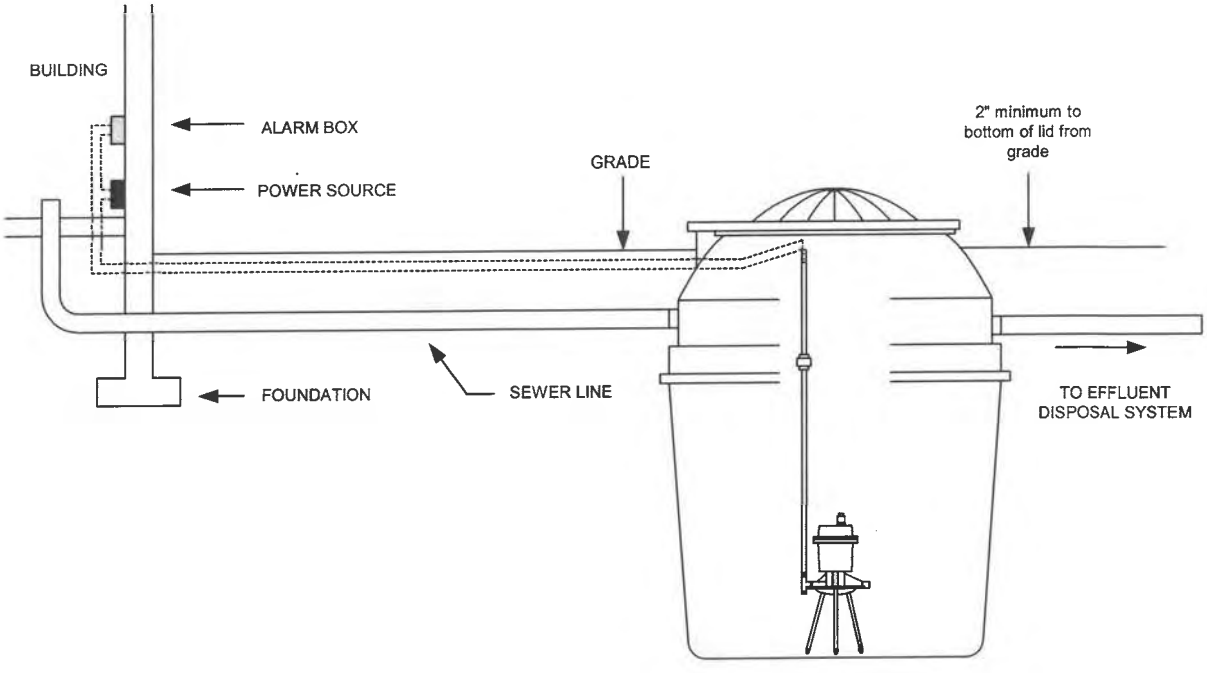
MULTI-FLO TANK COMPONENTS

Fig. 1.1



TYPICAL INSTALLATION
(Cross Section)

Fig. 1.2



MULTI-FLO
Procedures for
Assembly and Installation

Unless otherwise noted, the instructions within this manual may be used for all models (FTB 0.5, FTB 0.6, FTB 0.75, FTB 1.0 and FTB 1.5) of the ***MULTI-FLO*** wastewater treatment unit.

The installation must comply with state and local regulations

SECTION 1.0 SITE PREPARATION

1.10 LOCATION

1.11 **An accurate, detailed site plan is essential for successful installation of *MULTI-FLO* units.** The site plan should show the locations and elevations of the wastewater treatment unit and effluent disposal system. Check to make sure the site plan accurately reflects the conditions actually existing at the site and that all required set-backs (i.e., to property lines, wells, etc.) are being met.

1.20 GRADE AND GROUND CONTOUR

1.21 Position the wastewater treatment unit in accordance with the plan. Confirm the accuracy of the elevations shown in the plan.

SURFACE WATER MUST NOT ENTER THE SYSTEM AROUND THE ACCESS COVER OR FROM THE DISCHARGE PIPE.

1.30 COVER EXPOSURE

1.31 The access cover must be exposed at all times to permit the system to function properly and to allow for routine maintenance. There should be a minimum of two (2) inches between the bottom of the lid and the finished grade (refer to Fig. 1.2).

1.40 BUILDING SEWER LINE

1.41 Make sure that the sewer pipe from the building has the proper slope to meet the inlet invert of the ***MULTI-FLO*** and maintain the grade requirements for the exposure of the cover.

1.50 EXCAVATION PREPARATION

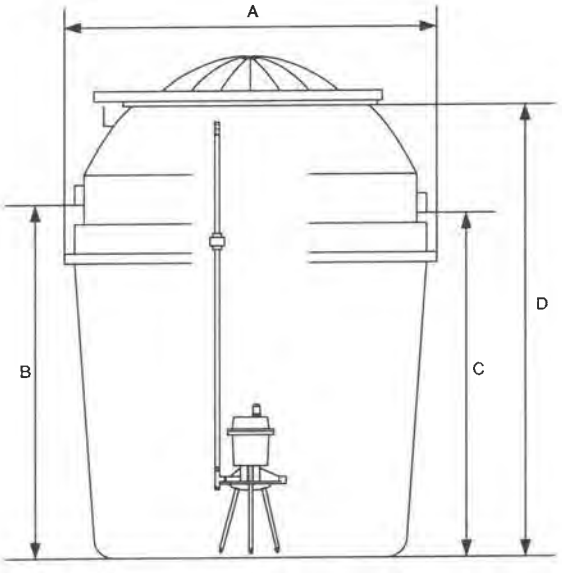
1.51 Mark off an area at least one foot larger than the dimensions of the ***MULTI-FLO*** and maintain the grade requirements for the exposure of the cover.

1.60 EXCAVATION (refer to Fig. 1.3)

1.61 Prepare the excavation. The opening should follow the area laid out in Section 1.51. Determine the required depth of the excavation based upon the elevation of the invert of the inlet sewer line (B) or the elevation of the finished grade (D), both of which should conform with the site plan. These dimensions are given for each model in Figure 1.3. NOTE: If the distance from the finish grade elevation to the bottom of the excavation exceeds the dimension (D) shown in Figure 1.3, a riser will be required (refer to Section 2.40). If digging in soil containing large rocks or clods of dirt, it may be necessary to remove an extra 6" to allow for bedding material (refer to Item 1.63).

MULTI-FLO TANK DIMENSIONS

Fig. 1.3



Model Numbers	Dimensions A	B	C	D
FTB 0.5	63	58	56	76
FTB 0.6	71	58	56	75
FTB 0.75	71	65	63	79
FTB 1.0	78	65	63	83
FTB 1.5	135 x 63	58	56	76

A = Outside diameter
B = Inlet invert from bottom of excavation
C = Outlet invert from bottom of excavation
D = Final grade from bottom of excavation

1.62 Level the floor of the excavation.

1.63 If bedding material is required, place at least six inches of sand, pea gravel or other similar, suitable granular material on the bottom and smooth out evenly. If ground water is present, use pea gravel or class 2 river rock to build a base for the system. In all cases, the bottom should be level and well compacted. **Note: Localized soil and groundwater conditions may require specialized procedures to assure proper installation.**

SECTION 2.0 INSTALLATION OF THE TANK

2.10 PLACING THE WASTEWATER TREATMENT UNIT INTO THE EXCAVATION (Refer to Fig. 2.1)

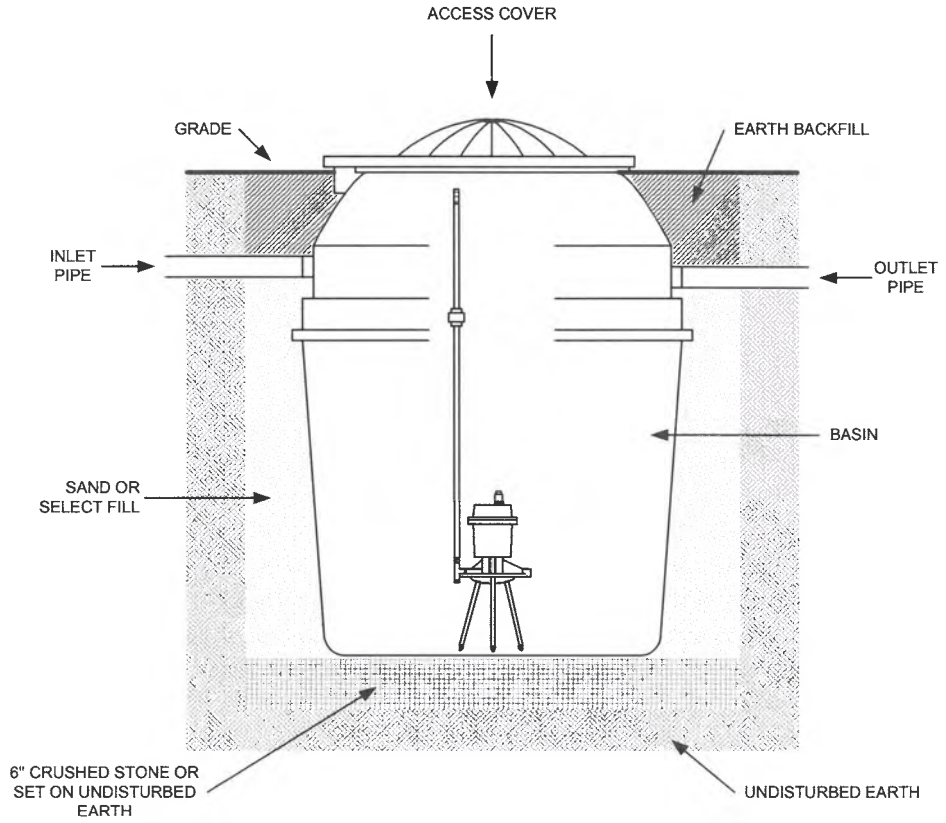
2.11 Rig the tank to lift. See unit specifications for actual weights. Except for the FTB 1.5, ropes can be attached to the inlet and outlet. Note: The FTB 1.5 has lifting hooks that must be used.

2.12 Slowly lower the tank into the hole, setting it carefully on the bottom.

2.13 Position the unit, so that the inlet (higher four inch pipe) is aligned with the sewer line from the building. (See Fig. 1.3)

BACKFILLING PROCEDURES

Fig. 2.1



2.20 LEVELING THE WASTEWATER TREATMENT UNIT
CAUTION: The system must be level. A tilted system will not work.

2.21 Place a level across the center tower in several directions. Adjust the tank until it is level. Leveling can be accomplished by shifting the bedding materials. Bedding materials must be evenly distributed to support the weight of the filled tank. **DO NOT USE WEDGES OR OTHER DEVICES TO LEVEL THE TANK.**

2.22 An alternative to using a mechanical level is to plug the outlet pipe with a four inch plastic pipe cap. Fill the area outside of the circular weir with water. As noted in 2.21, adjust the unit until it is perfectly level.

2.30 FILLING THE TANK WITH WATER
CAUTION: To avoid damage from floatation always fill the tank.

2.31 Fill the tank with clean water. Do not fill with water from a pond, river or ground water in the excavation because this water will contain silt or sediment.

2.32 While filling, check frequently to make certain that the tank remains level. If the tank shifts or seems to settle unevenly, discontinue filling and make the necessary corrections to level the tank.

2.33 When the water begins to flow over the weir, stop filling the tank.

2.40 BACKFILLING THE TANK (Fig. 2.1)

2.41 Once the tank has been leveled and has been filled with at least two (2) feet of water, backfilling can begin.

2.42 Using sand, pea gravel or other selected fine material carefully begin backfilling (by hand) until there is approximately 2-3' of compacted fill around the tank.

2.43 After checking the tank to insure it is level, place the access lid on the tank and carefully backfill to the bottom of the outlet pipe. Care should be taken with the backfilling procedures to prevent damaging the tank with rocks or clods of dirt, especially if the original soil is used for backfilling.

2.44 Glue and firmly insert the inlet and outlet sewer pipes (4" Sch. 40 PVC) into their respective fittings. **CAUTION: To prevent any damage to the inlet or outlet** pipes **due to settling or backfilling, make sure that both the inlet and outlet pipes are set on undisturbed or firmly packed fill material prior to final backfilling.**

2.45 Finish backfilling to a level approximately 2 inches below the access lid. When landscaping is completed, the access lid should be at, or above, finished grade level.

2.46 If the final elevation of the ***MULTI-FLO*** is below grade so that surface water can enter the access opening of the plant, (1) a dosing pump can be installed prior to the ***MULTI-FLO***; or (2) a riser (not exceeding 20") can be provided on the ***MULTI-FLO***. **CAUTION: The addition of a riser will make access for service more difficult.**

2.50 INSTALLATION OF FILTER BAGS AND EXPANDERS

2.51 Carefully place an expander into the bag and slide it to the bottom. Be careful not to rip or tear the bag. Even the smallest opening will cause the unit to malfunction.

2.52 Insert the closed end of the filter bag into one of the holes in the hanger plate.

2.53 Continue this process until all filters and expanders are installed. All holes in the hanger plate must have a filter and an expander.

2.60 INSTALLATION OF SPRING FASTENERS

2.61 All filters and expanders must be installed.

2.62 Grasp the spring fastener. (See Fig. 2.2)

2.63 Squeeze the arms of the fastener together until it will slip into the filter bag up to the grooves. (See Fig. 2.3)

2.64 Release the spring, so that the top of the groove in the fastener is on top of the ring that is inside the filter. The bottom of the groove should be in contact with the underside of the hanger plate. The fastener is now holding the filter to the hanger plate. (See Fig. 2.4)

2.65 Place a second spring fastener in the filter at a right angle, so that it lies across the first fastener.

2.66 Continue until each filter has two fasteners in place.

SPRING FASTENERS INSTALLATION

Fig. 2.2



Fig. 2.3



Fig. 2.4



2.70 AERATOR ASSEMBLY AND INSTALLATION

2.71 Remove all parts of the aerator from the box. This should include: aerator, legs (3), tee, 1/2" plug, 1/2" nipple, and the owner's manual.

2.72 Screw the three (3) legs into the angular threaded holes in the bottom of the aerator cross-shaped piece. Make sure the leg is screwed all the way into the cross.

2.73 A plastic cap should be on the plain end of each leg.

2.74 Turn the aerator on its side and spin the impeller by hand several times. THIS STEP IS IMPORTANT.

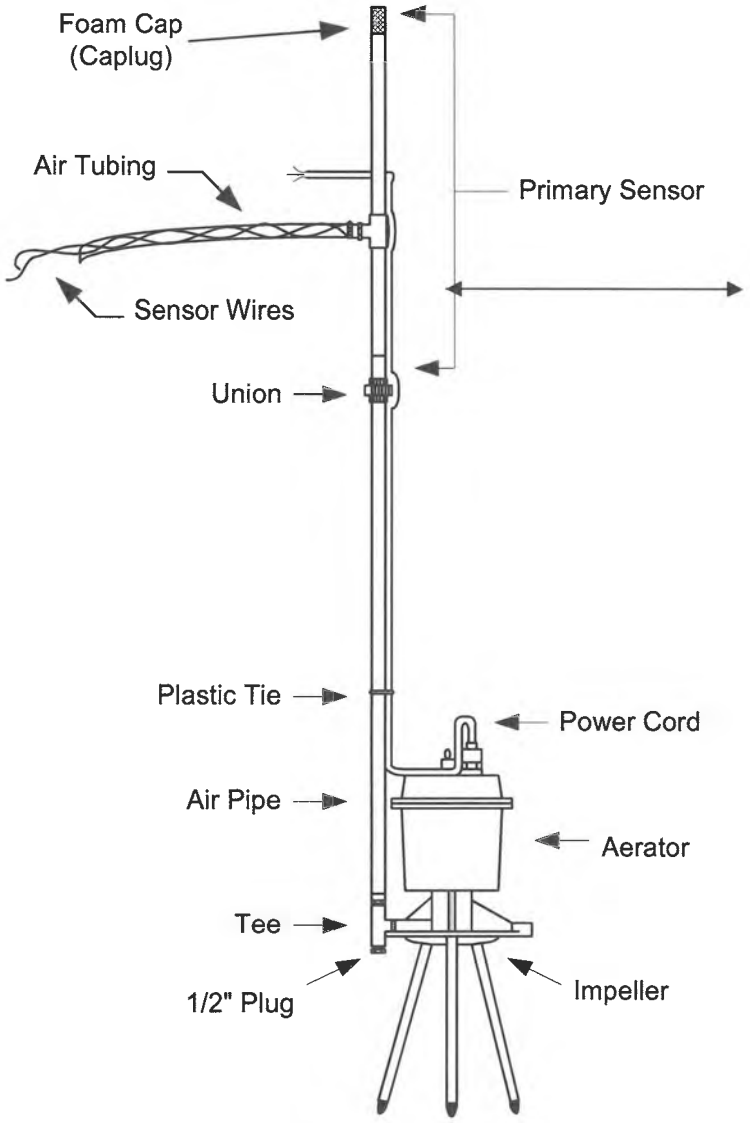
2.75 With the aerator in the position shown (See Fig. 2.5) assemble the plastic tee to the nipple on the aerator.

2.76 Screw the one-half inch plug into the bottom of the tee.

2.77 Screw the threaded end of the air intake pipe into the top of the tee.

AERATOR ASSEMBLY

Fig. 2.5



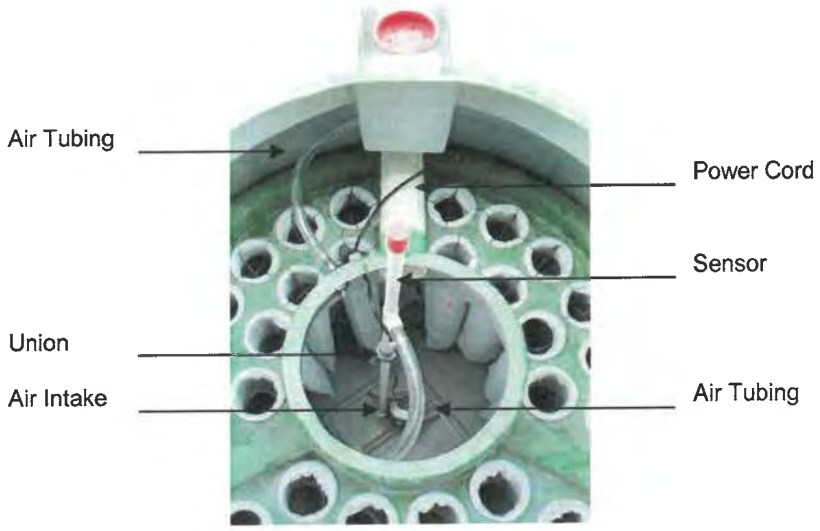
2.78 Attach the sensor assembly (Fig. 2.6) with the union to the air intake pipe. Tighten as much as possible by hand. NOTE: Be sure that the O ring seal is in the union half of the assembly.

2.79 Tie the aerator power cord to the air intake pipe with the plastic ties. **CAUTION: Do not pull or stretch the power cord. To facilitate removal, a nylon rope or chain can be attached to the lifting ring on the top of the aerator.**

2.80 By grasping the air intake pipe, carefully lower the aerator assembly through the center of the tank opening to the bottom. **CAUTION: Be sure to keep the air tubing from crimping which will prevent air flow.**

SENSOR ASSEMBLY

Fig. 2.6



2.81 Run the aerator power cord through the fittings as shown in figure 2.6 and into the junction box. **CAUTION: Use care when running the power cord through the fittings. Damage to the cord will void the warranty.**

SECTION 3.0 ELECTRICAL CONNECTIONS (ALARM AND AERATOR) (Refer to specific sheet of direction for each model)

SECTION 4.0 START-UP PROCEDURES

4.10 CHECKING THE AERATOR

4.11 Once the aerator and alarm have been installed, and all electrical work is completed, power should be supplied to the aerator and alarm.

4.12 Check the aerator to insure proper operation. If no air bubbles are observed coming from the aerator, immediately disconnect the power source. Refer to Items 1A, 1B, and 1C of the Trouble-Shooting Checklist for corrective action.

4.20 CHECKING THE FILTERS

4.21 Once the aerator is running, check each filter to see if any air bubbles are escaping under the filter ring. If so, remove the clips, re-adjust the filter and re-install the clips. Some adjustment may be necessary to eliminate the bubbles.

4.30 CHECKING THE ALARM

4.31 With the power being supplied to the aerator and alarm, press the "test" button to activate the alarm. Note: YOU MUST HOLD THE TEST BUTTON DOWN FOR 6-to-7 SECONDS BEFORE THE ALARM ACTIVATES.

4.32 Shut the power off to the aerator and check if the alarm is activated. Again, allow 6-to-7 seconds for the alarm to sound.

4.33 If the alarm is not activated during these tests, refer to Items IIA and IIC of the Trouble-Shooting Checklist for corrective action.

4.34 If the alarm activates after 10-15 minutes of operation, reverse the white and black sensor wires in the alarm.

4.40 UNIT START-UP

4.41 Once the aerator and alarm have been checked and are operational, the unit is ready to receive sewage flows.

4.42 Normally, it is not necessary to add any chemicals or enzymes to facilitate unit start-up. It is helpful, however, to restrict the discharge of excessive amounts of gray water from showers and laundry during the initial 6-to-8 weeks of use.

4.43 If the ***MULTI-FLO*** system exhibits a gray dishwater appearance in the aeration chamber, or has a noticeable odor, contact the factory or the local authorized representative for the proper procedure to follow to attain normal operation.

SECTION 5.0 USE OF A PRETREATMENT TANK (Fig. 5.1)

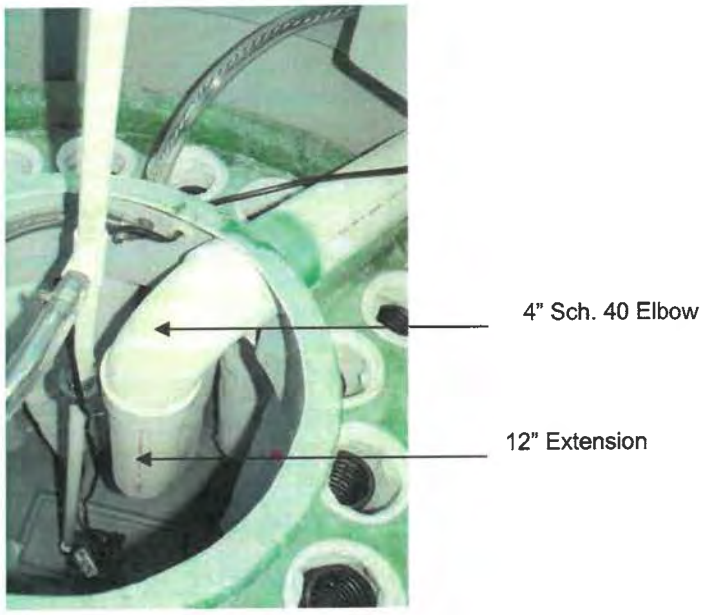
MULTI-FLO has been designed and certified to function without the use of pre-treatment tank. However, installation of a pre-treatment tank, if used to address local requirements or to reduce maintenance problems, will not adversely affect unit performance if it is properly sized and installed.

If a pre-treatment tank is installed, the liquid capacity of the pre-tank should be between 50-to-100 percent of the treatment capacity of the ***MULTI-FLO***. Slightly larger tanks can be used with the FTB 0.5 and FTB 0.6. Please refer to the ***MULTI-FLO*** Design Guide for details.

5.11 The use of a pre-tank may cause septic odors to escape from the ***MULTI-FLO*** during periods of heavy usage (i.e., laundry). In these cases, a 4-inch Schedule 40 elbow can be installed on the inlet pipe to the ***MULTI-FLO***. A 12-inch piece of pipe should be added to extend below the surface of the water (refer to Fig. 5.1).

MULTI-FLO INLET DEVICE WHEN INSTALLED AFTER A PRE-TANK

Fig. 5.1



MULTI-FLO

MULTI-FLO WASTEWATER TREATMENT SYSTEMS

DESIGN MANUAL

Revised December 19, 2003

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Multi-Flo -Series Onsite Wastewater Treatment Systems

Introduction

Onsite wastewater treatment refers to the process of treating and disposing, dispersing, or recycling of wastewater at or near its point of generation. Historically, the phrase has been synonymous with "septic system" because that was the only design alternative available. With the advent of different design technologies, septic systems are just one of several available alternatives. Because treated wastewater—effluent—is a valuable resource, owners have the flexibility in how they use this resource. Multi-Flo systems provide owners with options as to how they treat and recycle wastewater.

The suitability and design of septic systems rely upon native soils to treat *and* disperse wastewater. In fact, treatment and dispersal are essentially combined in the same process. For this reason, septic system use is limited to those soils where both functions can be accomplished. Multi-Flo units allow owners to separate treatment and dispersal and address each separately. If soil is the selected dispersal alternative, the design can be based solely upon the ability of the soil to transmit water from the site. Owners may have options, depending on local codes, to use the treated wastewater for beneficial purposes such as recycling into plumbing systems or irrigating gardens and turf. The Multi-Flo series provides owners with alternatives unavailable to those who rely solely upon septic systems.

The Multi-Flo -series are capable of treating typical domestic wastewater daily flows equal to rated capacities, which are shown in Table 1. The Multi-Flo FTB-series design is based on the same principles as many municipal wastewater treatment plants. These design principles have been adapted for the small flows developed by individual residences or small commercial/residential developments.

Table 1—Multi-Flo - Series

Model	Rated Flow (gpd)	O_2 Transfer (Max., lb/day)
FTB-0.5	500	3.6
FTB-0.6	600	3.6
FTB-0.75	750	3.6
FTB-1.0	1000	7.2
FTB-1.5	1500	10.8

This manual serves as a guide to design an onsite wastewater treatment system using Multi-Flo units. The manual includes recommendations for both residential and commercial applications. The recommendations include typical flow data and component suggestions. A failure to consider these recommendations may result in poor unit operation or additional maintenance.

Definitions

The following definitions are critical to understanding the design, installation and operation of Multi-Flo units. These definitions have been purposely simplified so they can be understood by a wide range of readers.

ANSI/NSF Standard 40: A performance certification standard intended for onsite wastewater treatment systems having a flow for between 400 and 1500 gpd (gallons per day) and a single point of discharge.

$CBOD_5$: The concentration of oxygen (expressed as mg/L) utilized by microorganisms in the non-nitrogenous oxidation of organic matter during a five-day period at a temperature of 20°C.

Clarify: A process of separating from wastewater fats, oils, grease, and floatable materials, which float to the surface; and solids, which sink to the bottom.

Commercial Occupancy: A building used for commerce or industry.

Dispersal: A process for recycling treated wastewater back into the environment.

Dosing: A process for periodic discharge of wastewater to a Multi-Flo unit.

Effluent: The discharge from a treatment component or system.

Flow Equalization: A process for mitigating variations in flow by holding wastewater in a tank and dosing the wastewater into the Multi-Flo unit.

Flow Equalization Tank: A watertight, airtight tank, timer, and pumping system having a detention time of 16-to-24 hours used to capture and retain solids, grit, and scum, and then meter the water into the Multi-Flo unit through periodic dosing.

FOG: Fats, oils, and grease in wastewater.

Frequenter: A visitor to and/or customer of a commercial occupancy.

Grease Trap: A tank for capturing and retaining fats, oil, and grease.

Maintenance: Periodic activities intended to maintain the efficiency and effectiveness of the system.

Mixed Liquor. The contents of the Multi-Flo aeration chamber consisting of, but not limited to, partially treated wastewater and microbial colonies that oxidize the organic material in the wastewater.

Onsite Wastewater Treatment System. A device or combination of devices, which may include tanks, vessels, pumps, aerators, aerators, and other mechanical equipment, intended to treat and disperse wastewater at or near the point of generation.

Pre-aeration: Aeration of wastewater to reduce the $CBOD_5$ prior to discharge to the Multi-Flo unit.

Pre-Aeration Tank: A tank used to reduce partially the $CBOD_5$ of the wastewater before the wastewater enters the Multi-Flo unit.

Pretreatment Tank: A watertight, airtight tank having a detention time from 12-to-24 hours used to capture and retain solids, grit, and scum before the wastewater enters the Multi-Flo unit.

Residential Occupancy: A building used to house individuals and families.

Septic System: An onsite wastewater treatment system comprised of a septic tank and soil absorption system.

Septic Tank: A watertight, airtight tank having a detention time of 24-to-48 hours, or more, used to clarify wastewater and capture fats, oil, greases, and inert solids.

Soil Absorption System: A system consisting of trenches and pipes—or equivalent "gravelless" devices—used to disperse water into the soil where additional treatment may occur and the water is dispersed from the site.

Trash Trap: A watertight, airtight tank for capturing and retaining solids.

Seeding: A process for facilitating bacterial growth by providing mixed liquor from another Multi-Flo unit.

TKN (Total Kjeldahl Nitrogen): The quantity of organic nitrogen and ammonia (expressed in mg/L) found in wastewater.

TN: The total quantity of nitrogen (expressed in mg/L-N) that exists in the wastewater. Nitrogen may be in the form of ammonia, TKN, nitrate or nitrite.

TSS: The quantity of solids (expressed in mg/L) that can be readily removed from a well-mixed sample with standard laboratory filtering procedures.

Typical Domestic Wastewater: Wastewater having the characteristics as shown in Table 2:

Table 2—Typical Domestic Wastewater	
Constituent	**Value**
CBOD5	100-300 mg/L
TSS	100-350 mg/L
FOG	30 mg/L
TKN	60 mg/L

Wastewater: Water generated as a result of human activities and containing feces, urine, blood, food byproducts, rinse water, laundry water, process water, and the like.

Design Principles

The goal of wastewater treatment is to return to the environment water that does not pose a public health or environmental threat. The role of the Multi-Flo in this process is to remove organic materials, solids, and pathogens through biological treatment.

Each model of the Multi-Flo FTB-Series has a specific design rating. Each rating is intended to identify the volume of typical domestic wastewater that the system can treat in a 24-hour period. The flow during this 24-hour period, as tested under ANSI/NSF Standard 40, is shown in Table 3.

Table 3—Typical Flo Regime Under ANSI/NSF Standard 40	
Time of Day	**Percent of Total Hydraulic Load**
6:00 AM-9:00 AM	35
11:00 AM-2:00 PM	25
5:00 PM-8:00 PM	40

Additional treatment may be necessary where the flow regime varies from Table 3 and/or the wastewater does not meet the criteria of typical domestic wastewater.

Typical domestic wastewater may include small quantities of medicines, cleaners, antibiotics, and other substances that, in large quantities, will adversely affect the operation of the system. The water will have a pH of approximately 7.0 and may have minute concentrations of heavy metals. If the pH is above 9.0 or less than 6.0, and/or there are high concentrations of harmful substances and heavy metals, additional treatment will be necessary.

Depending on the occupancy, an additional tank may be installed upstream of the Multi-Flo. This additional component may be a "trash trap," "pretreatment tank," "flow equalization tank," or "pre-aeration tank." The name will vary with the intended function of the tank, and the function of the tank is related to its capacity and components. A trash trap is the smallest of these, and its function is simply to capture and retain large solids such as tampons, disposable diapers, and so forth. No additional treatment or function is expected, and the capacity of the tank may be as small as 250 gallons.

A pretreatment tank is larger than a trash trap, and its function is to capture and retain fats, oils, grease, and smaller solids such as dental floss. The capacity of a pretreatment tank is related to the flow from the occupancy. A flow equalization tank serves as a pretreatment tank, but its primary function is to retain wastewater for periodic dosing into the Multi-Flo. A pre-aeration tank is intended to provide additional oxidation. This tank will contain additional aerators to facilitate a partial digestion of organic material prior to its discharge to the Multi-Flo unit. A pre-aeration tank may also serve as a flow equalization tank.

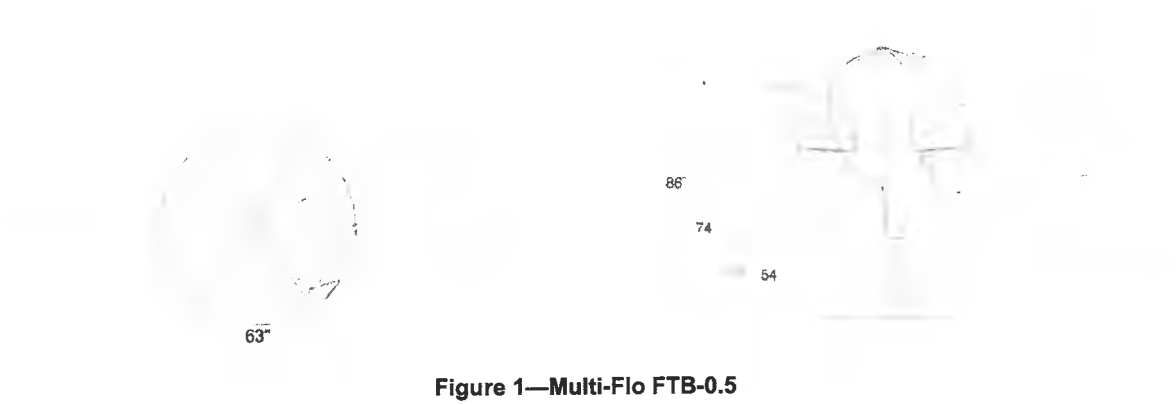


Figure 1—Multi-Flo FTB-0.5

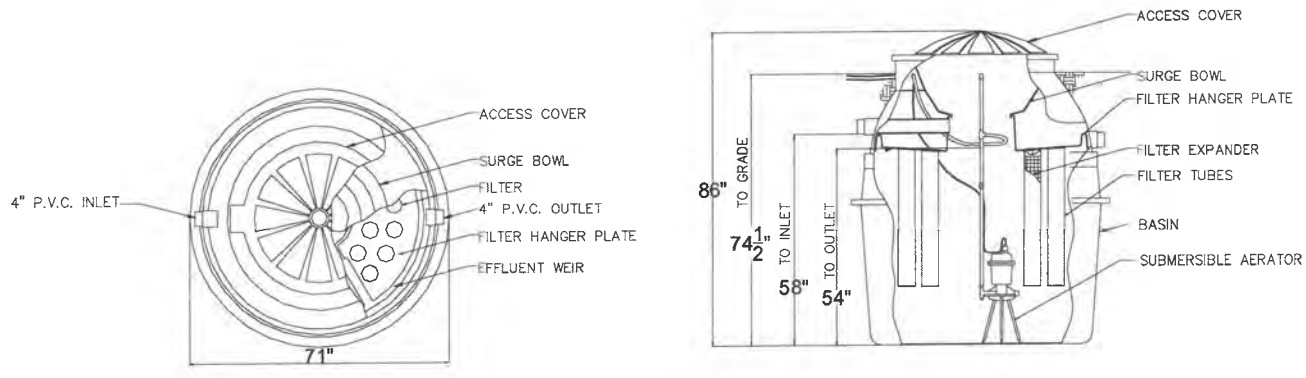


Figure 2—Multi-Flo FTB-0.6

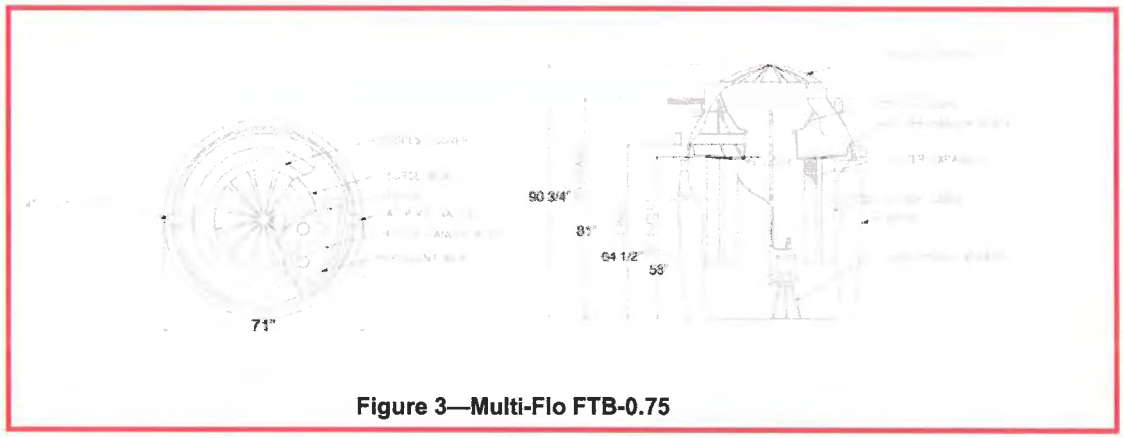


Figure 3—Multi-Flo FTB-0.75

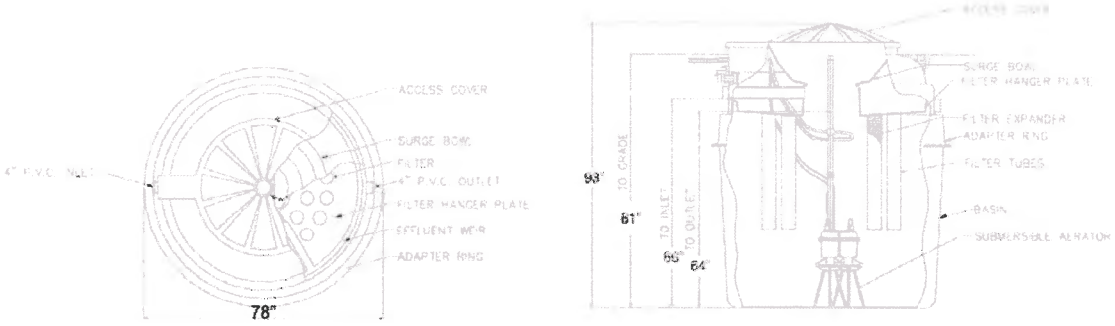


Figure 4—Multi-Flo FTB-1.0

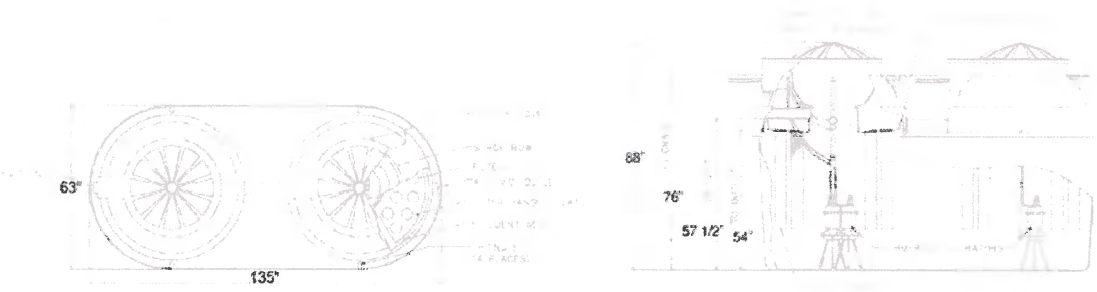


Figure 5—Multi-Flo FTB-1.5

Every county of almost every state regulates the design, installation, operation, and maintenance of onsite wastewater treatment systems. Some counties have few regulations while others maintain comprehensive programs that include licensing, certifications, plan review, and mandatory maintenance. Generally, these regulations mandate residential system sizing, usually based on the number of bedrooms. Commercial occupancies generally use building code parameters to establish design flow. These parameters are based on number of patrons, square footage of retail space, restaurant seats, and other indicators of potential wastewater generation. Some codes may consider alternative values to establish flow, such as actual water use for similar facilities, but most codes are prescriptive in setting design flows.

Listed in Table 4 are recommended sizing and components for single-family dwellings based on a design flow of 150 gpd/bedroom.

Multi-family occupancies are more susceptible to abuse by tenants, who may be unaware that they are using onsite wastewater treatment. For these occupancies, a pretreatment tank may eliminate maintenance issues related to grease and solids put into the system. Table 5, which is based on a flow of 150 gpd/bedroom, illustrates recommended components, volumes, and ratings for multiple family dwellings.

Table 4—Multi-Flo Sizing for Single-Family Dwellings

Number of Bedrooms	Garbage Disposal?	Recommended Size of Pretreatment Tank	Required Capacity of Multi-Flo (gpd)
1-2	No	Optional	500 gpd
1-2	Yes	Optional	500 gpd
3	No	Optional	500 gpd
3	Yes	Optional	500 gpd
4	No	Optional	600 gpd
4	Yes	Optional	600 gpd
5	No	Optional	750 gpd
5	Yes	500 gallon	750 gpd

Table 5—Multi-Flo Sizing for Multi-Family Dwellings

Number of Bedrooms Served	Recommended Size of Pretreatment Tank if needed, (gal)	Required Capacity of Multi-Flo (gpd)
1	Optional	500
2	500	500
3	500	500
4	500	600
5	500	750
6	750	1000
7	750	1200
8	750	1200
9	750	1500
10	1000	1500

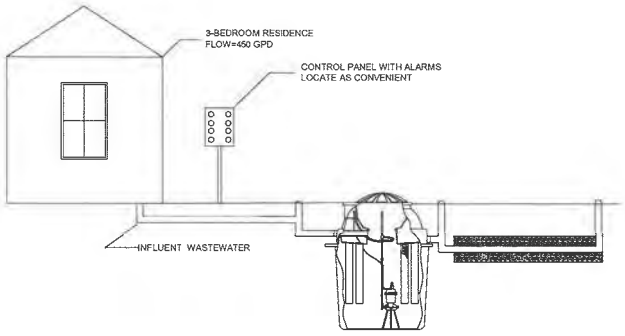


Figure 7 - Basic Multi-Flo Installation

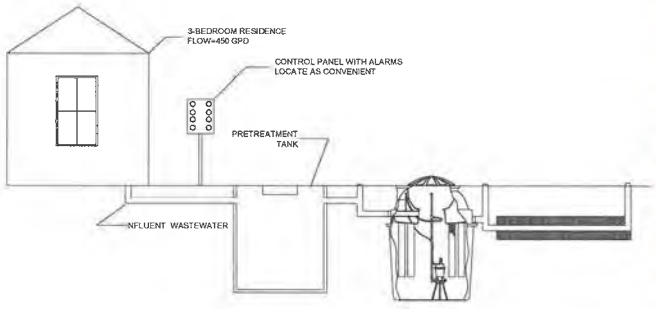


Figure 8 - Multi-Flo Installation With Pre-Treatment

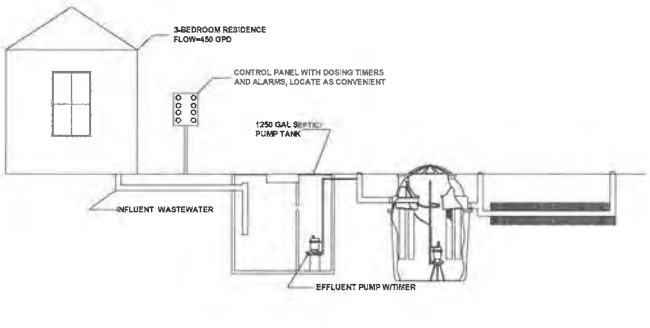


Figure 9 - Multi-Flo Installation With Flow Equalization

Figure 7 shows a basic installation. In this example, the Multi-Flo FTB-0.5 serves a three-bedroom residence. It receives and discharges flow by gravity. Effluent is dispersed through a drainfield sized in accordance with applicable codes. In this example, the Multi-Flo provides both the storage of a septic tank and wastewater treatment normally associated with the drainfield. The soil acts to "polish" the effluent of residual pathogens, solids, and organic material.

Figure 8 shows a basic Multi-Flo installation with the addition of a pretreatment tank. "Pretreatment" is essential when the wastewater is laden with solids or has other unusual characteristics. Pretreatment accomplishes several functions: capture and storage of solids, homogenization of the wastewater, and partial removal of organic material. Pretreatment may enhance treatment is generally not essential for successful performance.

Flow equalization may be needed when high variation exists. Such cases arise when much or all of the flow is generated during one or two short periods of a day or week. As an extreme example, flow equalization would help when all wastewater is generated in the morning and evening, there are parties on Friday evenings, and all laundry is washed on Saturdays. Flow equalization provides a method to capture, homogenize, and meter wastewater into the Multi-Flo,

MINNESOTA POLLUTION CONTROL AGENCY

520 Lafayette Road North | St. Paul, Minnesota 55155-4194 | 651-296-6300

800-657-3864 | Use your preferred relay service | info.pca@state.mn.us | Equal Opportunity Employer

January 1, 2025

Jeff Luthman
Consolidated Treatment Systems, Inc.
1501 Commerce Center Drive
Franklin, OH 45005

RE: **Product Registration Renewal– Notice of Proprietary Treatment Product Listing**

Description:	Sewage Treatment System, Suspended Growth with Filtration Process
Manufacturer:	Consolidated Treatment Systems
Product Name:	Multi-Flo® (with and without disinfection)
Model Numbers:	Multi-Flo FTB-0.5, Multi-Flo FTB-0.6, Multi-Flo FTB-0.75, Multi-Flo FTB-1.0, and Multi-Flo FTB-1.5 (Max Design Flow 500, 600, 750, 1000, and 1500 GPD per unit)
Product Listing:	Category A (residential sewage)

Dear Jeff Luthman:

Thank you for your application for product renewal for Consolidated Treatment Systems Multi-Flo Model Series, which includes the following models: Multi-Flo FTB-0.5, Multi-Flo FTB-0.6, Multi-Flo FTB-0.75, Multi-Flo FTB-1.0, and Multi-Flo FTB-1.5.

In accordance with Minn. R. chs. 7080 to 7083, the MPCA has reviewed Consolidated Treatment System's submitted materials requesting registration for Category A (residential) treatment product listing of the Multi-Flo Model Series in this application. Based on the submitted documentation, the MPCA finds that the Multi-Flo Model Series is eligible to be registered per Minn. R. 7083.4030 as meeting the following treatment levels:

- **Treatment Level A** ($cBOD_5$ of 15 mg/L, TSS of 15 mg/L, and fecal coliform of 1,000 colonies per 100 ml) with disinfection
- **Treatment Level A2** ($cBOD_5$ of 15 mg/L, TSS of 15 mg/L) without disinfection
- **Treatment Level B** ($cBOD_5$ of 25 mg/L, TSS of 30 mg/L, and fecal coliform of 10,000 colonies per 100 ml) with disinfection
- **Treatment Level B2** ($cBOD_5$ of 25 mg/L, TSS of 30 mg/L) without disinfection
- **Treatment Level C** ($cBOD_5$ of 125 mg/L, TSS of 60 mg/L and Oil & Grease of 25 mg/L) without disinfection

The Multi-Flo Model Series is registered with a design rated capacity of 500, 600, 750, 1000, and 1500 gallons per day per unit, as shown in Table 1 and Table 2.

Subject to this determination, the Multi-Flo Model Series, including the Multi-Flo FTB-0.5, Multi-Flo FTB-0.6, Multi-Flo FTB-0.75, Multi-Flo FTB-1.0, and Multi-Flo FTB-1.5 will be placed on the List of Registered Subsurface Sewage Treatment System (SSTS) Products. The product information listed in this Notice of Proprietary Product Listing will be maintained on the MPCA website and may not be altered or misrepresented by the manufacturer or any other person without permission by the MPCA.

Table 1. Multi-Flo Model Series with Salcor Ultraviolet (UV) Disinfection

Product Name Model	Treatment Process	Design Flow (gpd)	BOD_5 Removed (lbs/day)	Highest Treatment Level	Important Product Use Information
Multi-Flo with one (1) Salcor 3G UV Disinfection Unit Model FTB-0.5	Suspended Growth and Filtration	500	3.6	A	• Notice of Product Listing o MPCA Letter o Conditions of Registration o Expiration Date • Multi-Flo Manual o Submitted Drawings o Known Limitations o Installation o Operation & Maintenance o Owners Information o Regulators Checklist o Service Contract • Management Plan for Multi-Flo • Management Plan for Salcor UV Disinfection • Operating Permit Template
Multi-Flo with two (2) Salcor 3G UV Disinfection Units Model FTB-1.0	Suspended Growth and Filtration	1000	7.2	A	
Multi-Flo with three (3) Salcor 3G UV Disinfection Units Model FTB-1.5	Suspended Growth and Filtration	1500	10.8	A	

Table 2. Multi-Flo Model Series

Product Name Model	Treatment Process	Design Flow (gpd)	BOD_5 Removed (lbs/day)	Highest Treatment Level	Important Product Use Information
Multi-Flo Model FTB-0.5	Suspended Growth and Filtration	500	3.6	A2	• Notice of Product Listing o MPCA Letter o Conditions of Registration o Expiration Date • Multi-Flo Manual o Submitted Drawings o Known Limitations o Installation o Operation & Maintenance o Owners Information o Regulators Checklist o Service Contract • Management Plan for Multi-Flo • Operating Permit Template
Multi-Flo Model FTB-0.6	Suspended Growth and Filtration	600	3.6	A2	
Multi-Flo Model FTB-0.75	Suspended Growth and Filtration	750	3.6	A2	
Multi-Flo Model FTB-1.0	Suspended Growth and Filtration	1000	7.2	A2	
Multi-Flo Model FTB-1.5	Suspended Growth and Filtration	1500	10.8	A2	

The registration of the products in Minnesota is contingent upon compliance with the following conditions:

1. Products must be used in compliance with MPCA rules and the plans and design specifications provided. Any deviation from the plans and specifications shall not be permitted unless authorized by National Sanitation Foundation (NSF) and, in writing, by the MPCA for registered use.

2. The manufacturer shall have readily accessible information, specific to a product's registered use in Minnesota, for designers, installers, service providers, regulators, and interested parties for the following items: a) product manual, b) design instructions, c) installation instructions, d) operation and maintenance requirements, e) homeowner instructions, and f) list of manufacturer-certified service providers, if any, as required by Minn. R. 7083.4040 (H).

3. The design flows for the registered Multi-Flo Model Series are as follows:
    - 500 gallons per day for the Multi-Flo FTB-0.5
    - 600 gallons per day for the Multi-Flo FTB-0.6
    - 750 gallons per day for the Multi-Flo FTB-0.75
    - 1000 gallons per day for the Multi-Flo FTB-1.0
    - 1500 gallons per day for the Multi-Flo FTB-1.5

4. Septic/trash tank capacity for dwellings shall meet the manufacturer's size requirement consistent with National Sanitation Foundation (NSF) testing and as specified in the Application for Registration. The tank(s) shall be designed to withstand the pressures to which it will be subject to. The tank(s) and all pipe penetrations, risers, and other connections to the tank shall be watertight.

5. Each system must be delivered with an installation manual and owner's manual for the Multi-Flo Model Series (Multi-Flo FTB-0.5, Multi-Flo FTB-0.6, Multi-Flo FTB-0.75, Multi-Flo FTB-1.0, and Multi-Flo FTB-1.5) and for the Salcor 3G UV disinfection unit(s) used in the system. Each component must be installed in accordance with the manufacturer's installation manual.

6. Consolidated Treatment Systems, along with the Intermediate Designer/Advanced Designer and Installer, are responsible to ensure that proper flow splitting devices are used in splitting flows to Salcor 3G UV disinfection units. Flow splitting devices must meet the following criteria: a) designed specifically and reliably to split wastewater flows; b) accessible for on-going operation and maintenance; c) monitored to determine flow rates; d) adjustable after construction should settlement occur; and e) have infinite or continuous adjustment features.

7. For the Multi-Flo Model Series (Multi-Flo FTB-0.5, Multi-Flo FTB-0.6, Multi-Flo FTB-0.75, Multi- Flo FTB-1.0, and Multi-Flo FTB-1.5), each Multi-Flo Treatment System shall be equipped with a sufficient number of Salcor 3G UV disinfection units to achieve Treatment Level A and Treatment Level B as follows: (1) Multi-FloFTB-0.5 will require the use of one Salcor 3G UV disinfection unit; (2) Multi-Flo FTB 0.6 will require the use of one Salcor 3G UV disinfection unit; (3) Multi-Flo FTB 0.75 will require the use of two Salcor 3G UV disinfection units in parallel; and (4) Multi-Flo FTB 1.0 will require the use of two Salcor 3G UV disinfection units in parallel, and Multi-Flo FTB 1.5 will require the use of three Salcor 3G UV disinfection units in parallel. Flow to each Salcor UV disinfection unit shall not exceed the rated capacity to ensure adequate disinfection prior to soil dispersal.

8. All systems shall be designed and operated with (a) suitable alarm device(s) should either or both the Multi-Flo Model Series (Multi-Flo FTB-0.5, Multi-Flo FTB-0.6, Multi-Flo FTB-0.75, Multi-Flo FTB-1.0, and Multi-Flo FTB-1.5) or the Salcor 3G UV disinfection unit(s) malfunction.

9. This treatment product is a Minnesota-registered product for Type IV systems. For Treatment Levels A, A2, B, B2 and C, effluent loading rates to the soil, method of distribution, and vertical separation requirements shall meet the minimum requirements contained in Minn. R. Ch. 7080.2150 thru 7080.2350. The effluent, following treatment in the Multi-Flo Model Series, is required to be uniformly distributed to the soil for final treatment and dispersal.

10. Systems may only be designated as Type IV systems when designed and installed per the drawings submitted as part of the Application for Product Registration, dated November 4, 2009, and subsequent documents submitted prior to this registration.

11. As a Type IV system, the system must be constructed and operated under the required local permits.

12. The level of maintenance required for Multi-Flo Model Series and Salcor 3G UV disinfection components shall be as specified in the products Operation and Maintenance Manual. This includes, but is not limited to, maintenance every six months. Both the Multi-Flo Model Series and Salcor 3G UV disinfection units shall be serviced at six month intervals. The Salcor UV lamp shall be replaced at least once every two (2) years to ensure proper disinfection or more often as needed, to achieve the required fecal coliform bacteria treatment level.

13. For systems registered as meeting the requirements for Treatment Levels A and B, testing for fecal coliform bacteria is required per the local operating permits when reduced vertical soil separation is employed.

14. As specified in Owner's Manual, limitations of the product are identified, including the backwash from water softeners and other unsuitable wastes, must not be discharged into the system. The manufacturer is responsible to provide a listing of other known limitations, made available on the company's website or other means.

15. Training shall be provided to MPCA-licensed Subsurface Sewage Treatment System practitioners before designing, installing, or providing service to Multi-Flo Model Series (Multi-Flo FTB-0.5, Multi-Flo FTB-0.6, Multi-Flo FTB-0.75, Multi-Flo FTB-1.0, and Multi-Flo FTB-1.5) treatment systems and to Salcor 3G UV disinfection devices registered for use in Minnesota.

16. During the period of product registration and as part of the renewal process, systems using registered treatment products are subject to an audit by the MPCA.

Please be advised that this registration expires December 31, 2027. Manufacturers desiring to continue product registration beyond this date must obtain MPCA renewal according to the requirements in Minn. R. Ch. 7083.4040 (E). If the product has changed or is retested according to the protocol required for registration, renewal shall be based on the most recent test results. If the MPCA finds the product has changed in any way that may affect performance, it may not be renewed and must meet the requirements for initial registration.

The MPCA is in no way endorsing these products or any advertising, and is not responsible for any situation which may result from its use or misuse. The MPCA is not liable for any product failure and these statements are not intended and cannot be relied upon to establish any substantive or procedural rights with the state of Minnesota or the MPCA, either express or implied, that can be enforced in litigation or any administrative proceeding.

If you have any questions, please contact Wendy Chirpich at 507-344-5248 or by email at wendy.chirpich@state.mn.us.

Sincerely,

Wendy Chirpich

This document has been electronically signed.

Wendy Chirpich
Environmental Specialist
Municipal Division

WC:lm

Soil Map—Ramsey County, Minnesota



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Ramsey County, Minnesota
Survey Area Data: Version 20, Sep 10, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 1, 2024—Jul 1, 2024

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
169C	Braham loamy fine sand, 6 to 15 percent slopes	1.2	35.2%
454C	Mahtomedi loamy sand, 6 to 12 percent slopes	0.1	3.0%
454D	Mahtomedi loamy sand, 12 to 25 percent slopes	1.5	45.9%
540	Seelyeville muck	0.5	15.9%
Totals for Area of Interest		**3.3**	**100.0%**

Ramsey County, Minnesota

169C—Braham loamy fine sand, 6 to 15 percent slopes

Map Unit Setting

National map unit symbol: 1t98m
Elevation: 1,000 to 1,570 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 39 to 48 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Braham and similar soils: 90 percent
Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Braham

Setting

Landform: Sideslope moraines
Landform position (two-dimensional): Shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Outwash over till

Typical profile

Ap - 0 to 9 inches: loamy fine sand
E - 9 to 28 inches: loamy fine sand
2Bt - 28 to 39 inches: sandy clay loam
2C - 39 to 60 inches: loam

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F090AY013WI - Sandy Upland
Forage suitability group: Sloping Upland, Neutral (G090AN002MN)
Other vegetative classification: Sloping Upland, Neutral (G090AN002MN)
Hydric soil rating: No

Minor Components

Zimmerman

Percent of map unit: 3 percent
Hydric soil rating: No

Blomford

Percent of map unit: 3 percent
Landform: Drainageways on moraines
Hydric soil rating: Yes

Kratka

Percent of map unit: 2 percent
Landform: Depressions on flat moraines, Drainageways on flat moraines
Hydric soil rating: Yes

Cathro

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Ramsey County, Minnesota

454D—Mahtomedi loamy sand, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: 1t99y
Elevation: 670 to 1,600 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 39 to 48 degrees F
Frost-free period: 120 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Mahtomedi and similar soils: 90 percent
Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mahtomedi

Setting

Landform: Sideslope outwash plains
Landform position (two-dimensional): Shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Outwash

Typical profile

A - 0 to 5 inches: loamy sand
E - 5 to 8 inches: sand
Bw - 8 to 30 inches: gravelly coarse sand
C - 30 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F090AY019WI - Dry Sandy Upland
Forage suitability group: Not Suited (G090AN024MN)
Other vegetative classification: Not Suited (G090AN024MN)
Hydric soil rating: No

Minor Components

Antigo

Percent of map unit: 4 percent
Hydric soil rating: No

Demontreville

Percent of map unit: 3 percent
Hydric soil rating: No

Kingsley

Percent of map unit: 3 percent

Hydric soil rating: No

2001 System As-Built

Install 9-28-00

CITY OF NORTH OAKS

100 Village Center Dr., Suite 150, North Oaks, MN. 55127

AS-BUILT REPORT
INDIVIDUAL SEWAGE TREATMENT SYSTEM SEPTIC TANK INFORMATION

CERTIFIED STATEMENT: I (Print Name) RON PALMEN hereby certify that all work done on this system was completed in accordance with all applicable State and local Ordinances.

Signature | MPCA License No. 402 | Date 1/22/01

Site Address 2 CROCUS LN Owner's Name PAUL SEEL
Installer PALMEN EXCAVATION Phone No.
Installer's Address 1522 ALBANY AVE. ST. PAUL MN 55108

SEPTIC TANK INFORMATION
Include Manufacturer, Liquid Capacity and Number of Chambers

Tank #1 TRASH TRAP 625
Tank #2 MULTI-FLO
Tank #3 ~~1250 PUMP TANK~~

PUMP CHAMBER

Tank Manufacturer BROWN WILBERT Liquid Capacity 1250
Horsepower of Pump 1/2 Type of Warning Device LEVEL/ALARM
Pump Discharge in Gallons Per Minute ~~150~~ ~~180~~ at 30 Feet of Head
Number of Gallons Pumped Per Cycle 150

DRAINFIELD TRENCH

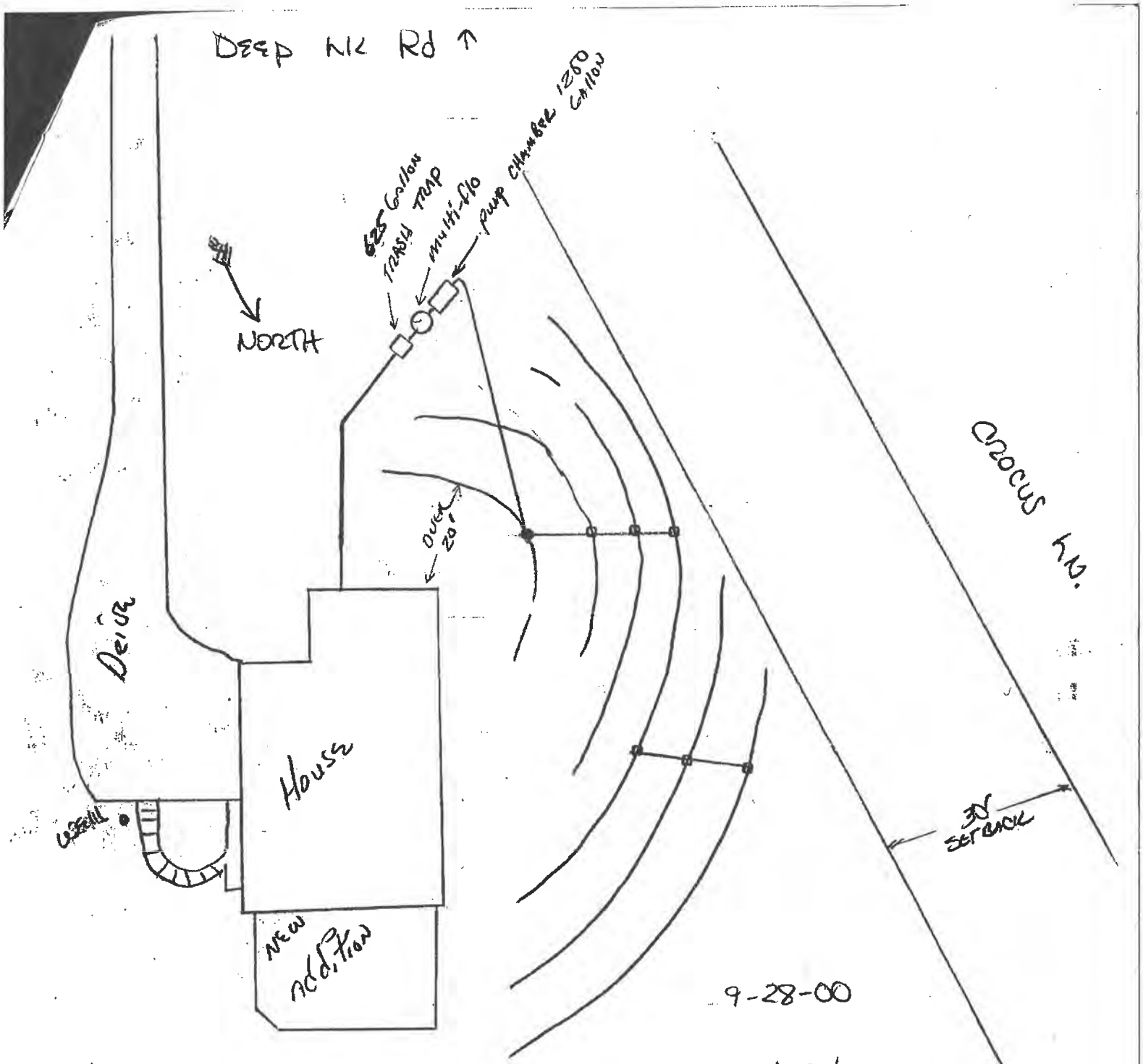
Width ____ No. of Trenches ____ Length of Each Trench 600 LF GRAVELESS
Depth of Trench Bottom from Finished Grade
Method of Distribution
Depth of Rock Under Distribution Pipe
Area Required 600 Area as Built 650

MOUND SYSTEM

Rock Bed: Width Length

Attach a completed As-Built Site Plan. Site plan must include location of structures, septic tank, pump station, sewer line from house to first tank, sewer line from tanks to treatment system, distribution lines, drop boxes, well, and driveway. Show all distances applicable to the sewage treatment system (distance from structure to tank, tank to treatment system, distance between distribution lines, length of distribution lines, and distance between well and sewage treatment system). Indicate North on the site plan and the scale of the plan.

THIS FORM & AS-BUILT SITE PLAN MUST BE COMPLETED, SIGNED AND RETURNED TO CITY OF NORTH OAKS.



9-28-00

Paul Seel
2 CROCUS LANE
NO, OAKS MN 55127

INSTALLER:
R.E. PALMEN
1522 ALBANY AVE.
St. Paul MN, 55108
651-644-4469

2001 System Design With Multi-Flo Model

CITY OF NORTH OAKS

Construction Permit
Individual Sewage Treatment System

Address 2 Crocus Lane

Permit No 300

Owner Paul Seel

Date August 29, 2000

Installer Palmen, Inc.

Fee Paid $200.00

Address 1522 Albany Ave.

St. Paul, MN. 55108
City, State, Zip

Phone No. (651) 644-4469 MPCA Cert. No. 402

Legal Description 220 (RLS) G (Tract) 428 (Lot No.)

Proposed Work

Description Construct Replacement Sewage Treatment System.
(New home, Alteration, Repair)

Standard Graveless Trenches X
Standard Trenches _____ Mound _____ No of bedrooms 5

Variances (Description) - None -

Permission is hereby granted to Palmen, Inc. to construct, alter or repair an individual sewage treatment system as herein described.

This permit is granted upon the express condition that the person, partnership, firm or corporation to whom it is granted, together with the agents, employees, workers and sub-contractors agree to abide by and conform to all ordinances of the City of North Oaks regarding the construction, alteration and repair of sewage treatment systems within the city; and that this permit may be revoked at any time upon evidence of violations of any of the provisions of said ordinances.

7/93

Greg Schmit (GR)
Sanitary Inspector

100 Village Center Drive, Suite 150 • North Oaks • St. Paul, Minnesota, 55127
Fax 651-484-2712 Phone 651-484-5777

SCHIRMERS WASTEWATER TREATMENT SYSTEMS,INC.
Steven B. Schirmers • 951 Katydid Lane NE • St. Michael, MN 55376
Cert.No.627 • (612) 497-3566 • FAX (612) 497-5011
State License #395

CONDITIONAL SALES CONTRACT

SOLD TO: Paul Seel
2 Crocus Lane
North Oaks, Ramsey Co., MN 55127

Schirmers Wastewater Treatment Systems, Inc. agrees to sell to Purchaser and Purchaser agrees to purchase the Multi-Flo Wastewater Treatment System described below on the terms and conditions in this order.

1-FtB 0.75, 750gallon per day (5 BR) Multi-Flow Wastewater Treatment System with A/V alarm & 2 year parts & service warranty.

Tax & shipping included $4307.70

(75% - $3230.78 is due upon order of the unit with the remaining 25% $1076.92 due upon installation of the unit. Final payment must be made within 60 days after the unit is ordered if not installed).

A 15% RETAINER FEE WILL BE KEPT FOR ANY CANCELLED ORDERS FOR SHIPPING AND RESTOCKING.

The above price includes delivery, assembly and installation. You provide the excavation. The unit comes with a 2 year Warranty and Service Agreement. This price does not include hook up between the tanks and field or any wiring to the unit or inside structure.

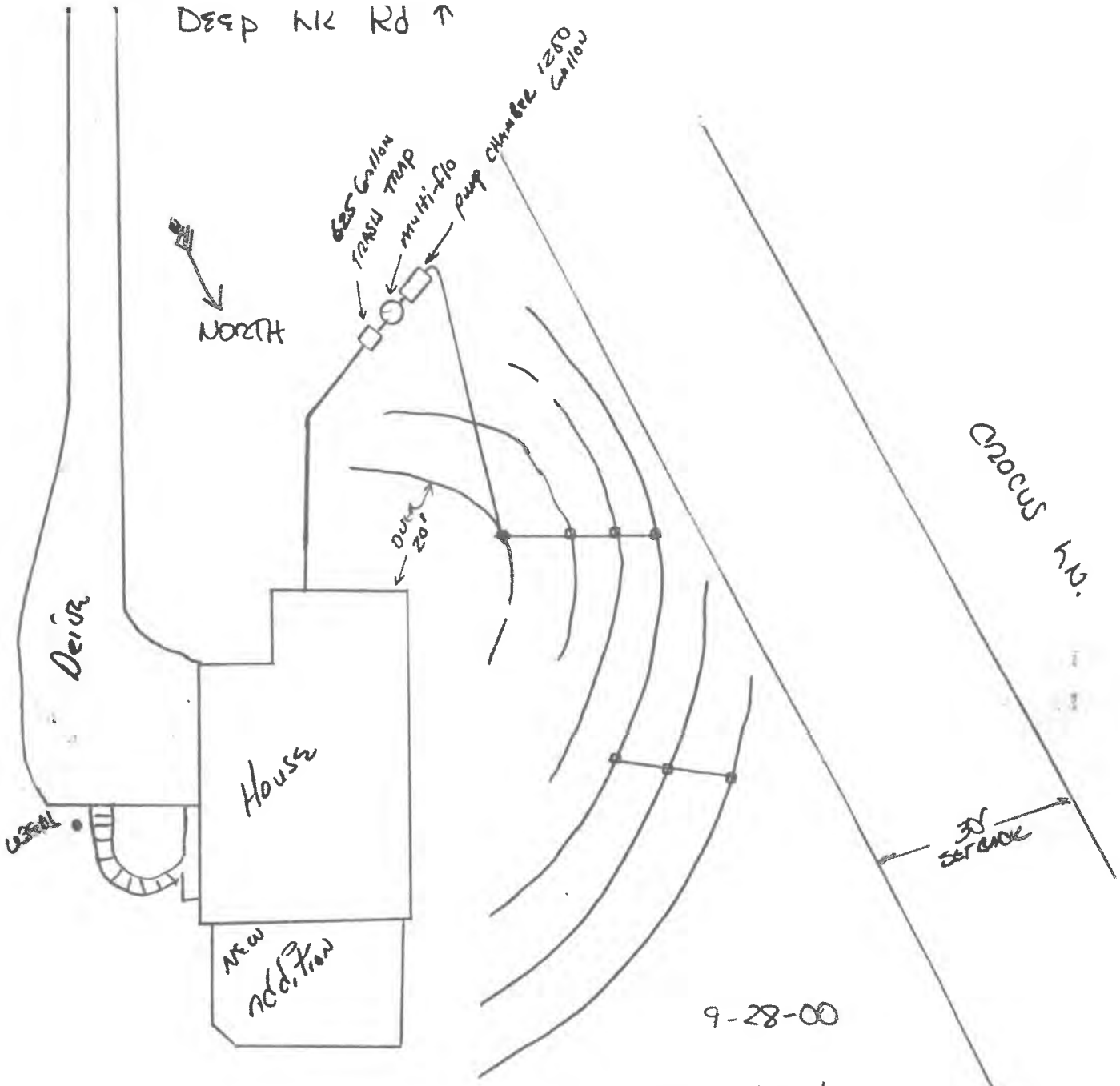
After the 2 year warranty for service, a service contract is required on a yearly basis.

THIS ORDER IS SUBJECT TO TERMS AND CONDITIONS, INCLUDING DISCLAIMERS OR WARRANTY AND LIMITATION OF REMEDIES.

PURCHASER_____SELLER_____

DATE_____.

Purchaser acknowledges he/she has read, Understands, and Agrees to the Terms of the Agreement including Limited Warranty, Limitations of Liability and Exclusion of Consequential Damages, and is authorized to execute this Agreement of behalf of Purchaser.



9-28-00

Paul Seel
2 Crocus Lane
No. Oaks MN 55127

Installer:
R.E. Palmen
1522 Albany Ave.
St. Paul MN, 55108
651-644-4469

JMC

Site Evaluation Report

Page 1 of 9

Date 9/16/98

CLIENT Paul Seel - 2 Crocus Lane North Oaks

LOCATION 2 Crocus Lane

TYPE OF WORK: Reconstruction

SYSTEM SERVING: 4 bedroom type 1 home

WASTE WATER FLOW: ~~600~~ 750 gal/day

SEPTIC TANK(S)/SIZE: 2 @ 1250 gallons

EJECTOR PUMP: No

PUMPING TANK: 1250 gallons

DEPTH TO RESTRICTING LAYER: 6'0"+

MAXIMUM DEPTH OF DRAINFIELD: 3'0"

DRAINFIELD TYPE/SIZE: drop box distribution, Rock trench 960 sq.ft. Gravelless trench ~~400~~ 500 linear ft

SETBACK FROM WELL: All wells greater than 50 feet from proposed sewer system

SOILS AND SOIL SIZING: fine sandy loam & Sandy clay loam. Soil Sizing factor 2.0

CONSTRUCTION REQUIREMENTS AND RECOMMENDATIONS

1. The sewer system must be constructed in accordance with State Rules Ch. 7080 and local codes by MPCA licensed installers.
2. Construct the system according to the site plan and attachments.
3. The septic tank should be cleaned, cover removed, every 2 years. Do not use a garbage disposal or septic tank additives and do not dispose of hazardous wastes into the sewer system.
4. This system is designed to dispose of ordinary volumes of household wastewater. Any system can be hydraulically overloaded as a result of improper maintenance and/or use that exceeds the system's design capacity. Minimum use of chlorine and soaps is recommended.

Provide either rock filled trenches or gravelless trench. The steep slope may however, require gravelless construction. After construction institute erosion control measures until the slope can be revegetated

APPROVED SUBJECT TO STATE AND LOCAL CODES AND ORDINANCES

8-29-00

BUILDING OFFICIAL

PROFESSIONAL CERTIFICATION

I hereby certify that this report was prepared by me, or under my direct supervision and that I am a duly licensed Independent Sewage Treatment System (ISTS) Designer-1 under the laws of the State of Minnesota

Jon M Christensen (427-0116)
ISTS License Number 293

Owner Copy

JMC

SOIL BORING & PERCOLATION TEST RESULTS

Date 9/16/98

CLIENT Paul Seel - 2 Crocus Lane North Oaks

LOCATION 2 Crocus Lane

Boring #1 — Saturated zone > 6'0"

0 - 1'4" Loamy fine sand (10yr 4/4)
1'4" - 4'3" fine sandy loam (10yr 3/6, 4/6)
4'3 - 6'0" Sandy clay loam (10yr 4/4)
No soil mottles, obstruction at end of boring, soil dry

Boring #2 — Saturated zone > 4'8"

0 - 3'4" fine sandy loam (10yr 3/4, 4/4)
3'4" - 4'8" Sandy clay loam + sandy loam (10yr 4/4) obstruction (10yr 4/4), No soil mottles, soil dry

Boring #3 — Saturated zone > 3'8"

0 - 2'0" fine sandy loam (10yr 3/4, 4/4)
2'0" - 3'8" Sandy clay loam + sandy loam + rocks (10yr 4/4) No soil mottles, soil dry, Obstruction

Boring #4 — Saturated zone > 6'3"

0 - 1'10" fine sandy loam (10yr 3/4, 4/4)
1'10" - 6'3" Sandy clay loam + sandy loam and rocks (10yr 4/4)
No soil mottles, soil dry

Boring #5 — saturated zone > 4'2"

0 - 3'0" fine sandy loam (10yr 4/4)
3'0" - 4'2" sandy loam + loamy sand + rocks (10yr 3/4, 3/6)
No soil mottles, obstruction

Boring #6 — saturated zone > 4'10"

0 - 1'10" fine sandy loam (10yr 3/4)
1'10" - 4'10" Sandy clay loam + sandy loam + rocks (10yr 4/4) No soil mottles, obstruction, soil dry

Perc #1

0 - 17" fine sandy loam
17" - 28" Sandy clay loam
Percolation rate - 24.7 min/inch

Perc #2

0 - 27" fine sandy loam
percolation rate 19.1 min/inch

* Mottled soils and soil chroma are indicators of the seasonally saturated zone. The bottom of the drainfield must be at least 3 ft. above this zone

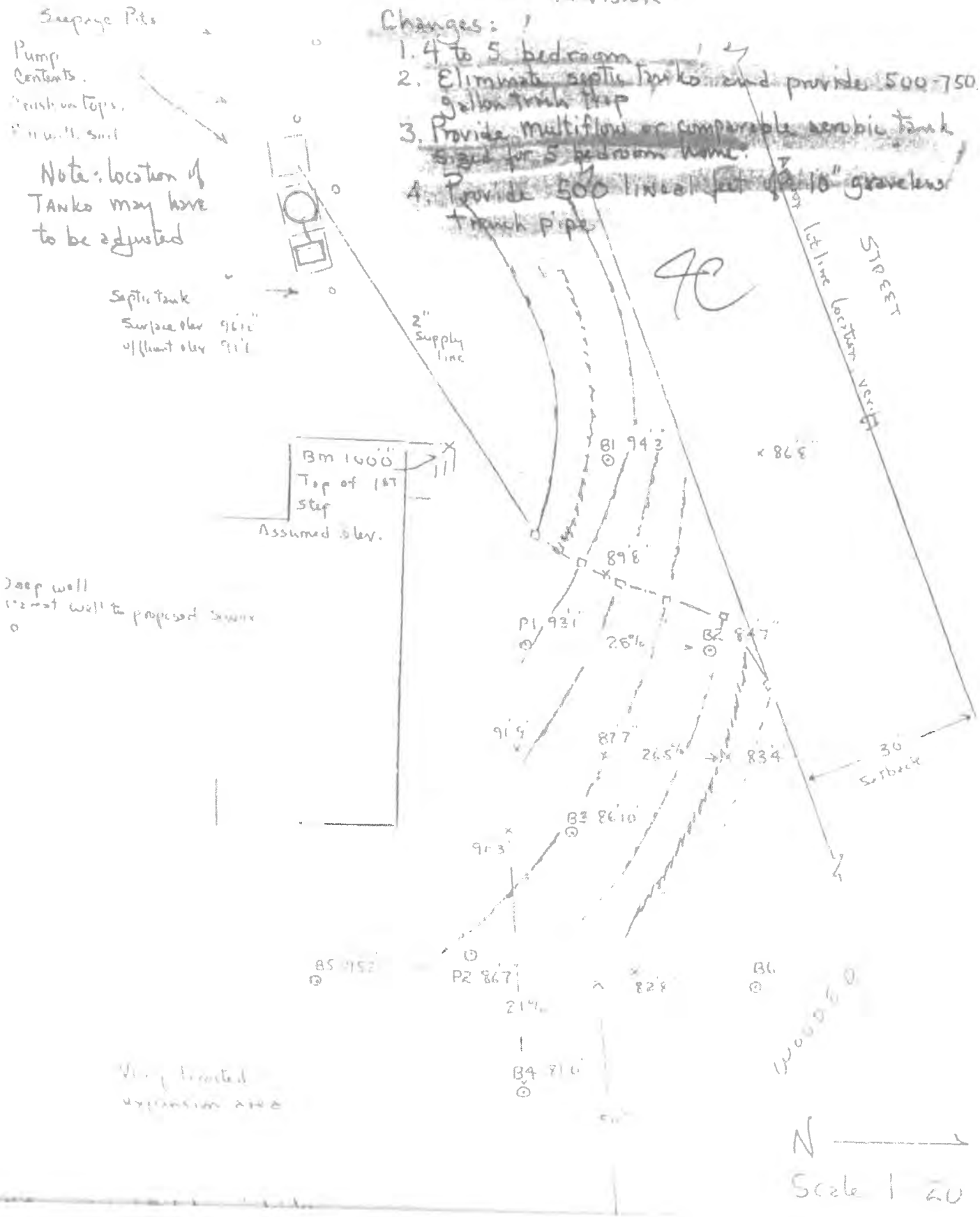
Jon M. Christensen • ISTS License # 293 • 427-0116

LOCATION 2 Crocus Lane

5·25·00 Revision

Changes:

1. 4 to 5 bedroom
2. Eliminate septic tank and provide 500-750 gallon trash trap
3. Provide multiflow or comparable aerobic tank sized for 5 bedroom home.
4. Provide 500 lineal feet of 10" gravelless trench pipe



INDIVIDUAL SEWAGE TREATMENT SYSTEM WORKSHEET

FLOW

A. Estimated 600 gpd
measured _____ x 1.5 = _____ gpd

SEPTIC TANK VOLUME

B. 2 @ 1250 gallons

SOILS (Site evaluation data)

C. Depth to restricting layer = 60 feet
D. Maximum depth of system C - 3 ft = 30" feet
E. Percolation rate 19 - 25 MPI
F. SSF 20 sq ft/gpd
G. Slope 2% % max

See Revised 5-25-00

TRENCH BOTTOM AREA

* H. For trenches with 6 inches of rock below the pipe:
A x F = 600 x 20 = 1200 sq ft of bottom area

** I. For trenches with 12 inches of rock below the pipe:
A x F x 0.8 = 600 x 20 x 0.8 = 960 sq ft of bottom area

* For trenches with 18 inches of rock below the pipe:
A x F x 0.66 = _____ x _____ x 0.66 = _____ sq ft of bottom area

* For trenches with 24 inches of rock below the pipe:
A x F x 0.6 = _____ x _____ x 0.6 = _____ sq ft of bottom area

BED BOTTOM AREA

* For seepage beds with 6 or 12 inches of rock below the pipe:
1.5 x A x F = 1.5 x _____ x _____ = _____ sq ft of bottom area

ROCK VOLUME IN CU FT

M. Rock depth below distribution pipe plus 0.5 foot times bottom area:
M = Rock depth - 6 inches x Area (H, I, J, L, K)
(1 - 0.5 ft) x 960 = 1440 cu ft

ROCK VOLUME IN CU YDS

N. Volume in cu ft divided by 27
M ÷ 27 = cu yds 1440 ÷ 27 = 53 cu yds

ROCK WEIGHT

O. Cubic yards times 1.4 = tons
N x 1.4 = tons 53 x 1.4 = 75 tons

TRENCH LENGTH

Rock filled Trench

P. Select trench width = 3 ft
Q. Divide bottom area by trench width: (H, I, J, or K) ÷ P = lineal feet
960 ÷ 3 = 320 lineal feet

Q1 Gravelless Design
1600 x 2 ÷ 3 = 400 feet of 10" pipe

LAWN AREA

R. Select trench spacing, center to center = 7.5 feet Min
S. Multiply trench spacing by lineal feet: R x Q = sq ft of lawn area
7 x 400 = 82 sq ft

* Gravelless

** Rockfilled Trench

Estimated Sewage Flow in Gallons per Day (gpd)

Number of Bedrooms	Type I	Type II	Type III	Type IV
1	300	225	180	60%
2	450	300	218	=
3	600	375	256	75%
4	750	450	294	=
5	900	525	332	75%
6	1050	600	370	additional
7	1200	675	408	bedrooms
8				

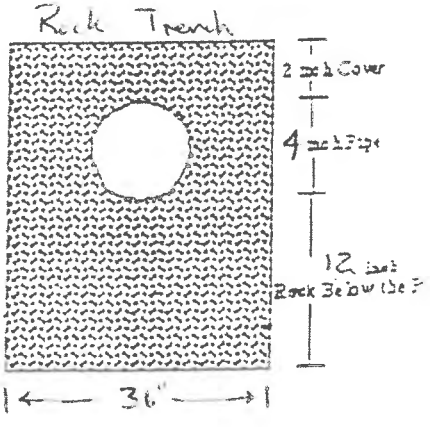
Number of Bedrooms	Minimum Septic Tank Liquid Capacity (gallons)	Minimum Capacity with Garbage Disposal (gallons)
2 or less	750	1:125
3 or 4	1,000	1,500
5 or 6	1,500	2,250
7 or 8	2,000	3,000
over 8	See fig. C-o	(x 1.5)

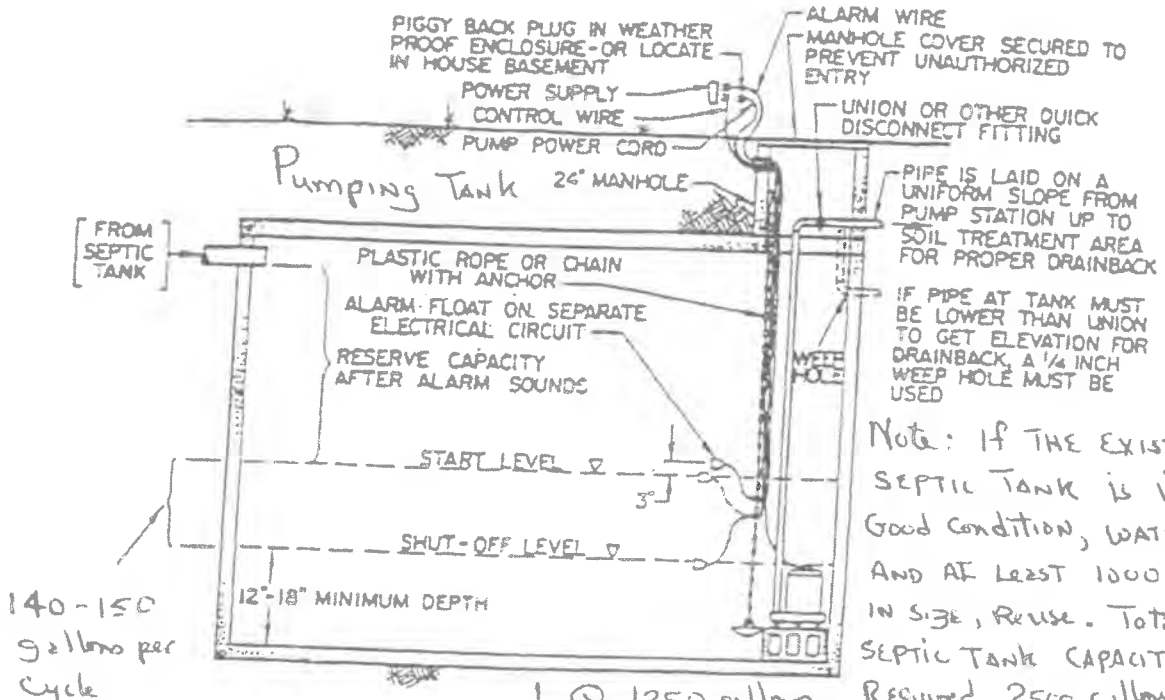
Soil Characteristics & Absorption Areas for Sewage Treatment

Percolation Rate Minutes per inch (MPI)	Soil Texture	Square feet per bedroom	Gallons per day per square foot
Faster than 0.1*	Coarse Sand	—	—
0.1 to 5	Sand	0.83	1.20
0.1 to 5	Fine Sand**	1.67	0.60
6 to 15	Sandy Loam	1.27	0.79
16 to 30	Loam	1.67	0.60
31 to 45	Silt Loam	2.00	0.50
46 to 60	Clay Loam	2.20	0.45
Slower than 60***	Clay	—	(0.24)

* Soil too coarse for average percolation. Use extreme for naturally permeable soils.
** Soil having 30% or more of fine or very fine sand.
*** Soil with less than a percentage of clay for installation of an underground absorption system.

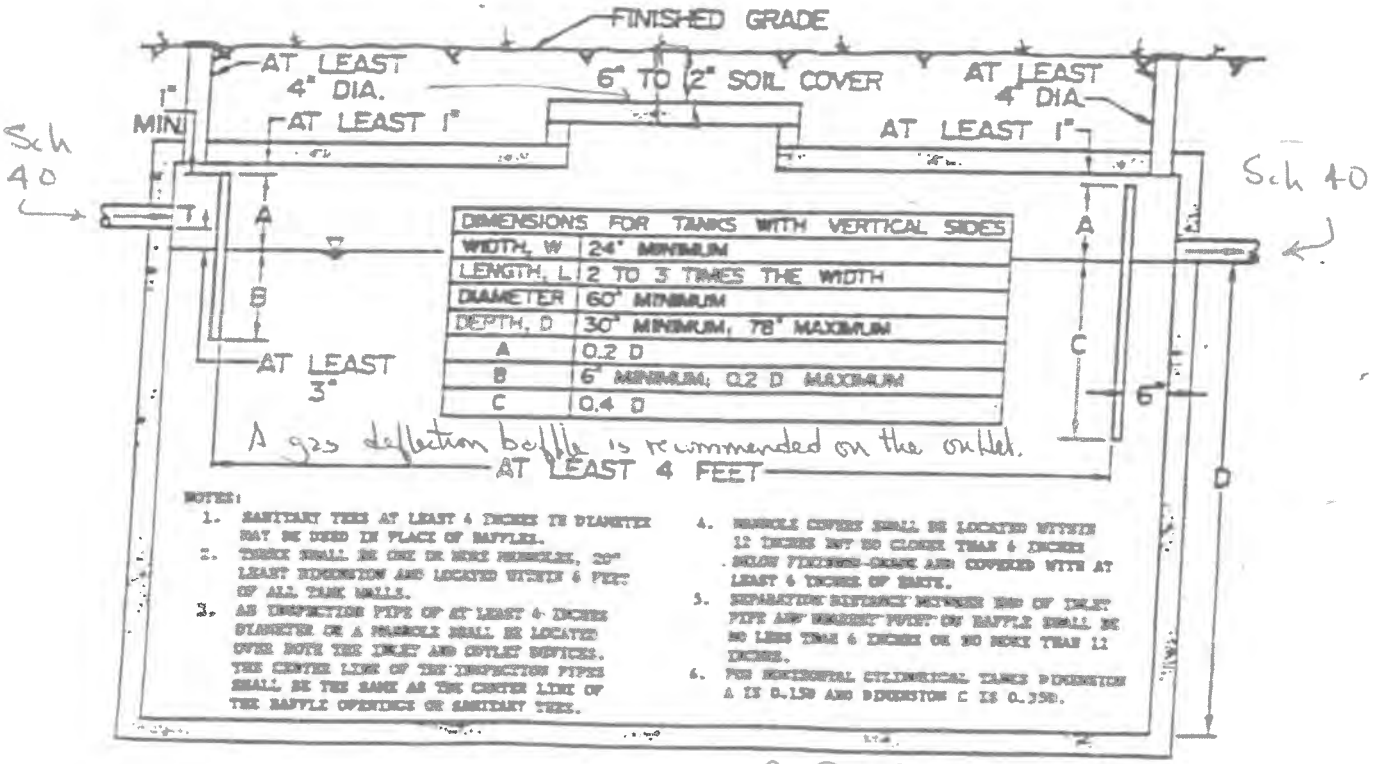
6 inches = 0% Reduction*
12 inches = 20% Reduction
18 inches = 34% Reduction
24 inches = 40% Reduction
* sizing for gravelless trench





Note: If the existing septic tank is in good condition, water tight and at least 1000 gallons in size, reuse. Total septic tank capacity required 2500 gallons. Each subsequent tank must be no bigger than the first

VERTICAL SIDEWALL SEPTIC TANK



DIMENSIONS FOR TANKS WITH VERTICAL SIDES	
WIDTH, W	24" MINIMUM
LENGTH, L	2 TO 3 TIMES THE WIDTH
DIAMETER	60" MINIMUM
DEPTH, D	30" MINIMUM, 78" MAXIMUM
A	0.2 D
B	6" MINIMUM; 0.2 D MAXIMUM
C	0.4 D

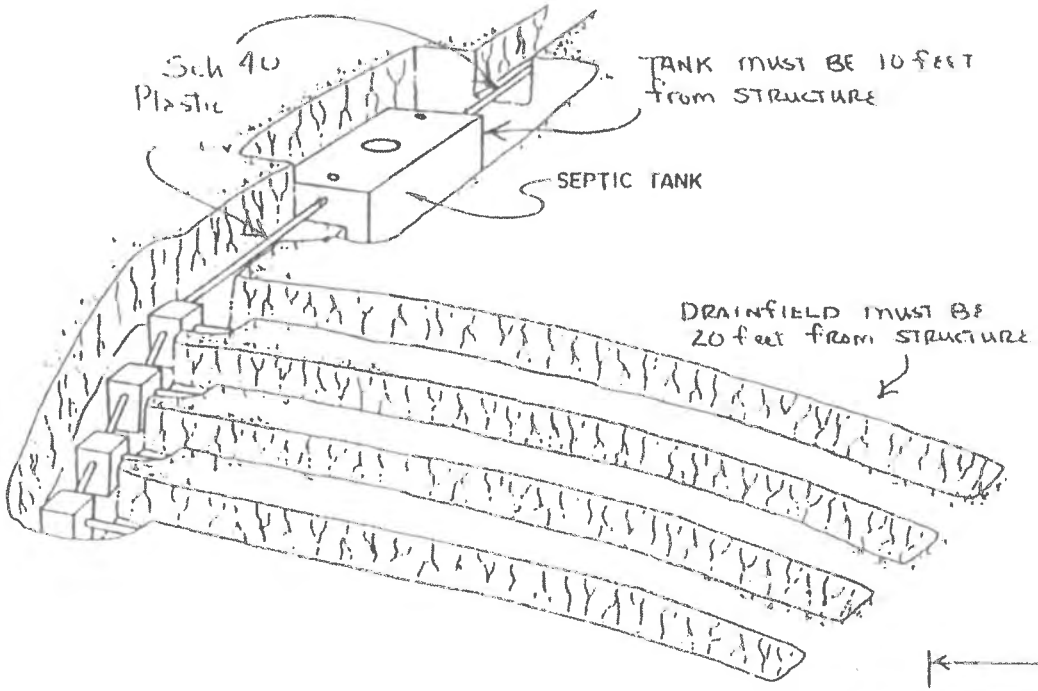
NOTES:

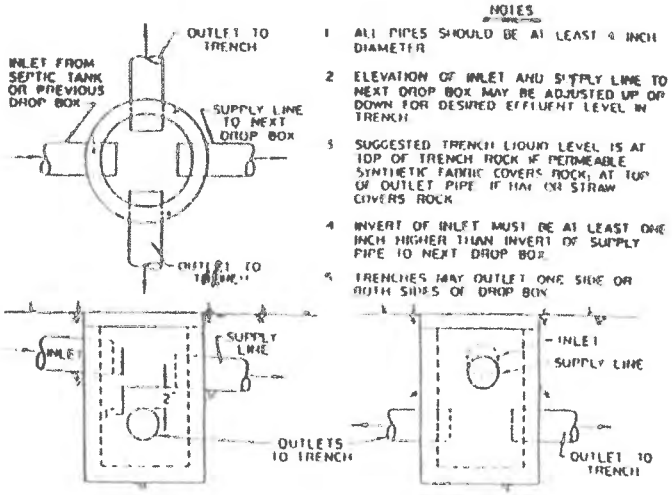
1. SANITARY TEES AT LEAST 4 INCHES IN DIAMETER MAY BE USED IN PLACE OF BAFFLES.
2. THERE SHALL BE ONE OR MORE MANHOLES, 20" LEAST DIMENSION AND LOCATED WITHIN 6 FEET OF ALL TANK WALLS.
3. AN INSPECTION PIPE OF AT LEAST 4- INCHES DIAMETER OR A MANHOLE SHALL BE LOCATED OVER BOTH THE INLET AND OUTLET DEVICES. THE CENTER LINE OF THE INSPECTION PIPES SHALL BE THE SAME AS THE CENTER LINE OF THE BAFFLE OPENINGS OR SANITARY TEES.
4. MANHOLE COVERS SHALL BE LOCATED WITHIN 12 INCHES BUT NO CLOSER THAN 4 INCHES BELOW FINISHED GRADE AND COVERED WITH AT LEAST 6 INCHES OF EARTH.
5. SEPARATION DISTANCE BETWEEN END OF INLET PIPE AND NEAREST POINT ON BAFFLE SHALL BE NO LESS THAN 6 INCHES OR NO MORE THAN 12 INCHES.
6. FOR HORIZONTAL CYLINDRICAL TANKS DIMENSION A IS 0.150 AND DIMENSION C IS 0.350.

2 @ 1250 gallons

Key Code

DROP BOX DISTRIBUTION OF EFFLUENT

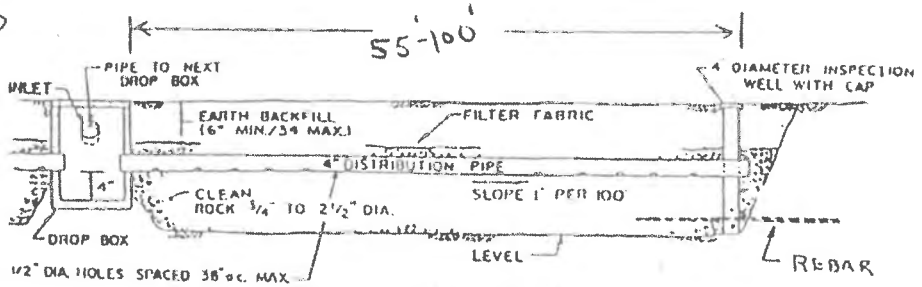


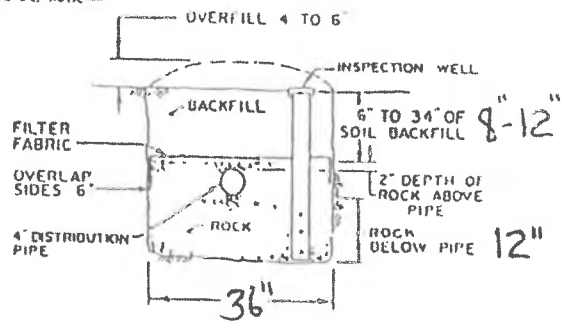


DROP BOX

4 bedroom type 1 home - 960 sq ft.

5 Trenches 55 feet to 100 feet in length. All 3 feet wide with 12 inches of drainfield rock under the distribution Pipes and located no less than 7 feet on center





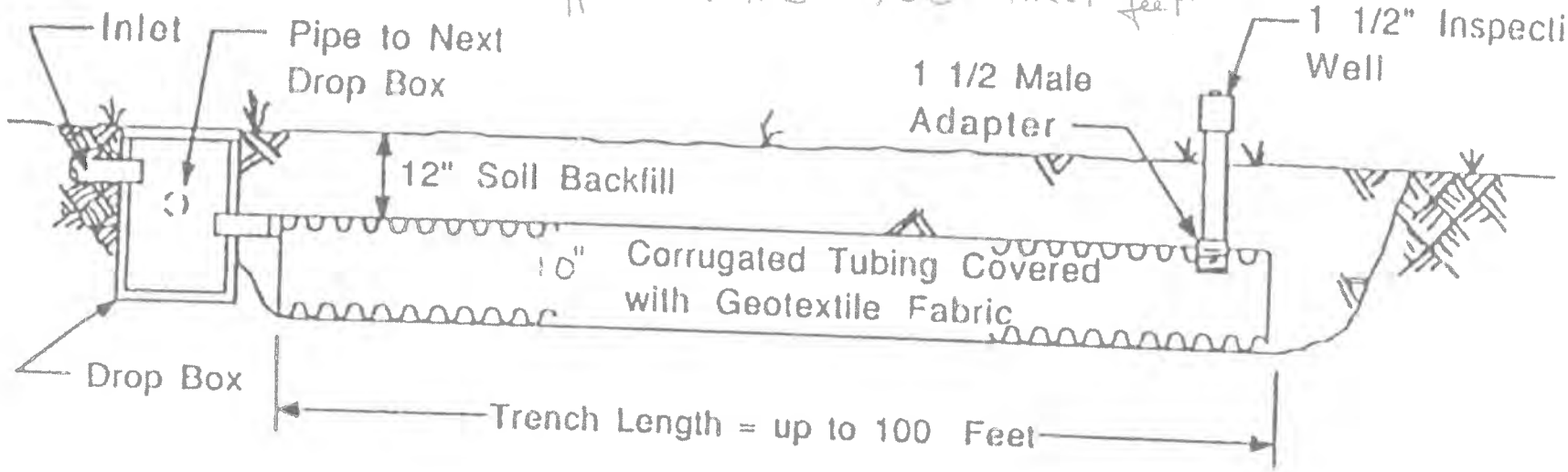
DRAINFIELD TRENCH

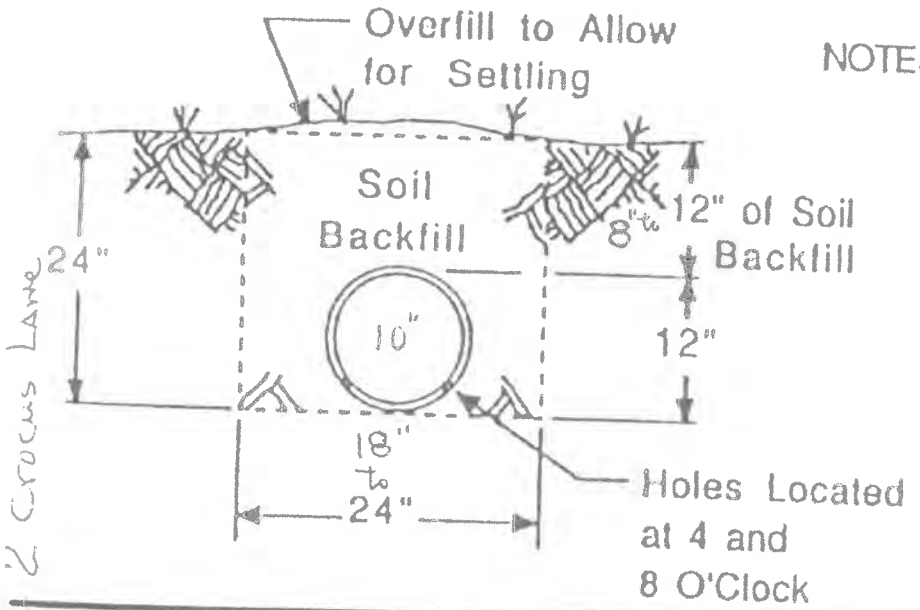
2 Creeks Lane

Page 7 of 9

GRAVELLESS TRENCH CONSTRUCTION DETAILS

4 bedroom type 1 home - 400 lineal feet





NOTES:

1. Bottom of trench must be level. Top of tubing must be level.
2. Scarify trench bottom and sidewalls at least 12 inches above trench bottom to expose natural soil.
3. For proprietary products consult manufacturers performance criteria.

2 Crocus Lane

CYCLUS LANE

Page 869

PUMP SELECTION PROCEDURE

A. Determine pump capacity:

Gravity Distribution

1. Minimum suggested is 600 gallons per hour (10 gpm) to stay ahead of water use rate.
2. Maximum suggested for delivery to a drop box of a home system is 2,700 gallons per hour (45 gpm) to prevent build-up of pressure in drop box.

Pressure Distribution

3. a. Select number of perforated laterals _____
   b. Select perforation spacing = _____ ft.
   c. Subtract 2 ft. from the rock layer length.
      _____ - 2 ft. = _____ ft.
   d. Determine the number of spaces between perforations.
      Length perf. spacing = _____ ft. ÷ _____ ft. = _____ spaces
   e. _____ spaces + 1 = _____ perforations/lateral
   f. Multiply perforations per lateral by number of laterals to get total number of perforations.
      _____ x _____ = _____ perforations.
   g. _____ x _____ = _____ gpm.

SELECTED PUMP CAPACITY 45 gpm Max

END PERFORATION OF A PERFORATED LATERAL

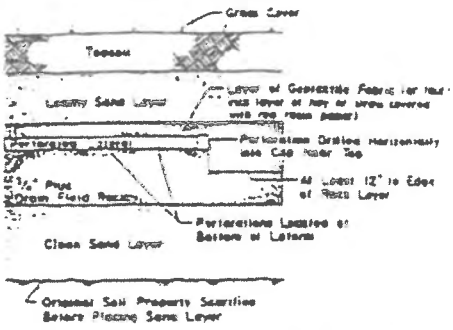


TABLE OF PERFORATION DISCHARGES IN GPM

Head	Perforation diameter (inches)	
	3/32	1/8
1.0a	0.56	0.74
1.5	0.69	0.90
2.0b	0.80	1.04
2.5	0.89	1.17
3.0	0.98	1.28
4.0	1.13	1.47
5.0	1.26	1.65

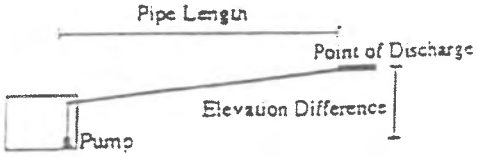
aUse 1.0 foot of head for residential systems.
bUse 2.0 feet of head for other establishments

B. Determine head requirements:

1. Elevation difference between pump and point of discharge.
   Approx 10 feet
2. If pumping to a pressure distribution system, add five feet for pressure required at manifold
   — feet
3. Friction loss
   a. Enter friction loss table with gpm and pipe diameter. Read friction loss in feet per 100 feet from table.
      F.L. = 3.28 ft./100 ft of pipe
   b. Determine total pipe length from pump to discharge point. Add 25 percent to pipe length for fitting loss, or use a fitting loss chart. Equivalent pipe length - 1.25 times pipe length =
      Approx 75 x 1.25 = 94 feet
   c. Calculate total friction loss by multiplying friction loss in ft/100 ft by equivalent pipe length.
      Total friction loss = 3.28 x 94 ÷100 = 3.1 feet
4. Total head required is the sum of elevation difference, special head requirements, and total friction loss.

10 (1) + — (2) + 4 (3c)

TOTAL HEAD 14 feet



gpm	1.5 inch	2.0 inch	3.0 inch
	Friction loss per 100 ft. of pipe		
10	0.69	0.20	
12	0.96	0.28	
14	1.28	0.38	
16	1.63	0.48	
18	2.03	0.60	
20	2.47	0.73	0.11
25	3.73	1.11	0.16
30	5.23	1.55	0.23
35	7.90	2.06	0.30
40	11.07	2.64	0.39
45	14.73	3.28	0.48
50		3.99	0.58
55		4.76	0.70
60		5.60	0.82

C. Pump selection

1. A pump must be selected to deliver at ~~least~~ Max 45 gpm with at least 14 feet of total head

2 Crows LN

Page 9 of 9

PERC TEST SHEET

TIME	INTERVAL (MINUTES)	WATER DEPTH	WATER DROP	PERC RATE
1040 1101	START 21	8 1/4 7 3/8	7/8	21 / 7/8 = 24.0 **A**
TIME	INTERVAL (MINUTES)	WATER DEPTH	WATER DROP	PERC RATE
1102 1124	REFILL 22	7 5/8 6	7/8	22 / 7/8 = 25.0 **B**
TIME	INTERVAL (MINUTES)	WATER DEPTH	WATER DROP	PERC RATE
1125 1147	REFILL 22	7 7/8 6 3/4	7/8	22 / 7/8 = 25.0 **C**
TIME	INTERVAL (MINUTES)	WATER DEPTH	WATER DROP	PERC RATE
____ ____	REFILL ____	____ ____	____	____ / ____ = ____ **D**
TIME	INTERVAL (MINUTES)	WATER DEPTH	WATER DROP	PERC RATE
1039 1059	REFILL 20	8 1/2 7 1/16	1 1/16	20 / 1 1/16 = 18.8 **E**
TIME	INTERVAL (MINUTES)	WATER DEPTH	WATER DROP	PERC RATE
1100 1120	REFILL 20	8 5/8 7 9/16	1 1/16	20 / 1 1/16 = 18.8 **F**
TIME	INTERVAL (MINUTES)	WATER DEPTH	WATER DROP	PERC RATE
1121 1143	REFILL 22	8 3/8 7 1/4	1 1/8	22 / 1 1/8 = 19.6 **G**
TIME	INTERVAL (MINUTES)	WATER DEPTH	WATER DROP	PERC RATE
____ ____	REFILL ____	____ ____	____	____ / ____ = ____ **H**

Ave 24.1

Ave 19.1

CONVERSIONS

1/16	.06
1/8	.13
3/16	.19
1/4	.25
5/16	.31
3/8	.38
7/16	.44
1/2	.5
9/16	.56
5/8	.63
11/16	.69
3/4	.75
13/16	.81
7/8	.88
15/16	.94

Ten Percent Calculation

A, B, C

25.0 (Largest # of ABC) − 24.0 (Smallest # of ABC) = 1.0

24.0 (Smallest # of ABC) x 0.10 = 2.4

If the top number is larger than the bottom number then take another reading. If the top number is equal or smaller than bottom number average the three numbers for the perc rate

B, C, D

(Largest # of BCD) − (Smallest # of BCD) = ____

(Smallest # of BCD) x 0.10 = ____

If the top number is larger than the bottom number then take another reading. If the top number is equal or smaller than bottom number average the three numbers for the perc rate

C, D, E

(Largest # of CDE) − (Smallest # of CDE) = ____

(Smallest # of CDE) x 0.10 = ____

If the top number is larger than the bottom number then take another reading. If the top number is equal or smaller than bottom number average the three numbers for the perc rate

D, E, F

(Largest # of DEF) − (Smallest # of DEF) = ____

(Smallest # of DEF) x 0.10 = ____

If the top number is larger than the bottom number then take another reading. If the top number is equal or smaller than bottom number average the three numbers for the perc rate

E, F, G

(Largest # of EFG) − (Smallest # of EFG) = ____

(Smallest # of EFG) x 0.10 = ____

If the top number is larger than the bottom number then take another reading. If the top number is equal or smaller than bottom number average the three numbers for the perc rate

F, G, H

(Largest # of FGH) − (Smallest # of FGH) = ____

(Smallest # of FGH) x 0.10 = ____

If the top number is larger than the bottom number then take another reading. If the top number is equal or smaller than bottom number average the three numbers for the perc rate

2026 Inspection Report - With Tank Certification

MINNESOTA POLLUTION CONTROL AGENCY

520 Lafayette Road North
St. Paul, MN 55155-4194

Compliance inspection report form

Existing Subsurface Sewage Treatment System (SSTS)

Doc Type: Compliance and Enforcement

Instructions: **Inspector must submit completed form to Local Governmental Unit (LGU) and system owner within 15 days of final determination of compliance or noncompliance.** Instructions for filling out this form are located on the Minnesota Pollution Control Agency (MPCA) website at https://www.pca.state.mn.us/sites/default/files/wq-wwists4-31a.pdf.

Property information

Local tracking number:

Parcel ID# or Sec/Twp/Range: 053022330011 Reason for Inspection: Property Transfer

Local regulatory authority info: City of North Oaks

Property address: 2 Crocus Lane, North Oaks, MN 55127

Owner/representative: Paul & Nancy Seel Owner's phone:

Brief system description: A precast sewage tank to a 5-bedroom Multi-Flo unit to a precast lift tank to gravelless pipe trenches.

System status

System status on date (mm/dd/yyyy): 4/24/2026

☐ **Compliant – Certificate of compliance***

*(**Valid for 3 years from report date** unless evidence of an imminent threat to public health or safety requiring removal and abatement under section 145A.04, subdivision 8 is discovered or a shorter time frame exists in Local Ordinance.)*

Note: Compliance indicates conformance with Minn. R. 7080.1500 as of system status date above and does not guarantee future performance.

☒ **Noncompliant – Notice of noncompliance**

Systems failing to protect ground water must be upgraded, replaced, or use discontinued within the time required by local ordinance.

An imminent threat to public health and safety (ITPHS) must be upgraded, replaced, or its use discontinued within ten months of receipt of this notice or within a shorter period if required by local ordinance or under section 145A.04 subdivision 8.

Reason(s) for noncompliance (check all applicable)

- ☐ Impact on public health (Compliance component #1) – *Imminent threat to public health and safety*
- ☐ Tank integrity (Compliance component #2) – *Failing to protect groundwater*
- ☐ Other Compliance Conditions (Compliance component #3) – *Imminent threat to public health and safety*
- ☐ Other Compliance Conditions (Compliance component #3) – *Failing to protect groundwater*
- ☐ System not abandoned according to Minn. R. 7080.2500 (Compliance component #3) – *Failing to protect groundwater*
- ☒ Soil separation (Compliance component #5) – *Failing to protect groundwater*
- ☐ Operating permit/monitoring plan requirements (Compliance component #4) – *Noncompliant - local ordinance applies*

Comments or recommendations

The trash tank, treatment unit, and lift tank are all in good condition and show no signs of failure. The soil analysis next to the lowest trench has redoximorphic features in the soil at 23" and 33" deep. This does not provide the required separation of 31.5" of separation. The treatment system does not include a disinfection unit. The existing tanks are also in the 30' setback from the ROW along Crocus Lane. A new design and installation of SSTS soil treatment area will be necessary to bring the system into compliance.

Certification

I hereby certify that all the necessary information has been gathered to determine the compliance status of this system. No determination of future system performance has been nor can be made due to unknown conditions during system construction, possible abuse of the system, inadequate maintenance, or future water usage.

***By typing my name below**, I certify the above statements to be true and correct, to the best of my knowledge, and that this information can be used for the purpose of processing this form.*

Business name: Kloeppner Services & Design Certification number: C8188

Inspector signature: Jesse Kloeppner License number: L4043

(This document has been electronically signed) Phone: 763-843-4114

Necessary or locally required supporting documentation (must be attached)

☒ Soil observation logs ☒ System/As-Built ☐ Locally required forms ☐ Tank Integrity Assessment ☐ Operating Permit

☐ Other information (list):

Property Address: 2 Crocus Lane, North Oaks, MN 55127
Business Name: Kloeppner Services & Design Date: 4/24/2026

1. Impact on public health – Compliance component #1 of 5

Compliance criteria:	
System discharges sewage to the ground surface	☐ Yes* ☒ No
System discharges sewage to drain tile or surface waters.	☐ Yes* ☒ No
System causes sewage backup into dwelling or establishment.	☐ Yes* ☒ No

Any "yes" answer above indicates the system is an imminent threat to public health and safety.

Attached supporting documentation:

☐ Other:
☒ Not applicable

Describe verification methods and results:

Visual Inspection of the area. No signs of sewage to the ground surface. The homeowners did not report back-ups in to the house.

2. Tank integrity – Compliance component #2 of 5

Compliance criteria:	
System consists of a seepage pit, cesspool, drywell, leaching pit, or other pit?	☐ Yes* ☒ No
Sewage tank(s) leak below their designed operating depth?	☐ Yes* ☒ No
If yes, which sewage tank(s) leaks:	

Any "yes" answer above indicates the system is failing to protect groundwater.

Attached supporting documentation:

☒ Empty tank(s) viewed by inspector

Name of maintenance business: Smilie's Sewer
License number of maintenance business: L2428
Date of maintenance: 4/24/2026

☐ Existing tank integrity assessment (Attach)

Date of maintenance (mm/dd/yyyy): (must be within three years)

(See form instructions to ensure assessment complies with Minn. R. 7082.0700 subp. 4 B (1))

☐ Tank is Noncompliant (pumping not necessary – explain below)
☐ Other:

Describe verification methods and results:

Tanks pumped and visually inspected with camera. No signs of cracks or leaking in any of the tanks. The lift tank had very clear water. The Mulit-flo unit was operating normally. The sewage (trash) tank baffles were in place and no signs of stress in the tank.

Property Address: 2 Crocus Lane, North Oaks, MN 55127
Business Name: Kloeppner Services & Design Date: 4/24/2026

3. Other compliance conditions – Compliance component #3 of 5

3a. Maintenance hole covers appear to be structurally unsound (damaged, cracked, etc.), or unsecured?
☐ Yes* ☒ No ☐ Unknown

3b. Other issues *(electrical hazards, etc.)* to immediately and adversely impact public health or safety? ☐ Yes* ☒ No ☐ Unknown

Yes to 3a or 3b - System is an imminent threat to public health and safety.

3c. System is non-protective of ground water for other conditions as determined by inspector? ☐ Yes* ☒ No

3d. System not abandoned in accordance with Minn. R. 7080.2500? ☐ Yes* ☒ No

Yes to 3c or 3d - System is failing to protect groundwater.

Describe verification methods and results:

Inspected area around tanks. No signs of damage.

Attached supporting documentation: ☒ Not applicable ☐ _____

4. Operating permit and nitrogen BMP* – Compliance component #4 of 5 ☒ Not applicable

Is the system operated under an Operating Permit? ☐ Yes ☒ No **If "yes", A below is required**

Is the system required to employ a Nitrogen BMP specified in the system design? ☐ Yes ☒ No **If "yes", B below is required**

BMP = Best Management Practice(s) specified in the system design

If the answer to both questions is "no", this section does not need to be completed.

Compliance criteria:

a. Have the operating permit requirements been met? ☐ Yes ☐ No

b. Is the required nitrogen BMP in place and properly functioning? ☐ Yes ☐ No

Any "no" answer indicates noncompliance.

Describe verification methods and results:

The system is currently not governed by an operating permit. However, the City of North Oaks has informed me that an Operating Permit will be required with a Service Contract from a licensed Service Provider in the future to be incompliance. The Operating Permit will provide requirements for the treatment system performance, testing requirements, and frequency of maintenance.

Attached supporting documentation: ☐ Operating permit (Attach) ☐

Property Address: 2 Crocus Lane, North Oaks, MN 55127
Business Name: Kloeppner Services & Design Date: 4/24/2026

5. Soil separation – Compliance component #5 of 5

Date of installation 9/28/2000 *(mm/dd/yyyy)* ☐ Unknown

Shoreland/Wellhead protection/Food beverage lodging? ☒ Yes ☐ No

Attached supporting documentation:

☒ Soil observation logs completed for the report
☐ Two previous verifications of required vertical separation
☐ Not applicable (No soil treatment area)
☐ _____

Compliance criteria (select one):

5a. *For systems built prior to April 1, 1996, and not located in Shoreland or Wellhead Protection Area or not serving a food, beverage or lodging establishment:* Drainfield has at least a two-foot vertical separation distance from periodically saturated soil or bedrock.	☐ Yes ☐ No*
5b. *Non-performance systems built April 1, 1996, or later or for non-performance systems located in Shoreland or Wellhead Protection Areas or serving a food, beverage, or lodging establishment:* Drainfield has a three-foot vertical separation distance from periodically saturated soil or bedrock.*	☐ Yes ☒ No*
5c. *"Experimental", "Other", or "Performance" systems built under pre-2008 Rules; Type IV or V systems built under 2008 Rules 7080. 2350 or 7080.2400 (Intermediate Inspector License required ≤ 2,500 gallons per day; Advanced Inspector License required > 2,500 gallons per day)* Drainfield meets the designed vertical separation distance from periodically saturated soil or bedrock.	☐ Yes ☐ No*

Indicate depths or elevations

A. Bottom of distribution media	916.0' & 914.0'
B. Periodically saturated soil/bedrock	915.9' & 914.1'
C. System separation	0.0 ft
D. Required compliance separation*	2.6 ft

*May be reduced up to 15 percent if allowed by Local Ordinance.

Any "no" answer above indicates the system is failing to protect groundwater.

Describe verification methods and results:

See attached soil boring logs and site plan for location of trenches and borings.

Upgrade requirements: *(Minn. Stat. § 115.55) An imminent threat to public health and safety (ITPHS) must be upgraded, replaced, or its use discontinued within ten months of receipt of this notice or within a shorter period if required by local ordinance. If the system is failing to protect ground water, the system must be upgraded, replaced, or its use discontinued within the time required by local ordinance. If an existing system is not failing as defined in law, and has at least two feet of design soil separation, then the system need not be upgraded, repaired, replaced, or its use discontinued, notwithstanding any local ordinance that is more strict. This provision does not apply to systems in shoreland areas, Wellhead Protection Areas, or those used in connection with food, beverage, and lodging establishments as defined in law.*

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Septic System Management Plan for Above Grade Systems

The goal of a septic system is to protect human health and the environment by properly treating wastewater before returning it to the environment. Your septic system is designed to kill harmful organisms and remove pollutants before the water is recycled back into our lakes, streams and groundwater.

This **management plan** will identify the operation and maintenance activities necessary to ensure long-term performance of your septic system. Some of these activities must be performed by you, the homeowner. Other tasks must be performed by a licensed septic maintainer or service provider. However, it is **YOUR** responsibility to make sure all tasks get accomplished in a timely manner.

The University of Minnesota's *Septic System Owner's Guide* contains additional tips and recommendations designed to extend the effective life of your system and save you money over time.

Proper septic system design, installation, operation and maintenance means safe and clean water!

Property Owner Nancy and Paul Seel	Email
Property Address 2 Crocus Lane, North Oaks, MN	Property ID 053022330011
System Designer Alex Pepin (Ten Thirty Environmental Solutions)	Contact Info 612-248-4281
System Installer	Contact Info
Service Provider/Maintainer	Contact Info
Permitting Authority City of North Oaks	Contact Info
Permit #	Date Inspected

Keep this Management Plan with your Septic System Owner's Guide. The Septic System Owner's Guide includes a folder to hold maintenance records including pumping, inspection and evaluation reports. Ask your septic professional to also:

- Attach permit information, designer drawings and as-built of your system, if they are available.
- Keep copies of all pumping records and other maintenance and repair invoices with this document.
- Review this document with your maintenance professional at each visit; discuss any changes in product use, activities, or water-use appliances.

For a copy of the *Septic System Owner's Guide*, visit www.bookstores.umn.edu and search for the word "septic" or call 800-322-8642.

For more information see http://septic.umn.edu

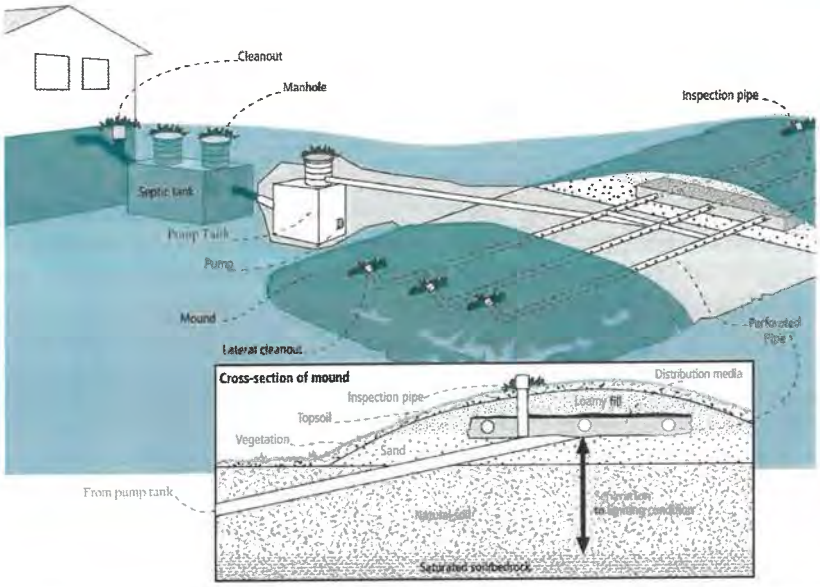
Version: August 2015

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Septic System Management Plan for Above Grade Systems



Your Septic System



Septic System Specifics

System Type: ◯ I ◯ II ◯ III ◉ IV* ◯ V*

(Based on MN Rules Chapter 7080.2200 – 2400)

**Additional Management Plan required*

☑ System is subject to operating permit*

☑ System uses UV disinfection unit*

Type of advanced treatment unit MultiFlo FTB-0.75

Dwelling Type

Number of bedrooms: 5

System capacity/ design flow (gpd): 750

Anticipated average daily flow (gpd): 450

Comments _____

Business? : ◯ Y ◯ N What type? _____

Well Construction

Well depth (ft): 228

- ❑ Cased well Casing depth: 185
- ❑ Other (specify): _____

Distance from septic (ft): _____

Is the well on the design drawing? ◉ Y ◯ N

Septic Tank

- ❑ First tank *Tank volume:* 625 *gallons*
  Does tank have two compartments? ◯ Y ◯ N
- ❑ Second tank *Tank volume:* _____ *gallons*
- ❑ Tank is constructed of _____
- ❑ Effluent screen: ◯ Y ◉ N Alarm ◯ Y ◉ N

- ❑ Pump Tank 1250 *gallons*
- ❑ Effluent Pump *make/model:* _____
  Pump capacity _____ GPM
  TDH _____ Feet of head
- ❑ Alarm location _____

Soil Treatment Area (STA)

Mound/At-Grade area (width x length): 20 ft x 141 ft

Rock bed size (width x length): 6 ft x 127 ft

Location of additional STA: _____

Type of distribution media: Drainfield Rock

☑ Inspection ports ☑ Cleanouts

☑ Surface water diversions

☐ Additional STA not available



Homeowner Management Tasks

These op*eration and maintenance ac*tivities are your responsibility. *Chart on page 6 can help track your activities.*

Your toilet is not a garbage can. Do not flush anything besides human waste and toilet paper. No wet wipes, cigarette butts, disposal diapers, used medicine, feminine products or other trash!

The system and septic tanks needs to be checked every 12 months

Your service provider or pumper/maintainer should evaluate if your tank needs to be pumped more or less often.

Seasonally or several times per year

- *Leaks.* Check (listen, look) for leaks in toilets and dripping faucets. Repair leaks promptly.
- *Soil treatment area.* Regularly check for wet or spongy soil around your soil treatment area. If surfaced sewage or strong odors are not corrected by pumping the tank or fixing broken caps and leaks, call your service professional. *Untreated sewage may make humans and animals sick.* Keep bikes, snowmobiles and other traffic off and control borrowing animals.
- *Alarms.* Alarms signal when there is a problem; contact your service professional any time the alarm signals.
- *Lint filter.* If you have a lint filter, check for lint buildup and clean when necessary. If you do not have one, consider adding one after washing machine.
- *Effluent screen.* If you do not have one, consider having one installed the next time the tank is cleaned along with an alarm.

Annually

- *Water usage rate.* A water meter or another device can be used to monitor your average daily water use. Compare your water usage rate to the design flow of your system (listed on the next page). Contact your septic professional if your average daily flow over the course of a month exceeds 70% of the design flow for your system.
- *Caps.* Make sure that all caps and lids are intact and in place. Inspect for damaged caps at least every fall. Fix or replace damaged caps before winter to help prevent freezing issues.
- *Water conditioning devices.* See Page 5 for a list of devices. When possible, program the recharge frequency based on *water demand (gallons)* rather than *time (days).* Recharging too frequently may negatively impact your septic system. Consider updating to demand operation if your system currently uses time,
- *Review your water usage rate.* Review the Water Use Appliance chart on Page 5. Discuss any major changes with your service provider or pumper/maintainer.

During each visit by a service provider or pumper/maintainer

- Make sure that your service professional services the tank through the manhole. (NOT though a 4" or 6" diameter inspection port.)
- Ask how full your tank was with sludge and scum to determine if your service interval is appropriate.
- Ask your pumper/maintainer to accomplish the tasks listed on the Professional Tasks on Page 4.



Professional Management Tasks

These are the operation and maintenance activities that a pumper/maintainer performs to help ensure long-term performance of your system. At each visit a written report/record must be provided to homeowner.

Plumbing/Source of Wastewater

- Review the Water Use Appliance Chart on Page 5 with homeowner. Discuss any changes in water use and the impact those changes may have on the septic system.
- Review water usage rates (if available) with homeowner.

Septic Tank/Pump Tanks

- *Manhole lid.* A riser is recommended if the lid is not accessible from the ground surface. Insulate the riser cover for frost protection.
- *Liquid level.* Check to make sure the tank is not leaking. The liquid level should be level with the bottom of the outlet pipe. (If the water level is below the bottom of the outlet pipe, the tank may not be watertight. If the water level is higher than the bottom of the outlet pipe of the tank, the effluent screen may need cleaning, or there may be ponding in the soil treatment area.)
- *Inspection pipes.* Replace damaged or missing pipes and caps.
- *Baffles.* Check to make sure they are in place and attached, and that inlet/outlet baffles are clear of buildup or obstructions.
- *Effluent screen.* Check to make sure it is in place; clean per manufacturer recommendation. Recommend retrofitted installation if one is not present.
- *Alarm.* Verify that the alarm works.
- *Scum and sludge.* Measure scum and sludge in each compartment of each septic and pump tank, pump if needed.

Pump

- *Pump and controls.* Check to make sure the pump and controls are operating correctly.
- *Pump vault.* Check to make sure it is in place; clean per manufacturer recommendations.
- *Alarm.* Verify that the alarm works.
- *Drainback.* Check to make sure it is draining properly.
- *Event counter or elapsed time meter.* Check to see if there is an event counter or elapsed time meter for the pump. If there is one or both, calculate the water usage rate and compare to the anticipated use listed on Design and Page 2. Dose Volume: _____ gallons: Pump run time: _____ Minutes

Soil Treatment Area

- *Inspection pipes.* Check to make sure they are properly capped. Replace caps and pipes that are damaged.
- *Surfacing of effluent.* Check for surfacing effluent or other signs of problems.
- *Lateral flushing.* Check lateral distribution; if cleanouts exist, flush and clean at recommended frequency.
- *Vegetation* - Check to see that a good growth of vegetation is covering the system.

All other components – evaluate as listed here:



Water-Use Appliances and Equipment in the Home

Appliance	Impacts on System	Management Tips
Garbage disposal	• Uses additional water. • Adds solids to the tank. • Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area.	• Use of a garbage disposal is not recommended. • Minimize garbage disposal use. Compost instead. • To prevent solids from exiting the tank, have your tank pumped more frequently. • Add an effluent screen to your tank.
Washing machine	• Washing several loads on one day uses a lot of water and may overload your system. • Overloading your system may prevent solids from settling out in the tank. Unsettled solids can exit the tank and enter the soil treatment area.	• Choose a front-loader or water-saving top-loader, these units use less water than older models. • Limit the addition of extra solids to your tank by using liquid or easily biodegradable detergents. Limit use of bleach-based detergents and fabric softeners. • Install a lint filter after the washer and an effluent screen to your tank • Wash only full loads and think even – spread your laundry loads throughout the week.
Dishwasher	• Powdered and/or high-phosphorus detergents can negatively impact the performance of your tank and soil treatment area. • New models promote "no scraping". They have a garbage disposal inside.	• Use gel detergents. Powdered detergents may add solids to the tank. • Use detergents that are low or no-phosphorus. • Wash only full loads. • Scrape your dishes anyways to keep undigested solids out of your septic system.
Grinder pump (in home)	• Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area.	• Expand septic tank capacity by a factor of 1.5. • Include pump monitoring in your maintenance schedule to ensure that it is working properly. • Add an effluent screen.
Large bathtub (whirlpool)	• Large volume of water may overload your system. • Heavy use of bath oils and soaps can impact biological activity in your tank and soil treatment area.	• Avoid using other water-use appliances at the same time. For example, don't wash clothes and take a bath at the same time. • Use oils, soaps, and cleaners in the bath or shower sparingly.
Clean Water Uses	**Impacts on System**	**Management Tips**
High-efficiency furnace	• Drip may result in frozen pipes during cold weather.	• Re-route water directly out of the house. Do not route furnace discharge to your septic system.
Water softener Iron filter Reverse osmosis	• Salt in recharge water may affect system performance. • Recharge water may hydraulically overload the system.	• These sources produce water that is not sewage and should not go into your septic system. • Reroute water from these sources to another outlet, such as a dry well, draintile or old drainfield. • When replacing, consider using a demand-based recharge vs. a time-based recharge. • Check valves to ensure proper operation; have unit serviced per manufacturer directions
Surface drainage Footing drains	• Water from these sources will overload the system and is prohibited from entering septic system.	

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Septic System Management Plan for Above Grade Systems



Homeowner Maintenance Log

Track maintenance activities here for easy reference. See list of management tasks on pages 3 and 4.

Activity	Date accomplished									
Check frequently:										
Leaks: check for plumbing leaks*										
Soil treatment area check for surfacing**										
Lint filter: check, clean if needed*										
Effluent screen (if owner-maintained)***										
Alarm**										
Check annually:										
Water usage rate (maximum gpd _____)										
Caps: inspect, replace if needed										
Water use appliances – review use										
Other:										

*Monthly

**Quarterly

***Bi-Annually

Notes: Service Provider to recommend pumping frequency based on observations during visits. On average should expect every 2 years. Please see Multi Flo requirements on following pages.

If add iron filter, divert reject water out of septic system. Recommend using low flow fixtures (<1.5 gpm) and a front end loading washing machine. Also recommend installing a Moen Flo water meter (or similar product) to monitor water usage and detect leaks. Examples of these are shown on the following pages.

"As the owner of this SSTS, I understand it is my responsibility to properly operate and maintain the sewage treatment system on this property, utilizing the Management Plan. If requirements in this Management Plan are not met, I will promptly notify the permitting authority and take necessary corrective actions. If I have a new system, I agree to adequately protect the reserve area for future use as a soil treatment system."

Property Owner Signature: _____ Date _____

Management Plan Prepared By: Alex Pepin Certification # 9844

Permitting Authority: City of North Oaks

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Onsite Sewage Treatment Program
Septic System Management Plan
Consolidated Treatment Systems
Enviro-Guard, Nayadic, and Multi-Flow Fixed Film Aerobic Treatment Unit

This Management Plan identifies some basic requirements for proper operation and maintenance of the Consolidated Treatment Systems Enviro-Guard, Nayadic, and Multi-Flow aerobic treatment unit (ATU) devices. Refer to the manufacturer's Operation and Maintenance Manual for Consolidated Treatment Systems for detailed instructions on proper system operation and maintenance. Refer to your soil treatment system management plan (below or above-grade) for additional management requirements.

The Consolidated Treatment Systems Manual for reach of types of ATUs, submitted by the manufacturer as part of the Minnesota registration of this product in Minnesota, can be found at the following website: https://septic.umn.edu/ssts-professionals/manual

SYSTEM COMPONENT	TASK	MINIMUM FREQUENCY	RESPONSIBLE PARTY
CONSOLIDATED Treatment Systems **Enviro-Guard** **Multi-Flo** **Nayadic** **Aerobic Treatment Unit**	Monitor alarm	On-going	User
	Clean vents on housing	Annually	User or Service Provider
	Monitor flow		Service Provider
	Verify flow splitting devices are performing accurately & adjust as needed		
	Check Multi-Flo or Enviro-Guard aerator impeller for proper spinning		
	Check mechanical and electrical components		
	Perform operational field tests on influent/effluent quality including odor, color, turbidity, temperature, dissolved oxygen and pH as appropriate		
	Check sludge level in septic tank(s)		Service Provider and Maintainer
	Check sludge levels in aerobic tanks; follow manufacturers recommendations for solids removal refilling with clean water after pump out		
	Sample effluent as required in the local Operating Permit	See Operating Permit*	Service Provider
	For seasonal use, follow manufacturers guidelines	As required based on seasonal usage	Service Provider

** See page 2 for recommended frequencies.*

Items not permitted in the wastewater for this system are specified in the device's Owner's Manual for Minnesota.

Systems designed to meet treatment level A or B with **UV disinfection** or **chlorination** must also have an ultraviolet or chlorine disinfection device which requires an additional management plan.

At the time of each service visit, Form 7-2: Aerobic Treatment Unit should be completed by the MPCA licensed Service Provider. See https://septic.umn.edu/ssts-professionals/forms-worksheets. The protocol for collection of wastewater samples is specified in the Consolidated Manual for Minnesota.

University of Minnesota
Onsite Sewage Treatment Program

Septic System Management Plan
Sampling Parameters and Frequency

Sampling of system

- Sampling frequencies assumes year-round occupancy and can potentially be reduced with seasonal facilities. Sampling requirements are specified in local operating permits.
- Over time sampling frequency may be adjusted based on performance.
- Systems with ultraviolet (UV) or chlorination treatment must refer to the additional management plan, but the sampling requirements are covered below.
- Sample locations for all Type IV and V systems should be from the pump tank to soil treatment area (STA) or based on manufacturers specifications.
  - See http://septic.umn.edu/ssts-professionals/forms-worksheets#maintenance/ for forms and supplementary information.
- Inspection forms and signed management plans should be submitted to the presiding county or local government unit.

Designer Specified Sampling Requirements

1. This system is designed to meet treatment level:

☑ A ☐ A2 ☐ B ☐ B2 ☐ C ☐ Total Nitrogen (TN)

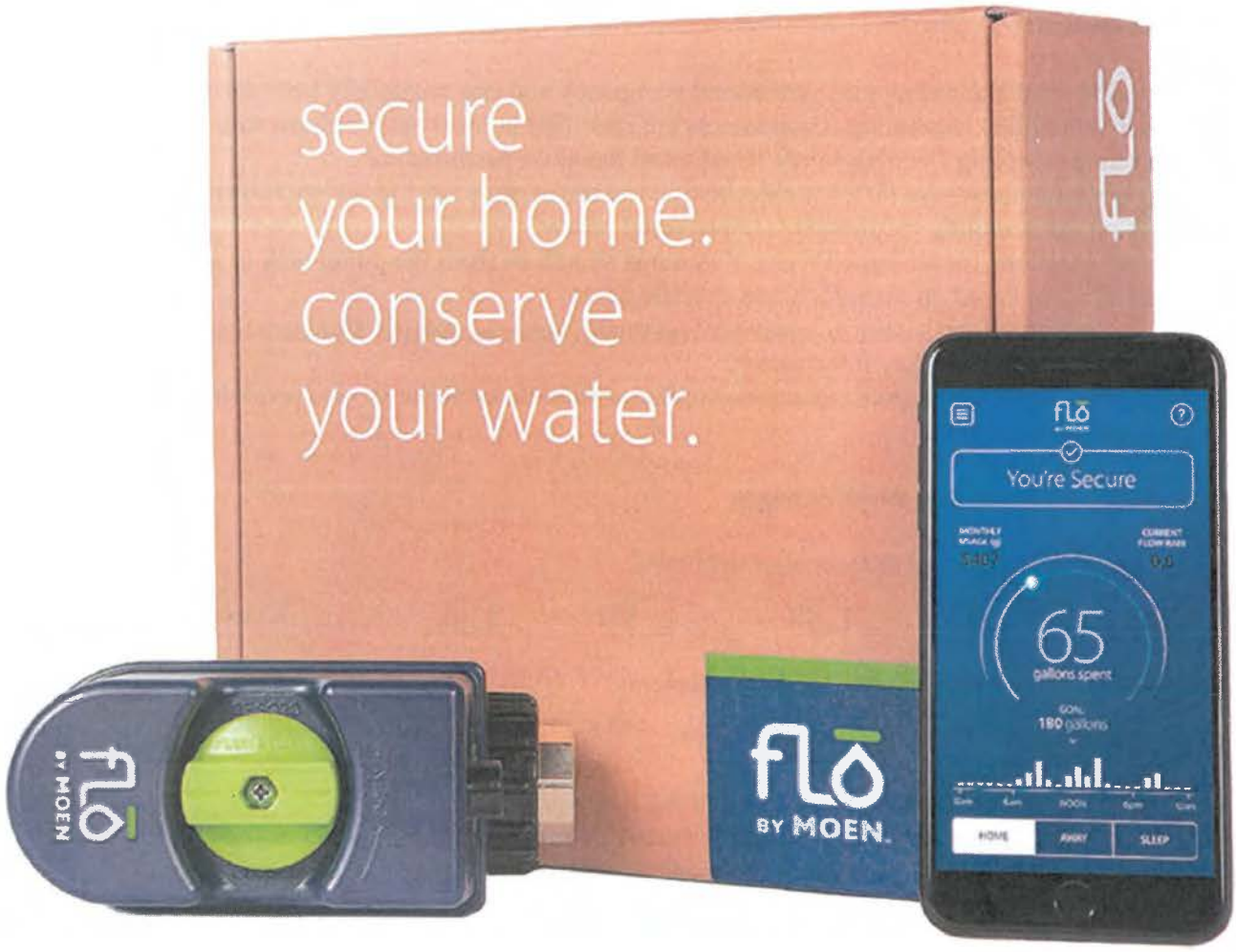
2. Based on the tables below or local requirements:
   a. The system needs to be sampled for: cBOD5, TSS and Fecal Coliform
   b. The system needs to be sampled at the frequency of: ONCE (per year)
      - Minimum sampling requirements may be reduced if building not occupied year-round.
      - Additional sampling may be required based on results of sampling and/or local ordinance.

Recommended sampling frequencies per wastewater parameters and system sizes

Sampling Parameters per System Treatment Level				
Parameter	Treatment level			
	A & B	A2 & B2	C*	TN**
BOD	X	X	X	X
TSS	X	X	X	X
Fecal	X			
Nitrogen				X
FOG			X*	

*Includes high strength wastewater treatment
**For midsize subsurface sewage treatment systems (MSTS) or systems requiring a BMP.

Sampling Frequencies Based on Design Flow Rates	
Flow (gallons per day)	Minimum sampling frequency per year
<2,500	1 (annually)
2,500 - 5,000	2 (bi-annually)
5,000 - 10,000	4 (quarterly)



flo BY MOEN

AWARD WINNER POPULAR SCIENCE BEST OF WHAT'S NEW 2018

BEST OF KBIS WINNER SMART HOME TECHNOLOGY

The smart home water security system

- Flo by Moen is a mainline water monitoring device for the home.
- The device monitors water, identifies leaks and alerts homeowners of these issues to protect the home.
- Real-time alerts through the smartphone app help inform homeowners on water usage on a daily, weekly and monthly basis.
- Features notifications for remote shutoff option for homeowner via mobile app and automatic shutoff if a catastrophic leak is detected in the home.

MOEN

flo BY MOEN



MODEL NO. 900-001

Whole-Home Water Security

Flo by Moen monitors the entire water system for big leaks, microleaks and even invisible leaks behind walls.

Proactive Protection

Daily health tests help keep the home leak-free and alert the user when there's an issue.

Water Shutoff

Remote water shutoff from the user's phone and automatic water shutoff for protection even when they're offline.

Visit **moen.ca/flo** for additional information.
Professional installation recommended.
Insurance discounts may be available based on carrier and region. Please check with your local insurance representative for eligibility.

Microleak™ Technology

Advanced sensors detect leaks as small as one drop of water per minute.

Support

On-call experts help users identify and troubleshoot detected leaks.

Savings

Save water and money while protecting the home and possessions from water damage.

App compatibility:

works with amazon alexa · works with the Google Assistant · Works with IFTTT

FloProtect™

- Water damage deductible guarantee $2,500USD
- Proactive monitoring and water concierge
- Enhanced water usage data
- Extended product warranty (3 years)
- Insurance Verification Letter
- $5USD per month fee with 30-day free trial

In the Box

- Flo by Moen device
- 3/4" – 14 NPT, Threaded brass tailpieces (×2)
- 10' power supply
- Spare O-rings (×2)
- Installation spacer
- 5/16" hex key
- Installation guide

Where is Flo by Moen installed?

One device is installed on the main water supply line and paired with the home's Wi-Fi. From here, Flo by Moen can capture all vulnerabilities in the potable water system.



MOEN

© 2019 Moen Incorporated

Not as accurate as Moen unit – however good at identifying leaks and less expensive and easier install





Droplet (https://shop.hydrificwater.com/pages/buy-droplet)

Smart Home Water Sensor

- Droplet is an all-in-one smart water sensor that uses powerful ultrasonic sensors and AI to track your household water use.
- Protect your home from water damage with instant leak alerts and get detailed insights into how each appliance in your home is using water.
- Instant Leak Alerts
- Real-Time Water Tracking
- $199.00

Description

Meet your new essential water tool.

Droplet is the most advanced water precision sensor that detects leaks instantly and gives you full control of your water use.

Best-in-class precision readings

Dual ultrasonic sensors scan water flow up to 50 times per second, detecting flows as low as 0.1 liters per minute for the most accurate leak detection and water tracking on the market.

Total control of your water

Get insights into your water bills with detailed breakdowns into your household water usage monthly, daily or even hourly.

See where your water is going

Pinpoint the appliances using the most water and understand your water use. Advanced AI monitors your water patterns so you can track and view your habits easily.

One Device for Your Entire Home

Other water monitors require you to place multiple sensors around the home where you think leaks are likely to occur. One Droplet in a single location is all you need to monitor your entire home's water system for leaks.

Self-install in minutes

No tools or plumber necessary. Simply clamp and connect in minutes to start tracking water and saving money.

What should I look for when buying a Clothes Washer?

Check the yellow EnergyGuide label

Use this label to determine the model's energy use, compare the energy use of similar models, and estimate annual operating costs. Learn How to Use the Federal Trade Commission's EnergyGuide Label and the Difference Between the Energy Guide and ENERGY STAR.

Think carefully about the size.

ENERGY STAR certified models are available in various product widths and drum capacities. Think about where you want to place your clothes washer and whether you typically run small or large loads. ENERGY STAR certified models are also available in stackable, under-the-counter designs, and combination washer-dryer designs which fit in smaller spaces.

Save the most by choosing a model with a high Integrated Modified Energy Factor (IMEF) and a low Integrated Water Factor (IWF).

Integrated Modified Energy Factor (IMEF) is a measure of energy efficiency that considers the energy used by the washer during the cycle and while on standby, the energy used to heat the water, and the energy used to run the dryer. The higher the IMEF, the more energy efficient the clothes washer.

Integrated Water Factor (IWF) is a measure of water efficiency in gallons of water consumed per cubic foot of capacity. The lower the IWF, the more water efficient the clothes washer. Both IMEF and IWF are provided for each model listed in the ENERGY STAR Product Finder.

Consider the benefits of front load

ENERGY STAR certified front load washers use about 45% less energy and 50% less water than a top load agitator washer. In the past decade or so, top load impeller washers, which have a low-profile cone or disc instead of an agitator, have become popular as a more energy- and water-efficient option compared to traditional top load washers. However, compared to a top load impeller washer, front load washers are still about 25% more energy and water efficient.

In recent years, clothes washer technology has seen dramatic improvements in efficiency and functionality. Selecting an ENERGY STAR certified washer gets you all these premium features and functionality, with the following additional benefits:

- **Get a shower of water savings.**
  New ENERGY STAR certified clothes washers use advanced technology to dramatically reduce water use. Full-sized washers that have earned the ENERGY STAR use 14 gallons of water per load, compared to the 20 gallons used by a standard machine.

- **Long live your clothes**
  Clothes washers with agitators can be rough on your clothes and put them through extra wear and tear. ENERGY STAR clothes washers have sophisticated wash systems that use a variety of methods to lift and tumble your laundry, lengthening the life of often-washed items. Additionally, because they are so gentle, many models can safely clean silk, wool, and other hand-washables.

- **Take time out.**
  Without a bulky agitator, there is more usable space in the washer for laundry — especially larger items like comforters. More capacity means fewer loads of laundry each week. What will you do with your extra time?

- **Save the environment.**
  More than 60% percent of U.S. electricity is generated by burning coal and natural gas, which releases greenhouse gases into the atmosphere and contributes to climate change. ENERGY STAR certified clothes washers use less energy and help us reduce our impact on the environment. By reducing water consumption, they also put less strain on limited water resources. Learn more about other ways to save water with EPA's WaterSense.

ENERGY STAR Most Efficient

Products that are recognized as ENERGY STAR Most Efficient deliver cutting edge energy efficiency along with the latest in technological innovation. They represent the very best for energy savings and environmental protection. Click the Most Efficient filter to find recognized models.

H2OPTION® SIPHONIC DUAL FLUSH ELONGATED TOILET
VITREOUS CHINA

H2OPTION® SIPHONIC DUAL FLUSH ELONGATED TOILET



❑ **2887.218**
- Vitreous china
- Ultra high efficiency
  - Full Flush (4.8 Lpf/1.28 gpf)
  - Partial Flush (3.4 Lpf/0.92 gpf)
- Elongated siphon action bowl with direct-fed jet
- Meets EPA WaterSense® criteria
- MaP PREMIUM listed
- Includes EverClean® antimicrobial surface
- PowerWash® rim scrubs bowl with each flush
- 305mm (12") rough-in
- Fully glazed 2" Trapway
- Generous 9" x 8" water surface area
- Chrome plated top mounted push button actuator
- Sanitary bar on bowl
- 2 color matched bolt caps
- Limited lifetime warranty on chinaware and limited five year warranty on all mechanical parts

❑ **2887.518** Same as above, except with Tank with AquaGuard Liner

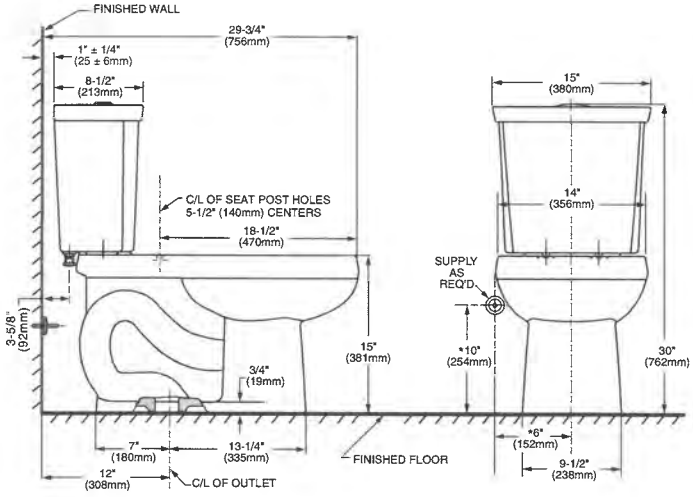
Separate Component Parts:
❑ **3706.216** Bowl
❑ **4133A.218** Tank
❑ **4133A.518** Tank with AquaGuard Liner

Nominal Dimensions:
756 x 380 x 762mm
(29-3/4" x 15" x 30")

Fixture only, seat and supply by others

Compliance Certifications -
Meets or Exceeds the Following Specifications:
- ASME A112.19.2-2008/CSA B45.1-08 for Vitreous China Fixtures
- CALGreen and Califonia Energy Commission (CEC) Compliant
- US EPA WaterSense® criteria for UHETs

To Be Specified:
❑ Color: ❑ White ❑ Bone ❑ Linen
❑ Seat: American Standard #5257A.65C Easy Lift and Clean Elongated Seat with Cover and Slow Close hinges
❑ Alternate Seat:
❑ Supply with stop:



NOTES:
THIS COMBINATION IS DESIGNED TO ROUGH-IN AT A MINIMUM DIMENSION OF 305MM (12") FROM FINISHED WALL TO C/L OF OUTLET.
* DIMENSION SHOWN FOR LOCATION OF SUPPLY IS SUGGESTED. SUPPLY NOT INCLUDED WITH FIXTURE AND MUST BE ORDERED SEPARATELY.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerance established by ANSI Standard A112.19.2
These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

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NIAGARA™



BI-MAX™

FIXED MOUNT SHOWERHEAD

NIAGARA™

BI-MAX™

FIXED MOUNT SHOWERHEAD







FEATURES

- Two pressure-compensated flow-rate options: 1.0 GPM/1.5 GPM
- Easy grip turn-dial for selecting flow rate
- Even, needle spray with a large spray diameter
- Compact, modern design
- Corrosion resistant high-impact ABS thermoplastic body
- Patented Equiforce™ Technology guarantees a consistent flow rate across a wide range of pressure
- 10 year limited lifetime warranty

SPECIFICATIONS

EQUIFORCE™

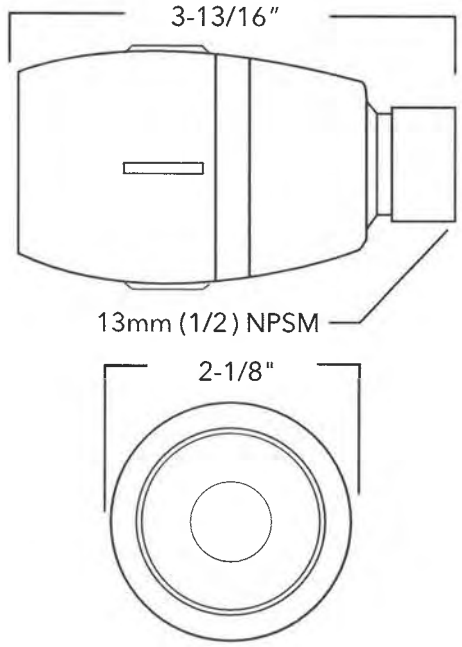
Item Number	Flow Rate	Finish	Spray
N2610	1.0/1.5 GPM	White	2 Function
N2610CH	1.0/1.5 GPM	Chrome	2 Function

Technology: Equiforce™

Materials: Body: ABS Thermoplatic; Internal Parts: ABS & POM Plastics, High-Heat Rubber Gaskets

ASME/CSA Certified: ASME A112.18.1 / CSA B125.1

MEASUREMENTS



*WARRANTY DETAILS: Niagara Conservation™ guarantees to the original purchaser or recipient of an aerator or showerhead that it is free from defects in material and workmanship for a period of 10 years. Niagara will, at our choice, replace any part of the aerator or showerhead which is, in our opinion, defective provided that the product has not been abused, misused, altered, or damaged after its purchase. This includes damage due to the use of tools or harsh chemicals. Call Niagara for complete warranty details.

CORPORATE HQ 1200 Lakeside Parkway, Suite 450, Flower Mound, Texas 75028 USA

© 2019 Niagara Conservation April 24, 2019 9:53 AM

To place an order, please contact:
(t) 800.831.8383 (f) 682.200.6962 (e) info@niagaracorp.com
niagaracorp.com



NIAGARA CONSERVATION

PRESSURE COMPENSATING NEEDLE SPRAY FAUCET AERATOR

Our Niagara Conservation branded Dual Spray Swivel Aerator with Pause Valve directs the water flow where it's needed the most providing greater efficiencies. It offers two stream options: a full force multiple stream and a splash-free bubble stream that can be changed by twisting the body. This aerator contains a 360° swivel which helps to reduce water use by directing the water flow where it's needed. This aerator also features a pause action valve that reduces flow to a trickle while keeping temperature constant.

THE FEATURES

- Dual threaded
- Fits most male and female threaded faucets, Male: 15/16-27, Female: 55/64-27
- Pressure compensating technology guarantees a consistent flow rate across a wide range of pressure
- Needle Spray
- 10 year warranty***

CERTIFICATION & PERFORMANCE REQUIREMENTS

- ASME A112.18.1 / CSA B125.1; ANSI/NSF 61



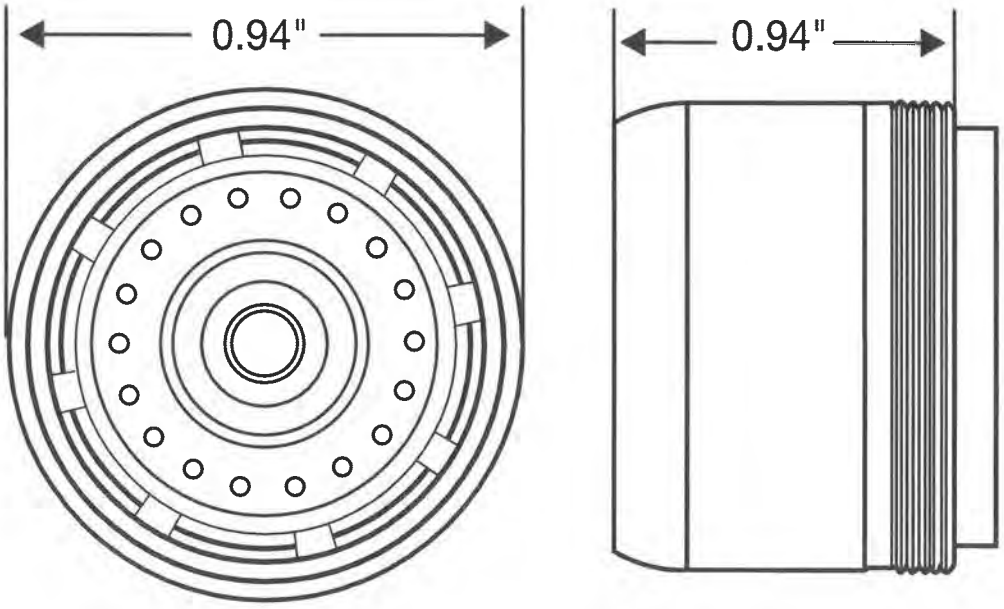
N3205NBN-PC-T

MODEL #	SPRAY	FINISH	FLOW RATE	WATERSENSE	CASE QTY.
N3205N-PC	Needle	Chrome	0.5 GPM	No	500
N3205NBN-PC-T	Needle	Brushed Nickel	0.5 GPM	No	500
N3210N-PC	Needle	Chrome	1.0 GPM	Yes	500
N3215N-PC	Needle	Chrome	1.5 GPM	Yes	500

THE POTENTIAL ANNUAL SAVINGS*

	FLOW RATE	WATER	ELECTRIC HEATING	GAS HEATING
DOLLAR SAVINGS	0.5 GPM	$124	$107	$52
UTILITY SAVINGS	0.5 GPM	14,892 gallons	842 kWh	46 therms
DOLLAR SAVINGS	1.0 GPM	$104	$67	$37
UTILITY SAVINGS	1.0 GPM	10,512 gallons	594 kWh	33 therms
DOLLAR SAVINGS	1.5 GPM	$51	$39	$21
UTILITY SAVINGS	1.5 GPM	6,132 gallons	347 kWh	19 therms

THE DIMENSIONS**



*Factors in calculating savings potential:
• 3-person households each person using a faucet 8 minutes per day, 365 days per
year (AWWARF Residential Study)
• Comparing water use with these aerator vs. a standard 2.2 GPM unit
• US city average water and sewer cost of $8.3 per 1,000 gallons (study done by NUS Consulting Group 2011)
• Average cost of electricity 0.113¢ per kWh (Energy Star Nov. 2013 Lightbulb
Calculator — http://www.energystar.gov/?c=cfls.pr_cfls_savings)
• Average cost of gas $1.137 per therm (Bureau of Labor Statistics April 2014)
• Calculations done by http://www.fishnick.com/savewater/tools/watercalculator

**Dimensions are subject to change

***WARRANTY DETAILS

AM Conservation Group, Inc. guarantees to the original purchaser or recipient of an aerator that it is free from defects in material and workmanship for a period of 10 years. AM Conservation Group, Inc. will at our choice replace any part of the aerator which is in our opinion defective provided that the product has not been abused, misused, altered, or damaged after its purchase. This includes damage due to the use of tools or harsh chemicals. In the event a product has been discontinued, AM Conservation Group, Inc. will replace it with what we determine to be the closest product. AM Conservation Group, Inc. is not responsible for labor charges, installation, or other consequential cost. AM Conservation Group, Inc.'s responsibility shall not exceed the original cost of the product.

GLACIER BAY®

Specifications

McKenna Single-Handle Pull-Down Sprayer Kitchen Faucet

MODEL	SKU#	FINISH
HD67726W-1201	1005604253	Chrome
HD67726W-1208D2	1005604255	Stainless Steel
HD67726W-1210H	1005604254	Matte Black
HD67726W-124405	314006951	Matte Gold

FEATURES

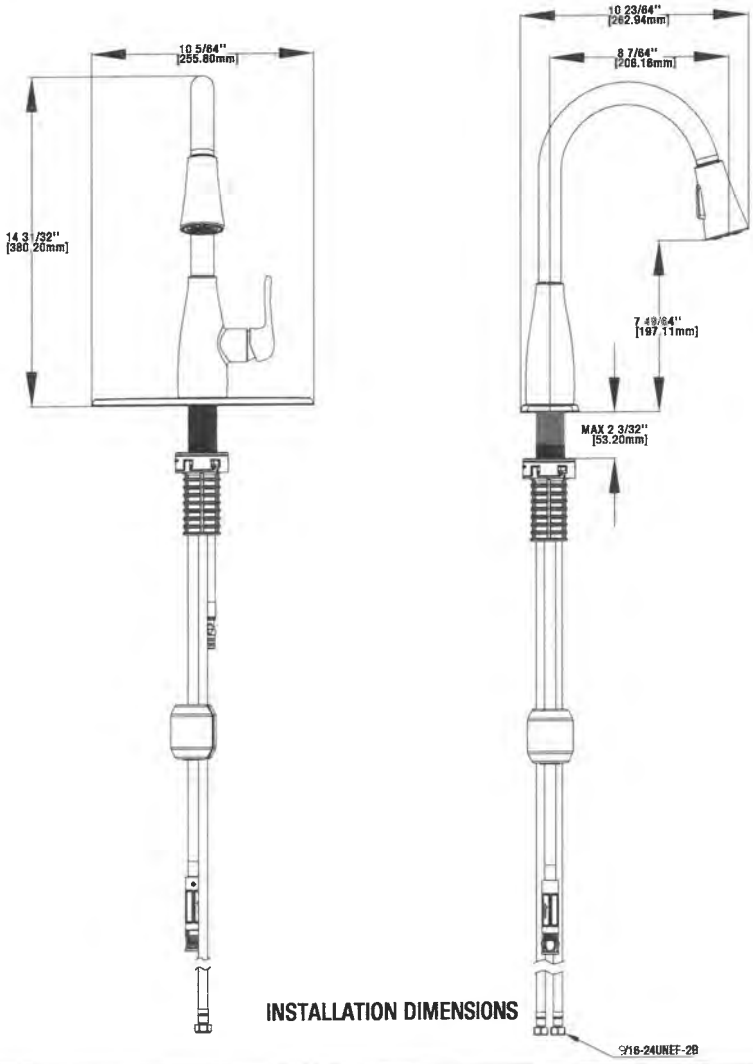
- Requires 1 Hole Sink with 8" On-Center
- Max Flow Rate: 1.8 gpm (6.8 L/min) at 60 psi
- Max Countertop Thickness: 2 3/32"
- Spout Reach: 8 7/64"
- Spout Height: 7 49/64"
- Ceramic Valve for Lifetime Drip-Free Operation
- With Zinc Lever Handle
- Fast Mount Installation

CODE COMPLIANCE

- IAPMO Certified: ASME A112.18.1/CSA B125.1
- NSF 61 Section 9
- NSF 372
- Calgreen Certified
- Meets AB 1953 Lead Standard
- ADA Compliant

WARRANTY

- Limited Lifetime Warranty



INSTALLATION DIMENSIONS

Glacier Bay reserves the right to make changes in specifications and materials and to change and discontinue models, both without notice or obligation. Dimensions are for reference only.

Landscaping Septic Systems

COLLEGE OF FOOD, AGRICULTURAL AND NATURAL RESOURCE SCIENCES

Mary H. Meyer, Extension Horticulturist
Brad Pedersen, Extension Horticulturist (retired)
Marguerite Jaster, Landscape Design Assistant
Department of Horticultural Science
James Anderson, Extension Soil Scientist, Department of Soil, Water, and Climate (retired)
Kenneth M. Olson, Extension Educator (retired)
David M. Gustafson, Extension Specialist, Onsite Sewage Treatment. Water Resources Center

Landscaping near and around septic systems is of concern to many homeowners. Whether drainfields or mounds, Minnesota septic systems must have a minimum of three feet of unsaturated soil between the drainfield or point of infiltration and limiting soil condition such as hardpan, bedrock or saturated soil in order to properly treat sewage. A mound system is required if three feet of separation cannot be achieved with an inground trench system. Mound systems are designed to maximize the absorption capacity of existing soil (see Figure 1). Mound location, size, shape, construction procedures and maintenance of the mound all interact in determining how well the system will function. Placement of plants on and near the mound must be done with care to ensure a properly functioning septic system. Plants enhance the system by removing moisture and nutrients from the soil and providing cover to prevent erosion.

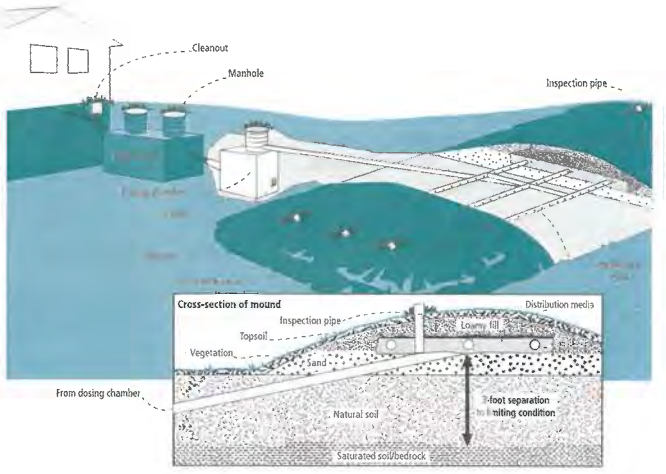


Figure 1. Cross section of a mound system.

Mound Placement

A rectangular mound rising 18 inches to 5 feet above the surface of a relatively flat home landscape may be quite noticeable and possibly very unsightly. Careful design planning **before the mound system is installed** can help to create a sustainable landscape with lower maintenance costs, greater environmental benefits, and much higher aesthetic value. Mounds can be placed to suit individual landscaping and lot size needs (see Figures 2 and 3). Properly landscaped areas around the mound can serve as privacy barriers, windbreaks for homes and a screen from unsightly views.

As a homeowner considering the placement of a septic mound, know your options. *The earlier in the process that you become involved in expressing your preferences, the more options you will have.* For instance, before the house is designed or built, potential septic locations, along with soil borings and percolation tests, can give some control over the placement and final outcome. State and local laws set distances from wells and lakes, based on well casing depth and lake classification. Property lines (PL) or rights-of-way set backs are usually 10 feet (see Figure 4). Additionally, on even a slight slope, it is paramount that the mound rockbed be on the contour for proper operation of the system. Soil must not be moved to create a different slope, as this reduces the ability of the soil to accept the effluent. Once the drainfield or mound is determined, protect it from compaction and disturbance to ensure proper sewage treatment.

When planning a landscape, there should be an **invisible or concept line** the eye follows around the yard (see Figures 2, 3 and 4). Where space allows, this line is a graceful curve which represents the division between two different types of plant material (turf or ground cover versus shrubs) or between plants and hard goods (turf, patio or deck). The concept line becomes a real bedline where the lawn ends and the shrubs begin. If your property is large enough to plan

This publication is meant to be used in conjunction with the *Septic System Owners Guide*, Item # 06583 which further explains the site requirements for placement and location of a mound system. See back page for ordering information.

UNIVERSITY OF MINNESOTA
EXTENSION

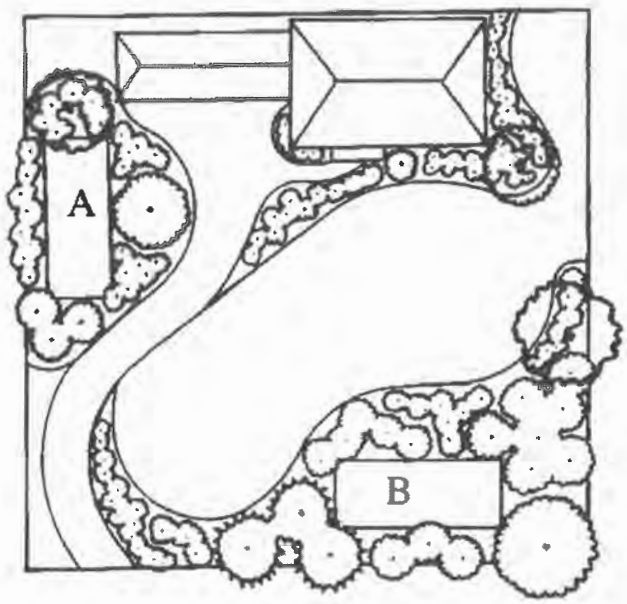


Figure 2. A and B represent possible placement of mound septic systems.

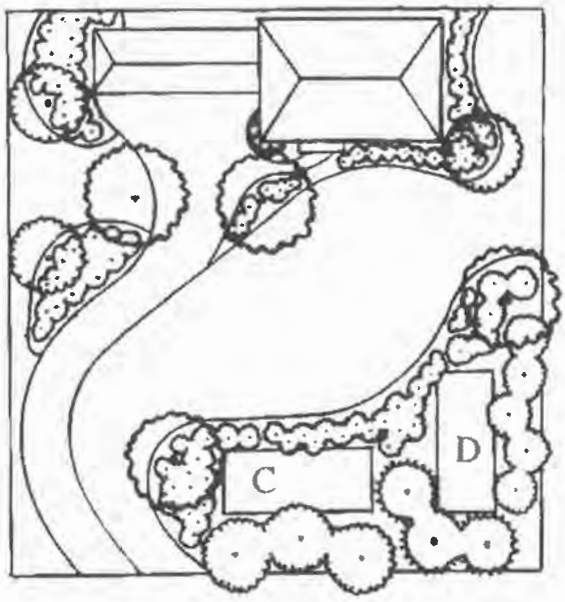


Figure 3. C and D show additional mound system locations.

an **unbroken turf area** as the **first priority**, then place the septic system beyond the bedline disguising it as part of a shrub or perennial area or screening it with trees or large shrubs. If your property is smaller, blending the mound into the overall landscape is still the key. Try moving the focal point from the mound to other plants or features. **Extending the actual berm** with additional topsoil at the same height and curving the perimeter, then sloping down and away can conceal the existence of the system (see Figure 4). If the drainfield must be located near a drive, patio, or walkway, retaining walls may be used to save space, but only on the uphill side of the berm. Connect the extended berm to another large feature in the yard, such as a pool enclosure or other fenced area, using retaining walls for transition. ALWAYS design with the entire yard or viewing area in mind—connect it to the whole picture.

Guidelines for Planting on and Near Septic Mounds

It is very important that the integrity of the mound be kept intact and that soil does not wash away. A permanent vegetation cover is required to minimize topsoil loss. Open sites are more susceptible to frost, heaving and erosion. Plants trap snow which acts as a mulch and prevents erosion.

- Topsoil on the mound should be a minimum of 6 inches and a maximum of 16 inches.
- Do not till when planting.
- Establish a cover as soon as possible to limit erosion.
- Always wear gloves when working over septic systems to minimize your contact with soil.
- Use plants that do not like water or wet soils near the septic system. This will prevent their root systems from interfering with the septic system. The larger the plant, the more extensive (not necessarily deeper) the root system.
- **Do not place** trees and shrubs **ON** the mound; they may be planted at the foot or on side slopes. Frame the mound with trees and shrubs at a distance, but use only herbaceous (non-woody) plants on the mound itself. Trees should be planted a minimum of 20 feet from the edge of the mound. Trees known for seeking water reservoirs, such as poplar, maple, willow and elm, should be planted at least 50 feet from the mound. Shrubs should not be planted on top of the mound.
- Avoid irrigation and fertilization on a mound; in fact, never plan to irrigate this area. Use plants that can withstand dry conditions. Plants listed on the back page tolerate and thrive on natural rainfall in Minnesota.
- Minimize traffic on the mound, both human and animal, to avoid soil compaction. Do not exercise pets or stake pets on septic mounds. Never drive a car or other vehicle across the mound or mow when the soil is wet. Compacted soil can lead to soil erosion and impedes the flow of air around the system. In winter, activity on a mound can cause frost to penetrate resulting in freezing problems.
- Do not plant edible plants, such as vegetables and herbs on a mound or drainfield.
- Annually inspect the mound for animal damage such as burrowing and tunneling. Control animals at the first sign of tunneling or burrowing before damage is extensive.
- Root barriers (geotextiles impregnated with a long-lasting herbicide that kills plant roots) have been used around mounds. Installation is expensive and can be avoided with proper plant selection.

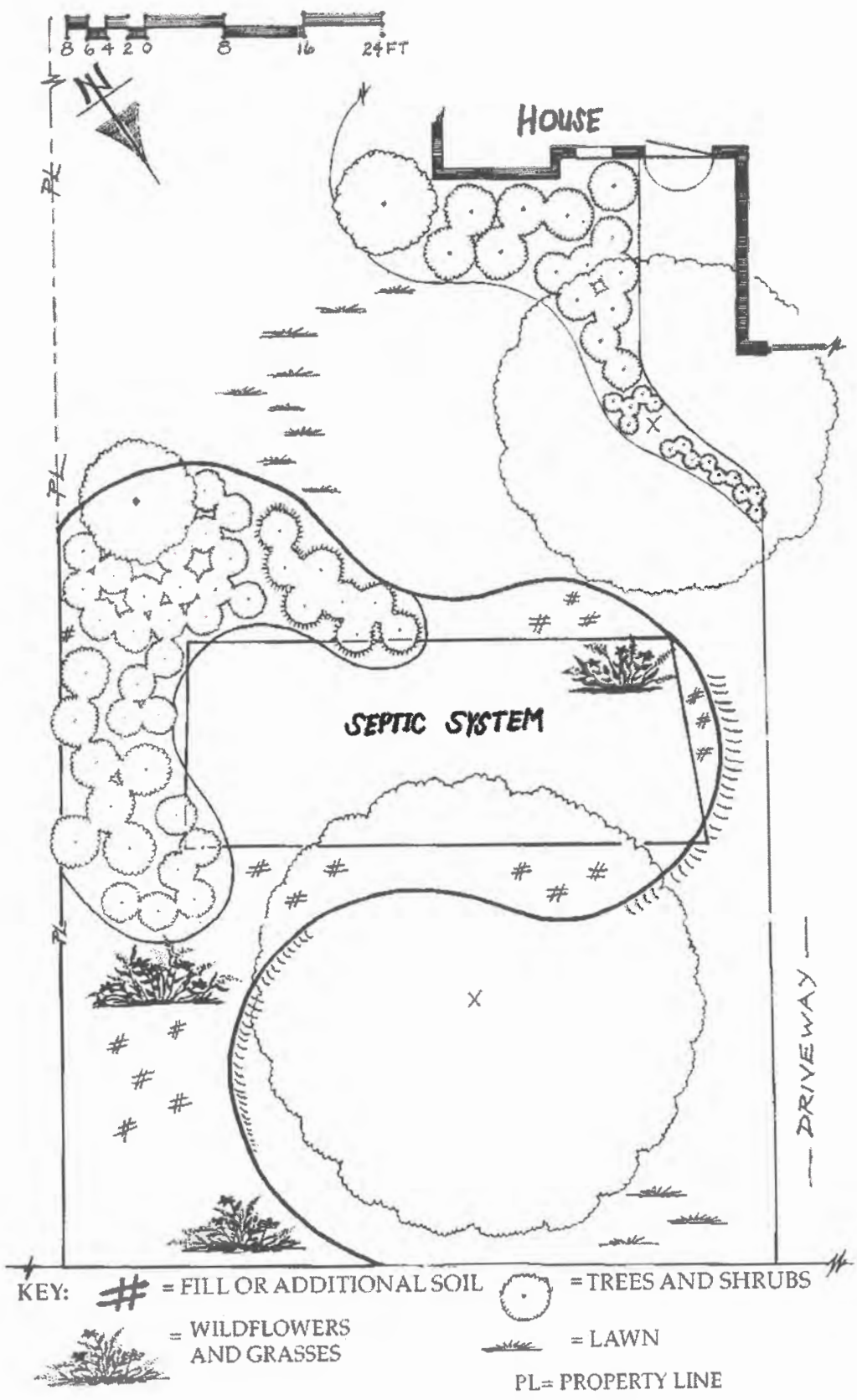


Figure 4. Model landscape plan for mound septic system.

Suggested Plants for Use on Septic Mounds

Herbaceous plants, such as **wildflowers and grasses**, are good choices for mound plantings. Grasses are especially desirable due to their fibrous root systems which hold soil in place. Grasses also provide year-round cover.

The following native prairie plants grow well on dry soils and would be good choices for a mound septic system:

Wildflowers

prairie onion (Allium stellatum)
pussytoes (Antennaria neglecta)
butterflyweed (Asclepias tuberosa)
heath aster (Aster ericodes)
bigleaf aster (Aster macrophyllus)*
Pennsylvania sedge (Carex pensylvanica)*
prairie clover (Dalea spp.)
pale purple coneflower (Echinacea angustifolia)
rattlesnake master (Eryngium yuccifolium)
wild geranium (Geranium maculatum)*
prairie smoke (Geum triflorum)
oxeye (Helianthus helianthoides)
rough blazing star (Liatris aspera)
wild bergamot (Monarda fistulosa)
penstemon (Penstemon spp.)
pasqueflower (Pulsatilla patens)
violets (Viola spp.)*

Grasses

sideoats grama (Bouteloua curtipendula)
blue grama (Bouteloua gracilis)
little bluestem (Schizachyrium scoparium)
prairie dropseed (Sporobolus heterolepis)
June grass (Koeleria macrantha)

* *shade tolerant*

These plants are propagated by seed or plants. A combination of both will make a faster cover. Use a mulch of clean straw or a cover crop of annual ryegrass or oats to prevent erosion while the plants become established.

Low maintenance lawn grasses, such as fine fescues, can make a dense cover and only need to be mowed once or twice a year. Mow in October and late June to reduce weeds. Fescues are traditional lawn grasses that tolerate dry soils and shady sites. A mixture of fine-textured fescues, such as creeping red, hard and sheep's fescues *(Festuca rubrum, Festuca longifolia, Festuca ovina)*, in equal proportions can be seeded at the rate of 3.5 pounds per 1000 square feet. Traditional lawn grasses, such as common Kentucky bluegrass and perennial ryegrass, can be planted on a mound and regularly mowed. Mowing will increase evaporation from the mound and aid in rodent control.

Perennial flowers, such as daylilies and peonies, can be grown; however, extra care must be taken to mulch or plant close together so soil will not be exposed and erode. Low maintenance plants that do not need tending and care (remember minimal traffic on the mound) are best. Enjoy from afar, and do not walk on the mound.



Figure 5. Pasqueflower is a native wildflower that tolerates dry soil conditions.

Proper selection and placement of plants best suited to the site means that those plants will be healthier, more attractive, and have fewer pest problems.

References and Further Information

Septic System Owners Guide, Item # 06583
Plants in Prairie Communities, Item # 03238

The publications can be ordered from University of Minnesota Extension. Go to http://shop.extension.umn.edu or call 1-800-876-8636.

For landscape design publications, refer to SULIS URL in Extension site: www.sustland.umn.edu

For more information about septic systems, refer to UMN Onsite Sewage Treatment Program website: http://septic.umn.edu

Item # 06986
2008
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From:	Chris Uebe
To:	Jupe Hale
Cc:	Kendra Lindahl, AICP; Bridget M. Nason; Kevin Kress (kkress@northoaksmn.gov); John Uphoff
Subject:	Re: Planning Commission
Date:	Tuesday, June 23, 2026 10:37:13 AM
Attachments:	G Rls 220 CERT rev 6-10-26.pdf ExampleVault.pdf

There are no new tanks being added. The existing tanks are being reused, and a "vault" is being added to contain the new UV components.

The “vault" is not a septic tank.

I have also attached the most recent survey in case it was overlooked.

Thank you,

Chris Uebe
Lead North Oaks SSTS Inspector
Phone: 612-437-3530

> On Jun 22, 2026, at 4:24 PM, Jupe Hale <jhale@wsbeng.com> wrote:
>
> Kendra et al –
>
> I have reviewed the 2 Crocus Lane Septic Variance and offer only one comment/request for clarification:
>
> It is no clear to me on the drawing where the existing and proposed tanks will be located. I can make some assumptions based on the access ports noted, but I would like to clarify the final tank locations. It appears that they will be within the 30-foot setback (as well as the drain field), which is presumably a piece of the variance request. I feel this is a relevant piece to understand when consideration is given for the variance.
>
> Other than the clarification, I have no comments on the application.
>
> Thank you,
>
> Jupe

Jupe Hale
Senior Director, Municipal Services

612.875.2156 (o)
-
701 Xenia Avenue S, Suite 300
Minneapolis, MN 55416


DANGER:
ULTRAVIOLET LIGHT!
Disconnect Power before Replacing Lamp
WARNING:
RISK OF ELECTRIC SHOCK!
Disconnect Power before Servicing
SALCOR INC. MODEL 3G
ULTRAVIOLET WASTE WATER DISINFECTION UNIT
Ratings: 120 VAC, 50/60 Hz, 0.5 Amp
Replaceable UV Lamp: Salcor P/N 1016 40 Watts
Manufactured: 3 QTR 2018
For OUTDOOR Use ONLY!
c UL us
LISTED
Ultraviolet Water Treatment Module, Model 3G
3VF6
Salcor Inc. P.O.Box 1090, Fallbrook, Ca., 92088-1090
Phone: (760) 731-0745 FAX: (760) 731-2405

CITY OF NORTH OAKS
RAMSEY COUNTY, MINNESOTA
RESOLUTION NO. _____

RESOLUTION GRANTING A SETBACK VARIANCE TO ALLOW REPLACEMENT OF A NON-COMPLIANT SUBSURFACE SEWAGE TREATMENT SYSTEM (SSTS) AT 2 CROCUS LANE

WHEREAS, the City of North Oaks (City) has received an application for a variance to allow a 20-foot setback from the north property line for a new SSTS to replace a non-compliant system at 2 Crocus Lane North Oaks, Ramsey County, Minnesota, legally described on the attached **EXHIBIT A**; and

WHEREAS, the variance would allow a replacement of the SSTS at 2 Crocus Lane, which is classified as non-compliant under MPCA Rule 7080.1500, Subp. 4(D); and

WHEREAS, the septic mound area is located 20 feet from the north property line where a setback of 30 feet is required; and

WHEREAS, a public hearing concerning the Application was held before the North Oaks Planning Commission in accordance with Minnesota Statutes, Section 462.357, subd. 3, on July 1, 2026, after which hearing the Planning Commission voted unanimously to recommend approval of the variance, subject to certain conditions, to the City Council.

NOW THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF NORTH OAKS that a variance to allow a 20-foot setback from the north property line for a new SSTS is approved subject to the following findings and conditions:

1. The SSTS, including the rock bed mound, shall be installed as shown on the survey dated June 4, 2026, and in accordance with the Ten Thirty Environmental Solutions design dated May 20, 2026, except that the septic design must be updated to reflect the 20-foot setback to the north property line as shown on the survey.

2. The variance standards in Section 151.078 of the Zoning Code have been met, and a practical difficulty exists as follows:

    a. Strict enforcement would cause practical difficulties because of circumstances unique to the individual land under consideration. The size and shape of the existing lot of record does not have another location for a new septic on this site and creates a practical difficulty. Approving the variance will allow construction of a new septic system and abandonment of the non-compliant system. It would not alter the essential character of the locality.

b. The variance requested is to replace a failing system. The variance is not based on economic considerations alone.

c. The variance would allow a new septic system. It would not allow a use that is not permitted by City Code.

d. The circumstances of this site do not apply to other properties in same zone and are the result of the small lot size, topography and existing conditions on this lot.

e. The proposed use is reasonable. It will allow replacement of the failing system with a new septic system.

f. The circumstances do not result from the action of the applicant. The existing septic system has failed and must be replaced.

g. Granting the variance will not confer upon the applicant any special privilege. It will simply allow them to replace their failing system.

h. The variance is the minimum action needed to alleviate the practical difficulties on site.

i. The proposed variance will not impair an adequate supply of light and air to adjacent land, or substantially increase the congestion of the roads and streets, or increase the danger of fire, or endanger the public safety, or substantially diminish or impair property values within the neighborhood.

j. At no time after the land became nonconforming was the property under common ownership with contiguous land, the combination of which could have been used to reduce or avoid the nonconformity of the land.

3. The applicant must apply for a septic permit and receive approval prior to beginning replacement of the system.

4. The system must be completed within 365 days of the approval.

BE IT FURTHER RESOLVED that the City Clerk, Deputy City Clerk, or City Attorney are hereby authorized and directed to record a certified copy of this Resolution with the Ramsey County Registrar of Titles.

Adopted by the City Council of the City of North Oaks this 16th day of July, 2026.

By: _____
Krista Wolter
Its: Mayor

Attested:

By: _____
Kevin Kress
Its: City Administrator/City Clerk

EXHIBIT A
LEGAL DESCRIPTION OF PROPERTY

Real property located in Ramsey County, Minnesota legally described as follows:

Tract G, Registered Land Survey No. 220, Ramsey County, Minnesota.

PID: 053022330011

NORTH OAKS

*Check Summary Register©

July 2026

	Name	Check Date	Check Amt	
10100	**Checking**			
1305e	Voya Financial	06/29/26	$125.00	Deferred Comp 7-02-26
1306e	PAYROLL	06/29/26	$19,064.27	Staff Wages
1307e	P E R A	06/29/26	$2,655.92	PERA 07-02-26
1308e	PAYROLL	06/29/26	$2,341.43	FICA
1309e	Connexus Energy	07/01/26	$8.66	5919 Centerville - May 2026
1310e	Beam	07/02/26	$134.88	Vision Benefits - July 2026
1311e	COMCAST	07/02/26	$487.16	July Dark Fiber
1312e	ADP	07/06/26	$188.69	ADP 7/2/26
1313e	WSB, LLC	07/07/26	$34,244.00	Meetings (April 2026)
1314e	PAYROLL	07/13/26	$17,249.75	PERA
1318e	EUREKA RECYCLING	07/14/26	$2,001.73	June 2026 Revenue Share
1319e	Department of Labor & Industry	07/07/26	$5,597.96	2nd Qtr 2026 Bldg Permit Surcharge
1320e	ShelterPoint Life	07/15/26	$633.35	MN PFML Premiium - 2nd Qtr 2026
1321e	Verizon Wireless	07/15/26	$20.02	Billing Period 6/2/26 - 71/26
1322e	Xcel Energy	07/16/26	$1,485.27	City 303585928 & 302708070
16296	Corey Triemert	07/07/26	$491.38	Rental Vehicle
16297	Leonard Carl Prof Services	07/07/26	$28,592.75	Permit & Plan Review - June 2026
16298	Northeast Youth & Family	07/07/26	$13,180.03	2026 Mental Health Services Contract
16299	Peterson-Waddle Recycling	07/07/26	$30,812.58	Volume Charge - June 2026
16300	Audrey Dotte	07/15/26	$31.04	Utiity refund for 4 Pearson Place
16301	Campbell Knutson	07/15/26	$1,912.50	June 2026
16302	Companion Animal Care	07/15/26	$150.00	Animal Control Services - June 2026
16303	Core & Main	07/15/26	$4,049.85	Flexread WBDB Annual Maint Fee
16304	Ehlers	07/15/26	$89,099.16	2026 Continuing Disclosure Reporting
16305	Ferguson Waterworks	07/15/26	$380.16	Misc. supplies
16306	Freshwater Scientific Services	07/15/26	$5,450.00	Curlyleaf Pondweed Delineation Surveys
16307	Gopher State One-Call, Inc.	07/15/26	$178.20	Monthly Services - June 2026
16308	GreatAmerica Financial Service	07/15/26	$110.00	Monthly Service
16309	Jerry Proulx	07/15/26	$48.74	Utility refund for 7 Hawthorne Ct
16310	Kelly & Lemmons, P.A.	07/15/26	$1,193.00	Prosecution Services - June
16311	Kennedy & Graven, Chartered	07/15/26	$8,183.70	General Services - June
16312	Lake Johanna Fire Department	07/15/26	$309,291.85	Reimbursement of Capital Expenses
16313	Landform Professionals	07/15/26	$5,555.00	Comp Plan Appeal & Legislation
16314	Marco, Inc.	07/15/26	$504.85	Monthly Fee - Copier Services
16315	Messerli Kramer	07/15/26	$2,000.00	2026 Legislative Representation
16316	Metro Council Envir Srvc-Sewer	07/15/26	$8,086.21	Monthly Sewer - August 2026
16317	Metro Council Envir Srvc-SAC	07/15/26	$4,920.30	2nd Qtr 2026 SAC Fees
16318	Metro-Inet	07/15/26	$3,824.00	IT Services - July 2026
16319	MN PEIP	07/15/26	$6,861.24	Coverage Period 8/1/26 to 8/31/26
16320	NineNorth	07/15/26	$498.76	June Cable Services
16321	North Oaks Village Center LLC	07/15/26	$9,812.37	Commercial Base Rent (7/26)
16322	Nykanen Inspections	07/15/26	$3,049.96	June Electrical Services
16323	PhycoTech, Inc.	07/15/26	$762.00	Automated Algal ID - Full Assemblage
16324	Premium Waters, Inc.	07/15/26	$39.21	Water Charge - July
16325	Press Publications	07/15/26	$83.11	Legal Notice - CUP Village Center
16326	Ramsey County Elections	07/15/26	$4,874.00	2026 Election Services - 3rd Quarter
16327	Ramsey County Sheriff	07/15/26	$106,243.93	Police & CSO - June 2026
16328	Ramsey County-Emergency Commun	07/15/26	$2,918.77	Fleet Support - May
16329	REHDER FORESTRY CONSULTING	07/15/26	$9,448.67	June 2026 Forestry Services
16330	ROADKILL ANIMAL CONTROL	07/15/26	$129.00	1 Deer/Coyote - June 2026
16331	Staples	07/15/26	$56.56	Misc. Office Supplies
16332	U S Bank	07/15/26	$520.60	Constant Contact Annual Renewal
16333	USDA	07/15/26	$2,334.22	Services through June 30, 2026
16334	White Bear Township	07/15/26	$4,390.00	Water Hookup - 18 Black Lk Rd (Cargill)

NORTH OAKS

*Check Summary Register©

July 2026

	Name	Check Date	Check Amt	
16335	William Jolitz	07/15/26	$12.17	Utility refund for 6 Robb Farm Road
		Total Checks	$756,317.96	

10100 Checking

101 GENERAL	$629,720.07
306 LGWA DEBT	$88,249.16
400 SPECIAL PROJECTS	$4,570.50
401 FIRE EQUIPMENT	$1,417.35
406 LAKE GILFILLAN	$105.21
601 WATER	$9,494.80
602 SEWER	$22,760.87
	$756,317.96

_____ Mayor Krista Wolter

_____ Mark Azman

_____ Andrew Gaspard

_____ Sara Shah

_____ Grover Sayer

NORTH OAKS

*Check Detail Register©

July 2026

Check #	Check Date	Vendor Name	Amount	Invoice	Comment
10100 Checking					
1305 e	06/29/26	**Voya Financial**			
E 602-43000-127		DEFERRED COMP CONT	$125.00		Deferred Comp 7-02-26
		Total	$125.00		
1306 e	06/29/26	**PAYROLL**			
E 101-41300-101		WAGES - FULL TIME	$13,500.83	7/2/26	Staff Wages
E 602-41300-101		WAGES - FULL TIME	$3,876.92	7/2/26	Public Works Director
E 602-43000-103		WAGES - PART TIME/TE	$810.00	7/2/26	Part-Time Utilities
E 101-41300-122		FICA CONTRIBUTIONS	$1,451.29	7/2/26	FICA
G 101-21701		FEDERAL TAXES PAYAB	$2,092.81	7/2/26	FWH
G 101-21701		FEDERAL TAXES PAYAB	($2,092.81)	7/2/26	FWH
G 101-21702		STATE TAXES PAYABLE	$972.09	7/2/26	SWH
G 101-21702		STATE TAXES PAYABLE	($972.09)	7/2/26	SWH
E 602-43000-127		DEFERRED COMP CONT	($125.00)	7/2/26	Empower PSC
E 602-41300-131		HEALTH, DENTAL, LIFE,	$450.00	7/2/26	Medical & Cell Phone
E 101-41300-132		CAR ALLOWANCE	$333.33	7/2/26	Car Allowance
E 101-41300-121		PERA CONTRIBUTIONS	$1,037.54	7/2/26	PERA (7.5%)
E 101-41300-121		PERA CONTRIBUTIONS	($1,936.75)	7/2/26	PERA
E 602-41300-121		PERA CONTRIBUTIONS	$385.26	7/2/26	PERA (7.5%)
E 602-41300-121		PERA CONTRIBUTIONS	($719.15)	7/2/26	PERA
		Total	$19,064.27		
1307 e	06/29/26	**P E R A**			
E 101-41300-121		PERA CONTRIBUTIONS	$1,936.77		PERA 07-02-26
E 602-41300-121		PERA CONTRIBUTIONS	$719.15		PERA 07-02-26
		Total	$2,655.92		
1308 e	06/29/26	**PAYROLL**			
E 101-41100-103		WAGES - PART TIME/TE	$2,175.00		City Council/Planning Commission
E 101-41300-122		FICA CONTRIBUTIONS	$166.43		FICA
		Total	$2,341.43		
1309 e	07/01/26	**Connexus Energy**			
E 101-43100-381		ELECTRIC UTILITIES	$8.66		5919 Centerville - June 2026
		Total	$8.66		
1310 e	07/02/26	**Beam**			
E 101-41300-131		HEALTH, DENTAL, LIFE,	$134.88	MN01025-20	Vision Benefits - July 2026
		Total	$134.88		
1311 e	07/02/26	**COMCAST**			
E 101-41300-309		COMPUTER/INTERNET/	$487.16		July Dark Fiber
		Total	$487.16		
1312 e	07/06/26	**ADP**			
E 101-41300-131		HEALTH, DENTAL, LIFE,	$188.69		ADP 7/2/26
		Total	$188.69		
1313 e	07/07/26	**WSB, LLC**			
E 101-41900-303		ENGINEERING SERVICE	$1,335.50		Meetings (April 2026)

NORTH OAKS

*Check Detail Register©

July 2026

Check #	Check Date	Vendor Name	Amount	Invoice	Comment
E 101-41900-303		ENGINEERING SERVICE	$14,099.25		General Services (April 2026)
E 101-41900-303		ENGINEERING SERVICE	$17,444.25		General Service (May 2026)
E 101-41900-303		ENGINEERING SERVICE	$1,365.00		Meetings (May 2026)
		Total	$34,244.00		
1314 e	07/13/26	**PAYROLL**			
E 101-41300-101		WAGES - FULL TIME	$13,300.26	7/16/26	Staff Wages
E 602-41300-101		WAGES - FULL TIME	$3,876.92	7/16/26	Public Works Director
E 101-41300-122		FICA CONTRIBUTIONS	$1,314.06	7/16/26	FICA
G 101-21701		FEDERAL TAXES PAYAB	$1,934.96	7/16/26	FWH
G 101-21701		FEDERAL TAXES PAYAB	($1,934.96)	7/16/26	FWH
G 101-21702		STATE TAXES PAYABLE	$885.11	7/16/26	SWH
G 101-21702		STATE TAXES PAYABLE	($885.11)	7/16/26	SWH
E 602-43000-127		DEFERRED COMP CONT	($125.00)	7/16/26	Empower PSC
E 101-41300-121		PERA CONTRIBUTIONS	$997.50	7/16/26	PERA (7.5%)
E 101-41300-121		PERA CONTRIBUTIONS	($1,862.00)	7/16/26	PERA
E 602-41300-121		PERA CONTRIBUTIONS	$290.76	7/16/26	PERA (7.5%)
E 602-41300-121		PERA CONTRIBUTIONS	($542.75)	7/16/26	PERA
		Total	$17,249.75		
1318 e	07/14/26	**EUREKA RECYCLING**			
E 101-43200-384		RECYCLING	$2,001.73		June 2026 Revenue Share
		Total	$2,001.73		
1319 e	07/07/26	**Department of Labor & Industry**			
E 101-42400-451		BUILDING PERMIT SURC	$5,597.96		2nd Qtr 2026 Bldg Permit Surcharge
		Total	$5,597.96		
1320 e	07/15/26	**ShelterPoint Life**			
E 101-41300-131		HEALTH, DENTAL, LIFE,	$633.35		MN PFML Premiium - 2nd Qtr 2026
		Total	$633.35		
1321 e	07/15/26	**Verizon Wireless**			
E 101-41300-210		OPERATING SUPPLIES	$20.02	6147465244	Billing Period 6/2/26 - 71/26
		Total	$20.02		
1322 e	07/16/26	**Xcel Energy**			
E 101-41300-381		ELECTRIC UTILITIES	$236.69		City 303585928 & 302708070
E 101-43100-381		ELECTRIC UTILITIES	$197.55		Signals 303740120 & 303839695
E 101-43100-381		ELECTRIC UTILITIES	$122.11		Street Lighting
E 406-43000-381		ELECTRIC UTILITIES	$17.40		8 Poplar Ln Aeration
E 406-43000-381		ELECTRIC UTILITIES	$87.81		7 Willow Rd 51-0572815-6
E 601-49400-381		ELECTRIC UTILITIES	$91.46		24 Maycomb, 304471197
E 602-49450-429		MISC/LIFTSTATIONS	$98.64		Liftstation #3, 302368925
E 602-49450-429		MISC/LIFTSTATIONS	$39.13		Liftstation #1, 302660004
E 602-49450-429		MISC/LIFTSTATIONS	$58.73		Liftstation #5, 302894636
E 602-49450-429		MISC/LIFTSTATIONS	$72.57		Liftstation #2, 302953888
E 602-49450-429		MISC/LIFTSTATIONS	$122.86		Liftstation #9, 304097091
E 602-49450-429		MISC/LIFTSTATIONS	$51.73		Liftstation #11, 304464164
E 602-49450-429		MISC/LIFTSTATIONS	$125.84		Wilkinson Blvd, 304097283

NORTH OAKS

*Check Detail Register©

July 2026

Check #	Check Date	Vendor Name	Amount	Invoice	Comment
E 602-49450-381		ELECTRIC UTILITIES	$33.17		28 Osprey Ct, 304097160
E 602-49450-429		MISC/LIFTSTATIONS	$129.58		2 Hill Farm Rd, 305082928
		Total	$1,485.27		
16296	07/07/26	**Corey Triemert**			
E 601-49400-330		SEWER & WATER MISC	$397.25		Rental Vehicle
E 601-49400-330		SEWER & WATER MISC	$94.13		Oil Change
		Total	$491.38		
16297	07/07/26	**Leonard Carl Prof Services**			
E 101-42400-313		CONTRACT SERVICES	$28,592.75		Permit & Plan Review - June 2026
		Total	$28,592.75		
16298	07/07/26	**Northeast Youth & Family**			
E 101-41100-433		DUES AND SUBSCRIPTI	$13,180.03	2393	2026 Mental Health Services Contract
		Total	$13,180.03		
16299	07/07/26	**Peterson-Waddle Recycling**			
E 101-43200-384		RECYCLING	$1,001.63		Volume Charge - June 2026
E 101-43200-384		RECYCLING	$563.24		Fuel Reimbursement - June 2026
E 101-43200-384		RECYCLING	$28,747.71		Monthly Service - June 2026
E 101-43200-384		RECYCLING	$350.00		Cart & Delivery Repair
E 101-43200-384		RECYCLING	$150.00		Storage Rent
		Total	$30,812.58		
16300	07/15/26	**Audrey Dotte**			
E 601-49400-383		WATER - WBT	$31.04		Utiity refund for 4 Pearson Place
		Total	$31.04		
16301	07/15/26	**Campbell Knutson**			
E 400-41600-300		PROFESSIONAL SERVIC	$1,912.50		June 2026
		Total	$1,912.50		
16302	07/15/26	**Companion Animal Care**			
E 101-46100-317		ANIMAL MANAGEMENT	$150.00		Animal Control Services - June 2026
		Total	$150.00		
16303	07/15/26	**Core & Main**			
E 601-49400-313		CONTRACT SERVICES	$4,000.00	V000048218	Flexread WBDB Annual Maint Fee
E 601-49400-255		WATER METERS	$49.85	V000050878	Rub drop in mtr gskt (10)
		Total	$4,049.85		
16304	07/15/26	**Ehlers**			
E 306-47000-601		BOND PRINCIPAL	$87,774.16	105539	General Obligation Bond
E 306-47000-620		PAYING AGENT FEES	$475.00	106326	Paying Agent Fee
E 101-41910-300		PROFESSIONAL SERVIC	$850.00	107144	2026 Continuing Disclosure Reporting
		Total	$89,099.16		
16305	07/15/26	**Ferguson Waterworks**			
E 601-49400-210		OPERATING SUPPLIES	$163.52	0568589	Misc. supplies
E 601-49400-210		OPERATING SUPPLIES	$216.64	0568594	Misc. supplies

NORTH OAKS

*Check Detail Register©

July 2026

Check #	Check Date	Vendor Name		Amount	Invoice	Comment
			Total	$380.16		
16306	07/15/26	**Freshwater Scientific Services**				
E 101-46100-318		NATURAL RESOURCES		$5,450.00	2026-065	Curlyleaf Pondweed Delineation Surveys
			Total	$5,450.00		
16307	07/15/26	**Gopher State One-Call, Inc.**				
E 101-42300-300		PROFESSIONAL SERVIC		$178.20	6060649	Monthly Services - June 2026
			Total	$178.20		
16308	07/15/26	**GreatAmerica Financial Services**				
E 101-41300-210		OPERATING SUPPLIES		$110.00	42408767	Monthly Service
			Total	$110.00		
16309	07/15/26	**Jerry Proulx**				
E 601-49400-383		WATER - WBT		$48.74		Utility refund for 7 Hawthorne Ct
			Total	$48.74		
16310	07/15/26	**Kelly & Lemmons, P.A.**				
E 101-41600-315		LEGAL FEES - PROSEC		$1,193.00	68027	Prosecution Services - June
			Total	$1,193.00		
16311	07/15/26	**Kennedy & Graven, Chartered**				
E 101-41600-304		LEGAL FEES - GENERAL		$6,841.20	194217	General Services - June
E 101-41600-304		LEGAL FEES - GENERAL		$1,132.50	194218	Charley Lake Water & Sewer Infrastructure Transfer Agreement
E 101-41900-305		ESCROW/PROJECT PAY		$90.00	194218	2 Crocus Lane - Septic Variance
E 101-41900-305		ESCROW/PROJECT PAY		$120.00	194218	5 South Long Lake Trail - Septic Variance
			Total	$8,183.70		
16312	07/15/26	**Lake Johanna Fire Department**				
E 101-42200-313		CONTRACT SERVICES		$307,874.50	1025	2nd half payment for services
E 401-42200-500		CAPITAL OUTLAY		$1,417.35	1027	Reimbursement of Capital Expenses
			Total	$309,291.85		
16313	07/15/26	**Landform Professionals**				
E 400-41600-300		PROFESSIONAL SERVIC		$658.00	38035	Comp Plan Appeal & Legislation
E 101-41900-305		ESCROW/PROJECT PAY		$94.00	38035	10 Hill Farm Circle Septic Variance
E 101-41900-305		ESCROW/PROJECT PAY		$1,088.00	38035	100 Village Center Drive Sign
E 101-41900-305		ESCROW/PROJECT PAY		$1,049.00	38035	25 South Deep Lake Road Septic Varianc
E 101-41900-305		ESCROW/PROJECT PAY		$1,272.00	38035	2 Crocus Lane Septic Variance
E 101-41900-305		ESCROW/PROJECT PAY		$591.00	38035	5 South Long Lake Trail Septic Variance
E 101-41910-300		PROFESSIONAL SERVIC		$803.00	38035	City Business & Meetings
			Total	$5,555.00		
16314	07/15/26	**Marco, Inc.**				
E 101-41300-210		OPERATING SUPPLIES		$504.85	42434795	Monthly Fee - Copier Services
			Total	$504.85		
16315	07/15/26	**Messerli Kramer**				
E 400-41600-300		PROFESSIONAL SERVIC		$2,000.00	511957	2026 Legislative Representation

NORTH OAKS

*Check Detail Register©

July 2026

Check #	Check Date	Vendor Name		Amount	Invoice	Comment
			Total	$2,000.00		
16316	07/15/26	**Metro Council Envir Srvc-Sewer**				
E 602-49450-385		SEWER		$8,086.21		Monthly Sewer - August 2026
			Total	$8,086.21		
16317	07/15/26	**Metro Council Envir Srvc-SAC**				
E 602-49450-455		SAC FEES		$4,920.30		2nd Qtr 2026 SAC Fees
			Total	$4,920.30		
16318	07/15/26	**Metro-Inet**				
E 101-41300-309		COMPUTER/INTERNET/		$3,824.00	3604	IT Services - July 2026
			Total	$3,824.00		
16319	07/15/26	**MN PEIP**				
E 101-41300-131		HEALTH, DENTAL, LIFE,		$6,861.24		Coverage Period 8/1/26 to 8/31/26
			Total	$6,861.24		
16320	07/15/26	**NineNorth**				
E 101-41420-345		CABLE TV		$498.76	2026-102	June Cable Services
			Total	$498.76		
16321	07/15/26	**North Oaks Village Center LLC**				
E 101-41300-410		RENTALS		$5,520.80		Commercial Base Rent (7/26)
E 101-41300-410		RENTALS		$4,291.57		Commercial CAM (7/26)
			Total	$9,812.37		
16322	07/15/26	**Nykanen Inspections**				
E 101-42400-313		CONTRACT SERVICES		$3,049.96		June Electrical Services
			Total	$3,049.96		
16323	07/15/26	**PhycoTech, Inc.**				
E 101-46100-318		NATURAL RESOURCES		$762.00	9301	Automated Algal ID - Full Assemblage
			Total	$762.00		
16324	07/15/26	**Premium Waters, Inc.**				
E 101-41300-210		OPERATING SUPPLIES		$27.29	311543551	Water Charge - July
E 101-41300-210		OPERATING SUPPLIES		$11.92	311567602	Monthly Rental - July
			Total	$39.21		
16325	07/15/26	**Press Publications**				
E 101-41100-350		PUBLISHING & ADVERTI		$45.71		Legal Notice - CUP Village Center
E 101-41100-350		PUBLISHING & ADVERTI		$37.40		Legal Notice - Fee Schedule
			Total	$83.11		
16326	07/15/26	**Ramsey County Elections**				
E 101-41400-340		ELECTIONS		$4,874.00	PRRRV-0043	2026 Election Services - 3rd Quarter
			Total	$4,874.00		
16327	07/15/26	**Ramsey County Sheriff**				
E 101-42100-313		CONTRACT SERVICES		$106,243.93	SHRFL-0024	Police & CSO - June 2026

NORTH OAKS

*Check Detail Register©

July 2026

Check #	Check Date	Vendor Name		Amount	Invoice	Comment
			Total	$106,243.93		
16328	07/15/26	**Ramsey County-Emergency Commun**				
E 101-42100-313		CONTRACT SERVICES		$9.36	EMCOM-013	Fleet Support - May
E 101-42100-313		CONTRACT SERVICES		$254.24	EMCOM-013	CAD Services - May
E 101-42100-313		CONTRACT SERVICES		$2,655.17	EMCOM-013	911 Dispatch - May
			Total	$2,918.77		
16329	07/15/26	**REHDER FORESTRY CONSULTING**				
E 101-46100-316		TREE PRESERVATION		$9,448.67	543	June 2026 Forestry Services
			Total	$9,448.67		
16330	07/15/26	**ROADKILL ANIMAL CONTROL**				
E 101-46100-318		NATURAL RESOURCES		$129.00		1 Deer/Coyote - June 2026
			Total	$129.00		
16331	07/15/26	**Staples**				
E 101-41300-210		OPERATING SUPPLIES		$56.56	6067148938	Misc. Office Supplies
			Total	$56.56		
16332	07/15/26	**U S Bank**				
E 101-41300-309		COMPUTER/INTERNET/		$554.60		Constant Contact Annual Renewal
E 101-41300-210		OPERATING SUPPLIES		$47.68		Council Chambers Microphone heads
E 101-41300-210		OPERATING SUPPLIES		($81.68)		Credit balance
			Total	$520.60		
16333	07/15/26	**USDA**				
E 101-46100-317		ANIMAL MANAGEMENT		$2,334.22	3005752100	Services through June 30, 2026
			Total	$2,334.22		
16334	07/15/26	**White Bear Township**				
E 601-49400-383		WATER - WBT		$4,390.00		Water Hookup - 18 Black Lk Rd (Cargill)
			Total	$4,390.00		
16335	07/15/26	**William Jolitz**				
E 601-49400-383		WATER - WBT		$12.17		Utility refund for 6 Robb Farm Road
			Total	$12.17		
			10100	$756,317.96		

NORTH OAKS

*Check Detail Register©

July 2026

Check #	Check Date	Vendor Name	Amount	Invoice	Comment

Fund Summary

10100 Checking	
101 GENERAL	$629,720.07
306 LGWA DEBT	$88,249.16
400 SPECIAL PROJECTS	$4,570.50
401 FIRE EQUIPMENT	$1,417.35
406 LAKE GILFILLAN	$105.21
601 WATER	$9,494.80
602 SEWER	$22,760.87
	$756,317.96

_____ Mayor Krista Wolter

_____ Mark Azman

_____ Andrew Gaspard

_____ Sara Shah

_____ Grover Sayer

CITY OF NORTH OAKS APPROVED 2026 BUDGET

Updated 7/16/26

APPROVED 2026 EXPENDITURES

ActCode	DEPT Descr	OBJ Descr	2025 Budget	12/31/2025	% of Budget	UnderLine	2026 Budget	7/16/2026	% of Budget
101-41100-103	LEGISLATIVE -	WAGES - PART TIME/TEMP	$12,600.00	$8,718.00	69.19%	CC/PC wages 675/mayor;	$12,600.00	$4,350.00	34.52%
101-41100-311	LEGISLATIVE -	CONFERENCES/SEMINARS	$800.00	$0.00	0.00%		$800.00	$41.55	5.19%
101-41100-313	LEGISLATIVE -	CONTRACT SERVICES			#DIV/0!	Timesavers			
101-41100-350	LEGISLATIVE -	PUBLISHING & ADVERTISING	$2,200.00	$1,826.68	83.03%	Legal/P.H	$2,752.00	$1,048.38	38.10%
101-41100-433	LEGISLATIVE -	DUES AND SUBSCRIPTIONS	$20,353.00	$20,619.96	101.31%	NWYFS/LMC/MCMA	$21,740.00	$21,116.03	97.13%
101-41300-101	CITY	WAGES - FULL TIME	318,259.00	$312,921.84	98.32%	combined wages	$345,326.00	$180,480.91	52.26%
101-41300-103	CITY	WAGES - PART TIME/TEMP			#DIV/0!				
101-41300-121	CITY	PERA CONTRIBUTIONS						$12,150.57	
101-41300-122	CITY	FICA CONTRIBUTIONS	24,653.00	$32,559.20	132.07%		$26,417.00	$19,293.71	73.04%
101-41300-127	CITY	DEFERRED COMP							
101-41300-131	CITY	HEALTH, DENTAL, LIFE, LTD INS	$55,623.00	$59,919.52	107.72%	Car/PERA/Health	104,046.00	$62,137.98	59.72%
101-41300-131	CITY	CAR ALLOWANCE	$4,000.00	$3,999.96	100.00%	Car Allowance	4,000.00	$2,333.32	58.33%
101-41300-210	CITY	OPERATING SUPPLIES	$30,500.00	$27,389.66	89.80%	Office/IT/Software	$31,415.00	$7,968.35	25.36%
101-41300-309	CITY	COMPUTER/INTERNET/GIS	$66,700.00	$74,406.87	111.55%	Granicus/Polco/Comcast	$68,701.00	$42,392.87	61.71%
101-41300-310	CITY	TRAINING	$3,000.00	$9,037.32	301.24%	League/MCMA/MAMA	$50,000.00	$1,003.26	2.01%
101-41300-322	CITY	MAILBOXES	$5,000.00	$1,717.87	34.36%	passthrough	$5,000.00	$599.41	11.99%
101-41300-360	CITY	INSURANCE	$26,000.00	$21,145.00	81.33%		$26,000.00	$47,860.69	184.08%
101-41300-381	CITY	ELECTRIC UTILITIES	$1,200.00	$1,323.13	110.26%		$1,300.00	$655.74	50.44%
101-41300-410	CITY	RENTALS	$112,131.00	$117,298.20	104.61%	Office Rent	$115,176.00	$70,216.71	60.96%
101-41300-430	CITY	MISCELLANEOUS EXPENSE	$0.00	$406.57	#DIV/0!	Website/Domain/OPG	$50,000.00		
101-41400-300	ELECTIONS	PROFESSIONAL SERVICES	$23,619.00	$22,399.00	94.83%	Election Contracts	$43,620.00	$17,444.00	39.99%
101-41420-345	CABLE TV	PROFESSIONAL SERVICES	$36,000.00	$37,414.66	103.93%		$38,066.00	$11,088.86	29.13%
101-41500-301	FINANCE	AUDIT SERVICES	$22,350.00	$20,878.00	93.41%	AEM - 3 year contract	$23,475.00	$21,931.90	93.43%
101-41600-304	LEGAL	LEGAL FEES - GENERAL	$50,000.00	$79,402.30	158.80%	Kennedy & Graven	$55,000.00	$76,523.10	139.13%
101-41600-315	LEGAL	LEGAL FEES - PROSECUTION	$13,104.00	$11,611.18	88.61%	Kelly & Lemmons	$13,104.00	$6,176.00	47.13%
101-41900-302	ENGINEERING	IMPROVEMENT PROJECTS	$100,000.00	$17,180.55		I35/CTY RD J	$30,000.00		
101-41900-303	ENGINEERING	ENGINEERING SERVICES	$75,000.00	$122,397.10	163.20%	WSB	$75,000.00	$82,780.00	110.37%
101-41900-305	ENGINEERING	ESCROW/PROJECT PAYABLE	$15,000.00	$36,021.85	240.15%		$15,000.00	$12,659.25	84.40%
101-41910-300	PLANNING	PROFESSIONAL SERVICES	$80,000.00	$42,980.75	53.73%	Planning Fees/Ehlers	$50,000.00	$10,909.00	21.82%
101-42100-313	POLICE	CONTRACT SERVICES	$1,107,195.00	$1,238,383.18	111.85%	Police Contract	$1,292,512.00	$544,284.93	42.11%
101-42110-313	SECURITY	CONTRACT SERVICES	$47,100.00	$2,070.00		Security - RAVE/LPR	$74,070.00	$2,070.00	2.79%
101-42200-313	FIRE	CONTRACT SERVICES	$540,000.00	$527,193.00	97.63%	LJFD	$630,000.00	$615,749.00	97.74%
101-42300-300	EMERGENCY	PROFESSIONAL SERVICES	$1,000.00	$1,953.90	195.39%	Gopher State	$1,500.00	$550.85	36.72%

APPROVED 2026 EXPENDITURES (CONTINUED)

101-42400-300	BUILDING	PROFESSIONAL SERVICES	$500.00	$260.00	52.00%	Other Inspections	$500.00		0.00%
101-42400-313	BUILDING	CONTRACT SERVICES	$300,000.00	$341,014.14	113.67%		$300,000.00	$163,883.35	54.63%
101-42400-451	BUILDING	BUILDING PERMIT SURCHARGE	$30,000.00	$15,001.13	50.00%		$30,000.00	$8,436.41	28.12%
101-43100-381	STREETS	ELECTRIC UTILITIES	$3,000.00	$2,757.41	91.91%		$3,000.00	$1,625.33	54.18%
101-43100-408	STREETS	STREETS/SIDEWALK/CURB	$80,500.00	$9,558.51	11.87%	Mel's Service	$50,000.00	$0.00	0.00%
101-43200-384	RECYCLING	RECYCLING	$361,380.00	$375,005.75	103.77%		$388,522.00	$197,248.75	50.77%
101-43200-384	RECYCLING	RECYCLING (Clean Up Day)	$6,000.00	$5,861.25	97.69%	Clean Up/Recycle Day	$6,000.00		0.00%
101-45100-470	RECREATION-	COMMUNITY FUNCTIONS		$0.00					
101-46100-316	NATURAL	TREE PRESERVATION	$45,000.00	$58,404.25	129.79%	City Forester	$60,000.00	$24,033.86	40.06%
101-46100-317	NATURAL	DEER/ANIMAL MANAGEMENT	$75,000.00	$21,679.13	28.91%	Deer/dogs/geese	$50,000.00	$26,917.31	53.83%
101-46100-318	NATURAL	NATURAL RESOURCES	$2,500.00	$7,354.08	294.16%	NRC	$5,000.00	$6,798.00	135.96%
101-46100-319	NATURAL	WEED MANAGEMENT				Lake Weed Management			
101-49450-313	SEWER	CONTRACT SERVICES	$15,000	$15,587.50	103.92%	Septic Inspector	$15,000		0.00%
101-49990-720	UNALLOCATED	TRANSFER OUT	$350,000.00	$350,000.00		Fire Capital	$75,000.00		
101-49990-720	UNALLOCATED	TRANSFER OUT				Police Capital			
101-49990-720	UNALLOCATED	TRANSFER OUT				General Capital			
			$4,062,819.00	$4,055,658.40	99.82%		$4,302,642.00	$2,304,759.38	53.57%

ActCode	DEPT Descr	OBJ Descr	2025 Budget	12/31/25	% of Budget	UnderLine	2026 Budget	7/16/2026	% of Budget
306-47000-601	DEBT SERVICE	BOND PRINCIPAL				LGWA Bond		$87,774.16	
306-47000-611	DEBT SERVICE	BOND INTEREST							
306-47000-620	DEBT SERVICE	PAYING AGENT FEES						$475.00	
400-41600-300	ATTORNEY	PROFESSIONAL SERVICES		$891.00		2050 Comp Plan System Stmt	$48,000.00	$47,413.50	
400-41910-300	PLANNING	PROFESSIONAL SERVICES					.		
400-41910-303	ENGINEERING	ENGINEERING SERVICES				WSB City Wide Full Design	$65,000.00		
400-43100-408	STREETS	STREETS/SIDEWALK/CURB							
400-46100-318	NATURAL	NATURAL RESOURCES							
401-42200-500	FIRE	CAPITAL OUTLAY	$350,000.00	$1,750,430.18		Fire Expenses		$55,254.74	#DIV/0!
402-49450-430	SEWER	MISCELLANEOUS EXPENSE	$0.00	$0.00					
403-47000-720	DEBT SERVICE	TRANSFER OUT	$0.00	$0.00					
403-49450-430	SEWER	MISCELLANEOUS EXPENSE	$0.00	$0.00					
404-42100-500	POLICE	CAPITAL OUTLAY				Police Expenses			
406-43000-381	PUBLIC WORKS	ELECTRIC UTILITIES		$1,041.97				$497.08	

Updated 7/16/2026

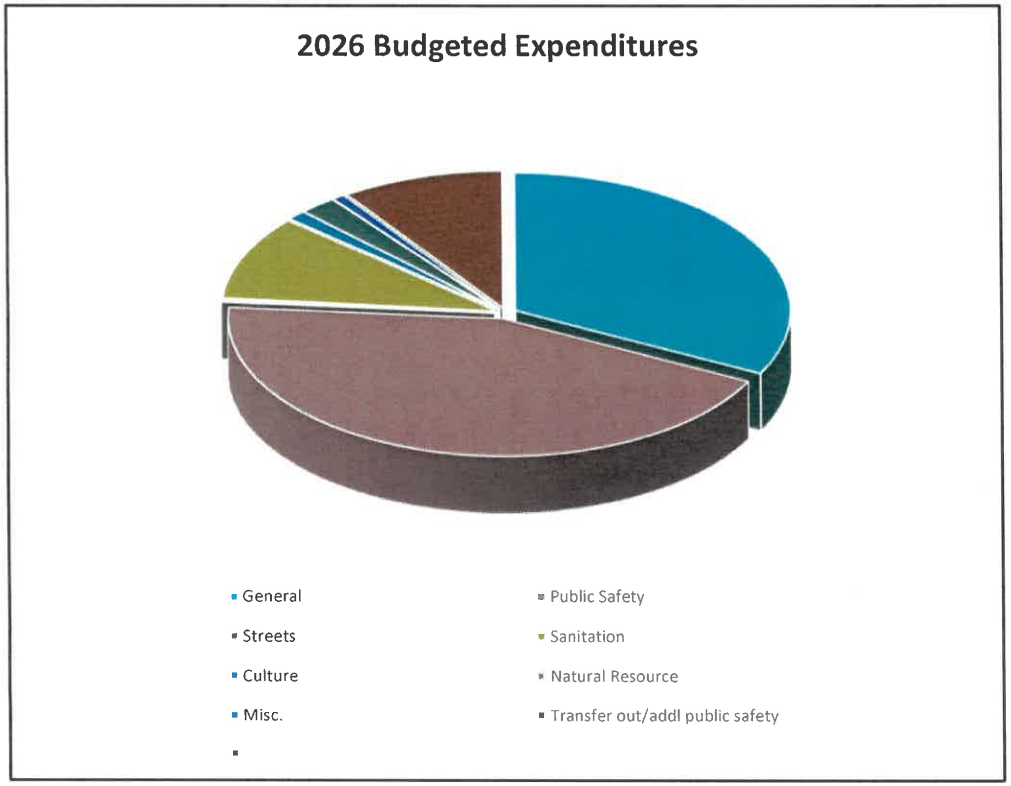
APPROVED 2026 REVENUES

ActCode	DEPT Descr	OBJ Descr	2025 Budget	12/31/25	% of Budget	UnderLine	2026 Budget	7/16/2026	% of Budget
101-31010	COUNCIL	GENERAL PROPERTY TAXES	$2,794,583.00	$2,722,833.62	97.43%		$2,900,879.00	$1,626,648.01	56.07%
101-31810	COUNCIL	CABLE T.V. FEES	$91,000.00	$88,245.96	96.97%		$89,900.00	$21,876.78	24.33%
101-32110	COUNCIL	ALCOHOLIC BEV LICENSE	$5,650.00	$5,500.00	97.35%		$5,650.00		0.00%
101-32111	COUNCIL	TOBACCO LICENSE	$600.00	$600.00	100.00%		$600.00		0.00%
101-32160	COUNCIL	CONTRACTOR LICENSES	$9,000.00	$15,940.00	177.11%		$10,000.00	$9,820.00	98.20%
101-32210	COUNCIL	BUILDING PERMIT	$500,000.00	$440,544.40	88.11%		$500,000.00	$225,301.62	45.06%
101-32230	COUNCIL	HEAT/PLUMB PERMIT	$50,000.00	$80,088.62	160.18%		$60,000.00	$38,102.03	63.50%
101-32240	COUNCIL	ANIMAL LICENSE	$0.00	$0.00	#DIV/0!		$0.00		0.00%
101-32260	COUNCIL	STATE SURCHARGE	$12,000.00	$15,667.81	130.57%		$15,000.00	$8,479.30	56.53%
101-32261	COUNCIL	ISTS PERMIT	$6,750.00	$11,650.00	172.59%		$7,000.00	$5,995.00	85.64%
101-32262	COUNCIL	RENTAL LICENSE FEE	$1,000.00	$200.00	20.00%		$500.00	$600.00	120.00%
101-32263	COUNCIL	SHORELAND/FORESTRY PERMIT	$300.00	$100.00	33.33%		$300.00		0.00%
101-32264	COUNCIL	ISTS PUMPING RECORDS	$5,000.00	$12,240.00	244.80%		$10,000.00	$4,385.00	43.85%
101-33440	COUNCIL	SCORE GRANT	$12,000.00	$25,710.00	214.25%		$12,000.00		0.00%
101-33600	COUNCIL	OTHER GOVT GRANTS/AID		$29,920.47			$0.00		
101-34103	COUNCIL	VARIANCE, PUD, PLAT FEES, CUP	$4,500.00	$4,500.00	100.00%		$4,500.00	$3,600.00	80.00%
101-34103	COUNCIL	ESCROW FEES	$15,000.00	$34,848.00			$15,000.00	$25,544.15	170.29%
101-34120	COUNCIL	CERTIFICATE OF OCCUPANCY FEE	$300.00	$500.00	166.67%		$300.00	$375.00	125.00%
101-34403	COUNCIL	RECYCLING FEES		$253.50			$0.00	$64.00	#DIV/0!
101-35100	COUNCIL	FINES AND FORFEITS	$5,000.00	$1,743.88	34.88%		$5,000.00	$768.95	15.38%
101-35104	COUNCIL	LATE FEES/NSF FEES		$15.00			$0.00		
101-36100	COUNCIL	SPECIAL ASSESSMENTS	$361,380.00	$374,979.61	103.76%	Recycling Assessment	$373,620.00	$192,790.26	51.60%
101-36102	COUNCIL	SPECIAL ASSESSMENTS - CLHOA		$87,498.81		Charley Lake HOA	$9,415.00	$1,882.92	
101-36200	COUNCIL	MISCELLANEOUS REVENUES	$5,000.00	$2,028.09	40.56%	Conduit Bond & Misc	$5,000.00	$1,182.35	23.65%
101-36210	COUNCIL	INTEREST EARNINGS	$84,000.00	$129,982.70	154.74%		$90,000.00	$82,603.54	91.78%
101-36220	COUNCIL	RENTS	$52,756.00	$58,916.23	111.68%	NOHOA Rent	$54,178.00	$30,254.98	55.84%
101-36222	COUNCIL	COMMUNITY FUNCTIONS	$3,000.00	$1,975.00	65.83%	Community Mtg Room	$800.00	$600.00	75.00%
101-36240	COUNCIL	REFUNDS AND REIMBURSEMENT	$44,000.00	$21,476.35	48.81%	LMC & Other Rebates	$20,000.00	$715.47	3.58%
101-39200	COUNCIL	TRANSFER IN	$0			Use of Fund Balance	$113,000.00		
			$4,062,819	**$4,167,958**			**$4,302,642.00**	**$2,281,589.36**	**53.03%**

ActCode	DEPT Descr	OBJ Descr	2025 Budget	12/31/25	% of Budget	UnderLine	2026 Budget	7/16/2026	% of Budge
306-36100	COUNCIL	SPECIAL ASSESSMENTS			#DIV/0!	LGWA Bond Assessments			
306-36210	COUNCIL	INTEREST EARNINGS							
400-33418	COUNCIL	MNDOT STATE AID STREETS							
400-36210	COUNCIL	INTEREST EARNINGS		$3,720		Special Project Interest			
400-36240	COUNCIL	REFUNDS AND REIMBURSEMENTS							
400-39200	COUNCIL	TRANSFER IN							
401-36210	COUNCIL	INTEREST EARNINGS		$17,450					
401-36240	COUNCIL	REFUNDS AND REIMBURSEMENTS							
401-39200	COUNCIL	TRANSFER IN		$350,000					
401-39310	COUNCIL	BOND		$1,644,999.82					
401-39400	COUNCIL	BOND		$142,664.00					
R 403-36210	403-36210	INTEREST EARNINGS							
R 403-37180	403-37180	MAINTENANCE/ESCROW FEE							
R 403-39200	403-39200	TRANSFER IN							
R 404-39200	R 404-39200	TRANSFER IN				Police			
406-36100	COUNCIL	SPECIAL ASSESSMENTS		$1,860.55				$1,702.44	
406-36200	COUNCIL	MISCELLANEOUS REVENUES	$0			LGWA Maint Assessments			
406-36210	COUNCIL	INTEREST EARNINGS		$0.00					

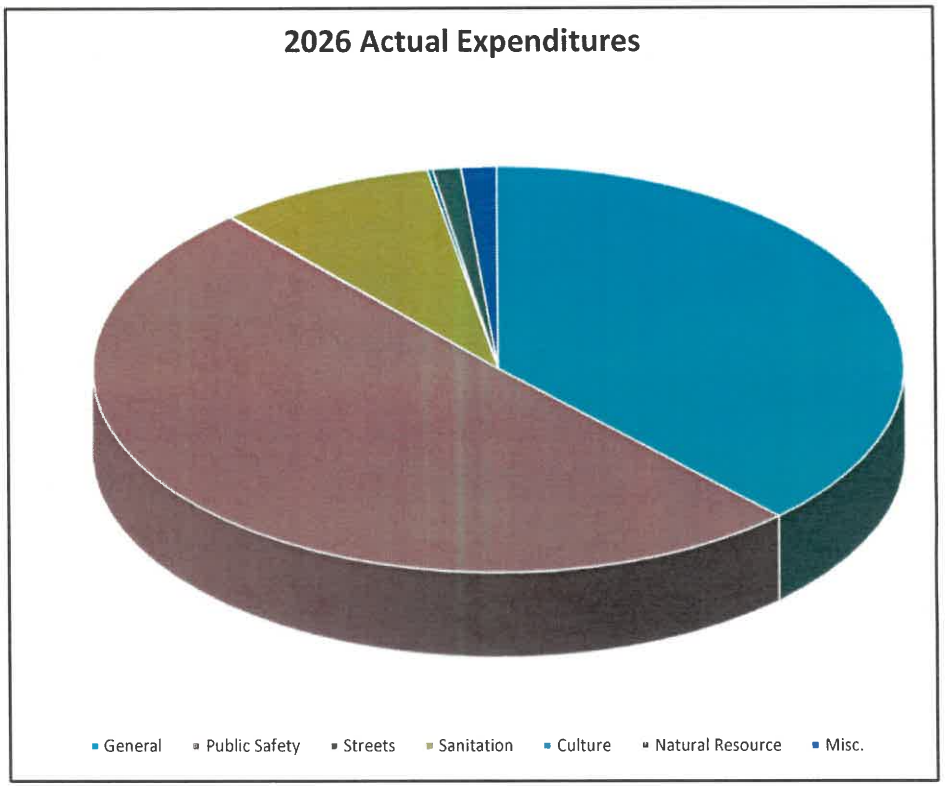
2026 Budgeted Expenditures

$1,603,680.00	General
$1,998,082.00	Public Safety
$53,000.00	Streets
$394,522.00	Sanitation
$38,066.00	Culture
$115,000.00	Natural Resource
$25,292.00	Misc.
$75,000.00	Transfer out/addl public safety



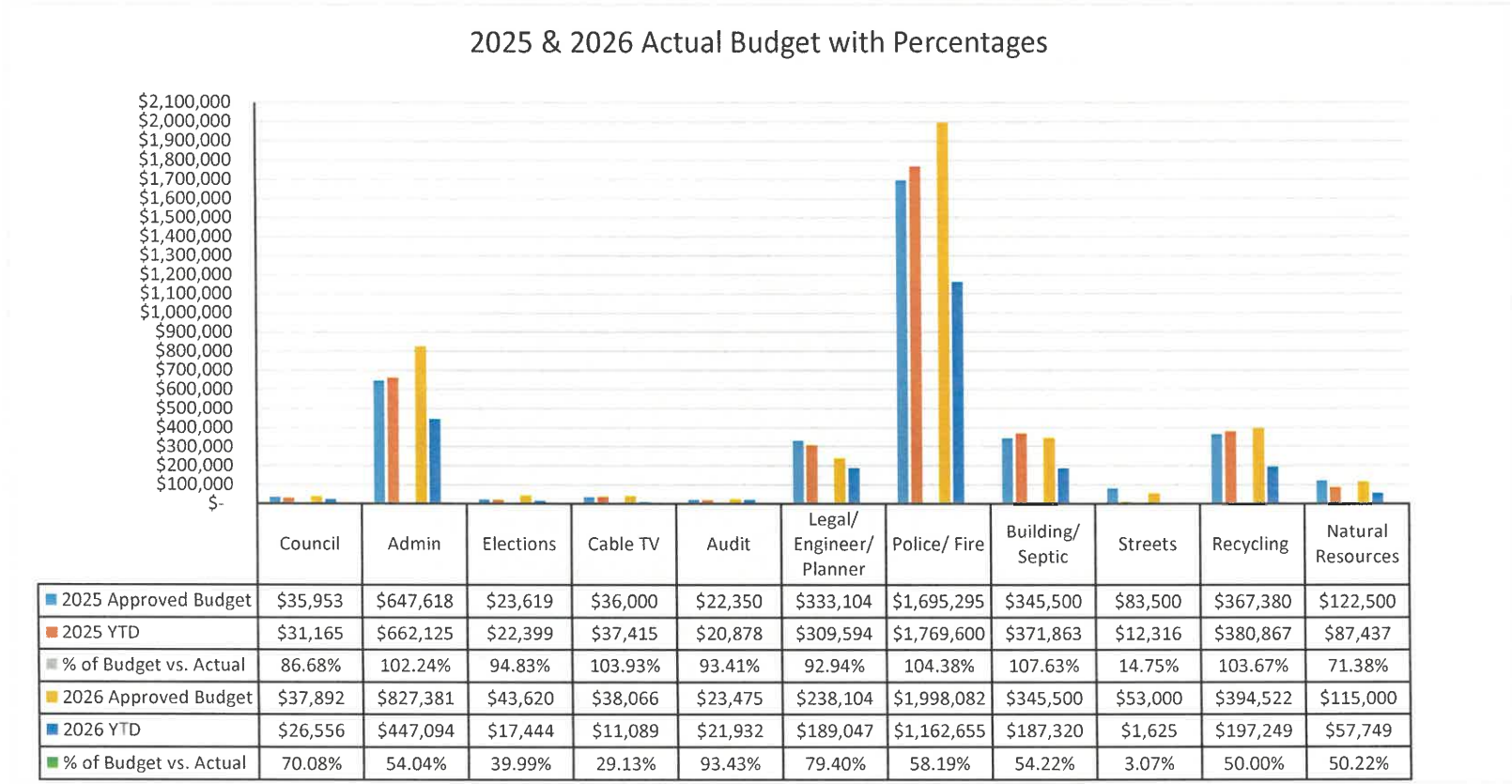
2026 YTD Expenditures

$	899,600.03	General
$	1,162,654.78	Public Safety
$	1,625.33	Streets
$	197,248.75	Sanitation
$	11,088.86	Culture
$	57,749.17	Natural Resource
$	22,205.96	Misc.
		Transfer out/addl public safety

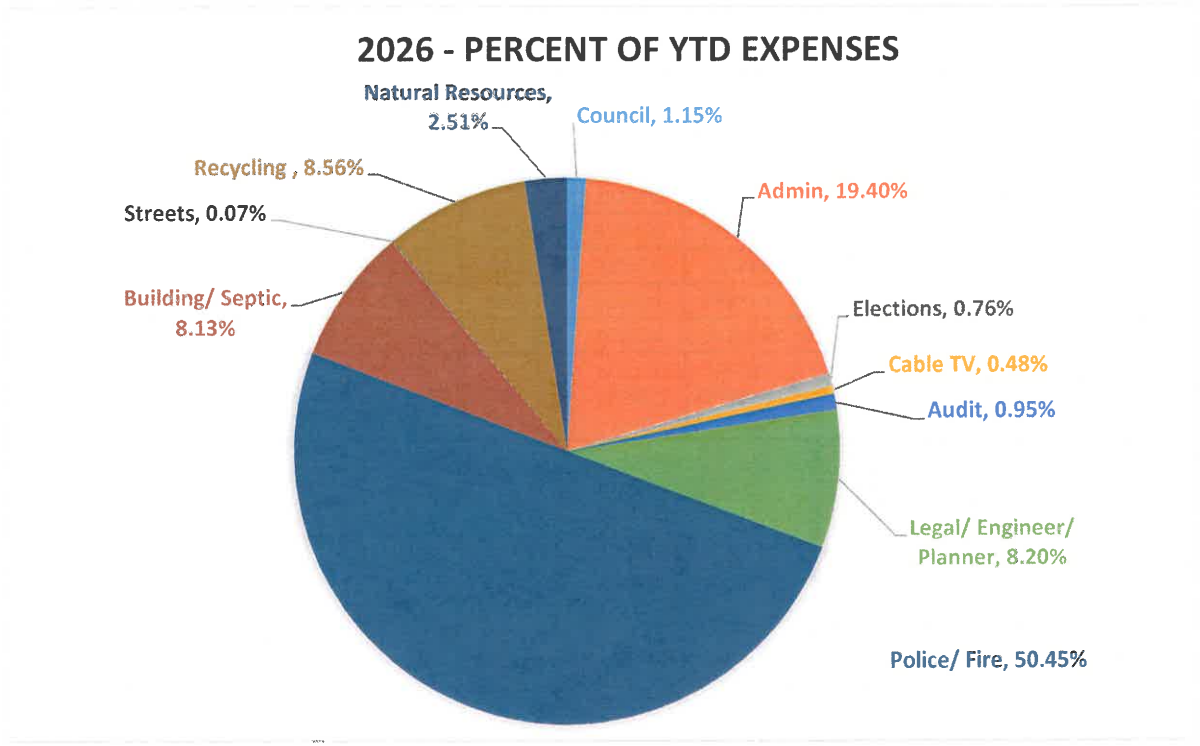


2026 Approved Budget with 2026 YTD/ % Of Budget vs. Actual/ Actual Expenses with % of Budget

	2026 Approved Budget	2026 YTD	% of Budget vs. Actual		2,304,759.38
Council	$ 37,892	$ 26,556	70.08%		1.15%
Admin	$ 827,381	$ 447,094	54.04%		19.40%
Elections	$ 43,620	$ 17,444	39.99%		0.76%
Cable TV	$ 38,066	$ 11,089	29.13%		0.48%
Audit	$ 23,475	$ 21,932	93.43%		0.95%
Legal/ Engineer/ Planner	$ 238,104	$ 189,047	79.40%		8.20%
Police/ Fire	$ 1,998,082	$ 1,162,655	58.19%		50.45%
Building/ Septic	$ 345,500	$ 187,320	54.22%		8.13%
Streets	$ 53,000	$ 1,625	3.07%		0.07%
Recycling	$ 394,522	$ 197,249	50.00%		8.56%
Natural Resources	$ 115,000	$ 57,749	50.22%		2.51%
Transfers		$ -			0.00%



	Council	Admin	Elections	Cable TV	Audit	Legal/ Engineer/ Planner	Police/ Fire	Building/ Septic	Streets	Recycling	Natural Resources
2025 Approved Budget	$35,953	$647,618	$23,619	$36,000	$22,350	$333,104	$1,695,295	$345,500	$83,500	$367,380	$122,500
2025 YTD	$31,165	$662,125	$22,399	$37,415	$20,878	$309,594	$1,769,600	$371,863	$12,316	$380,867	$87,437
% of Budget vs. Actual	86.68%	102.24%	94.83%	103.93%	93.41%	92.94%	104.38%	107.63%	14.75%	103.67%	71.38%
2026 Approved Budget	$37,892	$827,381	$43,620	$38,066	$23,475	$238,104	$1,998,082	$345,500	$53,000	$394,522	$115,000
2026 YTD	$26,556	$447,094	$17,444	$11,089	$21,932	$189,047	$1,162,655	$187,320	$1,625	$197,249	$57,749
% of Budget vs. Actual	70.08%	54.04%	39.99%	29.13%	93.43%	79.40%	58.19%	54.22%	3.07%	50.00%	50.22%


2026 - PERCENT OF YTD EXPENSES
Natural Resources, 2.51%
Council, 1.15%
Recycling , 8.56%
Admin, 19.40%
Streets, 0.07%
Building/ Septic, 8.13%
Elections, 0.76%
Cable TV, 0.48%
Audit, 0.95%
Legal/ Engineer/ Planner, 8.20%
Police/ Fire, 50.45%

Ramsey County Sheriff's Office

Public Safety Report: North Oaks

JUNE 2026

Deputy Craig Lydon
651-755-8089 ☆ craig.lydon@co.ramsey.mn.us

CALLS FOR SERVICE: 198

- 52 MEDICAL CALLS
- 21 FIRE CALLS
- 12 TRAFFIC STOPS
    - 5 ACCIDENTS

NOTABLE CALLS:

- **EBIKES-** THROUGH THE MONTH OF JUNE DEPUTIES HAVE BEEN MAKING CONTACT WITH JUVENILES ON EBIKES AND EMOTOS AND TAKING THE OPPORTUNITY TO EDUCATE BOTH THE JUVENILES AND THEIR PARENTS IN AN ATTEMPT TO PREVENT ACCIDENTS AND INJURIES.

- **VIOLATION OF A PROTECTION ORDER-** CN# 26029085 ON THE 0 BLOCK OF ORIOLE LN AT APPROXIMATELY 1426 HOURS DEPUTIES WERE CALLED ON REPORT OF A VOP WHICH OCCURRED WITHIN TWO WEEKS. DEPUTIES TOOK THE CALLERS STATEMENT, ISSUED A KOPS ALERT, WROTE A REPORT AND ISSUED A CITIATION.

- **SUSPICIOUS** – 06/25/2026 CN# 26029482 ON THE 0 BLOCK OF WILLOW RD AT APPROXIMATELY 1356 HOURS DEPUTIES WERE CALLED IN RESPONSE TO A SUSPICIOUS VEHICLE. A LONE MALE OCCUPANT CIRCLED THE CULDESAC AND HELD HIS PHONE IN HIS HAD AS THOUGH HE WAS RECORDING. THE CALLER WAS CONCERNED AS THERE WERE CHILDREN PLAYING IN THE YARD. THE CALLER WAS ABLE TO PROVIDE A LICENSE PLATE WHICH WAS USED TO OBESERVE THE VEHICLE ENTER AND EXIT THE CITY VIA FLOCK CAMERAS. CONTACT WITH THE REGIESTERED OWNER WAS ATTEMPTED WITH NEGATIVE RESULTS.

- **LOST PROPERTY –** CN# 26029739 06/26/2026 AT APPROXIMATELY 1713 HOURS DEPUTIES WERE DISPATCHED TO BLACK LAKE COURT ON REPORT OF A MISSING WALLET. UPON FURTHER INVESTIGATION AND ASSISTANCE FROM A GOOD CITIZEN, IT WAS LEARNED THAT THE WALLET WAS STOLEN. WITH VIDEO OBTAINED FROM THE GOOD CITIZEN AND THE USE OF FLOCK CAMERAS THE SUSPECTS AND THEIR VEHICLE WERE IDENTIFIED AND INVESTIGATORS ARE WORKING WITH PROSECUTERS TO GET THEM CHARGED.

NOHOA BOARD OF DIRECTORS
POLICY xxxx.00 VEGETATION & OBSTRUCTION MANAGEMENT IN ROAD EASEMENTS

ARTICLE I
PURPOSE

The purpose of this policy is to address vegetation, including trees, and obstructions within North Oaks Homeowners Association (NOHOA) road easements to protect motorists, bicyclists, and pedestrians.

ARTICLE II
AUTHORITY

The NOHOA Governing Documents establish the authority of the NOHOA Board of Directors.

Bylaws Article1, Section 1. Introduction and Purpose.

All roads within the community are private roads, maintained by NOHOA.

NOHOA is responsible for adopting and enforcing policies and procedures regarding covenants, restrictions, easements, conditions and terms of the Deeds, Declarations and other Governing Documents which establish and govern the private structure of the community.

Bylaws, Article IX, Enforcement and Remedies, Section 1.

In General. NOHOA shall be entitled to all remedies at law or in equity and may undertake any measures, legal or administrative with respect to all matters entrusted to it and within its authority.

Per the Deeds: The North Oaks Home Owners' Association has been assigned the right to trim trees overhanging wires, poles, cables, and similar installations, and overhanging roads or bridle paths, or both.

ARTICLE III
APPLICABILITY

This policy is applicable to all NOHOA road easements.

ARTICLE IV
DEFINITIONS

Bylaws: The most current version of the NOHOA Bylaws.

Hazardous Tree: A tree that is dead or dying or in otherwise poor health and a threat to property or personal safety should the tree fail.

Heritage Tree (H): as defined in NOHOA's Tree and Forest Conservation Policy (#1206.00) *for our reference A deciduous tree that measures twenty-four (24) inches DBH or greater, or a coniferous tree that measures sixteen (16) inches DBH or greater. Diameter or Diameter at Breast Height (DBH): Tree diameter as measured at fifty-four (54) inches above the ground.*

Intersection Sight Triangle: the triangular area at the intersection intended to preserve adequate visibility. The triangle is defined as the point of intersection of the projected edges of pavement from two streets, measure thirty (30) feet along each street pavement edge. Connect the two points so measured, thereby forming a triangle.

Invasive Species: As defined in NOHOA's Tree and Forest Conservation Policy 1206.00.

Horizontal Clearance: Measured from a NOHOA road pavement edge in a rural section or back of curb in an urban section.

Member: Refers to a NOHOA Member owning property located within the boundaries of NOHOA.

Member parcel: residential and corporate land parcels within NOHOA.

NOHOA parcel: land parcels owned by NOHOA.

Significant Tree (S): as defined in NOHOA's Tree and Forest Conservation Policy 1206.00. *For our reference: A deciduous tree that measures a minimum of six (6) inches but less than twenty-four (24) inches DBH, or a coniferous tree that measures a minimum of twelve (12) inches but less than sixteen (16) inches DBH.*

Road Easement: An easement that provides ingress and egress over the portion of the property covered by the easement area. The easement provides for the installation, maintenance, and repair of a roadway recorded with Ramsey County.

Vertical Height: Measured from the pavement edge in a rural section or back of curb in an urban section.

ARTICLE V
INTERSECTION SIGHT TRIANGLE

A. Purpose: This article is intended to define and regulate areas around street intersections for the purpose of preserving adequate visibility for the safety of motorists, cyclists, and pedestrians approaching or passing through the intersections.

B. Applicability: This article applies to intersections involving two or more NOHOA roads. It does not apply to a private driveway intersecting with a road.

C. Insert graphic here

D. Prohibited Conditions: Other than regulatory and NOHOA signage, no vegetation, structure, fence, landscaping material, or other obstruction shall be placed within a required intersection sight triangle. Article VIII does not apply to the Intersection Sight Triangle.

Visibility from Street: Visibility from any street shall be unobstructed below a height of sixteen feet (16') within the sight visibility triangle at intersections.

ARTICLE VI
VEGETATION & OBSTRUCTIONS WITHIN ROAD EASEMENTS

A. Purpose: This article is intended to define and regulate vegetation and other obstructions within NOHOA road easements to provide visibility of potential obstructions to travel, provide space for pedestrians or cyclists to move off the roadway, for parked cars, and for safe passage of larger trucks and emergency vehicles.

B. Prohibited Conditions: No person shall place, maintain, or permit vegetation or obstructions within a road easement unless noted in Article VIII Exceptions that:

1. Meets the definition of a hazardous tree;
2. Encroaches into any roadway and shoulder;
3. Interferes with traffic control devices, including signage;

C. Required Clearances: Vegetation shall be maintained to provide clearances within the road easement for the following areas:

1. Within the area of the pavement surface, all vegetation, including tree branches, shall be maintained to provide a minimum vertical clearance of sixteen (16) feet above the road surface without exception.
2. Within the area extending five (5) feet horizontally from the edge of pavement or back of curb, whichever is applicable, no vegetation, structure, object, or other obstruction shall be permitted that interferes with visibility, vehicle passage, roadway maintenance, drainage, pedestrian travel, or other intended roadway functions, except as expressly permitted under Article VIII. Notwithstanding the foregoing, Exception A.6. of Article VIII is modified within this five-foot area to allow tree branches that are maintained at a minimum height of eight (8) feet above the adjacent road surface or ground level, whichever is higher.

D. Additional vegetation or obstruction removal may be required where roadway curvature, topography, or other site conditions create visibility limitations or safety concerns.

ARTICLE VII
PLANTING WITHIN EASEMENT AREAS

A. Approval Required: No trees, shrubs, landscaping features, decorative materials, or other improvements shall be installed within a NOHOA easement without prior ASC approval.

B. Planting Standards: Approved plantings shall:

1. Meet the horizontal and vertical restrictions of this policy even when fully grown;
2. Utilize species appropriate for roadside conditions;
3. Be continuously maintained by the Member to remain compliant with this policy.

ARTICLE VIII
EXCEPTIONS

A. Exceptions:

1. Tree branches located entirely above the required sixteen (16') foot vertical clearance.
2. Regulatory and NOHOA owned signage
3. Power poles and other utility infrastructure
4. Mailboxes that meet ASC and USPS standards
5. Landscaping, decorative materials, and plantings not exceeding three (3) feet in height may be permitted within five (5) feet of the NOHOA road easement, provided they do not obstruct sight lines, interfere with roadway maintenance, impede drainage, or create a safety hazard for motorists, bicyclists, or pedestrians. Such features shall be limited to a cumulative length of twenty (20) feet along the property's frontage adjacent to the roadway.
6. Existing trees that meet the definition of a significant tree, and are not considered invasive or hazardous, with all branches below sixteen feet (16') removed.

ARTICLE IX
MAINTENANCE

A. Duty to Maintain: Property owners shall maintain vegetation within easement areas on their property to comply with this Policy.

B. Inspection: NOHOA may inspect easement areas and vegetation for compliance with this Policy and may require corrective action where violations exist.

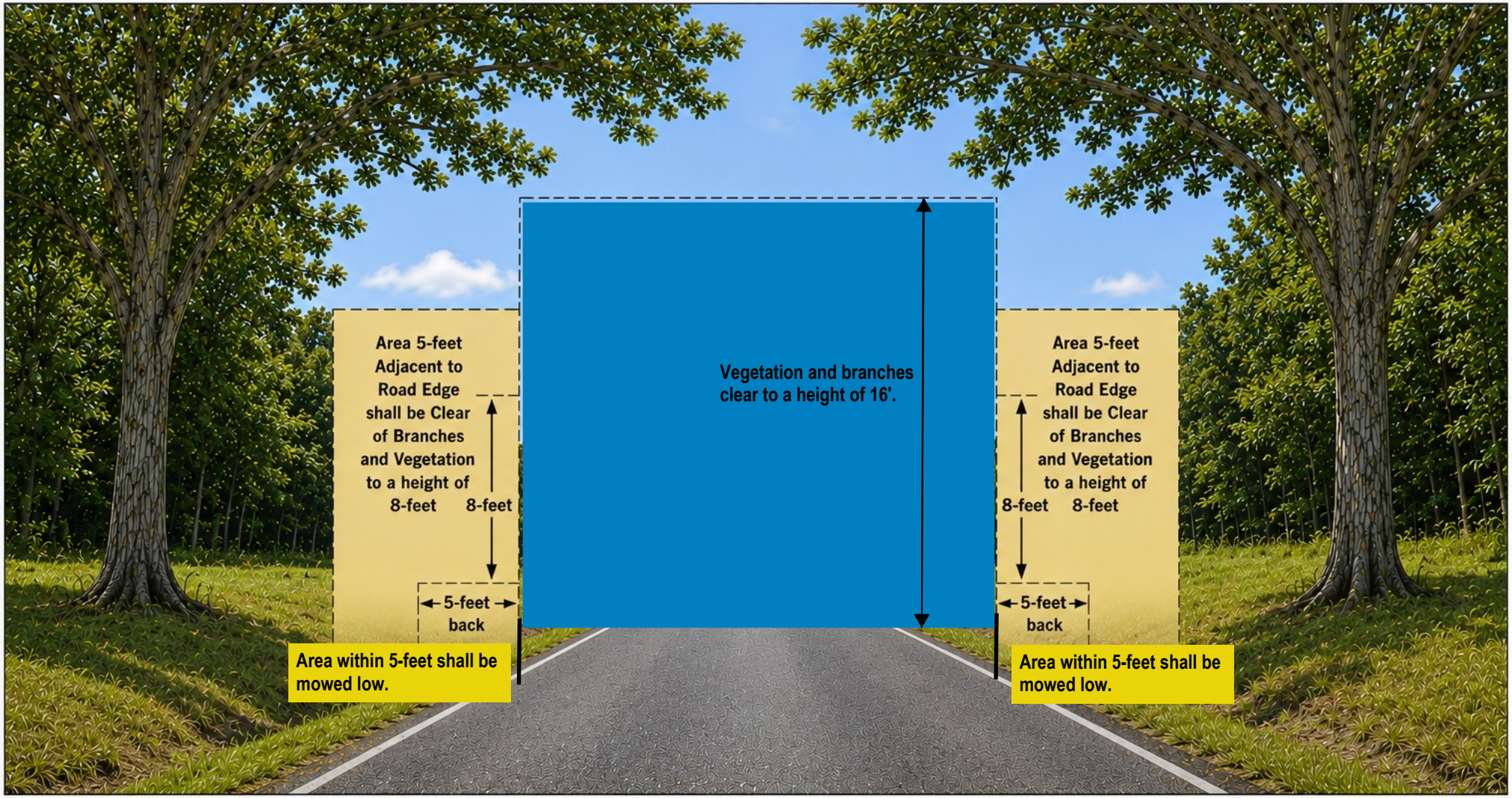
ARTICLE X
COMPLIANCE AND ENFORCEMENT

The Bylaws provide that "NOHOA is responsible for adopting and enforcing policies and procedures regarding the covenants, restrictions, easements, conditions and terms of the Deeds, Declarations and other Governing Documents which establish and govern the private structure of the community." NOHOA shall have the right to exercise the full authority granted by the Governing Documents, and other applicable laws.

A. Failure to Comply: If a Member fails to comply with this policy, General Enforcement Procedures of NOHOA Policy 1409.00 will be followed and enforced.

B. Appeal Process: If a member feels that an exception is warranted for a tree or obstruction prohibited by this policy, they may appeal to the NOHOA Board.

NOHOA Road Easement - Vegetation Clearance Requirements



Landscaping, decorative materials, and plantings not exceeding three (3) feet in height may be permitted within five (5) feet of the NOHOA road edge, provided they do not obstruct sight lines, interfere with roadway maintenance, impede drainage, or create a safety hazard for motorists, bicyclists, or pedestrians. Such features shall be limited to a cumulative length of twenty (20) feet along the property's frontage adjacent to the roadway.

STIPULATION OF SETTLEMENT

Recitals

1. The Metropolitan Council (Council) adopted a new regional development guide, Imagine 2050, on February 12, 2025.

2. In conjunction with updating its comprehensive development guide, the Council is required under Minn. Stat. § 473.856 to prepare and transmit to each local governmental unit a System Statement specific to that entity. The System Statement includes population, employment, and household forecasts which have been used by the Council as a basis for its Metropolitan System Plans.

3. The Council issued the 2025 System Statement for the City of North Oaks (City), which the City received on September 23, 2025. The System Statement included the following growth forecasts for population, households, and employment.

2025 System Statement (Original)				
	2020 (actual)	2030	2040	2050
Population	5,272	5,600	6,000	6,000
Households	1,972	2,100	2,300	2,310
Employment	1,288	1,490	1,530	1,530

4. The 2025 System Statement does not contemplate expansion of the Metropolitan Urban Service Area (MUSA) within the City.

5. On November 20, 2025, the City adopted Resolution No. 2025-1584, objecting to the 2025 System Statement and requesting a hearing pursuant to Minn. Stat. § 471.857. The City objected to the forecasted growth for population, households and employment as being too high and proposed the following amended forecasts:

City's Request				
	2020 (actual)	2030	2040	2050
Population	5,272	5,372	5,506	5,647
Households	1,972	2,012	2,062	2,115
Employment	1,288	1,300	1,320	1,330

6. The City also proposed that the 2025 System Statement be amended to allow for an expansion of the MUSA to serve the entire city.

7. The Council has undertaken a capacity study of the regional wastewater infrastructure for the northeast metro area, including the North Oaks properties that are not currently within the MUSA ("Capacity Study"). The Capacity Study is in progress and scheduled for completion in the spring of 2027.

8. Representatives of the Council and the City met on February 27, 2026, and April 10, 2026, and based on those meetings, additional City data submission, and further conversations, the City is willing to withdraw its request for a System Statement Reconciliation Hearing consistent with the agreements made below.

It is hereby stipulated and agreed by and between the Metropolitan Council (Council) and the City of North Oaks (City) as follows:

1. The parties agree to amended projections of 2030, 2040, and 2050 population, households and employment, as shown in the table below (the "**Revised Projections**").

2025 System Statement (Revised Projections)				
	2020 (actual)	2030	2040	2050
Population	5,272	5,700	5,700	5,700
Households	1,972	2,140	2,150	2,150
Employment	1,288	1,630	1,630	1,630

2. The parties agree that the City may use the Revised Projections for purposes of planning infrastructure and land uses in the 2050 Comprehensive Plan. Council agrees not to reject the 2050 Comprehensive Plan based solely on the use of the Revised Projections.

3. The Council agrees to update the MUSA and Community Designation maps to correctly represent areas in the City already served by Regional Sewer Service previously approved by the Council but not reflected in the above-referenced maps.

4. The Council will provide periodic updates to the City's engineering consultant regarding the status of the Capacity Study. The City's engineering consultant may provide periodic feedback to Council staff concerning the study. After completion of the Capacity Study, Council staff will present the results of the study to the Council and seek direction from its board members on priorities for infrastructure capacity and meeting the needs served by that infrastructure. In advance of the Council board meeting, affected communities, including the City, will be given the opportunity to provide written feedback to the Council on their community's needs to help inform the Council's decision-makers on prioritization. At the Council meeting, the City and other affected communities will be given the opportunity to address the Council directly and share their feedback on their community's needs and the results of the infrastructure study.

5. If the Council were to consider planning for a future connection to the regional wastewater system, the Council would need to amend its wastewater system plan. The amendment process would need to be completed prior to North Oaks submitting its 2050 comprehensive plan to the Council for review. The Council will consider additional information submitted as part of the City's comprehensive plan to determine whether any additional service will be made available.

6. The parties acknowledge that the management of SSTS within the city presents a challenge over the long term for the City and residents. Accordingly, the City may explore

options for long-term sustainable management of SSTS, which may include exploration of connection to sanitary sewer, consistent with the Council's adopted policies. ("Contingency Plans"). The City may include its Contingency Plans in its 2050 Comprehensive Plan as a development alternative that is subject to the Council's review of comprehensive plans pursuant to Minn. Stat. 473.175. There is not a guarantee that the Council will authorize any Contingency Plan as part of its review of the City's 2050 Comprehensive Plan, but it may still authorize the remainder of the City's 2050 Comprehensive Plan. Council will not object to the inclusion of the Contingency Plans in the City's 2050 Comprehensive Plan.

7. The parties agree that, following the completion of the Capacity Study and the City's presentation to the Council in accordance with Section 4 above, the Council will issue a post-study Revised 2025 System Statement. The Revised 2025 System Statement will incorporate the Revised Projections and Map Corrections as provided in Sections 1 and 3 above, and the City shall have sixty (60) days from the date that the Council transmits its Revised 2025 System Statement to request a System Statement Reconciliation Hearing pursuant to Minn. Stat. § 473.857. If no request for a hearing is received by the Council within 60 days, the 2025 Revised System Statement shall be final.

IN WITNESS WHEREOF, the parties, intending to be legally bound, execute this Stipulation on the dates set forth below.

Dated: _____, 2026

METROPOLITAN COUNCIL

By: _____
Its: Regional Administrator

Dated: _____, 2026

CITY OF NORTH OAKS

By: _____
Its: Mayor

By: _____
Its: City Administrator

June Month in Review

June 2026

Rehder Forestry Consulting

- Provided homeowner advice to residents with tree questions at 1 & 2 Swallow Ln, 4 Otter Ln, 27 Pheasant Ln, 16 Sherwood Rd, 53 Nord Cir, 4 Osprey Ct, 7 Robb Farm Rd, 6 Larch Ln, 11 Dove Ln, 2 Ridge Rd.
- We are following up on the last of the 2025 Emerald Ash Borer removals and have been actively inspecting for and marking problematic EAB trees for 2026.
- We provided an arborist workshop for a couple of tree care companies that missed the annual licensing meeting last December.
- Approved tree care vendors to be added to the arborist list.
- Oak trees are starting to express oak wilt symptoms indicating the beginning of the 2026 Oak wilt inspection season.
- We have three part time inspectors, two in college in environmental studies, who passed the MN DNR certified tree inspector test (CTI), and are grateful to work in an environment such as North Oaks and the other municipalities we serve.
- We inform residents about Operation Clearview when conducting homeowner calls and respond to calls with a knock on the door, and if necessary, a doorhanger.
- We continue to respond to and inspect for trees of concern and work with residents to abate the issue. We also follow up on these calls for compliance.