

Planning Memorandum

To: Sunfish Lake Mayor Dan O'Leary and City Councilmembers

From: Lori Johnson, City Planner

Date: August 7, 2024 (for the August 13, 2024, meeting)

Re: **5940 Zehnder Road –Variance**
WSB Project No. 025861-000

GENERAL INFORMATION

Applicant/Owner: Yue Him Tam

Project Location: 5940 Zehnder Road– PID 383350002060

Acreage: 1.24 acres

Existing Land Use: Single-Family Residential

Zoning: R-1 Single Family within Shoreland Overlay District

Surrounding Land Use / Zoning: Surrounded by Single Family Homes/R-1 Zoning

Comprehensive Plan: The City of Sunfish Lake (2040) Comprehensive Plan guides this property for Rural Residential land use.

Deadline for Agency Action:

Application Date:	06-19-2024
Application Complete:	07-10-2024
60 Days:	09-03-2024
Extension Letter Mailed:	n/a
120 Days:	n/a

Attachments: Location Map
Aerial
Site Plan
Septic System Design (20 pages)

CONSIDERATIONS RELATED TO THE REQUEST

1. Overview.

Yue Him Tam, applicant/owner, has made an application for a variance to allow for the installation of a new septic system at 5940 Zehnder Road. The current septic system on the property is not yet failing, but the applicant may sell the property in the future and wants to prepare for that sale, as the system will likely need to be replaced at that time. The applicant has been working with

Steve Kleist of Inspectron, who is the city's septic inspector, to get a new system installed on this property.

The proposed new septic system is proposed to be located 36 feet from the Ordinary Highwater Level for Horseshoe Lake. All septic systems, per zoning ordinance requirements, are required to be 150 feet from the Ordinary Highwater Level. Thus, a variance of 114 feet is required to install the septic system in the proposed location. The only location that is available for the new system is in the rear yard of the site adjacent to the lake.

The existing home on site is considered nonconforming as the building does not meet setback requirements from the OHWL. All buildings are required to have a 200-foot setback from the OHWL, and they must also have a 100-foot setback from the public street in the front yard of the site. The home is located 80-feet from the property line adjacent to Zehnder Road, and the home is setback 133 feet from the OHWL on the east side of the property.

Given that there are limited options for the location of the septic system based on setback requirements and system requirements, there is no way to avoid a variance for a necessary and required septic system to serve this home.

DNR Approval. The Minnesota DNR Area Hydrologist was notified of the proposed request.

Engineering Review. The City Engineer has reviewed this plan and is supportive of the variance request and proposed plans.

Variance Review Criteria

In considering all requests for a variance and in taking subsequent action, the Planning Commission and the City Council shall make a finding of fact that the proposed action will not:

1. Impair an adequate supply of light and air to adjacent property.
2. Unreasonably increase the congestion in the public street.
3. Have the effect of allowing any district uses prohibited therein, permit a lesser degree of flood protection than the flood protection elevation for the particular area, or permit standards which are lower than those required by State law.
4. Increase the danger of fire or endanger the public safety.
5. Unreasonably diminish or impair established property values within the neighborhood, or in any way be contrary to the intent of this Title.
6. Violate the intent and purpose of the Comprehensive Plan.
7. Violate any of the terms or conditions of Item 2, below.

Variances/Practical Difficulties

A variance from the terms of this Ordinance shall not be granted unless it can be demonstrated that:

1. Practical difficulties will result if the variance is denied due to the existence of special conditions and circumstances which are peculiar to the land, structure, or building involved and which are not applicable to other lands, structures or buildings in the same district. *The practical difficulty in this situation is that the existing buildings are*

nonconforming, and the lot size cannot accommodate a required and necessary septic system for the continued operation of the home site.

- a. Special conditions may include exceptional topographic or water conditions or, in the case of an existing lot or parcel of record, narrowness, shallowness, insufficient area or shape of the property. *The existing house pre-dates the City zoning code and is closer to the property lines and the OHWL than the current required setbacks. It is not possible to place the septic system in the front yard of the site due to driveway location and system requirements.*
 - b. Practical difficulties caused by the special conditions and circumstances may not be solely economic in nature if a reasonable use of the property exists under the terms of this Title. *This property cannot be reasonably used without a septic system and there are no alternative locations for such system.*
 - c. Special conditions and circumstances causing practical difficulties shall not be a result of lot size or building location when the lot qualifies as a buildable parcel. *This parcel is not vacant and the applicant is trying to work within the existing ordinances to the greatest extent possible.*
2. Compliance with the requirements of the provisions of this Ordinance would deprive the applicant of rights commonly enjoyed by other properties in the same district under the terms of this Ordinance or deny the applicant the ability to put the property in question to a reasonable use and the proposed variance permits the owner to use the property in a reasonable manner. *Compliance with the ordinance would deprive the owner of rights commonly enjoyed by other properties in the same district under the terms of this Ordinance, and the property cannot be put to a reasonable use without a variance.*
3. The special conditions and circumstances causing the practical difficulties do not result from the actions of the applicant. *The property owner was not responsible for the original construction and is now dealing with a situation that is essentially beyond his control with a nearly failing septic system.*
4. Granting the variance requested will not confer on the applicant any special privilege that is denied by this Ordinance to other lands, structures or buildings in the same district under the same conditions. *No special privilege would be gained by replacing a required septic system.*
5. The request is not a use variance. *This is not a use variance.*
6. The variance requested is the minimum variance necessary to accomplish the intended purpose of the applicant. *There are essentially no other options for the location of the septic system. The applicant has explored all other options. The proposal that has been submitted is the minimum variance necessary to construct a septic system.*
7. The request does not create an inconvenience to neighboring properties and uses. *This request will not create an inconvenience to neighboring properties. All proposed improvements are located on this property in the only location possible.*
8. The variance requested is in harmony with the purpose and intent of the Ordinance. *Staff finds this to be true of the requested variance.*
9. The variance requested is consistent with the Comprehensive Plan. *Staff finds this to be true of the requested variance.*
10. The variance requested will not alter the essential character of the locality. *Staff finds this to be true of the requested variance.*

The information provided in this staff report and on the proposed plans indicate that all above criteria have been met for variance approval. No public comments have been received as of the date of the staff report publication.

Planning Commission: Please note that the City Council agreed, at their meeting on July 9, 2024, to move this item directly to the City Council rather than routing this item to the Planning Commission for a public hearing. The applicant is hoping to work with the adjacent property owner of 5960 Zehnder Road on installation of the systems on both properties. You may recall that the owner of 5960 Zehnder Road received a similar variance for a septic installation, and if the two homeowners work together to install the systems at the same time, there are cost savings to the applicants. Therefore, a public hearing is scheduled for the City Council meeting on August 13, 2024.

RECOMMENDATION

Based on the foregoing considerations and applicable ordinances, staff recommends approval of the setback variance for a septic system subject to the following findings of fact and conditions of approval:

Variance of 114 feet to the 150 foot OHWL setback requirement:

1. The variance request is in harmony with the general purposes and intent of the ordinance.
2. The variance is consistent with the Comprehensive Plan.
3. The Applicant has demonstrated that there are practical difficulties in complying with the strict requirements of the zoning ordinance:
 - a. The property owner proposes to use the property in a reasonable manner not otherwise permitted by the zoning ordinance.
 - This property cannot be reasonably used without a septic system.
 - b. The circumstances are unique to the property, not created by the landowner.
 - The existing buildings are nonconforming, and the lot size cannot accommodate a required and necessary septic system for the continued operation of the home site.
 - The existing house pre-dates the zoning code and is closer to the property lines and the OHWL than the current required setbacks.
 - It is not possible to place the septic system in the front yard of the site due to driveway location, system requirements, setback requirements and lack of space
 - c. The variance will not alter the essential character of the locality.
 - This variance will not create an inconvenience to neighboring properties. All proposed improvements are located on this property in the only location possible.

Conditions of Approval:

1. Construction of all improvements shall occur in substantial conformance with the plans recommended for approval at the August 13, 2024, Planning Commission meeting.
2. The applicant must obtain all other permits as may be required.
3. The applicant shall comply with all applicable federal, state, and local laws, rules and ordinances.
4. The applicant must adhere to and remain in compliance with the requirements of this Resolution, applicable performance standards, and such other requirements as may apply.
5. Staff will need to perform an inspection of the installed erosion controls and tree protection before any construction activities begin on site. Applicant to provide an erosion control and tree protection plan to the City Engineer prior to the inspection.

**CITY OF SUNFISH LAKE
DAKOTA COUNTY, MINNESOTA**

RESOLUTION NO. 24-XX

**RESOLUTION APPROVING MAJOR SITE PLAN APPROVAL AND A VARIANCE
FOR THE PROPERTY AT 5940 ZEHNDER ROAD, SUNFISH LAKE, DAKOTA
COUNTY, MINNESOTA.**

WHEREAS, Applicant and property owner Yue Him Tam (“Applicant”), submitted an application for the approval of a 114-foot variance to the required 150-foot setback to the Ordinary High Water Level for the installation of a septic system at 5940 Zehnder Road, Sunfish Lake, Dakota County, Minnesota, legally described as:

Lot Six (6), Block Two (2), Horseshoe Lake, and that part of Lot Five (5), Block Two (2), Horseshoe Lake, described as follows: Beginning at the Southwest corner of Lot Five (5), thence East along the South line thereof to the Southeast corner of said Lot Five (5); thence North along the East line thereof Ten (10) feet; thence West and parallel and Ten (10) feet Northerly of the South line of said Lot Five (5) to a point which is 250 feet East and Ten (10) feet North of the point of beginning; thence Northwesterly to a point on the Westerly line of said Lot Five (5), said point being 52.8 feet Northerly, measured along said Westerly line from the point of beginning; thence Southerly along said Westerly Lot line to the point of beginning, Dakota County, Minnesota.

PID: 383350002060

(“the Property”); and

WHEREAS, the Sunfish Lake City Council held a public hearing on August 13, 2024; and

WHEREAS, the City Council considered the application and based on the information received hereby makes the following findings of fact in support of the variance:

1. The variance request is in harmony with the general purposes and intent of the ordinance.
2. The variance is consistent with the Comprehensive Plan.
3. The Applicant has demonstrated that there are practical difficulties in complying with the strict requirements of the zoning ordinance:
 - a. The property owner proposes to use the property in a reasonable manner not otherwise permitted by the zoning ordinance.
 - This property cannot be reasonably used without a septic system.
 - b. The circumstances are unique to the property, not created by the landowner.

- The existing buildings are nonconforming, and the lot size cannot accommodate a required and necessary septic system for the continued operation of the home site.
 - The existing house pre-dates the zoning code and is closer to the property lines and the OHWL than the current required setbacks.
 - It is not possible to place the septic system in the front yard of the site due to driveway location, soil conditions, setback requirements and lack of space
- c. The variance will not alter the essential character of the locality.
- This variance will not create an inconvenience to neighboring properties. All proposed improvements are located on this property in the only location possible.

NOW THEREFORE BE IT RESOLVED THAT the City Council of the City of Sunfish Lake hereby approves the 114-foot variance to the required 150-foot setback to the Ordinary High Water Level for the installation of a septic system at 5940 Zehnder Road with the following **Conditions of Approval:**

1. Construction of all improvements shall occur in substantial conformance with the plans recommended for approval at the August 13, 2024, Planning Commission meeting.
2. The applicant must obtain all other permits as may be required.
3. The applicant shall comply with all applicable federal, state, and local laws, rules and ordinances.
4. The applicant must adhere to and remain in compliance with the requirements of this Resolution, applicable performance standards, and such other requirements as may apply.
5. Staff will need to perform an inspection of the installed erosion controls and tree protection before any construction activities begin on site. Applicant to provide an erosion control and tree protection plan to the City Engineer prior to the inspection.

This resolution is adopted by the City Council of the City of Sunfish Lake this 13th day of August 2024.

Dan O'Leary, Mayor

Attest:

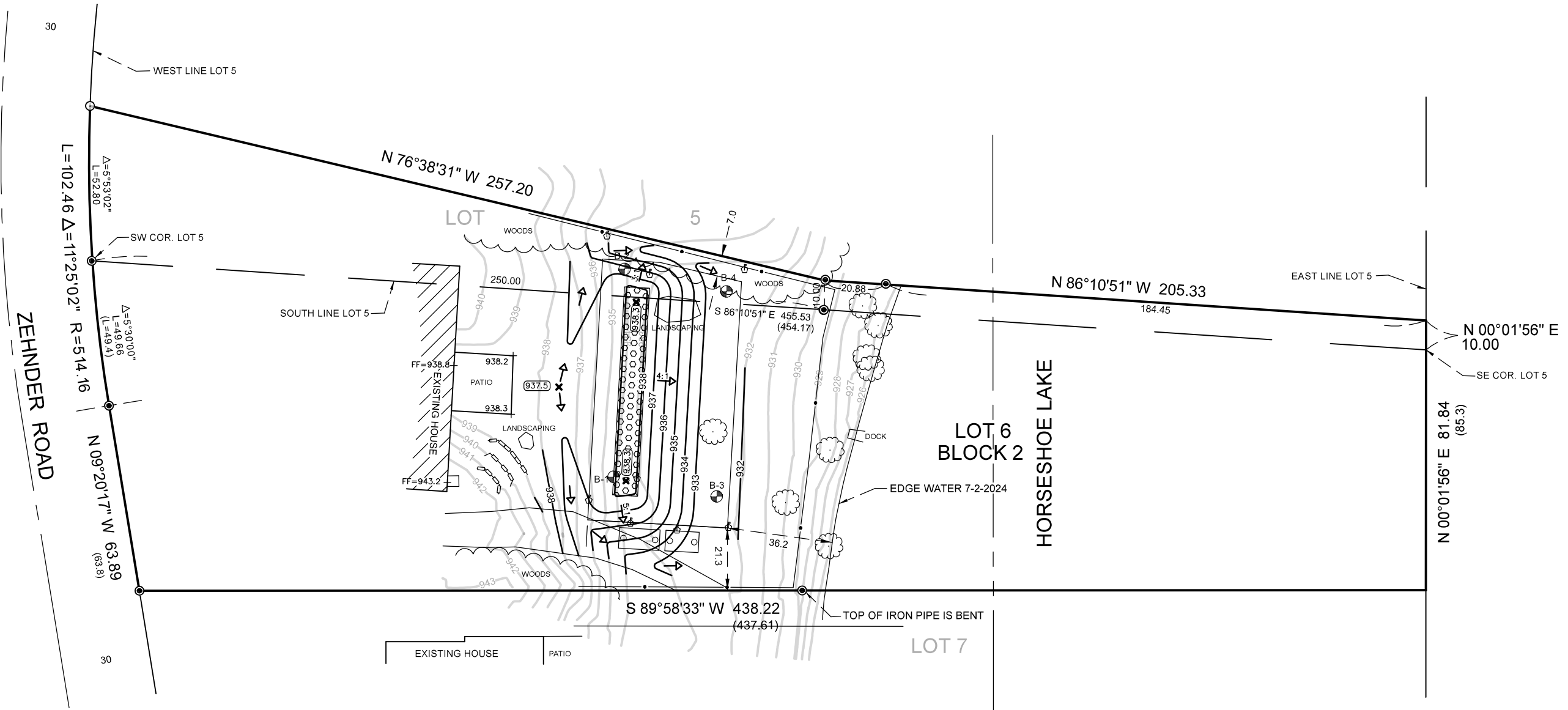
Christy Wilcox, City Clerk

Location Map for 5940 Zehnder Road



Aerial for 5940 Zehnder Road





NOTE:

SEE SEPTIC DESIGN FOR
SEPTIC DETAILS.

EXISTING PROPERTY DESCRIPTION
(Per Dakota County Doc. No. 2942418)

Lot Six (6), Block Two (2), Horseshoe Lake, and that part of Lot Five (5), Block Two (2), Horseshoe Lake, described as follows: Beginning at the Southwest corner of Lot Five (5), thence East along the South line thereof to the Southeast corner of said Lot Five (5); thence North along the East line thereof Ten (10) feet; thence West and parallel and Ten (10) feet Northerly of the South line of said Lot Five (5) to a point which is 250 feet East and Ten (10) feet North of the point of beginning; thence Northwesterly to a point on the Westerly line of said Lot Five (5), said point being 52.8 feet Northerly, measured along said Westerly line from the point of beginning; thence Southerly along said Westerly Lot line to the point of beginning, Dakota County, Minnesota.

- DENOTES A PLACED 1" BY 18" IRON PIPE HAVING A PLASTIC CAP BEARING LAND SURVEYOR LICENSE NO. 48634.
- ⊙ DENOTES FOUND IRON MONUMENT.
- ⊕ DENOTES FOUND SEPTIC FLAG.
- ▬ DENOTES RETAINING WALL.
- () DENOTES A PLAT DISTANCE.
- DENOTES PROPOSED DRAINAGE ARROW.
- 938.0 DENOTES PROPOSED SPOT ELEVATION.
- 936— DENOTES EXISTING CONTOUR OF ELEVATION.
- 936— DENOTES PROPOSED CONTOUR OF ELEVATION.
- DENOTES PROPOSED SILT FENCE.



CERTIFICATE OF SURVEY FOR:

STEVE HOLT



JOHNSON & SCOFIELD INC.
SURVEYING AND ENGINEERING

755 WESTVIEW DRIVE, SUITE 201, HASTINGS, MN 55033
(651) 438-0000

I hereby certify that this survey, plan or report 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.

Mitchell A. Scofield

Mitchell A. Scofield
Minnesota License No. 48634
Date: July 24, 2024

BK. NA	PG. NA	W.O.#	DRAWING NUMBER
SHEET 1 OF 1 SHEETS	24-587	S-11438	

"BLACKWATER SYSTEMS"

BRENT D. MATTER

646 ROUNDHOUSE STREET

SHAKOPEE, MN 55379

(952) 250-1649

bdmatter@outlook.com

TYPE III SSTs

SITE EVALUATION, SOIL BORINGS

With LGU Soil Verification

&

SEPTIC SYSTEM DESIGN

DATE: April 29, 2024

FOR: Yue-him & Lai-ping Tam

ADDRESS: 5940 Zehnder Road
Sunfish Lake, MN 55077

PHONE NUMBER: (507) 298-1626 c/o Steve Holt, Installer

SITE LOCATION: 5940 Zehnder Road.
PID #38.335.000.2060

Please Note: Time Dosing is required with a recommended Effluent Filter with an Alarm & Maintenance agreement to professionally clean filter as directed by manufacturer.

Property Lines must be surveyed.

2250-2c Gal. Septic Tank

1500 Gal. Pump Chamber

Rock Bed 8.5' X 70.6'

38 Tons Washed Rock

Absorption Width 28.1'

Min. Sand Base 40' X 80'

168 Tons Washed Sand

Up/Sideslope 8/9 Downslope 31.2'

Sand Depth 12" to 15"

21' Head 39 GPM perf/sp 7/32"-3'

SEPTIC SYSTEM DESIGN

DESIGN CRITERIA;

A New Type III SSTS for an existing 4 Bedroom single family Type I home with a garbage disposal is proposed.

WATER USAGE;

600 gallons per day maximum.

PERCOLATION RATE;

Estimated >40 MPI due to damaged soils from placing new SSTS over existing drainfield.

SEPTIC TANK;

Install one new 2250-gallon double compartment septic tank, please see detail.

NOTES: 1) Tanks require pumping once every three years

2) Use "APPROVED" tanks only.

3) Effluent Filter Required w/ Alarm & Maintenance Agreement.

PUMP CHAMBER;

Install a 1,500-gallon precast tank. Set as specified.

NOTES: 1) An event counter required

2) Use "APPROVED" tanks only.

3) Time Dosing Required

DRAINFIELD;

Treatment Mound, Pressure distribution required. Located on < 2% slope. Total mound Sand area is 48 feet by 89 feet. Rock bed measures 8.5 feet by 70.6 feet. 38 Tons of rock required. Downslope dike width is 31.2 feet, upslope dike width is 8 feet and the end dikes are 9 feet. 168 Tons of sand required. Please see detail.

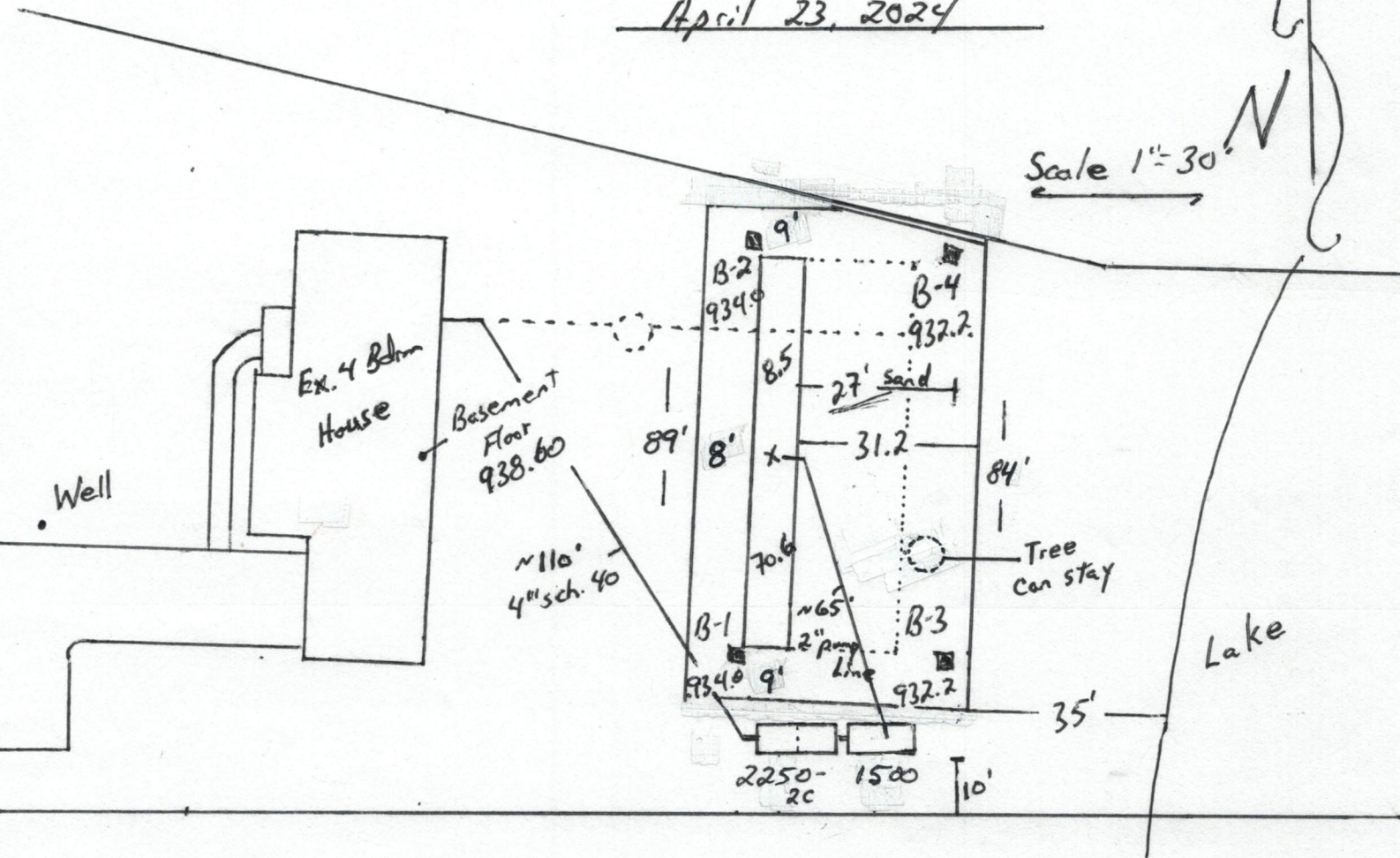
GENERAL CONSTRUCTION PRACTICES;

Divert all surface water away from the drainfield area. Do not disturb the drainfield area during construction. Fence off the drainfield area before permit application. If there are any questions regarding this design, please contact Brent Matter at (952) 250-1649.

Yeu-him & Lai-ping Tam

5940 Zehnder Rd.

April 23, 2024



Brent D. Matter
646 Roundhouse St.
Shakopee, MN 55379-1899
952-250-1649

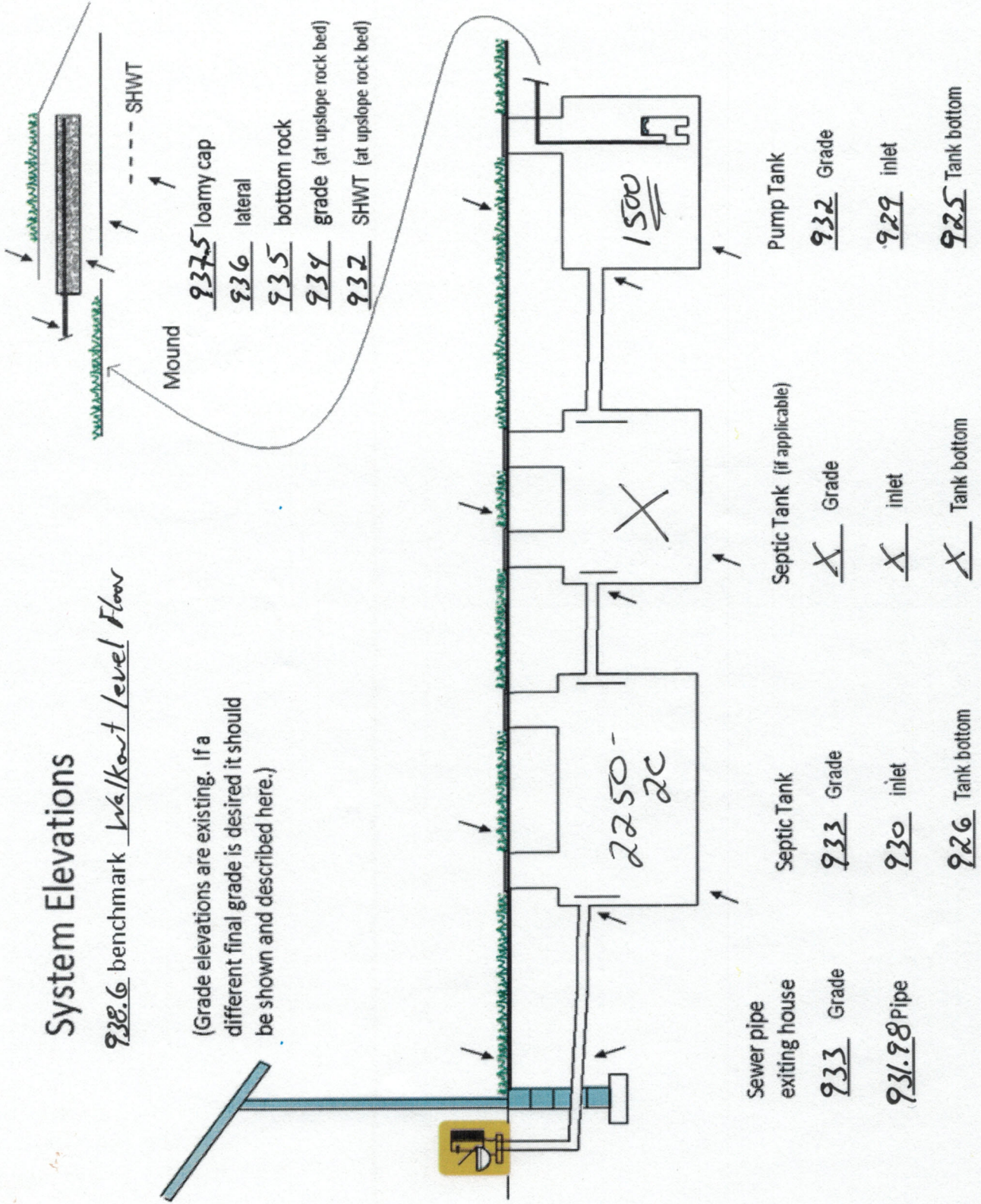
[Signature]
Lic. #2003

Elevations
Walkout Floor 938.60
Pipe out 931.98
Tank #1 in 930.00
Tank #2 in 929.00
Pump 925.00
Manifold 936.00

System Elevations

938.6 benchmark Walkout level floor

(Grade elevations are existing. If a different final grade is desired it should be shown and described here.)



Installer Summary

2250 gallon Septic tank (minimum)

Tank options: Multiple tanks or compartments req'd
50% larger tank with multiple comp/tanks
at 29.41 gpi

1500 gallon Dose tank (minimum)

39 GPM @ 21 ft. of head, Pump required

3.8 inch swing on Demand float which translates to roughly 2.9 inches of float tether length

REQUIRED Time Dosing of:

2.8 minutes ON

5.7 hours OFF

14 inches to "timer ON" float

31 inches to "Hi level" float

18 inches from bottom of tank to "pump ON" float, or

21 inches from bottom of tank to "Hi Level Alarm" or

65 ft. of 2.0 inch supply line with middle feed manifold connection

(Tip: "top feed" manifold to control drainback)

12 inch, or 1.0 ft. Sand Lift Mound

8.5 ft. wide by 70.6 ft. long Rock bed

6 laterals 1.50 inch diameter 34.3 ft. long

3.0 ft. lateral spacing

7/32 inch perfs 3.0 ft. perforation spacing

No Effluent filter & alarm

6 clean out & valve box assemblies

28.1 ft. Total sand ABSORPTION width (minimum)

0.0 ft. upslope and sideslope (sand beyond rockbed, minimum)

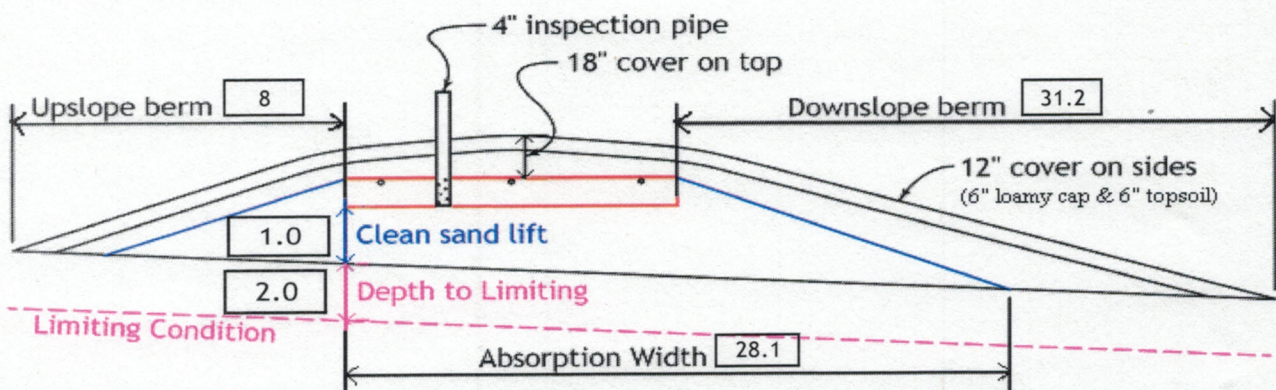
27.0 ft. Downslope (sand beyond rockbed, minimum)

Specific slope ratios give BERM widths (topsoil beyond rockbed) of:

3:1 upslope ratio 8 ft. upslope berm

3:1 sideslope 9 ft. sideslope berms

4:1 downslope 31.2 ft. downslope berm



Note:

For 0 to 1% slopes, Absorption Width is measured from the Bed equally in both directions.

For slopes >1%, Absorption Width is measured downhill from the upslope edge of the Bed.

Rock Bed:	27.0 yd ³ or *1.4=	38 ton
Mound Sand:	120 yd ³ or *1.4=	168 ton
Loamy Cap:	83 yd ³ or *1.4=	116 ton
Topsoil:	94 yd ³ or *1.4=	132 ton

9 inches under pipe

calculation based on 3:1/4:1 slope from top of rockbed

6" deep

6" deep

Preliminary & Field Evaluation Form

Owner Information			
Date	<u>04/25/2024</u>	Sec / Twp / Rng	<u></u>
Parcel ID	<u>38.335.000.2060</u>	LUG (county, city, township)	<u>City of Sunfish Lake</u>
Property Owner:	<u>Yue-him & Lai-ping Tam</u>	Owners address (if different)	
Property Address:	<u>5940 Zehnder Road</u>		<u></u>
City / State / Zip:	<u>Sunfish Lake, MN 55077</u>		<u></u>

Flow Information and Waste Type / Strength			
Estimated Design flow	<u>600</u>	Anticipated Waste strength	☐ Hi Strength ☒ Domestic
Comments: Type III Mound over Existing Trench Drainfield		Any Non-Domestic Waste	☐ Yes (class V) ☒ No
		Sewage ejector/grinder pump	☐ Yes ☒ No
		Water softener	☒ Yes ☐ No
		Garbage Disposal	☒ Yes ☐ No
		Daycare / In home business	☐ Yes ☒ No

Site Information					
Existing & proposed lot improvements located (see site map)	☒ Yes	☐ No	Well casing depth	<u>150' plus</u>	
Easements on lot located (see site map)	☐ Yes	☒ No	Drainfield w/in 100' of residential well	☐ Yes	☒ No
Property lines determined (see site map)	☒ Yes	☐ No	Site w/in 200' of transient noncommunity water supply (TNCWS)	☐ Yes	☒ No
Req'd setbacks determined (see site map)	☒ Yes	☐ No	Site w/in an inner wellhead mgmt zone (CWS/NTNCWS)	☐ Yes	☒ No
Utilities located & identified (gopher state one call)	☒ Yes	☐ No	Buried water supply pipe w/in 50' of system	☐ Yes	☒ No
Access for system maintenance (shown on site map)	☒ Yes	☐ No	Site located in Shoreland (w/in 1000' of lake, 300' of river)	☒ Yes	☐ No
Soil treatment area protected	☒ Yes	☐ No	Site map prepared with previous items included	☒ Yes	☐ No
Construction related issues					

[illegible]

Designer Signature	Brent D. Matter	2003
	Company	License #

Mound Design

Property Owner: Yue-him & Lai-ping Tam

Date: 04/25/2024

Site Address: 5940 Zehnder Road

PID: 38.335.000.2060

Comments: Type III Mound over Existing Trench DrainfieldInstructions: = enter data = adjust if desired = computer calculated - DO NOT CHANGE!

- 1) 4 bedroom Type III Residential System
- 2) 600 GPD design flow
- 3) Yes Garbage disposal or pumped to septic 50% larger tank with multiple comp/tanks
- 4) 2250 Gal Septic tank (code minimum) 2250 Gal Septic tank (design size / LUG req'd)
Tank options: Multiple tanks or compartments req'd
- 5) 1.0 GPD/ft² mound sand loading rate contour loading rate of 12 req's a min 50 ft. long rockbed
- 6) 8.5 ft rockbed width 70.6 ft rockbed length
- 7) 3.0 ft lateral spacing 3.0 ft perforation spacing (maximum of 3 for both)
middle feed manifold connection
- 8) 6 laterals 34.3 feet long 11.5 perfs / lateral 69 perfs total
(1/2 a perf means the first perf starts at the middle feed manifold)
- 9) 7/32 inch perfs at 1 feet residual head gives 0.56 gpm flow rate per perforation
for this perf size & spacing, & pipe size on line 12, max perfs/lateral = 19, line #8 must be less --> OK
- 10) 6.0 doses per day (4 minimum)
- 11) 100 gallons per dose (treatment volume)
- 12) 1.50 inch diameter laterals must be used to meet "4x pipe volume" requirement
- 13) 65 feet of 2.0 inch supply line leads to 11 gallons of drainback volume
(Tip: "top feed" manifold to control the drainback)
- 14) 111 gallons TOTAL pump out volume (treatment + drainback)
- 15) 12 feet vertical lift from pump to mound laterals, leads to a:
- 16) 39 GPM @ 21 feet of head, Pump requirement (note: >50gpm may require an extra 3-6' of head)
- 17) 500 gal Dose tank (code minimum) 1500 gal Dose tank (design size / LUG req'd) at 29.41 gpi
leads to a: REQUIRED Time Dosing of:
- 18) 3.8 inch swing on Demand float, (this delivers Average flow, =70% of Peak design flow)

2.8

 min ON

5.7

 hrs OFF

18

 inches to "Timer ON" float

35

 inches to "Hi Level" float
- 19) 18 inches from bottom of tank to "Pump OFF" float
- 20) 22 inches from bottom of tank to "Pump ON" float
- 21) 25 inches from bottom of tank to "Hi Level" float
- 22) 765 gallons reserve capacity (after High Level Alarm is activated-demand dosed)

23) 0.30 gpd/ft² Absorption area Soil Loading Rate, which gives a mound ratio of 3.3 (minimum)
(this must match the soil boring log) desired mound ratio 3.3

24) 2 percent-site slope (0-20% range) 2 (% downslope site slope, if different than upslope)

25) 24 inches, or 2.0 ft. to Redox or other limiting condition (need at least 12" to be a Type I)

Treatment zone contains 0 inches of 0% soil credit, and 0 inches of 50% soil credit. Giving a:

26) 12 inch, or 1.0 ft. Sand Lift Mound

CRITICAL FOR FUTURE CERTIFICATIONS!!!

27) 28.1 ft. Total ABSORPTION width (with sand beyond rockbed as follows:)

28) 0.0 ft. upslope and sideslope

19.6 ft. Downslope

Individual slope ratios give BERM widths (topsoil beyond rockbed) of:

29) 3:1 upslope ratio 8 ft. upslope berm

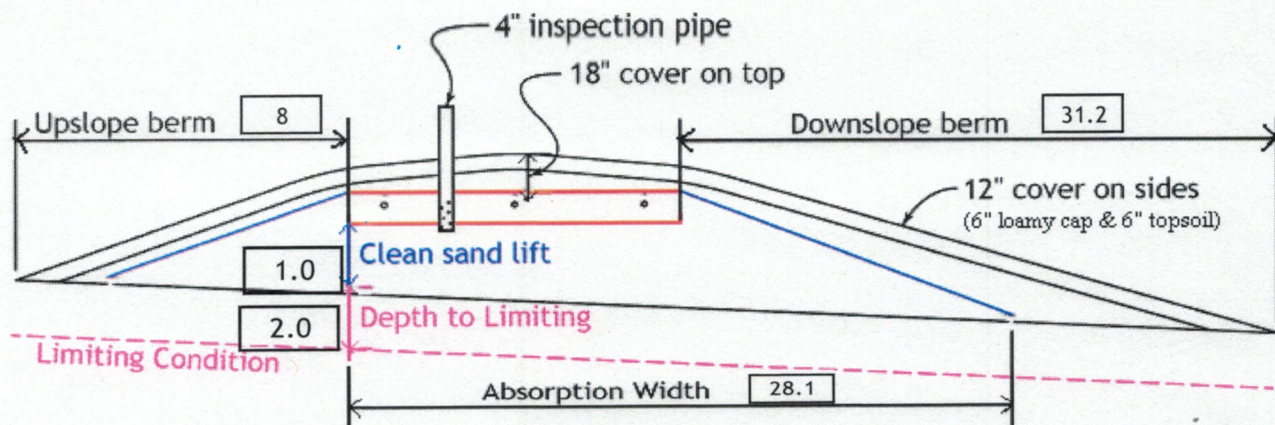
30) 3:1 sideslope 9 ft. sideslope berms

31) 4:1 downslope 31.2 ft. downslope berm

32) Overall Dimensions:

8.5 ft. wide by 70.6 ft. long Rock bed

48 ft. wide by 89 ft. long Mound footprint



Note:

For 0 to 1% slopes, *Absorption Width* is measured from the *Bed* equally in both directions.
For slopes >1%, *Absorption Width* is measured downhill from the upslope edge of the *Bed*.

33) Rock Bed:

8.5 ft. by 70.6 ft. by 9 inches under pipe, plus 20% gives 27 yd³ or *1.4= 38 ton

34) Mound Sand: (note: volume is based on 3:1/4:1 slope from top of rockbed, Exchange sand for loamy cap if desired)

92 17.3 up + 30.6 downslope + 4.4 ends + 24.1 under rock = 120 yd³ or *1.4= 168 ton
plus 20%

35) Loamy Cap:

44 ft. by 85 ft. 6" deep, plus 20% gives 83 yd³ or *1.4= 116 ton

36) Topsoil:

48 ft. by 89 ft. 6" deep, plus 20% gives 94 yd³ or *1.4= 132 ton

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

Designer Signature

Brent D. Matter
Company

2003
License#

04/25/2024
Date

Soil Observation Log

Owner Information

Property Owner / project: Yue-him & Lai-ping Tam

Date 04/25/2024

Property Address / PID: 5940 Zehnder Rd.

Soil Survey Information

☐ refer to attached soil survey

Parent mat'l's: ☒ Till ☐ Outwash ☐ Lacustrine ☐ Alluvium ☐ Organic ☐ Bedrock

landscape position: ☐ Summit ☐ Shoulder ☒ Side slope ☐ Toe slope

soil survey map units: _____ slope 2 % direction- downhill

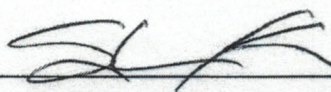
Soil Log #1

Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0-7	Med Sandy Loam	<35	10YR 2/2	None	Friable	Moderate	Granular
7-11	Med Sandy Loam	<35	10YR 4/6	None	Friable	Weak	Granular
11-24	Med Sandy Loam	<35	10YR 3/6	None	Friable	Weak	Granular
24-32	Med Sandy Loam	<35	7.5YR 4/4	7.5YR 5/3 & 5YR 3/4	Friable	Weak	Granular
				S2 Depletions at 24"	loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive

Comments: Soils were very wet below 24" inches.

Steve Kleist

C1641



4-29-24

5940 Zehnder Rd.

Soil Log #2

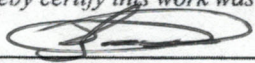
☐ Boring		☒ Pit	Elevation		Depth to SHWT		
934		25"					
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0-10	Med Sandy Loam	<35	10YR 2/2 & 4/3	None	Friable	Moderate	Granular
10-18	Med Sandy Loam	<35	7.5YR 4/3	None	Friable	Weak	Granular
18-25	Med Sandy Loam	<35	7.5YR 4/4	None	Friable	Weak	Granular
25-33	Med Sandy Loam	<35	7.5YR 4/4	5YR 3/4	Friable	Weak	Granular
				S2 Concentratns at 25'	loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive

5940 Zehnder Rd.

Soil Log #3

☐ Boring		☒ Pit	Elevation		932.2	Depth to SHWT		29"
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape	
0-7	Med Sandy Loam	<35	10YR 2/2	None	Friable	Moderate	Granular	
7-14	Med Sandy Loam	<35	10YR 3/6	None	Friable	Weak	Granular	
14-29	Med Sandy Loam	<35	7.5YR 3/4	None	Friable	Weak	Granular	
29-36	Med Sandy Loam	<35	10YR 3/3	7.5YR 5/3	Friable	Weak	Granular	
				S2 Depletions at 29"	loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive	

I hereby certify this work was completed in accordance with MN 7080 and any local req's.

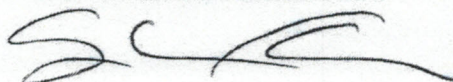

 Designer Signature

 Brent D. Matter
 Company

 2003
 License #

Steve Kleist

C/641



4-29-24

LUG soil verify Signature

+

LUG media elev/depth Signature

= Soil Separation Report

5940 Zehnder Rd.

Soil Log #4

		☐ Boring	☒ Pit	Elevation <u>932.3</u>		Depth to SHWT <u>25"</u>		
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape	
0-10	Med Sandy Loam	<35	10YR 2/2	None	Friable	Moderate	Granular	
10-19	Med Sandy Loam	<35	10YR 4/6	None	Friable	Weak	Granular	
19-25	Med Sandy Loam	<35	10YR 3/3	None	Friable	Weak	Granular	
25-32	Med Sandy Loam	<35	10YR 3/3	7.5YR 5/3	Friable	Weak	Granular	
				S2 Depletions at 25"	loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive	

5940 Zehnder Rd.

Soil Log #5

☐ Boring		☐ Pit	Elevation		Depth to SHWT		
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive

I hereby certify this work was completed in accordance with MN 7080 and any local req's.

Designer Signature

Steve Kleist

4641

Brent D. Matter

Company

SC

2003

License #

4-29-24

INSPECTOR CHECKLIST - mound

☐	5940 Zehnder Road	
☐	WELL setbacks:	20'- 50' to sewer line req's MDH pressure test form (5 psi for 15 min) 50' to everything 100' to drainfield with shallow well
☐	PROPERTY LINES setback:	10' to everything
☐	Road setback:	platted: 10' prop line. Metes & bounds: out of road easement, or outer ditch.
☐	LAKE / BLUFF setback:	20' for bluff. Lakes: GD __, RD __, NE __. Protected wetland __.
☐	Building setbacks:	10' for everything, 20' for dispersal area.
☐	WATER LINE under pressure	10' to bed, tank & sewer line. (else sewer line > 12" below)
 ☐	Sewer line & tank connection (no hard 90's, long sweep 90 or 2-45's, slope minimum 1" in 8' = 1%) (no depth req's, clean out every 100', Sch 40 pipe)	
 ☐	Septic tank and risers (water tight risers, baffles, insulated, proper depth, existing verified by pumping) mfg _____ 2250 gallons Multiple tanks or compartments req'd	
 ☐	Riser over outlet, riser over inlet or center, and 6"+ inspection pipe over any remaining baffles.	
 ☐	No effluent filter & alarm	
 ☐	Dose tank, risers and piping (water tight risers, insulated, proper depth, drainback) mfg _____ 1500 gallons	
 ☐	dose pump _____ 39 gpm 21 head	VERIFY PUMP CURVE
 ☐	verify that installed "vertical lift from pump to laterals"	is no more than design value of 12 feet
 ☐	float setting drop 3.8 inches at 29.4 gpi "DESIGNED"	2.9 inches approx float tether length
	111.0 gal dose divided by _____ gpi "INSTALLED"	= _____ inches float drop (field corrected)
	LABEL pump requirements and drawdown on riser or panel	
 ☐	Cam lock reachable from grade - 30" max. J-hook weep hole. Supply line access (no hard 90's)	
 ☐	2.0 inch supply pipe: Sch40, sloped 1/8"+, supported by 4" sch40 sleeve or compacted, and buried 6"+.	
 ☐	splice box / control panel / electrical connections	
 ☐	flow measurement: CT, ETM, time dosed, home water meter	
 ☐	mound absorption area rough up	
 ☐	mound rock dimensions 8.5 X 70.6	
 ☐	Sand lift depth 12 inches.	(Jar test : 2" sand leaves < 1/8" silt after 30 min)
 ☐	Absorption Sand beyond rock 0.0 upslope	19.6 downslope
 ☐	Bermed topsoil beyond rockbed 8 upslope	9 sideslope 31.2 downslope
 ☐	cover depth of 12-18"+	VERIFY
 ☐	6 laterals (1-2' from edge of rock)	
 ☐	1.50 inch pipe size (Sch40 pipe & fittings)	
 ☐	3.0 ft lateral spacing	
 ☐	7/32 inch perforations	
 ☐	3.0 ft perforation spacing	
 ☐	Air inlet at end of laterals, and at top feed manifold if necessary.	VERIFY
 ☐	clean outs (no hard 90's)	
 ☐	4" inspection pipe to bottom of rock, anchored	VERIFY
 ☐	Abandon existing system - if necessary	☐ Re-use existing tank certification
 ☐	monitoring plan and type	
 ☐	well abandonment form - if necessary	



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 **Yue-him & Lai-ping Tam**

Property Address **5940 Zehnder Road**

Property ID **38.335.000.2060**

System Designer **Brent D. Matter**

Phone **952-250-1649**

System Installer

Phone

Service Provider/Maintainer

Phone

Permitting Authority **City of Sunfish Lake**

Phone

Permit #

Date Inspected

Keep this Management Plan with your *Septic System Owner's Guide*. The *Septic System Owner's Guide* includes a folder designed to hold maintenance records including pumping, inspection and evaluation reports. Ask your septic professional to also:

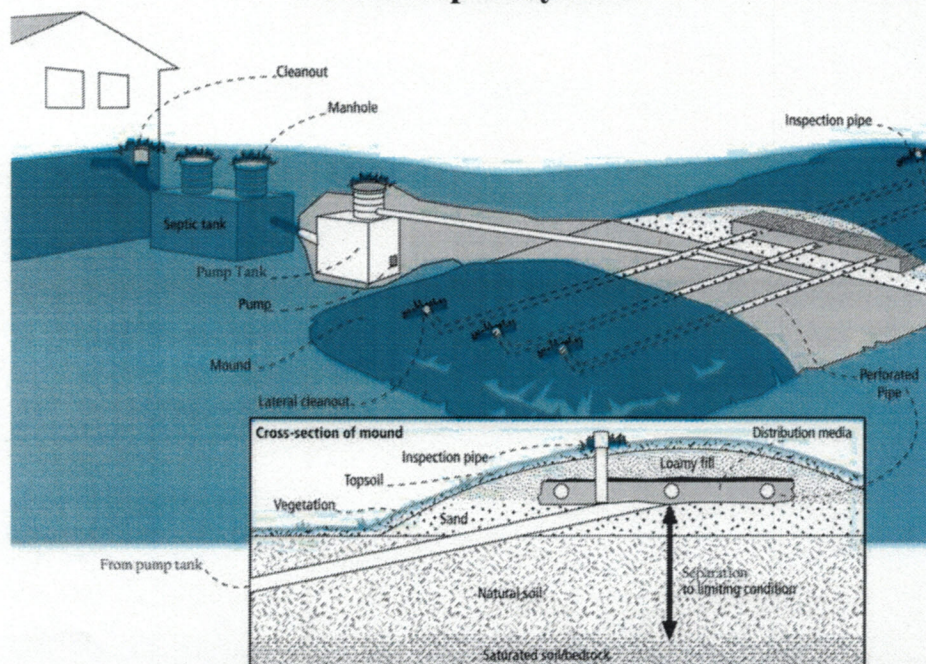
- Attach permit information, designer drawings and as-builts of your system, if they are available.
- Keep copies of all pumping records and other maintenance and repair invoices with this document.
- Review this document with your maintenance professional at each visit; discuss any changes in product use, activities or water-use appliances.

For a copy of the *Septic System Owner's Guide*, call 1-800-876-8636 or go to <http://shop.extension.umn.edu/>

<http://septic.umn.edu>



Your Septic System



Septic System Specifics

System Type: ☐ I ☐ II ☒ III ☐ IV* ☐ V*
(Based on MN Rules Chapter 7080.2200 – 2400)

☐ System is subject to operating permit*

☐ System uses UV disinfection unit*

Type of advanced treatment unit _____

*Additional Management Plan required

Dwelling Type

Number of bedrooms: 4

System capacity/ design flow (gpd): 600

Anticipated average daily flow (gpd): 420

Comments Filter is rec w/ a Maintenance Agreement

Business? No What type? _____

Well Construction

Well depth (ft): 150' plus

☒ Cased well Casing depth: >50'

☐ Other (specify): _____

Distance from septic (ft): _____

Is the well on the design drawing? ☒ Y ☐ N

Septic Tank

☐ One tank Tank volume: _____ gallons

Does tank have two compartments? ☒ Y ☐ N

☒ Two tanks Tank volume: 2250 gallons

☐ Tank is constructed of Concrete

☐ Effluent Screen type: _____

☒ Pump Tank 1500 gallons

☐ Effluent Pump make/model: _____

Pump capacity 39 GPM

TDH 21' Feet of head

☐ Alarm location Basement

Soil Treatment Area (STA)

Mound/At-Grade area (width x length): 48' ft x 89' ft

Rock bed size (width x length): 8.5' ft x 70.6' ft

Location of additional STA: _____

☒ Cleanouts or inspection ports

☒ Surface water diversions

☒ Additional STA not available



Homeowner Management Tasks

These operation and maintenance activities are your responsibility. Use the chart on page 6 to track your activities.

Identify the service intervals recommended by your system designer and your local government. The tank assessment for your system will be the shortest interval of these three intervals. Your pumper/maintainer will determine if your tank needs to be pumped.

System Designer: check every 36 months
Local Government: check every 36 months
State Requirement: check every 36 months

My tank needs to be checked
every 36 months

Seasonally or several times per year

- *Leaks.* Check (listen, look) for leaks in toilets and dripping faucets. Repair leaks promptly.
- *Surfacing sewage.* 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, call your service professional. *Untreated sewage may make humans and animals sick.*
- *Alarms.* Alarms signal when there is a problem; contact your maintainer any time the alarm signals.
- *Lint filter.* If you have a lint filter, check for lint buildup and clean when necessary. Consider adding one after washing machine.
- *Effluent screen.* If you do not have one, consider having one added the next time the tank is cleaned.

Annually

- *Water usage rate.* A water meter 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.
- *Review your water usage rate.* Review the Water Use Appliance chart on Page 5. Discuss any major changes with your pumper/maintainer.

During each visit by a pumper/maintainer

- Ask if your pumper/maintainer is licensed in Minnesota.
- Make sure that your pumper/maintainer services the tank through the manhole. (NOT through a 4" or 6" diameter inspection port.)
- 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. Professionals should refer to the O/M Manual for detailed checklists for tanks, pumps, alarms and other components. Call 800-322-8642 for more details.

- Written record provided to homeowner after each visit.

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 drainfield.)
- *Inspection pipes.* Replace damaged 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 operating properly.
- *Event counter or run time.* Check to see if there is an event counter or run time log for the pump. If there is one, calculate the water usage rate and compare to the anticipated average daily flow listed on Page 2.

Soil Treatment Area

- *Inspection pipes.* Check to make sure they are properly capped. Replace caps that are damaged.
- *Surfacing of effluent.* Check for surfaced effluent or other signs of problems.
- *Lateral flushing.* Check lateral distribution; if cleanouts exist, flush and clean as needed.
- *Ponding.* Check for ponding. Excessive ponding in at-grade and mound beds indicates problems.

All other components – inspect 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 a liquid or easily biodegradable detergents. • Install a lint filter after the washer and an effluent screen on your tank. • Wash only full loads. • Limit use of bleach-based detergents. • Think even – spread your laundry loads throughout the week.
2 nd floor laundry	• The rapid speed of water entering the tank may reduce performance.	• Install an effluent screen in the septic tank to prevent the release of excessive solids to the soil treatment area. • Be sure that you have adequate tank capacity.
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 into a sump pump or directly out of the house. Do not route furnace recharge 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, drintile or old drainfield.
Surface drainage Footing drains	• Water from these sources will likely overload the system.	• 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



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										
Check annually:										
Water usage rate (monitor frequency ____)										
Caps: inspect, replace if needed										
Water use appliances – review use										
Other:										

Notes: _____

Mitigation/corrective action plan: _____

"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 April 30, 2024

Management Plan Prepared By: Brent D. Matter

Certification # 2003

Permitting Authority: City of Sunfish Lake

Owners Septic System Management Plan

Date: 04/25/2024

Property Address: 5940 Zehnder Rd.

Septic Systems can be an expensive investment, good maintenance will ensure they last a lifetime. The purpose of a septic system is to properly "decompose" the pollutants before the water is recycled back into the groundwater. If you're not taking this seriously, ask yourself where your well water comes from.

Your septic design lists all the components of your system and their location. Keep the design, this management plan and the UofM "Septic System Owners Guide" in a safe place for future reference. For a copy of the Owners guide call the University of MN at 1-800-876-8636.

Some of the following tasks you can do yourself, some require a professional, but is it YOUR responsibility to see that it gets done.

Homeowner Tasks

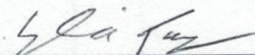
- Do your best to conserve water. Don't overload your septic with multiple large water uses at the same time or on the same day.
- Fix household leaks promptly (leaky toilet, dripping faucets).
- Limit bleach and anti-bacterial products. Use Biodegradable dishwasher detergent.
- Consider a lint filter on your clothes washer.
- Regularly check for wet or spongy soil around your drainfield.
- Have a septic professional check your tanks every 3 years to determine if they need pumping.
- If you have a septic tank filter (effluent filter) clean it on a regular basis (or have a professional do it).
- If a septic alarm goes off, call your septic professional to diagnose the problem.
- Notify the County/City/Township when this management plan is not being met.
- Be aware of and protect your secondary drainfield site.

Professional Tasks

- Disclose the location of the secondary drainfield (if applicable).
- Respond to alarms and diagnose problems as needed.
- Review water use with the owner, check for a "soggy" drainfield.
- Pump the septic tanks as needed and ensure they are in proper working order.
- Verify the pump, dose amount, HI Level Alarm & drainback are all working properly.

"As the owner, I understand it is my responsibility to properly operate and maintain this septic system".

Property Owner Signature: _____



Date

4/30/2024