ENVIRONMENTAL SYSTEMS LLC.

2358 HWY# 23
MORA MN. 55051
Ph. 320-241-7036

07/17/2024

DESIGN

LOCATION: 41936 248th PLACE MCGREGOR MN
PID: 14-0-045901

OWNER: RENEE JOHNSON
MILLE LACS BAND OF OJIBWE

SYSTEM TYPE: TYPE I

DESIGN FLOW: 3 BEDROOM DESIGNED @ 450 GPD

TREATMENT AREA: 380SQ.FT.

SLOPE: 7%

SEPTIC TANK: 2500 GAL. SPLIT/COMBO BROWN WILBERT

PUMP TANK: BROWN -WILBERT 1000 GAL.

PUMP: GOULDS WE511H

FLOW METER: SJE RHOMBUS
MODEL# EZP11W6COH1JV8G10EP17A22C

KEVIN HERWIG M.P.C.A. 3945

CONSTRUCTION NOTES

PRODUCT BRAND & MODEL LISTED IN DESIGN MUST BE USED. BROWN-WILBERT TANKS – SEPTIC 2500 GAL. COMBO WITH POLYLOK PL-122 FILTER AND ALARM, PUMP TANK 1000 GAL. BROWN-WIFLBERT PUMP – GOULDS WE511H ** PUMP CHAMBER AND PUMP SETTINGS WILL NOT BE CORRECT IF OTHER PRODUCTS ARE USED. 2-WAY CLEANOUTS ARE TO BE INSTALLED 1 FOOT OUTSIDE THE HOME

SJE RHOMBUS EZPIIW6COHIJV8GI0EP17A22C CONTROL

IT IS THE DESIGNER'S DISCRETION TO APPROVE OR DISAPPROVE SUBSTITUTIONS.THE INSTALLER WILL BE RESPONSIBLE FOR DESIGN CHANGE FEE.

ALL PRODUCTS AND CONSTRUCTION PRACTICES ARE TO MEET M.P.C.A. 7080 RULE AND MILLE LACS BAND SPECIFICATION FOR SEWAGE TREATMENT SYSTEMS

****A lift pump needs to be installed inside the home and be connected to the sewer mainline on the west side of the home. The existing drain line and septic tank on the east side of the home are to be abandoned.**

***Make sure the water softer is routed outside and not connected to the septic system.**

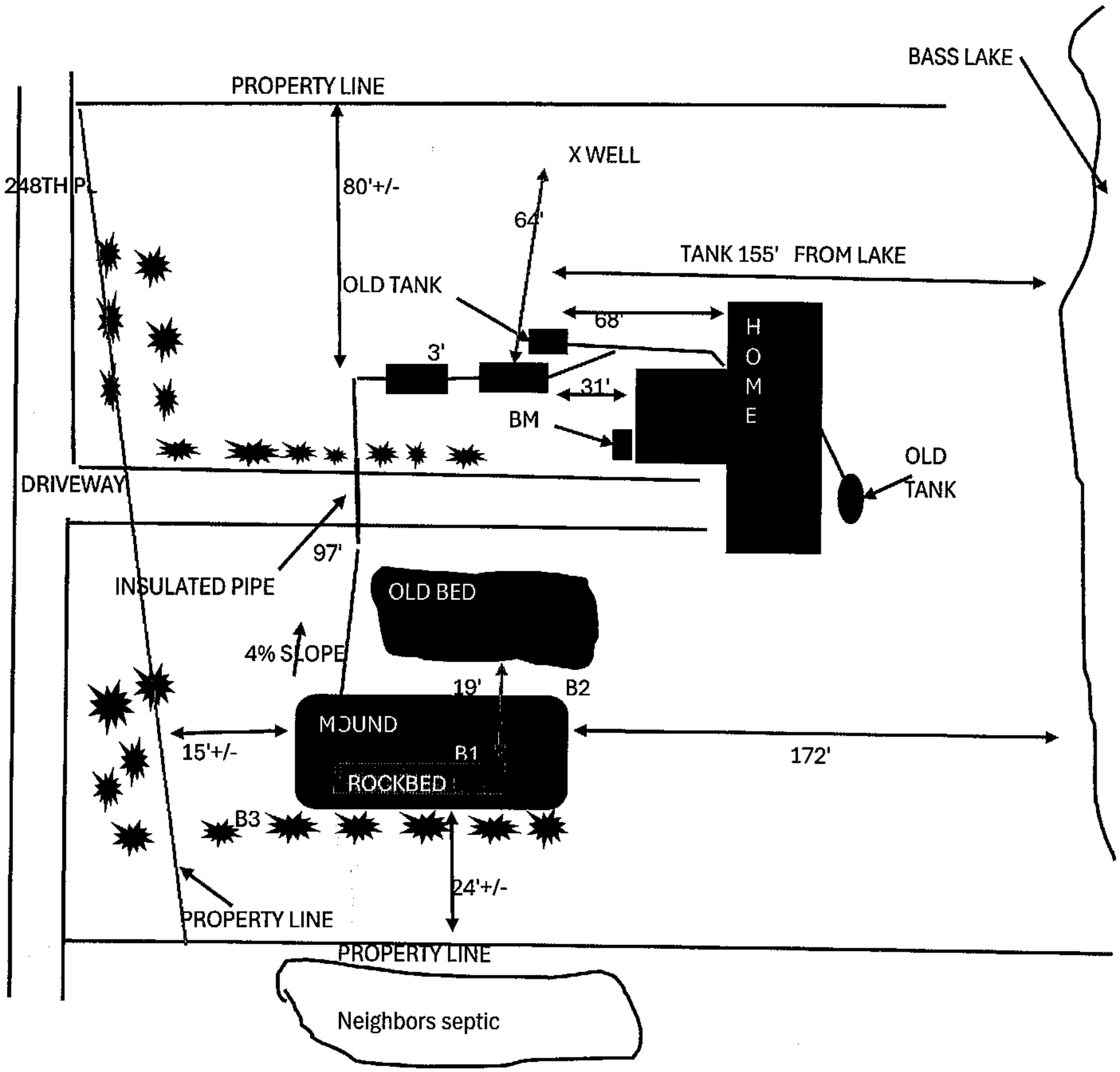
For a length of 20 feet under the driveway crossing a schedule #40 2" insulated pipe is to be used and sleeved with a 8" dual wall corrugated PVC culvert for the 20 foot length of the driveway crossing.

KEVIN HERWIG LIC # 3945

NOT TO SCALE

NORTH

LEGEND: TREES



ELEVATIONS

ROCK BED	NW 102.60	PITS	B1 102.90
	NE 102.70		B2 102.50
	SW 102.60		B3 102.90
	SE 103.00		

Preliminary & Field Evaluation Form

www.SepticResource.com ver

Owner Information

Date	7/17/2024	Sec / Twp / Rng	PID 14-0-045901
Parcel ID	14-0-045901	LUG (county, city, township)	AITKIN COUNTY
Property Owner:	RENEE JOHNSON	Owners address (if different)	
Property Address:	41936 248th PLACE		
City / State / Zip:	MCGREGOR MN. 55760		

Flow Information and Waste Type / Strength

Estimated Design flow: 450

Comments:

Anticipated Waste strength	☐ Hi Strength	☑ Domestic
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	>55'
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

Soil Information

Original soils ☑ Yes ☐ No

Soil logs completed and attached ☑ Yes ☐ No

Soil loading rate (gpd/ft^2) 1.20

Depth/elev to SHWT 36.00

Depth to system bottom maximum (or elev minimum) -24.00

Depth/elev to standing water (if applicable)

Depth/elev to bedrock (if applicable)

Soil Survey information determined (see attachment) ☑ Yes ☐ No

Differences between soil survey and field evaluation (if applicable) COLOR

Evidence of site:

Cut	☐ Yes	☑ No
Filled	☐ Yes	☑ No
Compacted	☐ Yes	☑ No
Disturbed	☐ Yes	☑ No

Perk test completed and attached (if applicable) ☐ Yes ☑ No

Percolation rate (if applicable)

Flooding or run-on potential (comments) ☐ Yes ☑ No

Flood elevation (if applicable)

Elevation of ordinary high water level (if applicable)

Floodplain designation and elev - 100 yr/10 yr (if applicable)

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

Designer Signature

ENVIRONMENTAL SYSTEMS
Company

3945
License #

2011 purple code

Mound Design - Aitkin county

www.SepticResource.com (vers 15.2)

Property Owner: RENEE JOHNSON **Date:** 7/17/2024

Site Address: 41936 248 PL MCGREGOR MN 55760 **PID:** 14-0-045901

Comments:

instructions: [ ] = enter data [ ] = adjust if desired [ ] = computer calculated - DO NOT CHANGE!

1) 3 bedroom Type 1 Residential System

2) 450 GPD design flow

3) No Garbage disposal or pumped to septic

4) 1000 Gal Septic tank (code minimum) 1000 Gal Septic tank (design size / LUG req'd)
Tank options: none

5) 1.2 GPD/ft^2 mound sand loading rate contour loading rate of 12 req's a min 37.5 ft. long rockbed

6) 10.0 ft rockbed width 37.5 ft rockbed length

7) 3.0 ft lateral spacing 3.0 ft perforation spacing (maximum of 3 for both)
end feed manifold connection

8) 3 laterals 35.5 feet long 12.0 perfs / lateral 36 perfs total
(1/2 a perf means the first perf starts at the middle feed manifold)

9) 1/4" inch perfs at 1 feet residual head gives 0.74 gpm flow rate per perforation

for this perf size & spacing, & pipe size on line 12, max perfs/lateral = 25 , line #8 must be less --> OK

10) 4.0 doses per day (4 minimum)

11) 113 gallons per dose (treatment volume)

12) 2.00 inch diameter laterals must be used to meet "4x pipe volume" requirement
2.00 5x

13) 97 feet of 2.0 inch supply line leads to 16 gallons of drainback volume
2.00 3x
(Tip: "top feed" manifold to control the drainback)

14) 129 gallons TOTAL pump out volume (treatment + drainback)

15) 12 feet vertical lift from pump to mound laterals, leads to a:

16) 27 GPM @ 20 feet of head, Pump requirement (note: >50gpm may require an extra 3-6' of head)

17) 500 gal Dose tank (code minimum) 1000 gal Dose tank (design size / LUG req'd) at 24.50 gpi
leads to a

18) 5.3 inch swing on Demand float, or timed dosing of 4.8 min ON (confirm pump rate with drawdown
(this delivers Average flow, =70% of Peak design flow) 9 hrs OFF test and adjust as necessary)

19) 12 inches from bottom of tank to "Pump OFF" float

20) 17 inches from bottom of tank to "Pump ON" float, or 12 inches to "Timer ON" float if time dosed

21) 20 inches from bottom of tank to "Hi Level" float, or 30 inches to "Hi Level" float if time dosed

22) 510 gallons reserve capacity (after High Level Alarm is activated)

23) 1.20 gpd/ft^2 Absorption area Soil Loading Rate, which gives a mound ratio of 1 (minimum)
(this must match the soil boring log) desired mound ratio 1.0

24) 4 percent site slope (0-20% range) 4 (% downslope site slope, if different than upslope)

25) 36 inches, or 3.0 ft. to Redox or other limiting condition (need at least 12" to be a Type I)
Treatment zone contains 12 inches of 0% soil credit, and 24 inches of 50% soil credit. Giving a:

26) 24 inch, or 2.0 ft. Sand Lift Mound **CRITICAL FOR FUTURE CERTIFICATIONS!!!**

27) 10.0 ft. base absorption width (with sand beyond rockbed as follows:)
19.0 greater of: absorption width OR sand slope

28) 4.0 ft. upslope and sideslope sand upslope 5.0
0.0 ft. Downslope sand down slope 9.0

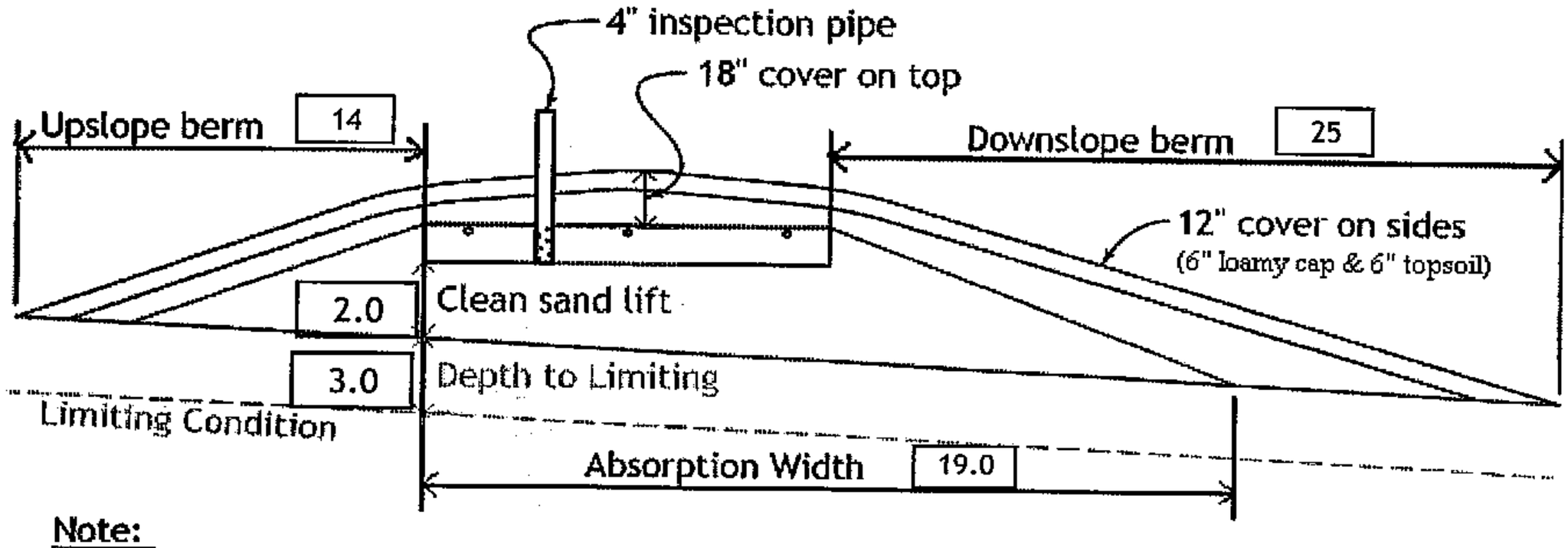
Individual slope ratios give BERM widths (topsoil beyond rockbed) of:

29) 4:1 upslope ratio 14 ft. upslope berm

30) 4:1 sideslope 18 ft. sideslope berms

31) 4:1 downslope 25 ft. downslope berm

32) Overall Dimensions: 10.0 ft. wide by 37.5 ft. long Rock bed
49 ft. wide by 74 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:
10.0 ft. by 37.5 ft. by 6 inches under pipe, plus 20% gives 13 yd^3 or *1.4= 18 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)
37.7 up + 66.7 downslope + 17.1 ends + 30.6 under rock = 183 yd^3 or *1.4= 256 ton
plus 20%

35) Loamy Cap:
45 ft. by 70 ft. 6" deep, plus 20% gives 70 yd^3 or *1.4= 98 ton

36) Topsoil:
49 ft. by 74 ft. 6" deep, plus 20% gives 81 yd^3 or *1.4= 113 ton

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

ENVIRONMENTAL SYSTEMS 3945 7/17/2024

Designer Signature Kevin Berry Company ENVIRONMENTAL SYSTEMS License# 3945 Date 7/19/2024

Installer Summary

1000 gallon Septic tank (minimum) Tank options: none

1000 gallon Dose tank (minimum) at 24.50 gpi

27 GPM @ 20 ft. of head, Pump required
5.3 inch swing on Demand float which translates to roughly 3.7 inches of float tether length
if time dosing is required --> 4.8 minutes ON time & 9 hours OFF time
17 inches from bottom of tank to "pump ON" float, or 12 inches to "timer ON" float
20 inches from bottom of tank to "Hi Level Alarm" or 30 inches to "Hi level alarm" if time dosed

97 ft. of 2.0 inch supply line with end feed manifold connection
(Tip: "top feed" manifold to control drainback)

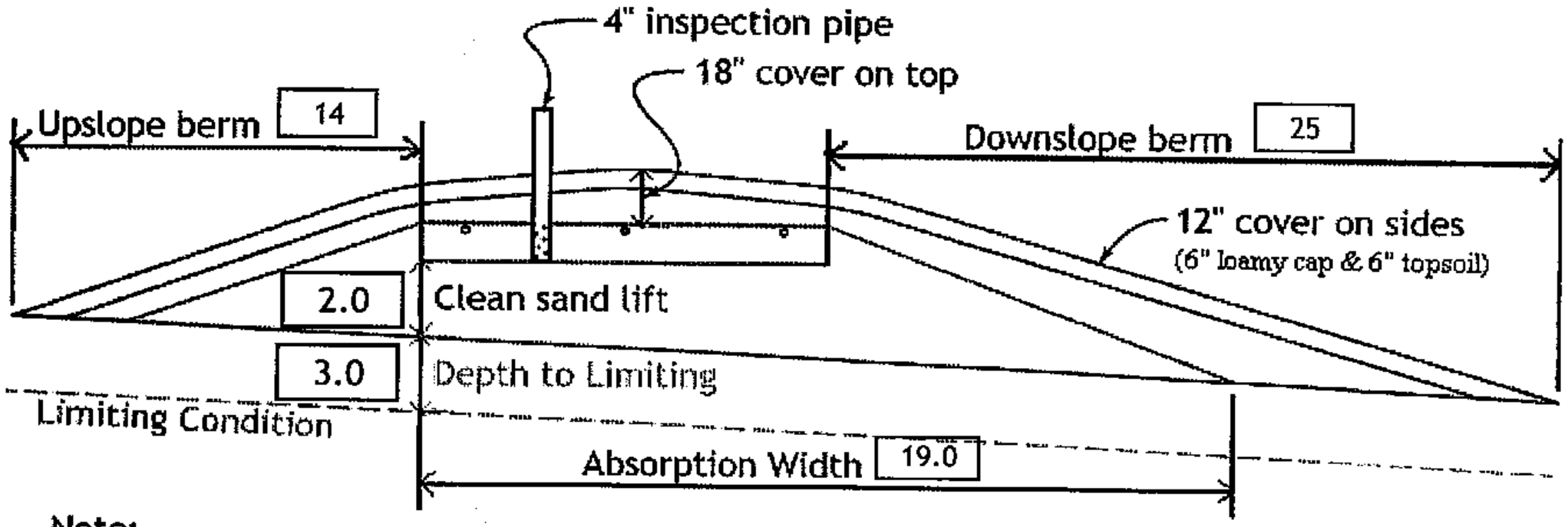
24 inch, or 2.0 ft. Sand Lift Mound
10.0 ft. wide by 37.5 ft. long Rock bed
3 laterals 2.00 inch diameter 35.5 ft. long 3.0 ft. lateral spacing
1/4" inch perfs 3.0 ft. perforation spacing

No Effluent filter & alarm
3 clean out & valve box assemblies

19.0 ft.Total sand ABSORPTION width (minimum)
5.0 ft. upslope and sideslope (sand beyond rockbed, minimum)
9.0 ft. Downslope (sand beyond rockbed, minimum)

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

4:1 upslope ratio 14 ft. upslope berm
4:1 sideslope 18 ft. sideslope berms
4:1 downslope 25 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:	13.0	yd^3 or *1.4=	18	ton
Mound Sand:	183	yd^3 or *1.4=	256	ton

6 inches under pipe
calculation based on 3:1/4:1 slope from top of rockbed

Loamy Cap:	70	yd^3 or *1.4=	98	ton	6" deep
Topsoil:	81	yd^3 or *1.4=	113	ton	6" deep

INSPECTOR CHECKLIST - mound

41936 248 PL MCGREGOR MN 55760

☐ WELL setbacks: 20' to pressure tested sewer line (5 psi for 15 min)
50' to everything 100' to dispersal area 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 se 10' to bed,tank & sewer line. (else sewer line > 12" below, else ok w/pvc)

☐ Sewer line & baffle connection (no 90's, 3' between 45's, slope min 1" in 8', max 2" in 8')
(no depth req's, clean out every 100', Sch 40 pipe)

☐ Septic tank and risers (water tight, insulated, proper depth, existing verified by pumping)
mfg_____ 1000 gallons none

☐ 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, insulated, proper depth, drainback)
mfg_____ 1000 gallons

☐ dose pump _____ 27 gpm 20 head VERIFY PUMP CURVE 4.8 min ON 9 hr OFF

☐ float setting drop 5.3 inches at 24.5 gpi "DESIGNED" 3.7 inches approx float tether length
129.0 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 10.0 X 37.5

☐ Sand lift depth 24 inches. (Jar test : 2" sand leaves < 1/8" silt after 30 min)

☐ Absorption Sand beyond rock 5.0 upslope 9.0 downslope

☐ Bermed topsoil beyond rockbed 14 upslope 18 sideslope 25 downslope

☐ cover depth of 12-18"+ VERIFY

☐ 3 laterals (1-2' from edge of rock)

☐ 2.00 inch pipe size (Sch40 pipe & fittings)

☐ 3.0 ft lateral spacing

☐ 1/4" 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

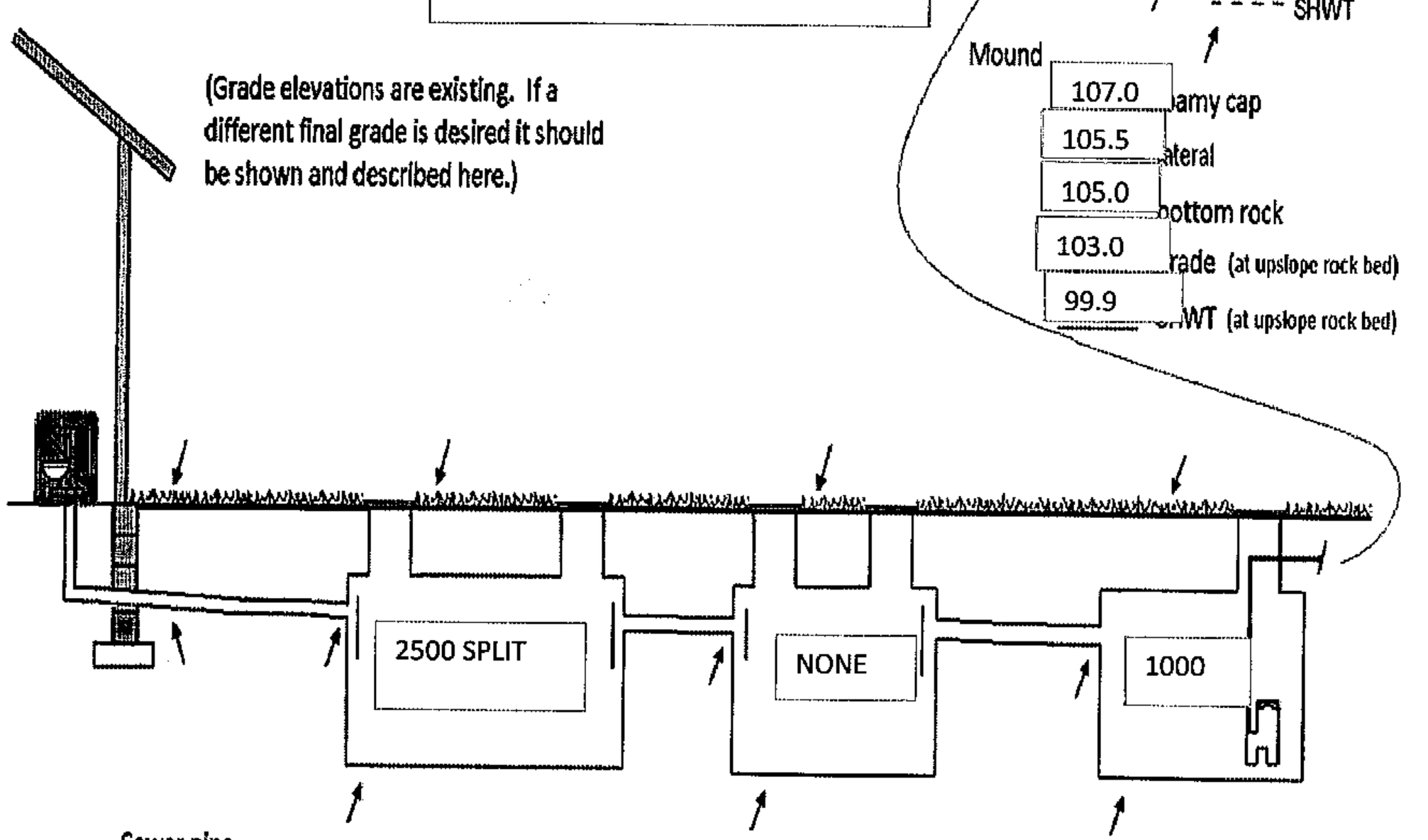
☐ monitoring plan and type _____

☐ well abandonment form - if necessary

☐ Re-use existing tank certification

System Elevations

100.00 benchmark Concrete landing West End of house



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

Sewer pipe exiting house

99.20 Grade

98.6 Pipe

Septic Tank

98.77 Grade

96.70 inlet

94.45 Tank bottom

Septic Tank (if applicable)

_____ Grade

_____ inlet

_____ Tank bottom

Pump Tank

98.75 Grade

96.10 inlet

92.05 Tank bottom

Soil Observation Log

www.SepticResource.com vers 12.4

Owner Information

Property Owner / project: RENEE JOHNSON Date 7/17/2024

Property Address / PID: 41936 248 PL MCGREGOR MN 557

Soil Survey Information

☐ refer to attached soil survey

Parent matl's: ☐ Till ☑ Outwash ☐ Lacustrine ☐ Alluvium ☐ Organic ☐ Bedrock

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

soil survey map units: 564 slope 4 % direction- downhill

Soil Log #1

☐ Boring ☑ Pit Elevation 102.9 Depth to SHWT 99.8

Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0-6	Loamy Sand	<35	10yr3/3		Friable	Weak	Granular
6-18	Loamy Sand	35 - 50	10yr4/4		Friable	Weak	Granular
18-30	Med Sand	35 - 50	10yr4/6		Friable	Weak	Blocky
30-45	Med Sand	35 - 50	10yr5/4	(@38' 10yr5/6	Loose	Loose	Single grain
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive

Comments:

41936 248 PL MCGREGOR MN 55760 — Soil Log #2

☐ Boring ☑ Pit Elevation 102.5 Depth to SHWT 99.5

Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0-10	Loamy Sand	<35	10yr3/3		Friable	Weak	Granular
10-18	Loamy Sand	35 - 50	10yr4/4		Friable	Weak	Granular
18-30	Med Sand	35 - 50	10yr4/6		Friable	Weak	Blocky
30-42	Med Sand	35 - 50	10yr5/4	(@36" 10yr5/6	Loose	Loose	Single grain
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive

41936 248 PL MCGREGOR MN 55760 — Soil Log #3

☐ Boring ☑ Pit Elevation 102.9 Depth to SHWT 99.8

Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0-4	Loamy Sand	>50	10yr3/3		Friable	Weak	Granular
4-12	Loamy Sand	>50	10yr4/3		Friable	Weak	Granular
12-18	Med Sand	35 - 50	10yr4/4		Friable	Weak	Blocky
18-30	Med Sand	35 - 50	10yr4/6		Loose	Loose	Single grain
30-48	Med Sand	35 - 50	10yr5/4	(@ 40" 10yr5/6	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.

Lic # 3945 ENVIRONMENTAL SYSTEMS

Owners Septic System Management Plan

Date: 7/17/2024

Property Address: 41936 248th PL MCGREGOR MN.

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** _____