

Preliminary & Field Evaluation Form

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Owner Information			
Date	<u>7/12/2021</u>	Sec / Twp / Rng	<u>S.18 T.46 R.22</u>
Parcel ID	<u>04-0-027700</u>	LUG (county, city, township)	<u>Aitkin County</u>
Property Owner:	<u>Layne Sprague</u>	Owners address (if different)	
Property Address:	<u>31635 Kestrel Ave.</u>		
City / State / Zip:	<u>McGregor, MN. 55760</u>		

Flow Information and Waste Type / Strength			
Estimated Design flow	<u>450</u>	Anticipated Waste strength	<input type="checkbox"/> Hi Strength <input checked="" type="checkbox"/> Domestic
Comments:		Any Non-Domestic Waste	<input type="checkbox"/> Yes (class V) <input checked="" type="checkbox"/> No
		Sewage ejector/grinder pump	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		Water softener	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		Garbage Disposal	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		Daycare / In home business	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Site Information					
Existing & proposed lot improvements located (see site map)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Well casing depth	<u>180'</u>	
Easements on lot located (see site map)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Drainfield w/in 100' of residential well	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Property lines determined (see site map)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Site w/in 200' of transient noncommunity water supply (TNCWS)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Req'd setbacks determined (see site map)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Site w/in an inner wellhead mgmt zone (CWS/NTNCWS)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Utilities located & identified (gopher state one call)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Buried water supply pipe w/in 50' of system	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Access for system maintenance (shown on site map)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Site located in Shoreland (w/in 1000' of lake, 300' of river)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Soil treatment area protected	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Site map prepared with previous items included	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Construction related issues	<hr/> <hr/>				

Mound Design - Aitkin county

Property Owner: Layne Sprague

Date: 7/12/2021

Site Address: 31635 Kestrel Ave.

PID: 04-0-027700

Comments: Recommend 3' sand lift mound.

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: Effluent filter & alarm req'd
- 5) 1.2 GPD/ft² 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 = 16, line #8 must be less --> OK
- 10) 4.0 doses per day (4 minimum)
- 11) 113 gallons per dose (treatment volume) 2.00 5x
- 12) 1.50 inch diameter laterals must be used to meet "4x pipe volume" requirement 2.00 3x
- 13) 30 feet of 2.0 inch supply line leads to 5 gallons of drainback volume
(Tip: "top feed" manifold to control the drainback)
- 14) 118 gallons TOTAL pump out volume (treatment + drainback)
- 15) 9 feet vertical lift from pump to mound laterals, leads to a:
- 16) 27 GPM @ 15 feet of head, Pump requirement (note: >50gpm may require an extra 3-6' of head)
- 17) 500 gal Dose tank (code minimum) 500 gal Dose tank (design size / LUG req'd) at 14.00 gpi
leads to a
- 18) 8.4 inch swing on Demand float, or timed dosing of 4.4 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) 20 inches from bottom of tank to "Pump ON" float, or 12 inches to "Timer ON" float if time dosed
- 21) 23 inches from bottom of tank to "Hi Level" float, or 33 inches to "Hi Level" float if time dosed
- 22) 178 gallons reserve capacity (after High Level Alarm is activated)

23) **0.78** gpd/ft² Absorption area Soil Loading Rate, which gives a mound ratio of **1.5** (minimum)
 (this must match the soil boring log) desired mound ratio **1.5**

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

25) **6** inches, or **0.5** 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) **30** inch, or **2.5** ft. Sand Lift Mound **CRITICAL FOR FUTURE CERTIFICATIONS!!!**

27) **15.0** ft. base absorption width (with sand beyond rockbed as follows:)

39.0 greater of: absorption width OR sand slope

28) **0.0** ft. upslope and sideslope sand upslope **13.0**
5.0 ft. Downslope sand down slope **16.1**

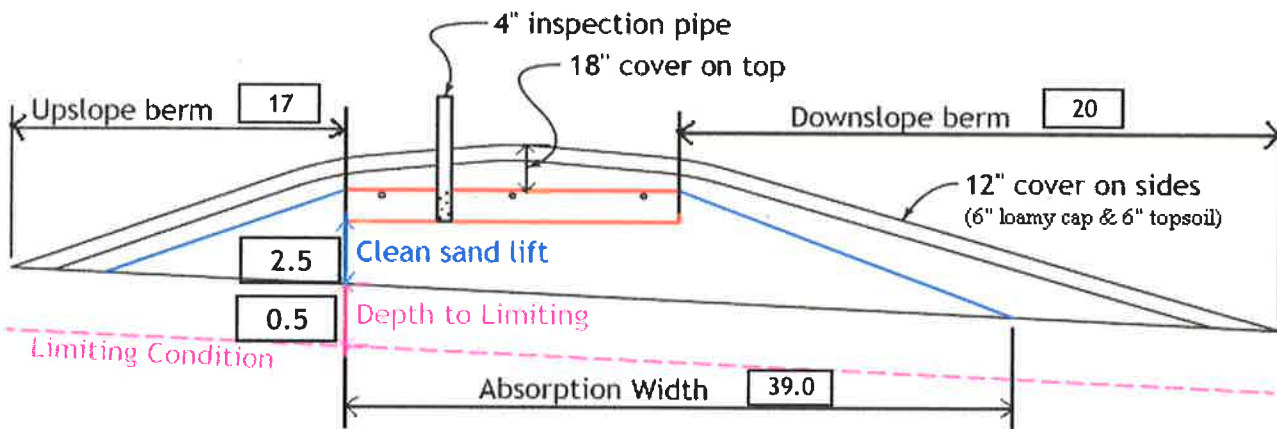
Individual slope ratios give BERM widths (topsoil beyond rockbed) of:

29) **4:1** upslope ratio **17** ft. upslope berm

30) **4:1** sideslope **19** ft. sideslope berms

31) **4:1** downslope **20** ft. downslope berm

32) Overall Dimensions: **10.0** ft. wide by **37.5** ft. long Rock bed
47 ft. wide by **76** 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** yd³ 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)
56.7 up + **74.4** downslope + **20.3** ends + **36.1** under rock = **225** yd³ or *1.4= **315** ton
 plus 20%

35) Loamy Cap:
43 ft. by **72** ft. 6" deep, plus 20% gives **69** yd³ or *1.4= **97** ton

36) Topsoil:
47 ft. by **76** ft. 6" deep, plus 20% gives **79** yd³ or *1.4= **111** ton

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

Rogan Alford
 Designer Signature

R.H. Inspection & Design
 Company

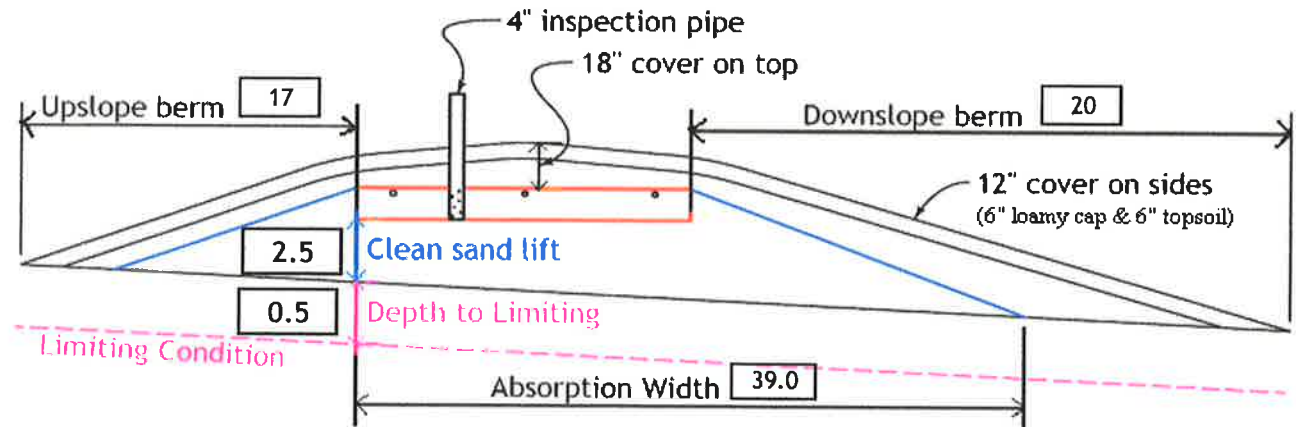
3847
 License#

7/12/2021
 Date

Installer Summary

- 1000 gallon Septic tank (minimum) Tank options: Effluent filter & alarm req'd
- 500 gallon Dose tank (minimum) at 14.00 gpi
- 27 GPM @ 15 ft. of head, Pump required
- 8.4 inch swing on Demand float which translates to roughly 5.2 inches of float tether length
if time dosing is required --> 4.4 minutes ON time & 9 hours OFF time
- 20 inches from bottom of tank to "pump ON" float, or 12 inches to "timer ON" float
- 23 inches from bottom of tank to "Hi Level Alarm" or 33 inches to "Hi level alarm" if time dosed
- 30 ft. of 2.0 inch supply line with end feed manifold connection
(Tip: "top feed" manifold to control drainback)
- 30 inch, or 2.5 ft. Sand Lift Mound
- 10.0 ft. wide by 37.5 ft. long Rock bed
- 3 laterals 1.50 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
- 39.0 ft. Total sand ABSORPTION width (minimum)
 - 13.0 ft. upslope and sideslope (sand beyond rockbed, minimum)
 - 16.1 ft. Downslope (sand beyond rockbed, minimum)
- Specific slope ratios give BERM widths (topsoil beyond rockbed) of:

4:1 upslope ratio	17 ft. upslope berm
4:1 sideslope	19 ft. sideslope berms
4:1 downslope	20 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	6 inches under pipe
Mound Sand:	225 yd ³ or *1.4=	315 ton	calculation based on 3:1/4:1 slope from top of rockbed
Loamy Cap:	69 yd ³ or *1.4=	97 ton	6" deep
Topsoil:	79 yd ³ or *1.4=	111 ton	6" deep

INSPECTOR CHECKLIST - mound

31635 Kestrel Ave.

- 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 set 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 Effluent filter & alarm 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, insulated, proper depth, drainback)
mfg _____ 500 gallons

- dose pump _____ 27 gpm 15 head VERIFY PUMP CURVE 4.4 min ON 9 hr OFF

- float setting drop 8.4 inches at 14.0 gpi "DESIGNED" 5.2 inches approx float tether length
118.0 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 30 inches. (Jar test : 2" sand leaves < 1/8" silt after 30 min)

- Absorption Sand beyond rock 13.0 upslope 16.1 downslope

- Bermed topsoil beyond rockbed 17 upslope 19 sideslope 20 downslope

- cover depth of 12-18"+ VERIFY
- 3 laterals (1-2' from edge of rock)
- 1.50 inch pipe size (Sch40 pipe & fittings)
- 3.0 ft lateral spacing

- 1/4" inch perforations
- 3.0 ft perforation spacing

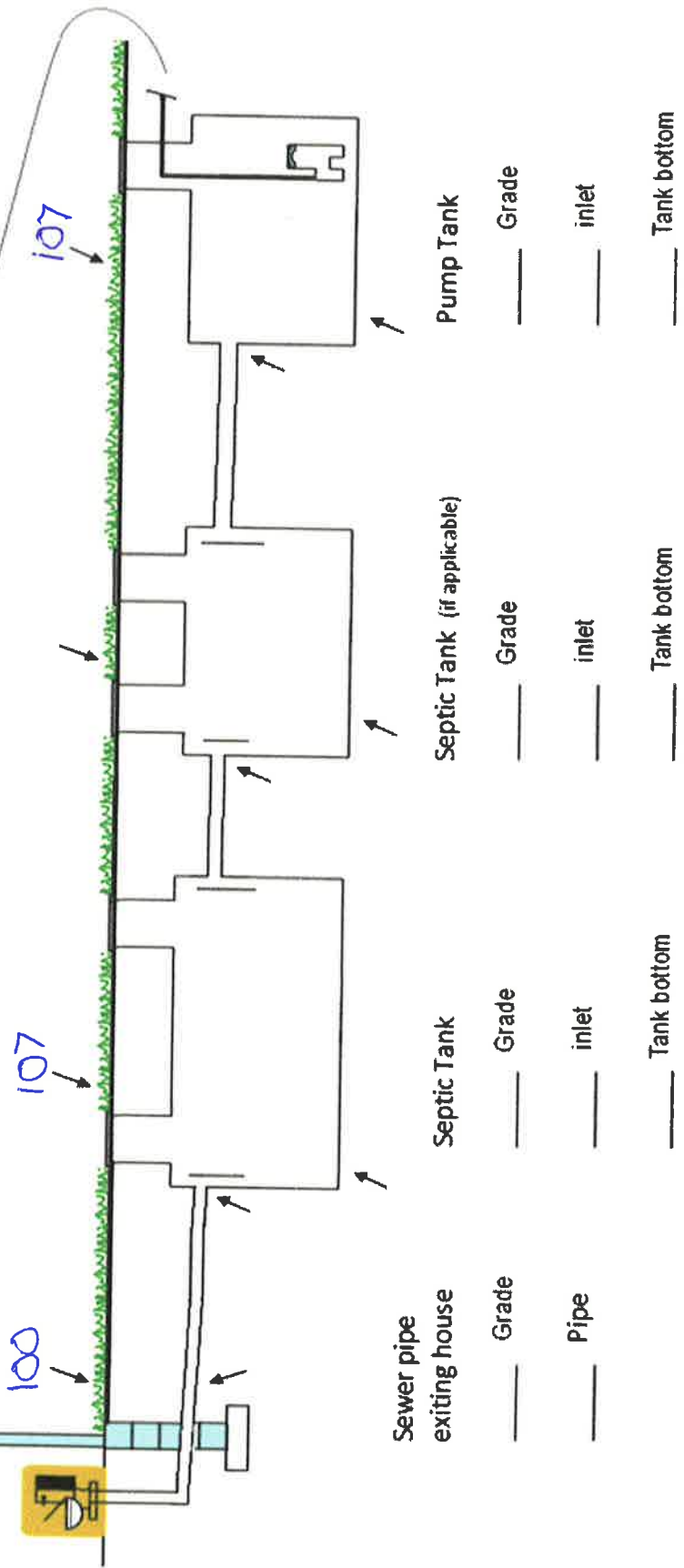
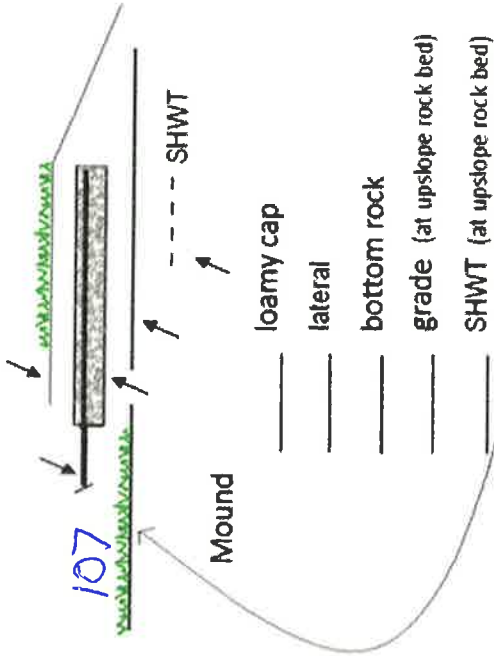
- Air inlet at end of laterals, and at top feed manifold if necessary. VERIFY
- clean outs (no hard 90's)
- 4" inspection pipe to bottom of rock, anchored VERIFY

- Abandon existing system - if necessary Re-use existing tank certification
- monitoring plan and type _____
- well abandonment form - if necessary

System Elevations

_____ benchmark

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



Soil Observation Log

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Owner Information	
Property Owner / project: <u>Layne Sprague</u>	Date <u>7/12/2021</u>
Property Address / PID: <u>31635 Kestrel Ave.</u>	

Soil Survey Information	
<input type="checkbox"/> refer to attached soil survey	
Parent mat'l's:	<input checked="" type="checkbox"/> Till <input type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input type="checkbox"/> Alluvium <input type="checkbox"/> Organic <input type="checkbox"/> Bedrock
landscape position:	<input type="checkbox"/> Summit <input type="checkbox"/> Shoulder <input checked="" type="checkbox"/> Side slope <input type="checkbox"/> Toe slope
soil survey map units:	_____ slope <u>2</u> % direction- <u>downhill</u>

Soil Log #1							
<input checked="" type="checkbox"/> Boring <input type="checkbox"/> Pit		Elevation _____		Depth to SHWT <u>6"</u>			
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0-6	Topsoil	<35	5YR3/3		Friable	Weak	Blocky
6+	Sandy Loam	<35	7.5YR4/6	7.5YR5/8	Loose	Weak	Granular
		<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
Comments:							


31635 Kestrel Ave. **Soil Log #2**

<input checked="" type="checkbox"/> Boring <input type="checkbox"/> Pit		Elevation _____		Depth to SHWT <u>6"</u>			
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0-6	Topsoil	<35	5YR3/3		Friable	Weak	Blocky
6+	Sandy Loam	<35	7.5YR4/6	7.5YR5/8	Loose	Weak	Granular
		<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

31635 Kestrel Ave. **Soil Log #3**

<input checked="" type="checkbox"/> Boring <input type="checkbox"/> Pit		Elevation _____		Depth to SHWT _____			
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0-6	Topsoil	<35	5YR3/3		Friable	Weak	Blocky
6+	Sandy Loam	<35	7.5YR4/6	7.5YR5/8	Loose	Weak	Granular
		<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

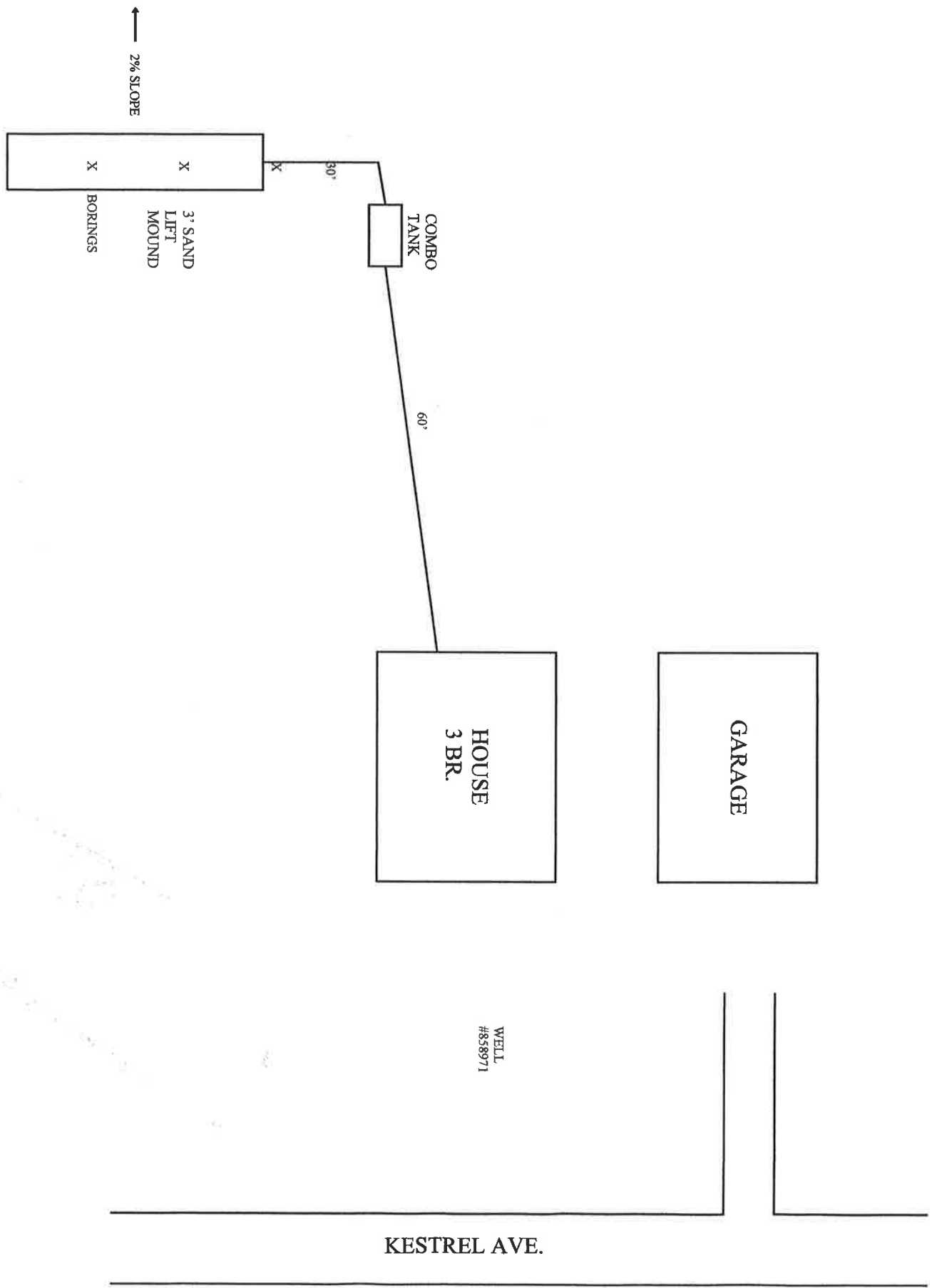
R.H. Inspection & Design

 Company

3847

 License #

31635 KESTREL AVE.
MCGREGOR, MN. 55760



← 2% SLOPE