

Mound Design - Aitkin county

Property Owner: Barry and Nichol Arcand

Date: 12/15/2023

Site Address: hwy 200(100ft past mm 189)

PID: 02-0-013800

Comments: no adress numbers at this time (100ft past mm 189 on north side of hwy 1st rd on left)

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) 1500 Gal Septic tank (code minimum) 1000 Gal Septic tank (design size / LUG req'd)
Tank options: none
- 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 2.5 ft perforation spacing (maximum of 3 for both)
end feed manifold connection
- 8) 3 laterals 35.5 feet long 15.0 perfs / lateral 45 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 = 28, 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) 40 feet of 2.0 inch supply line leads to 7 gallons of drainback volume 2.00 3x
(Tip: "top feed" manifold to control the drainback)
- 14) 120 gallons TOTAL pump out volume (treatment + drainback)
- 15) 8 feet vertical lift from pump to mound laterals, leads to a:
- 16) 34 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 11.60 gpi
leads to a
- 18) 10.3 inch swing on Demand float, or timed dosing of 3.5 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) 22 inches from bottom of tank to "Pump ON" float, or 12 inches to "Timer ON" float if time dosed
- 21) 25 inches from bottom of tank to "Hi Level" float, or 35 inches to "Hi Level" float if time dosed

22) 210 gallons reserve capacity (after High Level Alarm is activated)

23) 1.60 gpd/ft² Absorption area Soil Loading Rate, which gives a mound ratio of (minimum) 0.0 (this must match the soil boring log) desired mound ratio

24) 0 percent site slope (0-20% range) 0 (% 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 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) 10.0 ft. base absorption width (with sand beyond rockbed as follows:)

26.0 greater of: absorption width OR sand slope

28) 0.0 ft. upslope and sideslope

sand upslope 8.0

0.0 ft. Downslope

sand down slope 8.0

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

29) 4:1 upslope ratio 12 ft. upslope berm

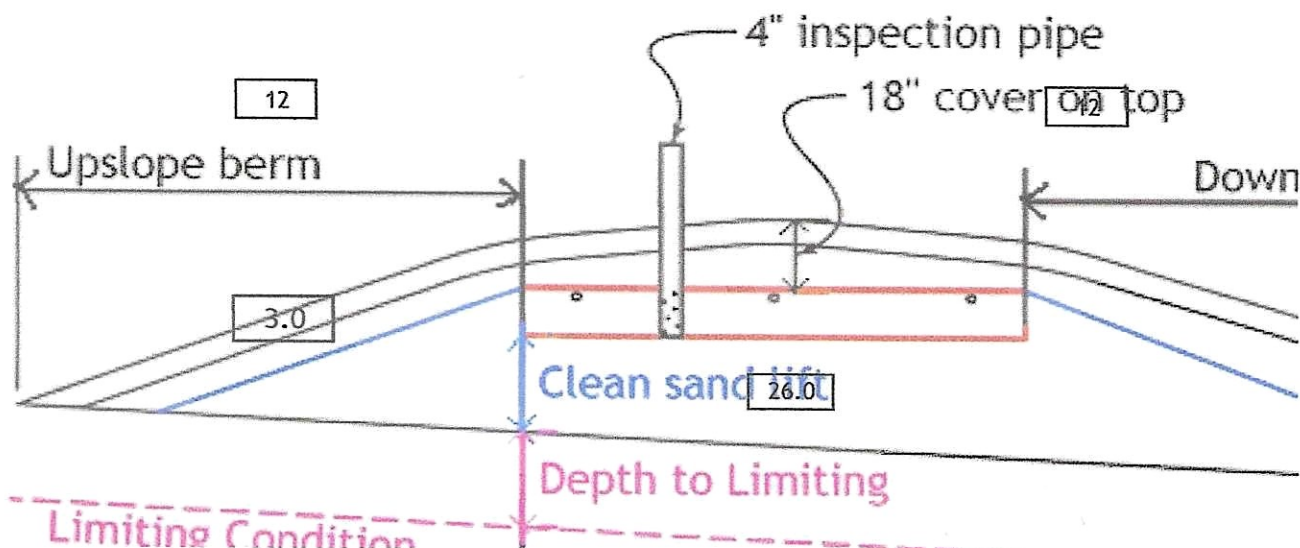
30) 4:1 sideslope 12 ft. sideslope berms

31) 4:1 downslope 12 ft. downslope berm

32) Overall Dimensions:

10.0 ft. wide by 37.5 ft. long Rock bed

34 ft. wide by 62 ft. long Mound footprint



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)

15.9 up + 15.9 downslope + 5.9 ends + 13.9 under rock = 62 yd³ or *1.4= 87 ton plus 20%

35) Loamy Cap:

30 ft. by 58 ft. 6" deep, plus 20% gives 39 yd³ or *1.4= 55 ton

36) Topsoil:

34 ft. by 62 ft. 6" deep, plus 20% gives 47 yd³ or *1.4= 66 ton

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

LARRY HOLMQUIST
Designer Signature

HOLMQUIST EXCAVATING
Company

L1016
License#

12/15/2023
Date

Installer Summary

1000 gallon Septic tank (minimum)

Tank options: none

500 gallon Dose tank (minimum)

at 11.60 gpi

34 GPM @ 15 ft. of head, Pump required

10.3 inch swing on Demand float which translates to roughly 6.2 inches of float tether length

if time dosing is required --> 3.5 minutes ON time & 9 hours OFF time

22 inches from bottom of tank to "pump ON" float, or 12 inches to "timer ON" float

25 inches from bottom of tank to "Hi Level Alarm" or 35 inches to "Hi level alarm" if time dosed

40 ft. of 2.0 inch supply line with end feed manifold connection

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

12 inch, or 1.0 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 2.5 ft. perforation spacing

No Effluent filter & alarm

3 clean out & valve box assemblies

26.0 ft. Total sand ABSORPTION width (minimum)

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

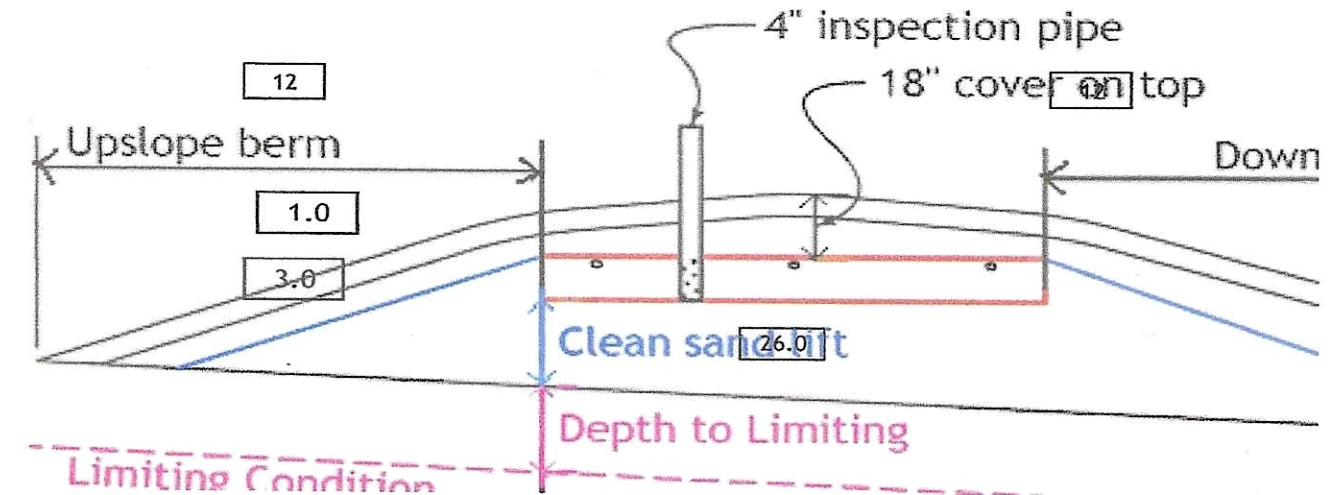
8.0 ft. Downslope (sand beyond rockbed, minimum)

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

4:1 upslope ratio 12 ft. upslope berm

4:1 sideslope 12 ft. sideslope berms

4:1 downslope 12 ft. downslope berm



Rock Bed:	13.0 yd ³ or *1.4=	18 ton
Mound Sand:	62 yd ³ or *1.4=	87 ton
Loamy Cap:	39 yd ³ or *1.4=	55 ton
Topsoil:	47 yd ³ or *1.4=	66 ton

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

INSPECTOR CHECKLIST - mound

hwy 200(100ft past mm 189)

- 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 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 _____ 500 gallons

- dose pump _____ 34 gpm 15 head VERIFY PUMP CURVE 3.5 min ON 9 hr OFF

- float setting drop $\frac{10.3}{120.0}$ inches at $\frac{11.6}{}$ gpi "DESIGNED" $\frac{6.2}{}$ inches approx float tether length
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 $\frac{10.0}{}$ X $\frac{37.5}{}$
- Sand lift depth $\frac{12}{}$ inches. (Jar test : 2" sand leaves < 1/8" silt after 30 min)

- Absorption Sand beyond rock $\frac{8.0}{}$ upslope $\frac{8.0}{}$ downslope

- Bermed topsoil beyond rockbed $\frac{12}{}$ upslope $\frac{12}{}$ sideslope $\frac{12}{}$ downslope

- cover depth of 12-18"+ VERIFY
- $\frac{3}{}$ laterals (1-2' from edge of rock)
- $\frac{2.00}{}$ inch pipe size (Sch40 pipe & fittings)
- $\frac{3.0}{}$ ft lateral spacing

- $\frac{1/4"}{}$ inch perforations
- $\frac{2.5}{}$ 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 _____



k bed
k bed

