Becker County Planning & Zoning
915 Lake Ave
Detroit Lakes, MN 56501
(218) 846-7314
www.co.becker.mn.us

140148000-2024

Certificate of Compliance

Inspection Report - Permit #: SS2024-2138

Owner & Property Information

Owner Name:	DOUGLAS K & LAURI ASKELSON
Mailing Address:	DOUGLAS K & LAURI ASKELSON 17170 220TH ST AUDUBON MN 56511
Parcel #:	140148000
Secondary Parcel #:	

Site Address:	17170 220TH ST
Township - Sec/Twp/Rng:	HAMDEN - 31/140/042
Legal Description:	S1/2 OF SW1/4
Designer:	Crescent Septic Services LLC L4224 (Peter Johnson)
Installer:	Boit Excavating, L559 (Todd Boit)

Inspector Verified Specifications

Insp- Effluent Screen Installed:	No
Insp- Alarm Required:	Yes
Insp- Lift Pump in System:	Yes
Insp- Number of Bedrooms:	3

Insp- Tank Nbr/Size:	0/1000/500
Insp- Drainfield Type:	Mound
Insp- Drainfield Size:	10X38 ROCK BED
Insp- Soil Verification:	#1:see attached #2:N/A #3:N/A

Inspector Verified Setbacks

Insp- Tank Dist to Road	EXISTING
Insp- Tank Dist to Nearest Prop Line	EXISTING
Insp- Tank Dist to Nearest Structure	EXISTING
Insp- Tank Dist to Well	EXISTING
Insp- Tank Dist to OHW	EXISTING
Insp- Tank Dist to Pond/Wetland	EXISTING
Insp- Tank Dist to Pressure Line	EXISTING

Insp- Drainfield Dist to Road	10+
Insp- Drainfield Dist to Nearest Prop Line	10+
Insp- Drainfield Dist to Nearest Structure	20+
Insp- Drainfield Dist to Well	50+
Insp- Drainfield Dist to OHW	150+
Insp- Drainfield Dist to Pond/Wetland	50
Insp- Drainfield Dist to Pressure Line	NA

Certificate of Compliance

(Yes) Certificate is hereby granted based upon the application, addendum from, plans, specifications and all other supporting data. With proper maintenance, this system can be expected to function satisfactory, however this is not a guarantee.

Certification Date: 09/04/2024

Zoning Office Signature:

Jeff Rusness - ISTS Inspector

*** Certificate of Compliance is not valid unless signed by a Registered Qualified Employee ***

Field Review Form

Permit # SS2024-2138

Property and Owner

Owner: **DOUGLAS K & LAURI ASKELSON**	Parcel Number: **140148000**
Site Address: **17170 220TH ST**	Secondary Parcel:

Home Information

Does the structure contain any of the following elements?	Designer submitted	Inspector verified
	Garbage disposal: No Dishwasher: Grinder pump: Lift pump in bsmt:	Garbage disposal? Y (N) Dishwasher? (Y) N Grinder pump? Y (N/A) Lift pump in basement? Y (N)
Number of bedrooms: **3**	Review - Number of bedrooms: 3	
Effluent screen	Effluent screen installed? Y (N) Mfr:	
Alarm: **No** Type: **unknown**	Review - Alarm? Y N Type & Mfr: EXISTING	
Lift pump in system: **Yes**	Review - Lift pump in system? Y N Mfr: EXISTING	

Component Information

Tank size: **1000/500**	Review - Tank nbr: size: EXISTING
Drainfield type: **Mound**	Review - Drainfield type: MOUND
Drainfield size: Full size - **380** Reduced/warr. size -	Review - Drainfield status: none / ~~Installed~~ / next spring Review - Drainfield size: 10 X ~~38~~ Rock Bed
Absorption area size: **9"**	Review - Absorption area size:
Chamber type/num: Trench sqft/chamber -	Review - Chamber type: NP ~~Num~~: Review - Trench sqft/chamber:
Drainfield rock depth: **9"**	Review - Rock depth: 9 IN

Soil Verification

Vertical separation verified See attached.	Boring #1: Boring #2: Boring #3:

Setback Verification

Distance to...	Designer submitted		Inspector verified	
	Tank	Drainfield	Tank	Drainfield
Road	166	182	EXISTING	10
Nearest prop line	860	830		10
Nearest structure	53	78		20
Well	178	190		50
OHW	563	533		150
Pond/Wetland				50
Pressure line	90	135		NA

Date System Installed: 6.30.2024 Installer: Boitet Inspector:

ONSITE SEWAGE TREATMENT PROGRAM

Preliminary Evaluation Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. Contact Information

v 03.15.2023

Property Owner/Client: Doug and Lauri Askelson | Date Completed: 8/16/2024

Site Address: 17170 220th St Audubon, MN 56511 | Project ID:

Email: | Phone: 701-200-6082

Mailing Address: 26838 COUNTY HIGHWAY 1 | Alt Phone:

Legal Description: S1/2 OF SW1/4

Parcel ID: 140148000 | SEC: 31 | TWP: 140 | RNG: 042

2. Flow and General System Information

A. Client-Provided Information

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

Project Use: ☑ Residential ☐ Other Establishment:

Residential use: # Bedrooms: 3 | Dwelling sq.ft.: | Unfinished sq.ft.:

Adults: | # Children: | # Teenagers:

In-home business (Y/N): | If yes, describe:

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

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

* Clear water source - should not go into system

Additional current or future uses:

Anticipated non-domestic waste:

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

B. Designer-determined Flow and Anticipated Waste Strength Information

Attach additional information as necessary.

Design Flow: 450 GPD | Anticipated Waste Type: Residential

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

3. Preliminary Site Information

A. Water Supply Wells

#	Description	Mn. ID#	Well Depth (ft.)	Casing Depth (ft.)	Confining Layer	STA Setback	Source
1	Deep Well	825878	81	77	unk	50	MDH
2							
3							
4							

Additional Well Information:

University of Minnesota Onsite Sewage Treatment Program

Preliminary Evaluation Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

Site within 200' of noncommunity transient well (Y/N)	No	Yes, source:
Site within a drinking water supply management area (Y/N)	No	Yes, source:
Site in Well Head Protection inner wellhead management zone (Y/N)	No	Yes, source:
Buried water supply pipes within 50 ft of proposed system (Y/N)	No	

B. Site located in a shoreland district/area? No — Yes, name: N/A

Elevation of ordinary high water level: N/A ft — Source: N/A

Classification: N/A — Tank Setback: N/A ft. — STA Setback: N/A ft.

C. Site located in a floodplain? No — Yes, Type(s): N/A

Floodplain designation/elevation (10 Year): N/A ft — Source: N/A

Floodplain designation/elevation (100 Year): N/A ft — Source: N/A

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

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

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

Map Units: J119D — Slope Range: 3-15 %

List landforms: Groumd moraines

Landform position(s): Back/ Side Slope

Parent materials: Till

Depth to Bedrock/Restrictive Feature: >80 in — Depth to Watertable: 59-75 in

Map Unit Ratings

Septic Tank Absorption Field- At-grade:	Extremely Limited
Septic Tank Absorption Field- Mound:	Extremely Limited
Septic Tank Absorption Field- Trench:	Moderately Limited

5. Local Government Unit Information

Name of LGU: Becker County Planning and Zoning

LGU Contact: Kyle Vareberg

LGU-specific setbacks:

LGU-specific design requirements:

LGU-specific installation requirements:

Notes:

ONSITE SEWAGE TREATMENT PROGRAM

Field Evaluation Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. Project Information

v 03.15.2023

Property Owner/Client: Doug and Lauri Askelson | Project ID:

Site Address: 17170 220th St Audubon, MN 56511 | Date Completed: 6/26/2024

2. Utility and Structure Information

Utility Locations Identified ☐ Gopher State One Call # | ☐ Any Private Utilities:

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

3. Site Information

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

Percent slope: 10 % | Slope shape: Linear, Linear | Slope direction: southwest

Describe the flooding or run-on potential of site: none

Describe the need for Type III or Type IV system:

Note:

Proposed soil treatment area protected? (Y/N): No | If yes, describe: flagged

4. General Soils Information

Filled, Compacted, Disturbed areas (Y/N): No

If yes, describe:

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

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

Number of soil observations: 3 | Soil observation logs attached (Y/N): Yes

Percolation tests performed & attached (Y/N): No

5. Phase I. Reporting Information

	Depth		Elevation	
Limiting Condition*:	28	in	**95.1**	ft
Periodically saturated soil:	28	in	95.1	ft
Standing water:		in		ft
Bedrock:		in		ft
Benchmark Elevation:	100.0	ft		

*Most Restrictive Depth Identified from List Below

Soil Texture: Clay Loam

Percolation Rate: min/inch

Soil Hyd Loading Rate: 0.45 gpd/sq.ft

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

Benchmark Elevation Location: nail in tree, center of east side of STA

Differences between soil survey and field evaluation: similar

Site evaluation issues / comments: none

Anticipated construction issues: none

University of Minnesota Onsite Sewage Treatment Program

Soil Observation Log

Project ID:

v 03.15.2023

Client:	Doug and Lauri Askelson			Location / Address:	17170 220th St Audubon, MN 56511
Soil parent material(s): (Check all that apply)	☐ Outwash ☐ Lacustrine ☐ Loess ☑ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter ☐ Disturbed/Fill				
Landscape Position:	Back/Side Slope	Slope %: 10.0	Slope shape:	Linear, Linear	Flooding/Run-On potential: No
Vegetation:	Forest	Soil survey map units:	J119D		Surface Elevation-Relative to benchmark: 98.4
Date/Time of Day/Weather Conditions:	8/19/2024	noon	sunny clear		Limiting Layer Elevation: 95.2
Observation #/Location:	1	NE Corner of STA		Observation Type:	Auger

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure Shape	Structure Grade	Structure Consistence
0-13	Medium Sandy Loam	0	10YR 2/2				Blocky	Moderate	Friable
13-22	Clay Loam	0	10YR 3/2				Blocky	Moderate	Friable
22-28	Clay Loam	0	10YR 3/3				Blocky	Moderate	Friable
28-38	Clay Loam	0	10YR 5/4	10YR 6/4 10YR 7/3			Blocky	Moderate	Friable
38	Clay Loam	0	10YR 5/4 10YR 3/2	10YR 6/2 10YR 6/4	Depletions		Blocky	Moderate	Friable
				10YR 5/6 10YR 7/3	Concentrations				

Comments: 38" numerous colors

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

Peter Johnson	Peter Johnson	L4224	8/19/2024
(Designer/Inspector)	(Signature)	(License #)	(Date)

Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

(LGU/Designer/Inspector)	(Signature)	(Cert #)	(Date)

University of Minnesota Onsite Sewage Treatment Program

Soil Observation Log

Project ID:

v 03.15.2023

Client:	Doug and Lauri Askelson	Location / Address:	17170 220th St Audubon, MN 56511

Soil parent material(s): (Check all that apply) ☐ Outwash ☐ Lacustrine ☐ Loess ☑ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter ☐ Disturbed/Fill

Landscape Position:	Back/Side Slope	Slope %:	10.0	Slope shape:	Linear, Linear	Flooding/Run-On potential:	No
Vegetation:	Forest	Soil survey map units:	J119D			Surface Elevation-Relative to benchmark:	98.4
Date/Time of Day/Weather Conditions:		8/19/2024	noon	sunny clear		Limiting Layer Elevation:	95.4
Observation #/Location:	2	SE Corner of STA				Observation Type:	Auger

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
0-18	Medium Sandy Loam	0	10YR 2/1				Blocky	Moderate	Friable
18-35	Medium Sandy Loam	0	10YR 3/2	10YR 5/4			Blocky	Moderate	Friable
35-36	Medium Sandy Loam	0	10YR 5/4				Blocky	Moderate	Friable
36	Medium Sandy Loam	0	10YR 5/4	10YR 6/4	Concentrations		Blocky	Moderate	Friable
				10YR 4/3					
				10YR 5/1	Depletions				

Comments: 36"

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

Peter Johnson	Peter Johnson	L4224	8/19/2024
(Designer/Inspector)	(Signature)	(License #)	(Date)

Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

(LGU/Designer/Inspector)	(Signature)	(Cert #)	(Date)

University of Minnesota
Onsite Sewage Treatment Program

Soil Observation Log

Project ID:

v 03.15.2023

Client:	Doug and Lauri Askelson	Location / Address:	17170 220th St Audubon, MN 56511

Soil parent material(s): (Check all that apply) ☐ Outwash ☐ Lacustrine ☐ Loess ☑ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter ☐ Disturbed/Fill

Landscape Position:	Back/Side Slope	Slope %:	10.0	Slope shape:	Linear, Linear	Flooding/Run-On potential:	No
Vegetation:	Forest	Soil survey map units:	J119D			Surface Elevation-Relative to benchmark:	97.4
Date/Time of Day/Weather Conditions:		8/19/2024	noon	sunny clear		Limiting Layer Elevation:	95.1
Observation #/Location:	3	West edge, center of STA		Observation Type:	Auger		

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure Shape	Structure Grade	Structure Consistence
0-18	Medium Sandy Loam	5	10YR 2/1				Blocky	Moderate	Friable
18-21	Loam	0	10YR 3/1				Blocky	Moderate	Friable
21-26	Loam	0	10YR 3/2				Blocky	Moderate	Friable
26-28	Loam	0	10YR 5/3				Blocky	Moderate	Friable
28	Clay Loam		10YR 5/3	10YR 3/3			Blocky	Moderate	Friable
				10YR 5/1	Depletions				
				10YR 5/6	Concentrations				

Comments: 28"

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

Peter Johnson	Peter Johnson	L4224	8/19/2024
(Designer/Inspector)	(Signature)	(License #)	(Date)

Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

(LGU/Designer/Inspector)	(Signature)	(Cert #)	(Date)

University of Minnesota Onsite Sewage Treatment Program

Design Summary Page

MINNESOTA POLLUTION CONTROL AGENCY

1. PROJECT INFORMATION

v 03.15.2023

Property Owner/Client: Doug and Lauri Askelson | Project ID:

Site Address: 17170 220th St Audubon, MN 56511 | Date: 08/19/24

Email Address: | Phone: 701-200-6082

2. DESIGN FLOW & WASTE STRENGTH

Attach waste strength data/estimated strength for Other Establishments

Design Flow: 450 GPD | Anticipated Waste Type: Residential

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

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

3. HOLDING TANK SIZING

Minimum Capacity: Residential =1000 gal or 400 gal/bedroom, Other Establishment = Design Flow x 5.0, Minimum size 1000 gallons

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

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

Type of High Level Alarm: (Set @ 75% tank capacity)

Comments:

4. SEPTIC TANK SIZING

A. Residential dwellings:

Number of Bedrooms (Residential): 3

Code Minimum **Septic Tank** Capacity: 1000 Gallons with 1 Tanks or Compartments

Recommended **Septic Tank** Capacity: 1000 Gallons with 1 Tanks or Compartments

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

B. Other Establishments:

Waste received by: GPD x Days Hyd. Retention Time

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

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

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

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

5. PUMP TANK SIZING

Soil Treatment Dosing Tank

Pump Tank Capacity (Minimum): 500 Gal

Pump Tank Capacity (Recommended): 500 Gal

Pump Req: 29.0 GPM Total Head 14.8 ft

Supply Pipe Dia. 2.00 in Dose Vol: 80.0 gal

Other Component Dosing Tank:

Pump Tank Capacity (Minimum): Gal

Pump Tank Capacity (Recommended): Gal

Pump Req: GPM Total Head ft

Supply Pipe Dia. in Dose Vol: Gal

* Flow measurement device must be incorporated for any system with a pump: Elapsed Time Meter and/or Event Counter *

University of Minnesota Onsite Sewage Treatment Program

Design Summary Page

MINNESOTA POLLUTION CONTROL AGENCY

6. SYSTEM AND DISTRIBUTION TYPE

Project ID:

Soil Treatment Type:	Mound	Distribution Type:	Pressure Distribution-Level
Elevation Benchmark:	100.0 ft	Benchmark Location:	nail in tree, center of east side o
MPCA System Type:	Type I	Distribution Media:	Rock
Type III/IV/V Details:	n/a		

7. SITE EVALUATION SUMMARY:

Describe Limiting Condition: Redoximorphic Features/Saturated Soils

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

Note:

	Depth		Depth		Elevation of Limiting Condition		
Limiting Condition:	28	inches	2.3	ft	95.10	ft	***Critical for system compliance***
Minimum Req'd Separation:	36	inches	3.0	ft			*Distribution Elevation >Code Max Depth*
					Elevation		
Code Max System Depth*:	Mound	inches	-0.7	ft	98.10	ft	**Elevation OK**

*This is the maximum depth to the bottom of the distribution media for required separation. Negative Depth (ft) requires a mound.

Designed Distribution Elevation: 98.4 ft Minimum Sand Depth: 12.0 inches

A. Soil Texture: Clay Loam B. Organic Loading Rate (optional): lbs/sq.ft/day 0

C. Soil Hyd. Loading Rate: 0.45 GPD/ft^2 D: Percolation Rate: MPI

E. Contour Loading Rate: 11.8 Note:

F. Measured Land Slope: 10.0 % Note:

Comments:

8. SOIL TREATMENT AREA DESIGN SUMMARY

Trench:

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

Bed:

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

Mound:

Dispersal Area	380.0	sq.ft	Bed Length	38.0	ft	Bed Width	10.0 ft
Absorption Width	26.0	ft	Clean Sand Lift	1.0	ft	Berm Width (0-1%)	ft
Upslope Berm Width	8.7	ft	Downslope Berm	27.0	ft	Endslope Berm Width	16.2 ft
Total System Length	70.4	ft	System Width	45.7	ft	Contour Loading Rate	12.0 gal/ft

University of Minnesota Onsite Sewage Treatment Program

Design Summary Page

MINNESOTA POLLUTION CONTROL AGENCY

Project ID:

At-Grade:

Dispersal Area		sq.ft	Bed Length		ft	Bed Width	ft
Upslope Berm		ft	Downslope Berm		ft	Finished Height	ft
System Length		ft	Endslope Berm		ft	System Width	ft

Level & Equal Pressure Distribution Soil Treatment Area

No. of Laterals	3		Lateral Diameter	1.50	in	Lateral Spacing	3 ft
Perforation Spacing	3	ft	Perforation Diameter	1/4	in	Drainback Volume	5 gal
Min Dose Volume	48	gal	Max Dose Volume	113	gal	Total Dosing Volume	85 gal

Non-Level and Unequal Pressure Distribution Soil Treatment Area

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

Minimum Dose Volume ____ gal

Maximum Dose Volume ____ gal

Total Dosing Volume ____ gal

9. Organic Loading and Additional Info for At-Risk, HSW or Type IV Design

Organic Loading to Soil Treatment

A. Starting BOD Concentration = Design Flow X 0.7 X Starting BOD (mg/L) X 8.35 ÷ 1,000,000

____ gpd X ____ mg/L X 8.35 ÷ 1,000,000 = ____ lbs. BOD/day (Organic Loading Design)

B. Organic Loading to Soil Treatment Area: (enter loading value in 7B)

____ mg/L X ____ gpd X 0.7 X 8.35 ÷ 1,000,000 ÷ ____ sq.ft = ____ lbs./day/sqft

HSW Technology Strength Reduction

A. Starting BOD Concentration = Design Flow X Starting BOD (mg/L) X 8.35 ÷ 1,000,000

____ gpd X ____ mg/L X 8.35 ÷ 1,000,00 = ____ lbs. BOD/day (HSW Technology Design)

B. Target BOD Concentration = Design Flow X Target BOD (mg/L) X 8.35 ÷ 1,000,000

____ gpd X ____ mg/L X 8.35 ÷ 1,000,00 = ____ lbs. BOD/day (HSW Technology Design)

Lbs. BOD To Be Removed: ____ lbs. BOD/day (HSW Technology Design)

Pretreatment Technology: ____ *Must Meet or Exceed Target

Disinfection Technology: ____ *Required for Levels A & B

10. Comments/Special Design Considerations:

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

Peter Johnson	Peter Johnson	L4224	8/21/2024
(Designer)	(Signature)	(License #)	(Date)

University of Minnesota Onsite Sewage Treatment Program

Mound Design Worksheet
≥1% Slope

MINNESOTA POLLUTION CONTROL AGENCY

1. SYSTEM SIZING: Project ID: v 03.15.2023

A. Design Flow:	450	GPD
B. Soil Loading Rate:	0.45	GPD/sqft
C. Depth to Limiting Condition	2.3	ft
D. Percent Land Slope:	10.0	%
E. Media (Sand) Loading Rate:	1.2	GPD/sqft
F. Mound Absorption Ratio:	2.60	

Table I
MOUND CONTOUR LOADING RATES:

Measured Perc Rate	← OR →	Texture - derived mound absorption ratio		Contour Loading Rate:
≤ 60mpi	← OR →	1.0, 1.3, 2.0, 2.4, 2.6	→	≤12
61-120 mpi		5.0	→	≤12
≥ 120 mpi*		>5.0*	→	≤6*

TABLE IXa
LOADING RATES FOR DETERMINING BOTTOM ABSORPTION AREA AND ABSORPTION RATIOS USING PERCOLATION TESTS

Percolation Rate (MPI)	Treatment Level C: Absorption Area Loading Rate (gpd/ft²)	Treatment Level C: Mound Absorption Ratio	Treatment Level A, A-2, B,: Absorption Area Loading Rate (gpd/ft²)	Treatment Level A, A-2, B,: Mound Absorption Ratio
<0.1	-	1	-	1
0.1 to 5	1.2	1	1.6	1
0.1 to 5 (fine sand and loamy fine sand)	0.6	2	1	1.6
6 to 15	0.78	1.5	1	1.6
16 to 30	0.6	2	0.78	2
31 to 45	0.5	2.4	0.78	2
46 to 60	0.45	2.6	0.6	2.6
61 to 120	-	5	0.3	5.3
>120	-	-	-	-

*Systems with these values are not Type I systems. Contour Loading Rate (linear loading rate) is a recommended value.

2. DISPERSAL MEDIA SIZING

A. Hydraulic Absorption Required Bottom Area: Design Flow (1A) ÷ Design Media Loading Rate(1E)

450 GPD ÷ 1.2 GPD/sqft = 375 sq.ft

Organic Sizing (OPTIONAL)

B. Organic Absorption Bed Area = Organic Loading (Summary 9A) ÷ Organic Soil Loading Rate (Summary 7B)

[ ] lbs BOD ÷ [ ] lbs BOD/sq.ft = [ ] sq.ft

C. Required Bed Area = Greater of Hydraulic (1D) or Organic Bed Area (1E) 375 sq.ft

D. Designed Dispersal Media Area: 380 sq.ft *Optional upsizing of area to be larger than 2C*

B. Enter Dispersal Bed Width: 10.0 ft *Can not exceed 10 feet*

C. Calculate Contour Loading Rate: Bed Width(2B) X Design Media Loading Rate(1E)

10 ft X 1.2 GPD/sqft = 12.0 gal/ft *Can not exceed Table 1*

D. Calculate Minimum Dispersal Bed Length: Dispersal Bed Area(2A) ÷ Bed Width(2B)

380 sqft ÷ 10.0 ft = 38.0 ft

If a larger dispersal media Length is desired, enter size: 38 ft

3. ABSORPTION AREA SIZING

A. Calculate Absorption Width: Bed Width(2B) X Mound Absorption Ratio(1F)

10.0 ft X 2.6 = 26.0 ft

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

Calculate Downslope Absorption Width: Absorption Width(1F) - Bed Width(2B)

26.0 ft - 10.0 ft = 16.0 ft

4. DISTRIBUTION MEDIA:

Project ID:

Select Dispersal Media: Rock — Enter Either 4A or 4B

A. Rock Depth Below Distribution Pipe

9 in

B. Registered Media

Registered Media Depth in

Check registered product information for specific application details and design

Specific Media Comments:

5. MOUND SIZING

Project ID:

A. Clean Sand Lift: Required Separation - Depth to Limiting Condition = Clean Sand Lift (1 ft minimum)

3.0 ft - 2.3 ft = 1.0 ft Design Sand Lift (optional): 1 ft

B. Upslope Height: Clean Sand Lift(6A) + Depth of Media(4AorB) +Depth to Cover Pipe+ Depth of Cover (1 ft)

1.0 ft + 0.75 ft + 0.3 ft + 1.0 ft = 3.1 ft

Land Slope %		0	1	2	3	4	5	6	7	8	9	10	11	12
Upslope Berm Ratio	3:1	3.00	2.91	2.83	2.75	2.68	2.61	2.54	2.48	2.42	2.36	2.31	2.26	2.21
	4:1	4.00	3.85	3.70	3.57	3.45	3.33	3.23	3.12	3.03	2.94	2.86	2.78	2.70

C. Select Upslope Berm Multiplier (based on land slope): 2.86

D. Calculate Upslope Berm Width: Multiplier (5C) X Upslope Mound Height (5B)

2.86 X 3.1 ft = 8.7 ft

E. Calculate Drop in Elevation Under Bed: Bed Width(2B) X Land Slope(1D) ÷ 100 = Drop (ft)

10.0 ft X 10.0 % ÷ 100 = 1.00 ft

F. Calculate Downslope Mound Height: Upslope Height(5B) + Drop in Elevation(5E)

3.1 ft + 1.00 ft = 4.1 ft

Land Slope %		0	1	2	3	4	5	6	7	8	9	10	11	12
Downslope Berm Ratio	3:1	3.00	3.09	3.19	3.30	3.41	3.53	3.66	3.80	3.95	4.11	4.29	4.48	4.69
	4:1	4.00	4.17	4.35	4.54	4.76	5.00	5.26	5.56	5.88	6.25	6.67	7.14	7.69

G. Select Downslope Berm Multiplier (based on land slope): 6.67

H. Calculate Downslope Berm Width: Downslope Multiplier(5G) X Downslope Height (5F)

6.67 x 4.1 ft = 27.0 ft

I. Calculate Minimum Berm to Cover Absorption Area: Downslope Absorption Width(3A) + 4 feet

16.0 ft + 4 ft = 20.0 ft

J. Design Downslope Berm = greater of 5H and 5I: 27.0 ft

K. Select Endslope Berm Multiplier: 4.00 *(usually 3.0 or 4.0)*

L. Calculate Endslope Berm Width = Endslope Berm Multiplier(5K) X Downslope Mound Height(5F)

4.00 X 4.1 ft = 16.2 ft

M. Calculate Mound Width: Upslope Berm Width(5D) + Bed Width(2B) + Downslope Berm Width(5J)

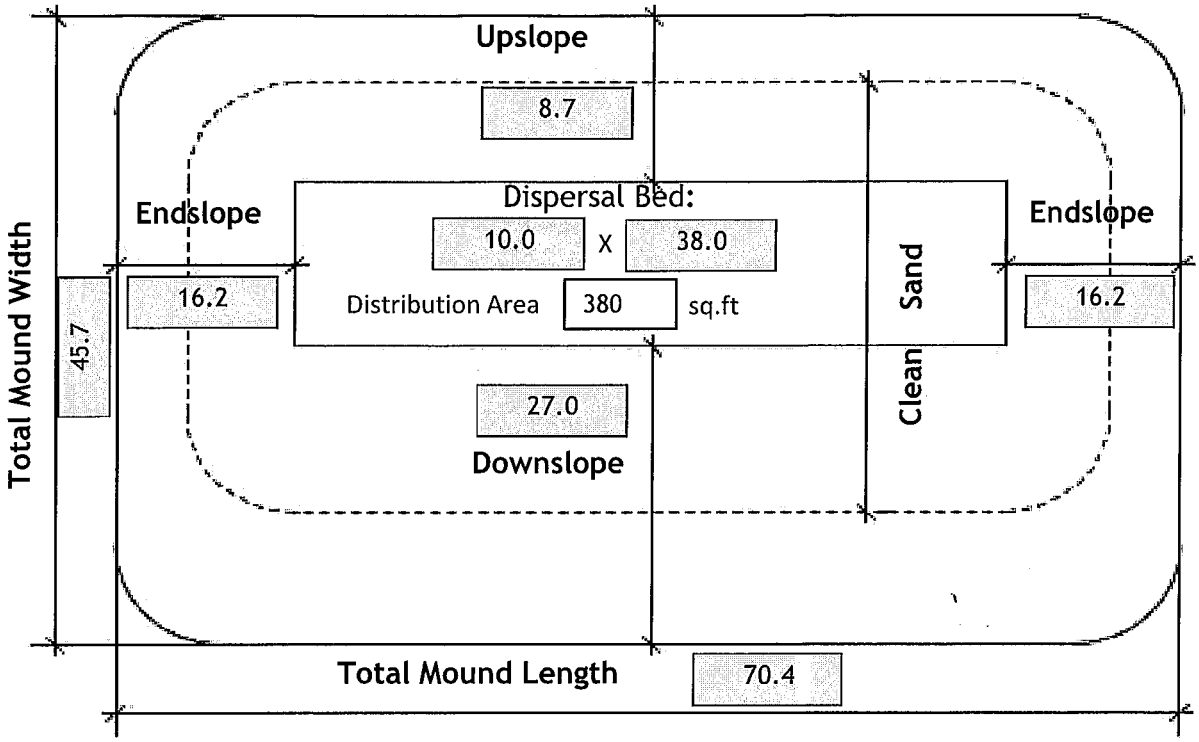
8.7 ft + 10.0 ft + 27.0 ft = 45.7 ft

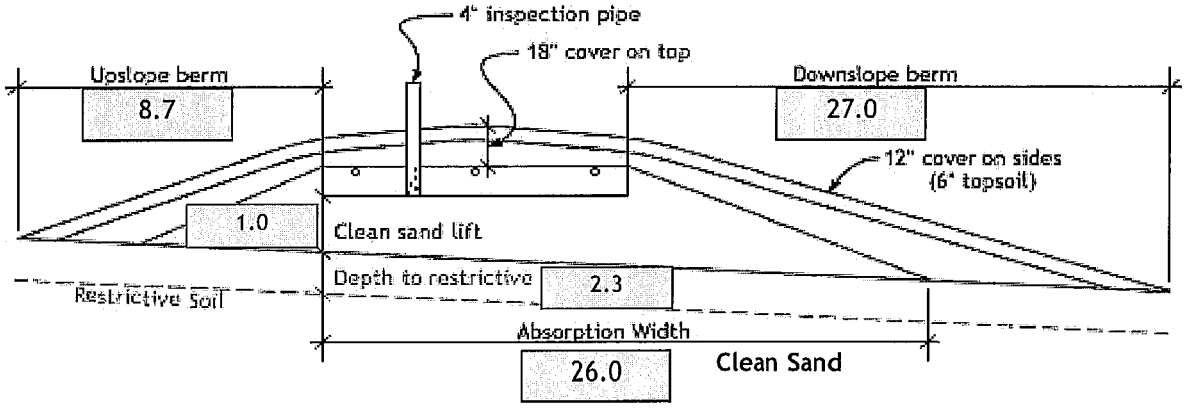
N. Calculate Mound Length: Endslope Berm Width (5L) + Bed Length(2D) + Endslope Berm Width(5L)

16.2 ft + 38.0 ft + 16.2 ft = 70.4 ft

6. MOUND DIMENSIONS (Feet)

Project ID:





			Elevation to Benchmark		
Required Separation:	36	(in)	Elevation Limiting Layer:	95.1	ft
Distribution Media:	Rock		Elevation required Separation:	98.1	ft
Media Depth:	9.0	(in)	Elevation Distribution Media Bottom:	99.4	ft
Manifold Connection:	End		Elevation Top of Media(min):	100.5	ft
Lateral Pipe Diameter:	1.50	(in)	Elevation Top of System(min):	101.5	ft
Perforation Size:	1/4	(in)	Perforation Spacing:	36.0	(in)

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

Comments:

University of Minnesota Onsite Sewage Treatment Program

Mound Materials Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

Project ID:

v 03.15.2023

A. Rock *Volume* : (Rock Below Pipe + Rock to cover pipe (*pipe outside dia + ~2 inch)*) X *Bed Length* X *Bed Width* = *Volume*

(9 in + 3.0 in) ÷ 12 X 38.0 ft X 10.0 ft = 380.0 cu.ft

Divide cu.ft by 27 cu.ft/cu.yd to calculate cubic yards: 380.0 cu.ft ÷ 27 = 14.1 cu.yd

Add 30% for constructability: 14.1 cu.yd X 1.3 = 18.3 cu.yd

B. Calculate *Clean Sand Volume:*

Volume Under Rock bed : *Average Sand Depth* x *Media Width* x *Media Length* = cubic feet

1.5 ft X 10.0 ft X 38 ft = 570 cu.ft

For a Mound on a slope from 0-1%

Volume from Length = ((Upslope Mound Height - 1) X Absorption Width Beyond Bed X Media Bed Length)

ft - 1) X X ft =

Volume from Width = ((Upslope Mound Height - 1) X Absorption Width Beyond Bed X Media Bed Width)

ft - 1) X X ft =

Total Clean Sand Volume : *Volume from Length* + *Volume from Width* + *Volume Under Media*

cu.ft + cu.ft + cu.ft = cu.ft

For a Mound on a slope greater than 1%

Upslope Volume : ((*Upslope Mound Height - 1*) x 3 x *Bed Length*) ÷ 2 = cubic feet

((3.1 ft - 1) X 3.0 ft X 38.0) ÷ 2 = 116.9 cu.ft

Downslope Volume : ((*Downslope Height - 1)* x Downslope Absorption Width x *Media Length*) ÷ 2 = cubic feet

((4.1 ft - 1) X 16.0 ft X 38.0) ÷ 2 = 927.2 cu.ft

Endslope Volume : (*Downslope Mound Height - 1)* x 3 x *Media Width* = cubic feet

(4.1 ft - 1) X 3.0 ft X 10.0 ft = 91.5 cu.ft

Total Clean Sand Volume : *Upslope Volume* + *Downslope Volume* + *Endslope Volume* + *Volume Under Media*

116.9 cu.ft + 927.2 cu.ft + 91.5 cu.ft + 570.0 cu.ft = 1705.6 cu.ft

Divide cu.ft by 27 cu.ft/cu.yd to calculate cubic yards: 1705.6 cu.ft ÷ 27 = 63.2 cu.yd

Add 30% for constructability: 63.2 cu.yd X 1.3 = 82.1 cu.yd

C. Calculate *Sandy Berm Volume:*

Total Berm Volume (approx.) : ((Avg. Mound Height - 0.5 ft topsoil) x Mound Width x Mound Length) ÷ 2

(3.6 - 0.5)ft X 45.7 ft X 70.4) ÷ 2 = 4910.3 cu.ft

Total Mound Volume - Clean Sand volume -Rock Volume = cubic feet

4910.3 cu.ft - 1705.6 cu.ft - 380.0 cu.ft = 2824.7 cu.ft

Divide cu.ft by 27 cu.ft/cu.yd to calculate cubic yards: 2824.7 cu.ft ÷ 27 = 104.6 cu.yd

Add 30% for constructability: 104.6 yd^3 x 1.3 = 136.0 cu.yd

D. Calculate *Topsoil Material Volume: Total Mound Width X Total Mound Length X .5 ft*

45.7 ft X 70.4 ft X 0.5 ft = 1609.9 cu.ft

Divide cu.ft by 27 cu.ft/cu.yd to calculate cubic yards: 1609.9 cu.ft ÷ 27 = 59.6 cu.yd

Add 30% for constructability: 59.6 cu.yd X 1.3 = 77.5 cu.yd

University of Minnesota Onsite Sewage Treatment Program

Pressure Distribution Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

Project ID:

v 03.15.2023

1. Media Bed Width: 10 ft

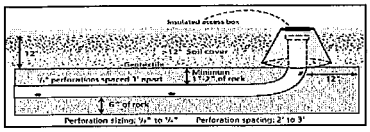
2. Minimum Number of Laterals in system/zone = Rounded up number of [(Media Bed Width - 4) ÷ 3] + 1.

[(10 - 4) ÷ 3] + 1 = 3 laterals *Does not apply to at-grades*

3. Designer Selected *Number of Laterals*: 3 laterals
Cannot be less than line 2 (Except in at-grades)

4. Select *Perforation Spacing*: 3.00 ft

5. Select *Perforation Diameter Size:* 1/4 in



6. *Length of Laterals* = Media Bed Length(1.) - 2 Feet.

38.0 - 2ft = 36.0 ft *Perforation can not be closer then 1 foot from edge.*

7. Determine the *Number of Perforation Spaces*. Divide the *Length of Laterals(6.)* by the *Perforation Spacing* (4.) and round down to the nearest whole number.

Number of Perforation Spaces = 36.0 ft ÷ 3.0 ft = 12 Spaces

8. *Number of Perforations per Lateral* is equal to 1.0 plus the *Number of Perforation Spaces(7.)*. Check table below to verify the number of perforations per lateral guarantees less than a 10% discharge variation. The value is double with a center manifold.

Perforations Per Lateral = 12 Spaces + 1 = 13 Perfs. Per Lateral

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

1/4 Inch Perforations

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

7/32 Inch Perforations

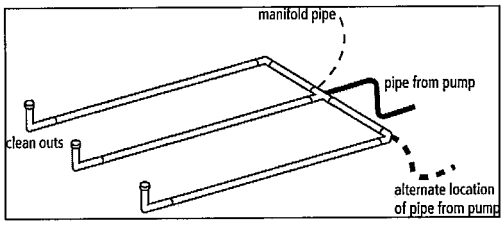
Perforation Spacing (Feet)	Pipe Diameter (Inches) 1	1¼	1½	2	3
2	11	16	21	34	68
2½	10	14	20	32	64
3	9	14	19	30	60

3/16 Inch Perforations

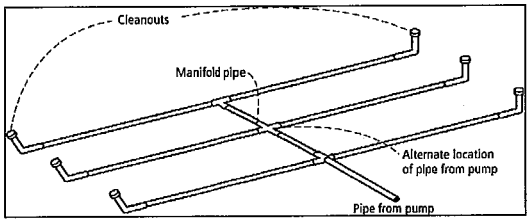
Perforation Spacing (Feet)	Pipe Diameter (Inches) 1	1¼	1½	2	3
2	12	18	26	46	87
2½	12	17	24	40	80
3	12	16	22	37	75

1/8 Inch Perforations

Perforation Spacing (Feet)	Pipe Diameter (Inches) 1	1¼	1½	2	3
2	21	33	44	74	149
2½	20	30	41	69	135
3	20	29	38	64	128



END Connection



CENTER Connection

Perf Per Lateral: 13

Perf Per Lateral Equal Split: 7 | 6

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

* must not exceed maximum number perfs per lateral in table

9. *Total Number of Perforations* equals the *Number of Perforations per Lateral (8.)* multiplied by the *Number of Perforated Laterals.(3.)*

13 Perf. Per Lat. X 3 Number of Perf. Lat. = 39 Total Number of Perf.

10. Spacing of laterals; Must be greater than 1 foot and no more than 3 feet: 3.0 ft

11. Select *Type of Manifold Connection* (End or Center): End

12. *Select Lateral Diameter (See Table)*: 1.50 in

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

University of Minnesota Onsite Sewage Treatment Program

Pressure Distribution Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

13. Calculate the *Square Feet per Perforation.*

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

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

10 ft X 38 ft = 380 sq.ft

b. *Square Foot per Perforation = Bed Area* ÷ by the *Total Number of Perfs*

380 sqft ÷ 39 perf = 9.7 sq.ft/perf

14. Select *Minimum Average Head*: 1.0 ft

15. Select *Perforation Discharge* based on Table: 0.74 GPM per Perf

16. *Flow Rate = Total Number of Perfs(9.) X Perforation Discharge(15.)*

39 Perfs X 0.74 GPM per Perforation = 29 GPM

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

18. *Volume of Distribution Piping = Number of Perforated Laterals(3.) X Length of Laterals(6.) X Volume of Liquid Per Foot of Distribution Piping (17.)*

3 X 36 ft X 0.110 gal/ft = 11.9 Gallons

19. Minimum Delivered Volume = Volume of Distribution Piping X 4

11.9 gals X 4 = 47.5 Gallons

20. Maximum Delivered Volume = Design flow x 25%

450.0 gpd X 25% = 112.5 Gallons

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

Perforation Discharge (GPM)				
Head (ft)	Perforation Diameter			
	1/8	5/32	7/32	1/4
1.0[a]	0.18	0.41	0.56	0.74
1.5	0.22	0.51	0.69	0.9
2.0[b]	0.26	0.59	0.80	1.04
2.5	0.29	0.65	0.89	1.17
3.0	0.32	0.72	0.98	1.28
4.0	0.37	0.83	1.13	1.47
5.0[c]	0.41	0.93	1.26	1.65

1 foot	Dwellings with 3/16 inch to 1/4 inch perforations
2 feet	Dwellings with 1/8 inch perforations
	Other establishments and MSTS with 3/16 inch to 1/4 inch perforations
5 feet	Other establishments and MSTS with 1/8 inch perforations

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

Comments/Special Design Considerations:

University of Minnesota Onsite Sewage Treatment Program

Basic STA Pump Selection Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. PUMP CAPACITY

Project ID:

v 03.15.2023

Pumping to Gravity or Pressure Distribution: Pressure

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

B. If pumping to a pressurized distribution system: 29.0 GPM

C. Enter pump description: Demand Dosing

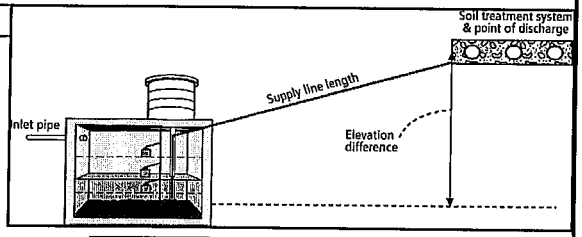
2. HEAD REQUIREMENTS

A. Elevation Difference between pump and point of discharge: 9 ft

B. Distribution Head Loss: 5 ft

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

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



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

Table I.Friction Loss in Plastic Pipe per 100ft

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

D. 1. Supply Pipe Diameter: 2.0 in

2. Supply Pipe Length: 27 ft

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

Friction Loss = 2.23 ft per 100ft of pipe

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

27 ft X 1.25 = 33.8 ft

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

Supply Friction Loss =

2.23 ft per 100ft X 33.8 ft ÷ 100 = 0.8 ft

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

9.0 ft + 5.0 ft + _____ ft + 0.8 ft = 14.8 ft

3. PUMP SELECTION

A pump must be selected to deliver at least **29.0** GPM with at least **14.8** feet of total head.

Comments:

Gould PE31 produces 38GPM at 14.8TFH

ONSITE SEWAGE TREATMENT PROGRAM

STA Dosing Pump Tank Design Worksheet (Demand Dose)

MINNESOTA POLLUTION CONTROL AGENCY

DETERMINE TANK CAPACITY AND DIMENSIONS Project ID: v 03.15.2023

1. A. *Design Flow (Design Sum.1A)*: 450 GPD C. Tank Use: Dosing
   B. Min. required pump tank capacity: 500 Gal D. Recommended pump tank capacity: 500 Gal

2. A. Tank Manufacturer: Existing B. Tank Model:
   C. Capacity from manufacturer: 500 Gallons
   D. Gallons per inch from manufacturer: 12.0 Gallons per inch
   E. Liquid depth of tank from manufacturer: 43.0 inches

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

DETERMINE DOSING VOLUME

3. Calculate *Volume to Cover Pump* (The inlet of the pump must be at least 4-inches from the bottom of the pump tank & 2 inches of water covering the pump is recommended)

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

   (16 in + 2 inches) X 12.0 Gallons Per Inch = 216 Gallons

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

   -Item 19 of the Pressure Distribution STA or Item 11 of Non-level STA 48 **Gallons (Minimum dose)** 4.0 inches/dose

5. Calculate ***Maximum** Pumpout Volume* (25% of Design Flow(1A))

   Design Flow: 450 GPD X 0.25 = 113 **Gallons (Maximum dose)** 9.4 inches/dose

6. *Select a pumpout volume that meets both Minimum and Maximum:* 80 Gallons

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

   450 gpd ÷ 80 gal = 5.63 *Doses**

   *** Doses need to be equal to or greater than 4**

8. Calculate Drainback:

   A. *Diameter of Supply Pipe* = 2 inches

   B. Length of Supply Pipe = 27 feet

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

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

   27 ft X 0.170 gal/ft = 4.6 Gallons

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

   80 gal + 4.6 gal = 85 Gallons

10. Minimum Alarm Volume = Depth of alarm (2 or 3 inches) X gallons per inch of tank(2D)

    3 in X 12.0 gal/in = 36.0 Gallons

11. Reserve Capacity Volume = [Tank Liquid Depth(2E) - Alarm Float Depth(10.)] x gallons per inch of tank(2D)

    [43.0 in - 28.0 in] X 12.0 gal/in = 179.4 Gallons

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

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

12. Calculate *Float Separation Distance* using *Dosing Volume*.

    Total Dosing Volume(9.) ÷ Gallons Per Inch(2D)

    85 gal ÷ 12.0 gal/in = 7.0 inches

13. Measuring from bottom of tank:

    A. *Distance to set Pump Off Float* = Pump + block height + 2 inches

    16 in + 2 in = 18 inches

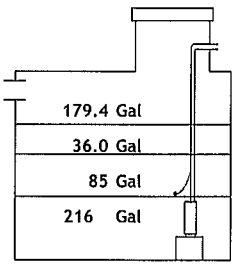
    B. *Distance to set Pump On Float=Distance to Set Pump-Off Float(13A) + Float Separation Distance(12.)*

    18 in + 7.0 in = 25 inches

    C. *Distance to set Alarm Float = Distance to set Pump-On Float(13B) + Alarm Depth* (2-3 inches)(10.)

    25 in + 3.0 in = 28 inches

Inches for Dose: 7.0 in
Alarm Depth 28.0 in
Pump On 25.0 in
Pump Off 18.0 in



Doug and Lauri Askelson
17170 220th st
140148000

Reusing existing 1500-2, update with risers on septic compartment, event counter required.

2" supply line

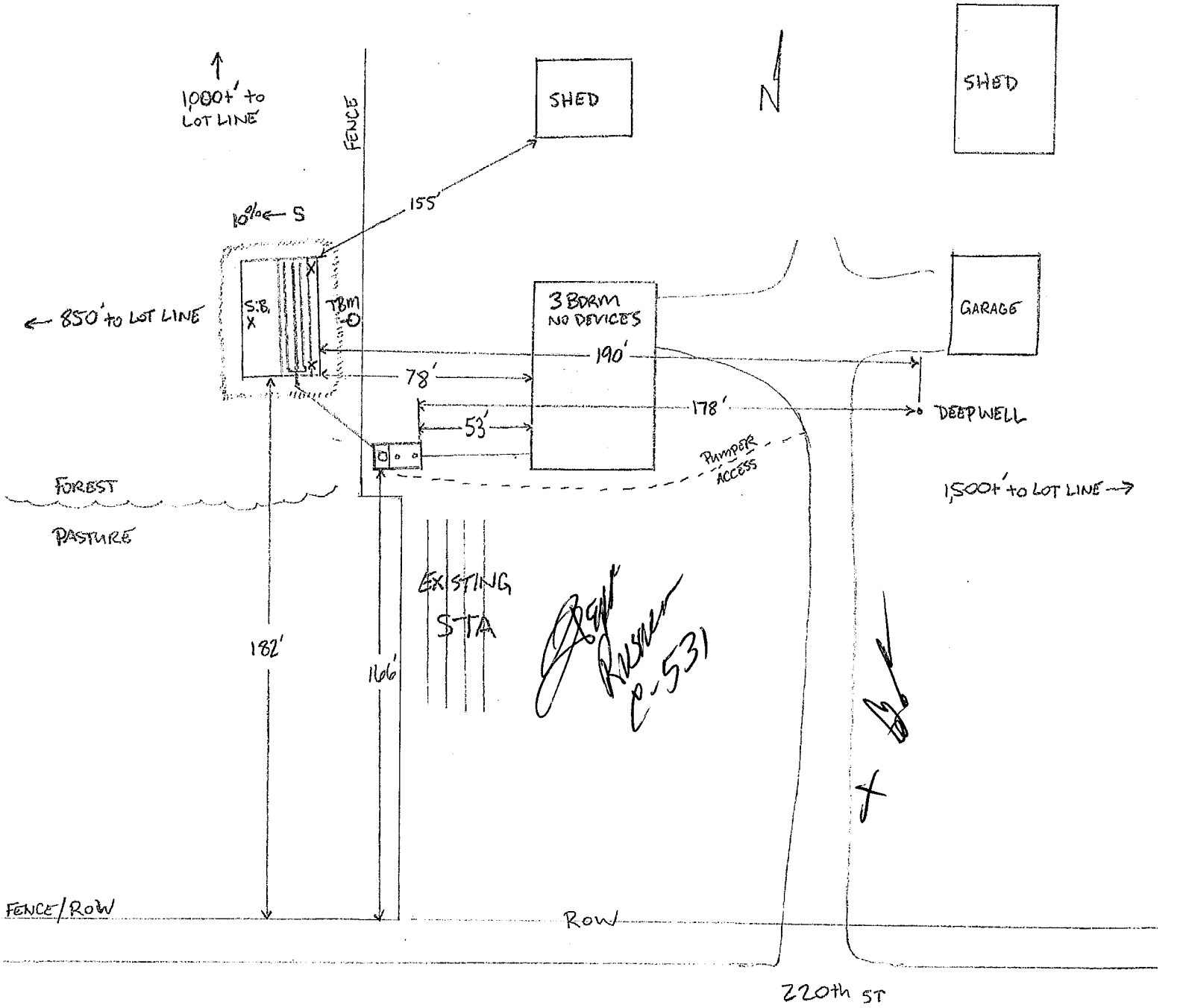
12" sand lift from highest elevation

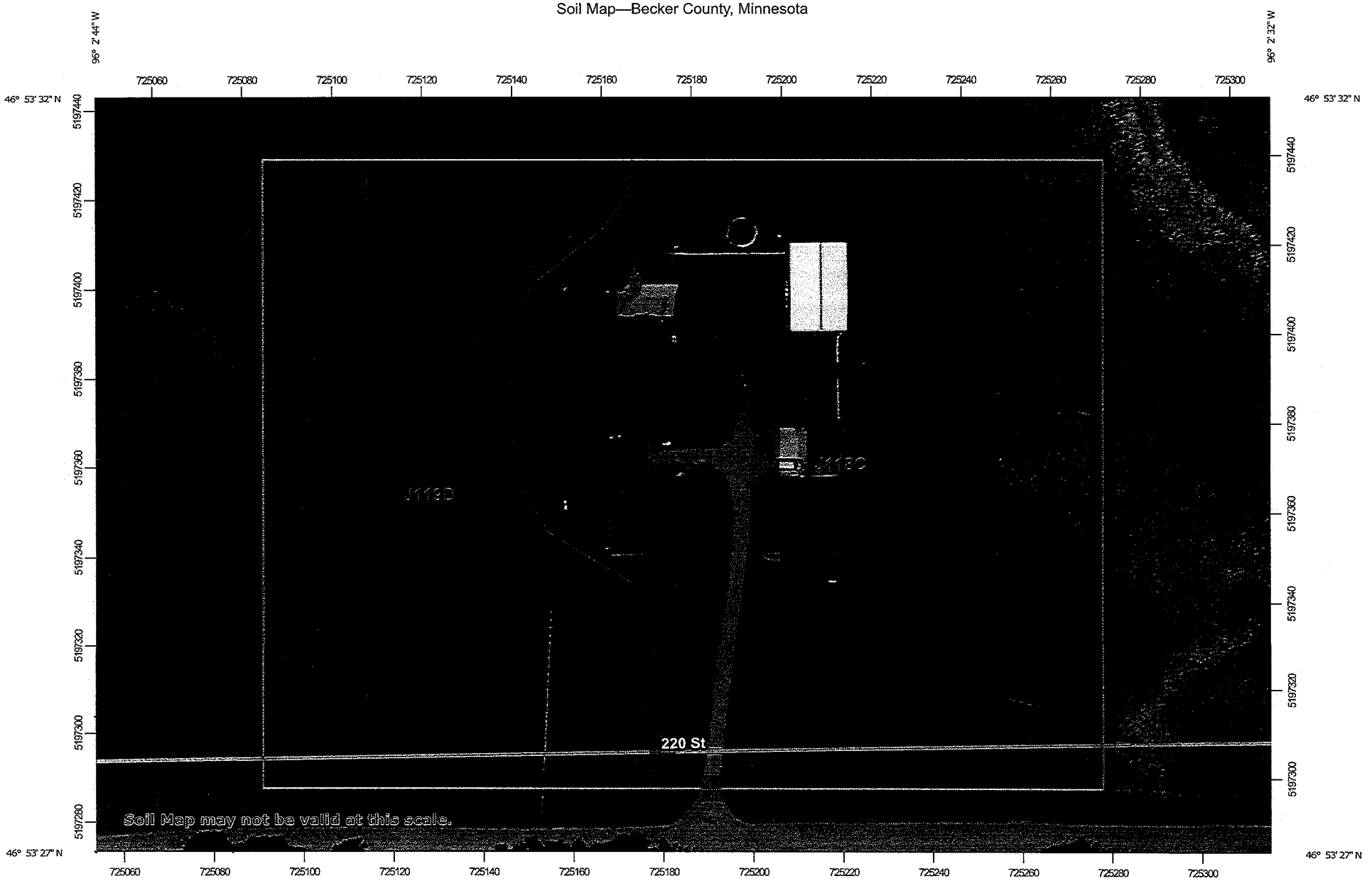
26'x40' soil absorption area

10'x38' rock bed, 9" rock depth minimum

Three 1-1/2" laterals, 1/4" perfs spaced 36"

Electric fence to be routed around soil treatment area to protect from livestock





Map Scale: 1:1,200 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

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

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

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

Soil Survey Area: Becker County, Minnesota
Survey Area Data: Version 19, Sep 9, 2023

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

Date(s) aerial images were photographed: May 24, 2021—Jun 12, 2021

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
J118C	Hokans-Svea-Buse complex, 2 to 12 percent slopes	4.0	61.7%
J119D	Barnes-Svea-Buse complex, 3 to 15 percent slopes	2.5	38.3%
Totals for Area of Interest		**6.6**	**100.0%**

Becker County, Minnesota

J119D—Barnes-Svea-Buse complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2yw63
Elevation: 920 to 2,130 feet
Mean annual precipitation: 22 to 31 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 120 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Barnes and similar soils: 35 percent
Svea and similar soils: 30 percent
Buse and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barnes

Setting

Landform: Ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 8 inches: clay loam
Bw - 8 to 17 inches: clay loam
Bk - 17 to 45 inches: clay loam
C - 45 to 79 inches: clay loam

Properties and qualities

Slope: 3 to 13 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 59 to 75 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R102AY010SD - Loamy
Forage suitability group: Loam (G102AY100SD)
Other vegetative classification: Loam (G102AY100SD)
Hydric soil rating: No

Description of Svea

Setting

Landform: Ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 7 inches: silty clay loam
A - 7 to 17 inches: silty clay loam
Bw - 17 to 26 inches: clay loam
Bk - 26 to 49 inches: clay loam
C - 49 to 79 inches: clay loam

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 30 to 39 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R102AY010SD - Loamy
Forage suitability group: Loam (G102AY100SD)
Other vegetative classification: Loam (G102AY100SD)
Hydric soil rating: No

Description of Buse

Setting

Landform: Ground moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope
Down-slope shape: Convex

Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 8 inches: clay loam
Bk - 8 to 31 inches: clay loam
C - 31 to 79 inches: clay loam

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 59 to 75 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R102AY012SD - Thin Upland
Forage suitability group: Loam (G102AY100SD)
Other vegetative classification: Loam (G102AY100SD)
Hydric soil rating: No

Minor Components

Lakepark

Percent of map unit: 5 percent
Landform: Drainageways on ground moraines
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R102AY002SD - Linear Meadow
Other vegetative classification: Wet (G102AY900SD)
Hydric soil rating: Yes

Formdale

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R102AY010SD - Loamy
Other vegetative classification: Loam (G102AY100SD)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Becker County, Minnesota
Survey Area Data: Version 19, Sep 9, 2023

140148000-2024

MINNESOTA POLLUTION CONTROL AGENCY

520 Lafayette Road North
St. Paul, MN 55155-4194

Compliance inspection report form

Existing Subsurface Sewage Treatment System (SSTS)

Doc Type: Compliance and Enforcement

Instructions: Inspector must submit completed form to Local Governmental Unit (LGU) and system owner within 15 days of final determination of compliance or noncompliance. Instructions for filling out this form are located on the Minnesota Pollution Control Agency (MPCA) website at https://www.pca.state.mn.us/sites/default/files/wq-wwists4-31a.pdf.

Property information

Local tracking number:

Parcel ID# or Sec/Twp/Range: 140148000 Reason for Inspection Sale

Local regulatory authority info: Becker County

Property address: 17170 220th St. Audubon, MN 56511

Owner/representative: Lauri Askelson Owner's phone: 701-200-6082

Brief system description: 1500/2 comp. tank with lift pump to chamber trench drainfield. 1000 sq.ft.

System status

System status on date (mm/dd/yyyy): 6/26/2024

☐ **Compliant – Certificate of compliance***

*(**Valid for 3 years from report date** unless evidence of an imminent threat to public health or safety requiring removal and abatement under section 145A.04, subdivision 8 is discovered or a shorter time frame exists in Local Ordinance.)*

Note: Compliance indicates conformance with Minn. R. 7080.1500 as of system status date above and does not guarantee future performance.

☒ **Noncompliant – Notice of noncompliance**

Systems failing to protect ground water must be upgraded, replaced, or use discontinued within the time required by local ordinance.

An imminent threat to public health and safety (ITPHS) must be upgraded, replaced, or its use discontinued within ten months of receipt of this notice or within a shorter period if required by local ordinance or under section 145A.04 subdivision 8.

Reason(s) for noncompliance (check all applicable)

- ☐ Impact on public health (Compliance component #1) – *Imminent threat to public health and safety*
- ☐ Tank integrity (Compliance component #2) – *Failing to protect groundwater*
- ☐ Other Compliance Conditions (Compliance component #3) – *Imminent threat to public health and safety*
- ☐ Other Compliance Conditions (Compliance component #3) – *Failing to protect groundwater*
- ☐ System not abandoned according to Minn. R. 7080.2500 (Compliance component #3) – *Failing to protect groundwater*
- ☒ Soil separation (Compliance component #5) – *Failing to protect groundwater*
- ☐ Operating permit/monitoring plan requirements (Compliance component #4) – *Noncompliant - local ordinance applies*

Comments or recommendations

Tank is in compliance, drainfield does not make soil seperation requirements. New drainfeild needed.

Certification

I hereby certify that all the necessary information has been gathered to determine the compliance status of this system. No determination of future system performance has been nor can be made due to unknown conditions during system construction, possible abuse of the system, inadequate maintenance, or future water usage.

***By typing my name below**, I certify the above statements to be true and correct, to the best of my knowledge, and that this information can be used for the purpose of processing this form.*

Business name: Stoll Inspections Inc. Certification number: 7526

Inspector signature: Phil Stoll License number: 2982

(This document has been electronically signed) Phone: 218-839-1849

Necessary or locally required supporting documentation (must be attached)

☒ Soil observation logs ☐ System/As-Built ☐ Locally required forms ☐ Tank Integrity Assessment ☐ Operating Permit

☐ Other Information (list):

Property Address: 17170 220th St. Audubon, MN 56511
Business Name: Stoll Inspections Inc. Date: 6/26/2024

1. Impact on public health – Compliance component #1 of 5

Compliance criteria:	
System discharges sewage to the ground surface	☐ Yes ☒ No
System discharges sewage to drain tile or surface waters.	☐ Yes ☒ No
System causes sewage backup into dwelling or establishment.	☐ Yes ☒ No

Any "yes" answer above indicates the system is an imminent threat to public health and safety.

Describe verification methods and results:

Attached supporting documentation:

☐ Other:

☐ Not applicable

2. Tank integrity – Compliance component #2 of 5

Compliance criteria:	
System consists of a seepage pit, cesspool, drywell, leaching pit, or other pit?	☐ Yes ☒ No
Sewage tank(s) leak below their designed operating depth?	☐ Yes ☒ No
If yes, which sewage tank(s) leaks:	

Any "yes" answer above indicates the system is failing to protect groundwater.

Describe verification methods and results:

Attached supporting documentation:

☒ Empty tank(s) viewed by inspector

Name of maintenance business: Deweys

License number of maintenance business: L2884

Date of maintenance: 6/25/2024

☐ Existing tank integrity assessment (Attach)

Date of maintenance (mm/dd/yyyy): (must be within three years)

(See form instructions to ensure assessment complies with Minn. R. 7082.0700 subp. 4 B (1))

☐ Tank is Noncompliant (pumping not necessary – explain below)

☐ Other:

Property Address: 17170 220th St. Audubon, MN 56511
Business Name: Stoll Inspections Inc. Date: 6/26/2024

3. Other compliance conditions – Compliance component #3 of 5

3a. Maintenance hole covers appear to be structurally unsound (damaged, cracked, etc.), or unsecured?
☐ Yes* ☒ No ☐ Unknown

3b. Other issues *(electrical hazards, etc.)* to immediately and adversely impact public health or safety? ☐ Yes* ☒ No ☐ Unknown

**Yes to 3a or 3b - System is an imminent threat to public health and safety.*

3c. System is non-protective of ground water for other conditions as determined by inspector? ☐ Yes* ☒ No

3d. System not abandoned in accordance with Minn. R. 7080.2500? ☐ Yes* ☒ No

**Yes to 3c or 3d - System is failing to protect groundwater*

Describe verification methods and results:

Attached supporting documentation: ☐ Not applicable ☐ _____

4. Operating permit and nitrogen BMP* – Compliance component #4 of 5 ☒ Not applicable

Is the system operated under an Operating Permit? ☐ Yes ☐ No **If "yes", A below is required**

Is the system required to employ a Nitrogen BMP specified in the system design? ☐ Yes ☐ No **If "yes", B below is required**

BMP = Best Management Practice(s) specified in the system design

If the answer to both questions is "no", this section does not need to be completed.

Compliance criteria:

a. Have the operating permit requirements been met? ☐ Yes ☐ No

b. Is the required nitrogen BMP in place and properly functioning? ☐ Yes ☐ No

Any "no" answer indicates noncompliance.

Describe verification methods and results:

Attached supporting documentation: ☐ Operating permit (Attach) ☐

Property Address: 17170 220th St. Audubon, MN 56511
Business Name: Stoll Inspections Inc. Date: 6/26/2024

5. Soil separation – Compliance component #5 of 5

Date of installation 7/30/2008 (mm/dd/yyyy) ☐ Unknown

Shoreland/Wellhead protection/Food beverage lodging? ☐ Yes ☒ No

Attached supporting documentation:

☒ Soil observation logs completed for the report
☐ Two previous verifications of required vertical separation
☐ Not applicable (No soil treatment area)
☐ _____

Compliance criteria (select one):

5a. *For systems built prior to April 1, 1996, and not located in Shoreland or Wellhead Protection Area or not serving a food, beverage or lodging establishment:* Drainfield has at least a two-foot vertical separation distance from periodically saturated soil or bedrock.	☐ Yes ☐ No*
5b. *Non-performance systems built April 1, 1996, or later or for non-performance systems located in Shoreland or Wellhead Protection Areas or serving a food, beverage, or lodging establishment:* Drainfield has a three-foot vertical separation distance from periodically saturated soil or bedrock.*	☐ Yes ☒ No*
5c. *"Experimental", "Other", or "Performance" systems built under pre-2008 Rules; Type IV or V systems built under 2008 Rules 7080. 2350 or 7080.2400 (Intermediate Inspector License required ≤ 2,500 gallons per day; Advanced Inspector License required > 2,500 gallons per day)* Drainfield meets the designed vertical separation distance from periodically saturated soil or bedrock.	☐ Yes ☐ No*

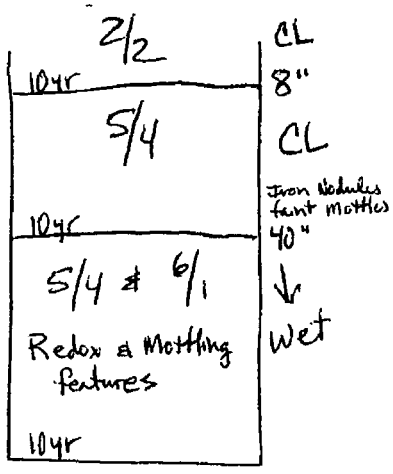
Indicate depths or elevations

A. Bottom of distribution media	30"
B. Periodically saturated soil/bedrock	40"
C. System separation	10"
D. Required compliance separation*	36"

*May be reduced up to 15 percent if allowed by Local Ordinance.

Any "no" answer above indicates the system is failing to protect groundwater.

Describe verification methods and results:



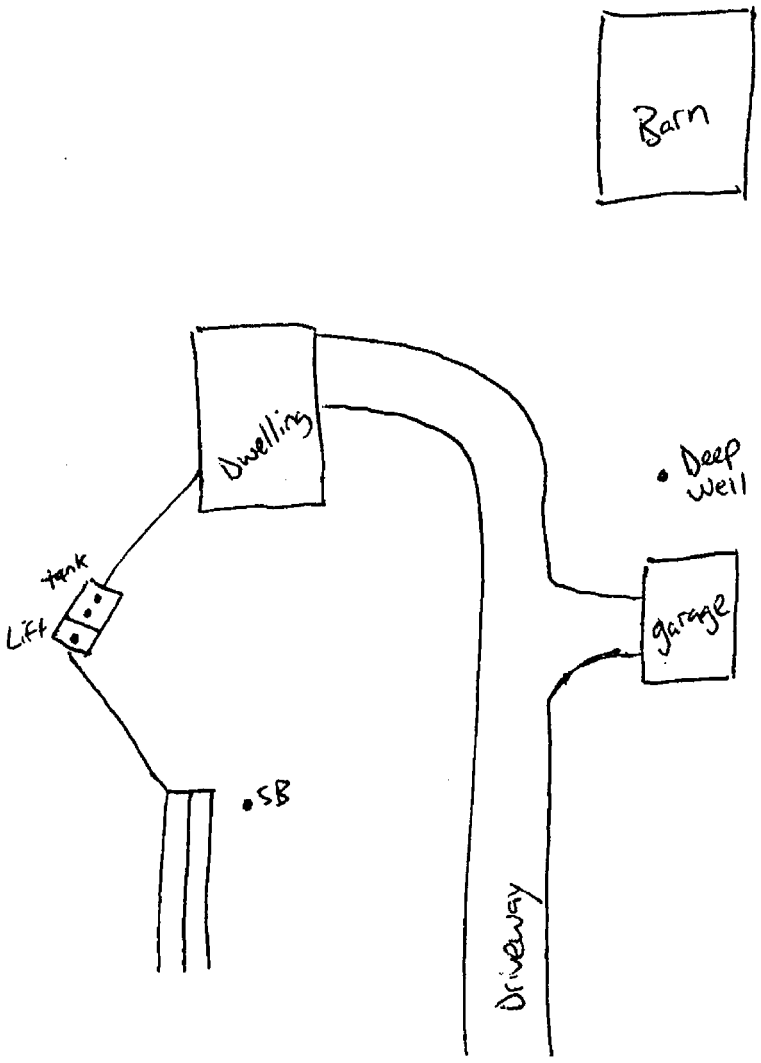
Upgrade requirements: *(Minn. Stat. § 115.55) An imminent threat to public health and safety (ITPHS) must be upgraded, replaced, or its use discontinued within ten months of receipt of this notice or within a shorter period if required by local ordinance. If the system is failing to protect ground water, the system must be upgraded, replaced, or its use discontinued within the time required by local ordinance. If an existing system is not failing as defined in law, and has at least two feet of design soil separation, then the system need not be upgraded, repaired, replaced, or its use discontinued, notwithstanding any local ordinance that is more strict. This provision does not apply to systems in shoreland areas, Wellhead Protection Areas, or those used in connection with food, beverage, and lodging establishments as defined in law.*

Parcel Number: 140148000

Date & Initial: 6-26-24 PJS

System Drawing

The system drawing which includes and identifies a graphic scale in feet or indicates all setback distances, all septic/holding/lift tanks, drainfields, wells within 100 feet of system (indicate depth of wells), dwelling and non-dwelling structures, lot lines, road right-of-ways, easements, OHWLs, wetlands, and topographic features (i.e. bluffs).



Additional Comments: Septic is non-compliant