080329000-2025

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

Certificate of Compliance
Inspection Report - Permit #: SS2025-2333

Owner & Property Information

Owner Name:	JENEL INVESTMENTS LLC
Mailing Address:	JENEL INVESTMENTS LLC 37684 SUNSET DR PONSFORD MN 56575
Parcel #:	080329000
Secondary Parcel #:	

Site Address:	25626 BRANDY LAKE RD
Township - Sec/Twp/Rng:	DETROIT - 21/139/041
Legal Description:	BEG AT SW COR SW1/4 OF NE1/4 TH N 400' E 200' S 395.38' & W 190' TO BEG
Designer:	Cubed B LLC, L4142 (Brant Bigger)
Installer:	Stenger Excavating LLC, L553 (Timothy Stenger)

Inspector Verified Specifications

Insp- Effluent Screen Installed:	Yes
Insp- Alarm Required:	Yes
Insp- Lift Pump in System:	Yes
Insp- Number of Bedrooms:	6

Insp- Tank Nbr/Size:	3/1000/1600/650
Insp- Drainfield Type:	Pressure Bed
Insp- Drainfield Size:	2-10X38 PRESSURE BEDS
Insp- Soil Verification:	#1:SEE ATTACHED #2:N/A #3:N/A

Inspector Verified Setbacks

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

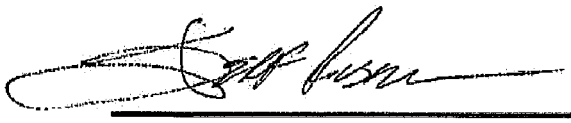
Insp- Drainfield Dist to Road	10
Insp- Drainfield Dist to Nearest Prop Line	10
Insp- Drainfield Dist to Nearest Structure	20
Insp- Drainfield Dist to Well	50
Insp- Drainfield Dist to OHW	150
Insp- Drainfield Dist to Pond/Wetland	NA
Insp- Drainfield Dist to Pressure Line	

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: 06/18/2025

Zoning Office Signature:



Jeff Rusness - ISTS Inspector

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

Field Review Form

Permit # SS2025-2333

Property and Owner

Owner: **JENEL INVESTMENTS LLC**	Parcel Number: **080329000**
Site Address: **25626 BRANDY LAKE RD**	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) Lift pump in basement? Y (N)
Number of bedrooms: **6**	Review - Number of bedrooms: 6	
Effluent screen	Effluent screen installed? (Y) N Mfr: PolyLoc 525	
Alarm: **Yes** Type: **electronic**	Review - Alarm? (Y) N Type & Mfr: Alderon	
Lift pump in system: **Yes**	Review - Lift pump in system? (Y) N Mfr: Gould Dopl Pumps	

360 380 760

Component Information

Tank size: **2x 1,000-gallon septic, 1x 1,600-gallon 2-compartment septic, & 650-gallon pump**	Review - Tank nbr: 3 size: 2-1000 1-1650 Mfr: Brown/Wilbert
Drainfield type: **Pressure Bed**	Review - Drainfield type: 2- 10X138 Pressure beds
Drainfield size: Full size - ~~1000~~ 760 Reduced/warr. size -	Review - Drainfield status: none / (installed) next spring Review - Drainfield size: 760 SQFT
Absorption area size: **9" under pipe**	Review - Absorption area size: NA
Chamber type/num: Trench sqft/chamber -	Review - Chamber type: NA Num: Review - Trench sqft/chamber:
Drainfield rock depth: **9" under pipe**	Review - Rock depth: 12 11

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	>100'	>30'	10+	10
Nearest prop line	>100'	>10'	10+	10
Nearest structure	>10'	>20'	20+	10
Well	>50'	>80'	50	50
OHW	150	150	150	150+
Pond/Wetland	na	na	NA	NA
Pressure line				NA

Date System Installed: 5-28-2025 Installer: Stenger B/C Inspector:

University of Minnesota Onsite Sewage Treatment Program

Preliminary Evaluation Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. Contact Information

v 04.02.2024

Property Owner/Client:	Steven Schmit	Date Completed:	4/25/2025
Site Address:	25626 BRANDY LAKE RD, DETROIT LAKES MN 56501	Project ID:	
Email:	bluerydge@aol.com	Phone:	218-841-5793
Mailing Address:		Alt Phone:	
Legal Description:	BEG AT SW COR SW1/4 OF NE1/4 TH N 400' E 200' S 395.38' & W 190' TO BEG		

Parcel ID: 080329000 SEC: 21 TWP: 139 RNG: 041

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: 6 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: This is a tri-plex with tennants

Anticipated non-domestic waste:

The above is complete & accurate: Digitally signed by owner on May 21, 2025 at 21:36

Client signature & date

B. Designer-determined Flow and Anticipated Waste Strength Information

Attach additional information as necessary.

Design Flow: 900 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					50'	veritied onsite
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: 78C—Dorset-Corliss complex Slope Range: 6-12 %

List landforms: Hillslopes

Landform position(s): Summit, shoulder, backslope

Parent materials: Loamy glaciofluvial deposits over sandy and gravelly outwash

Depth to Bedrock/Restrictive Feature: >80 in Depth to Watertable: >80 in

Map Unit Ratings

Septic Tank Absorption Field- At-grade:	Slightly 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

LGU Contact: Kyle Vareberg

LGU-specific setbacks:

LGU-specific design requirements:

LGU-specific installation requirements:

Notes:

Cubed B LLC
SEPTIC SYSTEM DESIGN & INSPECTION

BRANT B. BIGGER
Owner

13248 US Hwy 10
Lake Park, MN 56554
218-234-6906
brant.bigger@gmail.com
cubedbllc.com

Upper System Corners
NW = 100' 1" NE = 100' 5"
SW = 101' SE = 101'

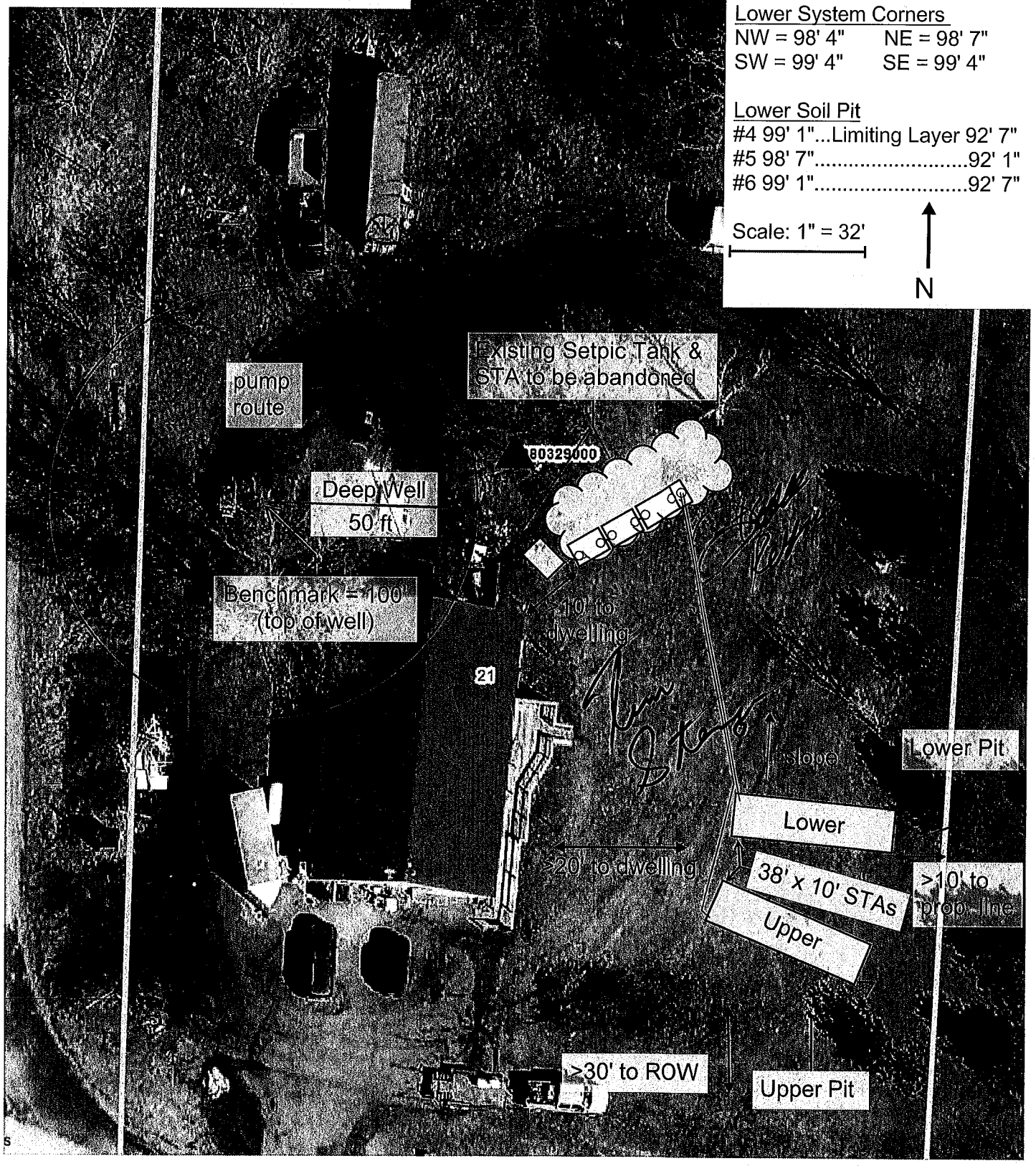
Upper Soil Pit
#1 100' 5".Limiting Layer 93' 11"
#2 100' 11".....94' 5"
#3 100' 11".....94' 5"

Lower System Corners
NW = 98' 4" NE = 98' 7"
SW = 99' 4" SE = 99' 4"

Lower Soil Pit
#4 99' 1"...Limiting Layer 92' 7"
#5 98' 7".....92' 1"
#6 99' 1".....92' 7"

Scale: 1" = 32'

N



University of Minnesota Onsite Sewage Treatment Program

Field Evaluation Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. Project Information

v 04.02.2024

Property Owner/Client: Steven Schmit | Project ID:

Site Address: 25626 BRANDY LAKE RD, DETROIT LAKES MN 56501 | Date Completed: 5/7/2025

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): Lawn | Landscape position: Back/ Side Slope

Percent slope: 9.0 % | Slope shape: Linear, Linear | Slope direction: northwest

Describe the flooding or run-on potential of site: slight risk of run-on from up-slope

Describe the need for Type III or Type IV system:

Note:

Proposed soil treatment area protected? (Y/N): Yes | If yes, describe: flagged & painted

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: 6 | Soil observation logs attached (Y/N): Yes

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

5. Phase I. Reporting Information

	Depth		Elevation	
Limiting Condition*:	72	in	**92.60**	ft
Periodically saturated soil:		in		ft
Standing water:		in		ft
Bedrock:		in		ft

Most Restrictive Depth Identified from List Below

Soil Texture: Medium Loamy Sand

Percolation Rate: min/inch

Soil Hyd Loading Rate: 1.20 gpd/sq.ft

Benchmark Elevation: 100.0 ft | Elevations and Benchmark on map? (Y/N): Yes

Benchmark Elevation Location: top of well NW of the STA & house

Differences between soil survey and field evaluation:

Site evaluation issues / comments:

Anticipated construction issues:

University of Minnesota Onsite Sewage Treatment Program

Soil Observation Log

Project ID:

v 04.02.2024

Client:	Steven Schmit			Location / Address:	25626 BRANDY LAKE RD, DETROIT LAKES MN 56501
Soil parent material(s): (Check all that apply)	☑ Outwash	☐ Lacustrine	☐ Loess	☐ Till	☐ Alluvium ☐ Bedrock ☐ Organic Matter ☐ Disturbed/Fill
Landscape Position:	Back/Side Slope	Slope %:	6.0	Slope shape:	Linear, Linear
Flooding/Run-On potential:	No				
Vegetation:	Grass	Soil survey map units:	78C—Dorset-Corliss complex	Surface Elevation-Relative to benchmark:	100' 5"
Date/Time of Day/Weather Conditions:	5/7/2025	1:30 PM	sunny	Limiting Layer Elevation:	93' 11"
Observation #/Location:	#1	N side of upper pit		Observation Type:	Pit

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure		
							Shape	Grade	Consistence
0-8	Medium Loamy Sand	10	10YR 2/2		None	None	Granular	Structureless	Loose
8-26	Medium Loamy Sand	40	10YR 4/4		None	None	Single grain	Structureless	Loose
26-36	Medium Sand	40	10YR 5/4		None	None	Single grain	Structureless	Loose
36-54	Medium Sand	40	10YR 5/6		None	None	Single grain	Structureless	Loose
54-78	Medium Sand	5	10YR 6/3		None	None	Single grain	Structureless	Loose

Comments: This observation is for the upper STA. 50% credit applied for 8-54" depth (46" * 50% = 23")

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

Brant Bigger	Brant Bigger	L4142	5/15/2025
(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 04.02.2024

Client: Steven Schmit		Location / Address: 25626 BRANDY LAKE RD, DETROIT LAKES MN 56501	
Soil parent material(s): (Check all that apply) ☑ Outwash ☐ Lacustrine ☐ Loess ☐ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter ☐ Disturbed/Fill			
Landscape Position: Back/Side Slope	Slope %: 6.0	Slope shape: Linear, Linear	Flooding/Run-On potential: No
Vegetation: Lawn	Soil survey map units: 78C—Dorset-Corliss complex		Surface Elevation-Relative to benchmark: 100' 11"
Date/Time of Day/Weather Conditions:	5/7/2025	1:30 PM	sunny	Limiting Layer Elevation: 94' 5"
Observation #/Location: #2	W side of upper pit		Observation Type: Pit

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
0-8	Medium Loamy Sand	10	10YR 2/2		None	None	Granular	Structureless	Loose
8-26	Medium Loamy Sand	40	10YR 4/4		None	None	Single grain	Structureless	Loose
26-36	Medium Sand	40	10YR 5/4		None	None	Single grain	Structureless	Loose
36-54	Medium Sand	40	10YR 5/6		None	None	Single grain	Structureless	Loose
54-78	Medium Sand	5	10YR 6/3		None	None	Single grain	Structureless	Loose

Comments: This observation is for the upper STA. 50% credit applied for 8-54" depth (46" * 50% = 23")

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Brant Bigger		L4142	5/15/2025
(Designer/Inspector)	(Signature)	(License #)	(Date)

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

University of Minnesota Onsite Sewage Treatment Program

Soil Observation Log

Project ID:

v 04.02.2024

Client:	Steven Schmit	Location / Address:	25626 BRANDY LAKE RD, DETROIT LAKES MN 56501

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

Landscape Position:	Back/Side Slope	Slope %: 6.0	Slope shape: Linear, Linear
Flooding/Run-On potential:	No		
Vegetation:	Grass	Soil survey map units:	78C—Dorset-Corliss complex
Surface Elevation-Relative to benchmark:	100' 11"		
Date/Time of Day/Weather Conditions:	5/7/2025	1:30 PM	sunny
Limiting Layer Elevation:	94' 5"		
Observation #/Location:	#3	E side of upper pit	Observation Type: Pit

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure Shape	Structure Grade	Structure Consistence
0-8	Medium Loamy Sand	10	10YR 2/2		None	None	Granular	Structureless	Loose
8-26	Medium Loamy Sand	40	10YR 4/4		None	None	Single grain	Structureless	Loose
26-36	Medium Sand	40	10YR 5/4		None	None	Single grain	Structureless	Loose
36-54	Medium Sand	40	10YR 5/6		None	None	Single grain	Structureless	Loose
54-78	Medium Sand	5	10YR 6/3		None	None	Single grain	Structureless	Loose

Comments: This observation is for the upper STA. 50% credit applied for 8-54" depth (46" * 50% = 23")

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

Brant Bigger		L4142	5/15/2025
(Designer/Inspector)	(Signature)	(License #)	(Date)

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

University of Minnesota Onsite Sewage Treatment Program

Soil Observation Log

Project ID:

v 04.02.2024

Client: Steven Schmit		Location / Address: 25626 BRANDY LAKE RD, DETROIT LAKES MN 56501	
Soil parent material(s): (Check all that apply) ☑ Outwash ☐ Lacustrine ☐ Loess ☐ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter ☐ Disturbed/Fill			
Landscape Position: Back/Side Slope	Slope %: 8.0	Slope shape: Linear, Linear	Flooding/Run-On potential: No
Vegetation: Lawn	Soil survey map units: 78C—Dorset-Corliss complex		Surface Elevation-Relative to benchmark: 99' 1"
Date/Time of Day/Weather Conditions:	5/7/2025	2:00 PM	sunny	Limiting Layer Elevation: 92' 7"
Observation #/Location: #4	W side of lower pit		Observation Type: Pit

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
0-10	Medium Loamy Sand	10	10YR 2/2		None	None	Granular	Structureless	Loose
10-28	Medium Sand	35	10YR 4/4		None	None	Single grain	Structureless	Loose
28-78	Medium Sand	10	10YR 5/4		None	None	Single grain	Structureless	Loose

Comments: This observation is for the lower STA. 50% credit applied for 10-28" depth (18" * 50% = 9")

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

Brant Bigger		L4142	5/15/2025
(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 04.02.2024

Client: Steven Schmit		Location / Address:	25626 BRANDY LAKE RD, DETROIT LAKES MN 56501
Soil parent material(s): (Check all that apply) ☑ Outwash ☐ Lacustrine ☐ Loess ☐ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter ☐ Disturbed/Fill			
Landscape Position: Back/Side Slope	Slope %: 8.0	Slope shape: Linear, Linear	Flooding/Run-On potential: No
Vegetation: Lawn	Soil survey map units: 78C—Dorset-Corliss complex		Surface Elevation-Relative to benchmark: 98' 7"
Date/Time of Day/Weather Conditions:	5/7/2025	2:00 PM sunny	Limiting Layer Elevation: 92' 1"
Observation #/Location: #5	N side of lower pit	Observation Type: Pit	

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
0-10	Medium Loamy Sand	10	10YR 2/2		None	None	Granular	Structureless	Loose
10-28	Medium Sand	35	10YR 4/4		None	None	Single grain	Structureless	Loose
28-78	Medium Sand	10	10YR 5/4		None	None	Single grain	Structureless	Loose

Comments: This observation is for the lower STA. 50% credit applied for 10-28" depth (18" * 50% = 9")

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Brant Bigger		L4142	5/15/2025
(Designer/Inspector)	(Signature)	(License #)	(Date)

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

University of Minnesota Onsite Sewage Treatment Program

Soil Observation Log

Project ID:

v 04.02.2024

Client:	Steven Schmit	Location / Address:	25626 BRANDY LAKE RD, DETROIT LAKES MN 56501

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

Landscape Position:	Back/Side Slope	Slope %:	8.0	Slope shape:	Linear, Linear	Flooding/Run-On potential:	No
Vegetation:	Lawn	Soil survey map units:	78C—Dorset-Corliss complex			Surface Elevation-Relative to benchmark:	99' 1"
Date/Time of Day/Weather Conditions:		5/7/2025	2:00 PM	sunny		Limiting Layer Elevation:	92' 7"
Observation #/Location:	#6	E side of lower pit		Observation Type:	Pit		

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)		Mottle Color(s)		Redox Kind(s)	Indicator(s)	I-------- Structure----------I		
									Shape	Grade	Consistence
0-10	Medium Loamy Sand	10	10YR	2/2			None	None	Granular	Structureless	Loose
10-28	Medium Sand	35	10YR	4/4			None	None	Single grain	Structureless	Loose
28-78	Medium Sand	10	10YR	5/4			None	None	Single grain	Structureless	Loose

Comments: This observation is for the lower STA. 50% credit applied for 10-28" depth (18" * 50% = 9")

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

Brant Bigger		L4142	5/15/2025
(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)

Textures:	
C	Clay
SiC	Silty Clay
SC	Sandy Clay
CL	Clay Loam
SiCL	Silty Clay Loam
SCL	Sandy Clay Loam
Si	Silt
SiL	Silt Loam
L	Loam
SL	Sandy Loam*
LS	Loamy Sand*
S	Sand*

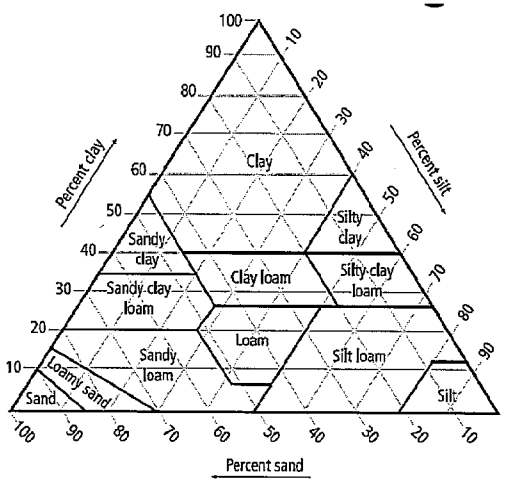
*Sand Modifiers:	
Co	Coarse
M	Medium
F	Fine
VF	Very Fine

Topsoil Indicator(s) of Saturation:

T1. Wetland Vegetation
T2. Depressional Landscape
T3. Organic texture or organic modifiers
T4. N 2.5/ 0 color
T5. Redox features in topsoil
T6. Hydric indicators

Subsoil Indicator(s) of Saturation:

S1. Depleted matrix (value >/=4 and chroma </=2)
S2. Distinct gray or red redox features (any Matrix Hue)
S3. Matrix Hue of 5Y with a chroma </= 3
S4. Matrix Hue of 7.5 YR or redder with faint redox concentrations or redox depletions



Shape:

Granular	The peds are approximately spherical or polyhedral and are commonly found in topsoil. These are the small, rounded peds that hang onto roots when soil is turned over.
Platy	The peds are flat and plate like. They are oriented horizontally and are usually overlapping. Platy structure is commonly found in forested areas just below the leaf litter or shallow topsoil.
Blocky	The peds are block-like or polyhedral, and are bounded by flat or slightly rounded surface that are castings of the faces of surrounding peds. Blocky structure is commonly found in the lower topsoil and subsoil.
Prismatic	Flat or slightly rounded vertical faces bound the individual peds. Peds are distinctly longer vertically, and faces are typically casts or molds of adjoining peds. Prismatic structure is commonly found in the lower subsoil.
Single Grain	The structure found in a sandy soil. The individual particles are not held together.

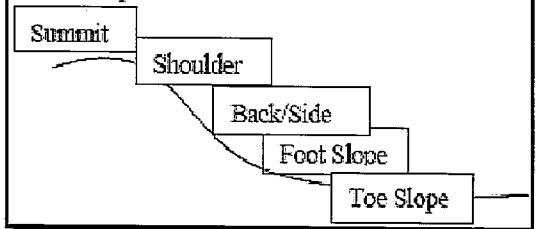
Grade:

Loose	No peds, sandy soil
Weak	Poorly formed, indistinct peds, barely observable in place
Moderate	Well formed, distinct peds, moderately durable and evident, but not distinct in undisturbed soil
Strong	Durable peds that are quite evident in un-displaced soil, adhere weakly to one another, withstand displacement, and become separated when soil is disturbed
Massive	No observable aggregates, or no orderly arrangement of natural lines of weakness

Consistence:

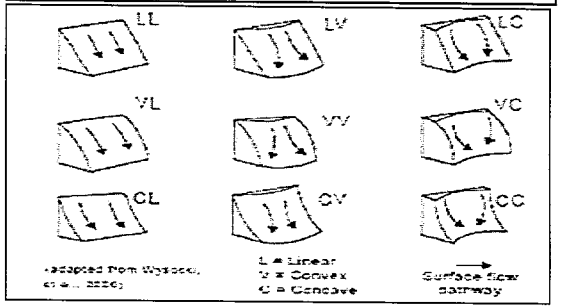
Loose	Intact specimen not available
Friable	Slight force between fingers
Firm	Moderate force between fingers
Extremely Firm	Moderate force between hands or slight foot pressure
Rigid	Foot pressure

Landscape Position:



Slope Shape:

Slope shape is described in two directions:
up and down slope (perpendicular to the contour),
and across slope (along the horizontal contour);
e.g. Linear, Convex or LV'.



University of Minnesota Onsite Sewage Treatment Program

Bed Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. SYSTEM SIZING: Project ID: v 04.02.2024

A. Design Flow: 900 GPD

B. Code Maximum Depth: 36.0 inches Designers Maximum Depth: 12.0 inches

C. Soil Loading Rate: 1.20 GPD/sq.ft

D. Hydraulic Absorption Required Bottom Area: Design Flow (1A) ÷ Soil Loading Rate (1C)

900 GPD ÷ 1.20 GPD/sq.ft = 750 sq.ft

Optional Upsizing of Dispersal Media Area

E. Larger Bed Area Size or Organic Sizing of Bed Area (see organic loading sheet - 2G) 380 sq.ft

F. Select Distribution Method: Pressure Notes:

G. Select Dispersal Media: Rock Product:

H. If distribution media is installed in contact with sand or loamy sand or with a percolation rate of 0.1 to 5 mpi indicate distribution or treatment method:

2. BED CONFIGURATION: (Less than 6% slope required)

A. Select size Multiplier: 1.0 1.0 = pressurized or 1.5 = gravity

B. Required Bed Area =Hydraulic Absorption area (1D) or Upsized Bed Area (1E) X Size Multiplier (2A) =

380 sq.ft X 1.0 = 380 sq.ft

C. Select Bed Width: 10.0 ft

D. Calculate Bed Length: Designed Bottom Area (2B) ÷ Bed Width (2C) = Bed Length

380 sq.ft ÷ 10.0 ft = 38.0 ft

E. Contour Loading Rate: Bed Width (2C) x SHLR (1C) *Must be less then 12 to be a Type I system*

10.0 ft x 1.20 GPD/sq.ft = 12.0 gal/ft

3. ESTIMATED MATERIAL CALCULATION: ROCK

A. If drainfield rock is being used, select sidewall height

9 in 0.75 ft (0.33 ft for pressure, 0.5 ft for gravity)

B. Media Volume: (Media Depth(3A) + depth to cover pipe) X Designed Bottom Area(2B) = cu.ft

(0.8 ft + 0.33 ft) X 380.0 sq.ft = 410.4 cu.ft

C. Calculate Volume in cubic yards: Media volume in cubic feet (3A) ÷ 27 = cubic yards

410.4 cu.ft ÷ 27 = 15.2 cu.yd

Bed to be constructed to dimensions in design. This is an estimate of materials needed. Individual construction practices may vary quantities.

4. ESTIMATED MATERIAL CALCULATION: REGISTERED PRODUCTS - CHAMBERS AND EZFLOW

A. Registered Product:

B. Bed Width 10.0 ft

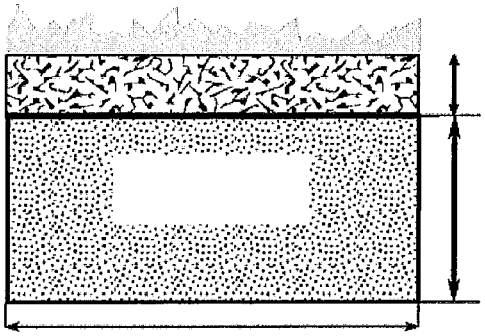
C. Bed Length Minimum 38.0 ft

D. Component depth (see Registration) in

Check registered product information for specific application details and design

5. Dimension Summary Project ID:

End View



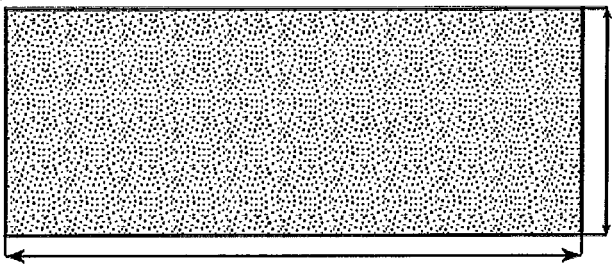
Minimum 12 inch cover

Elevation based on Benchmark

9.0	Media Depth (in) *Below Pipe*	99.83 ft
12.0	Max Depth (in)- Design	99.08 ft
10 Bed Width (ft)	36.0 Required Separation (in)	96.85 ft
	72.0 Limiting Condition (in)	93.85 ft

Top View

Distribution Pipes must be no less 12 inches and no more than 24 inches from the edge



One 4" Inspection pipe per bed required

10.0 Bed Width (ft)

38.0 Bed Length (ft)

Bottom Area (sq.ft) 380

Distribution Media: Rock

Manifold Connection: End

Perforation Size: 1/4 (in)

Perforation Spacing: 36 (in)

Comments:

This sheet is for the Upper STA

Two separate (Upper & Lower) STAs will be installed. Both will be the same size.
Bottom of the STA be 12" deep on the lower side of the bed (99' 1" for Upper and 98' 4" for lower).

University of Minnesota Onsite Sewage Treatment Program

Bed Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. SYSTEM SIZING: Project ID: v 04.02.2024

A. Design Flow: 900 GPD

B. Code Maximum Depth: 36.0 inches Designers Maximum Depth: 12.0 inches

C. Soil Loading Rate: 1.20 GPD/sq.ft

D. Hydraulic Absorption Required Bottom Area: Design Flow (1A) ÷ Soil Loading Rate (1C)

900 GPD ÷ 1.20 GPD/sq.ft = 750 sq.ft

Optional Upsizing of Dispersal Media Area

E. Larger Bed Area Size or Organic Sizing of Bed Area (see organic loading sheet - 2G) 380 sq.ft

F. Select Distribution Method: Pressure Notes:

G. Select Dispersal Media: Rock Product:

H. If distribution media is installed in contact with sand or loamy sand or with a percolation rate of 0.1 to 5 mpi indicate distribution or treatment method:

2. BED CONFIGURATION: (Less than 6% slope required)

A. Select size Multiplier: 1.0 1.0 = pressurized or 1.5 = gravity

B. Required Bed Area =Hydraulic Absorption area (1D) or Upsized Bed Area (1E) X Size Multiplier (2A) =

380 sq.ft X 1.0 = 380 sq.ft

C. Select Bed Width: 10.0 ft

D. Calculate Bed Length: Designed Bottom Area (2B) ÷ Bed Width (2C) = Bed Length

380 sq.ft ÷ 10.0 ft = 38.0 ft

E. Contour Loading Rate: Bed Width (2C) x SHLR (1C) *Must be less then 12 to be a Type I system*

10.0 ft x 1.20 GPD/sq.ft = 12.0 gal/ft

3. ESTIMATED MATERIAL CALCULATION: ROCK

A. If drainfield rock is being used, select sidewall height

9 in 0.75 ft (0.33 ft for pressure, 0.5 ft for gravity)

B. Media Volume: (Media Depth(3A) + depth to cover pipe) X Designed Bottom Area(2B) = cu.ft

(0.8 ft + 0.33 ft) X 380.0 sq.ft = 410.4 cu.ft

C. Calculate Volume in cubic yards: Media volume in cubic feet (3A) ÷ 27 = cubic yards

410.4 cu.ft ÷ 27 = 15.2 cu.yd

Bed to be constructed to dimensions in design. This is an estimate of materials needed. Individual construction practices may vary quantities.

4. ESTIMATED MATERIAL CALCULATION: REGISTERED PRODUCTS - CHAMBERS AND EZFLOW

A. Registered Product:

B. Bed Width 10.0 ft

C. Bed Length Minimum 38.0 ft

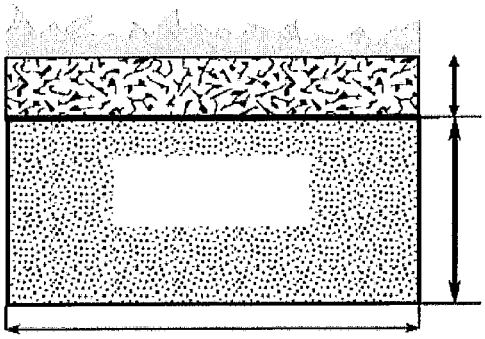
D. Component depth (see Registration) in

Check registered product information for specific application details and design

5. Dimension Summary

Project ID:

End View



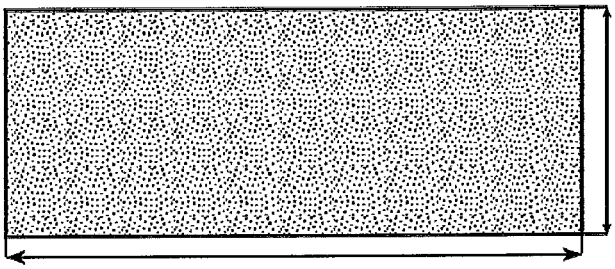
Minimum 12 inch cover

Elevation based on Benchmark

9.0	Media Depth (in) *Below Pipe*	98.08 ft
12.0	Max Depth (in)- Design	97.33 ft
10 Bed Width (ft)		
36.0	Required Separation (in)	94.33 ft
72.0	Limiting Condition (in)	91.33 ft

Top View

Distribution Pipes must be no less 12 inches and no more than 24 inches from the edge



One 4" Inspection pipe per bed required

10.0 Bed Width (ft)

38.0 Bed Length (ft)

Bottom Area (sq.ft) 380

Distribution Media: Rock

Manifold Connection: End

Perforation Size: 1/4 (in)

Perforation Spacing: 36 (in)

Comments:

This sheet is for the Lower STA

Two separate (Upper & Lower) STAs will be installed. Both will be the same size.
Bottom of the STA be 12" deep on the lower side of the bed (99' 1" for Upper and 98' 4" for lower).

University of Minnesota Onsite Sewage Treatment Program

Pressure Distribution Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

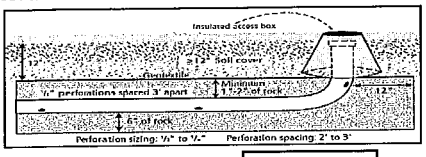
Project ID: v 04.02.2024

1. Media Bed Width: 10.0 ft
2. Media Bed Length: 38.0 ft
3. Minimum Number of Laterals in system/zone = Rounded up number of [(Media Bed Width(1.) - 4) ÷ 3] + 1.

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

4. Designer Selected *Number of Laterals*: 3 laterals

   Cannot be less than line 2 (Except in at-grades)



5. Lateral spacing in Bed; *Must be greater than 1 foot and no more than 2 feet from Edge*: 1.00 ft
6. *Length of Laterals* = Media Bed Length(2.) - 2 Feet.

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

7. Select *Perforation Spacing*: 3.0 ft
8. Determine the *Number of Perforation Spaces*. Divide the *Length of Laterals(6.)* by the *Perforation Spacing* (7.) and round down to the nearest whole number.

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

9. *Number of Perforations per Lateral* is equal to 1.0 plus the *Number of Perforation Spaces(8.)*. 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

10. Select *Perforation Diameter Size:* 1/4 in 0.25
11. *Select Lateral Diameter (See Table)*: 2.00 in
12. Select *Manifold Connection* (End or Center): End

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

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

¼ 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

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

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

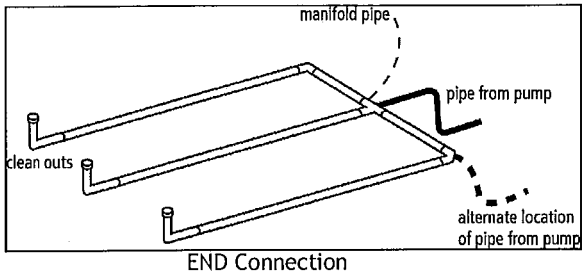
1/8 Inch Perforations

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

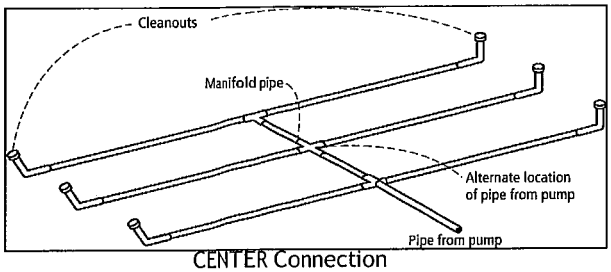
University of Minnesota Onsite Sewage Treatment Program

Pressure Distribution Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY



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

End Feed Lateral Min Diameter: 2.00

Center Feed Lateral Min Diameter: ____

13. *Total Number of Perforations* equals the *Number of Perforations per Lateral (9.)* multiplied by the *Number of Perforated Laterals.(4.)*

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

14. 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)(1.) X Bed Length (ft)(2.)

10.00 ft X 38.00 ft = 380 sq.ft

b. *Square Foot per Perforation = Bed Area (14a)* ÷ by *Total Number of Perfs (13)*

380 sqft ÷ 39 perf = 10 sq.ft/perf

15. Select *Minimum Average Head*: 1.0 ft

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

17. *Flow Rate = Total Number of Perfs(13.) X Perforation Discharge(16.)*

39 Perfs X 0.74 GPM per Perforation = 29.0 GPM

18. *Volume of Liquid Per Foot of Distribution Piping (Table II)*: 0.170 Gallons/ft

19. *Volume of Distribution Piping = Number of Perforated Laterals(4.) X Length of Laterals(6.) X Volume of Liquid Per Foot of Distribution Piping (18.)*

3 X 36.0 ft X 0.170 gal/ft = 18.4 Gallons

20. Minimum Delivered Volume = Volume of Distribution Piping (19.) X 4

18.4 gal X 4 = 73.4 Gallons

21. Maximum Delivered Volume = Design flow x 25%

900 gpd X 25% = 225.0 Gallons

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

Perforation Discharge (GPM)				
Head (ft)	Perforation Diameter			
	1/8	3/16	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:

Basic STA Pump Selection Design Worksheet

ONSITE SEWAGE TREATMENT PROGRAM

MINNESOTA POLLUTION CONTROL AGENCY

1. PUMP CAPACITY

Project ID:

v 04.02.2024

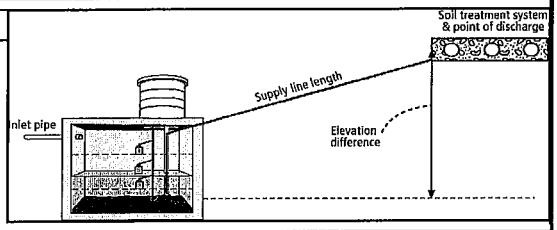
Pumping to Gravity or Pressure Distribution: Pressure

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: _____

2. HEAD REQUIREMENTS



A. Elevation Difference between pump and point of discharge: 9.0 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

D. 1. Supply Pipe Diameter: 2.0 in

2. Supply Pipe Length: 100 ft

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

Friction Loss = 2.2 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*

100 ft X 1.25 = 125.0 ft

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

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 =

2.2 ft per 100ft X 125.0 ft ÷ 100 = 2.8 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 ft + 5.0 ft + _____ ft + 2.8 ft = 16.8 ft

3. PUMP SELECTION

A pump must be selected to deliver at least **29.0** GPM with at least **16.8** feet of total head.

Comments:

This sheet is for the Upper STA

University of Minnesota Onsite Sewage Treatment Program

Basic STA Pump Selection Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. PUMP CAPACITY

Project ID:

v 04.02.2024

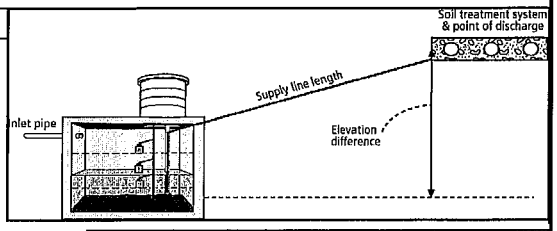
Pumping to Gravity or Pressure Distribution: Pressure

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: Equalization/Time Dosing

2. HEAD REQUIREMENTS



A. Elevation Difference between pump and point of discharge: 8.0 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

D. 1. Supply Pipe Diameter: 2.0 in

2. Supply Pipe Length: 80 ft

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

Friction Loss = 2.2 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*

80 ft X 1.25 = 100.0 ft

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

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 =

2.2 ft per 100ft X 100.0 ft ÷ 100 = 2.2 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)

8 ft + 5.0 ft + ____ ft + 2.2 ft = 15.2 ft

3. PUMP SELECTION

A pump must be selected to deliver at least **29.0** GPM with at least **15.2** feet of total head.

Comments:

This sheet is for the Lower STA

ONSITE SEWAGE TREATMENT PROGRAM

STA Dosing Pump Tank Design Worksheet (Demand Dose)

MINNESOTA POLLUTION CONTROL AGENCY

DETERMINE TANK CAPACITY AND DIMENSIONS | Project ID: | v 04.02.2024

1. A. Design Flow: 900 GPD C. Tank Use: Dosing
   B. Code minimum pump tank capacity: 500 Gal D. Designed pump tank capacity: 650 Gal

2. A. Tank Manufacturer: Wippler B. Tank Model: 650 Pump
   C. Capacity from manufacturer: 650 Gallons
   D. Liquid depth of tank from manufacturer: 42.0 inches
   E. Gallons per inch from manufacturer: 15.5 Gallons per inch

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* (2E)

   (14 in + 2 inches) X 15.5 Gallons Per Inch = 248 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 73.4 **Gallons (Minimum dose)** 4.74 inches/dose

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

   Design Flow: 600 GPD X 0.25 = 150.0 **Gallons (Maximum dose)** 9.68 inches/dose

6. *Select a pumpout volume that meets both Minimum and Maximum:* 107.0 Gallons

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

   600 gpd ÷ 107.0 gal = 5.6 *Doses**

   * Doses need to be equal to or greater than 4

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

8. Calculate Drainback:

   A. *Diameter of Supply Pipe* = 2 inches

   B. Length of Supply Pipe = 100 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)*

   100 ft X 0.170 gal/ft = 17.0 Gallons

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

   107.0 gal + 17.0 gal = 124.0 Gallons

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

    3 in X 15.5 gal/in = 46.5 Gallons

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

    [42.0 in - 27.0 in] X 15.5 gal/in = 232.5 Gallons

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(2E)

    124.0 gal ÷ 15.5 gal/in = 8.00 inches

13. Measuring from bottom of tank:

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

    14.0 in + 2 in = 16.0 inches

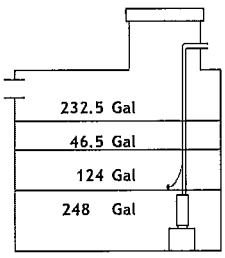
    B. *Distance to set Pump On Float=Distance to Set Pump-Off Float(13A) + Float Separation Distance(12.)*

    16.0 in + 8.0 in = 24.0 inches

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

    24.0 in + 3.0 in = 27.0 inches

Inches for Dose:	8.0	in
Alarm Depth	27.0	in
Pump On	24.0	in
Pump Off	16.0	in



University of Minnesota Onsite Sewage Treatment Program

Design Summary Page

MINNESOTA POLLUTION CONTROL AGENCY

1. PROJECT INFORMATION

v 04.02.2024

Property Owner/Client:	Steven Schmit	Project ID:	
Site Address:	25626 BRANDY LAKE RD, DETROIT LAKES MN 56501	Date:	05/15/25
Email Address:	bluerydge@aol.com	Phone:	218-841-5793

2. DESIGN FLOW & WASTE STRENGTH

Design Flow: 900 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 *Holding Tank Sizing: see 7080.2290*

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

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

The holding tank(s) will be: _____ *Existing tank reuse requires a tank integrity assessment*

Type of High Level Alarm: _____

(Alarm Set @ 75% tank capacity measured from inlet to bottom)

Comments: _____

4. SEPTIC TANK SIZING *Sizing: See 7080.1930*

A. Residential dwellings:

Number of Bedrooms (Residential): 6

Code Minimum **Septic Tank** Capacity: 2500 Gallons with 1 Tanks or Compartments

Recommended **Septic Tank** Capacity: 3600 Gallons with 4 Tanks or Compartments

The septic tank(s) will be: All New *Existing tank reuse requires a tank integrity assessment*

Comments: upsizing tanks and number of compartments because of tenant/non-owner usage

Effluent Screen & Alarm (Y/N): Yes Model/Type: Polylok PL-525 w/ eltrc. alarm or equ.

B. Other Establishments:

Waste received by: _____ _____ GPD x _____ Days Hyd. Retention Time

7080 Minimum **Septic Tank** Capacity: _____ Gallons with _____ Tanks or Compartments

Designed **Septic Tank** Capacity: _____ Gallons with _____ Tanks or Compartments

The septic tank(s) will be: _____ *Existing tank reuse requires a tank integrity assessment*

Comments: _____

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

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

University of Minnesota Onsite Sewage Treatment Program

Design Summary Page

MINNESOTA POLLUTION CONTROL AGENCY

5. PUMP TANK SIZING *Sizing: see 7080.2100*

Soil Treatment Dosing Tank				Other Component Dosing Tank:			
Pump Tank Capacity (7080 Minimum):	500 Gal			Pump Tank Capacity (7080 Minimum):	Gal		
Pump Tank Capacity (Designed):	650 Gal			Pump Tank Capacity (Designed):	Gal		
Pump Req:	29.0 GPM	Total Head	16.8 ft	Pump Req:	GPM	Total Head	ft
Supply Pipe Dia.	2.00 in	Dose Vol:	107.0 gal	Supply Pipe Dia.	in	Dose Vol:	Gal

* Flow measurement device must be incorporated for any system with a pump *

6. SYSTEM AND DISTRIBUTION TYPE

Project ID:

Soil Treatment Type:	Bed	Distribution Type:	Pressure Distribution-Level
Elevation Benchmark:	100.00 ft	Benchmark Location:	top of well NW of the STA & hous
MPCA System Type:	Type I	Distribution Media:	Rock
Type III/IV/V Details:			

7. SITE EVALUATION SUMMARY:

Describe Limiting Condition: Depth of Observation

Layers with >35% Rock Fragments? (yes/no) Yes 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: 50% credit applied for 8-54" depth (46" * 50% = 23") for Upper STA.
50% credit applied for 10-28" depth (18" * 50% = 9") for Lower STA.

	Depth		Depth	Elevation	
Limiting Condition:	72.0	inches	6.00 ft	94.4/92.6 ft	*Elevations are critical for system compliance.*
Minimum Req'd Separation:	36	inches	3.00 ft		
				Elevation	
Distribution Media Bottom*:	36	inches	3.00 ft	99.1/97.3 ft	Media Bottom 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 Bottom Elevation: 99.1/97.3 ft Mound Minimum Sand Depth: N/A inches

A. Soil Texture:	Medium Loamy Sand		
B. Soil Hyd. Loading Rate:	1.20 GPD/ft^2	C: Percolation Rate:	MPI
D. Contour Loading Rate:	12.0	Note:	
E. Measured Land Slope:	9.0 %	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	2x 380 sq.ft	Sidewall Depth	9.0 in	Maximum Bed Depth	36 in
Bed Width	10 ft	Bed Length	38.0 ft	Designed Bed Depth	12 in

University of Minnesota Onsite Sewage Treatment Program

Design Summary Page

MINNESOTA POLLUTION CONTROL AGENCY

Project ID:

Mound:

Dispersal Area		sq.ft	Bed Length		ft	Bed Width	ft
Absorption Width		ft	Clean Sand Lift		ft	Berm Width (0-1%)	ft
Upslope Berm Width		ft	Downslope Berm		ft	Endslope Berm Width	ft
Total System Length		ft	System Width		ft	Contour Loading Rate	gal/ft

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	2.00	in	Lateral Spacing	1.0 ft
Perforation Spacing	3.0	ft	Perforation Diameter	1/4	in	Drainback Volume	17.0 gal
Min Dose Volume	73.4	gal	Max Dose Volume	225.0	gal	Total Dosing Volume	124.0 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 HSW or Type IV/V Design - See Organic Loading tab

Organic Loading to Soil Treatment (Based on Waste Strength Data and Organic Loading Design)

A. Organic Loading Based on: B. Minumum required area sq.ft

Technology Strength Reduction (Tretment Level or HSW)

A. Starting Waste Strength Treatment desinged to meet:

Pretreatment Technology: *Must Meet or Exceed Target Level

Model: Units:

Disinfection Technology: *Required for Levels A & B

Model: Units:

10. Comments/Special Design Considerations:

Two separate 50' x 10' STAs dosed by alternating pumps.

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

Brant Bigger		L4142	20-May-25
(Designer)	(Signature)	(License #)	(Date)

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Septic System Management Plan for Above Grade Systems

The goal of a septic system is to protect human health and the environment by properly treating wastewater before returning it to the environment. Your septic system is designed to kill harmful organisms and remove pollutants before the water is recycled back into our lakes, streams and groundwater.

This **management plan** will identify the operation and maintenance activities necessary to ensure long-term performance of your septic system. Some of these activities must be performed by you, the homeowner. Other tasks must be performed by a licensed septic maintainer or service provider. However, it is **YOUR** responsibility to make sure all tasks get accomplished in a timely manner.

The University of Minnesota's *Septic System Owner's Guide* contains additional tips and recommendations designed to extend the effective life of your system and save you money over time.

Proper septic system design, installation, operation and maintenance means safe and clean water!

Property Owner	Steven Schmit	Email	bluerydge@aol.com
Property Address	25626 BRANDY LAKE RD, DETROIT LAKES MN 56501	Property ID	080329000
System Designer	Cubed B LLC	Contact Info	218-234-6906
System Installer	Stenger Excavating	Contact Info	218-847-2912
Service Provider/Maintainer		Contact Info	218-846-7314
Permitting Authority	Becker County	Contact Info	
Permit #	SS2025-421963	Date Inspected	

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

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

For a copy of the *Septic System Owner's Guide*, visit www.bookstores.umn.edu and search for the word "septic" or call 800-322-8642.

For more information see http://septic.umn.edu

Version: August 2015

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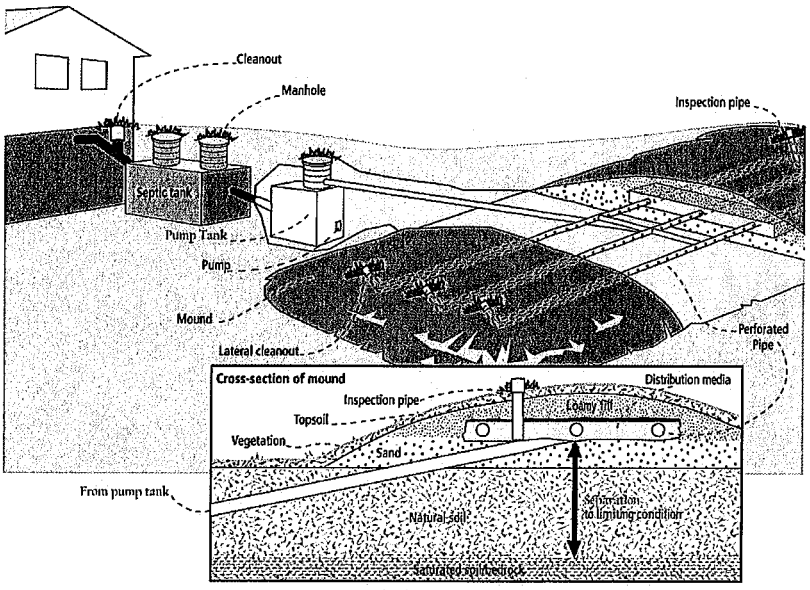
Septic System Management Plan for Above Grade Systems

Your Septic System



Septic System Specifics

System Type: (●) I ( ) II ( ) III ( ) IV* ( ) V*

(Based on MN Rules Chapter 7080.2200 – 2400)

**Additional Management Plan required*

☐ System is subject to operating permit*

☐ System uses UV disinfection unit*

Type of advanced treatment unit _____

Dwelling Type

Number of bedrooms: 6

System capacity/ design flow (gpd): 900

Anticipated average daily flow (gpd): 630

Comments _____

Business? : ( ) Y (●) N What type? _____

Well Construction

Well depth (ft): deep

- ☐ Cased well Casing depth: _____
- ☐ Other (specify): _____

Distance from septic (ft): >50'

Is the well on the design drawing? (●) Y ( ) N

Septic Tank

- ☐ First tank *Tank volume:* 2x 1,000 *gallons*
  Does tank have two compartments? (●) Y ( ) N
- ☐ Second tank *Tank volume:* 1,600 *gallons*
- ☐ Tank is constructed of concrete
- ☐ Effluent screen: (●) Y ( ) N Alarm (●) Y ( ) N

- ☐ Pump Tank 660 *gallons*
- ☐ Effluent Pump *make/model:* Goulds EP05 or equiv.
  Pump capacity 29 GPM
  TDH 16.8 & 15.2 Feet of head
- ☐ Alarm location pedistal

Soil Treatment Area (STA)

Mound/At-Grade area (width x length): 2x38 ft x 10 ft

Rock bed size (width x length): 2x 38 ft x 10 ft

Location of additional STA: north of new STAs

Type of distribution media: rock

- ☑ Inspection ports ☑ Cleanouts
- ☑ Surface water diversions
- ☐ Additional STA not available

Homeowner Management Tasks

These op*eration and maintenance ac*tivities are your responsibility. *Chart on page 6 can help track your activities.*

Your toilet is not a garbage can. Do not flush anything besides human waste and toilet paper. No wet wipes, cigarette butts, disposal diapers, used medicine, feminine products or other trash!

The system and septic tanks needs to be checked every 24 months

Your service provider or pumper/maintainer should evaluate if your tank needs to be pumped more or less often.

Seasonally or several times per year

- *Leaks.* Check (listen, look) for leaks in toilets and dripping faucets. Repair leaks promptly.
- *Soil treatment area.* Regularly check for wet or spongy soil around your soil treatment area. If surfaced sewage or strong odors are not corrected by pumping the tank or fixing broken caps and leaks, call your service professional. *Untreated sewage may make humans and animals sick.* Keep bikes, snowmobiles and other traffic off and control borrowing animals.
- *Alarms.* Alarms signal when there is a problem; contact your service professional any time the alarm signals.
- *Lint filter.* If you have a lint filter, check for lint buildup and clean when necessary. If you do not have one, consider adding one after washing machine.
- *Effluent screen.* If you do not have one, consider having one installed the next time the tank is cleaned along with an alarm.

Annually

- *Water usage rate.* A water meter or another device can be used to monitor your average daily water use. Compare your water usage rate to the design flow of your system (listed on the next page). Contact your septic professional if your average daily flow over the course of a month exceeds 70% of the design flow for your system.
- *Caps.* Make sure that all caps and lids are intact and in place. Inspect for damaged caps at least every fall. Fix or replace damaged caps before winter to help prevent freezing issues.
- *Water conditioning devices.* See Page 5 for a list of devices. When possible, program the recharge frequency based on *water demand (gallons)* rather than *time (days)*. Recharging too frequently may negatively impact your septic system. Consider updating to demand operation if your system currently uses time,
- *Review your water usage rate.* Review the Water Use Appliance chart on Page 5. Discuss any major changes with your service provider or pumper/maintainer.

During each visit by a service provider or pumper/maintainer

- Make sure that your service professional services the tank through the manhole. (NOT though a 4" or 6" diameter inspection port.)
- Ask how full your tank was with sludge and scum to determine if your service interval is appropriate.
- Ask your pumper/maintainer to accomplish the tasks listed on the Professional Tasks on Page 4.

Professional Management Tasks

These are the operation and maintenance activities that a pumper/maintainer performs to help ensure long-term performance of your system. At each visit a written report/record must be provided to homeowner.

Plumbing/Source of Wastewater

- Review the Water Use Appliance Chart on Page 5 with homeowner. Discuss any changes in water use and the impact those changes may have on the septic system.
- Review water usage rates (if available) with homeowner.

Septic Tank/Pump Tanks

- *Manhole lid.* A riser is recommended if the lid is not accessible from the ground surface. Insulate the riser cover for frost protection.
- *Liquid level.* Check to make sure the tank is not leaking. The liquid level should be level with the bottom of the outlet pipe. (If the water level is below the bottom of the outlet pipe, the tank may not be watertight. If the water level is higher than the bottom of the outlet pipe of the tank, the effluent screen may need cleaning, or there may be ponding in the soil treatment area.)
- *Inspection pipes.* Replace damaged or missing pipes and caps.
- *Baffles.* Check to make sure they are in place and attached, and that inlet/outlet baffles are clear of buildup or obstructions.
- *Effluent screen.* Check to make sure it is in place; clean per manufacturer recommendation. Recommend retrofitted installation if one is not present.
- *Alarm.* Verify that the alarm works.
- *Scum and sludge.* Measure scum and sludge in each compartment of each septic and pump tank, pump if needed.

Pump

- *Pump and controls.* Check to make sure the pump and controls are operating correctly.
- *Pump vault.* Check to make sure it is in place; clean per manufacturer recommendations.
- *Alarm.* Verify that the alarm works.
- *Drainback.* Check to make sure it is draining properly.
- *Event counter or elapsed time meter.* Check to see if there is an event counter or elapsed time meter for the pump. If there is one or both, calculate the water usage rate and compare to the anticipated use listed on Design and Page 2. Dose Volume: _____ gallons: Pump run time: _____ Minutes

Soil Treatment Area

- *Inspection pipes.* Check to make sure they are properly capped. Replace caps and pipes that are damaged.
- *Surfacing of effluent.* Check for surfacing effluent or other signs of problems.
- *Lateral flushing.* Check lateral distribution; if cleanouts exist, flush and clean at recommended frequency.
- *Vegetation* - Check to see that a good growth of vegetation is covering the system.

All other components – evaluate as listed here:

Water-Use Appliances and Equipment in the Home

Appliance	Impacts on System	Management Tips
Garbage disposal	• Uses additional water. • Adds solids to the tank. • Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area.	• Use of a garbage disposal is not recommended. • Minimize garbage disposal use. Compost instead. • To prevent solids from exiting the tank, have your tank pumped more frequently. • Add an effluent screen to your tank.
Washing machine	• Washing several loads on one day uses a lot of water and may overload your system. • Overloading your system may prevent solids from settling out in the tank. Unsettled solids can exit the tank and enter the soil treatment area.	• Choose a front-loader or water-saving top-loader, these units use less water than older models. • Limit the addition of extra solids to your tank by using liquid or easily biodegradable detergents. Limit use of bleach-based detergents and fabric softeners. • Install a lint filter after the washer and an effluent screen to your tank • Wash only full loads and think even – spread your laundry loads throughout the week.
Dishwasher	• Powdered and/or high-phosphorus detergents can negatively impact the performance of your tank and soil treatment area. • New models promote "no scraping". They have a garbage disposal inside.	• Use gel detergents. Powdered detergents may add solids to the tank. • Use detergents that are low or no-phosphorus. • Wash only full loads. • Scrape your dishes anyways to keep undigested solids out of your septic system.
Grinder pump (in home)	• Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area.	• Expand septic tank capacity by a factor of 1.5. • Include pump monitoring in your maintenance schedule to ensure that it is working properly. • Add an effluent screen.
Large bathtub (whirlpool)	• Large volume of water may overload your system. • Heavy use of bath oils and soaps can impact biological activity in your tank and soil treatment area.	• Avoid using other water-use appliances at the same time. For example, don't wash clothes and take a bath at the same time. • Use oils, soaps, and cleaners in the bath or shower sparingly.
Clean Water Uses	**Impacts on System**	**Management Tips**
High-efficiency furnace	• Drip may result in frozen pipes during cold weather.	• Re-route water directly out of the house. Do not route furnace discharge to your septic system.
Water softener Iron filter Reverse osmosis	• Salt in recharge water may affect system performance. • Recharge water may hydraulically overload the system.	• These sources produce water that is not sewage and should not go into your septic system. • Reroute water from these sources to another outlet, such as a dry well, draintile or old drainfield. • When replacing, consider using a demand-based recharge vs. a time-based recharge. • Check valves to ensure proper operation; have unit serviced per manufacturer directions
Surface drainage Footing drains	• Water from these sources will overload the system and is prohibited from entering septic system.	

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Septic System Management Plan for Above Grade Systems

Homeowner Maintenance Log

Track maintenance activities here for easy reference. See list of management tasks on pages 3 and 4.

Activity	Date accomplished									
Check frequently:										
Leaks: check for plumbing leaks*										
Soil treatment area check for surfacing**										
Lint filter: check, clean if needed*										
Effluent screen (if owner-maintained)***										
Alarm**										
Check annually:										
Water usage rate (maximum gpd _____)										
Caps: inspect, replace if needed										
Water use appliances – review use										
Other:										

*Monthly

**Quarterly

***Bi-Annually

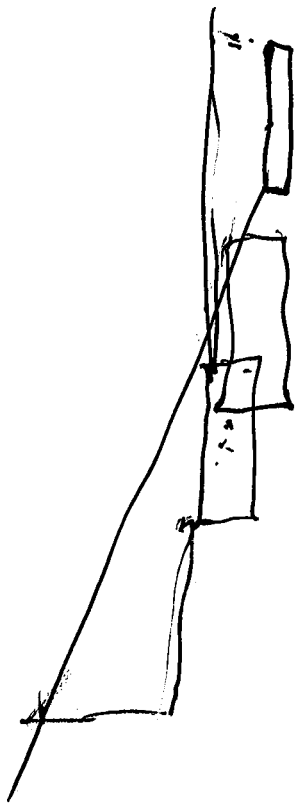
Notes:

"As the owner of this SSTS, I understand it is my responsibility to properly operate and maintain the sewage treatment system on this property, utilizing the Management Plan. If requirements in this Management Plan are not met, I will promptly notify the permitting authority and take necessary corrective actions. If I have a new system, I agree to adequately protect the reserve area for future use as a soil treatment system."

Property Owner Signature: _____ Date _____

Management Plan Prepared By: Brant Bigger Certification # C1835

Permitting Authority: Becker County



University of Minnesota Onsite Sewage Treatment Program

Soil Observation Log

Project ID:

v 03.15.2023

Client:	Steve Schmit	Location / Address:	080329000 / 25626 BRANDY LAKE RD, DETROIT LAKES

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

Landscape Position:	Back/Side Slope	Slope %:	6.0	Slope shape:	Linear, Linear	Flooding/Run-On potential:	No
Vegetation:	Lawn	Soil survey map units:	778C—Dorset-Corliss complex			Surface Elevation-Relative to benchmark:	1044'
Date/Time of Day/Weather Conditions:		29-May-25	13:30	cloudy		Limiting Layer Elevation:	<1038'
Observation #/Location:	#1	S end 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
0-10	Medium Sandy Loam	20	10YR 2/2		None	None	Blocky	Weak	Friable
10-20	Medium Sandy Loam	20	10YR 4/3		None	None	Blocky	Weak	Friable
20-26	Medium Sand	20	10YR 5/3		None	None	Single grain	Structureless	Loose
26-56	Medium Loamy Sand	20	10YR 6/4		None	None	Single grain	Structureless	Loose
56-74	Medium Sand	25	10YR 6/3		None	None	Single grain	Structureless	Loose

Comments: There was red/rust surrounding rocks in the 10-26" layers but it is not distinct redox.

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

tim Stenger	Tim Stenger	L553	6-2-25
(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.

Brant Bagger		C1835	02 Jun 2025
(LGU/Designer/Inspector)	(Signature)	(Cert #)	(Date)

Cubed B LLC
SEPTIC SYSTEM DESIGN & INSPECTION

BRANT B. BIGGER
Owner

13248 US Hwy 10
Lake Park, MN 56554
218-234-6906
brant.bigger@gmail.com
cubedbllc.com

Parcel # 080329000
Steven Schmit
31 May 2025

6 bedroom tri-plex
no garbage disposal
no lift pump in basement
3 new septic/pump tanks
- two 1,000-gallon
- one 1,600-gallon two-compartment

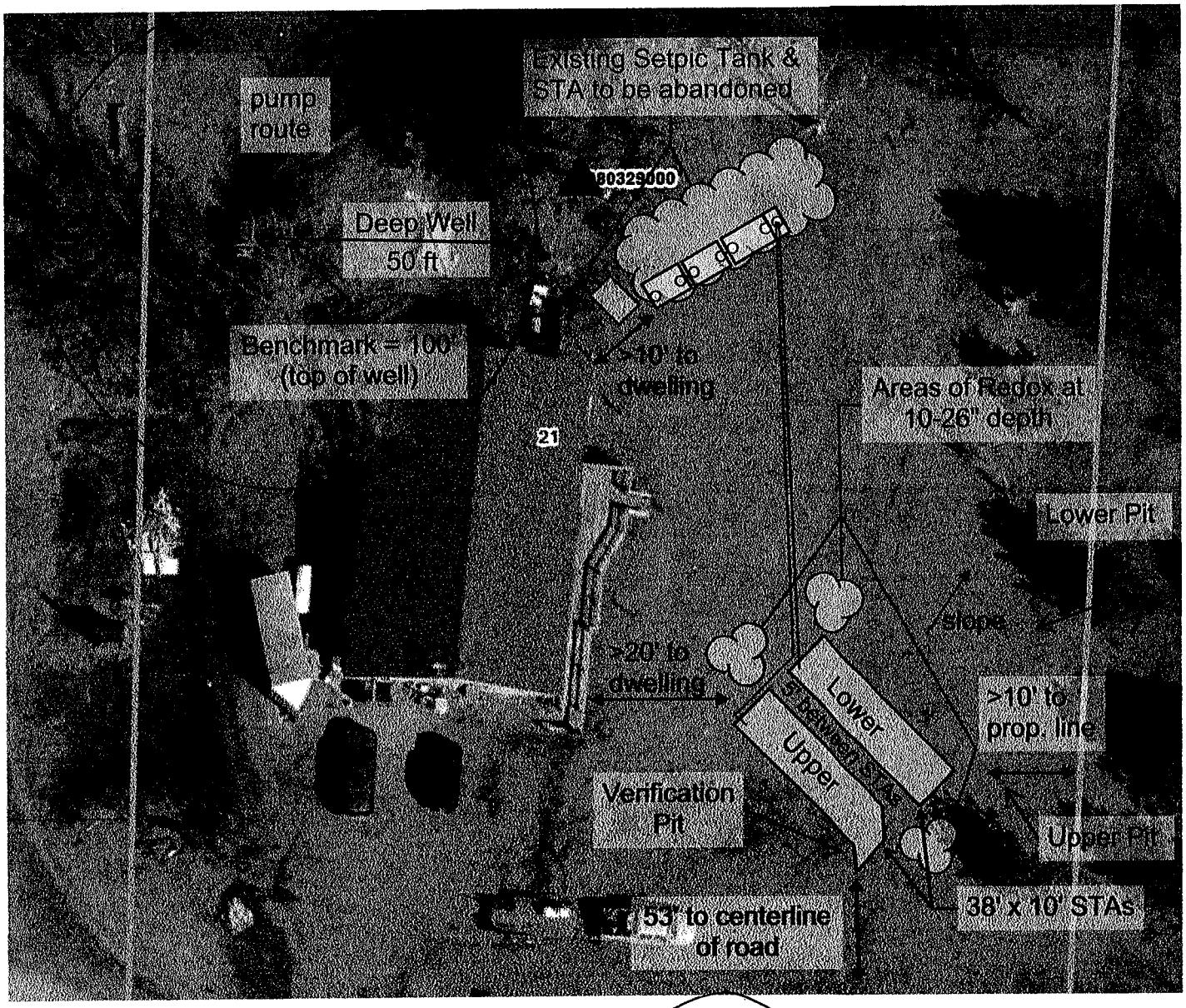
2-zone control w/ electronic alarm
Polylok PL-525 effluent screen or equiv.

Type I Pressure Beds
- **two 38' x 10' STAs**
- **3 2" laterals with 3' spacing**
- **¼" hole size with 3' spacing**
- **Upper STA**
  - **bottom of STA is 100' 7" (20 depth)**
  - **2" supply line (100')**
- **Lower STA**
  - **bottom of STA is 101' 10" (20" depth)**
  - **2" supply line (80')**

Pumps
- **2 Goulds EP05 or equiv.**
- **alternate dosing between Upper & Lower STA**
- **29 gpm**
- **16.8 (Upper) & 15.2 (Lower) tfh**
- **8" per dose**
- **27" alarm depth**
- **24" pump on**
- **16" pump off**

Scale: 1" = 32'

N



As built