

PROPERTY OWNER SIGNATURE & AUTHORIZATION SHEET

Winona County Planning & Environmental Services applications must be signed by each and every property owner listed on the property deed, or by individuals with legal authority to sign on behalf of each property owner, before the application will be considered complete.

Signatures authorize the application to be submitted for the parcel and permit type, as indicated below.

Parcel #: 220300080 Permit Type: SEPIC

Steve Vetsch Jr.

Steve Vetsch Jr

7/21/2026

Property Owner Printed Name

Property Owner Signature

Date

Nicole Dahl

Nicole Dahl

7/21/2026

Property Owner Printed Name

Property Owner Signature

Date

Property Owner Printed Name

Property Owner Signature

Date

Property Owner Printed Name

Property Owner Signature

Date

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Date

Septic Design Outline

Stephan Vetsch

460 Center Street

Dakota, MN 55925

Parcel # 220300080

BM = Garage Floor / Overhead Door Threshold = 100.00'.

Existing Septic Tank Inlet = 91.80' +/-.

Proposed Starting Contour Dispersal Bed = 97.50'.

- Proposed mound area has fill material over original soils. Upslope contour of system will need to be excavated to 97.50'.
- Fills soils present from elevations 96.07' – 96.40'.
- Limiting Layer @ 96.40'. No credit will be taken in any of the fill soils.

- Type

3-bedroom home – Type III / Class I (450 GPD)

- Tanks

Existing 1000 gallon septic tank and 600 gallon pump tank will be used. A pressure filter must be installed. **Recommended filter is an Simtech STF-100 with sock.**

Tank was inspected for integrity by A1 Precision Pumping Inc.

If a sump pump is present in the home, it must not enter the septic system.

- Soil Treatment Area

The system will be a pressurized mound system. The system will have 10' x 37.5' bed. The system will be end fed.

Minimum 24" clean sand lift.

10' x 37.5' rock bed, 6" media depth (rock), 2" x 35.5' lateral, 12 perforations w/ 3' spacing and 7/32" diameter size (36 total), diffuser shields

Drainfield rock shall conform to MN Rule Chapter 7083.4070. Clean sand shall conform with MN Rule Chapter 7080.2220 Subpart 3(c) and/or meets such requirements of Houston County.

The system shall be seeded and mulched immediately after final grading of system is completed.

Final grade shall shed/divert water from system. Additional material may be required.

All pipes shall be Schedule 40.

- Pumps and Controls

The pump shall meet the requirements of the designer.

Dosing shall not exceed 600 GPD.

21 GPM / 17.4 TDH is proposed pump requirement. MUST BE VERIFIED

The controls shall have an alarm for high water levels.

The controls shall contain event counters to monitor flows.



Overview



Legend

Roads

- Interstate
- US/State Highway
- City Streets
- County Road
- Township Road
- Private Drive
- Other

- Municipalities
- Winona Boundary
- Parcel

Parcel ID	220300080	Alternate ID	n/a	Owner Address	STEPHAN C VETSCH
Sec/Twp/Rng	010200-020861-	Class	201		460 CENTER ST
Property Address	460 CENTER ST	Acreage	0.3118		DAKOTA, MN 55925
	DAKOTA				
District	2201				
Brief Tax Description	SECT-12 TWP-105 RANGE-005 SOUTHWIND ADD LOT-007 W 70'				
	(Note: Not to be used on legal documents)				

Note: This map is created from data contained in Winona County GIS and is for reference purposes only. While significant effort has been invested to depict boundary extents as accurately as possible per existing records, this map should not be considered a replacement for professional land survey.

Date created: 12/2/2025

Last Data Uploaded: 12/2/2025 7:04:08 AM

Developed by  SCHNEIDER
GEOSPATIAL

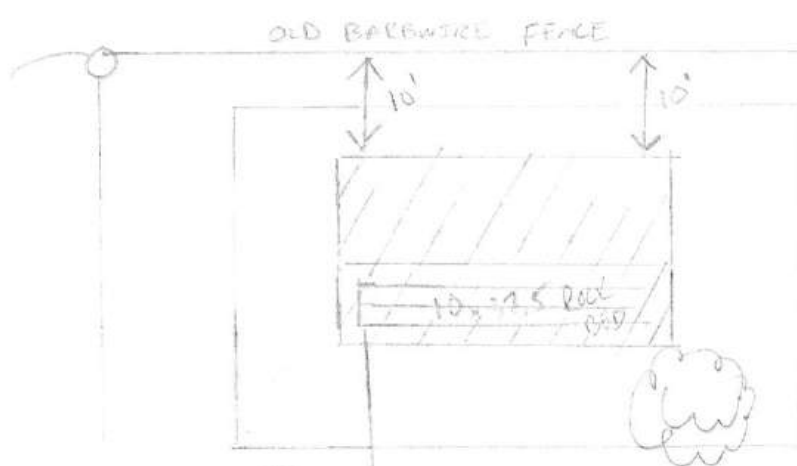
LARGE
CONCRETE
POST

OLD BARNWIRE FENCE

2M
TREE



NOT TO SCALE



EXISTING
WELL
(NEEDS TO
BE SEALED)

70' x 1'
FENCE WASH

ESTABLISHED FENCELINE

EXISTING
1000 GALLON
SEPTIC



EXISTING
600 GALLON
PUMP TANK

ESTABLISHED FENCELINE



PROPOSED
NEW WELL

COUNTY 12 / CENTER ST

Sewage tank integrity assessment form

Subsurface Sewage
Treatment Systems (SSTS) Program

Doc Type: Compliance and Enforcement

Purpose: This form may be used to certify the compliance status of the sewage tank components of the SSTS. **This form is not a complete SSTS inspection report, only a tank integrity assessment, and may only certify sewage tank compliance status when entirely completed and signed by a qualified professional.** SSTS compliance inspection report forms can be found at: <https://www.pca.state.mn.us/water/inspections>.

Instructions: This form may be completed, and signed, by a Designated Certified Individual (DCI) of a licensed SSTS inspection, maintenance, installation, or service provider business who personally conducts the necessary procedures to assess the compliance status of each sewage tank in the system. Only a licensed maintenance business is authorized to pump the tank for assessment. A copy of this information should be submitted to the system owner and be maintained by the licensed SSTS business for a period of five (5) years from the assessment date.

When this form is signed by a qualified certified professional, it becomes *necessary supporting documentation* to an Existing System Compliance Inspection Report: [Compliance inspection form - Existing system \(wg-wwists4-31b\)](#). This form can be found on the MPCA website at <https://www.pca.state.mn.us/water/inspections>.

The information and certified statement on this form is **required** when existing septic tank compliance status is determined by an individual other than the SSTS Inspector that submits an inspection report. This form represents a third party assessment of SSTS component compliance and is allowable under Minn. R. 7082.0700, subp. 4(B)(1). This form is valid for a period of three years beyond the signature date on this form unless a new evaluation is requested by the owner or owner's agent or is required according to local regulations. Additional Administrative Rule references for this activity can be found at Minn. R. 7082.0700, subp. 4(B),(C), and (D) and; Minn. R. 7083.0730(C).

Owner informationOwner/Representative Stephan VetschProperty address: 460 Center St Dakota, MN 55925Local Regulatory Authority: Winona CountyParcel ID: 220300080**System status**System status on date (mm/dd/yyyy): 4/23/2026☒ **Certificate of sewage tank compliance**☐ **Notice of sewage tank non-compliance****Compliance criteria:**

The SSTS has a seepage pit, cesspool, drywell, leaching pit, or other pit - "Failure to Protect Groundwater."

☐ Yes* ☒ No

The SSTS has a sewage tank that leaks below the designed operating depth - "Failure to Protect Groundwater."

☐ Yes* ☒ No

The SSTS presents a threat to public safety by reason of structurally unsound (damaged, cracked, or weak) maintenance hole cover(s) or lids or any other unsafe condition - "Imminent Threat to Public Health or Safety."

☐ Yes* ☒ No**Any "yes" answer above indicates sewage tank non-compliance.****Company information**Company name: A1 Precision Pumping IncBusiness license number: 3310**Designated Certified Individual (DCI) information**Print name: Chase MunsonCertification number: 9076

I personally conducted the work described above as a Designated Certified Individual of a Minnesota-licensed SSTS inspection, maintenance, installation, or service provider Business. I personally conducted the necessary procedures to assess the compliance status of each sewage tank in this SSTS.

By typing/signing 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.

Designated Certified Individual's signature: Chase Munson*(This document has been electronically signed.)*Date (mm/dd/yyyy): 7/7/2026



Preliminary Evaluation Worksheet

1. Contact Information

v 04.02.2024

Property Owner/Client: Date Completed:

Site Address: Project ID:

Email: Phone:

Mailing Address: Alt Phone:

Legal Description:

Parcel ID: SEC: TWP: RNG:

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: 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: GPD Anticipated Waste Type:

Maximum Concentration BOD: mg/L TSS: mg/L Oil & Grease: 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	Private Well		Unknown	Unknown		> 100	
2	New well to be drilled			> 50		> 50	
3							
4							

Additional Well Information:



Preliminary Evaluation Worksheet

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?	Yes	Yes, name:	
Elevation of ordinary high water level:		ft	Source:
Classification:	Tank Setback:	ft.	STA Setback: 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:	455B2	Slope Range:	1 to 6	%
List landforms:	Terraces			
Landform position(s):	Tread			
Parent materials:	Silty alluvium over silty/sandy alluvium			
Depth to Bedrock/Restrictive Feature:	> 80	in	Depth to Watertable:	> 80 in
Map Unit Ratings	Septic Tank Absorption Field- At-grade:	See attached Map Unit Description		
	Septic Tank Absorption Field- Mound:	See attached Map Unit Description		
	Septic Tank Absorption Field- Trench:	See attached Map Unit Description		

5. Local Government Unit Information

Name of LGU:	Winona County
LGU Contact:	507-457-6520
LGU-specific setbacks:	MN Rules 7080 - 7083
LGU-specific design requirements:	MN Rules 7080 - 7083
LGU-specific installation requirements:	MN Rules 7080 - 7083

Notes:



Overview



Legend

- Shoreland
- Roads**
 - Interstate
 - US/State Highway
 - City Streets
 - County Road
 - Township Road
 - Private Drive
 - Other
- Municipalities
- Winona Boundary
- Parcel
- Streams

Parcel ID	220300080	Alternate ID	n/a	Owner Address	STEPHAN C VETSCH
Sec/Twp/Rng	010200-020861-	Class	201		460 CENTER ST
Property Address	460 CENTER ST	Acreage	0.3118		DAKOTA, MN 55925
	DAKOTA				

District 2201
 Brief Tax Description SECT-12 TWP-105 RANGE-005 SOUTHWIND ADD LOT-007 W 70'
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Developed by **SCHNEIDER**
 GEOSPATIAL



Minnesota
Department of
Health

Minnesota Well Index

Version 3.2.1 Tool Date: 2025-01-21 15:24

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Tools

Base Maps

Other L



Soil Map—Winona County, Minnesota



Winona County, Minnesota

455B2—Festina silt loam, 1 to 6 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2xpm4
Elevation: 560 to 1,740 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 120 to 190 days
Farmland classification: All areas are prime farmland

TRENCH - NOT LIMITED

AT-GRADE - NOT LIMITED

MOUND - SLIGHTLY LIMITED
(SLOPE)

Map Unit Composition

Festina, moderately eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Festina, Moderately Eroded

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty alluvium over stratified sandy and silty alluvium

Typical profile

Ap - 0 to 9 inches: silt loam
BE - 9 to 11 inches: silt loam
Bt1 - 11 to 32 inches: silt loam
Bt2 - 32 to 65 inches: silt loam
BC - 65 to 68 inches: silt loam
2C - 68 to 79 inches: silt loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water
(Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 12.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: B
Ecological site: F105XY015WI - Shallow Clayey Upland
Forage suitability group: Sloping Upland, Acid (G105XS006MN),
High AWC, adequately drained (G105XY008WI)
Other vegetative classification: Sloping Upland, Acid
(G105XS006MN), High AWC, adequately drained
(G105XY008WI)
Hydric soil rating: No

Minor Components

Plumcreek, moderately eroded

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F105XY013WI - Loamy-Silty Upland
Other vegetative classification: Sloping; Fine Texture
(G105XS023MN), High AWC, adequately drained with
limitations (G105XY009WI)
Hydric soil rating: No

Ella, moderately eroded

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F105XY013WI - Loamy-Silty Upland
Other vegetative classification: Sloping Upland, Neutral
(G105XS002MN), High AWC, adequately drained
(G105XY008WI)
Hydric soil rating: No

Data Source Information

Soil Survey Area: Winona County, Minnesota
Survey Area Data: Version 20, Sep 10, 2025



Field Evaluation Worksheet

1. Project Information

v 04.02.2024

Property Owner/Client:

Project ID:

Site Address:

Date Completed:

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):

Landscape position:

Percent slope: %

Slope shape:

Slope direction:

Describe the flooding or run-on potential of site:

Describe the need for Type III or Type IV system:

Note:

Proposed soil treatment area protected? (Y/N):

If yes, describe:

4. General Soils Information

Filled, Compacted, Disturbed areas (Y/N):

If yes, describe:

~~Established lot. More than 50% of~~
BURIED MIX MATERIAL CLOSER TO HOME. FILL OVER ORIGINAL IN PROPOSED AREA

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

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

Number of soil observations:

Soil observation logs attached (Y/N):

Percolation tests performed & attached (Y/N):

5. Phase I. Reporting Information

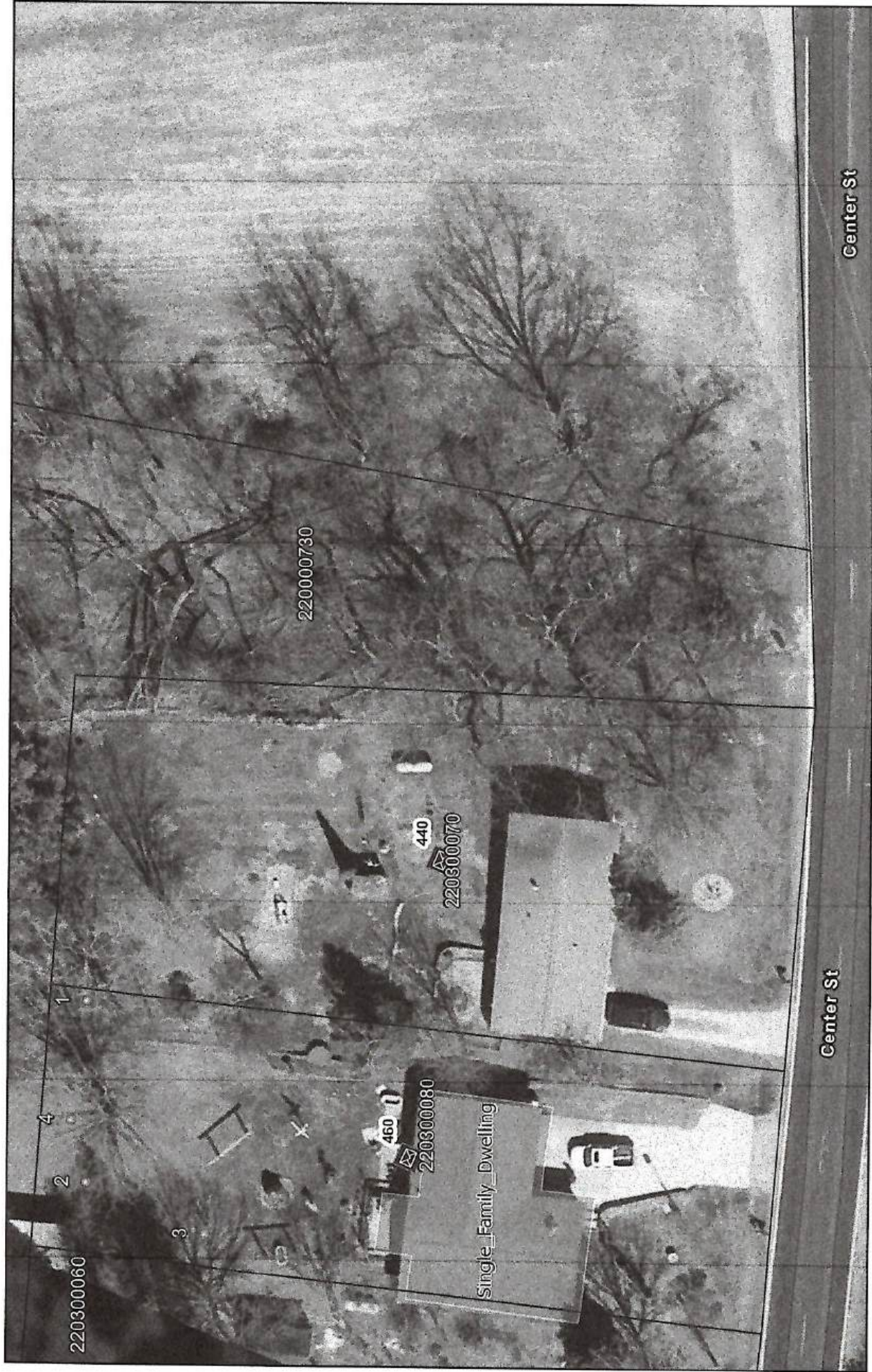
	Depth	Elevation	
Limiting Condition*:	12 in	95.40 ft	*Most Restrictive Depth Identified from List Below
Periodically saturated soil:	12 in	See Soils ft	Soil Texture: Silt Loam
Standing water:	> 14 in	See Soils ft	Percolation Rate: 1 min/inch
Bedrock:	> 14 in	See Soils ft	Soil Hyd Loading Rate: 0.50 gpd/sq.ft
Benchmark Elevation:	100.0 ft	Elevations and Benchmark on map? (Y/N):	Yes

Benchmark Elevation Location:

Differences between soil survey and field evaluation:

Site evaluation issues / comments:

Anticipated construction issues:



4/23/2026

- ☒ WinonaCounty_DBO_CountyAddresses Structures ZValue
- ☐ Parcels Existing SepticPoints

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, Winona County GIS-IT



Soil Observation Log

Project ID:

v 04.07.2025

Client:		Vetch		Location / Address:		22.030.0080					
Soil parent material(s): (Check all that apply)				☐ Outwash	☐ Lacustrine	☐ Loess	☐ Till	☒ Alluvium	☐ Bedrock	☐ Organic Matter	☒ Disturbed/Fill
Landscape Position:		Foot Slope		Slope %:		-		Slope shape:		-	
Vegetation:		Lawn		Soil survey map units:		4/9/2026		1PM		Sun	
Date/Time of Day/Weather Conditions:										Surface Elevation-Relative to benchmark: tbd	
Observation #/Type/Location:		B1		Auger						Limiting Layer Elevation: 22"	
Depth (in)		Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Shape		Consistence	
0-10		Fill Soil	10	10YR 3/3	7.5YR 4/6	None	None	None		None	
10-14		Silt Loam	0	10YR 5/4	7.5YR 5/6	None	None	None		None	
14-18		Silt Loam	0	10YR 3/2	None	None	None	Blocky		Moderate	
18-22		Silt Loam	0	10YR 3/2	None	None	None	Blocky		Moderate	
22-24		Silty Clay Loam	0	10YR 5/4	None	None	None	Blocky		Moderate	
None		None	None	10YR 5/6	10YR 7/3	Depletions	52	Blocky		Firm	
None		None	None	None	None	None	None	None		None	
None		None	None	None	None	None	None	None		None	
None		None	None	None	None	None	None	None		None	
None		None	None	None	None	None	None	None		None	
Comments: Designer to obtain surface elevation and calculate limiting layer elevation. Mottle colors listed are not limiting conditions unless indicated so in the redox and indicator columns.											
I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.											
Chance Nelson											
(Designer/Inspector)				(Signature)				(License #)			
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.											
Aaron Lacher				Aaron Lacher				C506			
(LGU/Designer/Inspector)				(Signed Electronically)				(Cert #)			
								4/9/2026			
								(Date)			



Soil Observation Log

Project ID: v 04.07.2025

Client:		Vetch		Location / Address:		22.030.0080					
Soil parent material(s): (Check all that apply)				☐ Outwash	☐ Lacustrine	☐ Loess	☐ Till	☐ Alluvium	☐ Bedrock	☐ Organic Matter	☒ Disturbed/Fill
Landscape Position:		Foot Slope		Slope %:		-		Slope shape:		-	
Vegetation:		Lawn		Soil survey map units:		4/9/2026		1PM		Auger	
Date/Time of Day/Weather Conditions:				B2							
Observation #/Type/Location:		Rock Frag. %		Matrix Color(s)		Mottle Color(s)		Redox Kind(s)		Indicator(s)	
Depth (in)	Texture										
0-12	Fill Soil			10YR 4/2	None	None	None	None	None	None	None
12-18	Fine Sandy Loam	0		10YR 3/2	None	None	10YR 4/4	None	None	None	None
18-24	Silty Clay Loam	15		10YR 5/4	None	None	10YR 3/2	None	None	None	None
24-26	Silty Clay Loam	50		10YR 5/6	None	None	7.5YR 5/8	Concentrations	S2	None	None
None	None	None		None	None	None	10YR 3/2	None	None	None	None
None	None	None		None	None	None	None	None	None	None	None
None	None	None		None	None	None	None	None	None	None	None
None	None	None		None	None	None	None	None	None	None	None
None	None	None		None	None	None	None	None	None	None	None
None	None	None		None	None	None	None	None	None	None	None
None	None	None		None	None	None	None	None	None	None	None
Comments: Designer to obtain surface elevation and calculate limiting layer elevation. Mottle colors listed are not limiting conditions unless indicated so in the redox and indicator columns.											
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C506											
(Cert #)											
4/9/2026											
(Date)											



v 04.07.2025

[illegible]



Soil Observation Log

Project ID:

v 04.07.2025

Client:		Vetch		Location / Address:		22.030.0080					
Soil parent material(s): (Check all that apply)				☐ Outwash	☐ Lacustrine	☐ Loess	☐ Till	☒ Alluvium	☐ Bedrock	☐ Organic Matter	☒ Disturbed/Fill
Landscape Position:		Foot Slope		Slope %:		-		Slope shape:		-	
Vegetation:		Lawn		Soil survey map units:		1PM		Sun		Surface Elevation-Relative to benchmark:	
Date/Time of Day/Weather Conditions:				4/9/2026						Limiting Layer Elevation: 23"	
Observation #/Type/Location:		B4		Auger						Depth to Standing Water-inches: -	
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Shape	Grade	Consistence		
0-11	Fill Soil	0	10YR 4/2	None	None	None	None	None	None	None	None
11-18	Fine Sandy Loam	0	10YR 3/2	None	None	None	None	None	None	None	None
18-23	Silt Loam	0	10YR 4/2	None	None	None	None	None	None	None	None
23-26	Silty Clay Loam	0	10YR 5/4	10YR 5/8	Concentrations	S2	Blocky	Moderate	Friable		
None	None	None	None	10YR 6/2	Depletions	S2	Blocky	Moderate	Friable		
None	None	None	None	10YR 3/2	None	None	None	None	None	None	None
None	None	None	None	None	None	None	None	None	None	None	None
None	None	None	None	None	None	None	None	None	None	None	None
None	None	None	None	None	None	None	None	None	None	None	None
None	None	None	None	None	None	None	None	None	None	None	None
None	None	None	None	None	None	None	None	None	None	None	None
Comments: Designer to obtain surface elevation and calculate limiting layer elevation. Mottle colors listed are not limiting conditions unless indicated so in the redox and indicator columns.											
I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.											
Chance Nelson				(Signature)				(License #)			
(Designer/Inspector)				Aron Lacher				C506			
Aron Lacher				(Signed Electronically)				4/9/2026			
(LGU/Designer/Inspector)								(Date)			



Soil Observation Log

Project ID: v 04.02.2024

Client:		Stephan Vetsch		Location / Address:		460 Center St. Dakota, MN 55925													
Soil parent material(s): (Check all that apply)				☐ Outwash	☐ Lacustrine	☒ Loess	☐ Bedrock	☐ Alluvium	☐ Organic Matter	☒ Disturbed/Fill									
Landscape Position:		Back/Side Slope		Slope %:		2.0		Slope shape:		Linear, Linear		Flooding/Run-On potential:		No					
Vegetation:		Lawn		Soil survey map units:		4/9/2026		1:00 - 2:15		Partly Sunny		Surface Elevation-Relative to benchmark:		96.90					
Date/Time of Day/Weather Conditions:				4/9/2026		1:00 - 2:15		N 43.91267°, W 09136382' (12' Acc.)		Observation Type:		Limiting Layer Elevation:		95.07					
Observation #/Location:		B1		N 43.91267°, W 09136382' (12' Acc.)										Auger					
Depth (in)		Texture		Rock Frag. %		Matrix Color(s)		Mottle Color(s)		Redox Kind(s)		Indicator(s)		Shape		Grade		Consistence	
0 to 10		Fill Soil / Sandy Loam				10YR 3/2													
						10YR 4/4													
						10YR 4/6													
10 to 14		Medium Sandy Loam		0		10YR 3/2								Blocky		Moderate		Friable	
14 to 18		Medium Loamy Sand		0		10YR 3/2		10YR 5/4						Blocky		Moderate		Friable	
18 to 22		Silt Loam		0		10YR 5/4		10YR 3/2						Blocky		Moderate		Friable	
22 to 24		Silty Clay Loam		0		10YR 5/6		10YR 7/3		Concentrations		S2		Blocky		Weak		Firm	
Comments: Limit @ 22" or 12" of original soils prior to redox features.																			
I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.																			
Chance Nelson (Designer/Inspector) (Signature) 3647 (License #) 4/9/2026 (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.																			
Aaron Lacher (Winona County) (LGU/Designer/Inspector) (Signature) (Cert #) (Date)																			



Soil Observation Log

Project ID: v 04.02.2024

Client: Stephan Vetsch		Location / Address: 460 Center St. Dakota, MN 55925							
Soil parent material(s): (Check all that apply) ☐ Outwash ☐ Lacustrine ☒ Loess ☐ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter ☒ Disturbed/Fill									
Landscape Position: Back/Side Slope		Slope %: 3.0	Slope shape: Linear, Linear	Flooding/Run-On potential: No					
Vegetation: Lawn		Soil survey map units: 455B2		Surface Elevation-Relative to benchmark: 97.40					
Date/Time of Day/Weather Conditions: B2		4/9/2026	1:00 - 2:15	Partly Sunny					
Observation #/Location: B2		N 43.91260, W 091.36393 (13' Acc.)							
Observation Type: Auger									
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Shape	Grade	Consistence
0 to 12	Fill / Sandy Loam	0	10YR 3/2						
12 to 18	Medium Sandy Loam	0	10YR 3/2	10YR 5/4	Migrated soils		Blocky	Moderate	Friable
18 to 24	Silt Loam	0	10YR 5/4	10YR 3/2	Migrated Soils		Blocky	Moderate	Friable
24 to 26	Silty Clay Loam	40	10YR 5/6	10YR 3/2	Migrated Soils		Blocky	Weak	Friable
				7.5YR 5/8	Concentrations	S2			
Comments: Limit @ 24" or 12" of original soils prior to redox features.									
I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.									
Chance Nelson (Designer/Inspector)		3647 (License #)		4/9/2026 (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.									
Aaron Lacher (Winona County)		(Cert #)		(Date)					
LGU/Designer/Inspector		(Signature)		(Date)					



Project ID:

Client:		Stephan Vetsch		Location / Address:		460 Center St. Dakota, MN 55925				
Soil parent material(s): (Check all that apply)		☐ Outwash ☐ Lacustrine ☒ Loess ☐ Till ☐ Alluvium ☐ Bedrock ☒ Organic Matter ☒ Disturbed/Fill								
Landscape Position:		Back/Side Slope		Slope %: 0.0		Slope shape: Linear, Linear				
Vegetation:		Lawn		Soil survey map units: 45582		Surface Elevation-Relative to benchmark: No				
Date/Time of Day/Weather Conditions:		4/9/2026		1:00 - 2:15		Partly Sunny				
Observation #/Location:		B3		N 43.91254', W 091.36397' (11' Acc.)		Observation Type: Auger				
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure-----I			
							Shape	Grade	Consistence	
0 to 8	Fill Soil		10YR 3/2							
			10YR 4/4							
			10YR 4/6							
8 to 15	Fill / Silt Loam		10YR 4/2	7.5YR 4/6			Platy	Weak	Friable	
			10YR 2/2							
Comments: Mixed soils. Neighbor mentioned that an old house was buried in area of boring. Mixed soils in profile. Outside of proposed area.										
I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.										
Chance Nelson		(Signature)		3647		(License #)		4/9/2026 (Date)		
(Designer/Inspector)		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)		



v 04.02.2024

[illegible]

1. PROJECT INFORMATION		v 04.02.2024
Property Owner/Client:	Stephan Vetsch	Project ID:
Site Address:	460 Center St. Dakota, MN 55925	Date: 04/15/26
Email Address:		Phone: 608-385-4947
2. DESIGN FLOW & WASTE STRENGTH		
Design Flow:	450 GPD	Anticipated Waste Type: Residential
BOD:	170 mg/L	TSS: 60 mg/L Oil & Grease: 25 mg/L
Treatment Level:	C <i>Select Treatment Level C for residential septic tank effluent</i>	
3. HOLDING TANK SIZING <i>Holding Tank Sizing: see 7080.2290</i>		
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:	<i>Existing tank reuse requires a tank integrity assessment</i>	
Type of High Level Alarm:		
(Alarm Set @ 75% tank capacity measured from inlet to bottom)		
Comments:		
4. SEPTIC TANK SIZING <i>Sizing: See 7080.1930</i>		
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
The septic tank(s) will be:	All Existing <i>Existing tank reuse requires a tank integrity assessment</i>	
Comments:	1000 gallon septic tank with 600 gallon pump tank	
Effluent Screen & Alarm (Y/N):	Yes	Model/Type: STF -100
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:	<i>Existing tank reuse requires a tank integrity assessment</i>	
Comments:		
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 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):	600	Gal		Pump Tank Capacity (Designed):		Gal					
Pump Req:	23.0	GPM	Total Head	17.6	ft	Pump Req:		GPM	Total Head		ft
Supply Pipe Dia.	2.00	in	Dose Vol:	78.0	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:	Mound	Distribution Type:	Pressure Distribution-Level	
Elevation Benchmark:	100.00	ft	Benchmark Location:	North overhead garage door apron
MPCA System Type:	Type III	Distribution Media:	Rock	
Type III/IV/V Details:	Fill soils over original			

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				
Limiting Condition:	12.0	inches	1.00	ft	95.40	ft	Elevations are critical for system compliance.
Minimum Req'd Separation:	36	inches	3.00	ft			
Distribution Media Bottom*:	Mound	inches	-2.00	ft	98.40	ft	Check Design Media Bottom Elevations

*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: ft Mound Minimum Sand Depth: 24 inches

A. Soil Texture: Silt Loam

B. Soil Hyd. Loading Rate: 0.50 GPD/ft² C: Percolation Rate: MPI

D. Contour Loading Rate: 12.0 Note:

E. Measured Land Slope: 1.0 % 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

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 Lateral Diameter in Lateral Spacing ft
 Perforation Spacing ft Perforation Diameter in Drainback Volume gal
 Min Dose Volume gal Max Dose Volume gal Total Dosing Volume 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)	Minimum Dose Volume gal
Lateral 1								
Lateral 2								Maximum Dose Volume gal
Lateral 3								gal
Lateral 4								Total Dosing Volume gal
Lateral 5								gal
Lateral 6								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. Minimum required area sq.ft

Technology Strength Reduction (Treatment Level or HSW)

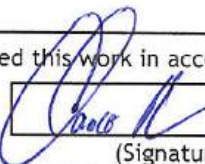
A. Starting Waste Strength Treatment designed to meet:
 Pretreatment Technology: *Must Meet or Exceed Target Level
 Model: Units:
 Disinfection Technology: *Required for Levels A & B
 Model: Units:

10. Comments/Special Design Considerations:

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

Chance Nelson

(Designer)



(Signature)

3647

(License #)

4/16/2024

(Date)

Mound Design Worksheet

≥1% Slope

1. SYSTEM SIZING: Project ID: v 04.02.2024

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

Table I MOUND CONTOUR LOADING RATES:				
Measured Perc Rate	OR	Texture - derived mound absorption ratio		Contour Loading Rate:
≤ 60mpi		1.0, 1.3, 2.0, 2.4, 2.6	→	≤ 12
61-120 mpi	OR	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		Treatment Level A, A-2, B,	
	Absorption Area Loading Rate (gpd/ft ²)	Mound Absorption Ratio	Absorption Area Loading Rate (gpd/ft ²)	Mound Absorption Ratio
<0.1	-	1	-	1
0.1 to 0.5	1.2	1	1.6	1
0.1 to 0.5 (fine sand and loamy fine sand)	0.6	2	1	1.6
0.6 to 1.5	0.78	1.5	1	1.6
1.6 to 3.0	0.6	2	0.78	2
3.1 to 4.5	0.5	2.4	0.78	2
4.6 to 6.0	0.45	2.6	0.6	2.6
6.1 to 12.0	-	5	0.3	5.3
>12.0	-	-	-	-

*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)

$$\frac{450 \text{ GPD}}{1.20 \text{ GPD/sqft}} = 375.0 \text{ sq.ft}$$

Optional Upsizing of Dispersal Media Area

B. Larger Bed Area Size or Organic Sizing of Bed Area sq.ft
[see organic loading sheet(2G)]

C. Designed Dispersal Media Area: sq.ft Larger of 2A or 2B

D. Enter Dispersal Bed Width: ft Can not exceed 10 feet

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

$$10.0 \text{ ft} \times 1.2 \text{ GPD/sqft} = 12.0 \text{ gal/ft} \quad \text{Can not exceed Table 1}$$

F. Calculate Minimum Dispersal Bed Length: Dispersal Bed Area(2C) ÷ Bed Width(2D)

$$\frac{375 \text{ sqft}}{10.0 \text{ ft}} = 37.5 \text{ ft}$$

If a larger dispersal media Length is desired, enter Length(ft): ft

3. ABSORPTION AREA SIZING

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

$$10.0 \text{ ft} \times 2.4 = 24.0 \text{ ft}$$

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

Calculate Downslope Absorption Width: Absorption Width(3A) - Bed Width(2D)

$$24.0 \text{ ft} - 10.0 \text{ ft} = 14.0 \text{ ft}$$

4. DISTRIBUTION MEDIA:

Project ID:

Select Dispersal Media:

Rock

Enter Either 4A or 4B

A. Rock Depth Below Distribution Pipe

6 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)

3.00 ft - 1.00 ft = 2.00 ft Design Sand Lift (optional):

B. Upslope Height: Clean Sand Lift(5A) + Depth of Media(4AorB) + Depth to Cover Pipe + Depth of Cover (1 ft)

2.00 ft + 0.50 ft + 0.33 ft + 1.00 ft = 3.83 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):

2.91

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

2.91 X 3.83 ft = 11.15 ft

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

10.00 ft X 1.0 % ÷ 100 = 0.10 ft

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

3.83 ft + 0.10 ft = 3.93 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):

3.09

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

3.09 X 3.93 ft = 12.14 ft

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

14.00 ft + 4.00 ft = 18.00 ft

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

18.00 ft

K. Select Endslope Berm Multiplier:

3.0

(usually 3.0 or 4.0)

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

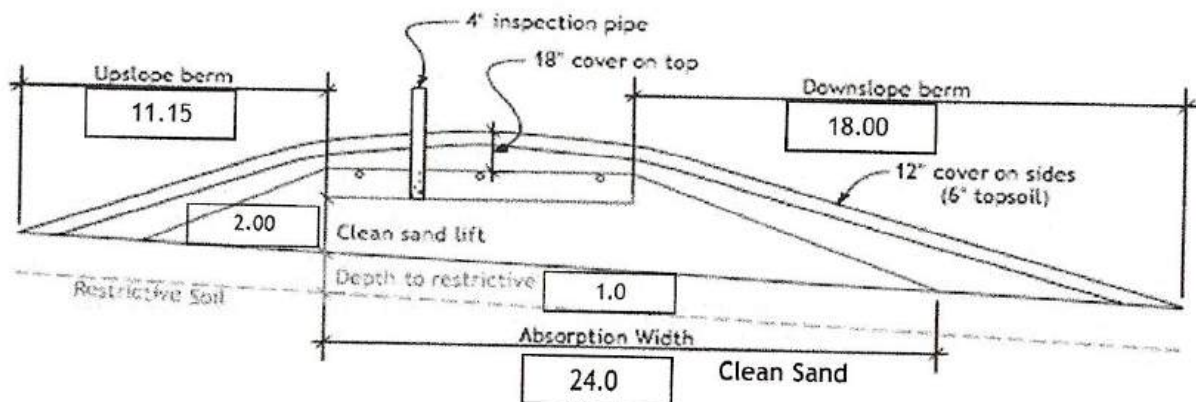
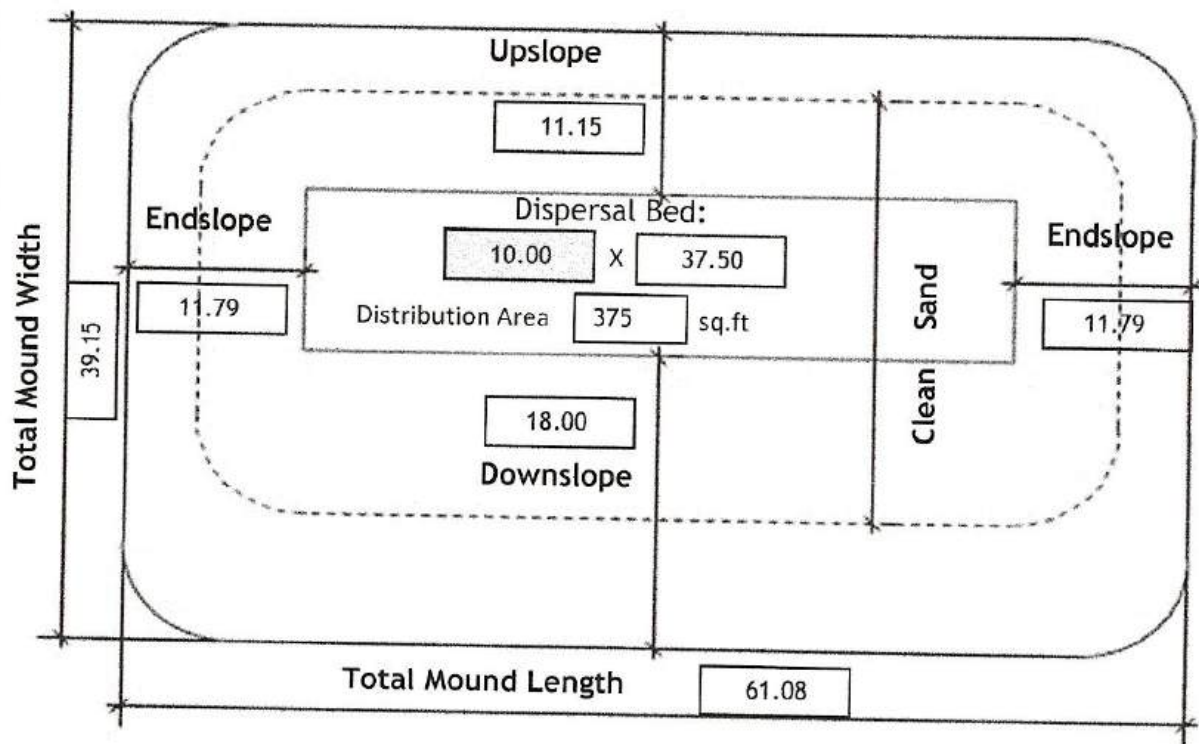
3.00 X 3.9 ft = 11.79 ft

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

11.15 ft + 10.00 ft + 18.00 ft = 39.15 ft

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

11.79 ft + 37.50 ft + 11.79 ft = 61.08 ft



Required Separation: 36.0 (in)

Distribution Media: Rock

Media Depth Below Pipe: 6 (in)

Manifold Connection: end

Perforation Size: 7/32 (in)

Elevation to Benchmark

Elevation Limiting Layer: 95.40 ft

Elevation required Separation: 98.40 ft

Elevation Distribution Media Bottom: ft

Lateral Pipe Diameter: 2.00 (in)

Perforation Spacing: 36.0 (in)

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

Comments:



Estimated Mound Materials Worksheet

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

Project ID:

v 04.02.2024

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

$$(\boxed{6} \text{ in} + \boxed{3.5} \text{ in}) \div 12 \times \boxed{37.5} \text{ ft} \times \boxed{10.0} \text{ ft} = \boxed{296.9} \text{ cu.ft}$$

Divide cu.ft by 27 cu.ft/cu.yd to calculate cubic yards: $\boxed{296.9} \text{ cu.ft} \div 27 = \boxed{11.0} \text{ cu.yd}$

Add 30% for constructability: $\boxed{11.0} \text{ cu.yd} \times 1.3 = \boxed{14.3} \text{ cu.yd}$

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B. Calculate Clean Sand Volume:

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

$$\boxed{2.1} \text{ ft} \times \boxed{10.0} \text{ ft} \times \boxed{37.5} \text{ ft} = \boxed{769} \text{ cu.ft}$$

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)

$$\boxed{} \text{ ft} - 1) \times \boxed{} \times \boxed{} \text{ ft} = \boxed{}$$

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

$$\boxed{} \text{ ft} - 1) \times \boxed{} \times \boxed{} \text{ ft} = \boxed{}$$

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

$$\boxed{} \text{ cu.ft} + \boxed{} \text{ cu.ft} + \boxed{} \text{ cu.ft} = \boxed{} \text{ cu.ft}$$

For a Mound on a slope greater than 1%

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

$$((\boxed{3.8} \text{ ft} - 1) \times 3.0 \text{ ft} \times \boxed{37.5}) \div 2 = \boxed{159.2} \text{ cu.ft}$$

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

$$((\boxed{3.9} \text{ ft} - 1) \times \boxed{14.0} \text{ ft} \times \boxed{37.5}) \div 2 = \boxed{769.1} \text{ cu.ft}$$

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

$$(\boxed{3.9} \text{ ft} - 1) \times 3.0 \text{ ft} \times \boxed{10.0} \text{ ft} = \boxed{87.9} \text{ cu.ft}$$

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

$$\boxed{159.2} \text{ cu.ft} + \boxed{769.1} \text{ cu.ft} + \boxed{87.9} \text{ cu.ft} + \boxed{768.8} \text{ cu.ft} = \boxed{1785.0} \text{ cu.ft}$$

Divide cu.ft by 27 cu.ft/cu.yd to calculate cubic yards: $\boxed{1785.0} \text{ cu.ft} \div 27 = \boxed{66.1} \text{ cu.yd}$

Add 30% for constructability: $\boxed{66.1} \text{ cu.yd} \times 1.3 = \boxed{85.9} \text{ cu.yd}$

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C. Calculate Sandy Berm Volume:

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

$$(\boxed{3.9} - 0.5) \text{ ft} \times \boxed{39.1} \text{ ft} \times \boxed{61.1} \div 2 = \boxed{4040.8} \text{ cu.ft}$$

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

$$\boxed{4040.8} \text{ cu.ft} - \boxed{1785.0} \text{ cu.ft} - \boxed{296.9} \text{ cu.ft} = \boxed{1958.9} \text{ cu.ft}$$

Divide cu.ft by 27 cu.ft/cu.yd to calculate cubic yards: $\boxed{1958.9} \text{ cu.ft} \div 27 = \boxed{72.6} \text{ cu.yd}$

Add 30% for constructability: $\boxed{72.6} \text{ yd}^3 \times 1.3 = \boxed{94.3} \text{ cu.yd}$

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

$$\boxed{39.1} \text{ ft} \times \boxed{61.1} \text{ ft} \times 0.5 \text{ ft} = \boxed{1195.5} \text{ cu.ft}$$

Divide cu.ft by 27 cu.ft/cu.yd to calculate cubic yards: $\boxed{1195.5} \text{ cu.ft} \div 27 = \boxed{44.3} \text{ cu.yd}$

Add 30% for constructability: $\boxed{44.3} \text{ cu.yd} \times 1.3 = \boxed{57.6} \text{ cu.yd}$

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Pressure Distribution Design Worksheet

Project ID:

v 04.02.2024

1. Media Bed Width: ft
2. Media Bed Length: ft
3. Minimum Number of Laterals in system/zone = Rounded up number of $[(\text{Media Bed Width}(1.) - 4) \div 3] + 1$.

$$[(\text{10} - 4) \div 3] + 1 = \text{3} \text{ laterals} \quad \text{Does not apply to at-grades}$$

4. Designer Selected Number of Laterals: 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: ft
6. Length of Laterals = Media Bed Length(2.) - 2 Feet.
 - 2ft = ft Perforation can not be closer then 1 foot from edge.
7. Select Perforation Spacing: 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.

$$\text{Number of Perforation Spaces} = \text{35.5} \text{ ft} \div \text{3.0} \text{ ft} = \text{11} \text{ Spaces}$$

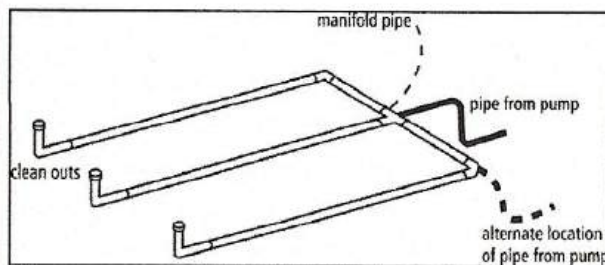
9. Number of Perforations per Lateral is equal to 1.0 plus the Number of Perforation Spaces(8.). Check table below to verify the number of perforations per lateral guarantees less than a 10% discharge variation. The value is double with a center manifold.

$$\text{Perforations Per Lateral} = \text{11} \text{ Spaces} + 1 = \text{12} \text{ Perfs. Per Lateral}$$

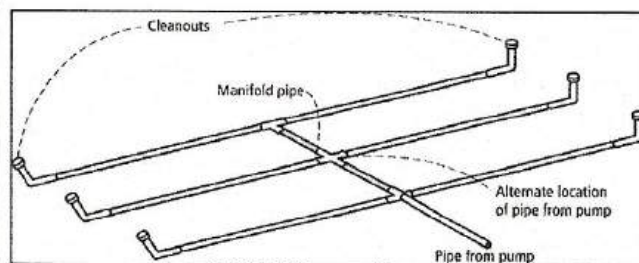
10. Select Perforation Diameter Size: in 0.21875
11. Select Lateral Diameter (See Table): in
12. Select Manifold Connection (End or Center):

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										
1/4 Inch Perforations						7/32 Inch Perforations				
Perforation Spacing (Feet)	Pipe Diameter (Inches)					Perforation Spacing (Feet)	Pipe Diameter (Inches)			
	1	1 1/4	1 1/2	2	3		1	1 1/4	1 1/2	2
2	10	13	18	30	60	2	11	16	21	34
2 1/2	8	12	16	28	54	2 1/2	10	14	20	32
3	8	12	16	25	52	3	9	14	19	30
3/16 Inch Perforations						1/8 Inch Perforations				
Perforation Spacing (Feet)	Pipe Diameter (Inches)					Perforation Spacing (Feet)	Pipe Diameter (Inches)			
	1	1 1/4	1 1/2	2	3		1	1 1/4	1 1/2	2
2	12	18	26	46	87	2	21	33	44	74
2 1/2	12	17	24	40	80	2 1/2	20	30	41	69
3	12	16	22	37	75	3	20	29	38	64



END Connection



CENTER Connection

Perf Per Lateral: 12

Perf Per Lateral Equal Split: 6 | 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.)

12 Perf. Per Lat. X 3 Number of Perf. Lat. = 36 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 37.50 ft = 375 sq.ft

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

375 sqft ÷ 36 perf = 10 sq.ft/perf

15. Select Minimum Average Head:

1.0 ft

16. Select Perforation Discharge based on Table:

0.56 GPM per Perf

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

36 Perfs X 0.56 GPM per Perforation = 21.0 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 35.5 ft X 0.170 gal/ft = 18.1 Gallons

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

18.1 gal X 4 = 72.4 Gallons

21. Maximum Delivered Volume = Design flow x 25%

450 gpd X 25% = 112.5 Gallons

22. Minimum Delivered vs Maximum Delivered evaluation:

Volume ratio correct

Perforation Discharge (GPM)				
Head (ft)	Perforation Diameter			
	1/8	3/16	1/4	5/16
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			
5 feet	Other establishments and MSTs with 3/16 inch to 1/4 inch perforations			
	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:

Diffuser shields shall be used.

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: 21.0 GPM

C. Enter pump description: Equalization/Time Dosing

2. HEAD REQUIREMENTS

A. Elevation Difference 11.0 ft
between pump and point of discharge:

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

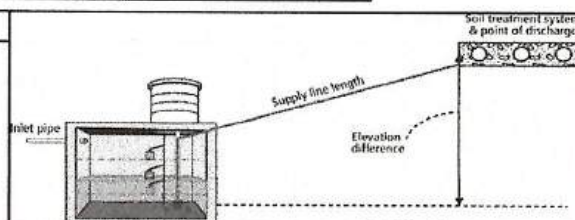


Table I. Friction Loss in Plastic Pipe per 100ft

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

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: 90 ft

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

Friction Loss = 1.2 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

90 ft X 1.25 = 112.5 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 =

1.2 ft per 100ft X 112.5 ft ÷ 100 = 1.4 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)

11 ft + 5.0 ft + ft + 1.4 ft = 17.4 ft

3. PUMP SELECTION

A pump must be selected to deliver at least 21.0 GPM with at least 17.4 feet of total head.

Comments:

Elevations and distances need to be verified at time of installation.

Project ID:

v 04.02.2024

DETERMINE TANK CAPACITY AND DIMENSIONS

1. A. Design Flow: GPD B. Tank Use:
- C. Percentage of Design Flow % Gal Up to 75% design flow is normal for Design percentage
- D. Code minimum pump tank capacity: Gal E. Recommended capacity: Gal

2. A. Tank Manufacturer: B. Tank Model:
- C. Capacity from manufacturer: Gallons
- D. Liquid depth of tank from manufacturer: inches
- E. Gallons per inch: 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. Volume to Cover Pump (The inlet of pump should be 4 inches from the bottom of the tank & 2 inches covering the pump recommended)

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

(in + 2 inches) X Gallons Per Inch = Gallons

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

-Item 19 of the Pressure Distribution or Item 11 of Non-level Gallons (minimum dose) inches/dose

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

Design Flow: GPD X 0.25 = Gallons (maximum dose) inches/dose

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

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

gpd ÷ gal = Doses

8. Calculate Drainback:

A. Diameter of Supply Pipe = inches

B. Length of Supply Pipe = feet

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

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

ft X gal/ft = Gallons

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

gal + gal = Gallons

10. Working Storage Volume = Tank Volume (2C) - Volume to Cover Pump(3.) - Reserve Capacity (22.)

gal - gal - = Gallons

11. Required Flow Rate :

A. From Pump Curve - Must verify after Install: GPM*

B. Calculated GPM = Change in Depth (in) x Gallons Per Inch(2E) / Time Interval in Minutes

in X gal/in ÷ min = GPM

12. Select Flow Rate from 11 A or B: GPM*

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

**Note: This value must be adjusted after installation based on pump calibration.*

NORMAL OPERATION TIMER SETTINGS*

13. Calculate **TIMER ON** setting*:

Total Dosing Volume(9.) ÷ GPM(12.)

93 gal ÷ 23.0 gpm = 4.1 Minutes ON*

HR MIN SEC

0 4.0 3 ON Time

14. Calculated **TIMER OFF** setting*:

Minutes Per Day (1440) / Doses Per Day(7.) - Minutes On(13.)

1440 min ÷ 4 doses/day - 4.1 min = 352.5 Minutes OFF*

HR MIN SEC

5 52.0 31 OFF Time

OPTIONAL PEAK ENABLE DOSING* - Designers option for peak flow operation

15. Peak Percentage of Design Flow %

16. Peak Pump Volume that meets both Minimum and Maximum Volume gal + Drainback 15.3 gal

17. Peak Dose Volume gal

18. Peak TIMER ON gal ÷ gpm = min ON

HR MIN SEC

Peak ON

*Note: This value must be adjusted after installation based on pump calibration.

HR MIN SEC

19. Peak TIMER OFF: 1440 min ÷ doses/day - min On min Off

Peak OFF

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

20. Pump Off Float - Measuring from bottom of tank:

Distance to set Pump Off Float = Gallons to Cover Pump(3.) ÷ Gallons Per Inch(2E):

227 gal ÷ 16.2 gal/in = 14.0 inches

Reserve Capacity 68 Gal

Alarm Depth 37.8 in

21. Alarm Float - Measuring from bottom of tank (90% recommended):

Distance to set Alarm Float = Tank Depth(2D) X % of Tank Depth (90% recommended)

42.0 in X 90 % = 37.8 inches

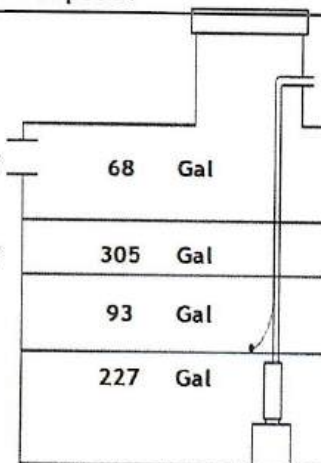
Storage Capacity 305 Gal

Normal Dose Volume 93 Gal

Pump Off 14.0 in

22. Reserve Capacity in gallons = Tank Depth(2D) - Alarm Depth(21.) X Gallons Per Inch(2E)

(42.0 in - 37.8 in) X 16.2 = 68.0 gallons





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	Stephan Vetsch	Email
Property Address	460 Center Street Dakota, MN 55925	Property ID 220300080
System Designer	C. Nelson Septic LLC	Contact Info 507-259-9940
System Installer	C. Nelson Septic LLC	Contact Info
Service Provider/Maintainer	A1 Precison Pumping	Contact Info 608-790-6615
Permitting Authority	Winona County	Contact Info 507-457-6520
Permit #		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:

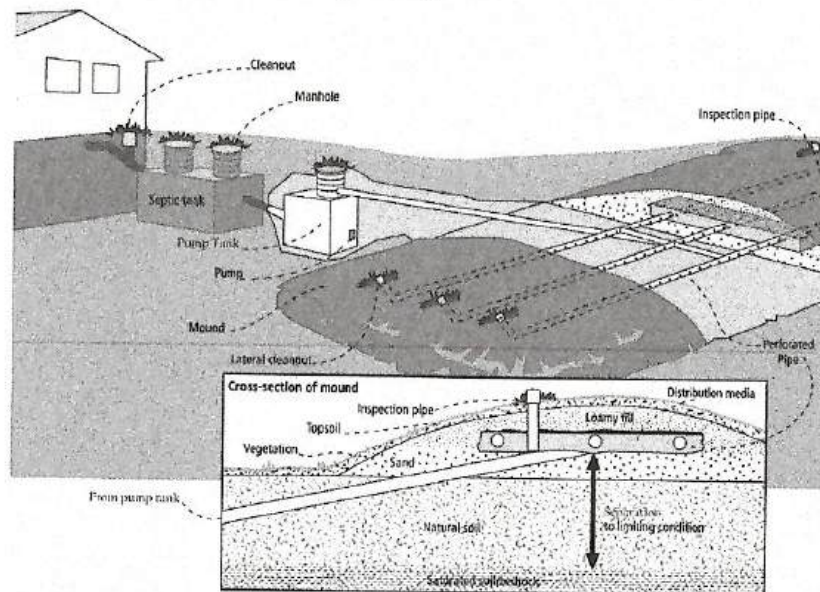
- Attach permit information, designer drawings and as-built of your system, if they are available.
- Keep copies of all pumping records and other maintenance and repair invoices with this document.
- Review this document with your maintenance professional at each visit; discuss any changes in product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



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: 3

System capacity/ design flow (gpd): 450

Anticipated average daily flow (gpd): < 315

Comments Selling Home

Business?: ☐ Y ☒ N What type? _____

Well Construction

Well depth (ft): New Well to be drilled

☐ Cased well Casing depth: > 50

☐ Other (specify): _____

Distance from septic (ft): > 50

Is the well on the design drawing? ☒ Y ☐ N

Septic Tank

☐ First tank Tank volume: > 1000 gallons

Does tank have two compartments? ☐ Y ☒ N

☐ Second tank Tank volume: _____ gallons

☐ Tank is constructed of Concrete

☐ Effluent screen: ☒ Y ☐ N Alarm ☒ Y ☐ N

☐ Pump Tank 600 gallons

☐ Effluent Pump make/model: _____

Pump capacity > 21 GPM

TDH > 17.5 Feet of head

☐ Alarm location TBD

Soil Treatment Area (STA)

Mound/At-Grade area (width x length): 39 ft x 61 ft

Rock bed size (width x length): 10 ft x 37.5 ft

Location of additional STA: none

Type of distribution media: Rock

☒ Inspection ports ☒ Cleanouts

☐ Surface water diversions

☐ Additional STA not available



Homeowner Management Tasks

These *operation and maintenance* activities 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 12/36 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, draitile or old drainfield.
Surface drainage Footing drains	• Water from these sources will overload the system and is prohibited from entering septic system.	• 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



Homeowner Maintenance Log

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

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

*Monthly

**Quarterly

***Bi-Annually

Notes: Change / inspect pressure filter sock once per calendar year or sooner if needed.
Service tank @ intervals of 24-36 months.

"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: Steve Vetsch Jr.

Date: 7/21/2026

Management Plan Prepared By: C. Nelson Septic LLC

Certification # 9386

Permitting Authority: Winona County