

SEPTIC CHECK

EXPERT SERVICE. LASTING VALUE. CLEAN WATER

INDIVIDUAL SEWAGE SYSTEM DESIGN SUMMARY

Property Owner: Paul & Amy Gauer Phone: Contractor – Jeremy Paquette 218-244-4443

Address: 51694 Long Point Place PID: 29-1-492800

City: McGregor Zip: 55760 County: Aitkin

DESIGN USAGE

Single Family Home Other

Number of Potential Bedrooms 3

Garbage Disposal No

Sewage Lift Pump No

SITE CHARACTERISTICS

Soil type Sandy Loam

Hydraulic Loading 0.78 gpd/ft2

Depth to restrictive layer 7"

PUMP INFORMATION

Pump GPM & TDH 29 GPM & 13.4 TDH

Cycles per day 4 Doses

Gallons per cycle 78 Gallons

Perforation size & spacing 1/4" perfs every 3'

Number, spacing, & diameter of laterals 3 – 1 1/2" laterals every 3'

Forcemain Size 2"

CAPACITIES

Daily Water Use Est 450 Calc gpd

Septic Tank Capacity 1514 Gallons (3 compartment tank – 2250 Brown Wilbert)

Pump Tank Capacity 757 gallons – last compartment

MOUND SYSTEM

Dimension of Rock Base 10' x 38'

Depth of Rock Below Pipe 6"

Dimensions of Mound 32.6' x 60.6'

% Slope of Soil Under Mound 0%

Upslope Dike Width 11.3'

Downslope Dike Width 11.3'

Sideslope Dike Width 11.3'

APPROVAL

By  Date 7/12/22

Brian Koski License #2624

See additional information sheet if checked



Property Owner: Paul & Amy Gauer – 51694 Long Point Place McGregor, MN 55760

Description of Wastewater Treatment and Dispersal System

Existing system summary:

The Gauer's built a new 3-bedroom, Class I home without a garbage disposal or sewage ejector. They want a septic system instead of using the existing 1,820 gallon holding tank. There is limited space on the property, so there is not another location for a drainfield in the future. Therefore, a Type IV system utilizing pretreatment and UV light will be used to upgrade the system.

Soil Observations:

Three soil pits were dug by shovel in the proposed rockbed area. The material from 0" to 7" is mixed fill with a Sandy Loam soil texture, concentrations and depletions appearing at 7". From 7" – 12" the texture turns to a Loam, then to Clay Loam at 12". For this design a soil loading rate of 0.78 gpd/ft² will be used, which is that of Sandy Loam. **Installer must dig out the 15' x 43' absorption area and replace the mixed fill with washed sand.**

Pretreatment Treatment System Upgrade:

The design flow will be that of a 3-bedroom home at 450 gallons per day. The existing 1,820 gallon holding tank will need to be pumped, crushed, and removed. A Brown Wilbert 2,250-gallon triple compartment tank will be set in its place. Sewage will flow by gravity from the home into first 757-gallon compartment, then flow into the second 757-gallon compartment equipped with an EcoPod E50 pretreatment unit. The total septic capacity between the two compartments is 1,514 gallons. Effluent will then flow into a Salcor UV light installed on the inlet of the pump compartment. From there effluent will flow to the last 757-gallon compartment that will be used as the time dosed pump tank. The pump installed must deliver at least 29.0 GPM and 13.4 TDH. All manholes will need to be installed to grade for ease of servicing.

Effluent will then be time dosed to a 10' by 38' rockbed mound with a 1' clean sand lift. Installer will dig out the 15' x 43' absorption area to an elevation of 95.90 and replace the mixed fill with washed sand. From there the installer will continue adding washed sand to the elevation of the new rockbed which is 97.90. The rockbed will be built with 1 ½" washed rock, 1 ½" laterals that have cleanouts and inspection pipes to grade. There will be 18" of cover material over the rockbed, and the installer must complete final grade, rake, and seeding.

System Detail:

- **Septic Tank**
 - 1st compartment of Brown Wilbert 2,250-gallon triple compartment tank
757 gallons serving septic capacity
 - 2nd compartment of Brown Wilbert 2,250-gallon triple compartment tank
757 gallons serving septic capacity and equipped with Ecopod E50 pretreatment unit
 - Salcor UV light
 - Blower unit
 - (4) 24" manholes to grade; lids to be insulated
 - 24" ultra-rib riser, attached with ADH 100- or two-part epoxy

- **Time Dose Mound Pump Tank**
 - 3rd compartment of Brown Wilbert 2,250-gallon triple compartment tank
757 gallons
 - Goulds PE 31 pump
 - Delta CP2210/MN control panel (ships with EcoPod E50)

- **Drainfield**
 - 10' x 38' Rockbed mound with a 1' clean sand lift
 - 15' x 43' absorption area digout to an elevation of 95.90
 - Replace fill material with washed sand to an elevation of 97.90
 - 1 ½" washed rock
 - (3) 36' 1 ½" laterals using SCH 40 pipe with ¼" perforations every 3'
 - Lateral cleanouts, inspection pipes to grade
 - 18" cover material
 - Final grade, rake, and seed

Water supply / wells:

The drainfield and tank locations are over 50' from any wells on the property or neighboring properties.

Additional Notes:

Gopher locates must be completed before installation. Installer to ensure tanks are set no closer than 10 feet from the home. All tanks are to be bedded in a level base of at least 6" of pea gravel, ¾" minus rock or screened fill sand. Backfill material around the tanks should be granular without excessive moisture content. Existing soils may be used for backfilling if they are granular in nature and free of rocks and debris over 2" in size. Granular backfill shall be compacted in lifts to prevent pipes from settling. A tank certificate shall be provided to the inspector.

Keep all vehicles and construction equipment off septic area. Rutting and/or compacting the soil will change the percolation rates and may lead to system failure.

General Contractor to verify all property lines.

Elevations are referenced to Benchmark which is the concrete in front of the garage door.

Installer to verify all elevations, dimensions, and ensure proper fall to pipes. Pitch pump chamber outlet to ensure complete drainback to pump chamber.

Establish turf to prevent erosion and freezing.

Each tank is to be pumped through the maintenance cover when serviced. Do not pump through inspection pipes.

Homeowner is responsible for all costs involved in servicing, monitoring, and mitigating the system.

All construction to be performed in accordance with MN Rule 7080 and the Aitkin County septic ordinance.

Maintenance Requirements

See attached operating permit - Bi-annual maintenance is recommended for this system. The service visit frequency can be modified based on the system performance and recommendations by the service provider. Level A treatment was used in this design. Below is a list of maintenance requirements to be completed by the service provider, maintainer, and owner.

Owner requirements:

- Hire a licensed service provider to complete the tasks below and maintain compliance with the operating permit.
- The owner is to maintain compliance with the operating permit at all times or follow the mitigation plan to make changes to get back into compliance if operating permit limits are not being met.
- Record water meter readings weekly and provide this information to the service provider.
- Maintain vegetation around tanks and drainfields. It is suggested the sites be mowed and trimmed twice per year.
- Update the service provider, designer, and county if changes in water use are expected such as adding food service or expansion of the building.
- Maintain access points for service equipment to reach tanks and other components.

Maintainer requirements:

- Pump and clean tanks when solids levels reach 25% of tank capacity.
- Pump and clean lift tanks when sludge levels exceed 4" in depth.
- Inspect tank integrity when pumping to ensure tank compliance.
- Clean baffles and effluent screens at each tank pumping.
- Report any unsafe conditions to owner and service provider.
- Report and note any issues such as infiltration, seepage, or other non-compliance issues.
- Follow local and state regulations when disposing of septage.

Service Provider requirements:

- Use the maintenance checklist below as a reference for service to be completed on the system at which frequency.

- Adjust or recommend changes in maintenance tasks and frequency based on operational results.
- Schedule or complete tank maintenance pumping when solids reach critical levels.
- Follow the operating permit and sampling requirements. Send maintenance reports to the County.
- For detailed maintenance tasks or troubleshooting information, refer to the attached installation and operation & maintenance manual provided the manufacture.

Component Description: Septic Tank 757 Gal.		
Location	Description	Frequency
Manholes	Inspect manholes for infiltration	Bi-annual
Manholes	Inspect inlet and outlet for infiltration	Bi-annual
Manholes	Inspect and clean effluent filter if needed	Bi-annual
Inlet/outlet	Sample sludge and scum levels	Bi-annual

Component Description: Ecopod E50 Treatment Tank 757 Gal.		
Location	Description	Frequency
Manholes	Inspect manholes for infiltration	Bi-annual
Manholes	Inspect inlet and outlet for infiltration	Bi-annual
Pretreatment	Maintain per manufacturer recommendations	Bi-annual
UV Light	Maintain per manufacturer recommendations	Bi-annual

Component Description: Mound Dose Time Dose Tank 757 Gal.		
Location	Description	Frequency
Manholes	Inspect manholes for infiltration	Bi-annual
Manholes	Inspect inlet and outlet for infiltration	Bi-annual
Inlet/outlet	Sample sludge and scum levels	Bi-annual
Pump Tank	Pump solids level exceeds 4" in depth	As needed
Manhole	Inspect pumps and floats for proper operation	Bi-annual
Panel	Inspect panel and alarm system for proper operation	Bi-annual
Panel	Record cycle counters and/or elapsed timer meters.	Bi-annual
Panel	Adjust timer settings based on dosing results	As needed
Manhole	Sample effluent fecal coliform	Bi-annual

Component Description: Mound 10' by 38' rockbed		
Location	Description	Frequency
Drainfield	Inspect for ponding or seepage	Bi-annual
Drainfield	Mow the system	June 1 st , August 1st
Drainfield	Clean and flush lateral lines	As Needed

Mitigation Plan:

Problem	Action	Mitigation Steps
Rockbeds ponding	<ul style="list-style-type: none"> • Verify flow and effluent results are within permit limits. • Verify equal distribution in bed dosing. 	<ul style="list-style-type: none"> • If flow cannot be accepted by the beds, pump and haul excess effluent. • Complete pump calibration to verify timer settings are correct.
Seepage below beds	<ul style="list-style-type: none"> • Verify dosing volumes and equal distribution • Inspect all beds to determine if it's isolated to one area or in all beds. • Verify pump operation • Review flow data 	<ul style="list-style-type: none"> • Adjust timer settings to reduce flow entering the bed with seepage. • Complete pump calibration to verify timer settings are correct.
Treatment levels not meeting operating permit limits	<ul style="list-style-type: none"> • Verify flow, influent, and effluent results are within permit limits. • Verify dosing volumes from EQ tank to treatment tank. • Adjust sludge return pump settings. • Verify blower and aeration network are working properly • Sample influent 	<ul style="list-style-type: none"> • If treatment levels cannot be met, expand the treatment system or add more tankage • Adjust dosing tank match long term daily flow averages as close as possible. • Sample influent from EQ tank to verify loading. • Sample dissolved oxygen and pH in EQ tank and Treatment tank. • Check blower air filter, amperage and pressure.
Flow limit exceeded	<ul style="list-style-type: none"> • Inspect for signs of infiltration in all tanks • Inspect building plumbing for leak fixtures or toilets. • Discuss water use patterns with the owner or mgmt. 	<ul style="list-style-type: none"> • Adjust timer settings within the permit limits and operating permit limits • Pump and haul excess flow.

1. Contact Information

v 04.01.2021

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)*

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

* 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 Information *Attach additional information as necessary.*

Design Flow: GPD Anticipated Waste Type:

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	Deep Well		>50'	>50'			Contractor
2							
3							
4							

Additional Well Information:

Preliminary Evaluation Worksheet

Site within 200' of noncommunity transient well (Y/N)	<input type="text" value="No"/>	Yes, source: <input style="width: 100%;" type="text"/>
Site within a drinking water supply management area (Y/N)	<input type="text" value="No"/>	Yes, source: <input style="width: 100%;" type="text"/>
Site in Well Head Protection inner wellhead management zone (Y/N)	<input type="text" value="No"/>	Yes, source: <input style="width: 100%;" type="text"/>
Buried water supply pipes within 50 ft of proposed system (Y/N)	<input type="text" value="No"/>	
B. Site located in a shoreland district/area?	<input type="text" value="Yes"/>	Yes, name: <input style="width: 100%;" type="text" value="Big Sandy"/>
Elevation of ordinary high water level:	<input style="width: 100%;" type="text" value="1216.56"/> ft	Source: <input style="width: 100%;" type="text" value="MN DNR"/>
Classification: <input style="width: 100%;" type="text" value="Lake - General Development"/>	Tank Setback: <input style="width: 100%;" type="text" value="75"/> ft.	STA Setbk: <input style="width: 100%;" type="text" value="75"/> ft.
C. Site located in a floodplain?	<input type="text" value="No"/>	Yes, Type(s): <input style="width: 100%;" type="text" value="N/A"/>
Floodplain designation/elevation (10 Year):	<input style="width: 100%;" type="text" value="N/A"/> ft	Source: <input style="width: 100%;" type="text" value="N/A"/>
Floodplain designation/elevation (100 Year):	<input style="width: 100%;" type="text" value="N/A"/> ft	Source: <input style="width: 100%;" type="text" value="N/A"/>
D. Property Line Id / Source:	<input checked="" type="checkbox"/> Owner <input checked="" type="checkbox"/> Survey <input checked="" type="checkbox"/> County GIS <input type="checkbox"/> Plat Map <input type="checkbox"/> Other: <input style="width: 100%;" type="text"/>	
E. ID distance of relevant setbacks on map:	<input checked="" type="checkbox"/> Water <input type="checkbox"/> Easements <input checked="" type="checkbox"/> Well(s) <input checked="" type="checkbox"/> Building(s) <input checked="" type="checkbox"/> Property Lines <input type="checkbox"/> OHWL <input type="checkbox"/> Other: <input style="width: 100%;" type="text"/>	

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

Map Units:	<input style="width: 95%;" type="text" value="564 Friendship Loam Sand"/>	Slope Range:	<input style="width: 95%;" type="text" value="0-3"/> %
List landforms:	<input style="width: 100%;" type="text" value="Outwash Plains"/>		
Landform position(s):	<input style="width: 100%;" type="text" value="Back/ Side Slope"/>		
Parent materials:	<input style="width: 100%;" type="text" value="Outwash"/>		
	Depth to Bedrock/Restrictive Feature: <input style="width: 100%;" type="text" value="80"/> in	Depth to Watertable: <input style="width: 100%;" type="text" value="41"/> in	
Map Unit Ratings	Septic Tank Absorption Field- At-grade: <input style="width: 100%;" type="text"/>		
	Septic Tank Absorption Field- Mound: <input style="width: 100%;" type="text" value="Not Limited"/>		
	Septic Tank Absorption Field- Trench: <input style="width: 100%;" type="text"/>		

5. Local Government Unit Information

Name of LGU:	<input style="width: 80%;" type="text" value="Aitkin County"/>
LGU Contact:	<input style="width: 95%;" type="text" value="218-927-7342"/>
LGU-specific setbacks:	<input style="width: 95%;" type="text"/>
LGU-specific design requirements:	<input style="width: 95%;" type="text"/>
LGU-specific installation requirements:	<input style="width: 95%;" type="text"/>

Notes:

Field Evaluation Worksheet

1. Project Information		v 04.01.2021	
Property Owner/Client:	<input type="text" value="Paul & Amy Gauer"/>	Project ID: <input type="text"/>	
Site Address:	<input type="text" value="51694 Long Point Place McGregor, MN 55760"/>	Date Completed: <input type="text" value="7.12.22"/>	
2. Utility and Structure Information			
Utility Locations Identified	<input type="checkbox"/> Gopher State One Call # <input type="text"/>	<input type="checkbox"/> Any Private Utilities: <input type="text"/>	
Locate and Verify (see Site Evaluation map) <input checked="" type="checkbox"/> Existing Buildings <input type="checkbox"/> Improvements <input type="checkbox"/> Easements <input checked="" type="checkbox"/> Setbacks			
3. Site Information			
Vegetation type(s):	<input type="text" value="Grass"/>	Landscape position: <input type="text" value="Back/ Side Slope"/>	
Percent slope:	<input type="text" value="0"/> %	Slope shape: <input type="text"/> Slope direction: <input type="text"/>	
Describe the flooding or run-on potential of site: <input type="text"/>			
Describe the need for Type III or Type IV system: <input type="text" value="Limited space for drainfield"/>			
Note: <input type="text"/>			
Proposed soil treatment area protected? (Y/N):	<input type="text" value="Yes"/>	If yes, describe: <input type="text" value="Staked and flagged"/>	
4. General Soils Information			
Filled, Compacted, Disturbed areas (Y/N):	<input type="text" value="No"/>		
If yes, describe:	<input type="text"/>		
Soil observations were conducted in the proposed system location (Y/N): <input type="text" value="Yes"/>			
A soil observation in the most limiting area of the proposed system (Y/N): <input type="text" value="Yes"/>			
Number of soil observations:	<input type="text" value="3"/>	Soil observation logs attached (Y/N): <input type="text" value="Yes"/>	
Percolation tests performed & attached (Y/N): <input type="text" value="No"/>			
5. Phase I. Reporting Information			
	Depth	Elevation	
Limiting Condition*:	<input type="text" value="1"/> in	<input type="text" value="96.9"/> ft	<i>*Most Restrictive Depth Identified from List Below</i>
Periodically saturated soil:	<input type="text" value="1"/> in	<input type="text" value="96.9"/> ft	Soil Texture: <input type="text" value="Medium Sandy Loam"/>
Standing water:	<input type="text"/> in	<input type="text"/> ft	Percolation Rate: <input type="text"/> min/inch
Bedrock:	<input type="text"/> in	<input type="text"/> ft	Soil Hyd Loading Rate: <input type="text" value="0.78"/> gpd/ft ²
Benchmark Elevation:	<input type="text" value="100.0"/> ft	Elevations and Benchmark on map? (Y/N): <input type="text" value="Yes"/>	
Benchmark Elevation Location:	<input type="text" value="Concrete at garage door"/>		
Differences between soil survey and field evaluation:	<input type="text"/>		
Site evaluation issues / comments:	<input type="text"/>		
Anticipated construction issues:	<input type="text" value="Install tank first."/>		

1. PROJECT INFORMATION		v 04.01.2021
Property Owner/Client:	<input type="text" value="Paul & Amy Gauer"/>	Project ID: <input type="text"/>
Site Address:	<input type="text" value="51694 Long Point Place McGregor, MN 55760"/>	Date: <input type="text" value="7.12.22"/>
Email Address:	<input type="text" value="paquettedandb@yahoo.com"/>	Phone: <input type="text" value="218-244-4443"/>
2. DESIGN FLOW & WASTE STRENGTH <i>Attach data / estimate basis for Other Establishments</i>		
Design Flow:	<input type="text" value="450"/> GPD	Anticipated Waste Type: <input type="text" value="Residential"/>
BOD:	<input type="text" value="15"/> mg/L	TSS: <input type="text" value="15"/> mg/L
		Oil & Grease: <input type="text"/> mg/L
Treatment Level:	<input type="text" value="A"/>	<i>Select Treatment Level C for residential septic tank effluent</i>
3. HOLDING TANK SIZING		
Minimum Capacity: Residential =400 gal/bedroom, Other Establishment = Design Flow x 5.0, Minimum size 1000 gallons		
Code Minimum Holding Tank Capacity:	<input type="text"/> Gallons	in <input type="text"/> Tanks or Compartments
Recommended Holding Tank Capacity:	<input type="text"/> Gallons	in <input type="text"/> Tanks or Compartments
Type of High Level Alarm:	<input type="text"/> (Set @ 75% tank capacity)	
Comments:	<input type="text"/>	
4. SEPTIC TANK SIZING		
A. Residential dwellings:		
Number of Bedrooms (Residential):	<input type="text" value="3"/>	
Code Minimum Septic Tank Capacity:	<input type="text" value="1000"/> Gallons	in <input type="text" value="1"/> Tanks or Compartments
Recommended Septic Tank Capacity:	<input type="text" value="1514"/> Gallons	in <input type="text" value="2"/> Tanks or Compartments
Effluent Screen & Alarm (Y/N):	<input type="text"/>	
Model/Type:	<input type="text"/>	
B. Other Establishments:		
Waste received by:	<input type="text"/>	<input type="text"/> GPD x <input type="text"/> Days Hyd. Retention Time
Code Minimum Septic Tank Capacity:	<input type="text"/> Gallons	in <input type="text"/> Tanks or Compartments
Recommended Septic Tank Capacity:	<input type="text"/> Gallons	in <input type="text"/> Tanks or Compartments
Effluent Screen & Alarm (Y/N):	<input type="text"/>	
Model/Type:	<input type="text"/>	
5. PUMP TANK SIZING		
Pump Tank 1 Capacity (Minimum):	<input type="text" value="500"/> Gal	Pump Tank 2 Capacity (Minimum): <input type="text"/> Gal
Pump Tank 1 Capacity (Recommended):	<input type="text" value="757"/> Gal	Pump Tank 2 Capacity (Recommended): <input type="text"/> Gal
Pump 1 <input type="text" value="29.0"/> GPM	Total Head <input type="text" value="13.4"/> ft	Pump 2 <input type="text"/> GPM Total Head <input type="text"/> ft
Supply Pipe Dia. <input type="text" value="2.00"/> in	Dose Vol: <input type="text" value="78.0"/> gal	Supply Pipe Dia. <input type="text"/> Dose Vol: <input type="text"/> Gal

6. SYSTEM AND DISTRIBUTION TYPE		Project ID:	
Soil Treatment Type:	<input type="text" value="Mound"/>	Distribution Type:	<input type="text" value="Pressure Distribution-Level"/>
Elevation Benchmark:	<input type="text" value="100"/> ft	Benchmark Location:	<input type="text" value="Concrete at garage door"/>
MPCA System Type:	<input type="text" value="Type IV"/>	Distribution Media:	<input type="text" value="Rock"/>
Type III/IV/V Details:	<input type="text" value="EcoPod E50"/>		

7. SITE EVALUATION SUMMARY:

Describe Limiting Condition:

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

Note:

	Depth	Depth	Elevation of Limiting Condition
Limiting Condition:	<input type="text" value="0"/> inches	<input type="text" value="0.0"/> ft	<input type="text" value="96.90"/> ft
Minimum Req'd Separation:	<input type="text" value="12"/> inches	<input type="text" value="1.0"/> ft	Elevation <i>Critical for system compliance</i>
Code Max System Depth:	<input type="text" value="Mound"/> inches	<input type="text" value="-1.0"/> ft	<input type="text" value="97.90"/> ft

This is the maximum depth to the bottom of the distribution media for required separation. Negative Depth (ft) means it must be a mound.

Soil Texture:

Soil Hyd. Loading Rate: GPD/ft² Percolation Rate: MPI

Contour Loading Rate: Note:

Measured Land Slope: % Note:

Comments:

8. SOIL TREATMENT AREA DESIGN SUMMARY

Trench:

Dispersal Area	<input type="text"/>	ft ²	Sidewall Depth	<input type="text"/>	in	Trench Width	<input type="text"/>	ft
Total Lineal Feet	<input type="text"/>	ft	No. of Trenches	<input type="text"/>		Code Max. Trench Depth	<input type="text"/>	in
Contour Loading Rate	<input type="text"/>	ft	Minimum Length	<input type="text"/>	ft	Designed Trench Depth	<input type="text"/>	in

Bed:

Dispersal Area	<input type="text"/>	ft ²	Sidewall Depth	<input type="text"/>	in	Maximum Bed Depth	<input type="text"/>	in
Bed Width	<input type="text"/>	ft	Bed Length	<input type="text"/>	ft	Designed Bed Depth	<input type="text"/>	in

Mound:

Dispersal Area	<input type="text" value="380.0"/>	ft ²	Bed Length	<input type="text" value="38.0"/>	ft	Bed Width	<input type="text" value="10.0"/>	ft
Absorption Width	<input type="text" value="15.0"/>	ft	Clean Sand Lift	<input type="text" value="1.0"/>	ft	Berm Width (0-1%)	<input type="text" value="11.3"/>	ft
Upslope Berm Width	<input type="text" value="11.3"/>	ft	Downslope Berm	<input type="text" value="11.3"/>	ft	Endslope Berm Width	<input type="text" value="11.3"/>	ft
Total System Length	<input type="text" value="60.6"/>	ft	System Width	<input type="text" value="32.6"/>	ft	Contour Loading Rate	<input type="text" value="12.0"/>	gal/ft

At-Grade:

Bed Width ft Bed Length ft Finished Height ft
 Contour Loading Rate gal/ft Upslope Berm ft Downslope Berm ft
 Endslope Berm ft System Length ft System Width ft

Level & Equal Pressure Distribution

No. of Laterals Perforation Spacing ft Perforation Diameter in
 Lateral Diameter in Min Dose Volume gal Max Dose Volume gal

Non-Level and Unequal Pressure Distribution

	Elevation (ft)	Pipe Size (in)	Pipe Volume (gal/ft)	Pipe Length (ft)	Perf Size (in)	Spacing (ft)	Spacing (in)	
Lateral 1								Minimum Dose Volume <input type="text"/> gal
Lateral 2								
Lateral 3								
Lateral 4								Maximum Dose Volume <input type="text"/> gal
Lateral 5								
Lateral 6								

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

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

gpd X mg/L X 8.35 ÷ 1,000,000 = lbs. BOD/day

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

gpd X mg/L X 8.35 ÷ 1,000,000 = lbs. BOD/day

Lbs. BOD To Be Removed:

PreTreatment Technology: *Must Meet or Exceed Target


Disinfection Technology: *Required for Levels A & B

C. Organic Loading to Soil Treatment Area:

mg/L X gpd x 8.35 ÷ 1,000,000 ÷ ft² = lbs./day/ft²

10. Comments/Special Design Considerations:

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

Brian Koski (Designer)	 (Signature)	2624 (License #)	7.12.22 (Date)
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Mound Design Worksheet

<1% Slope

1. **SYSTEM SIZING:** Project ID: _____ v 04.01.2021

- A. Design Flow : GPD
- B. Soil Loading Rate: GPD/ft²
- C. Depth to Limiting Condition: ft
- D. Percent Land Slope: %
- E. Design Media Loading Rate: GPD/ft²
- F. Mound Absorption Ratio:

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 5	1.2	1	1.6	1
0.1 to 5 (fine sand and loamy fine sand)	0.6	2	1	1.6
6 to 15	0.78	1.5	1	1.6
16 to 30	0.6	2	0.78	2
31 to 45	0.5	2.4	0.78	2
46 to 60	0.45	2.6	0.6	2.6
61 to 120	-	5	0.3	5.3
>120	-	-	-	-

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*

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

2. DISPERSAL MEDIA SIZING

A. Calculate Dispersal Bed Area: Design Flow (1.A) ÷ Design Media Loading Rate

$$\frac{450 \text{ GPD}}{1.2 \text{ GPD/ft}^2} = 375 \text{ ft}^2$$

If a larger dispersal media area is desired, enter size: ft²

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

C. Calculate Contour Loading Rate: Bed Width X Design Media Loading Rate

$$10 \text{ ft} \times 1.2 \text{ GPD/ft}^2 = 12.0 \text{ gal/ft}$$

Can not exceed Table 1

D. Calculate Minimum Dispersal Bed Length: Dispersal Bed Area ÷ Bed Width

$$\frac{380 \text{ ft}^2}{10 \text{ ft}} = 38.0 \text{ ft}$$

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

3. ABSORPTION AREA SIZING

A. Calculate Absorption Width: Bed Width X Mound Absorption Ratio

$$10.0 \text{ ft} \times 1.5 = 15.0 \text{ ft}$$

B. For slopes from 0 to 1%, the Absorption Width is measured from the bed equally in both directions.

Absorption Width Beyond the Bed: Absorption Width - Bed Width ÷ 2

$$\frac{(15.0 \text{ ft} - 10.0 \text{ ft})}{2} = 2.5 \text{ ft}$$

4. DISTRIBUTION MEDIA

Project ID:

Select Dispersal Media:

Rock

Enter Either A. or B.

A. Rock Depth Below Distribution Pipe

6

in

B. Registered Media

0

Registered Media Depth

in

Check registered product information for specific application details and design

Specific Media Comments:

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

1.0

ft -

ft =

1.0

ft

Design Sand Lift (optional):

ft

B. Upslope Height = Clean Sand Lift + Depth of Media + Depth to Cover Pipe + Depth of Cover (1 ft)

1.0

ft +

0.50

ft +

0.33

ft +

1.00

ft =

2.8

ft

C. Berm Width = Upslope Mound Height X 4 (4 is recommended, but could be 3-12)

2.8

ft X

4.0

ft =

11.3

ft

D. Total Landscape Width = Berm Width + Dispersal Bed Width + Berm Width

11.3

ft +

10.0

ft +

11.3

ft =

32.6

ft

E. Additional Berm Width necessary for absorption = Absorption Width - Total Landscape Width

15.0

ft -

32.6

ft =

0

ft

if number is negative (<0), value is ZERO

F. Final Berm Width = Additional Berm Width + Berm Width

0

ft +

11.3

ft =

11.3

ft

G. Total Mound Width = Final Berm Width + Dispersal Bed Width + Final Berm Width

11.3

ft +

10.0

ft +

11.3

ft =

32.6

ft

H. Total Mound Length = Final Berm Width + Dispersal Bed Length + Final Berm Width

11.3

ft +

38.0

ft +

11.3

ft =

60.6

ft

I. Setbacks from the Bed: Absorption Width - Dispersal Bed Width divided by 2

(15.0

ft -

10.0

) /

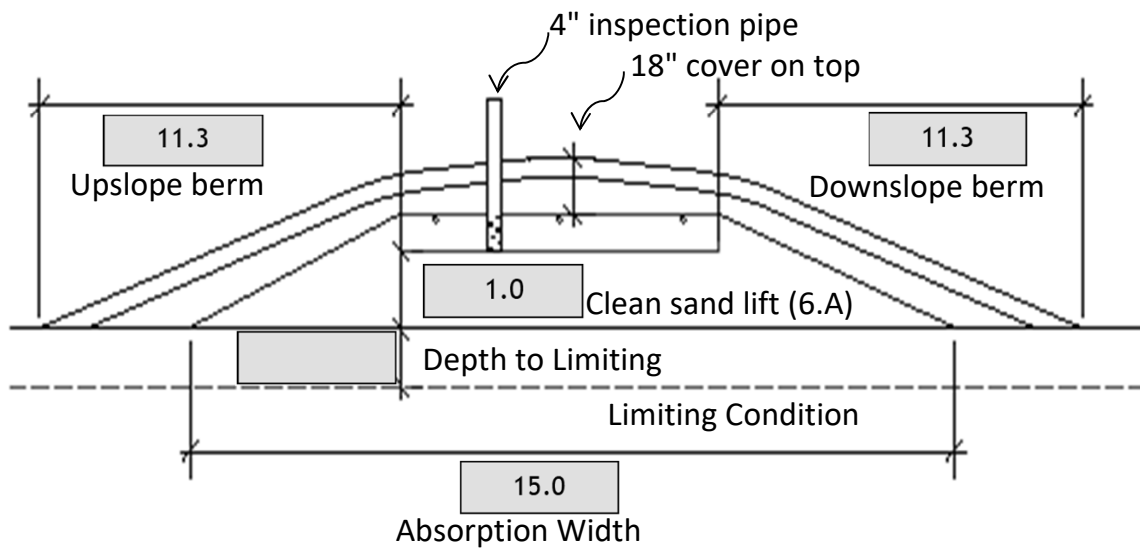
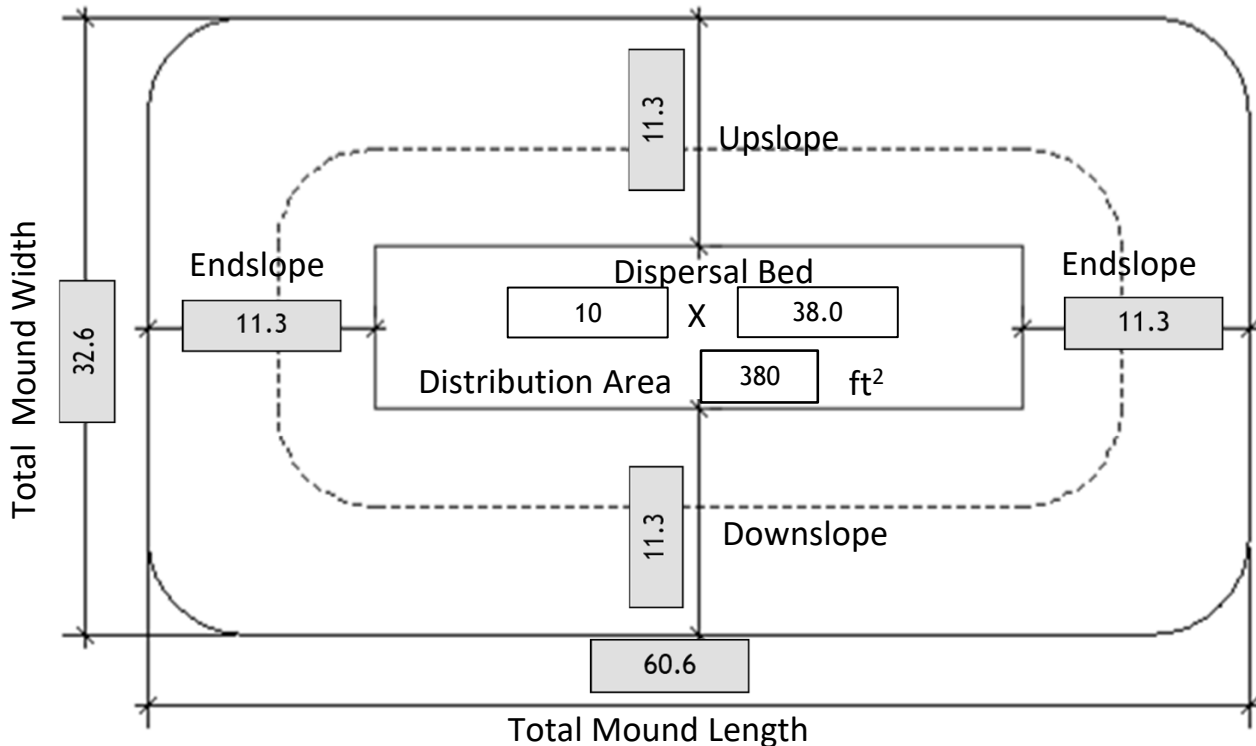
2 =

2.5

ft

7. MOUND DIMENSIONS (Feet)

Project ID:



Required Separation	<input type="text" value="12"/> (in)	Distribution Media	<input type="text" value="Rock"/>
Manifold Connection	<input type="text" value="End"/>	Media Depth	<input type="text" value="6.0"/> (in)
Perforation Size:	<input type="text" value="1/4"/> (in)	Perforation Spacing:	<input type="text" value="36.0"/> (in)

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

Comments:



Mound Materials Worksheet

Project ID:

v 04.01.2021

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

$$\left(\boxed{6} \text{ in} + \boxed{3.0} \text{ in} \right) \div 12 \times \boxed{38.0} \text{ ft} \times \boxed{10.0} \text{ ft} = \boxed{285.0} \text{ ft}^3$$

Divide ft³ by 27 ft³/yd³ to calculate cubic yards: $\boxed{285.0} \text{ ft}^3 \div 27 = \boxed{10.6} \text{ yd}^3$

Add 30% for constructability: $\boxed{10.6} \text{ yd}^3 \times 1.3 = \boxed{13.7} \text{ yd}^3$

B. Calculate Clean Sand Volume:

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

$$\boxed{1.0} \text{ ft} \times \boxed{10.0} \text{ ft} \times \boxed{38} \text{ ft} = \boxed{380} \text{ ft}^3$$

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)

$$\boxed{2.83} \text{ ft} - 1) \times \boxed{2.50} \times \boxed{38} \text{ ft} = \boxed{173.9}$$

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

$$\boxed{2.83} \text{ ft} - 1) \times \boxed{2.50} \times \boxed{10} \text{ ft} = \boxed{45.8}$$

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

$$\boxed{173.9} \text{ ft}^3 + \boxed{45.8} \text{ ft}^3 + \boxed{380.0} \text{ ft}^3 = \boxed{599.6} \text{ ft}^3$$

For a Mound on a slope greater than 1%

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

$$\left(\boxed{} \text{ ft} - 1 \right) \times 3.0 \text{ ft} \times \boxed{} \div 2 = \boxed{} \text{ ft}^3$$

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

$$\left(\boxed{} \text{ ft} - 1 \right) \times \boxed{} \text{ ft} \times \boxed{} \div 2 = \boxed{} \text{ ft}^3$$

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

$$\left(\boxed{} \text{ ft} - 1 \right) \times 3.0 \text{ ft} \times \boxed{} \text{ ft} = \boxed{} \text{ ft}^3$$

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

$$\boxed{} \text{ ft}^3 + \boxed{} \text{ ft}^3 + \boxed{} \text{ ft}^3 + \boxed{} \text{ ft}^3 = \boxed{} \text{ ft}^3$$

Divide ft³ by 27 ft³/yd³ to calculate cubic yards: $\boxed{599.6} \text{ ft}^3 \div 27 = \boxed{22.2} \text{ yd}^3$

Add 30% for constructability: $\boxed{22.2} \text{ yd}^3 \times 1.3 = \boxed{28.9} \text{ yd}^3$

C. Calculate Sandy Berm Volume:

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

$$\left(\boxed{2.8} - 0.5 \right) \text{ ft} \times \boxed{32.6} \text{ ft} \times \boxed{60.6} \div 2 = \boxed{2305.9} \text{ ft}^3$$

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

$$\boxed{2305.9} \text{ ft}^3 - \boxed{599.6} \text{ ft}^3 - \boxed{285.0} \text{ ft}^3 = \boxed{1421.3} \text{ ft}^3$$

Divide ft³ by 27 ft³/yd³ to calculate cubic yards: $\boxed{1421.3} \text{ ft}^3 \div 27 = \boxed{52.6} \text{ yd}^3$

Add 30% for constructability: $\boxed{52.6} \text{ yd}^3 \times 1.3 = \boxed{68.4} \text{ yd}^3$

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

$$\boxed{32.6} \text{ ft} \times \boxed{60.6} \text{ ft} \times 0.5 \text{ ft} = \boxed{989.6} \text{ ft}^3$$

Divide ft³ by 27 ft³/yd³ to calculate cubic yards: $\boxed{989.6} \text{ ft}^3 \div 27 = \boxed{36.7} \text{ yd}^3$

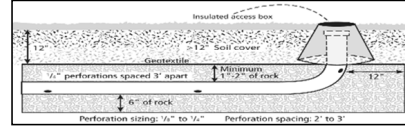
Add 30% for constructability: $\boxed{36.7} \text{ yd}^3 \times 1.3 = \boxed{47.6} \text{ yd}^3$

Project ID:

v 04.01.2021

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

$$[(\text{ } \boxed{10} \text{ } - 4) \div 3] + 1 = \text{ } \boxed{3} \text{ } \text{laterals} \quad \text{Does not apply to at-grades}$$
- Designer Selected Number of Laterals: laterals
Cannot be less than line 2 (Except in at-grades)
- Select Perforation Spacing: ft
- Select Perforation Diameter Size: in
- Length of Laterals = Media Bed Length - 2 Feet.



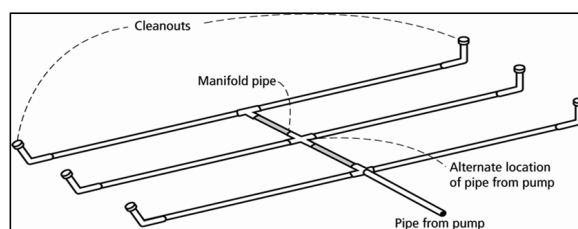
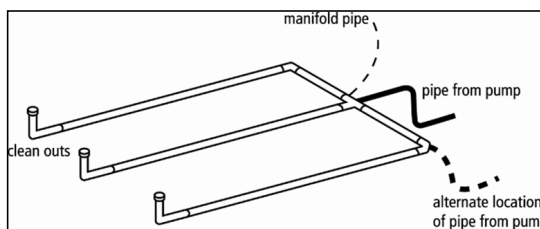
- 2ft = ft *Perforation can not be closer than 1 foot from edge.*

- Determine the Number of Perforation Spaces. Divide the Length of Laterals by the Perforation Spacing and round down to the nearest whole number.

$$\text{Number of Perforation Spaces} = \text{ } \boxed{36.0} \text{ ft} \div \text{ } \boxed{3.0} \text{ ft} = \text{ } \boxed{12} \text{ Spaces}$$
- Number of Perforations per Lateral is equal to 1.0 plus the Number of Perforation Spaces. 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.

$$\text{Perforations Per Lateral} = \text{ } \boxed{12} \text{ Spaces} + 1 = \text{ } \boxed{13} \text{ Perfs. Per Lateral}$$

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	3
2	10	13	18	30	60	2	11	16	21	34	68
2 1/2	8	12	16	28	54	2 1/2	10	14	20	32	64
3	8	12	16	25	52	3	9	14	19	30	60
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	3
2	12	18	26	46	87	2	21	33	44	74	149
2 1/2	12	17	24	40	80	2 1/2	20	30	41	69	135
3	12	16	22	37	75	3	20	29	38	64	128



- Total Number of Perforations equals the Number of Perforations per Lateral multiplied by the Number of Perforated Laterals.

$$\text{ } \boxed{13} \text{ Perf. Per Lat.} \times \text{ } \boxed{3} \text{ Number of Perf. Lat.} = \text{ } \boxed{39} \text{ Total Number of Perf.}$$

- Spacing of laterals; Must be greater than 1 foot and no more than 3 feet: ft
- Select Type of Manifold Connection (End or Center):
- Select Lateral Diameter (See Table): in

13. Calculate the **Square Feet per Perforation**.

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

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

ft X ft = ft²

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

ft² ÷ perf = ft²/perf

14. Select **Minimum Average Head** :

ft

15. Select **Perforation Discharge** based on Table:

GPM per Perf

16. **Flow Rate** = Total Number of Perfs X Perforation Discharge.

Perfs X GPM per Perforation = GPM

17. **Volume of Liquid Per Foot of Distribution Piping (Table II)** :

Gallons/ft

18. **Volume of Distribution Piping** =

= [Number of Perforated Laterals X Length of Laterals X (Volume of Liquid Per Foot of Distribution Piping)]

X ft X gal/ft = Gallons

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

gals X 4 = Gallons

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:

1. PUMP CAPACITY

Project ID:

v 04.01.2021

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:

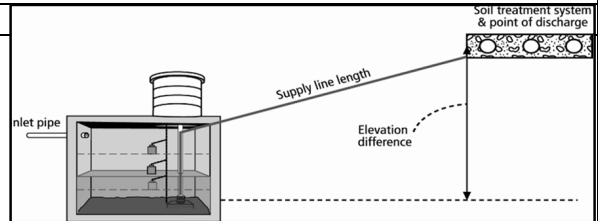
Equalization/Time Dosing

2. HEAD REQUIREMENTS

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

B. Distribution Head Loss: ft

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



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

Table I. Friction Loss in Plastic Pipe per 100ft

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

D. 1. Supply Pipe Diameter: in

2. Supply Pipe Length: ft

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

Friction Loss = 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*

ft X 1.25 = ft

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

Supply Friction Loss =

ft per 100ft X ft ÷ 100 = ft

H. *Total Head* requirement is the sum of the *Elevation Difference* + *Distribution Head Loss*, + *Additional Head Loss* + *Supply Friction Loss*

ft + ft + ft + ft = ft

3. PUMP SELECTION

A pump must be selected to deliver at least **29.0** GPM with at least **13.4** feet of total head.

Comments:

Blank area for comments.

DETERMINE TANK CAPACITY AND DIMENSIONS

Project ID: _____

v 04.01.2021

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

2. A. Tank Manufacturer: B. Tank Model:
- C. Capacity from manufacturer: Gallons *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.*
- D. Gallons per inch: Gallons per inch
- E. Liquid depth of tank from manufacturer: inches

DETERMINE DOSING VOLUME

3. Volume to Cover Pump (The inlet of pump should be 4 in from the bottom of the tank & 2 in covering the pump recommended)

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

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

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

-Item 18 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 ÷ Delivered Volume

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 X Volume of Liquid Per Lineal Foot of Pipe

ft X gal/ft = Gallons

9. Total Dosing Volume = Delivered Volume plus Drainback

gal + gal = Gallons

10. Working Storage Volume = Tank Volume - Volume to Cover Pump - Reserve Capacity

gal - gal - = Gallons

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

11. Required Flow Rate :

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

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

in X gal/in ÷ min = GPM

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

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

NORMAL OPERATION TIMER SETTINGS*

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

Total Dosing Volume ÷ GPM

81	gal	÷	29.0	gpm	=	2.8	Minutes ON*	HR	MIN	SEC
								0	2.0	46

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

Minutes Per Day (1440)/Doses Per Day - Minutes On

1440 min	÷	4	doses/day	-	2.8	min	=	353.8	Minutes OFF*	HR	MIN	SEC
										5	53.0	48

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

15. Peak Percentage of Design Flow %

16. Peak Pump Volume that meets both Minimum and Maximum Volume gal + DrainBack 2.6 gal

17. Peak Dose Volume gal

HR	MIN	SEC

18. Peak TIMER ON gal ÷ gpm = min ON

HR	MIN	SEC

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

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

HR	MIN	SEC

FLOAT SETTINGS

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

Distance to set Pump Off Float = Gallons to Cover Pump / Gallons Per Inch:

216	gal	÷	15.4	gal/in	=	14.0	Inches
-----	-----	---	------	--------	---	------	--------

Reserve Capacity
 Alarm Depth 24.8 in

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

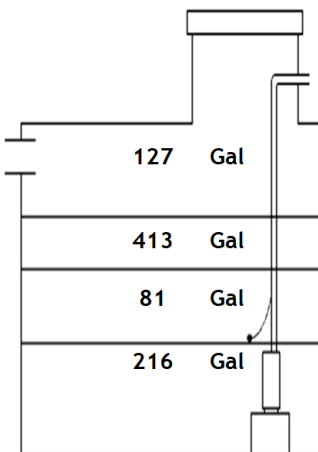
Distance to set Alarm Float = Tank Depth X % of Tank Depth (90% recommended)

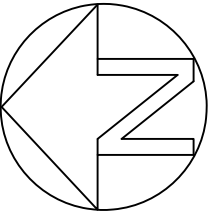
33.0	in	X	75	%	=	24.75	Inches
------	----	---	----	---	---	-------	--------

Storage Capacity
 Normal Dose Volume
 Pump Off 14.0 in

22. Reserve Capacity in gallons = (Tank Depth - Alarm Depth) X GPI

(33.0	in	+	24.8	in)	X	15.4	=	127.4	gallons
---	------	----	---	------	-----	---	------	---	-------	---------





SCALE - 1"=20'

PREPARED FOR:
GAUER, PAUL & AMY

PROPERTY LOCATION
51694 Long Point Place
McGregor, MN 55760

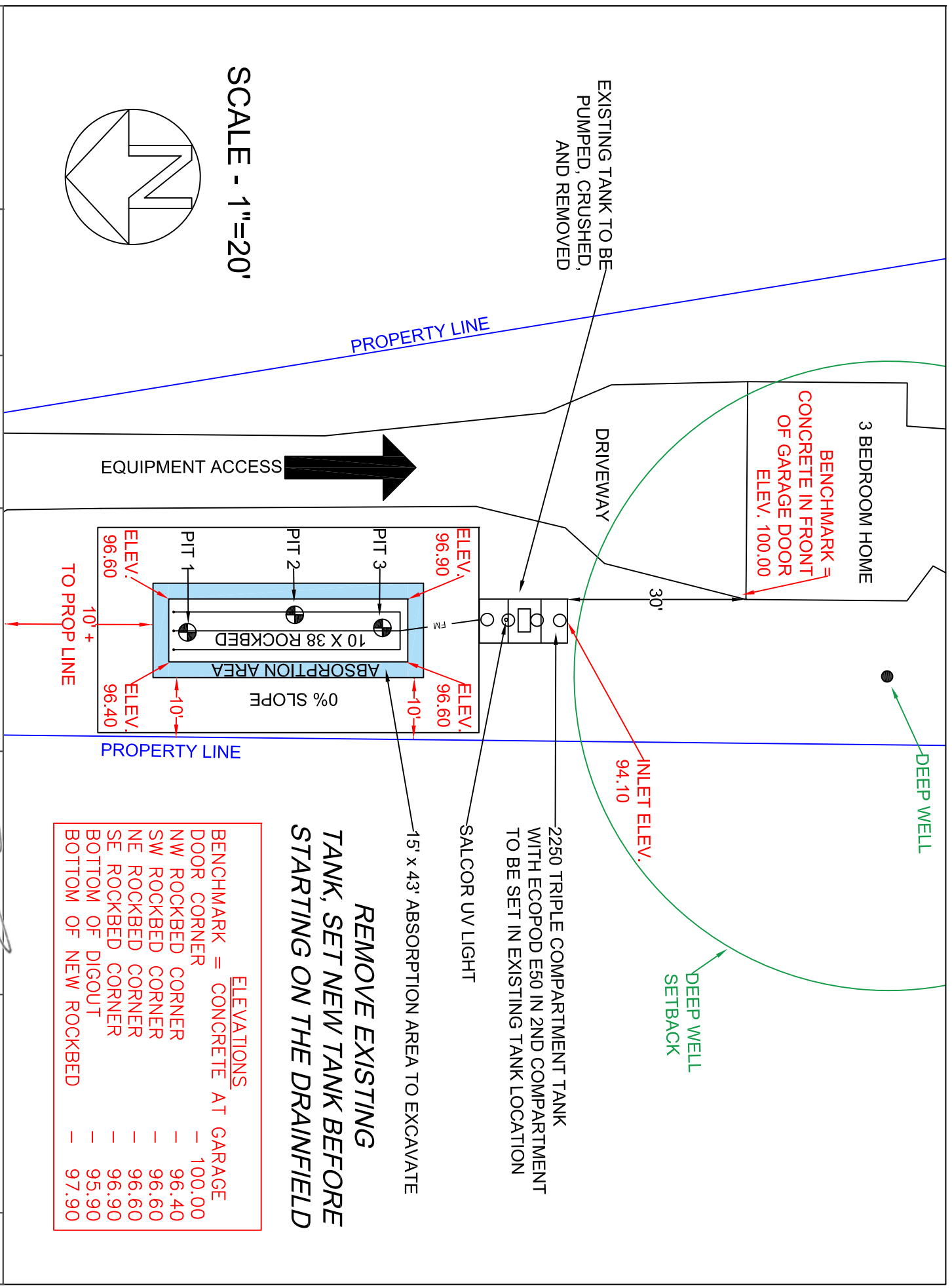
LEGAL DESCRIPTION
Aitkin County, Minnesota
Pfd# 28-1-482800

SEPTIC CHECK
6074 KEVSTONE RD MILACA, MN 56353
(320)-983-2447 (FAX) (320)-983-2151

I hereby certify that this plan was prepared by me or under my direct supervision.
DATE 7/12/22

PAGE TITLE
DESIGN SITE MAP

SHEET NUMBER
1 OF 1



REMOVE EXISTING TANK, SET NEW TANK BEFORE STARTING ON THE DRAINFIELD

ELEVATIONS	
BENCHMARK = CONCRETE AT GARAGE DOOR CORNER	100.00
NW ROCKBED CORNER	96.40
SW ROCKBED CORNER	96.60
NE ROCKBED CORNER	96.60
SE ROCKBED CORNER	96.90
BOTTOM OF DIGOUT	95.90
BOTTOM OF NEW ROCKBED	97.90

SEPTIC CHECK

EXPERT SERVICE. LASTING VALUE. CLEAN WATER

Paul & Amy Gauer

51694 Long Point Place McGregor, MN 55760
PID 29-1-492800



Existing tank looking towards the cabin and from the cabin down driveway. This tank will be pumped, crushed, and removed. The new tank will be set in its place



Staked Rockbed



Soil Pit



Benchmark on
Concrete at garage door.

Soil Observation Log

Soil Verification for:	Paul & Amy Gauer		Property Address		51694 Long Point Place McGregor, MN 55760
Soil parent material(s): (Check all that apply)	<input checked="" type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input type="checkbox"/> Loess <input type="checkbox"/> Till <input type="checkbox"/> Alluvium <input type="checkbox"/> Bedrock <input type="checkbox"/> Organic Matter				
Landscape Position: (check one)	<input checked="" type="checkbox"/> Summit <input type="checkbox"/> Shoulder <input type="checkbox"/> Back/Side Slope <input type="checkbox"/> Foot Slope <input type="checkbox"/> Toe Slope				
Vegetation	Weeds	Soil survey map units		564 Friendship Loamy Sand	
Weather Conditions/Time of Day:		Sunny 10am		Date	07/12/22
Observation #/Location: 1					
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)
0" - 2"	Fill Soil	<5%	10YR 3/2		
2" - 7"	Fill Soil	<5%	10YR 5/2	10YR 5/8	Concentrations, depletions
7" - 12"	Loam	<5%	10YR 3/2		
12" - 15"	Clay Loam	<5%	10YR 5/2		
Observation #/Location: 2					
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)
0" - 4"	Fill Soil	<5%	10YR 3/2		
4" - 7"	Fill Soil	<5%	10YR 5/2	10YR 5/8	Concentrations, depletions
7" - 12"	Loam	<5%	10YR 3/2		
Observation #/Location: 3					
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)
0" - 4"	Fill Soil	<5%	10YR 3/2		
4" - 7"	Fill Soil	<5%	10YR 5/2	10YR 5/8	Concentrations, depletions
7" - 12"	Loam	<5%	10YR 3/2		
12" - 15"	Clay Loam	<5%	10YR 5/2		

Observation #/Location:	1		Observation Type:	Soil Pit
Depth (in)	Texture	Rock Frag. %	Indicator(s)	Structure-----I
0" - 2"	Fill Soil	<5%	Granular	Grade Moderate
2" - 7"	Fill Soil	<5%	Granular	Moderate
7" - 12"	Loam	<5%	Blocky	Strong
12" - 15"	Clay Loam	<5%	Blocky	Strong

Observation #/Location:	2		Observation Type:	Soil Pit
Depth (in)	Texture	Rock Frag. %	Indicator(s)	Structure-----I
0" - 4"	Fill Soil	<5%	Granular	Grade Moderate
4" - 7"	Fill Soil	<5%	Granular	Moderate
7" - 12"	Loam	<5%	Blocky	Strong

Observation #/Location:	3		Observation Type:	Soil Pit
Depth (in)	Texture	Rock Frag. %	Indicator(s)	Structure-----I
0" - 4"	Fill Soil	<5%	Granular	Grade Moderate
4" - 7"	Fill Soil	<5%	Granular	Moderate
7" - 12"	Loam	<5%	Blocky	Strong

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

Brian Koski
 (Designer/Inspector)


 (Signature)

2624
 (License #)

7/12/2022
 (Date)

Aitkin County, Minnesota

564—Friendship loamy sand

Map Unit Setting

National map unit symbol: gjhw
Elevation: 980 to 1,640 feet
Mean annual precipitation: 25 to 30 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 120 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Friendship and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Friendship

Setting

Landform: Outwash plains
Landform position (two-dimensional): Summit, backslope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Sandy outwash

Typical profile

E - 0 to 3 inches: loamy sand
Bw1 - 3 to 6 inches: loamy sand
Bw2,Bw3,BC - 6 to 39 inches: sand
C1,C2 - 39 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 41 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Forage suitability group: Sloping Upland, Low AWC, Acid (G090AN008MN)
Other vegetative classification: Sloping Upland, Low AWC, Acid (G090AN008MN)

Hydric soil rating: No

Minor Components

Leafriver and similar soils

Percent of map unit: 5 percent

Landform: Depressions

Hydric soil rating: Yes

Meehan and similar soils

Percent of map unit: 5 percent

Hydric soil rating: No

Menahga and similar soils

Percent of map unit: 5 percent

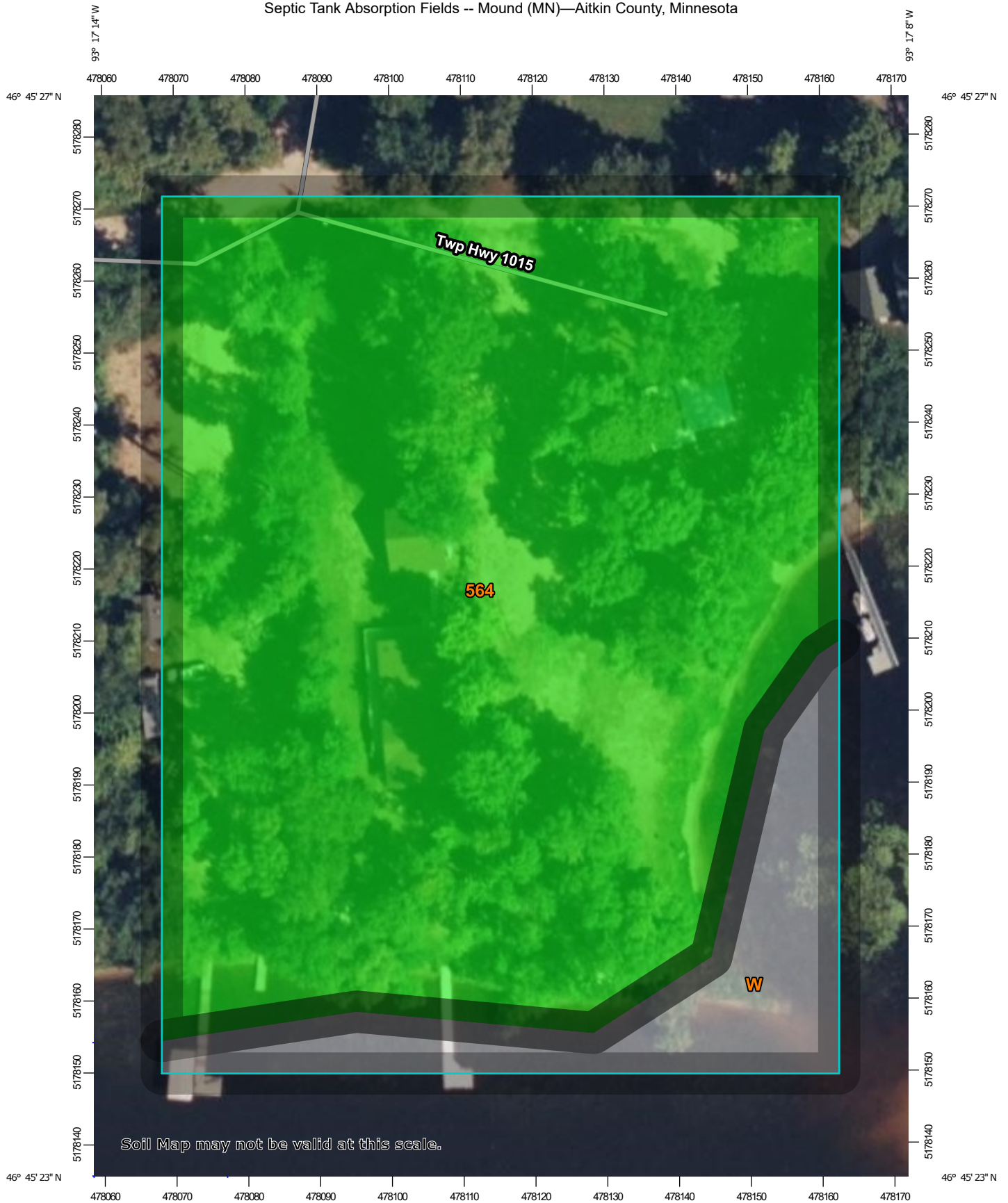
Hydric soil rating: No

Data Source Information

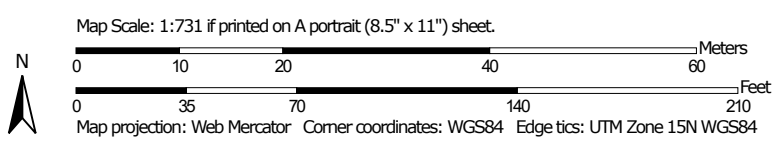
Soil Survey Area: Aitkin County, Minnesota

Survey Area Data: Version 22, Sep 10, 2021

Septic Tank Absorption Fields -- Mound (MN)—Aitkin County, Minnesota



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)	Transportation
Area of Interest (AOI)	Rails
Soils	Interstate Highways
Soil Rating Polygons	US Routes
Extremely limited	Major Roads
Very limited	Local Roads
Moderately limited	Background
Slightly limited	Aerial Photography
Not limited	
Not rated or not available	
Soil Rating Lines	
Extremely limited	
Very limited	
Moderately limited	
Slightly limited	
Not limited	
Not rated or not available	
Soil Rating Points	
Extremely limited	
Very limited	
Moderately limited	
Slightly limited	
Not limited	
Not rated or not available	
Water Features	Streams and Canals

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Aitkin County, Minnesota
 Survey Area Data: Version 22, Sep 10, 2021

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

Date(s) aerial images were photographed: Jul 13, 2021—Aug 14, 2021

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

Septic Tank Absorption Fields — Mound (MN)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
564	Friendship loamy sand	Not limited	Friendship (85%)		2.5	87.8%
W	Water	Not rated	Water (100%)		0.3	12.2%
Totals for Area of Interest					2.9	100.0%

Rating	Acres in AOI	Percent of AOI
Not limited	2.5	87.8%
Null or Not Rated	0.3	12.2%
Totals for Area of Interest	2.9	100.0%

Description

"Mound septic tank absorption fields" are areas in which effluent from a septic tank is distributed into the soil surface through perforated pipe. In this system the drain field is placed above the soil surface in a mound. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity (Ksat) is evaluated from the surface to a depth of 30 centimeters. Depth to saturation and depth to bedrock are evaluated from the surface to a depth of 203 centimeters. The frequency of ponding and flooding also is evaluated. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Slightly limited" indicates that the soil has features that are favorable for the specified use. "Moderately limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Good performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without special design or expensive installation procedures. "Extremely limited" indicates that the soil has one or more features that are very unfavorable for the specified use. The limitations generally cannot be overcome.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as the one shown for the map unit. The percent composition of each component in a particular map unit is given to help the user better understand the extent to which the rating applies to the map unit.

Other components with different ratings may occur in each map unit. The ratings for all components, regardless the aggregated rating of the map unit, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

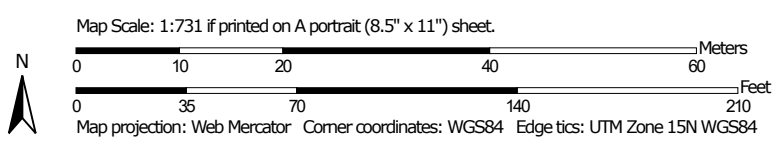
Component Percent Cutoff: None Specified

Tie-break Rule: Higher






































Soil Map—Aitkin County, Minnesota



Soil Map may not be valid at this scale.



MAP LEGEND

-  Area of Interest (AOI)
-  Area of Interest (AOI)
-  Soil Map Unit Polygons
-  Soil Map Unit Lines
-  Soil Map Unit Points
- Special Point Features**
-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot
-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features
- Water Features**
-  Streams and Canals
- Transportation**
-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads
- Background**
-  Aerial Photography

MAP INFORMATION

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

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 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

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 Survey Area Data: Version 22, Sep 10, 2021

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

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
564	Friendship loamy sand	2.5	87.8%
W	Water	0.3	12.2%
Totals for Area of Interest		2.9	100.0%



**MAINTENANCE SERVICE, MONITORING, AND INSPECTION
CONTRACT FOR ONSITE WASTEWATER TREATMENT SYSTEM**

It is hereby agreed this 23rd day of June 2022 by and between Septic Check (Service Provider) and Client:

Client Name and Site Address	
Name:	Paul & Amy Gauer
Street Address:	51694 Long Point Place
City, State, Zip:	McGregor, MN 55760
Parcel ID:	29-1-492800
LGU:	Aitkin County
Contract Type:	ATU 2x/yr TESTING
Treatment System:	ECOPOD

That in consideration of the payments provided herein, the Service Provider shall provide services to perform preventative maintenance, monitoring, and inspection of the Onsite Wastewater Treatment System (OWTS) located at the property described in this Contract.

Each inspection visit includes an examination of the OWTS per this Contract and a follow-up report. The report shall contain status of conditions and recommended corrective measures or replacement parts if deemed appropriate. The Service Provider is authorized to submit a copy of the report to the Local Governmental Unit (LGU) listed above.

This Contract does not assume any responsibilities or obligations which are normally the responsibilities of the Client as related to parts or labor, and does not extend to cover any costs that may be associated with any recommendations made under this Contract.

The Service Provider will only contract or subcontract for parts or labor after Client authorization. Billings for service calls outside of this Contract shall be made on a case-by-case basis. This Contract covers listed services and does not cover alarm calls of any kind.

PHONE 320-983-2447 • TOLL FREE 888-983-2447 • FAX 320-983-2151

6074 Keystone Road • Milaca, MN 56353 • info@SepticCheck.com • www.SepticCheck.com

A Division of WEX Companies

The Service Provider shall be provided access to the site and the system in order to perform the following services as indicated:

SEPTIC TANK AND LIFT STATION(S) INSPECTION

- Check septic tank and compartments for solids build-up and general appearance. If necessary, recommend pumping when 25 to 33% of the operating levels contain solids.
- Inspect the septic tank baffles, inspection pipes, risers, and lids for structural integrity.
- Check pumping system, including control panel and floats (if applicable).
- Record and date the readings of flow measurement devices (if applicable).
- Check dosing settings in the control panel (if applicable).
- Check and clean effluent screen(s) (if applicable).
- Other:

*****The cost of tank or lift station pumping is the responsibility of the Client and is not included in this Contract.***

TREATMENT DEVICE – Aerobic Treatment Unit (ATU)

- Inspect ATU per manufacturer's recommendations (if applicable).
- Inspect and clean any parts per manufacturer's recommendations.
- Inspect the appearance of the wastewater inside the unit for color and turbidity, and check odors.
- Sample effluent per operating permit.
- Inspect UV disinfection unit (if applicable); clean tube and replace bulb when needed.
- Other:

*****The cost of the replacement bulb is the responsibility of the Client and is not included in this Contract.***

DISPERSAL FIELD

*****Mowing is not included in this Contract.***

- Inspect for visible signs of failure (surface discharge, wet spots, settling, etc.).
- Check inspection pipes for evidence of ponding.
- Inspect and clean lateral lines when necessary.

*****The cost of cleaning lateral lines is the responsibility of the Client and is not included in this Contract.***

OPERATING PERMIT COMPLIANCE

****Operating permit fees are not included in this Contract.**

- Complete onsite inspection reports and enter in database.
- Collect and compile sample results and flow data.
- Submit service and sample reports to the LGU prior to deadline.
- Act as liaison between client and LGU as needed.

In no event shall the Service Provider be responsible for special or consequential damages including but not limited to loss of time, injury to personal property or any other consequential damages or incidental or economic loss due to equipment failure or for any other reason. This Contract does not assume any responsibilities or obligations which are normally the responsibility of the Client related to parts or labor, and does not extend to cover any costs that may be associated with any recommendations made under this Contract.

Contract Terms	
Contract Effective Date:	Upon acceptance of this Contract, automatic annual renewal
Frequency of Regular Service Visits:	SEMI-ANNUAL – 2x/yr
Sample Parameters:	Fecal Coliform, Flow
Cost for Maintenance Contract:	\$430/year to include regular service visits, testing (if applicable), and reporting with annual price increases equivalent to the Regional Consumer Price Index (CPI) to cover variable costs such as fuel, materials, and laboratory fees (average 3% per year approximately).
Billing Dates:	\$215 after each regular service visit is complete
Alarm/Emergency Call Charge:	Invoiced using current service visit and labor fees.
Expected Repair Budget:	\$300/year* (See below)
Repeat Sampling Cost:	\$100/Repeat sample retrieval and processing due to initial sample not meeting permit limits.

**The expected repair budget above is a recommended planning amount to cover expected repair/replacement costs associated with your treatment device. Other costs for items such as tank pumping and cleaning, pump or other component replacements are not expected to be covered by the amount.*

OUTSIDE SCOPE OF WORK:

- **Alarm Response:** Service Provider will be available to respond to alarm conditions as notified by the owner or automatic dialer (if installed). A typical response time is three to six hours and within 24 hours. Some alarms may need to be responded to immediately.
- **Repairs:** Parts/material costs will be as needed for each repair. Estimates for repairs can be provided before work starts if you prefer, although some potential alarm conditions may not permit delay.
- **Tank pumping and other services:** Services not covered in this Contract will be billed by outside vendors directly to the Client. In the event Service Provider pays vendor for said services, the Client will be billed for the service cost plus 10%.
- **Repeat sampling:** Any additional required sampling shall be billed separately.
- **Operating Permit Fees:** Ongoing permit fees from the LGU are to be paid and submitted by the client.

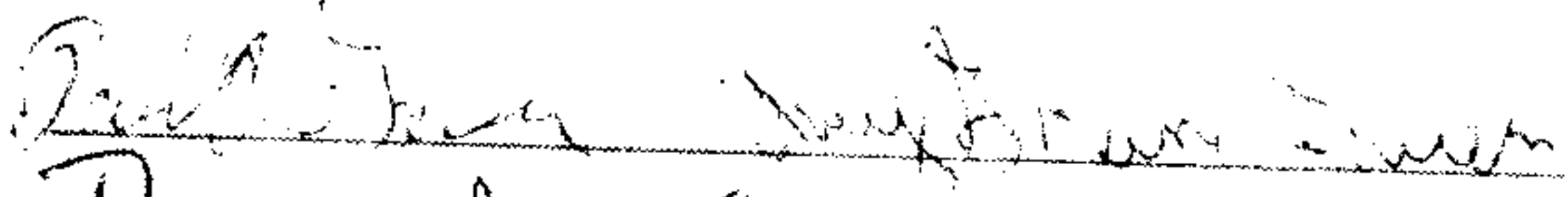
SLUG LOADS AND ACCIDENTAL SPILLS

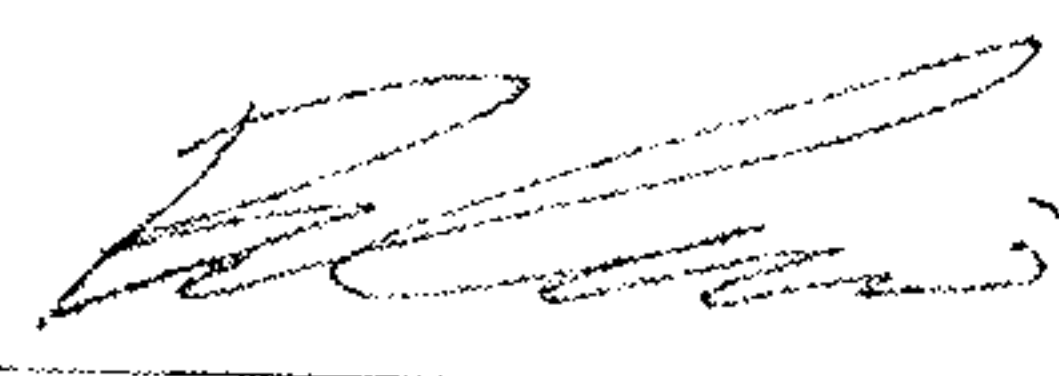
Service Provider is not responsible for any illicit discharges into the wastewater system that may harm the treatment efficiency such as: accidental release of cleansers/oils, pharmaceuticals, feminine products, rags/paper towels, condoms, grease or food products, volume of water or high strength waste beyond system design, or other chemical discharges. Trucking or hauling the waste may be required in those circumstances at the cost of the Client.

The Service Provider agrees to provide inspection, monitoring, and routine maintenance service only under this Contract. The Client remedies for breach of this Contract shall be limited to refund of any amounts paid in advance for service. The Client or operator may terminate this agreement, without cause, upon 30 days written notice.

Client:

Service Provider:

Sign: 
Signed by: PAUL AND AMY GAUER
Date: 7/7/22

Sign: 
Signed by: Brian Koski, Owner, Septic Check
Date: 6/23/2022

Aitkin County Environmental Services
Wastewater Treatment and Dispersal Permit

Permit Number: _____ Date: _____

Facility Information

Permittee name: Paul & Amy Gauer Phone number: _____
 Mailing address: 1028 241st Ave NE
 City: East Bethel State: MN Zip code: 55005
 Property ID number (GPS location): 29-1-492800 51694 Long Point Place McGregor, MN 55760

_____ authorizes the Permittee to operate a wastewater treatment and dispersal system at the address named above in accordance with the requirements of this operating permit. The attached Management Plan is hereby incorporated as part of the requirements of this operating permit.

Issuance date: _____ Expiration date: _____
 System type: Type IV Treatment level: A
 System design flow: 450 GPD Residential/Commercial: Residential

System Components:

(2250 Triple compartment tank) 757 GAL septic compartment to 757 GAL septic compartment equipped with an Ecopod E50 pretreatment unit, Salcor UV light to the last 757 GAL compartment serving as the time dose pump tank dosing a 10' x 38' rockbed mound with a 1' lift.

Monitoring Requirements

Parameter	Effluent limits	Frequency	Location
Peak flow (gpd)	450 GPD	Semi-Annual (2 x yr)	Control Panel
Average flow (gpd)			
CBOD ₅ (mg/L)	15 mg/l	As Needed	Bed dose tank
TSS (mg/L)	15 mg/l	As Needed	Bed dose tank
Fecal (cfu/ml)	1000 cfu/100ml	Annual (1 x yr)	Bed dose tank
Ponding/Surfacing in soil treatment	none	Annual (1 x yr)	Drainfield

Maintenance Requirements

Maintenance requirements shall be performed as specified in the Management Plan as prepared by the system's Advanced Designer.

System component	Maintenance	Frequency
Septic tank/Trash tank	Check annually, pump as needed	Annual (1 x yr)
Pump tank and controls	Check annually, pump/replace as needed	Annual (1 x yr)
Soil treatment and dispersal	Clean/jet laterals	As needed – 1 st cleaning not expected for 3-5 years, maybe longer
Ponding/Surfacing in soil treatment	Check yearly, repair as needed.	Annual (1 x yr)
Pretreatment	Check Semi-Annual	Semi-Annual (2 x yr)

Monitoring Protocol

Any sampling and laboratory testing procedures shall be performed in accordance with the proprietary treatment product's protocol, Standard Methods, and at a Minnesota Department of Health approved laboratory. Results shall be submitted to the permitting authorities at: Aitkin County.

Parameter	Effluent limits	High risk / Resample	Bad Sample
Peak flow (gpd)	450	>315	>450
Average flow (gpd)	<315	>315	>450
Fecal	1000 or less	<1500	>1500

Contingency Plan

In the event the wastewater treatment system does not meet required performance requirements as contained in this operating permit, the owner shall notify the local unit of government within 30 days of non-compliance. The owner is responsible to obtain the services of a Minnesota Pollution Control Agency (MPCA)-licensed Service Provider or other qualified practitioner to complete the required corrective measures. If a sample value is exceeded but the sample value is less than the resample column above, a new sample should be collected within 30 days.

After three resamples in the high-risk category, monitoring will be increased too monthly. After 3 bad samples or a combination of 6 total samples over the permit limits, a corrective action plan following the mitigation plan in the design will be enforced.

Authorization

This permit is effective on the issuance date identified above. This permit and the authorization to treat and disperse wastewater shall expire one year from date of issue.

This system will be Compliant as long as the conditions of the Operating Permit are met. This permit will need to be renewed 30 days before expiration date.

Any additional tanks or equipment that need to be added to meet standards required by this permit due to expansion, failure of equipment, or increased flow shall not require additional permits provided that this system is current with the standards outlined in this operating permit.

The Permittee is not authorized to discharge after the above date of expiration.

The Permittee shall submit monitoring information and forms as required by Aitkin County Environmental Services yearly no later than sixty (60) days after service date. This permit is not transferable.

The owner is required to obtain the services of a Minnesota Pollution Control Agency (MPCA) licensed 1) Service Provider to provide ongoing system operation, maintenance, and monitoring and 2) Maintainer to pump the system's sewage tanks and components. The owner is responsible to provide the name of the Service Provider business prior to the issuance of this operating permit. The owner has secured the services of Septic Check as the Service Provider for this system (signed Service Provider contract attached).

I hereby certify with my signature as the Permittee that I understand the provisions of the wastewater treatment and dispersal system operating permit including maintenance and monitoring requirements. I agree to indemnify and hold either Aitkin County Environmental Services harmless from all loss, damages, costs and charges that may be incurred by the use of this system. If I fail to comply with the provisions of this operation permit, I understand that penalties may be issued. If I sell this property during the life of the permit, I will inform the new owner(s) of the permit requirements and the need to renew the operating permit.

The Operating Permit is hereby granted to: Paul & Amy Gauer

Permittee (please print): PAUL AND AMY GAUER

Permitting Authority (please print):

Title: OWNERS Date: 7/7/22

Title: Date:

Signature: [Handwritten Signature]

Signature:

Instructions for Completing an Operating Permit

The following instructions provide an explanation for local units of government to complete the operating permit template. This is intended to provide guidance to local units of governments (LGU) in developing operating permits for Type IV and Type V systems, including both residential and commercial systems. The template could be modified for holding tanks. Since the Management Plan is considered part of the operating permit, it needs to be attached to the operating permit. A signed contract, between the owner and Service Provider, should be attached to the operating permit to help ensure the owner has made the necessary arrangements to have the system maintained and monitored.

LGU Name, Department and Address – fill in the name, department and address of local unit of government at the top of the operating permit.

Wastewater Treatment and Dispersal Operating Permit No. – assign an operating permit number to be able to track the system over the years.

Permittee Name, Telephone Number, and Address – fill in the name, address and phone number of the owner.

Property Id. Number (GPS Location) – these are simply identifiers used by local units of government in the event the property address changes over time.

Name of Local Unit of Government – fill in the name of the local unit of government. This authorizes the Permittee to operate the wastewater treatment system at the address named above, according to the operating permit, attached Management Plan and contract with the Service Provider.

Issuance Date – fill in the date the operating permit is issued. The operating permit should not be issued until all required information is submitted.

Expiration Date – fill in the date when this operating permit expires. The first time an operating permit is issued to an owner, it should be issued for one (1) year. This helps ensure the owner actually does the required maintenance and monitoring during the first year. If the owner complies, the operating permit can then be issued for a longer period of time as determined by the local unit of government (typically 3 to 5 years). However, if the owner does not comply the first year, the second operating permit could, again, be issued for a period of one (1) year.

System Type – fill in as Type IV or Type V system. Holding tanks also require operating permits (Type II system).

Treatment Level – specify Treatment Level A, B, C, TN or TP. Treatment Level A = Carbonaceous Biochemical Oxygen Demand, five day (CBOD₅) 15 milligrams per liter (mg/L), Total Suspended Solids (TSS) 15 mg/L, Fecal Coliform Bacteria 1000 per 100 milliliter (mL); Treatment Level B = CBOD₅ 25 mg/L, TSS 30 mg/L, Fecal Coliform Bacteria 10,000 per 100 mL; Treatment Level C = CBOD₅ 125 mg/L, TSS 80 mg/L, Oil and Grease 20 mg/L; TN = 20 mg/L, or TP = 2 mg/L.

System Design Flow – fill in the design flow specified on the construction permit for the system, along with the projected average daily flow for the system. Average daily flow is generally 60 to 70 percent of design flow.

Residential/Commercial – specify if the system is residential or commercial. You may specify additional information, such as classification of dwelling, number of bedrooms; or type of commercial establishment.

System Components – provide a brief description of the system components. An example would be the following: 600 gallon trash tank, 600 gallon ECOPOD treatment device, 1 Salcor Ultra Violet (UV) light disinfection unit, 500-gallon pump tank, pump, floats and controls, and 250-foot shallow trenches using pressure distribution.

Monitoring Requirements (Table)

The monitoring requirements specified in an operating permit are unique to the site and soil conditions of the property (its environmental sensitivity) and system complexity. The monitoring requirements include specific parameters to be monitored, target limits and the frequency and location of monitoring. The monitored parameters, at a minimum, would include: 1) wastewater flow - the most basic parameter to know in understanding system performance, 2) ponding in the soil treatment system and 3) surfacing of the soil treatment system. Monitoring for CBOD₅, TSS, fecal coliform bacteria and nitrogen are unique to the site, its receiving environment and complexity of the wastewater system. Field tests for temperature, pH and dissolved oxygen can be performed by the Service Provider to serve as general indicators of system performance.

1. **Flow** – flow to each system needs to be determined as specified in the Management Plan or as determined by the local unit of government. Flow can be determined several ways, using water meters, event counters, and running time clocks. Telemetry can also be used and has the advantage that flow can be determined continually.

The determination for the frequency of flow measurement is done on a case-by-case basis. At first, daily flow monitoring may be needed to determine average flow and peak flows to a system. After a period of time, weekly or monthly flow determination may be acceptable. Flow determinations once a year generally provide limited information.

2. **CBOD₅** – monitoring for CBOD₅ is not typically required for the majority of wastewater systems used for single-family homes generating typical domestic strength effluent. However, monitoring for CBOD₅ may be needed periodically. For example, there may be a need to audit systems as part of the product registration process in Minnesota or if the Service Provider is trying to troubleshoot a system. For commercial systems, monitoring for CBOD₅ is generally necessary to determine CBOD₅ removal efficiencies of proprietary treatment devices and/or organic loading rates to the soil's infiltrative surface.
3. **TSS** – monitoring for TSS is not typically required for most residential wastewater systems that generate typical domestic strength effluent. However, turbidity measurements may be taken in the field by Service Providers. Monitoring for TSS may be needed periodically as part of an audit process for the registration of proprietary treatment products in Minnesota. For commercial systems, monitoring for TSS may be necessary.
4. **Fecal Coliform Bacteria** – monitoring for fecal coliform bacteria should generally be required for systems listed as Treatment Level A and Treatment Level B systems where reduced vertical soil separation is used.
5. **Total Nitrogen and Total Phosphorus** – monitoring for Total Nitrogen (TN) may be needed in areas identified as nitrogen sensitive environments. Monitoring for Total Phosphorus (TP) may be required in phosphorus sensitive lake environments.
6. **Field Tests** – these are tests performed by the Service Provider to help 'monitor' system performance and identify problems (troubleshooting a system). Although field tests are not a strict monitoring requirement, they are appropriate to list in the operating permit if specified in the Management Plan or in the product's Operation and Maintenance Manual. The local unit of government will determine if the permittee is required to report field test results as part of the operating permit.
7. **Ponding/Surfacing in Soil Treatment** – all systems should be monitored periodically as specified in the Management Plan to determine extent and frequency of ponding in soil treatment systems. A check for surfacing is needed.

Maintenance Requirements (Table)

This table lists some of the basic maintenance requirements for each major component of the wastewater system. Since you can't possibly list all the maintenance requirements in this table, it is best to reference the Management Plan. You could reference the proprietary product's Operation and Maintenance Manual.

1. **System Component** – list each system component, including the septic tank, trash tank, effluent screen, pump tank and controls, proprietary treatment product, disinfection device, and soil treatment and dispersal system.
2. **Maintenance** – briefly identify the maintenance requirements of each major system component. For additional information, you could also reference the proprietary product documents listed on the MPCA Web site at <http://www.pca.state.mn.us/programs/ists/productregistration.html>.
3. **Frequency** – briefly identify the frequency of maintenance as per the systems Management Plan and Operation and Maintenance Manual.

Monitoring Protocol – this section of the operating permit states that testing needs to be performed in accordance with approved methods and the results submitted to the local unit of government.

Contingency Plan – briefly describes requirements if the system does not function as intended. The owner must notify the local unit of government when non-compliance occurs. The Management Plan may identify some of the corrective actions required or you will need to consult your Service Provider. The owner is responsible to obtain the services of a MPCA-licensed Service Provider or other qualified practitioner to complete the required corrective measures. More detail could be added here by the local unit of government.

Authorization – fill in the length of time of the operating permit; this is typically one to five years. Fill in the name of the local unit of government in the second blank space. Next, fill in the name of the MPCA licensed Service Provider identified by the owner in contract; this is needed to help ensure the owner has made the necessary arrangements to have the system maintained and monitored.

The Operating Permits Hereby Granted to – print the name of the owner who signed the operating permit.

Signature of Permittee (and date of signature) – the owner signs and dates the operating permit.

By Order of – signature of the permitting authority, title, and date.



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	Paul & Amy Gauer	Email
Property Address	51694 Long Point Place McGregor	Property ID 29-1-492800
System Designer	Septic Check	Contact Info 320-983-2447
System Installer	Septic Check	Contact Info 320-983-2447
Service Provider/Maintainer	Septic Check	Contact Info 320-983-2447
Permitting Authority	Aitkin County	Contact Info 218-927-7342
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:

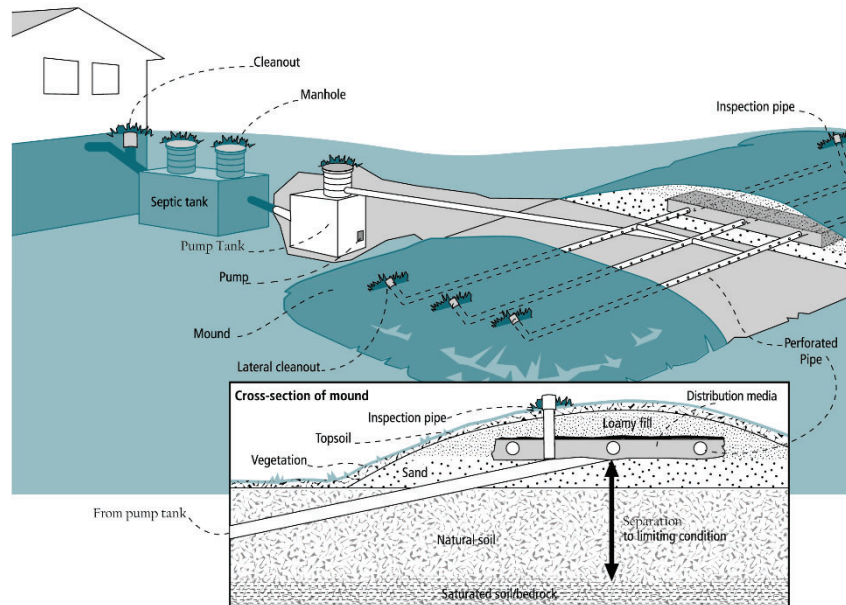
- Attach permit information, designer drawings and as-built of your system, if they are available.
- Keep copies of all pumping records and other maintenance and repair invoices with this document.
- Review this document with your maintenance professional at each visit; discuss any changes in product 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	
<p>System Type: <input type="radio"/> I <input type="radio"/> II <input type="radio"/> III <input checked="" type="radio"/> IV* <input type="radio"/> V*</p> <p><i>(Based on MN Rules Chapter 7080.2200 – 2400)</i></p> <p>*Additional Management Plan required</p>	<p><input checked="" type="checkbox"/> System is subject to operating permit*</p> <p><input checked="" type="checkbox"/> System uses UV disinfection unit*</p> <p>Type of advanced treatment unit <u>EcoPod E50</u></p>
Dwelling Type	Well Construction
<p>Number of bedrooms: <u>3</u></p> <p>System capacity/ design flow (gpd): <u>450</u></p> <p>Anticipated average daily flow (gpd): <u><450</u></p> <p>Comments _____</p> <p>Business? : <input type="radio"/> Y <input checked="" type="radio"/> N What type? _____</p>	<p>Well depth (ft): <u>+50'</u></p> <p><input checked="" type="checkbox"/> Cased well Casing depth: <u>+50'</u></p> <p><input type="checkbox"/> Other (specify): _____</p> <p>Distance from septic (ft): <u>>50'</u></p> <p>Is the well on the design drawing? <input checked="" type="radio"/> Y <input type="radio"/> N</p>
Septic Tank	
<p><input type="checkbox"/> First tank Tank volume: <u>757</u> gallons</p> <p>Does tank have two compartments? <input checked="" type="radio"/> Y <input type="radio"/> N</p> <p><input type="checkbox"/> Second tank Tank volume: <u>757</u> gallons</p> <p><input type="checkbox"/> Tank is constructed of <u>Concrete</u></p> <p><input type="checkbox"/> Effluent screen: <input type="radio"/> Y <input checked="" type="radio"/> N Alarm <input checked="" type="radio"/> Y <input type="radio"/> N</p>	<p><input type="checkbox"/> Pump Tank <u>757</u> gallons</p> <p><input type="checkbox"/> Effluent Pump make/model: <u>Goulds PE 31</u></p> <p>Pump capacity <u>29.0</u> GPM</p> <p>TDH <u>13.4</u> Feet of head</p> <p><input type="checkbox"/> Alarm location <u>Outdoor Powerpost</u></p>
Soil Treatment Area (STA)	
<p>Mound/At-Grade area (width x length): <u>32.6</u> ft x <u>60.6</u> ft</p> <p>Rock bed size (width x length): <u>10</u> ft x <u>38</u> ft</p> <p>Location of additional STA: _____</p> <p>Type of distribution media: <u>1 1/2" Washed Rock</u></p>	<p><input checked="" type="checkbox"/> Inspection ports <input checked="" type="checkbox"/> Cleanouts</p> <p><input type="checkbox"/> Surface water diversions</p> <p><input type="checkbox"/> Additional STA not available</p>



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 6 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 through 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	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area. 	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Drip may result in frozen pipes during cold weather. 	<ul style="list-style-type: none"> • Re-route water directly out of the house. Do not route furnace discharge to your septic system.
Water softener Iron filter Reverse osmosis	<ul style="list-style-type: none"> • Salt in recharge water may affect system performance. • Recharge water may hydraulically overload the system. 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Water from these sources will overload the system and is prohibited from entering septic system. 	<ul style="list-style-type: none"> • 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									
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: If flow exceeds system capacity, check for and repair any leaks into the system, including household plumbing fixtures. If system ponds or otherwise cannot handle flow, repair options include; add time dosing, adding pre-treatment, or expanding the system.

"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: **Brian Koski**

Certification # **7989**

Permitting Authority: **Aitkin County**



This Management Plan identifies some basic requirements for proper operation and maintenance of the ECOPOD wastewater treatment device for residential use. Refer to the manufacturer’s Operation and Maintenance Manual for ECOPOD wastewater treatment products for detailed instructions on proper system operation and maintenance. Refer to your soil treatment system management plan (below or above-grade) for additional management requirements.

The ECOPOD Manual, submitted by the manufacturer (Delta Environmental Products) as part of the registration of this product in Minnesota, can be found at the Minnesota Pollution Control Agency’s website <http://www.pca.state.mn.us/programs/ists/productregistration.html>.

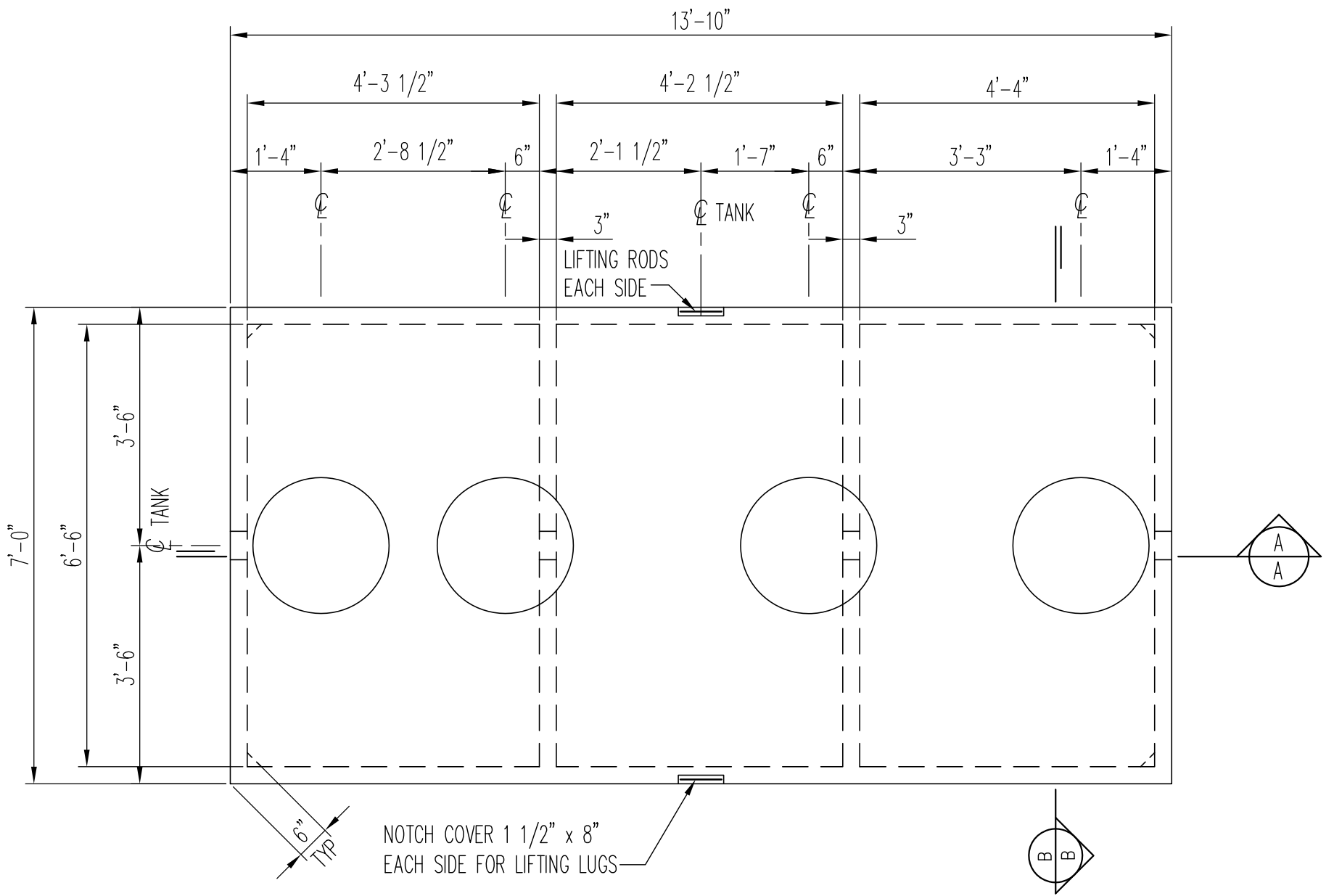
SYSTEM COMPONENT	TASK	FREQUENCY	RESPONSIBLE PARTY
ECOPOD Wastewater Treatment Device	Monitor alarm	On-going	Homeowner
	Keep vents on blower housing clear of obstruction	On-going	Homeowner
	Check and clean air filter on the air pump	Every three months	Homeowner or Service Provider
	Monitor flow	Every six months	Service Provider
	Check mechanical and electrical components	Every six months	Service Provider
	Perform operational field tests on influent/effluent quality including odor, color, turbidity, temperature, dissolved oxygen and pH as appropriate	Every six months	Service Provider
	Sample effluent as required in the local Operating Permit	See Operating Permit*	Service Provider
	Check sludge level in all sewage tanks; follow manufacturers recommendations for solids removal	Every six months	Service Provider & Maintainer
	For seasonal use, follow manufacturers guidelines	As required based on seasonal usage	Service Provider

* Systems designed to meet treatment level A or B with UV disinfection must collect effluent sample for fecal coliform annually at a minimum.

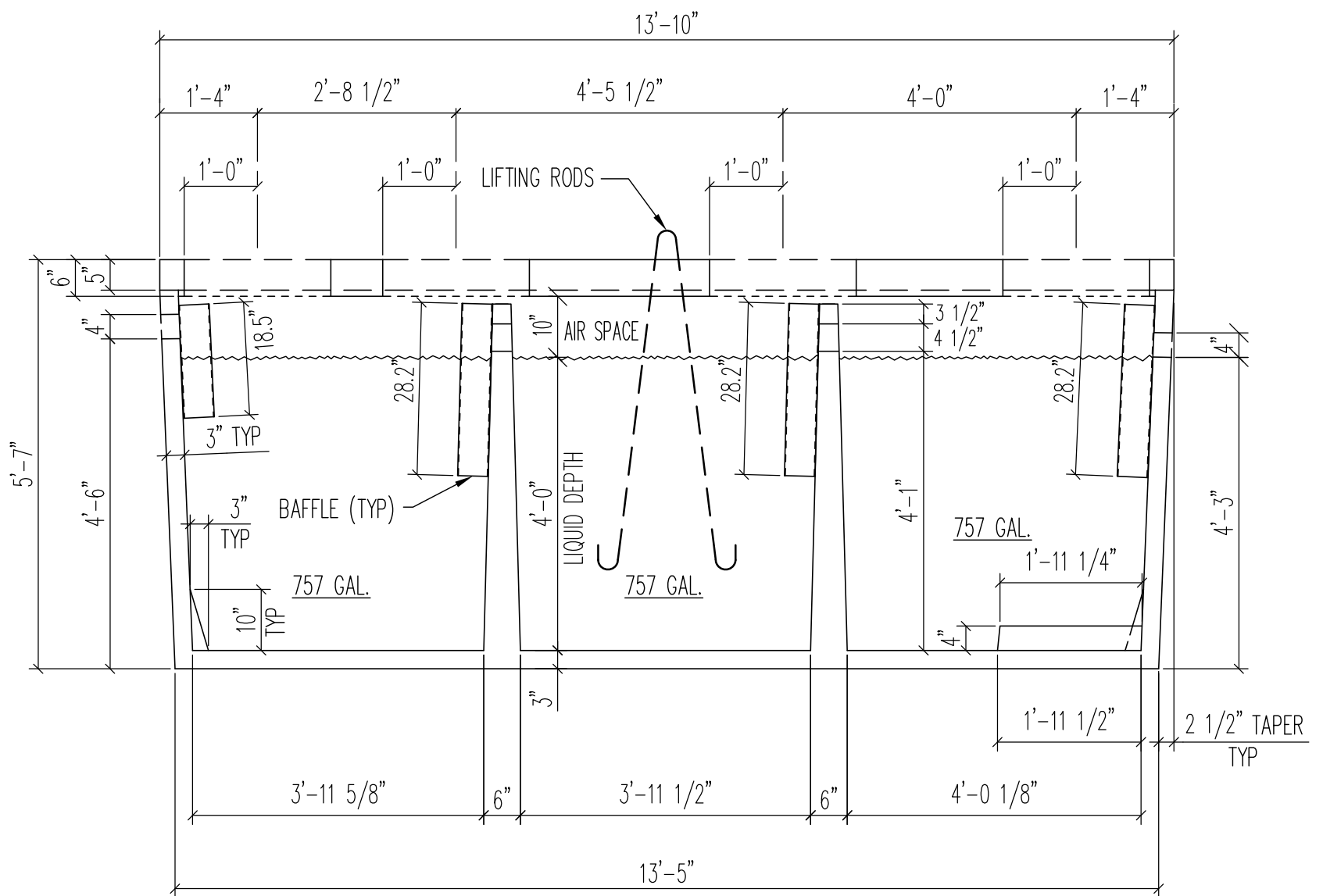
At the time of each service visit, Form 7-2: Aerobic Treatment Unit should be completed. See <http://www.onsiteconsortium.org/omspchecklists.html>

Items not permitted in the ECOPOD wastewater systems are specified in the ECOPOD Manual for Minnesota.

Sampling requirements may be specified in local operating permits. The protocol for collection of wastewater samples is specified in the ECOPOD Manual for Minnesota.



2250 GALLON 3 COMP. TANK
 $1/2" = 1'-0"$



SECTION A-A
 $1/2" = 1'-0"$

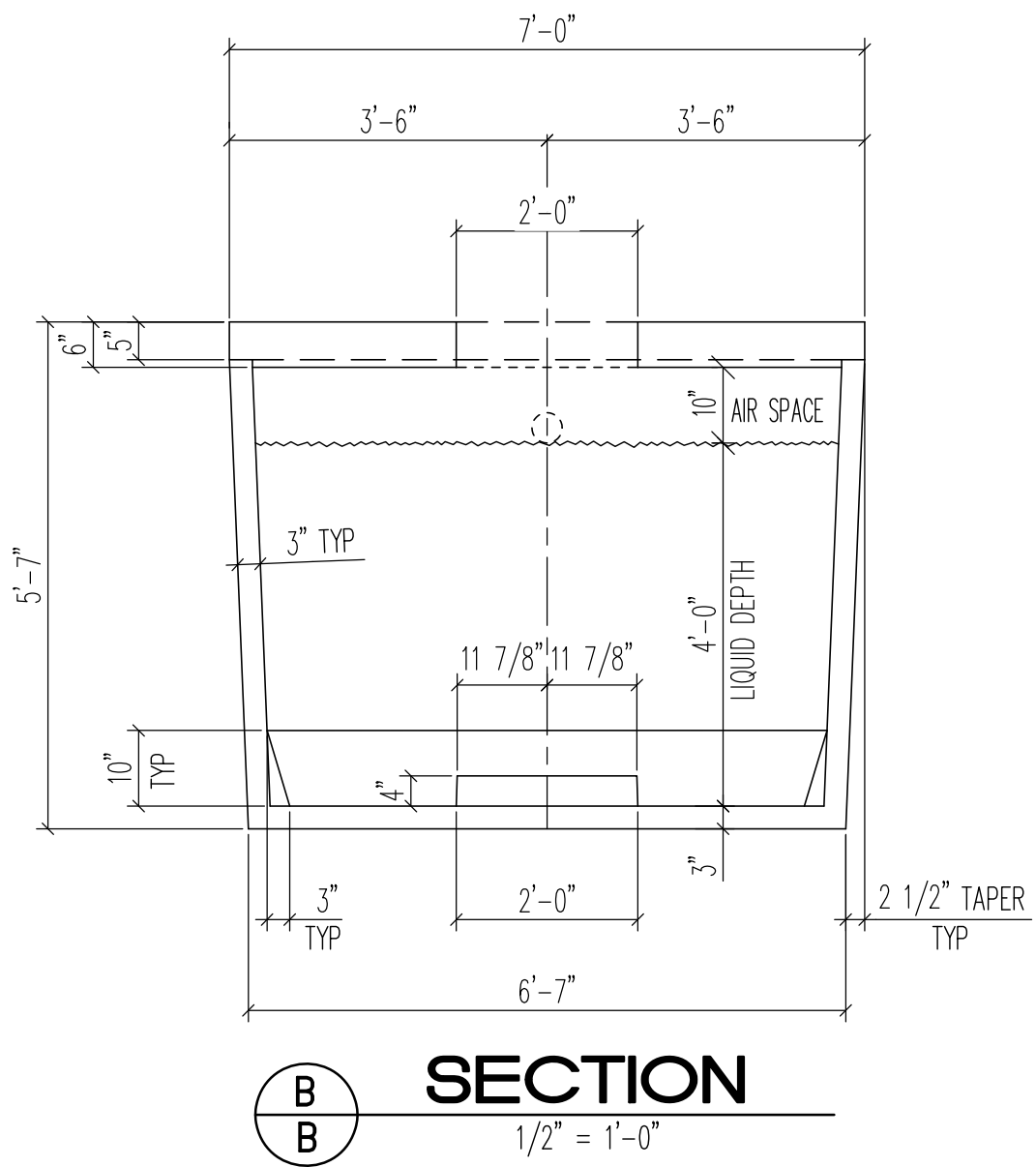
NOTE:

1. PROVIDE MINIMUM 1" CLEAR BETWEEN TOP OF BAFFLE AND UNDERSIDE OF LID.

2250 GALLON 3 COMP.
 SEPTIC TANK
 (2250 3C)

Brown Wilbert

WEIGHT= 21,760#
 MAX. SOIL COVER= 8'-0"
 TOTAL LIQUID VOLUME= 2271 GAL.



NOTE:

1. PROVIDE MINIMUM 1" CLEAR BETWEEN TOP OF BAFFLE AND UNDERSIDE OF LID.

2250 GALLON 3 COMP.
 SEPTIC TANK
 (2250 3C)

Brown *Wilbert*

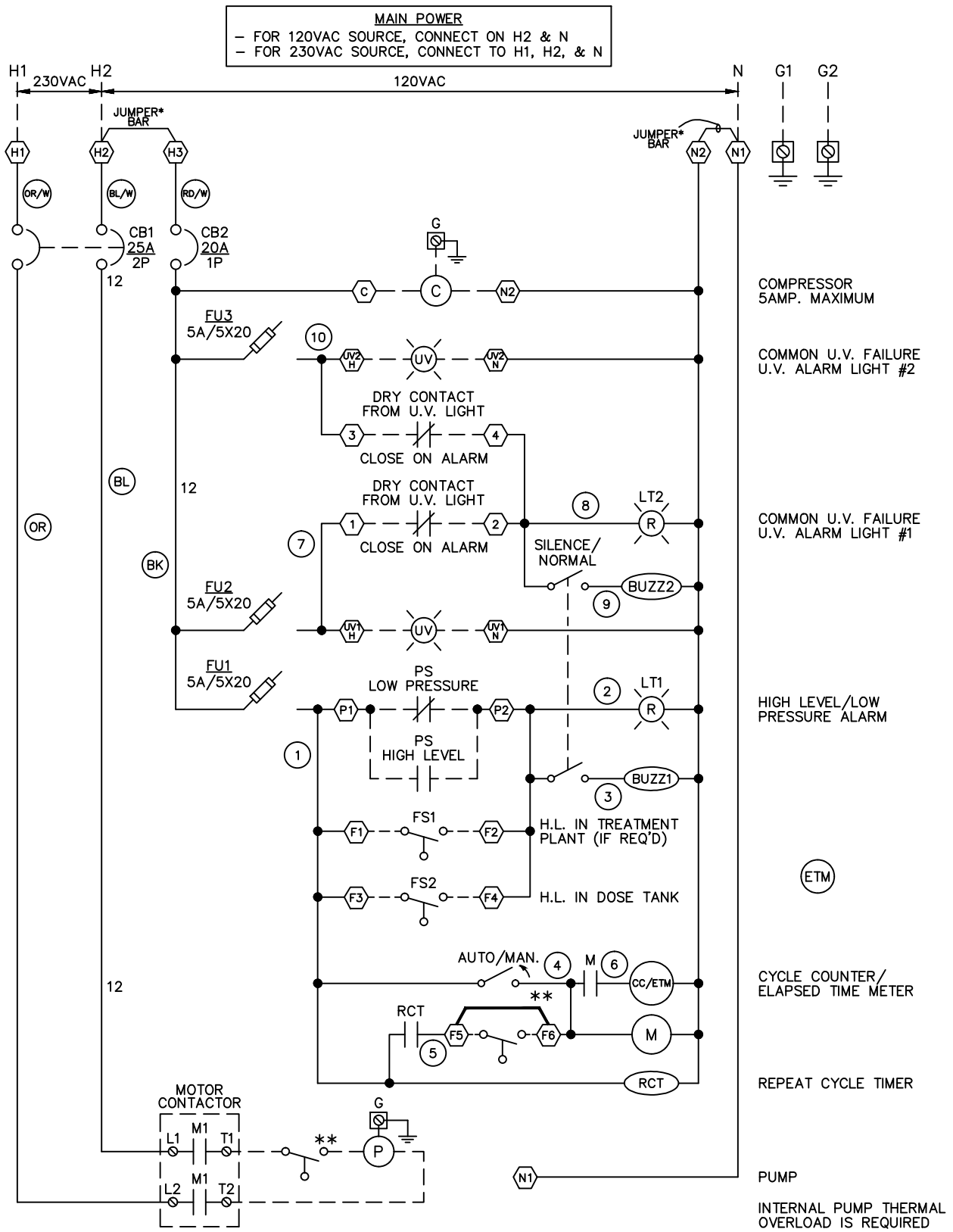
WEIGHT= 21,760#
 MAX. SOIL COVER= 8'-0"
 TOTAL LIQUID VOLUME= 2271 GAL.



CP2210/MN
CONTROL PANEL

Delta Treatment Systems
9125 Comar Drive
Walker, LA 70785
(225) 665-6162 Fax (800) 219-9183

CP2210/MN



FS1-HIGH LEVEL FLOAT SWITCH IN TREATMENT PLANT
 FS2-HIGH LEVEL FLOAT SWITCH IN DOSE TANK

* REMOVE JUMPER BARS FOR SEPERATE SOURCES.
 ** IF PUMP REQUIRES SEPARATE PERMISSIVE FLOAT,
 REMOVE JUMPER AND CONNECT FLOAT TO (F5) & (F6).

PUMP POWER
 - FOR 120VAC, CONNECT PUMP HOT LEAD TO T1 ON MOTOR CONTACTOR, AND NEUTRAL ON N1
 - FOR 230VAC, CONNECT PUMP TO T1 & T2

MAX. RATINGS
 2HP@230V/1Ø
 3/4HP@115V/1Ø
 MAX. 15A

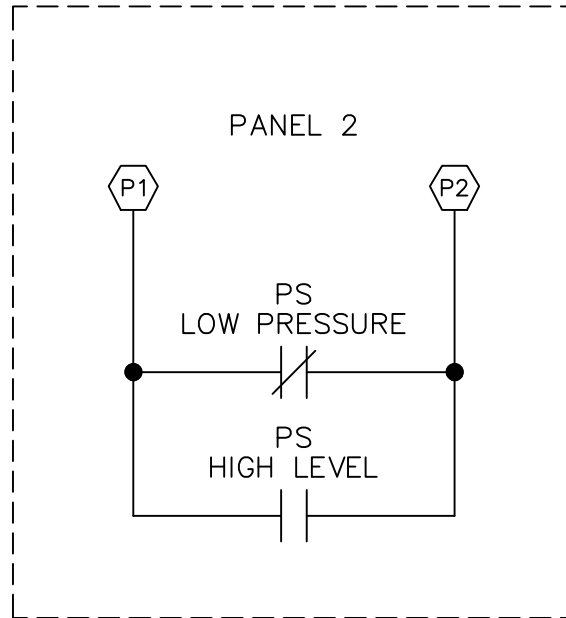
REV.	DATE	REVISION DESCRIPTION	BY
-	-	-	-
-	-	-	-

9125 Comar Drive
 Walker, LA
 70785
 Ph. (225) 665-6162
 Fax (800)219-9183

SCHEMATIC DIAGRAM

COMPANY CONFIDENTIAL: INFORMATION CONTAINED HEREIN IS CONFIDENTIAL, IT IS THE PROPERTY OF PENTAIR PUMP GROUP, IT IS TO BE USED SOLELY FOR THE PURPOSE PROVIDED, AND IT IS NOT TO BE DISCLOSED TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF PENTAIR PUMP GROUP.	PLOT SCALE NTS	DRAWING NUMBER CP2210/MN	DRAWN BY BMF	DATE 04/23/19	SHEET OF 1 4	REV. A
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PRESSURE SWITCH PANEL LOCATED
NEAR COMPRESSOR



REV.	DATE	REVISION DESCRIPTION	BY
-	-	-	-
-	-	-	-



9125 Comar Drive
Walker, LA
70785
Ph. (225) 665-6162
Fax (800)219-9183

SCHEMATIC DIAGRAM

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PLOT SCALE
NTS

DRAWING NUMBER
CP2210/MN

DRAWN BY
BMF

DATE
04/23/19

SHEET OF
2 4

REV.
A

⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘
UV1	UV1	UV2	UV2	C	1	2	3	4	P1	P2	F1	F2	F3	F4	F5	F6	H1	H2	H3	N1	N1	N2
⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘
⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘

120VAC TO U.V. LIGHT 1

120VAC TO U.V. LIGHT 2

COMPRESSOR HOT

DRY CONTACT FROM U.V. LIGHT 1
CLOSE ON ALARM

DRY CONTACT FROM U.V. LIGHT 2
CLOSE ON ALARM

TREATMENT PLANT HIGH LEVEL
FLOAT (IF REQUIRED)

DOSE TANK HIGH LEVEL FLOAT

PUMP PERMISSIVE FLOAT
(IF REQUIRED)

INCOMING 230VAC SOURCE 1 HOT

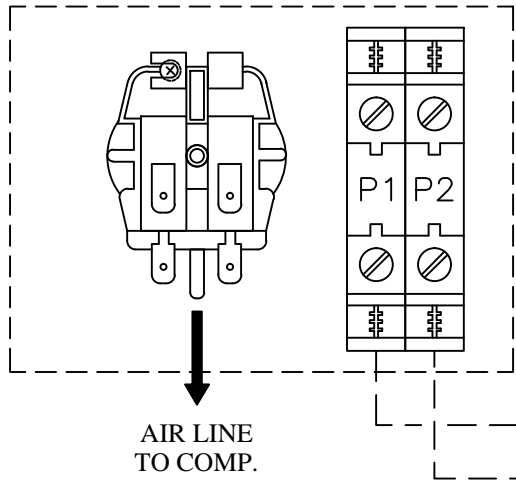
INCOMING 120VAC SOURCE 2 HOT

INCOMING 120VAC NEUTRAL

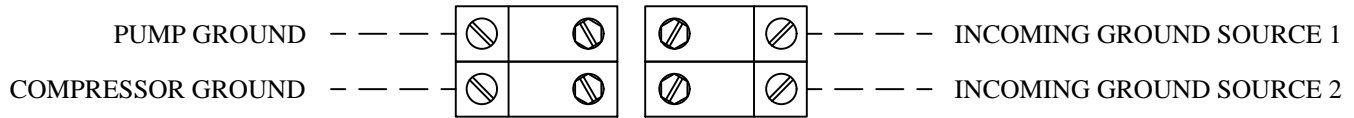
PUMP NEUTRAL

COMPRESSOR NEUTRAL

PRESSURE SWITCH PANEL
LOCATED NEAR COMPRESSOR



SETTING HIGH LEVEL PRESSURE SWITCH
BRING PLANT TO OPERATING WATER LEVEL WITH COMPRESSOR TURNED ON. USING PROPERLY SIZED SCREW DRIVER, TURN HIGH LEVEL ALARM ADJUSTMENT SCREW CLOCKWISE UNTIL ALARM OCCURS, THEN TURN THE SCREW COUNTER-CLOCKWISE UNTIL ALARM STOPS.



REV.	DATE	REVISION DESCRIPTION	BY
-	-	-	-
-	-	-	-



9125 Comar Drive
Walker, LA
70785
Ph. (225) 665-6162
Fax (800)219-9183

EXTERNAL CONNECTIONS

HOW TO SET THE REPEAT CYCLE TIMER

EXAMPLES OF SETTINGS

	Selector			Dial		Time On	Time Off
	3	4 (On)	7 (Off)	Orange (On)	Green (Off)		
*	1.2	10m	10h	.7	.2	7min	2hours
	1.2	10m	10h	1.2	1.2	12min	12hours
	3.0	10m	hrs	2.0	2.0	20min	2hours
	3.0	10m	hrs	3.0	3.0	30min	3hours

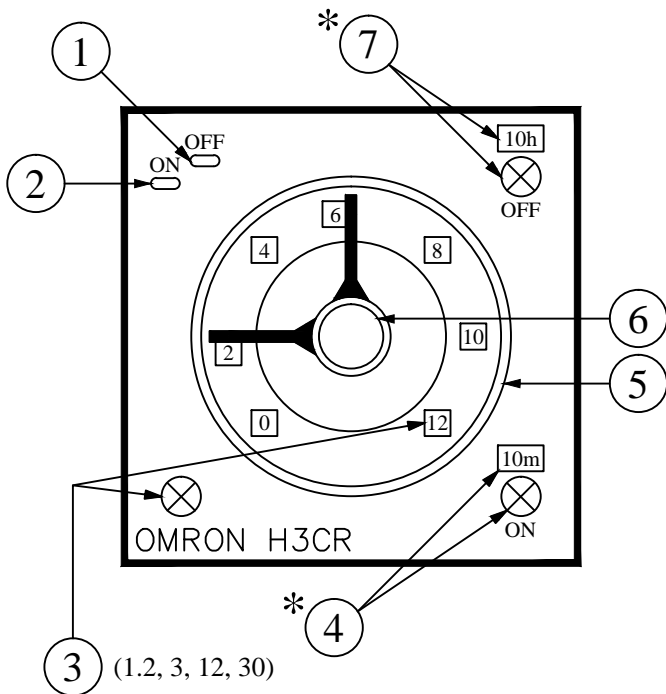
* = Factory Settings

Time On = 4(On) Setting x Orange Setting
 Time Off = 7(Off) Setting x Green Setting

Factory Setting:

Time On = 10m x 0.7 = 7 Minutes

Time Off = 10h x 0.2 = 2 Hours



* H3CR-F8N
 (10s, 10m, hrs, 10h)

- ① OFF Indicator (Green)
- ② ON Indicator (Orange)
- ③ Range Time Selector
- ④ ON Time Unit Selector
- ⑤ Setting dial for OFF (Green pointer)
- ⑥ Setting dial for ON (Orange pointer)
- ⑦ OFF Time Unit Selector

Note: If pointer is turned counterclockwise until overranged, instantaneous output will be set.

REV.	DATE	REVISION DESCRIPTION	BY
-	-	-	-
-	-	-	-




9125 Comar Drive
 Walker, LA
 70785
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REPEAT CYCLE TIMER INSTRUCTIONS

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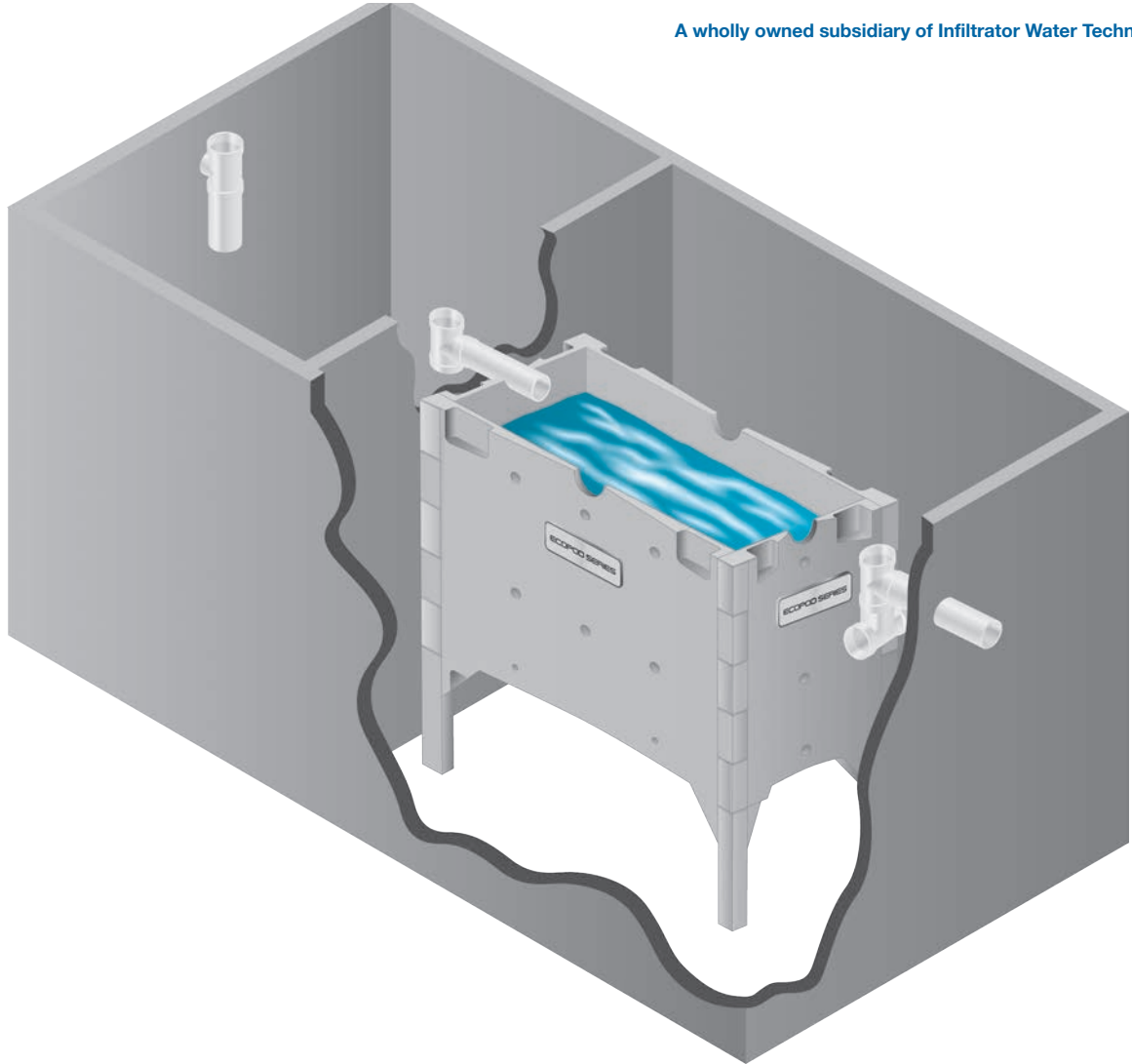
BILL OF MATERIALS

ITEM	QTY.	MANUFACTURER	PART NUMBER	DESCRIPTION
1	1	STAHLIN	RJ1412HPL	ENCLOSURE 1
2	1	STAHLIN	BP1412AL	BACKPLATE
3	1	SQUARE D	QOU225	CB1
4	1	SQUARE D	QOU120	CB2
5	3	PHOENIX CONTACT	UT4-HESI	FUSE HOLDER
6	3	BUSSMANN	BK/GMA-SA	FU1,2
7	2	ARK-LES	-	BUZZER1,2
8	2	ABB	CL100R W/BULBS	RED PILOT LIGHT
9	1	EZ SWITCH	18159-5	SILENCE SWITCH
10	1	OMRON	H3CR-F8N-100-240AC	REPEAT CYCLE TIMER
11	1	EZ SWITCH	01-796520-5D	AUTO-MANUAL SWITCH
12	1	ABB	AF16-30-10-13	CONTACTOR
13	1	CANTEX	5133705	ENCLOSURE 2
14	1	HERGA	-	DUAL PRESSURE SWITCH
15	17	PHOENIX	UT4	TERMINALS
16	6	PHOENIX	UT6	TERMINALS
17	1	EATON	CEC-48DR-406	COMBO COUNTER/ETM
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

					9125 Comar Drive Walker, LA 70785 Ph. (225) 665-6162 Fax (800)219-9183	<h3>BILL OF MATERIALS</h3>
REV.	DATE	REVISION	DESCRIPTION	BY		
-	-	-	-	-		
-	-	-	-	-		
COMPANY CONFIDENTIAL: INFORMATION CONTAINED HEREIN IS CONFIDENTIAL. IT IS THE PROPERTY OF PENTAIR PUMP GROUP, IT IS TO BE USED SOLELY FOR THE PURPOSE PROVIDED, AND IT IS NOT TO BE DISCLOSED TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF PENTAIR PUMP GROUP.				PLOT SCALE NTS	DRAWING NUMBER CP2210/MN	DRAWN BY BMF
				DATE 04/23/19	SHEET OF A	REV. A



A wholly owned subsidiary of Infiltrator Water Technologies, LLC



DELTA TREATMENT SYSTEMS

ECOPOD-N[®]

NSF/ANSI 40 AND 245

RESIDENTIAL WASTEWATER

TREATMENT SYSTEM



DELTA TREATMENT SYSTEMS

NSF/ANSI 40 AND 245

Residential Wastewater Treatment System

ECOPOD-N® Advanced Wastewater Treatment

ECOPOD-N is the clear choice for an on-site wastewater disposal system where nitrogen reduction is required. It was tested under Standard 40 and 245 of NSF/ANSI with an average nitrogen reduction of greater than 50% and met and exceeded Class 1 requirements with an average effluent quality of 9 mg/L BOD5 and 8 mg/L TSS.

ECOPOD-N directly contributes to a cleaner, safer environment using the bacteria nature provides. As a result of air being pumped into the system, the bacteria thrive and grow in much greater numbers than would occur naturally. This "overpopulation" of bacteria speeds the process of breaking down the sewage, making it safe for release into the environment.

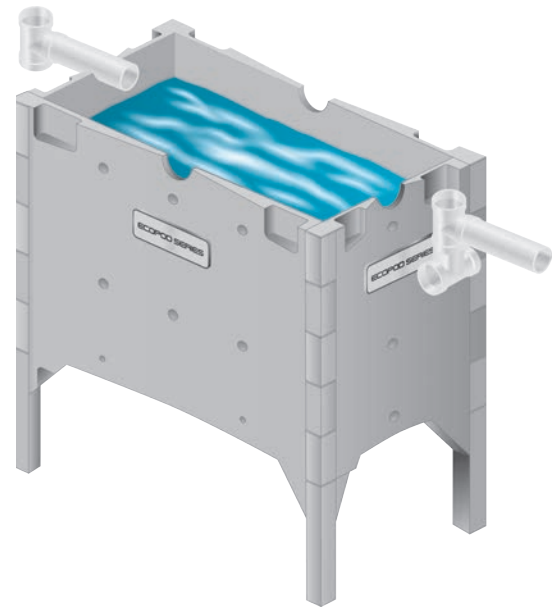
ECOPOD-N significantly reduces BOD, TSS, fecal coliforms, and nutrients in the wastewater. Nitrification and denitrification occur in a single tank.

ECOPOD-N series uses a fixed film process which is characteristically stable, reliable and sturdy. Fixed film is a preferred treatment process for on-site wastewater treatment systems.

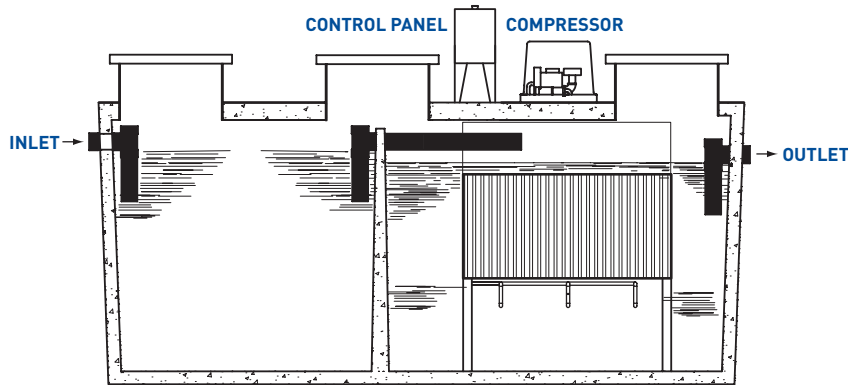
ECOPOD-N Available Offering

ECOPOD-N Units are manufactured to specifications according to wastewater flow requirements. Units are available in the following sizes:

- Model E50-N treating 500 gallons per day
- Model E60-N treating 600 gallons per day
- Model E75-N treating 750 gallons per day
- Model E100-N treating 1,000 gallons per day
- Model E150-N treating 1,500 gallons per day



Certified to NSF/ANSI 245 for Nitrogen Reduction



Why Use ECOPOD-N® Advanced Wastewater Treatment?

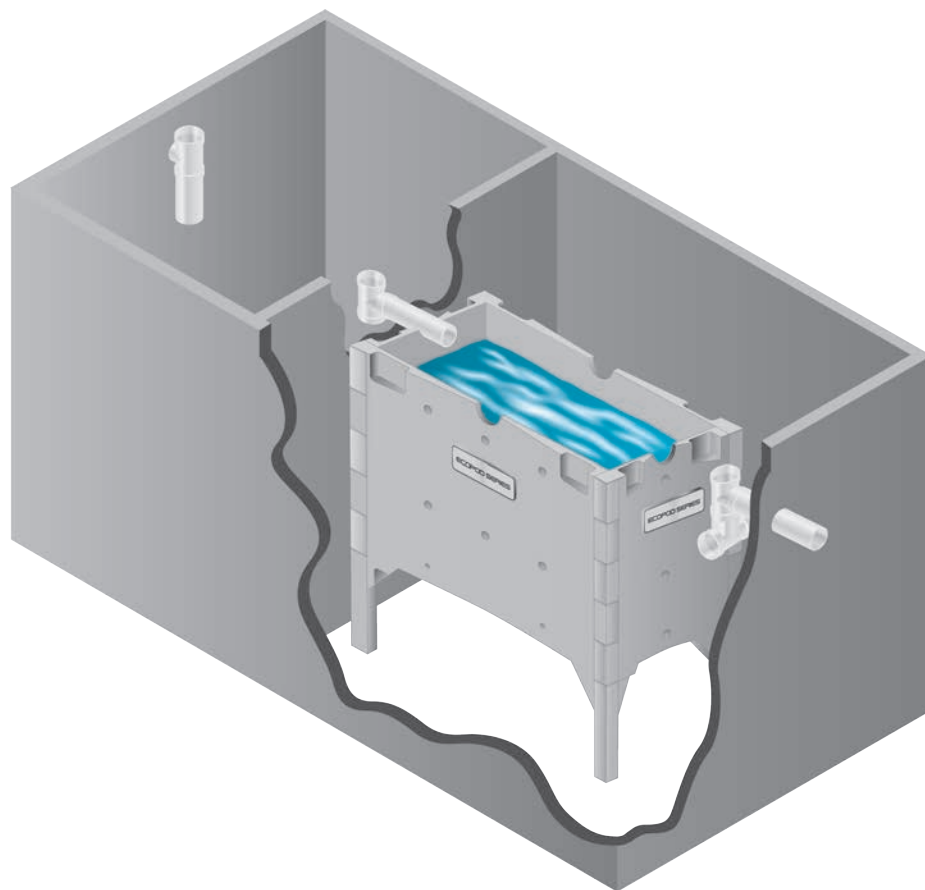
- Built with technology which meets NSF/ANSI 40 and 245 – Class 1
- Completely submerged reactor disposes of wastewater quietly, efficiently, and with no odor
- Typical effluent quality of 9 mg/L BOD5 and 8 mg/L TSS
- No inner tank filters, screens or diffusers to service
- Patented non-clogging air delivery system
- Remote mount air compressor
- Low initial capital cost and operation
- Complete on-site system designs
- ECOPOD-N treatment systems are pre-engineered, requiring no special expertise to design, specify, or install
- True attached growth system – no mixed liquor
- Integral clarifier – no external clarifier required

Manufactured According to Need

Choices of fabrication are offered, consistent with your preference or regulatory requirements:

- Fiberglass Construction
- Concrete Construction*
- Polypropylene Construction
- Round or Rectangular

*Based on regional availability



Design Components Material Specifications

Shown is the ECOPOD-N MODEL E50-N

Treatment Capacity	500 GPD
Electrical Requirement	115/1/60
Aerator Compressor	EN50

Other Delta Treatment Systems Products

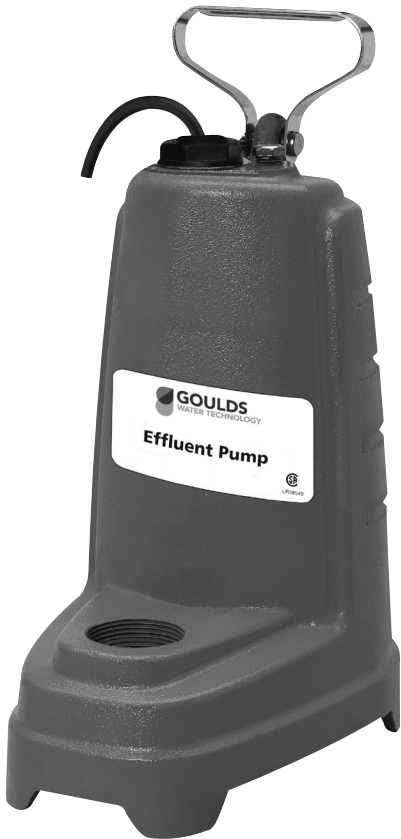
A respected leader in wastewater treatment with decades of technical design and manufacturing experience, Delta Treatment Systems is committed to the continuing development of new products in the 21st century.



Distributor Network

ECOPOD® Series Advanced Wastewater Treatment Systems and accessories are sold, installed and serviced by certified distributors who are fully trained to provide all necessary components and to ensure professional installation.





FEATURES

- Corrosion resistant construction
- Cast iron body
- Thermoplastic impeller and cover.
- Upper sleeve and lower heavy duty ball bearing construction.
- Motor is permanently lubricated for extended service life.
- Powered for continuous operation.
- All ratings are within the working limits of the motor.
- Quick disconnect power cord, 20' standard length, heavy duty 16/3 SJTW with 115 or 230 volt grounding plug.
- Complete unit is heavy duty, portable and compact.
- Mechanical seal is carbon, ceramic, BUNA and stainless steel.
- Stainless steel fasteners

PE

SUBMERSIBLE EFFLUENT PUMP



APPLICATIONS

Specially designed for the following uses:

- Mound Systems
- Effluent/Dosing Systems
- Low Pressure Pipe Systems
- Basement Draining
- Heavy Duty Sump/Dewatering

SPECIFICATIONS

Pump - General:

- Discharge: 1½" NPT
- Temperature: 104°F (40°C) maximum, continuous when fully submerged.
- Solids handling: ½" maximum sphere.
- Automatic models include a float switch.
- Manual models available.
- Pumping range: see performance chart or curve.

PE31 Pump:

- Maximum capacity: 53 GPM
- Maximum head: 25' TDH

PE41 Pump:

- Maximum capacity: 61 GPM
- Maximum head: 29' TDH

PE51 Pump:

- Maximum capacity: 70 GPM
- Maximum head: 37' TDH

MOTOR

General:

- Single phase
- 60 Hertz
- 115 and 230 volts
- Built-in thermal overload protection with automatic reset.
- Class B insulation
- Oil-filled design
- High strength carbon steel shaft

PE31 Motor:

- .33 HP, 3000 RPM
- 115 volts
- Shaded pole design

PE41 Motor:

- .40 HP, 3400 RPM
- 115 and 230 volts
- PSC design

PE51 Motor:

- .50 HP, 3400 RPM
- 115 and 230 volts
- PSC design

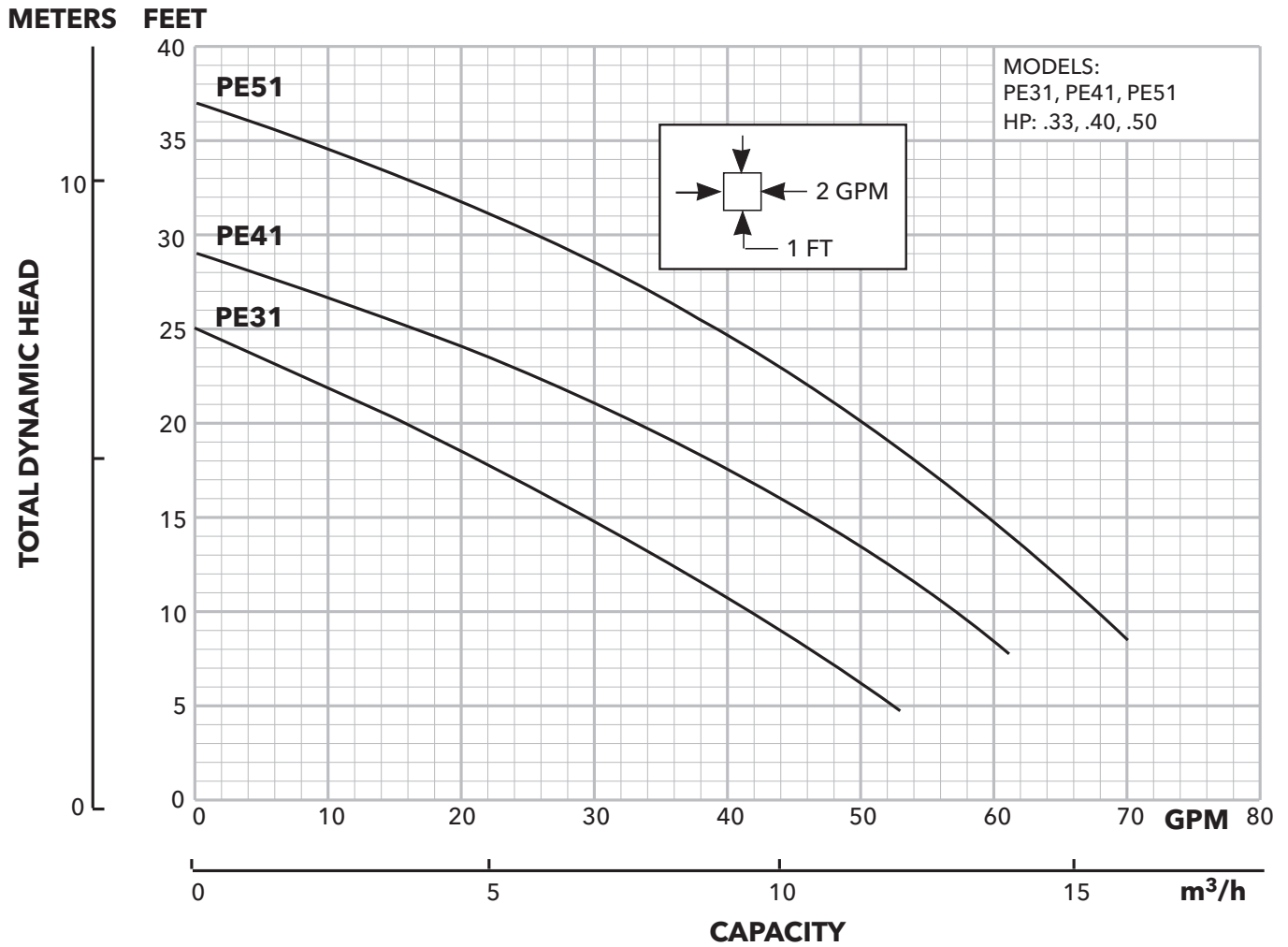
AGENCY LISTINGS



Tested to UL 778 and CSA 22.2 108 Standards
By Canadian Standards Association
File #LR38549

PUMP INFORMATION

Order No.	HP	Volts	Amps	Minimum Circuit Breaker	Phase	Float Switch Style	Cord Length	Discharge Connection	Minimum Basin Diameter	Maximum Solids Size	Shipping Weight lbs/kg
PE31M	0.33	115	12	20	1	Manual / No Switch	20'	1.5"	18"	.5"	31 / 14.1
PE31P1						Piggyback Float Switch					
PE41M	0.4	230	7.5	15		Manual / No Switch					
PE41P1				Piggyback Float Switch							
PE42M	0.4	230	3.7	10		Manual / No Switch					
PE42P1				Piggyback Float Switch							
PE51M	0.5	115	9.5	20		Manual / No Switch					
PE51P1						Piggyback Float Switch					
PE52M		230	4.7	10		Manual / No Switch					
PE52P1						Piggyback Float Switch					



PERFORMANCE RATINGS

PE31

Total Head (feet of water)	GPM
5	52
10	42
15	29
20	16
25	0

PE41

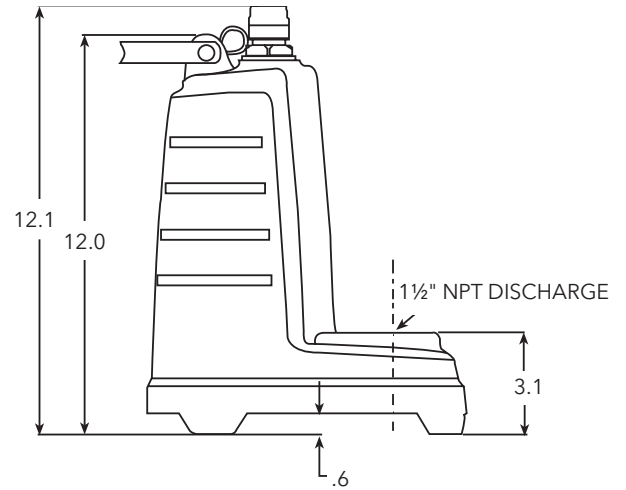
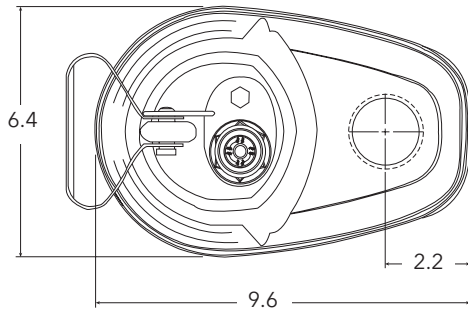
Total Head (feet of water)	GPM
8	61
10	57
15	46
20	33
25	16

PE51

Total Head (feet of water)	GPM
10	67
15	59
20	50
25	39
30	26
35	8

DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)



xylem
Let's Solve Water

Xylem Inc.
2881 East Bayard Street Ext., Suite A
Seneca Falls, NY 13148
Phone: (866) 325-4210
Fax: (888) 322-5877
www.gouldswatertechnology.com

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