SEPTIC CHECK

EXPERT SERVICE. LASTING VALUE. CLEAN WATER

TYPE IV SEWAGE SYSTEM DESIGN SUMMARY

Property Owner: Scott & Stacey Hughes
Phone: 952-250-0278
Address: 38985 337th Lane
PID: 24-0-008802
City: Aitkin Zip: 56431
County: Aitkin

DESIGN USAGE

Single Family Home X Other
Number of Potential Bedrooms 4
Garbage Disposal No
Sewage Lift Pump No

SITE CHARACTERISTICS

Soil type Loamy Sand
Hydraulic Loading 1.0
Depth to restrictive layer 16”

PUMP INFORMATION

Pump GPM & TDH 37.0 & 12.7
Cycles per day 4
Gallons per cycle 125
Perforation size & spacing 7/32
Number, spacing, & diameter of laterals 3’spacing / 1 ½” Laterals
Forcemain Size 2”

CAPACITIES

Daily Water Use Est Calc 600 gpd
Septic Tank Capacity 1350 existing combo+1000 E60
Pump Tank Capacity 1000 gallon

PRESSURE BED SYSTEM

Dimension of Rock Base 15’ x 40’
Depth of Rock Below Pipe 9”

TRENCH SYSTEM

Type of trench
Maximum Depth of trench
Square Feet of bed Required
Square Feet of bed Proposed
Lineal Feet of bed Proposed

APPROVAL

By Date 6-1-2021
Brian Koski License #2624
See additional information sheet if checked ☒

Type IV Septic System Design
Additional Information

Property Owner: Scott & Stacey Hughes – 38985 337th Lane Aitkin, MN 56431

Proposed Update summary:

This is a Type IV design that will utilize pretreatment with UV light and time dosing to address the lack of soil separation and space for a type 1 system. The existing system was sized for two bedrooms, the owners would like to add on and make the system support four bedrooms. The existing 1350 combo tank needs to be pumped and inspected to be reused in this design. A county variance will be needed to allow the drainfield to be ten feet from the deck and six feet from a shed.

Existing system summary:

The existing system consists of a 1,350-gallon combo septic/pump tank dosing a 8' x 33' pressure bed.

Flow Estimates:

The design flow was calculated using code book values for a 4-bedroom home without a garbage disposal or a sewage ejector.

Total Proposed Design Flow = 600 GPD

Anticipated Average flow = < 420 GPD

Water supply / wells:

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

Pretreatment Treatment System upgrade:

An Ecopod E60 is to be installed in Infiltrator IM1060 gallon tank. Effluent will flow into a 24" riser equipped with a Salcor UV light **OR** the Salcor UV light can be placed at the inlet of the pump tank. A Infiltrator 1000-gallon tank will serve for the time dose pump tank. An operating permit and maintenance contract will be required.

System detail:

- **<u>Septic tank - Reuse the existing 1350 gallon tank if compliant</u>**
  - Remove the existing pump and plumbing
  - Install 4” schedule 40 from outlet to treatment tank

- **<u>Pretreatment – Infiltrator IM 1060 Equipped with EcoPod E60</u>**

  - All lids shall be insulated lids.
  - 24” ultra-rib riser, attached with ADH 100- or two-part epoxy
  - Install new an effluent filter on the outlet of the treatment tank.
  - Polylok PL122 effluent filter
  - All lids shall be insulated lids and
  - One lid with a 4” vent is optional

- **<u>Time Dose Pump Tank</u>**
  - Install a Infiltrator IM 1060-gallon tank
  - (2) 24” manholes to grade, both lids shall be insulated
  - Goulds PE41 pump
  - SJE Rhombus IFS Simplex Time Dose panel

- **<u>Pressurzied drainfield</u>**
  - 15’ x 40’ pressure bed
  - Bed needs to be dug flat and clear wash sand added to new rockbed elevation of 99.2

Additional Notes:

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.

Owner and installer to verify all property lines.

Benchmark is referenced to the top of the conduit next to the electric pole. See photos.

Installer to verify all elevations, dimensions, and ensure proper fall to pipes.

Establish turf to prevent erosion and freezing. Final restoration includes seeding and straw mulch over the disturbed areas.

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

Owner 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 ordinance.

Maintenance Requirements

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 1350 Gal.		
Location	***Description***	***Frequency***
Manholes	Inspect manholes for infiltration	annual
Manholes	Inspect inlet and outlet for infiltration	annual
Manholes	Inspect and clean effluent filter if needed	annual
Inlet/outlet	Sample sludge and scum levels	annual

Component Description: Ecopod E60 Treatment Tank 1000Gal.		
Location	***Description***	***Frequency***
Manholes	Inspect manholes for infiltration	annual
Manholes	Inspect inlet and outlet for infiltration	annual
Pretreatment	Maintain per manufacturer recommendations	annual
UV Light	Maintain per manufacturer recommendations	annual

Component Description: Pressure Bed Dose tank 1000 Gal.		
Location	***Description***	***Frequency***
Manholes	Inspect manholes for infiltration	annual
Manholes	Inspect inlet and outlet for infiltration	annual
Inlet/outlet	Sample sludge and scum levels	annual
Pump Tank	Pump solids level exceeds 4” in depth	annual
Manhole	Inspect pumps and floats for proper operation	annual
Panel	Inspect panel and alarm system for proper operation	annual
Panel	Record cycle counters and/or elapsed timer meters.	annual
Panel	Adjust timer settings based on dosing results	annual
Manhole	Sample effluent fecal coliform	annual

Component Description: 15’ by 40’ rockbed		
Location	***Description***	***Frequency***
Drainfield	Inspect for ponding or seepage	annual
Drainfield	Mow the system	June 1st, August 1st
Drainfield	Clean and flush lateral lines	As Needed

Mitigation Plan:

Problem	Action	Mitigation Steps
Rockbeds ponding	• Verify flow and effluent results are with in permit limits. • Verify equal distribution in bed dosing.	• 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	• 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	• 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	• Verify flow, influent, and effluent results are with in 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	• If treatment levels cannot be met, expand the treatment system or adding 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	• 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.	• Adjust timer settings within the permit limits and operating permit limits • Pump and haul excess flow.

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Septic System Management Plan for Below 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	Scott Hughes	Email	
Property Address	38985 337th Lane, Aitkin, MN	Property ID	24-0-008802
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	
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

Version: August 2015

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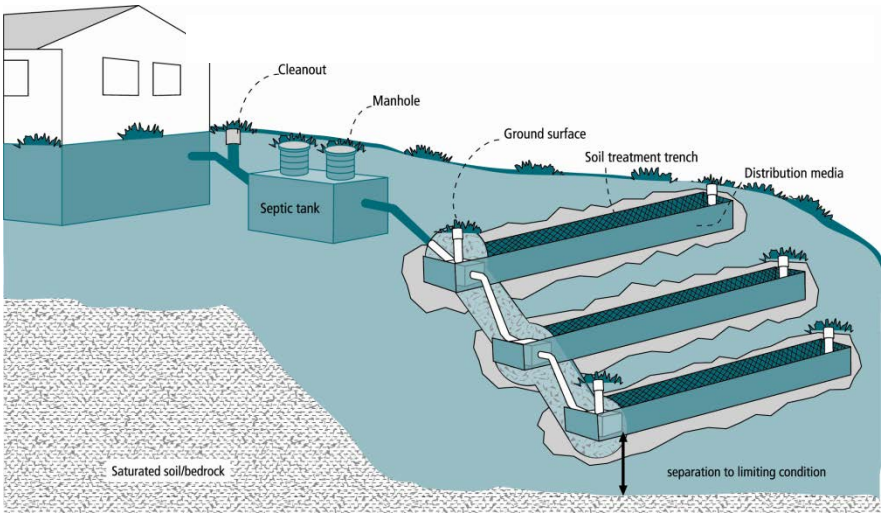
Septic System Management Plan for Below Grade Systems

Your Septic System



Septic System Specifics

System Type: ◯ I ◯ II ◯ III ◉ IV* ◯ V*

(*Based on MN Rules Chapter 7080.2200 – 2400)*

**Additional Management Plan required*

☑ System is subject to operating permit*

☑ System uses UV disinfection unit*

Type of advanced treatment unit EcoPod E60

Dwelling Type

Number of bedrooms: 4

System capacity/ design flow (gpd): 600

Average daily flow (gpd): 420

Comments_____

Business? ◯ Y ◉ N What type? _____

Well Construction

Well depth (ft): deep

❑ Cased well Casing depth: _____

❑ Other (specify): _____

Distance from septic (ft): >50'

Is the well on the design drawing? ◉ Y ◯ N

Septic Tank

❑ First tank *Tank volume:* 1350 *gallons*

Does tank have two compartments? ◉ Y ◯ N

❑ Second tank *Tank volume:* 1000 *gallons*

❑ Tank is constructed of Plastic

❑ Effluent screen: ◉ Y ◯ N Alarm ◉ Y ◯ N

❑ Pump tank (*if one*) 1000 *gallons*

❑ Effluent pump *make/model*: PE41

Pump capacity 37 GPM

TDH 12.7 Feet of head

❑ Alarm ◉ Y ◯ N Location Outdoor Powerpost

Soil Treatment Area (STA)

Trenches: _____ total lineal feet

Number of trenches: _____ at _____ feet each

STA size (width x length): 15 ft x 40 ft

Location of additional STA:_____

Type of distribution media: 1.5" Washed Rock

☐ Gravity distribution ☑ Pressure distribution

☑ Inspection ports ☑ Cleanouts

☑ Additional STA not available

☐ Surface water diversions

Homeowner Management Tasks

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

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

The system and septic tanks needs to be checked every 12 months

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

Seasonally or several times per year

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

Annually

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

During each visit by a service provider or pumper/maintainer

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

Professional Management Tasks

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

Plumbing/Source of Wastewater

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

Septic Tank/Pump Tanks

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

Pump

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

Soil Treatment Area

- *Inspection pipes*. Check to make sure they are properly capped. Replace caps and pipes that are damaged.
- *Surfacing of effluent.* Check for surfacing effluent or other signs of problems.
- *Gravity trenches and beds.* Check the number of gravity trenches with effluent ponded in distribution media. Identify the percentage of the system in use. Determine if action is needed.
- *Pressure trenches and beds - Lateral flushing.* Check lateral distribution; if cleanouts exist, flush and clean at recommended frequency.
- *Vegetation* - Check to see that a good growth of vegetation is covering the system.

All other components – evaluate as listed here:

_____

_____

Water-Use Appliances and Equipment in the Home

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

Homeowner Maintenance Log

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

Activity	Date accomplished									
Check frequently:										
Leaks: check for plumbing leaks *										
Soil treatment area check for surfacing **										
Lint filter: check, clean if needed *										
Alarms **										
Check annually:										
Water usage rate (max gpd: 600)										
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

Aitkin County Environmental Services
Wastewater Treatment and Dispersal Permit

Permit Number: _____ Date: _____

Facility Information

Permittee name: Scott and Stacey Hughes Phone number: 952-250-0278

Mailing address: 38985 337th Lane

City: Aitkin State: MN Zip code: 56431

Property ID number (GPS location): 24-0-008802

Aitkin County 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: 600 GPD Residential/Commercial: Residential

System Components:

Existing 1250 gallon two compartment tank to be converted to all septic, add IM1060 equipped with a ECO-POD E60 treatment unit and UV light, add a IM1060 time dose pump tank. 15'x40' raised pressure bed.

Monitoring Requirements

Parameter	Effluent limits	Frequency	Location
Peak flow (gpd)	600 GPD	Weekly	Control Panel
Average flow (gpd)	420GPD		
$CBOD_5$ (mg/L)	15 mg/l	Annual	Bed dose tank
TSS (mg/L)	15 mg/l	Annual	Bed dose tank
FOG (mg/l)	1000 cfu/100ml	Annual	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 – 1st 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 annually	N/A

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 Environmental Services.

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.

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: _____

Permittee (please print): _____

Title: _____ Date: _____

Signature: _____

Permitting Authority (please print): _____

Title _____ Date: _____

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 ($CBOD_5$) 15 milligrams per liter (mg/L), Total Suspended Solids (TSS) 15 mg/L, Fecal Coliform Bacteria 1000 per 100 milliliter (mL); Treatment Level B = $CBOD_5$ 25 mg/L, TSS 30 mg/L, Fecal Coliform Bacteria 10,000 per 100 mL; Treatment Level C = $CBOD_5$ 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 $CBOD_5$, 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. **$CBOD_5$** – monitoring for $CBOD_5$ is not typically required for the majority of wastewater systems used for single-family homes generating typical domestic strength effluent. However, monitoring for $CBOD_5$ 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 $CBOD_5$ is generally necessary to determine $CBOD_5$ 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.

UNIVERSITY OF MINNESOTA

Onsite Sewage Treatment Program
Septic System Management Plan
Delta Environmental Products
Ecopod Fixed Film Aerobic Treatment Unit

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.

Minnesota Pollution Control Agency

OSTP Design Summary Worksheet

University of Minnesota

Property Owner/Client: Scott and Stacey Hughes | **Project ID:** | v 07.14.15

Site Address: 38985 337th Lane Aitkin, MN 56431 | **Date:** 6/1/21

1. DESIGN FLOW AND TANKS

A. *Design Flow:* 600 Gallons Per Day (GPD)

Note: The estimated design flow is considered a peak flow rate including a safety factor. For long term performance, the average daily flow is recommended to be < 60% of this value.

B. *Septic Tanks:*

Minimum Code Required Septic Tank Capacity: 1500 Gallons, in [ ] Tanks or Compartments

Recommended Septic Tank Capacity: 2250 Gallons, in 2 Tanks or Compartments

Effluent Screen: [ ] Alarm: [ ]

C. *Holding Tanks Only:*

Minimum Code Required Capacity: [ ] Gallons, in [ ] Tanks

Designer Recommended Capacity: [ ] Gallons, in [ ] Tanks

Type of High Level Alarm: [ ]

D. *Pump Tank 1* Capacity (Code Minimum): 600 Gallons — *Pump Tank 2* Capacity (Code Minimum): [ ] Gallons

Pump Tank 1 Capacity (Designer Rec): 1000 Gallons — *Pump Tank 2* Capacity (Designer Rec): [ ] Gallons

Pump 1: 37.0 GPM, Total Head: 12.7 ft — Pump 2: [ ] GPM, Total Head: [ ] ft

Supply Pipe Dia.: 2.00 in, Dose Volume: 125.0 gal — Supply Pipe Dia.: [ ] in, Dose Volume: [ ] gal

2. SYSTEM TYPE

○ Trench ◉ Bed ○ Mound ○ At-Grade ○ Gravity Distribution ◉ Pressure Distribution-Level ○ Pressure Distribution-Unlevel

○ Drip ○ Holding Tank ○ Other [ ] *** Selection Required**

Benchmark Elevation: [ ] ft

Benchmark Location: [ ]

System Type				
☐ Type I	☐ Type II	☐ Type III	☑ Type IV	☐ Type V

Type of Distribution Media:

☑ Drainfield Rock ☐ Registered Treatment Media: [ ]

3. SITE EVALUATION:

A. Depth to Limiting Layer: 16 in / 1.3 ft — **B.** Measured Land Slope %: 3.0 %

C. Elevation of Limiting Layer: [ ] — **D.** Soil Texture: Loamy Sand

E. Loc. of Restricive Elevation: [ ] — **F.** Soil Hyd. Loading Rate: 1.00 GPD/ft²

G. Minimum Required Separation: 12 in / 1.0 ft — **H.** Perc Rate: [ ] MPI

I. Code Maximum Depth of System: 4 in — Comments: [ ]

4. DESIGN SUMMARY

Trench Design Summary

Dispersal Area [ ] ft² — Sidewall Depth [ ] in — Trench Width [ ] ft

Total Lineal Feet [ ] ft — Number of Trenches [ ] — Code Maximum Trench Depth [ ] in

Contour Loading Rate [ ] ft — Designer's Max Trench Depth [ ] in

Bed Design Summary

Absorption Area 600 ft² — Depth of sidewall 6.0 in — Code Maximum Bed Depth 4.0 in

Bed Width 15 ft — Bed Length 40.0 ft — Designer's Max Bed Depth [ ] in

Minnesota Pollution Control Agency

OSTP Design Summary Worksheet

University of Minnesota

Mound Design Summary

Absorption Bed Area	ft²	Bed Length	ft	Bed Width	ft
Absorption Width	ft	Clean Sand Lift	ft	Berm Width (0-1%)	ft
Upslope Berm Width	ft	Downslope Berm Width	ft	Endslope Berm Width	ft
Total System Length	ft	Total System Width	ft	Contour Loading Rate	gal/ft

At-Grade Design Summary

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

Level & Equal Pressure Distribution Summary

No. of Perforated Laterals	5	Perforation Spacing	3 ft	Perforation Diameter	7/32 in
Lateral Diameter	1.50 in	Min. Delivered Volume	79 gal	Maximum Delivered Volume	150 gal

Non-Level and Unequal Pressure Distribution Summary

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

Minimum Delivered Volume _____ gal

Maximum Delivered Volume _____ gal

5. Additional Info for Type IV/Pretreatment Design

A. ***Calculate the organic loading***

1. *Organic Loading to Pretreatment Unit = Design Flow X Estimated BOD* in mg/L in the effluent X 8.35 ÷ 1,000,000

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

2. Type of Pretreatment Unit Being Installed: _____

3. Calculate *Soil Treatment System Organic Loading: BOD concentration after pretreatment ÷ Bottom Area* = lbs/day/ft²

_____ mg/L X 8.35 ÷ 1,000,000 ÷ _____ ft² = _____ lbs/day/ft²

Comments/Special Design Considerations:

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

Brian Koski		2624	06/01/21
(Designer)	(Signature)	(License #)	(Date)

Minnesota Pollution Control Agency

OSTP Bed Design Worksheet

University of Minnesota

1. SYSTEM SIZING: Project ID: v 07.14.15

A. Design Flow (Design Sum.1A): 600 GPD

B. Code Maximum Depth*: 4 inches Designers Maximum Depth: inches

C. Soil Loading Rate: 1.00 GPD/ft^2

D. Required Bottom Area: Design Flow (1.A) ÷ Loading Rate (1.C) = Initial Required Bottom Area

600 GPD ÷ 1.00 GPD/ft^2 = 600 ft^2

E. Select Distribution Method: ☑ Pressure ☐ Gravity

F. Select Dispersal Type: ☑ Rock ☐ Registered

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

2. BED CONFIGURATION: (for sites with less than 6% slope)

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

B. Req'd Bottom Area = Bottom Area (1.D) X Size Multiplier =

600.0 ft^2 X 1.0 ft = 600 ft^2

C. Designed Bottom Area: ft *Optional upsizing of bed area*

D. Select Bed Width: 15 ft

E. Calculate Bed Length: Designed Bottom Area ÷ Bed Width = Bed Length

600 ft^2 ÷ 15.0 ft = 40.0 ft

3. MATERIAL CALCULATION: ROCK

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

6.0 inches = 0.50 ft

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

(0.5 ft + 0.33 ft) X 600.0 ft^2 = 498 ft^3

C. Calculate Volume in cubic yards: Media volume in cubic feet ÷ 27 = cubic yards

498 ft^3 ÷ 27 = 18 yd^3

4. MATERIAL CALCULATION: REGISTERED PRODUCTS - CHAMBERS AND EZFLOW

A. Registered Product:

B. Component Length: ft

C. Component Width: ft

D. Component depth (louver or depth of sidewall loading) in

D. Number of Components per Row = Bed Length divided by Component Length (Round up)

ft ÷ ft = components

E. Actual Bed Length = Number of Components X Component Length:

components **X** ft = ft

F. Number of Rows = Bed Width divided by Component Width

ft ÷ ft = rows *Adjust width so this is an whole number.*

G. Total Number of Components = Number of Components per Row X Number of Rows

X = components

Minnesota Pollution Control Agency

OSTP Pressure Distribution Design Worksheet

University of Minnesota

Project ID: v 07.14.15

1. Media Bed Width: 15 ft

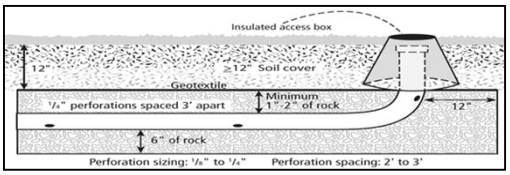
2. Minimum Number of Laterals in system/zone = Rounded up number of [(Media Bed Width - 4) ÷ 3] + 1.

(15 - 4) + 1 = 5 laterals *Does not apply to at-grades*

3. Designer Selected *Number of Laterals*: 5 laterals
Cannot be less than line 2 (accept in at-grades)

4. Select *Perforation Spacing*: 3.0 ft

5. Select *Perforation Diameter Size:* 7/32 in



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

38 - 2ft = 36 ft *Perforation can not be closer then 1 foot from edge.*

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

Number of Perforation Spaces = 36 ft ÷ 3 ft = 12 Spaces

8. *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.

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

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

¼ Inch Perforations						7/32 Inch Perforations					
Perforation Spacing (Feet)	Pipe Diameter (Inches)					Perforation Spacing (Feet)	Pipe Diameter (Inches)				
	1	1¼	1½	2	3		1	1¼	1½	2	3
2	10	13	18	30	60	2	11	16	21	34	68
2½	8	12	16	28	54	2½	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	1¼	1½	2	3		1	1¼	1½	2	3
2	12	18	26	46	87	2	21	33	44	74	149
2½	12	17	24	40	80	2½	20	30	41	69	135
3	12	16	22	37	75	3	20	29	38	64	128

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

13 Perf. Per Lat. X 5 Number of Perf. Lat. = 65 Total Number of Perf.

10. Select *Type of Manifold Connection* (End or Center): ☑ End ☐ Center

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

Minnesota Pollution Control Agency

OSTP Pressure Distribution Design Worksheet

University of Minnesota

12. 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)

15	ft	X	38	ft	=	570	ft^2

b. *Square Foot per Perforation* = *Bed Area* divided by the *Total Number of Perforations* .

570	ft^2	÷	65	perforations	=	8.8	ft^2/perforations

13. Select *Minimum Average Head* : 1.0 ft

14. Select *Perforation Discharge* (GPM) based on Table: 0.56 GPM per Perforation

15. Determine required *Flow Rate* by multiplying the *Total Number of Perfs.* by the *Perforation Discharge.*

65	Perfs	X	0.56	GPM per Perforation	=	37	GPM

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

17. *Volume of Distribution Piping* =

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

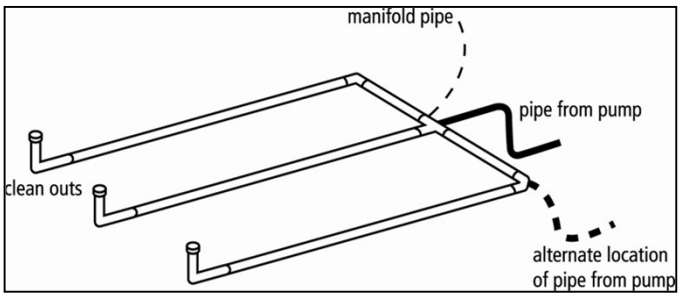
5	X	36	ft	X	0.110	gal/ft	=	19.8	Gallons

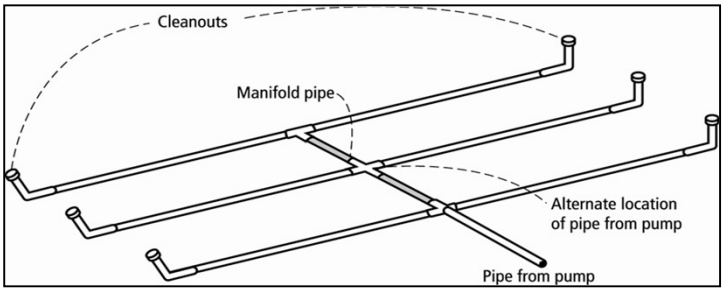
18. Minimum Delivered Volume = Volume of Distribution Piping X 4

19.8	gals	X	4	=	79.2	Gallons

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:

OSTP Basic Pump Selection Design Worksheet

Minnesota Pollution Control Agency

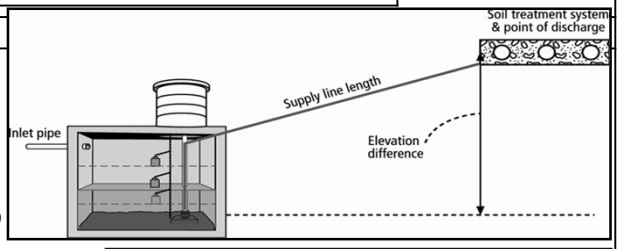
University of Minnesota

1. PUMP CAPACITY Project ID:

Pumping to Gravity or Pressure Distribution: ○ Gravity ◉ Pressure **Selection required**

1. If pumping to gravity enter the gallon per minute of the pump: _____ GPM *(10 - 45 gpm)*
2. If pumping to a pressurized distribution system: 37.0 GPM
3. Enter pump description: Demand Dosing Soil Treatment

2. HEAD REQUIREMENTS



A. Elevation Difference between pump and point of discharge: 6 ft

B. Distribution Head Loss: 5 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: 2.0 in

2. Supply Pipe Length: 40 ft

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

Friction Loss = 3.50 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 (D.2)* X 1.25 = *Equivalent Pipe Length*

40 ft X 1.25 = 50.0 ft

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

Supply Friction Loss =

3.50 ft per 100ft X 50.0 ft ÷ 100 = 1.7 ft

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

6.0 ft + 5.0 ft + _____ ft + 1.7 ft = 12.7 ft

3. PUMP SELECTION

A pump must be selected to deliver at least **37.0** GPM (Line 1 or Line 2) with at least **12.7** feet of total head.

Comments:

Minnesota Pollution Control Agency

OSTP Pump Tank Design Worksheet

University of Minnesota

DETERMINE TANK CAPACITY AND DIMENSIONS Project ID: v 07.14.15

1. A. *Design Flow (Design Sum.1A)*: 600 GPD

   B. Min. required pump tank capacity: 600 Gal C.Recommended pump tank capacity: 1000 Gal

   D. Pump tank description: Time to Pressure

MEASURED TANK CAPACITY (existing tanks):

2. A. Rectangle area = Length (L) X Width (W)

   ____ ft X ____ ft = ____ ft^2

   B. Circle area = $3.14r^2$ (3.14 X radius X radius)

   3.14 X ____ ^{2} ft = ____ ft^2

   C. Calculate Gallons Per Inch. Multiply the area from 1.A or 1.B, by 7.5 to determine the gallons per foot the tank holds and divide by 12 to calculate the gallons per inch.

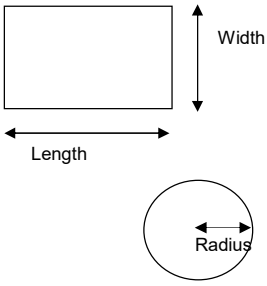
   ____ ft^2 X 7.5 gal/ft^3 ÷ 12 in/ft = ____ Gallons per inch

   D. Calculate *Total Tank Volume*

   Depth from bottom of inlet pipe to tank bottom: ____ in

   Total Tank Volume = Depth from bottom of inlet pipe (Line 4.A) X *Gallons/Inch* (Line 2)

   ____ in X 24.9 Gallons Per Inch = ____ Gallons



MANUFACTURER'S SPECIFIED TANK CAPACITY (when available):

3. A. Tank Manufacturer: Infiltrator

   B. Tank Model: IM-1060

   C. Capacity from manufacturer: 1094 Gallons

   D. Gallons per inch from manufacturer: 24.9 Gallons per inch

   E. Liquid depth of tank from manufacturer: 44.0 inches

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

DETERMINE DOSING VOLUME

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

   (Pump and block height + 2 inches) X *Gallons Per Inch* (2C or 3E)

   (12 in + 2 inches) X 24.9 Gallons Per Inch = 348 Gallons

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

   - Line 17 of the Pressure Distribution or Line 11 of Non-level 79 Gallons (minimum dose)

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

   Design Flow: 600 GPD X 0.25 = 150 Gallons (maximum dose)

7. *Select a pumpout volume that meets both Minimum and Maximum:* 125 Gallons

8. Calculate *Doses Per Day* = Design Flow ÷ *Delivered Volume*

   600 gpd ÷ 125 gal = 4 *Doses*

9. Calculate Drainback:

   A. *Diameter of Supply Pipe* = 2 inches

   B. Length of Supply Pipe = 40 feet

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

   D. *Drainback = Length of Supply Pipe* X *Volume of Liquid Per Lineal Foot of Pipe*

   40 ft X 0.170 gal/ft = 6.8 Gallons

10. *Total Dosing Volume = Delivered Volume* plus *Drainback*

    125 gal + 6.8 gal = 132 Gallons

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

    3 in X 24.9 gal/in = 74.6 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

Minnesota Pollution Control Agency

OSTP Pump Tank Design Worksheet

University of Minnesota

TIMER or DEMAND FLOAT SETTINGS

Select Timer or Demand Dosing: (●) Timer ( ) Demand Dose

A. Timer Settings

12. Required *Flow Rate* :

A. From Design (Line 12 of Pressure, Line 10 of Non-Level or Line 6 of Pump*): 37 GPM

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

[ ] in X [24.9] gal/in ÷ [ ] min = [ ] GPM

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

13. Flow Rate from Line 12.A or 12.B above. 37 GPM

14. Calculate **TIMER ON** setting:

Total Dosing Volume/GPM

[132] gal ÷ [37.0] gpm = [3.6] Minutes ON

15. Calculate **TIMER OFF** setting:

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

1440 min ÷ [4] doses/day - [3.6] min = [356.4] Minutes OFF

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

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

[348.04] gal ÷ [24.9] gal/in = [14.0] Inches

17. Alarm Float - Measuring from bottom of tank:

Distance to set Alarm Float = Tank Depth(4A) X 90% of Tank Depth

[44] in X 0.90 = [39.6] in

B. DEMAND DOSE FLOAT SETTINGS

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

Total Dosing Volume /Gallons Per Inch

[ ] gal ÷ [ ] gal/in = [ ] Inches

19. Measuring from bottom of tank:

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

[ ] in + [ ] in = [ ] Inches

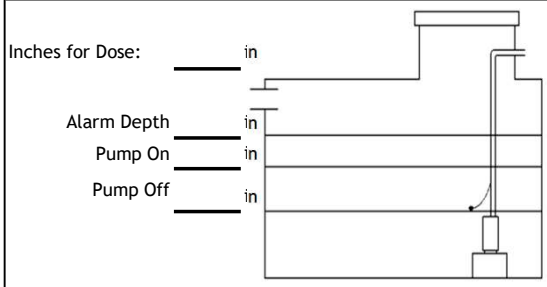
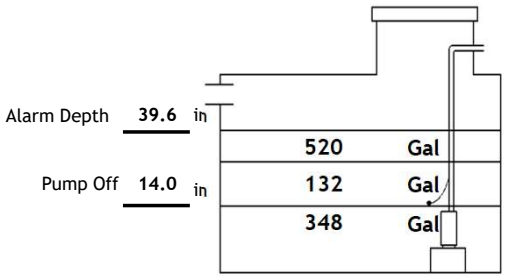
B. *Distance to set Pump On Float=Distance to Set Pump-Off Float + Float Separation Distance*

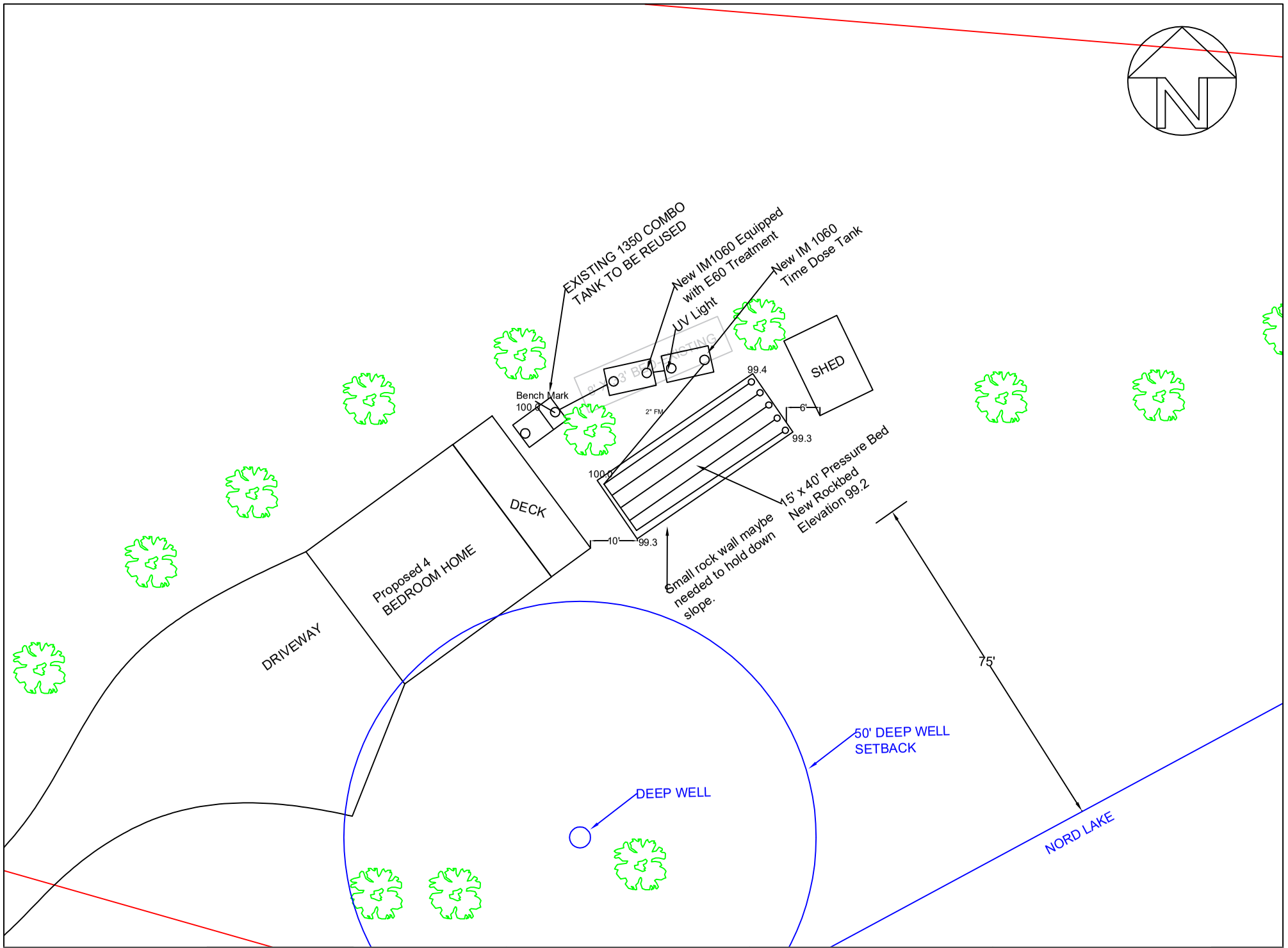
[ ] in + [ ] in = [ ] Inches

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

[ ] in + [ ] in = [ ] Inches

FLOAT SETTINGS

DEMAND DOSING	TIMED DOSING
	



PREPARED FOR:	PROPERTY LOCATION	LEGAL DESCRIPTION	SEPTIC CHECK		PAGE TITLE	SHEET NUMBER
SCOTT HUGHES	38985 337TH LANE AITKIN, MN 56431	Aitkin County, Minnesota PID# 24-0-008802	6074 KEYSTONE RD MILACA, MN 56353 (320)-983-2447 (FAX) (320)-983-2151	I hereby certify that this site plan was prepared by me or under my direct supervision. Brian Koski M. P. C. A. License # 2624 DATE 6/ 21	SEPTIC DESIGN SITE MAP	1 OF 1

Map Scale: 1:923 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 40 80 160 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Aitkin County, Minnesota
Survey Area Data: Version 21, Jun 4, 2020

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

Date(s) aerial images were photographed: Apr 19, 2014—Aug 23, 2016

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
504E	Duluth fine sandy loam, 12 to 25 percent slopes	1.1	30.6%
544	Cathro muck	1.5	43.1%
928D	Cushing-Mahtomedi complex, 10 to 25 percent slopes	0.4	12.6%
W	Water	0.5	13.7%
Totals for Area of Interest		**3.5**	**100.0%**

Soil Observation Log

Property Owner	Hughes	**Property Address**	38985 337th Lane Aitkin, MN 56431

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

Landscape Position: (check one) ☑ Summit ☐ Shoulder ☐ Back/Side Slope ☐ Foot Slope ☐ Toe Slope

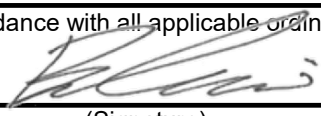
Vegetation	grass	**Soil survey map units**	928D
Weather Conditions/Time of Day:	Cloudy/ 11am	**Date**	05/27/21

Observation #/Location:	Soil Pit 1	Observation Type:	Soil Pit

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I-------- Structure----------I		
							Shape	Grade	Consistence
0-4"	Loamy Sand	<35%	10YR 3/3				Granular	Weak	Loose
4-24"	Loamy Sand	<35%	10YR 5/4				Granular	Weak	Loose
24"-26"	Loamy Sand	<35%	10YR 5/4	10YR 6/8			Granular	Weak	Loose
Observation #/Location:			Soil Pit 2			Observation Type:		Soil Pit	
0-4"	Loamy Sand	<35%	10YR 3/3				Granular	Weak	Loose
4-20"	Loamy Sand	<35%	10YR 5/4				Granular	Weak	Loose
20-22"	Loamy Sand	<35%	10YR 5/2	10YR 6/6			Granular	Weak	Friable
Observation #/Location:			Soil Pit 3			Observation Type:		Soil Pit	
0-4"	Loamy Sand	<35%	10YR 3/3				Granular	Weak	Loose
4-16"	Loamy Sand	<35%	10YR 5/4				Granular	Weak	Loose
16-20"	Loamy Sand	<35%	10YR 5/2	10YR 6/6			Granular	Weak	Loose

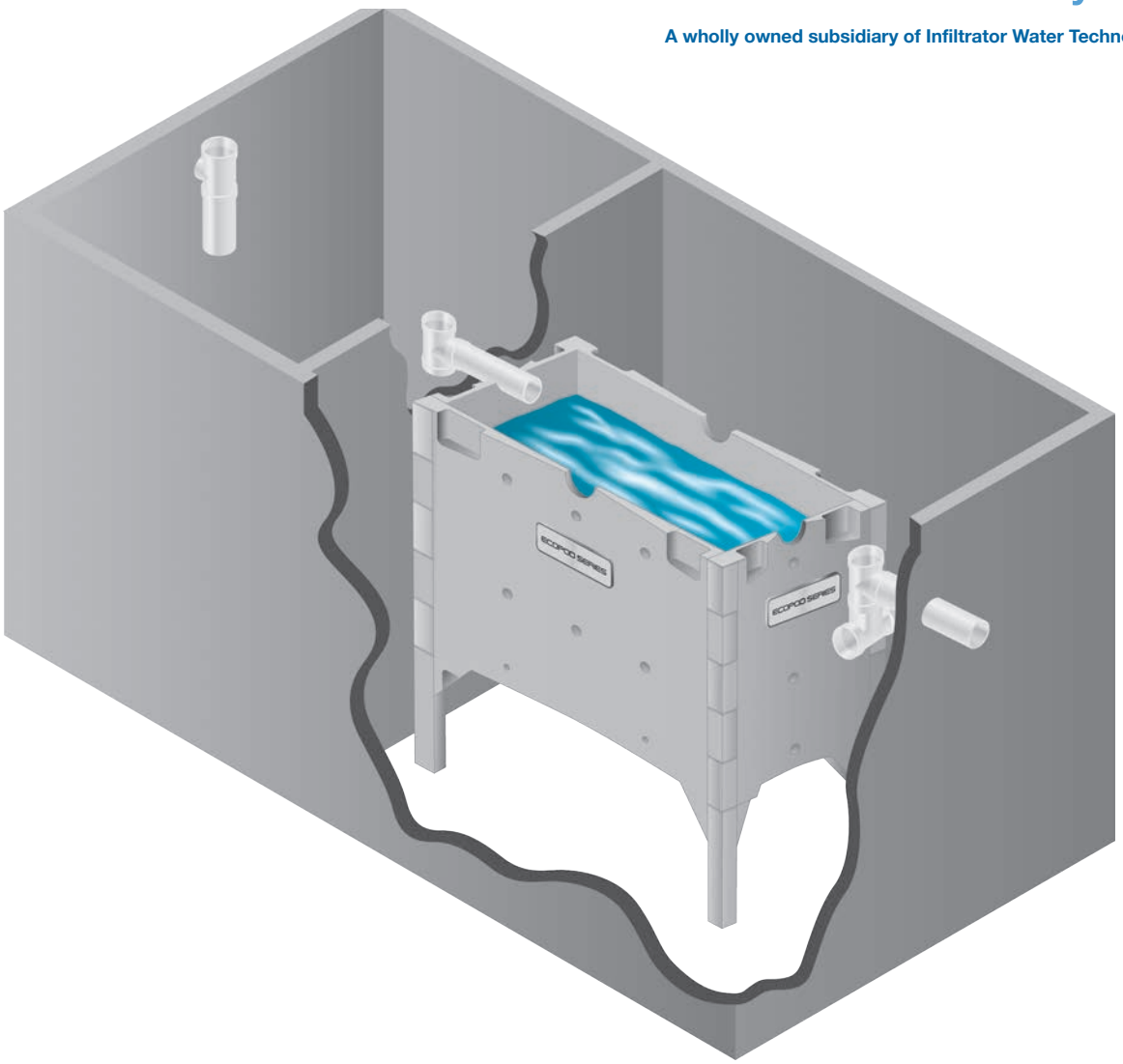
Comments	most restrictive layer @ 16".

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

Brian Koski		**2624**	**5/27/2021**
(Designer/Inspector)	(Signature)	(License #)	(Date)

delta™
treatment systems

A wholly owned subsidiary of Infiltrator Water Technologies, LLC



DELTA TREATMENT SYSTEMS

ECOPOD-N®

NSF/ANSI 40 AND 245 RESIDENTIAL WASTEWATER TREATMENT SYSTEM

NSF
Certified to NSF/ANSI Standards 40 & 245

WWW.DELTATREAMENT.COM

DELTA TREATMENT SYSTEMS
NSF/ANSI 40 AND 245
Residential Wastewater Treatment System

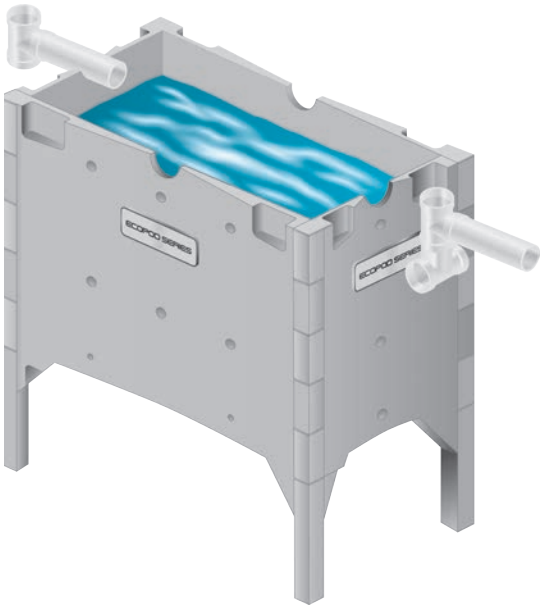
ECOPOD-N® Advanced Wastewater Treatment

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.

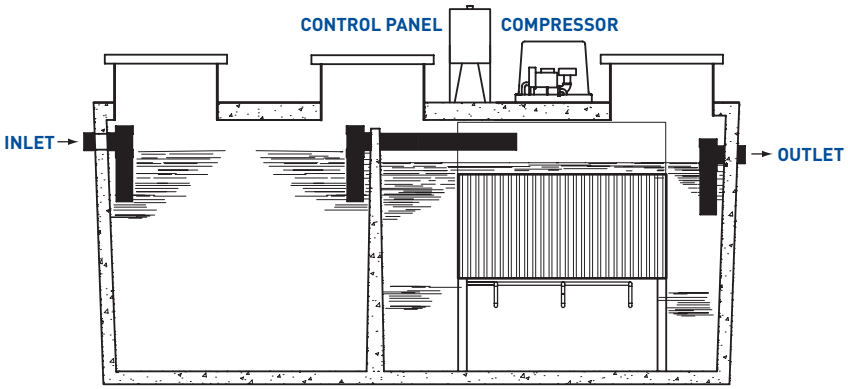


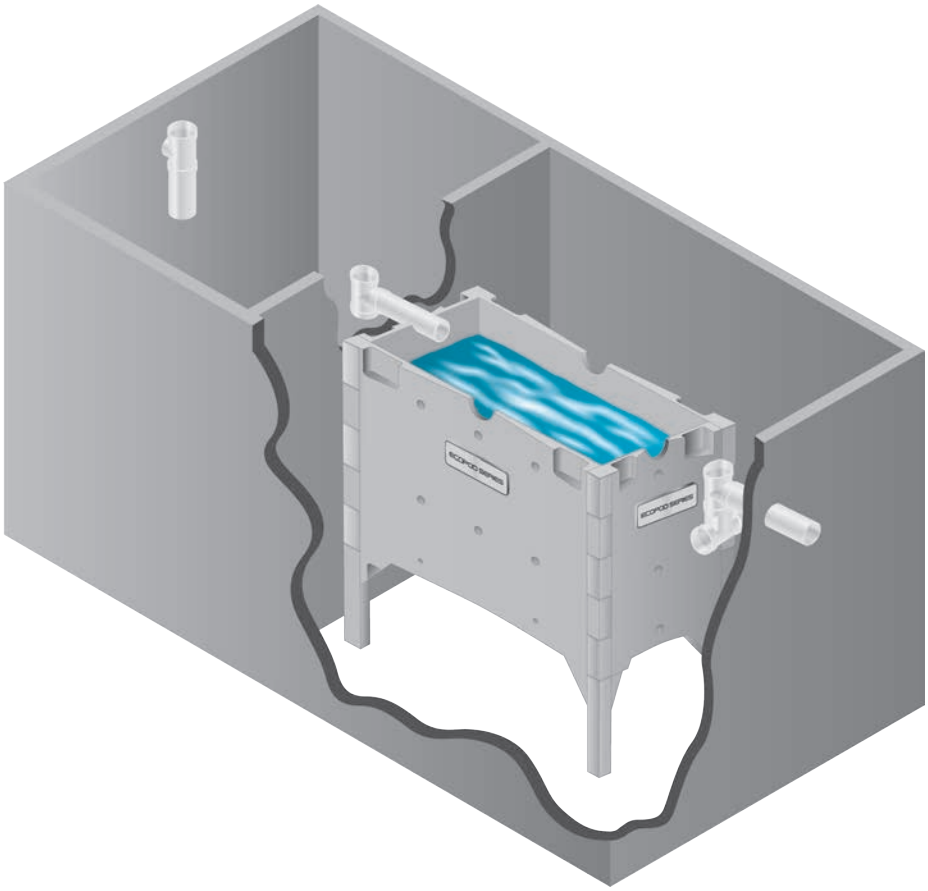
ECOPOD-N Available Offering

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.

WHITEWATER® DF SERIES

CONTROLSERIES

ECODRIP SERIES

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.

ECOPOD SERIES

delta™ treatment systems

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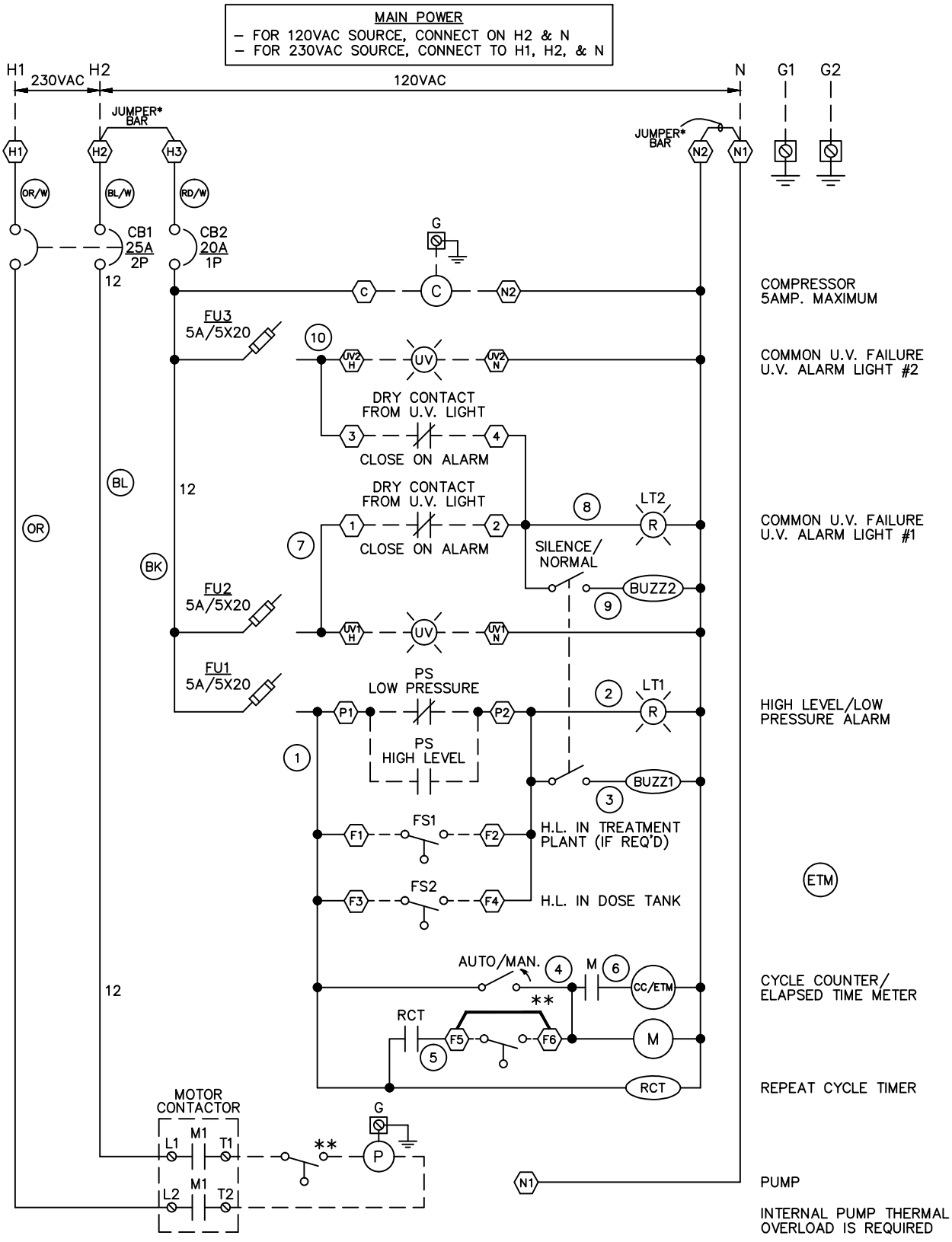
CP2210/MN
CONTROL PANEL

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



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

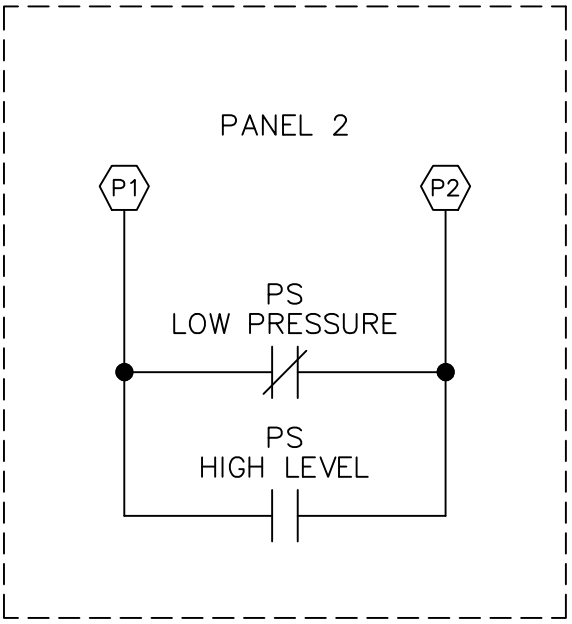
REV.	DATE	REVISION DESCRIPTION	BY
–	–	–	–
–	–	–	–

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

SCHEMATIC DIAGRAM

PLOT SCALE	DRAWING NUMBER	DRAWN BY	DATE	SHEET OF	REV.
NTS	CP2210/MN	BMF	04/23/19	1 4	A

PRESSURE SWITCH PANEL LOCATED
NEAR COMPRESSOR



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–	–	–	–

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Ph. (225) 665-6162
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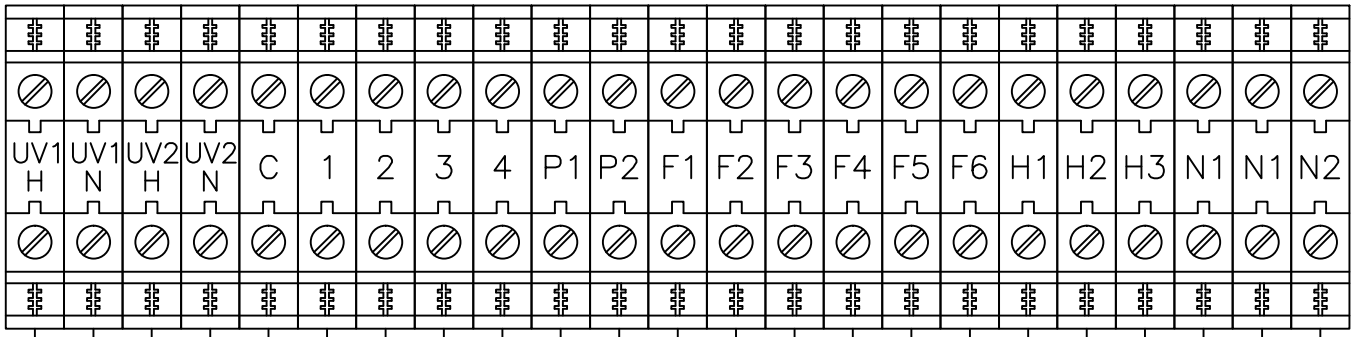
SCHEMATIC DIAGRAM

PLOT SCALE	DRAWING NUMBER	DRAWN BY	DATE	SHEET OF	REV.
NTS	CP2210/MN	BMF	04/23/19	2 4	A



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

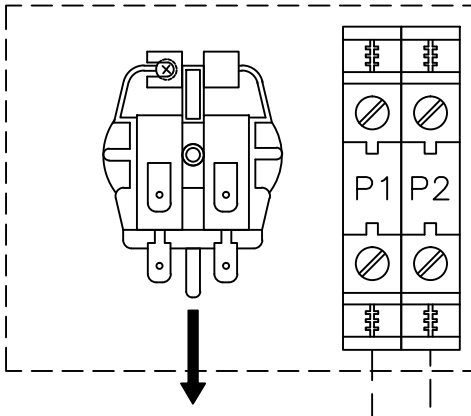
INCOMING 120VAC SOURCE 2 HOT

INCOMING 120VAC NEUTRAL

PUMP NEUTRAL

COMPRESSOR NEUTRAL

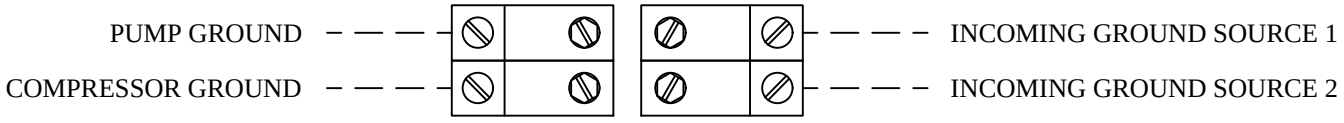
PRESSURE SWITCH PANEL
LOCATED NEAR COMPRESSOR



AIR LINE
TO COMP.

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.



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EXTERNAL CONNECTIONS

PLOT SCALE	DRAWING NUMBER	DRAWN BY	DATE	SHEET OF	REV.
NTS	CP2210/MN	BMF	04/23/19	3 4	A

HOW TO SET THE REPEAT CYCLE TIMER

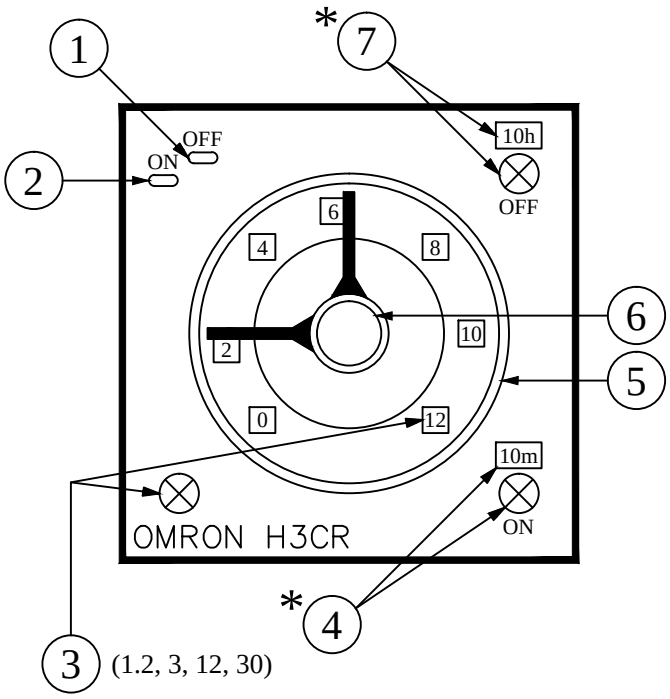
EXAMPLES OF SETTINGS

	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
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–	–	–	–

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REPEAT CYCLE TIMER INSTRUCTIONS

PLOT SCALE	DRAWING NUMBER	DRAWN BY	DATE	SHEET OF	REV.
NTS	CP2210/MN	BMF	04/23/19	4 4	A

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				

REV.	DATE	REVISION DESCRIPTION	BY
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BILL OF MATERIALS

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TECHNICAL BROCHURE
BPE R1

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

BUILT IN THE USA
ENGINEERED, ASSEMBLED & TESTED

GOULDS WATER TECHNOLOGY
a xylem brand

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:

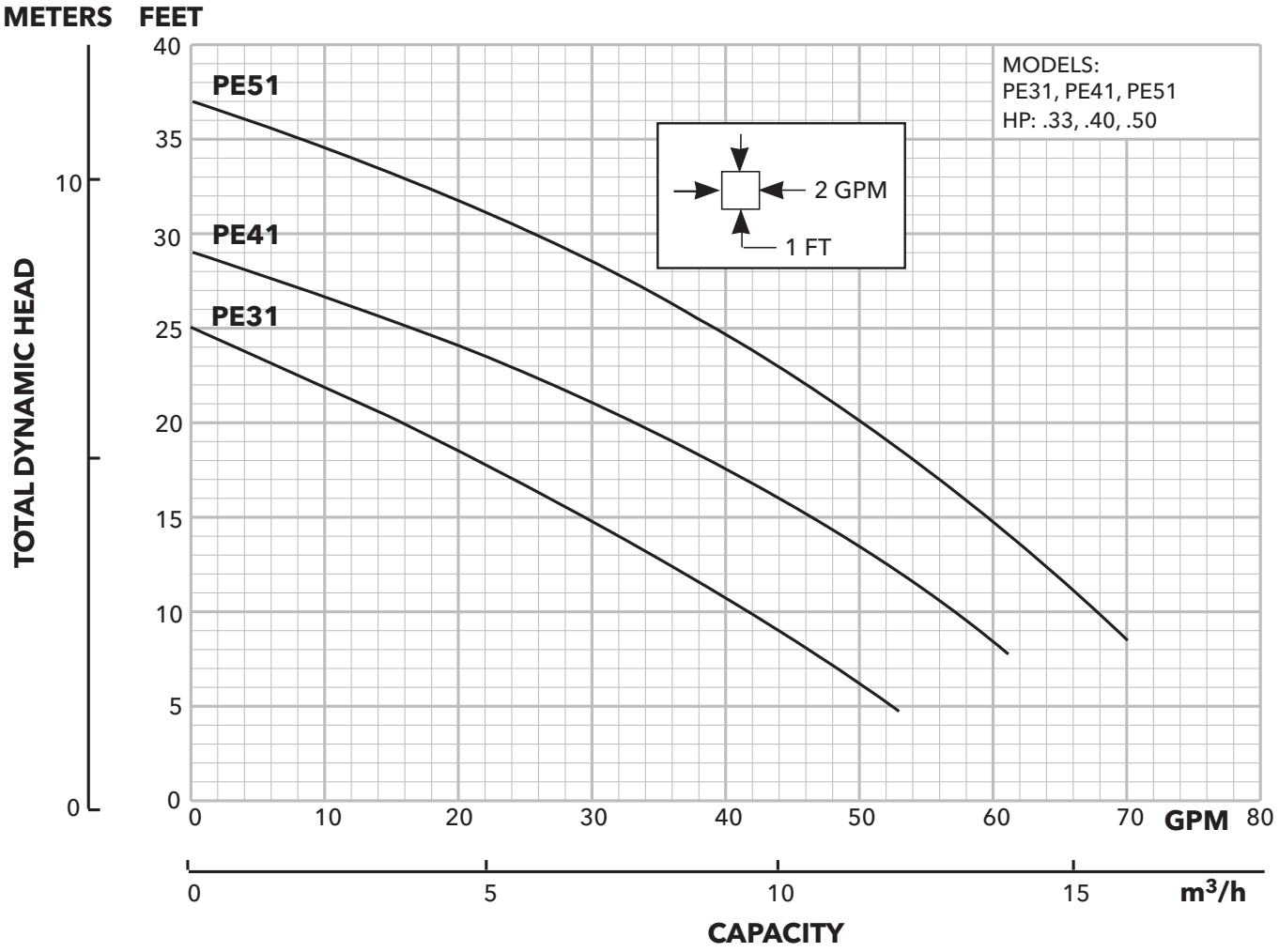
- .50 HP, 3400 RPM
- 115 and 230 volts
- PSC design

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		7.5	15		Manual / No Switch					
PE41P1						Piggyback Float Switch					
PE42M		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

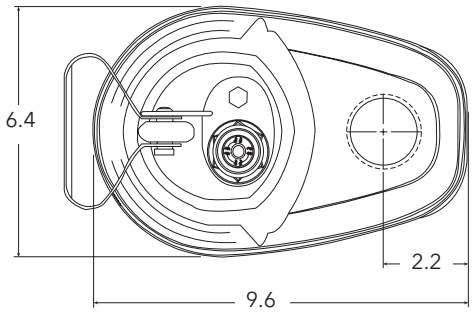
Total Head (feet of water)	GPM
8	61
10	57
15	46
20	33
25	16

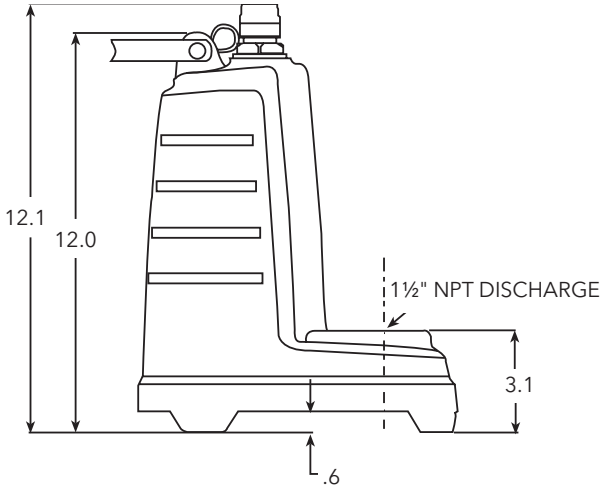
PE51

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.)





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

INFILTRATOR®
septic tanks

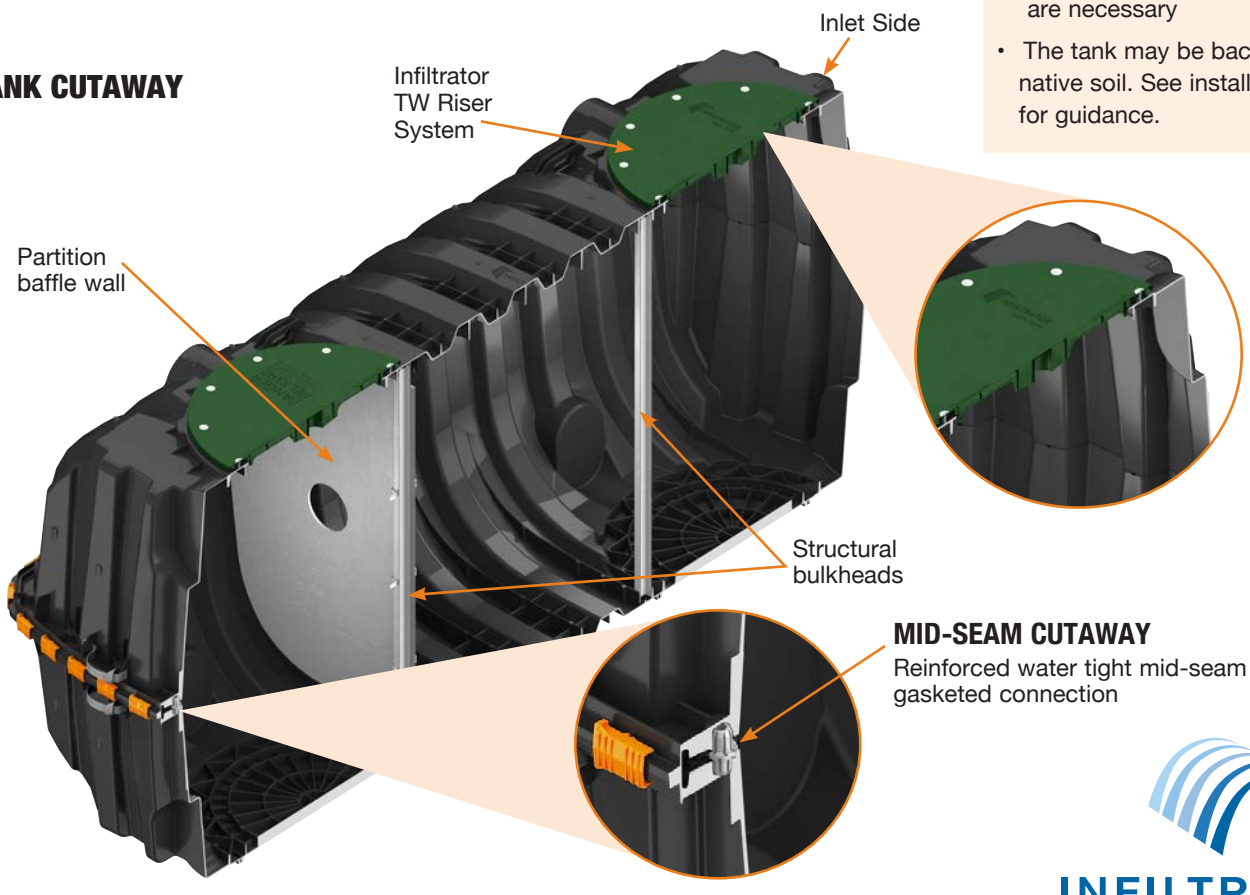
IM-1060

The Infiltrator IM-1060 is a lightweight strong and durable septic tank. This watertight tank design is offered with Infiltrator's line of custom-fit risers and heavy-duty lids. Infiltrator injection molded tanks provide a revolutionary improvement in plastic septic tank design, offering long-term exceptional strength and watertightness.

Features & Benefits

- Strong injection molded polypropylene construction
- Lightweight plastic construction and inboard lifting lugs allow for easy delivery and handling
- Integral heavy-duty green lids that interconnect with TW™ risers and pipe riser solutions
- Structurally reinforced access ports eliminate distortion during installation and pump-outs
- Reinforced structural ribbing and fiberglass bulkheads offer additional strength
- Can be installed with 6" to 48" of cover
- Can be pumped dry during pump-outs
- Suitable for use as a septic tank, pump tank, or rainwater (non-potable) tank
- No special water filling requirements are necessary
- The tank may be backfilled with suitable native soil. See installation instructions for guidance.

TANK CUTAWAY



HEAVY DUTY LID CUTAWAY
Reinforced 24" structural access port

MID-SEAM CUTAWAY
Reinforced water tight mid-seam gasketed connection

Protecting the Environment with **Innovative Wastewater Treatment Solutions**

INFILTRATOR®
water technologies

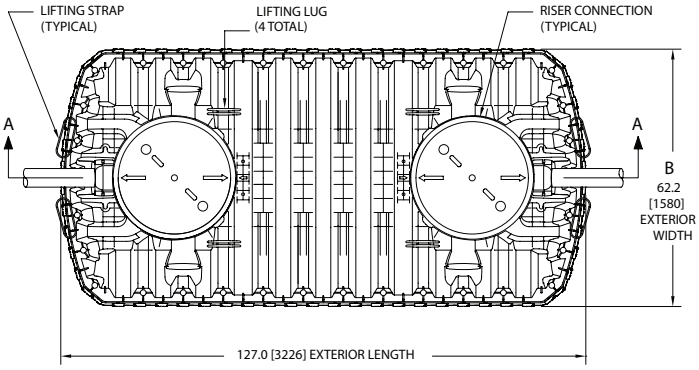
IM-1060 General Specifications and Illustrations

The IM-1060 is an injection molded two piece mid-seam plastic tank. The IM-1060 injection molded plastic design allows for a mid-seam joint that has precise dimensions for accepting an engineered EPDM gasket. Infiltrator's gasket design utilizes technology from the water industry to deliver proven means of maintaining a watertight seal. The two-piece design is permanently fastened using a series of non-corrosive plastic alignment dowels and locking seam clips. The IM-1060 is assembled and sold through a network of certified Infiltrator distributors.

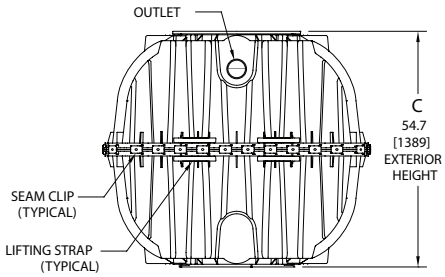
Must be backfilled and installed in accordance with Infiltrator Water Technologies, Infiltrator IM-Series Septic Tank General Installation Instructions and for shallow ground water conditions reference the Infiltrator IM-Series Tank Buoyancy Control Guidance.

Please visit www.infiltratorwater.com/images/pdf/ManualsGuides/TANK01.pdf for the latest information.

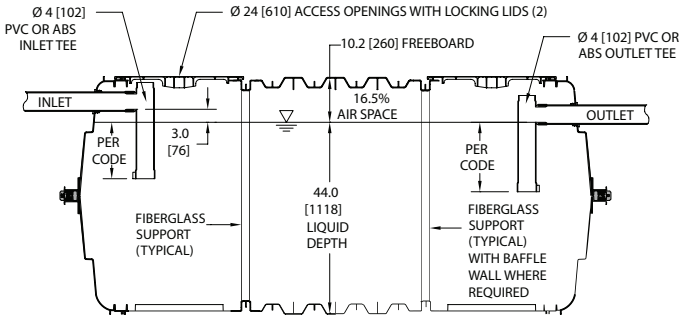
IM-1060	
Working Capacity	1094 gal (4141 L)
Total Capacity	1287 gal (4872 L)
Airspace	16.5%
Length	127" (3226 mm)
Width	62.2" (1580 mm)
Length-to-Width Ratio	2.3 to 1
Height	54.7" (1389 mm)
Liquid Level	44" (1118 mm)
Invert Drop	3" (76 mm)
Fiberglass Supports	2
Compartments	1 or 2
Maximum Burial Depth	48" (1219 mm)
Minimum Burial Depth	6" (152 mm)
Maximum Pipe Diameter	6" (152 mm)
Weight	320 lbs (145 kg)



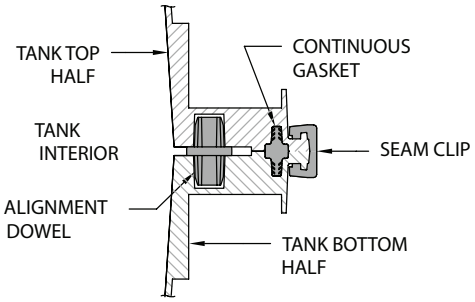
TOP VIEW



END VIEW



SIDE VIEW



MID-HEIGHT SEAM SECTION

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