

Grinder Pumps

The following words and definitions will be seen throughout this informational document on grinder pumps, low pressure systems, and more.

- 1. <u>Grinder Pump:</u> A submersible pump that includes a grinding mechanism. The pump grinds wastewater particulates to a slurry that can flow through small-diameter pipes.
- 2. <u>Gravity Sewer System:</u> A gravity sewer system collects wastewater from homes and transports it to a collection line. A gravity sewer system involves digging wide, downward-sloping trenches.
- 3. <u>Collection Line:</u> Pipes that are installed at a slope to keep both water flowing and solids in suspension.
- 4. <u>**Pressure Sewer Systems:**</u> Provide an alternative, innovative method for transferring wastewater through small diameter pipes to collection or treatment facilities.

Where Do You Use Pressure Sewer?

- 1. Undulating terrain
- 2. Rocky soil conditions
- 3. High groundwater table
- 4. Flat terrain

5. In conjunction with existing sewage collection systems to expand the service area





Advantages of Pressure Sewer Systems

Pressure Sewer Systems using grinder pumps are particularly effective in new construction, second-home communities and existing communities with aging septic tanks. With their smaller pipe diameters in the piping network reduce the solids size in the wastewater. The operating cost and maintenance of the pressure sewers' can economically solve the problems of aging septic tanks and unsatisfactory soil conditions. A pressure system can also offer a more effective and less costly method for sewage transport. They also provide excellent performance, highly reliable, low upfront infrastructure costs.

- Smaller Pipes: Smaller pipes allow for much more narrow and shallow trenches to be dug which reduces installation costs. When roads or streams separate a new lot from an existing system it can pose a challenge for a traditional gravity sewer system. Pressure sewer systems can reduce the need for road repairs and traffic disruptions due to the directional boring¹ of the small diameter piping.
- 2. <u>Compatible with Existing Collection Systems:</u> Pressure and gravity sewer utilities can be mixed and matched into site-specific designs to provide a complete solution to wastewater collection challenges. When a worn out septic system is at the end of its useful life, a pressure sewer system will provide a cost effective method to connect to a municipal system with minimal disruption to the existing landscape shortening remediation.
- 3. <u>Eliminates Risk of Inflow and Infiltration (I&I)</u>: In residential pressure sewers, the only required extraneous water entry points in the system between the homes and the treatment plant are the homes. Gravity based systems require manholes to

¹Horizontal Directional Drilling (HDD) is a trenchless method of sewer construction. It is suitable for soft to hard clays, wet soils, and environmentally sensitive areas. This method avoids having to dig large pits to install jacking and boring machines.



be places specific distances and at every pipe-turn, and these are potential entry points for infiltration/inflow.

- 4. **<u>Reduce Upfront Capital Costs:</u>** The low up front cost of a pressure sewer system force main compared to a more traditional gravity main represents a true cost saving for builders and developers. This combined with the deferred installation and cost of the grinder pump station to just prior to closing reduces cash outlay. Not only does the pressure sewer system cost less to install, but the cost savings grow proportionately as the number and size of lots increases.
- 5. <u>Odor Control:</u> Odors can be occasional problem in any wastewater system, as large-diameter, long-distance gravity mains can be a source of gas generation and odor. Pressure sewers are less likely to produce odors due to their short retention time and closed network of the small diameter pipelines. Falmouth, MA

Period from	5/18/2018			
Period Ending	5/11/2020		A Stranger	
Fime 1.984 Years		Years]	
Total Pumps Installed	671			
Total service calls	41			
Percent serviced/year	3%			
Breakdown of Calls	Number	Percent of calls Calls	Percent of All Pumps	Comments
Brown Out	7	17%	1.04%	Non-Pump Related Service vist at owner insistance
Power off at Breaker	3	7%	0.45%	Non-Pump Related
Electrical issue in Home	4	10%	0.60%	Non-Pump Related
Remote Sentry Batteries	1	2%	0.15%	Routine Owner Obligation
Plumbing clog before pump	3	7%	0.45%	Abuse
Broken Cord Grip	1	2%	0.15%	Installer issue
Water in Panel Back Penetration	1	2%	0.15%	Installer Issue
*Undetermined issue	2	5%	0.30%	Unknown at this time. Pumps are functioning well
Sensing Column and Grease issue	4	10%	0.60%	Abuse. Owners notified
*Sensing Colum Recharge (Seasonal)	10	24%	1.49%	From long dormancy. Pumps pulled and reset
Total Service Expense	\$ 9,103.00	1		
Cost Per Call (Average)	\$ 222.02			
Cost Per Pump Installed	\$ 13.57			
*Pump Related Service Costs	\$ 2,664.29	Total		
Cost Per Pump Installed	\$ 3.97	-		

Here is a video presentation and informative webinar by e-one : <u>All About Low Pressure Sewer System</u>



How Much Energy Does a Grinder Pump Use?



Energy Consumption of Selected Home Appliances

Item	Annual Electric Energy Usage Kilowatt Hours
Air Conditioner	2000
Clothes Dryer	1200
Refrigerator (12 cu. ft. auto-defi	rost) 750
42 Inch LCD TV 4 hours /day	300
E/One Grinder Pump	200*
Coffee Maker	100
Vacuum Cleaner	45
Clock	17

*With a \$0.11 cost per kWh, the energy cost per pump would average \$22.00 a year for a single family home.







E-One Grinder Pump Units Operation: Maintenance Questions and Answers



Environment/One Grinder Pump Units Operation & Maintenance Questions and Answers

Q. What is the average yearly cost of electricity to operate a unit servicing the typical single typical home?

A. A typical single family home will use 250 gallons of water per day. The E/One pump for this home will consume about 200 kwh of electricity per year. At \$.011/ kwh x 200 kwh = \$22.00 per year cost of electricity to operate the E/One pump.

Q. What is the maintenance schedule?

A. There is no required maintenance schedule. All pump components used are designed to provide years of trouble free service without maintenance. The storage tank is designed to be self-scouring, eliminating the need to wash down the tank periodically.

Q. What if my home is vacant for a period of time?

A. If you are planning to be away for more than two weeks -run clean water into the tank until the pump activates. Shut the water off and allow pump to run until it shuts off. If possible, leave the power on. This will insure that if somehow water from your home (such as a leaky faucet) gets into the tank it will be pumped out.

Q. What materials or objects will clog the pump?



A. The E/One pump is capable of accepting and pumping all materials commonly found in domestic wastewater as well as unintentional disposal of materia

commonly found in domestic wastewater as well as unintentional disposal of materials such as plastic - diapers - sanitary napkins. The toilet should never be used for a trash receptacle and materials that are non-biodegradable belong in proper trash receptacles. **DO NOT FLUSH** baby wipes.

Avoid - Bones and seafood shells as well as introducing large amounts of grit such as fish tank gravel as these wear on the grinding components of the pump. Avoid dumping cooking grease. Avoid metal (such as a bolt or nut) as these should not enter the grinding shroud.

The following materials should never be introduced into any sewer and may damage the pump components:

Explosives - Flammable materials - Strong chemicals - Gasoline.

Please contact your local authority for proper disposal Methods.

Q. Can I use a garbage disposal?

A. Yes. The E/One pump is not affected by material passing through a garbage disposal. Check local regulations about the use of garbage disposals.

Q. What type of Warranty does this pump unit have?

A. The Environment/One Corporation provides a two-year (from the date of installation) or 27 Month (from the date of shipment) whichever occurs first. The warranty covers manufacturer's defects for the entire pump unit (no pass through warranties) and includes parts and service, which is typically done On-site.





Q. How long will my pump last before I need to repair or replace it?

A. The E/One pump unit has been providing sewer to homes and businesses since 1970. Service providers and the Environment/One Corporation have kept excellent service records. The mean time between service calls has proven to be 8 to 10 years. The need for a major pump rebuild has proven to be 15 to 20 years.

Q. What is the cost for a repair or rebuild when needed?

A. Of course it will depend on what pump component was responsible for the service call, but again well kept service records show the most common call is related to wear of the rubber stator (boot) around the stainless steel rotor. We are typically able to rebuild a pump even after 15-20 years of service. The average ownership cost including operation and service has proven to be less than \$70.00 per year.

The E/One pump units you receive today have many upgrades, including solid state relays which should increase the Mean time between service calls and extend the over all life of the pump unit, both of which are already the best in the industry.

Q. If I get an alarm what should I do?

A. F.R. Mahony & Associates Inc. Is and has been the New England representative for the Environment/One Corporation for over 35 years. Each pump unit has an alarm panel in a location convenient to the homeowner. Each alarm panel is supplied with an F.R. Mahony name tag on it with telephone number to reach our 24 hour service department. A trained service technician will respond to your home to repair the pump. The occupants of the home can continue to use the system while the service technician is in route. Most repairs are completed on site. Should the service technician decide that the pump will be repaired at the service shop, they will place a replacement core (at no cost to you) in your wet well. This insures that your sewer system will work while your pump core is being repaired.

Q. Why can't I just call my plumber?

A. Because the pumps (which are designed and engineered specifically to operate in a domestic wastewater environment) are providing a very important function for the homeowner, Environment/One Corporation requires a commitment from the people and companies they approve for service. This commitment includes providing 24-hour service and charging no more per hour than other providers of similar service in the area. The approved service representatives also receive product specific training, insuring the customer receives professional service with genuine factory repair parts in a timely fashion. This policy has proven to be cost effective and appreciated by our thousands of customers.

Q. What happens if there is a power outage?

A. The pump does require electricity to operate. So when the electricity is out the pump will not run. During power outage water usage drops significantly, because the appliances, which account for much of the water we use, are not working. There is adequate storage in the wet well to continue using water for necessities for a period of several days. The pump will automatically come on when power is restored. The Environment/One Corporation now uses a NEMA 6 electrical quick disconnect instead of troublesome junction boxes. This feature allows a generator to be connected and provide power to the pump. Since most power outages are of short duration you will probably never have an occasion to take advantage of this feature.

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Typical Standard System Lay Out



Websites/PDF's with more information relating to grinder pumps, Wastewater collection systems, as well as diagrams and informative pictures.

- 1. <u>EPA</u>
- 2. <u>E-One</u>
- 3. <u>E-One Anywhere</u>

Works Cited

- BARNES. (2023, January 27). *Crane Pumps*. Retrieved from Advantages-of-Pressure-Sewer-Systems-White-Paper: https://www.cranepumps.com/uploads/2019/05/Advantages-of-Pressure-Sewer-Systems-White-Paper.pdf
- one, e. (2020, April 28). *All About Low Pressure Sewer System*. Retrieved from Youtube: https://www.youtube.com/watch?v=eYygVVKtA0Q



Please do not hesitate to call the office for any questions or for a tour of the Wareham Water Pollution Control Facility. We are open Monday – Friday 7am to 3:30pm. (508) 295- 6144.

