



STATE OF MAINE
DEPARTMENT OF HUMAN SERVICES
DIVISION OF HEALTH ENGINEERING
11 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0011

JOHN ELIAS BALDACCI
GOVERNOR

April 10, 2003

Aeration Systems
Attn.: Matthew Engleman
155 Gray Road
Falmouth, ME 04105

Subject: Product Registration, OxyBoost

Mr. Engleman:

Thank you for your letter dated March 6, 2003 regarding your company's product. This information was submitted pursuant to Section 1802 of the Maine State Plumbing Code, Subsurface Wastewater Disposal Rules (Rules), for code registration, for use in Maine.

Product Description

The OxyBoost consists of a plastic distribution box within which is an air intake system and a proprietary venturi assembly. As effluent is pumped through the device, air is drawn into the waste stream via the venturi, thereby oxygenating the effluent prior to final disposal. The OxyBoost is designed for use with conventional onsite sewage disposal areas.

Claim

According to the information you provided, the OxyBoost raises dissolved oxygen levels in septic tank effluent from <02.mg/l to as much as 8.5 mg/l.

Determination

On the basis of the foregoing, the Division has determined that the OxyBoost is acceptable for use in the State of Maine on a General Use basis, provided that it is installed, operated, and maintained in conformance with the manufacturer's directions.

Because installation and owner maintenance has a significant effect on the working order of onsite sewage disposal systems, including their components, the Division makes no representation or guarantee as to the efficiency and/or operation of OxyBoost. Further, registration of this product for use in the State of Maine does not represent Division preference or recommendation for this product over similar products.

If you have any questions please feel free to contact me at (207) 287-5695.

Sincerely,

James A. Jacobsen, Environmental Specialist IV
Wastewater and Plumbing Control Program
Division of Health Engineering
e-mail: james.jacobsen@state.me.us

/jaj

xc: Product File



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155 Gray Road • Falmouth, Maine 04105
(207) 797-7351 • FAX 878-2364

email: aerationsys@aol.com
website: www.septicaeration.com

March 6, 2003

James Jacobsen
Department of Human Services
Division of Health Engineering
State House Station 10
Augusta, Maine 04333



RE: Product submission for state approval

Dear Jim:

It has been a busy three years for Aeration Systems since we first wrote to you in May of 2000 to secure approval for our wastewater treatment system the OxyPro. Besides undertaking numerous projects involving the installations of OxyPro systems handling flows from 200 to 20,000 gallons per day, we have also been busy developing new products to further enhance the operation of more conventional subsurface wastewater disposal systems. We had the pleasure to unveil two of those new products at the MASE meeting this past month and at the Granite State Designers and Installers expo in New Hampshire this week and were very well received at both events. As such, I am writing to offer both new products for review by the state and inclusion on the department's approved products list if acceptable.

The OxyBoost™ is a modified eight-hole plastic distribution box designed to be installed in place of a conventional distribution box in any subsurface wastewater disposal area receiving pressurized wastewater via a pump station. The OxyBoost™ utilizes a specialized venturi to produce a negative pressure differential across the venturi whenever water is pumped to the subsurface wastewater disposal area. This pressure differential results in air being drawn into and entrained within the wastewater stream as it moves through the venturi into the distribution box and out to the disposal area components. The air is drawn through an intake assembly that includes a check valve and debris shield. The intake assembly is installed below grade inside an insulated fiber-reinforced valve box that has an access cover set flush with finished grade. The OxyBoost™ fulfills two separate functions not achieved by standard distribution boxes. Firstly, it injects additional oxygen into the wastewater helping to fortify the aerobic conditions found in the fill and soil at the base of a properly functioning disposal area. Field measurements of an installed OxyBoost™ indicate that wastewater pumped to a standard distribution box typically has a dissolved oxygen concentration of less than 0.2 mg/L, whereas wastewater passing through the OxyBoost™ instantly reaches saturation with a dissolved oxygen concentration of 8.5 mg/L. This

should help to delay the onset of hydraulic failure resulting from "slime" forming anaerobic bacteria which thrive when the oxygen demand exerted by the wastewater exceeds the amount of oxygen available in a disposal area. Secondly, the venturi portion of the OxyBoost™ slows the rate at which wastewater enters the distribution when the effluent pump is activated. An OxyBoost™ can slow the water entering a disposal area from a pump station by as much as 50%. This helps to reduce scouring effects in plastic chamber systems and prevents hydraulic overload of the distribution box and proximal components of the disposal area.

The Septic Sentry™ (pat. pending) is a device designed to aid septic system users in identifying hydraulic problems in a subsurface wastewater disposal area BEFORE the system actively fails by allowing water to pond on top of the ground or back up into the home. The Septic Sentry™ is comprised of a sensor and an alarm box. The entire unit is powered by a small 9VDC plug-in wall transformer to eliminate potential safety hazards. The sensor portion of the Septic Sentry™ is comprised of a miniature pellet float switch that is orientated vertically in a length of slotted PVC pipe. The slotted pipe serves to protect the float from contacting scum, soil, or other material which might interfere with its operation. The float is set to magnetically activate a sealed reed switch imbedded in the float stem when the float reaches a predetermined point. The entire sensor can be installed in a subsurface wastewater disposal area regardless of the type of system. As the system ages and the depth of ponding reaches the predetermined "critical" level the sensor is activated and alerts the alarm box via a buried low-voltage cable. The alarm box alerts the user with a flashing red light and an audible alert which can be silenced. Typically the critical level is selected to be approximately 1 inch below the bottom of the distribution piping in the subsurface wastewater disposal area. This alert level allows ample time for the user to have the system inspected, reduce water usage, or take other corrective action before the system fully malfunctions and presents a public nuisance.

Thanks for your time in reviewing these two products. We are very excited to fully introduce them into the market as we believe they represent a step forward in improving the function of conventional septic systems. I have include our sales literature on both products and look forward to answering any questions you might have. Should you wish, I can also arrange for you to view either product.

Sincerely,



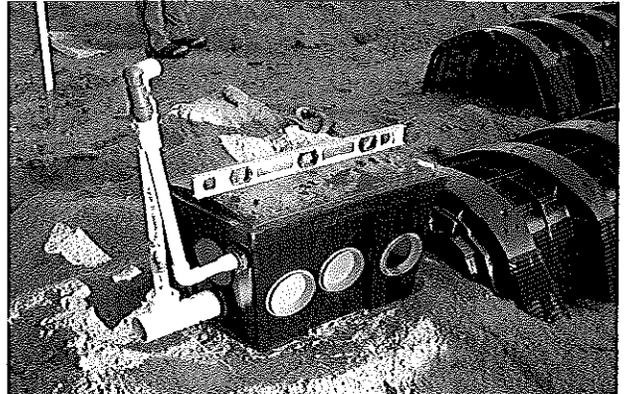
Matthew Engelman
Aeration Systems LLC

Aeration Systems Presents . . .

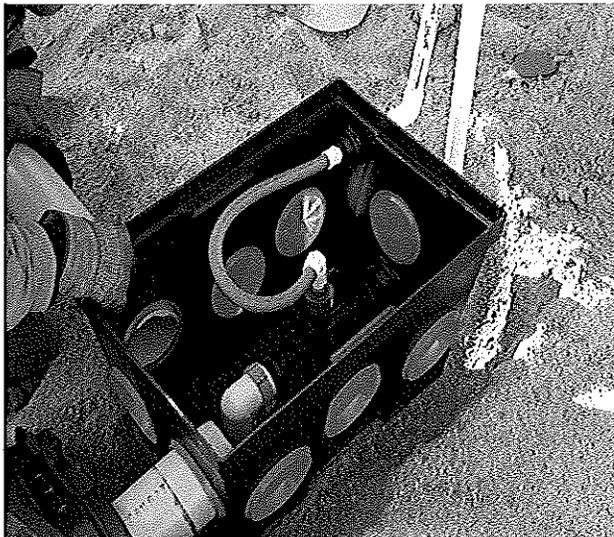
OxyBoost™

THE PASSIVE AIR INJECTION SYSTEM FOR PUMPED WASTEWATER

Septic system disposal fields generally fail due to lack of oxygen in the disposal field. Bacteria that live under these anaerobic conditions proliferate creating a clogging zone along the sides and base of the disposal field. OxyBoost delays the onset of anaerobic conditions, and the accompanying clogging in a disposal field by boosting the oxygen content in the wastewater. OxyBoost is intended to be installed in systems served by effluent pumps. The entire unit installs below grade.



THE PROCESS



The OxyBoost consists of an eight-hole plastic distribution box enclosing a venturi and air line. The OxyBoost is connected to the pump/line from the existing or proposed effluent pump. When the effluent pump turns on, wastewater is pumped through the OxyBoost where air is drawn into the wastewater via the venturi. The air is supplied via an intake assembly installed in a small irrigation valve box (not shown). The top of the green cover of this valve box is the only visible portion of the OxyBoost when the installation is complete. The oxygenated wastewater then flows to the disposal field through the attached distribution pipes. There are no moving parts or electricity supplied to the OxyBoost system.

COST

\$295.00 plus tax and shipping



155 Gray Road, Falmouth, ME 04105 • 207-797-7351 • www.septicaeration.com

WASTEWATER TECHNOLOGY

NSF/ANSI Standard 40 - *Residential Wastewater Treatment Systems*

Final Report:

Aeration Systems, LLC
OxyPro 1000C Wastewater Treatment System
08/04/055/0030

RECEIVED
APR 22 2010
WASTEWATER
PLUMBING PROGRAM



NSF International
789 N. Dixboro Road
PO Box 130140
Ann Arbor, Michigan 48113-0140 USA



John Elias Baldacci
Governor

Maine Department of Health and Human Services

Maine Center for Disease Control and Prevention
(Maine CDC)
286 Water Street
11 State House Station
Augusta, ME 04333-0011

Brenda M. Harvey
Commissioner

Dora Anne Mills, MD, MPH
Public Health Director
Maine CDC Director

April 24, 2007

Aeration Systems
Attn.: Richard A. Sweet, Vice President
155 Gray Road
Falmouth, ME 04105

Subject: Use of OxyPro Advanced Treatment Units in Maine

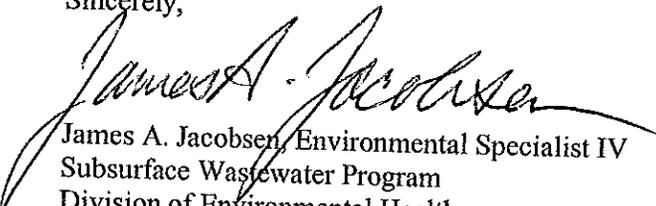
Dear Mr. Sweet:

This letter is in response to your letter of 04/13/07.

In march of 2001, the Division approved the use of OxyPro advanced treatment units in Maine. While we do not have jurisdiction in the marketing and so forth of any particular product, we are aware that the OxyPro is in relatively wide spread use. Further, we are not aware of any issues or problems with these devices.

Please contact me at (207) 287-5695 if you have any additional questions.

Sincerely,


James A. Jacobsen, Environmental Specialist IV
Subsurface Wastewater Program
Division of Environmental Health
e-mail: james.jacobsen@maine.gov

/jaj

xc: OxyPro File

FILE

OXI PRO PRODUCT
FILE



Fax Cover Sheet

To: RUSSELL MARTIN

Company: DIVISION OF HEALTH ENGINEERING

Fax #: 287-3165

From: MATT ENGELMAN

Date: 4-17-03

Pages (including cover sheet): 2

Comments:



155 Gray Road
Falmouth, ME 04105
(207) 797-7351
(207) 878-2364
aeration@maine.rr.com
www.septicaeration.com



155 Gray Road • Falmouth, Maine 04105
(207) 797-7351 • FAX 878-2364

email: aerationsys@aol.com
website: www.septiceraeration.com

April 17, 2003

John Toothaker
Sebago Technics
PO Box 1339
Westbrook, ME 04098

Mr. Toothaker:

I am writing regarding your inquiry about reducing the vertical separation distance between ledge and the base of a replacement septic system from 24 to 12 inches when using an OxyPro advanced wastewater treatment system to pretreat the septic tank effluent. I spoke with Russell Martin at the Division of Health Engineering regarding your request. Mr. Martin stated that he has traditionally granted that reduction for disposal areas preceded by SeptiTech treatment systems. He stated that because OxyPro and SeptiTech are functionally equivalent the department would allow the same reduction for OxyPro equipped disposal systems.

Sincerely,

A handwritten signature in black ink, appearing to read "Matthew Engelman", is written over a horizontal line.

Matthew Engelman
VP-Operations
Aeration Systems, LLC

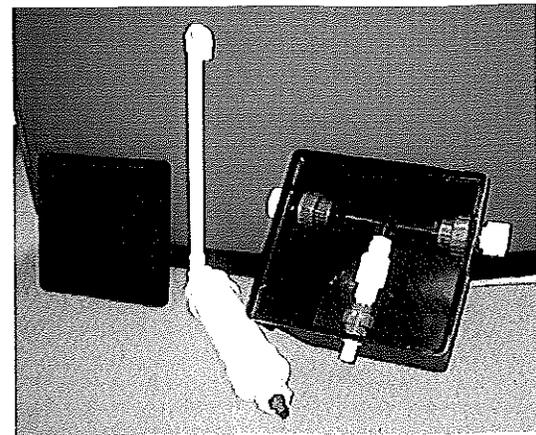
cc. Russell Martin

Aeration Systems Presents . . .

OxyBoost

THE PASSIVE AIR INJECTION SYSTEM FOR PUMPED WASTEWATER

Septic system disposal fields generally fail due to lack of oxygen in the disposal field. Bacteria that live under these anaerobic conditions proliferate creating a clogging zone along the sides and base of the disposal field. OxyBoost delays the onset of anaerobic conditions, and the accompanying clogging in a disposal field by boosting the oxygen content in the wastewater. OxyBoost is intended to be installed in systems served by effluent pumps. The only above ground component is the air vent.



THE PROCESS

The OxyBoost consists of a small plastic container enclosing a venturi and air line. The container is buried in the ground. The OxyBoost is connected to the pump/line from the existing or proposed effluent pump. When the effluent pump turns on, wastewater is pumped through the OxyBoost where air is drawn into the wastewater via the venturi. An air vent with an attached muffler is generally located next to the house and is connected to the venturi. This oxygenated wastewater is then pumped to the disposal field. There are no moving parts or electricity supplied to the OxyBoost system.

COST

\$295.00 plus tax and shipping



Aeration Systems Presents . . .

SEPTIC SENTRY™

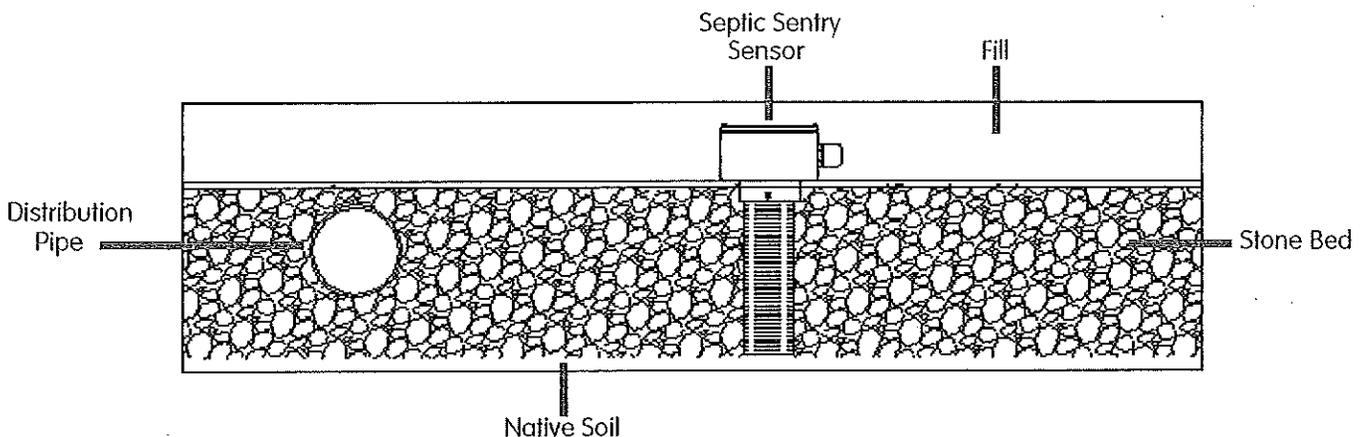
Pat. Pend.

The advanced leach field monitoring system

Aeration Systems developed the Septic Sentry for monitoring large disposal areas. The Septic Sentry provides an early warning before a malfunction can occur.

As traditional wastewater disposal areas age, the infiltration rate of the soil decreases causing effluent to pond in the disposal field. This ponding progresses over time until eventually the disposal field "fails." Often there is no warning that a disposal area is about to fail. This can present a major health and image problem for restaurants, hotels, day care centers, summer camps, and other similar facilities.

The Septic Sentry is comprised of one or more water level sensors that can be installed in stone bed, plastic chamber, in-drain, or fabric covered pipe style disposal areas. These sensors send a signal to the Sentry control panel if effluent begins to rise past a pre-determined "alert level." Multiple level sensors are also available to track water levels throughout the life of a disposal area.



In addition to serving as an "early warning system" the Septic Sentry is uniquely suited to monitor for unequal distribution in large systems. It can also be adapted to automate distribution systems which utilize zoned or multiple disposal areas.

***Commercial septic systems represent a massive investment.
Protect your system with the Septic Sentry.***

Typical cost is \$95 for single-zone, single level monitoring.

Please call for specific pricing.



155 GRAY ROAD, FALMOUTH, ME 04105 • 207-797-7351 • WWW.SEPTICAERATION.COM



STATE OF MAINE
DEPARTMENT OF HUMAN SERVICES
DIVISION OF HEALTH ENGINEERING
10 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0010

ANGUS S. KING, JR.
GOVERNOR

KEVIN W. CONCANNON
COMMISSIONER

March 29, 2001

Aeration Systems
Attn.: Richard A. Sweet
155 Gray Road
Falmouth, Maine 04105

Subject: Product Registration, Aeration Systems, OxyPro Advanced Treatment Unit

Dear Mr. Sweet:

Thank you for your letter dated February 16, 2001 regarding your company's product. Please forgive my delay in responding.

Under provisions of Section 1802 of the Maine State Plumbing Code, Subsurface Wastewater Disposal Rules (copy enclosed), the Division approved the Oxymax 2000 advanced treatment unit for use in Maine, in June of 2000. The device has been renamed OxyPro, and four units with a revised design have been installed.

It is our understanding that fine tuning of the design for the device has resulted in consistent effluent quality of less than 10 milligrams/liter of BOD₅ and TSS, each. You have asked for a reduction in disposal area sizing of 50 percent, pursuant to Table 603.1 of the Subsurface Wastewater Disposal Rules.

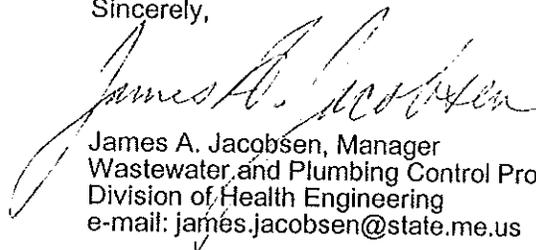
Therefore, the Division grants approval for use of the OxyPro, pursuant to Chapter 18 of the Rules, Section 1801.0. This approval is subject to the following conditions:

1. The OxyPro is allowed a 50% reduction to the disposal area sizing; and
2. Provided that such records are available, laboratory analyses of BOD₅ and TSS reductions for the four installed units must be submitted to the Division on at least a quarterly basis, comprising at least one calendar year's worth of data for each system.

Because installation and owner maintenance has a significant effect on the working order of onsite sewage disposal systems, including their components, the Division makes no representation or guarantee as to the efficiency and/or operation of Aeration Systems, OxyPro. Further, registration of this product for use in the State of Maine does not represent Division preference or recommendation for this product over similar products.

If you have any questions please feel free to contact me at (207) 287-5695.

Sincerely,



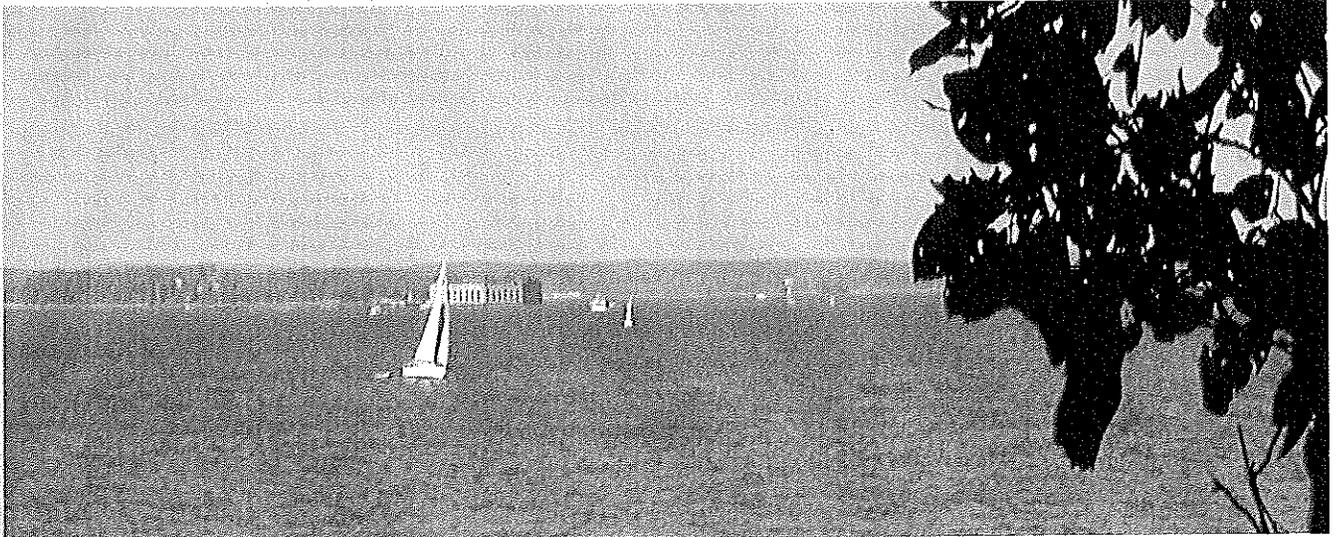
James A. Jacobsen, Manager
Wastewater and Plumbing Control Program
Division of Health Engineering
e-mail: james.jacobsen@state.me.us

cc: Product File
OxyMax File



RECYCLING SYMBOL

OXYPRO 1000



Wastewater Technology

"We design septic system products with simplicity, practicality, and low cost - our primary objectives."

(Richard Sweet)

Aeration Systems

155 Gray Road

Falmouth, ME 04105

(207) 797-7351

(207) 878-2364 Fax

E-mail: aerationsys@aol.com

Web site: www.septicaeration.com

Aeration Systems

155 Gray Road, Falmouth, ME 04105

October 2000

Dear Wastewater Professional:

Thank you for your interest in Aeration Systems, LLC and our line of innovative wastewater treatment products. Enclosed are some materials to introduce OxyPro, our answer to the call for a cost-effective, on-site wastewater treatment system.

OxyPro (formerly OXYMAX) is an advanced sewage treatment system capable of cleaning sewage effluent to the point where it is environmentally safe, reducing the size of the leach field and extending the life of the disposal area. The system is simply and practically designed and operates at low cost. The designers of the OxyPro have more than 40 years experience designing septic systems and working on creative solutions to septic system problems. We bring that experience not only to the design, but also to the installation and follow-up. The OxyPro has received a Maine Technology Institute grant for continued testing. Modifications are an on-going part of our quest to always be improving our products. The OxyPro has been installed in single-family homes and in a community system of 106 houses. The OxyPro has been approved by the Maine Department of Human Services for use in residential and commercial sites. The state approval allows for a 30% reduction in disposal field size and a 10 point New System Variance credit.

Every aspect of the OxyPro system has been carefully considered to maximize treatment effectiveness and durability while minimizing cost and complexity. We are constantly improving our products with input from designers and installers - at Aeration Systems innovation is a way of life.

Please feel free to contact us with your wastewater disposal needs.

Sincerely,



Richard A. Sweet
President, Aeration Systems

(207) 797-7351

(207) 878-2364 Fax

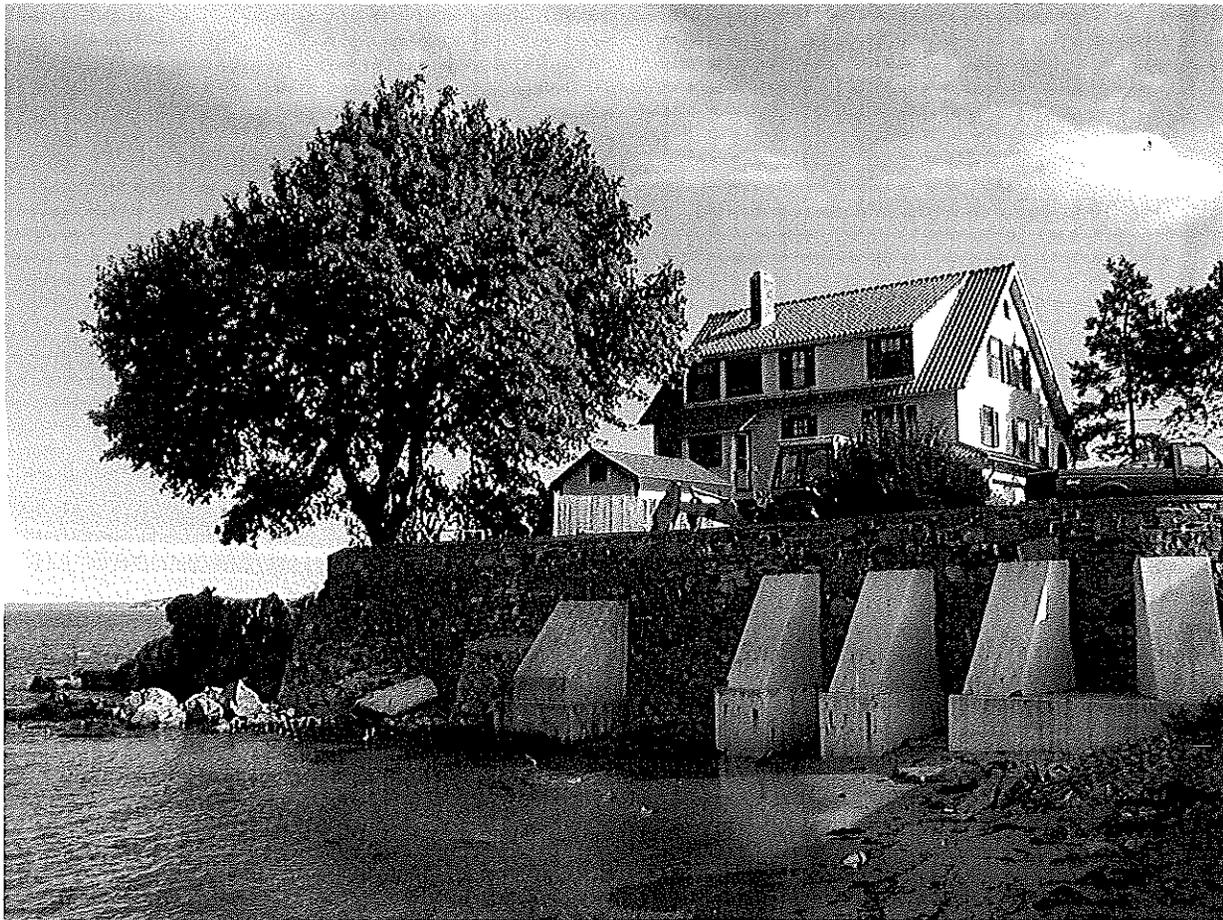
aerationssys@aol.com

Welcome to Aeration Systems!

Airing out the Wastewater Problems in Your World.

We are environmental geologists and septic system designers with more than 40 years of experience designing and inspecting on-site wastewater disposal systems. Our products are designed to meet the needs of people experiencing the problems we have consulted on all these years. Our practical approach to problem solving helps us help you!

We design septic system products with simplicity, practicality, and low cost - our primary objectives. Please have a look at the information here and if you do not find the answers you need, do not hesitate to contact us by E-mail at aerationsys@aol.com or by telephone at 207-797-7351.

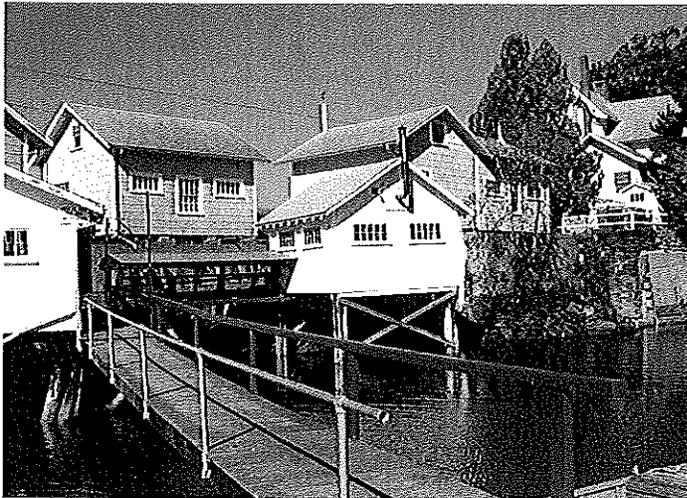


Typical OxyPro advanced wastewater treatment unit installation site.

OxyPro

The OxyPro offers you an innovative system of wastewater treatment at a reasonable price. It combines the best design components of modern aeration methods and avoids unnecessary complexity in both installation and operation. It is suitable for new septic systems as well as an addition to existing systems.

By reducing the strength of the wastewater through natural, aerobic microbial growth, the OxyPro will extend the working life of a standard sized leach field.



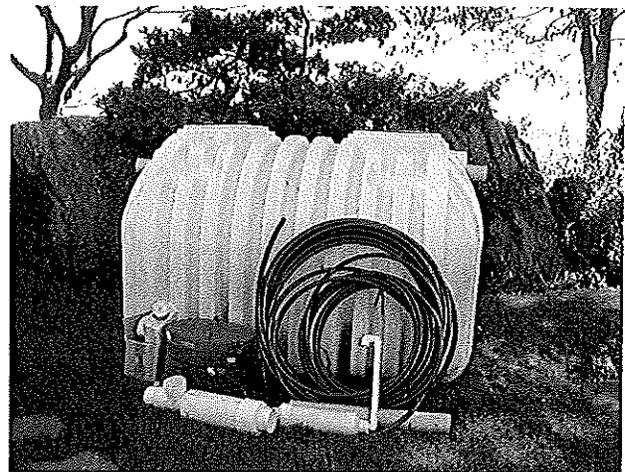
Depending on local regulations, the use of OxyPro allows a smaller leach field to be installed. Where space is at a premium, OxyPro may be the best choice.

OxyPro is designed with the owner in mind. All working components are buried out of sight. Only a small vent pipe is above ground. OxyPro is silent, inexpensive to operate, and unobtrusive.

OxyPro is uniquely suited to handle tough wastewater disposal systems.

The operation of OxyPro is controlled by a tamper resistant, pre-programmed panel. An alarm is included in the event air flow is interrupted. If disinfection of wastewater is required before disposal, a sterilizing ultraviolet unit is available.

OxyPro systems for common household flows are available as complete packages ready for immediate installation. On sites with special installation or treatment requirements Aeration Systems can provide the custom design and technical expertise to get the job done.

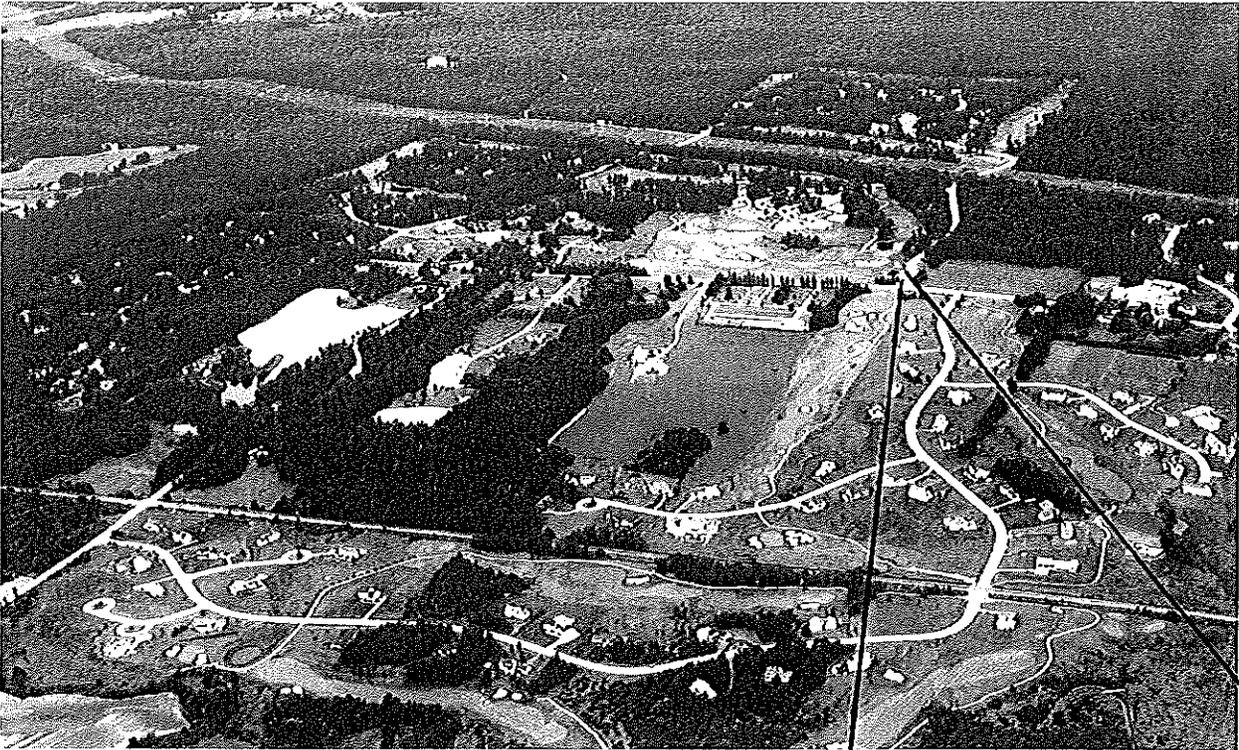


A typical residential OxyPro unit delivered with all components, hoses, and fittings and ready for installation.

The OxyPro system has repeatedly demonstrated its ability to be adapted to handle a wide range of wastewater flows, strengths, and on-site conditions. OxyPro has been used to successfully treat flows ranging from 180 to 30,000 gallons per day.

For people seeking a cost-effective solution to wastewater treatment, OxyPro is the best choice.

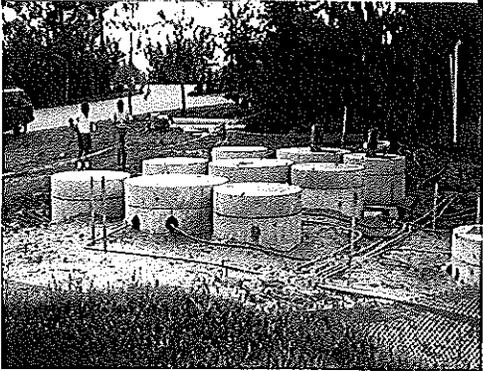
The OxyPro has received a Maine Technical Institute scientific grant to continue research and development on this unique system.



100+ housing development served by a centralized OxyPro treatment system and on-site subsurface wastewater disposal area.



Completed installation of the OxyPro system.



Custom centralized OxyPro system, handling 30,000 gallons per day, undergoing installation.

The OxyPro System

General Process Description

Septic Tank

Wastewater from the house flows into a septic tank sized according to State Code. In the septic tank, settling occurs with the formation of sludge and scum. Clarified wastewater flows through a filter and into the OxyPro tank.

Aeration Treatment Unit - OxyPro

In the OxyPro tank the wastewater is aerated using a high-efficiency, low-pressure blower and a bubble diffuser. The diffuser allows oxygen transfer and mixing of organic rich wastewater and oxygen. The aeration promotes the growth of aerobic microorganisms which convert and remove biodegradable organic matter. (The organics removed by the aerobic process are the constituents that are measured in the BOD₅ analysis).

To increase contact time the OxyPro utilizes a biomedium in the aerobic sections. This plastic media is used to supply a support structure for the establishment of microorganisms and is specifically developed for optimized biological growth. The main advantage is that the microorganisms are attached to the media and do not get flushed out at high input flow rates. The biomedium also enhances the nitrification process, which requires a larger population of organisms due to the lower metabolic rate of the nitrifying bacteria.

The aerobically treated wastewater, which is now high in nitrates but low in carbon, flows into the second chamber of the system, where clarification and settling of the suspended solids take place. The cleaner water in the clarification chamber rises to the top and flows into a second set of aeration and clarifying chambers to complete treatment.

To promote denitrification and to remove the accumulated biomass, the wastewater is recirculated from both clarifying chambers back to the septic tank. Denitrification is facilitated by this recirculation because the bacteria in the septic tank use the oxygen from the nitrate molecule with nitrogen being released as gas. Removing the accumulated biomass also helps to ensure optimum clarifier performance resulting in an effluent with low suspended solids. The recirculation process also benefits the system in times of low loading such as vacation periods or during the night. When the water is recirculated, it carries nutrients from the septic tank into the OxyPro.

The OxyPro is controlled by a computer system. The computer runs the pumps and alarm. The computer can also be connected through the telephone to a monitoring facility to eliminate the need for alarms on-site.



155 Gray Road • Falmouth, Maine 04105
(207) 797-7351 • FAX 878-2364

email: aerationsys@aol.com
website: www.septicaeration.com

February 16, 2001

James A. Jacobsen, Manager
Wastewater & Plumbing Control Program
Division of Health Engineering
10 State House Station
Augusta, ME 04333-0010

RE: OxyPro (formerly OxyMax), Aeration Systems

Dear Jim:

This is a follow-up from your letter of June 29, 2000, regarding Division approval of the OxyMax 2000. First, we have officially changed the name of the product to OxyPro since the U.S. Trademark Office denied our use of the name OxyMax. We are now awaiting trademark approval of the OxyPro. We will add numbers after the word OxyPro that will correspond to the tank size we are using, i.e. OxyPro 1000 if we install our processor in a 1,000 gallon tank.

Attached is a copy of an installation manual and homeowner's operation manual for your approval, as requested. We expect to make minor changes to both documents as time goes on.

Since our original application to you on May 2, 2000, we redesigned the product increasing the size, changing to a compressor blower, and adding minor advances. We have four of these newest versions in the ground. The longest running one was installed on September 25, 2000 and is averaging 9.5 mg/liter BOD and 6.5 mg/liter TSS. As per Table 603.1 we are requesting a 50% disposal field reduction based on the efficiency of the OxyPro system. These systems are being sampled on a quarterly basis and as lab results become available we will provide them to you.

Thank you for your review of this application.

Sincerely,

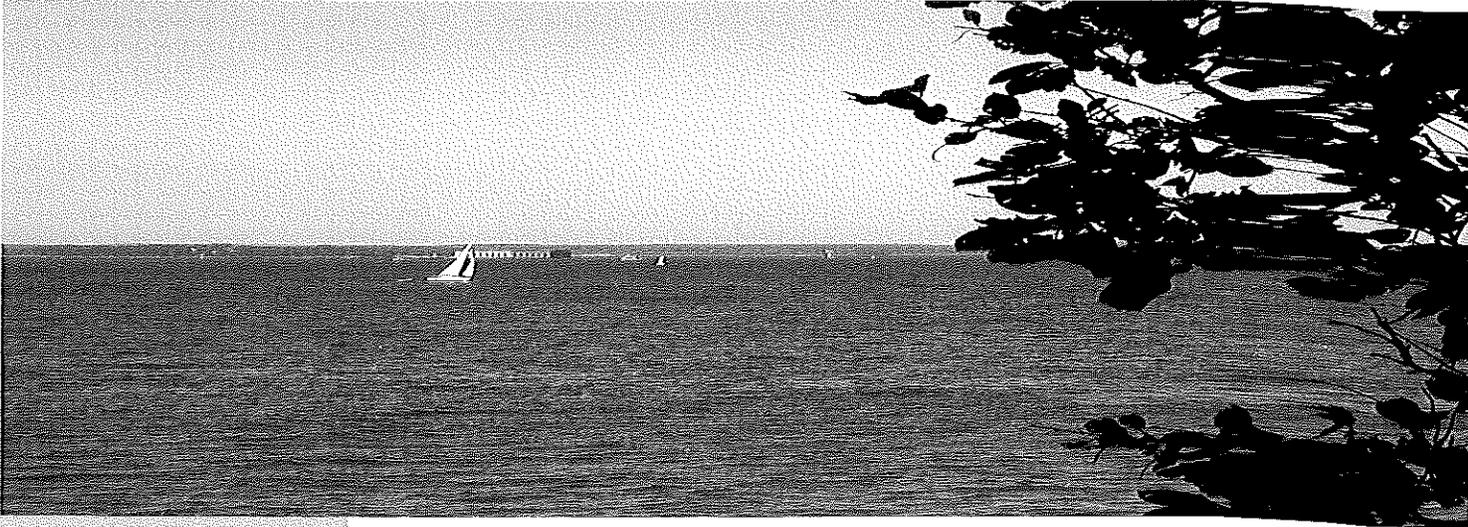
Richard A. Sweet

Enclosures

RAS/smh



OxyPro 1000



Wastewater Technology

*"We design septic system products with simplicity, practicality, and low cost - our primary objectives."
Richard Sweet*

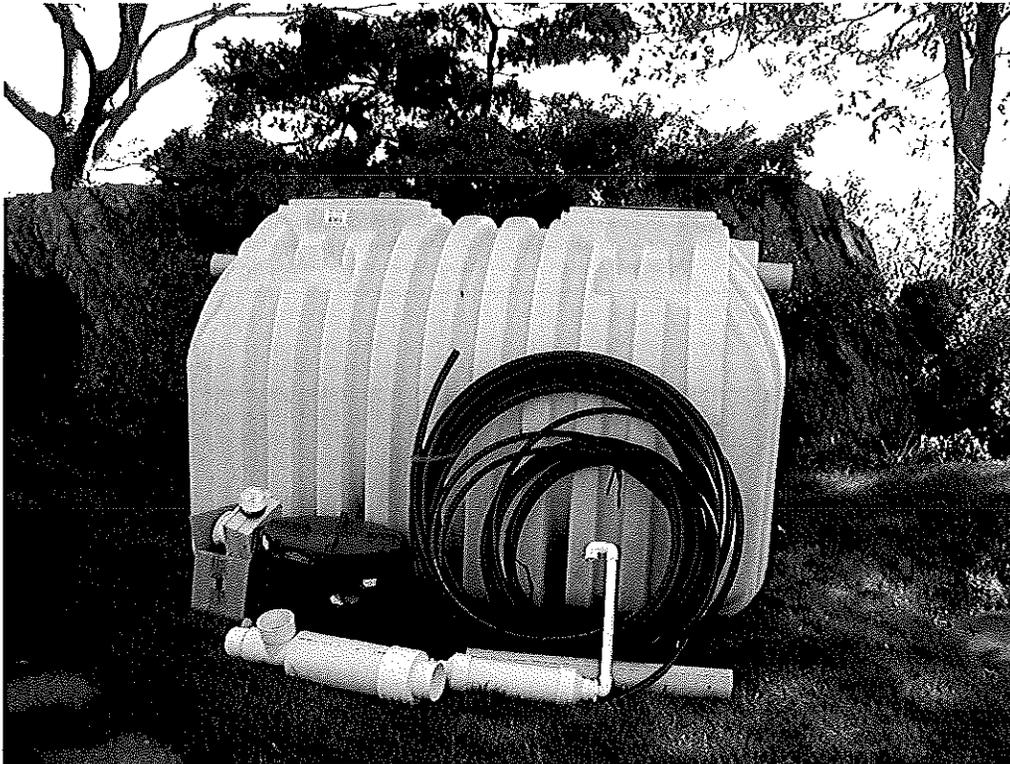
Installation Manual

Aeration Systems
155 Gray Road
Falmouth, ME 04105
(207) 797-7351
(207) 878-2364 Fax
E-mail: aerationsys@aol.com
www.septicaeration.com

INSTALLATION MANUAL

Aeration Systems has made every attempt to design the OxyPro system so that it is easy to install and operate. That being said, OxyPro is still a highly advanced system to treat wastewater and must be properly installed to function at optimal performance. We encourage installers to familiarize themselves with all aspects of the OxyPro system in order to provide efficient quality installation. If you have any questions about the OxyPro system, please feel free to contact our technical support specialists. We understand that every site is different and presents its own challenges. We are eager to help in any way possible. We also urge installers to consider signing up for our free informational course on the OxyPro system. This course covers the basic principles behind the system as well as installation and servicing details. Completion of the course and some additional fieldwork will qualify attendees to become factory certified service technicians.

This installation manual is divided into two sections. The first section is a basic, step-by-step procedure covering a typical OxyPro installation. The second section provides a detailed description of each major OxyPro component.



SECTION I: OxyPro General Installation

1. Over dig the hole for the OxyPro Processor Tank 18 - 24 inches on the sides, 6 - 12 inches on the bottom.
Fill the bottom of the hole with a well compacted sand and gravel mixture to necessary elevation. The tank must be installed level to ensure proper operation.

2. Install cover and any risers before beginning to backfill. The processor tank covers must be within 6 inches of finished grade.
3. Begin filling tank with clean water into the inlet or outlet when starting to backfill. Keep the water level and backfill levels even to prevent tank warping. Backfill with gravelly sand in well compacted 12 inch lifts. Always compact tank ends first. Compact the backfill under the inlet and outlet pipes.
4. Install the air blower housing (do not install below the spring high water table). The air blower housing lid must be within 6 inches of finished grade.

5. Connect the air line from the air blower unit to the processor tank using the 3/4 inch red color-coded connectors on the air blower housing and the processor tank.

6. Connect the waste line from the processor tank to the septic tank using the 1 inch blue color-coded connectors on the processor tank and the 4 inch septic tank inlet adapter.

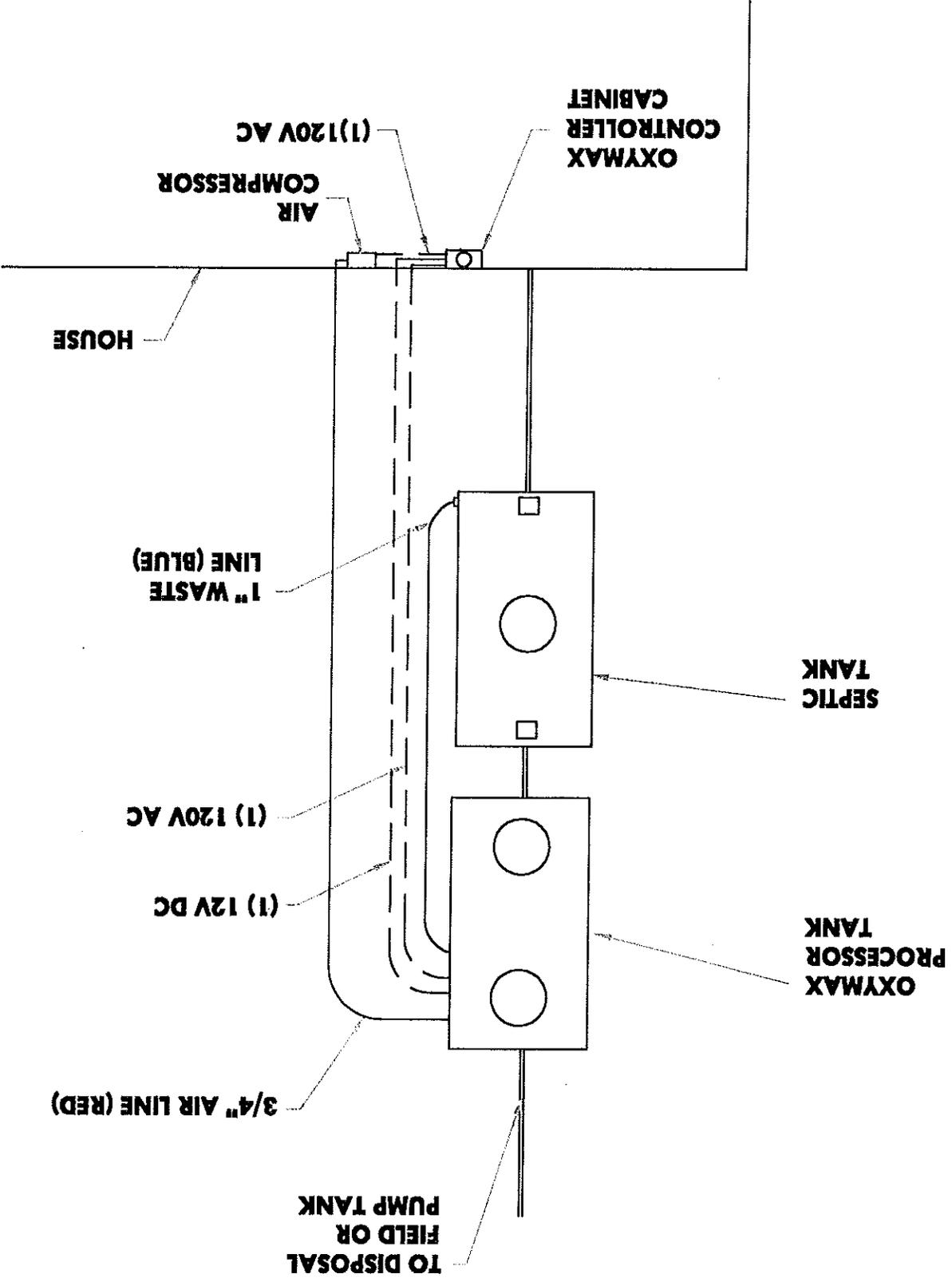
7. Connect vent/muffler and piping to air blower housing using the 1 inch green color-coded connectors on the processor tank and the vent assembly.

8. Install OxyPro control cabinet inside the house and complete electrical hook-ups to the air blower, waste pump, and 12V DC alarm switch. See electrical specifications for detailed electrical information and instructions.

9. The location of all buried covers must be noted (on a sketch plan) with measurements to permanent features such as house corners. This sketch should be given to the homeowner or stored inside the OxyPro control cabinet.

SECTION II: OxyPro Components

The OxyPro system is comprised of four major components. These are 1) the OxyPro processor tank, 2) the air blower and air blower housing, 3) the air vent and muffler, and 4) the OxyPro controller and controller cabinet.



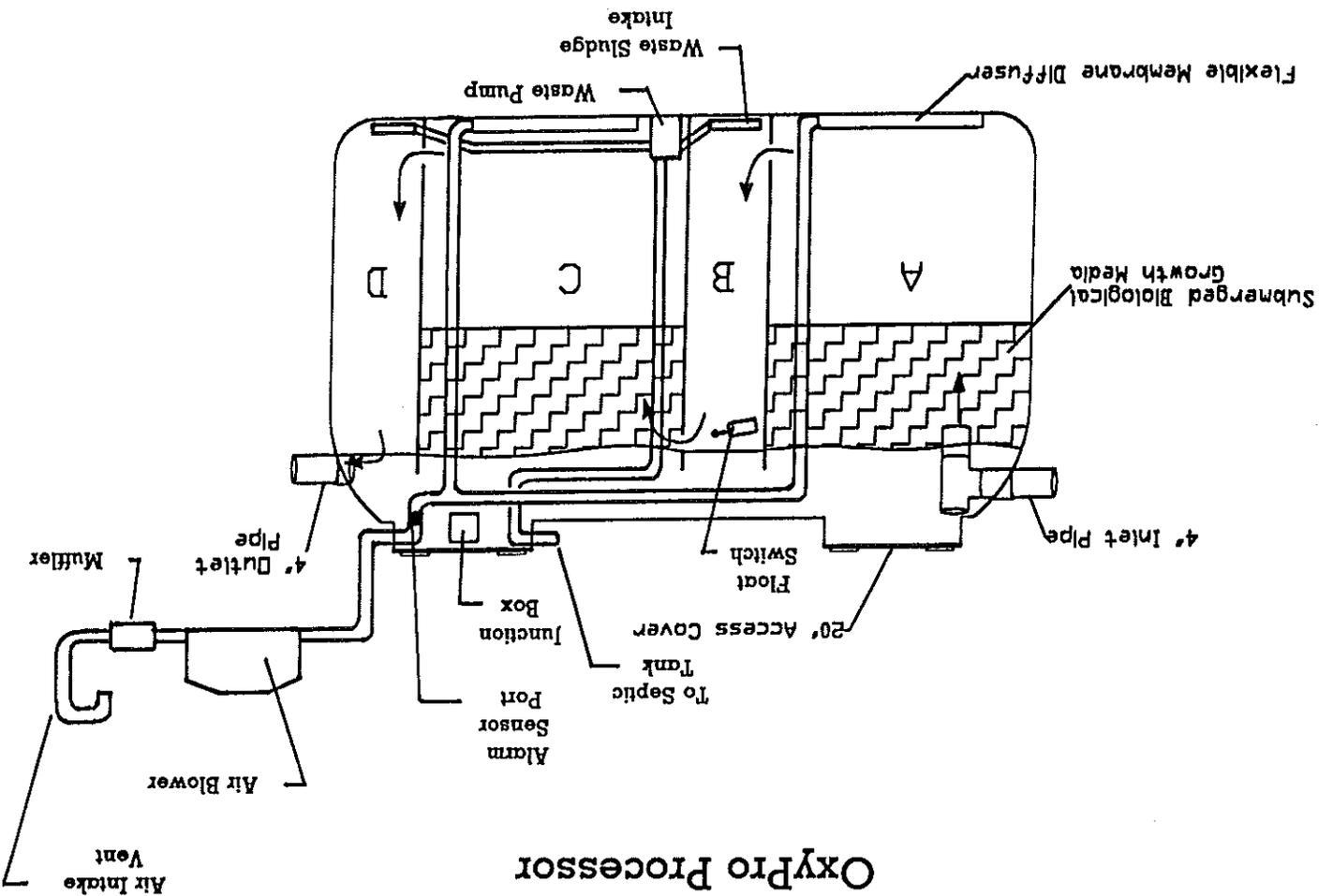
TYPICAL OXYPRO INSTALLATION

The OxyPro Processor Tank:

The processor tank is where the majority of the actual wastewater treatment occurs. The tank consists of a polyethylene tank with a volume of 1000, 1500, or 2000 gallons depending on the OxyPro model. Concrete tanks may also be used but require special arrangements and sometimes additional cost. Please contact Aeration Systems for information regarding concrete tanks.

The processor tank is installed between the septic tank and the disposal field. Wastewater flows out of the septic tank, through the processor tank, and to the disposal field by gravity or lift station. There are three inches of elevation drop between the inlet and outlet of the processor tank. If there is insufficient elevation drop between the processor tank and the disposal field then a pump and pump tank, supplied by the installer, needs to be provided to pump wastewater to the disposal field.

There are four compartments inside the OxyPro processor tank. The first chamber, located at the inlet end of the tank, is a large aeration compartment. In this chamber air is bubbled through the wastewater from a medium bubble diffuser anchored to the bottom of the tank. Some of this air dissolves into the wastewater, increasing the dissolved oxygen (DO) level. This high dissolved oxygen level allows aerobic microorganisms to thrive in the water. These kinds of microorganisms are extremely efficient and use the organic material in the wastewater as food.



OxyPro Processor

SECTION II (Cont.)

Huge numbers of these microorganisms live on a special plastic media that floats in the aeration chamber. The microorganisms rapidly use up the organic material in the wastewater. As some of these bacteria colonies grow old and die, they fall off the plastic media and float along in the wastewater. Turbulence from the air bubbles keeps these dead bacteria from falling to the bottom of the chamber. Instead they are carried by the wastewater into the next chamber. This compartment is smaller than the first and does not have air being bubbled through it. As a result, the water in this compartment is very calm. The wastewater slowly flows up towards the entrance to the next chamber. Because the wastewater is so still in this chamber, the colonies of dead microorganisms carried from the first aeration compartment fall to the bottom. At the bottom of the clarifier they are drawn into the intake of the waste pump. The waste pump delivers the dead bacteria back into the inlet end of the septic tank.

The dead bacteria settle to the bottom of the septic tank until they are removed during normal septic tank pump-out.

The third and fourth chambers in the processor tank mirror the first and second so that the wastewater goes through two aeration chambers and two clarifiers. As a result, the effluent leaving the processor tank is clean, clear, and nearly odorless.

The OxyPro Compressor and Compressor Housing:

The air bubbled through the wastewater in the processor tank is supplied by a compact, highly efficient linear diaphragm air compressor. The compressor is housed in a small polyethylene basin. The basin has color coded hose connections for the included 3/4 inch flexible piping connecting the compressor to the processor tank and the hose to the vent and the muffler. The compressor and its housing may be installed below ground where no water table is present. The top of the housing must be within six inches of finish grade and its location should be noted relative to the house or other landmark. The compressor may also be removed from the housing and mounted inside the home. This arrangement allows for easier servicing and should cause minimal disturbance as the compressor is very quiet.

The OxyPro Vent and Muffler:

When the compressor and compressor housing are installed below ground the vent and muffler must be attached to supply the compressor with fresh air. The vent and muffler must be installed in a sheltering area that will be free from drifting snow. Underneath a deck or porch is a perfect spot for installing the vent and muffler. The vent is attached to the compressor housing using the color coded hose connections and the included one inch flexible pipe. If the compressor is installed in the house the vent and muffler are not needed since air from the house is drawn into the compressor for use in the processor tank.

SECTION II (Cont.)

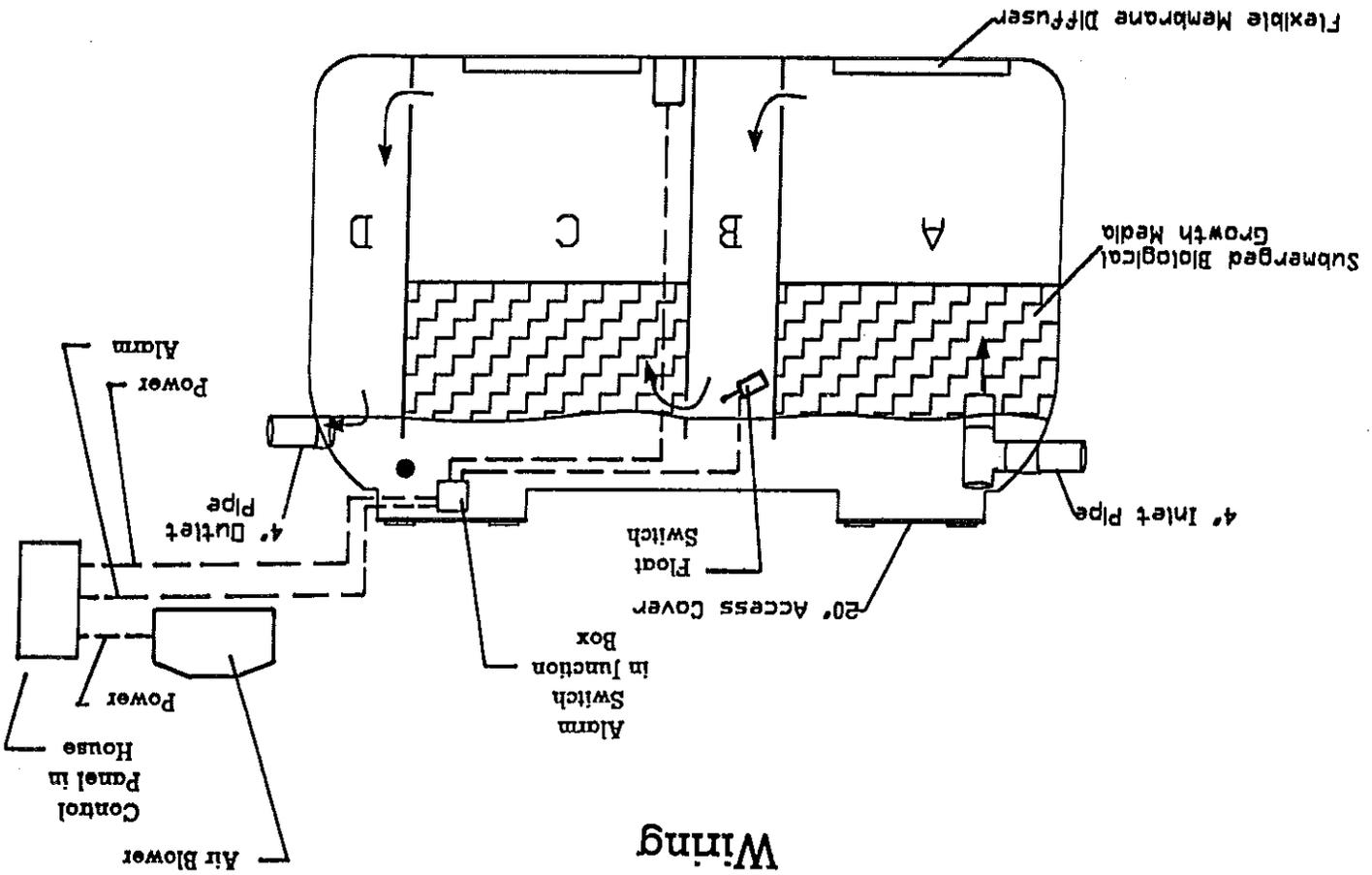
The OxyPro Controller:

The OxyPro system is controlled by a custom-built programmable logic computer controller located in the controller cabinet. The main functions of the controller are to operate the compressor, to turn the waste pump on and off at pre-programmed times, and to provide an alarm in the event of a mechanical problem. The controller can be plugged directly into standard 120VAC household current. An internal 12VDC transformer supplies power to the computer controller. Electrical connections are made in the junction box, below the controller cabinet. Two 120VAC leads are supplied to provide power for the compressor and the waste pump. These two components share a common ground and neutral. The remaining two wires go to the pressure switch in the processor tank. This switch senses air flow loss in case of compressor failure and signals the controller to sound the alarm. The processor tank and compressor housing are supplied with fittings for direct burial underground feed wire.

The controller is supplied with an audible and visual alarm. The audible alarm can be silenced using the small toggle switch located outside the control cabinet on its right hand side.

If the alarm should sound, check the air intake vent for any signs of blockage. Do not attempt to access the blower unit or processor tank. These components are designed to be serviced by authorized personnel only. Please contact Aeration Systems or a certified service technician in the event of an alarm.

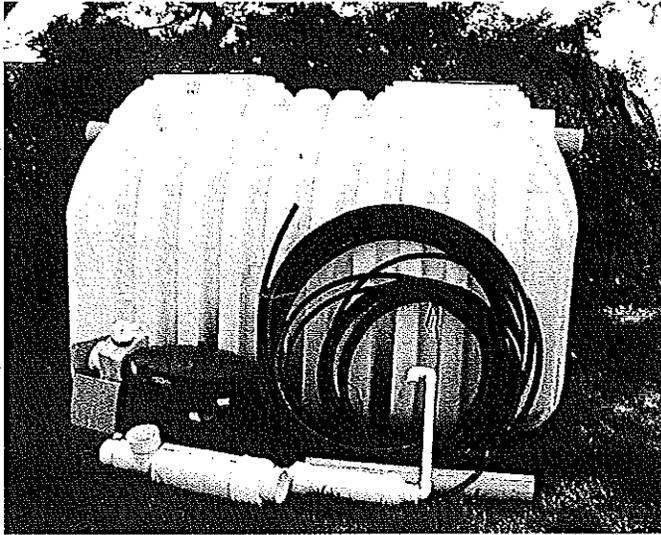
Wiring



OxyPro 1000



155 Gray Road
Falmouth, ME 04105
207-797-7351
www.septicaeration.com



A typical residential OxyPro unit delivered with all components, hoses and fittings. Ready for installation.

50% leach field reduction with the OxyPro System

The OxyPro septic system is the best in the business because septic system specialists design it. These professionals have over 40 years experience as environmental geologists and septic system consultants and have used this experience to design an innovative system of wastewater treatment at a reasonable price. Because of this, OxyPro sets the standard for wastewater treatment systems, combining the best design components of modern aeration methods while avoiding unnecessary complexity in both installation and operation. OxyPro is suitable for new septic systems as well as an addition to existing systems.



OxyPro is uniquely suited to handle tough wastewater disposal problems.

The OxyPro advantage includes the following benefits:

- 50% leach field reduction in Maine
- Extends the life of standard sized leach fields
- Reasonably priced and inexpensive to operate
- Unobtrusive design which operates noiselessly
- Can be designed to treat flows of any size
- Minimal maintenance requirements
- Can be delivered in either a standard concrete or plastic tank to meet your needs

By reducing the strength of the wastewater through natural, aerobic microbial growth, the OxyPro will extend the working life of a standard sized leach field. Depending on local regulations, the use of OxyPro allows a smaller leach field to be installed. Where space is at a premium, OxyPro may be the best choice.

OxyPro is designed with the owner in mind. All working components are buried out of sight. Only a small vent pipe is above ground. OxyPro is silent, inexpensive to operate, and unobtrusive. The system runs on standard household electricity and draws only 5 amps.

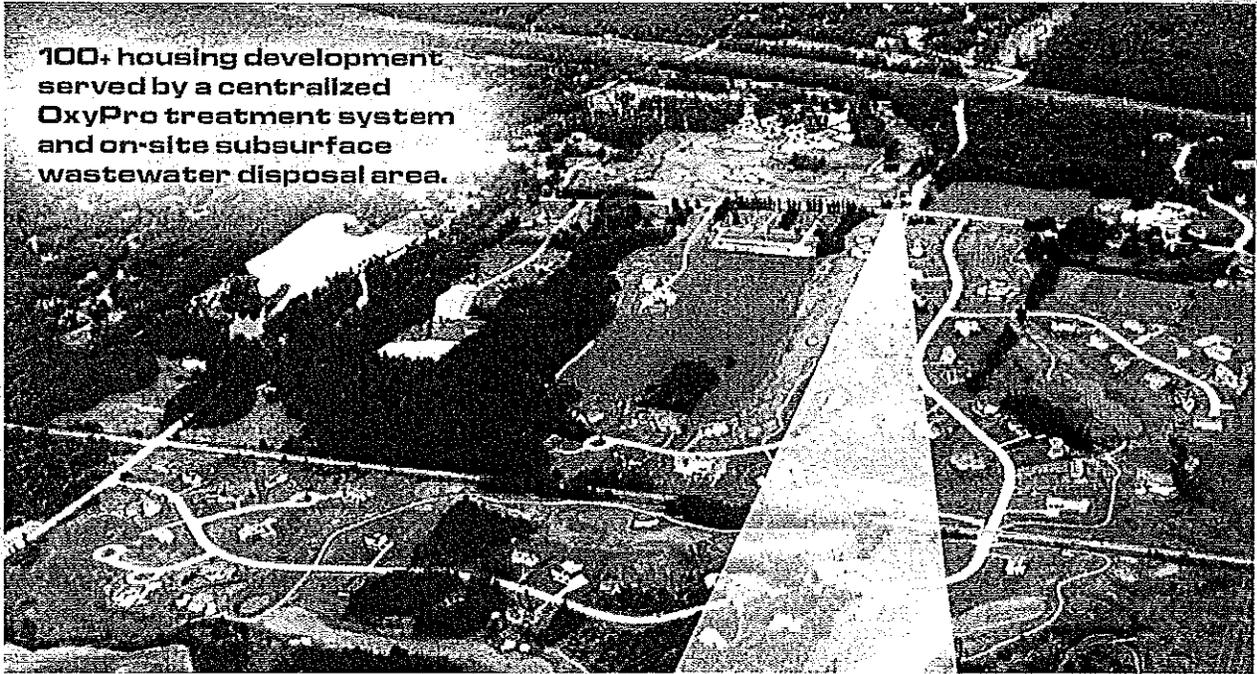
A tamper resistant, programmable logic controller (PLC) operates OxyPro. An alarm is included in the event airflow is interrupted. If disinfection of wastewater is required before disposal, a sterilizing ultraviolet unit is available. OxyPro does not require an effluent pump to operate, but one can easily be added if site conditions require it.

OxyPro systems for common household flows are available as complete packages ready for immediate installation. On sites with special installation or treatment requirements Aeration Systems can provide the custom design and technical expertise to get the job done.

OXYPRO 10000

Airing out the Wastewater Problems in Your World

100+ housing development served by a centralized OxyPro treatment system and on-site subsurface wastewater disposal area.

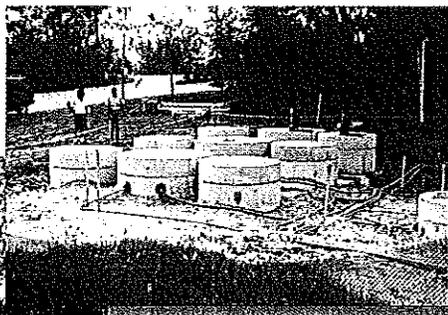


We design septic system products with simplicity, practicality, and low cost — our primary objectives. The OxyPro has repeatedly demonstrated its ability to be adapted to handle a wide range of wastewater flows, strengths, and on-site conditions and has been used to successfully treat flows ranging from 180 to 30,000 gallons per day. The Maine Technical

Institute has awarded a scientific grant to Aeration Systems to continue the research and development of this unique system.



Completed installation with optional access covers at grade.



Custom centralized OxyPro system, handling 30,000 gallons per day, undergoing installation.

For people seeking a cost-effective solution to wastewater treatment today, OxyPro is the best choice. Email or call us now at aerationsys@aol.com or 207-797-7351 to get a free estimate. You'll be glad you did.

The OxyPro System

General Process Description

OxyPro
installation in
a tight spot

Septic Tank

Wastewater from the house flows into a septic tank, sized according to State Code. In the septic tank settling occurs with the formation of sludge and scum. Clarified wastewater flows through a filter and into the OxyPro tank.

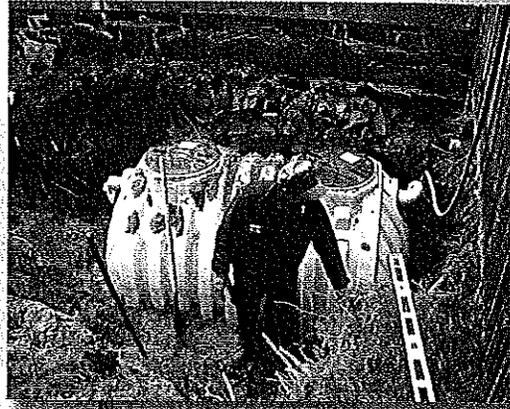
Aeration Treatment Unit - OxyPro

In the OxyPro tank the wastewater is aerated using a high-efficiency, low-pressure blower and a bubble diffuser. The quiet blower can be buried in the ground or located in the home. The diffuser causes oxygen transfer and mixing of organic rich wastewater and oxygen.

The aeration promotes the growth of aerobic microorganisms, which convert and remove biodegradable organic matter. (The organics removed by the aerobic process are the constituents that are measured in the BOD₅ analysis.)

To increase contact time the OxyPro utilizes a biomedium in the aerobic sections. This plastic media forms a support structure for the establishment of microorganisms and optimizes biological growth. The main advantage is that the microorganisms are attached to the media and do not get flushed out during times of high input flow rates.

The aerobically treated wastewater flows upward into the second chamber of the system, where clarification and settling of the suspended solids take place. The cleaner water in the clarification chamber rises to the top and flows into a second set of aeration and clarifying chambers to repeat the process and complete treatment.



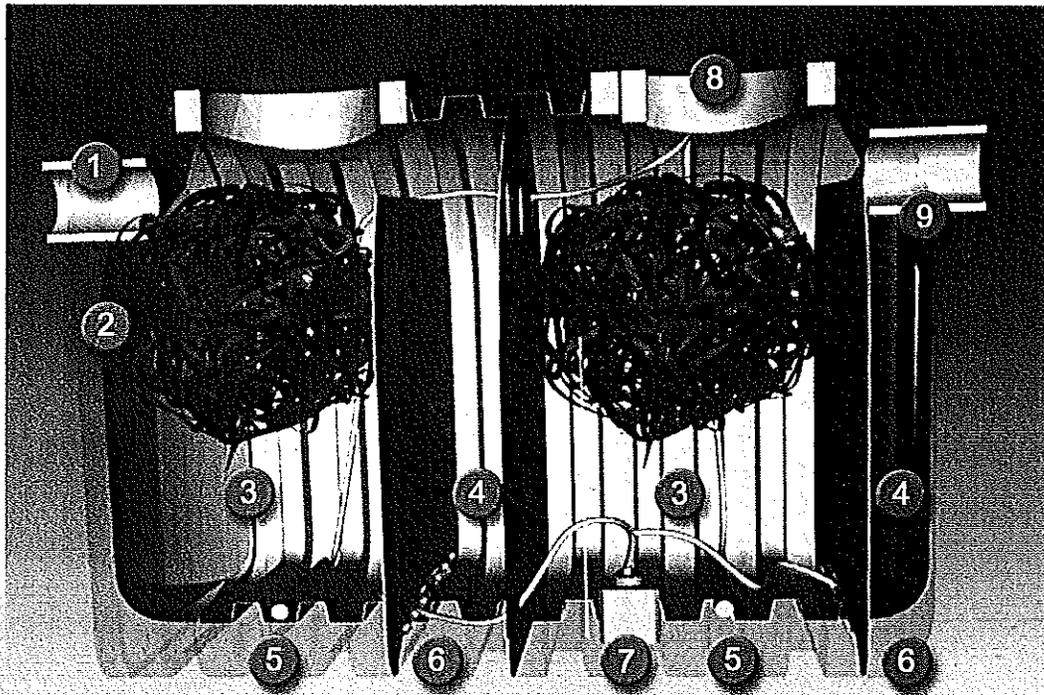
To remove the accumulated biomass, a portion of wastewater is recirculated from both clarifying chambers back to the septic tank. A magnetic drive pump is used for recirculation. Removing the accumulated biomass also helps to

ensure optimum clarifier performance resulting in an effluent with low suspended solids. The recirculation process also benefits the system in times of low loading such as vacation periods or during the night. When the water is recirculated to the septic tank, high BOD wastewater is displaced to the OxyPro.

The OxyPro is operated by a programmable logic controller (PLC). The PLC runs the pumps and alarm and can also be connected through the telephone to a monitoring facility to eliminate the need for alarms on-site.

Maintenance requirements are minimal. OxyPro does not need to be pumped. Semi-annual inspections by a knowledgeable professional, however, are recommended.

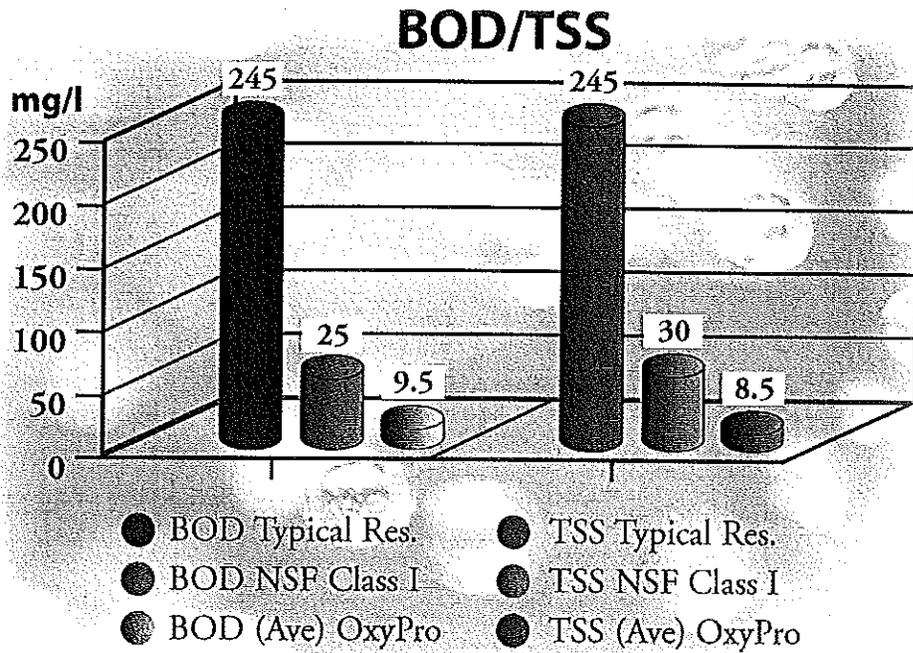
OxyPro 1000



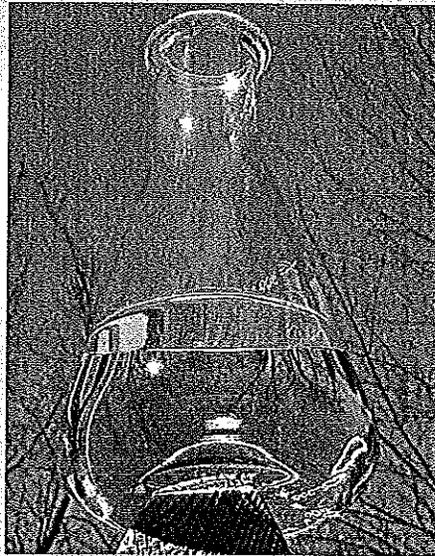
Simplicity of design in action

The OxyPro Advanced Treatment System

1. OxyPro inlet from septic tank
2. Free floating high surface area synthetic growth media
3. Aeration compartment
4. Upflow clarifier compartment
5. Fine bubble flexible membrane diffuser
6. Sludge removal suction diffuser
7. Sludge removal submersible pump
8. Service access
9. OxyPro outlet to disposal area



Average effluent quality from an OxyPro 1000 Advanced Wastewater Treatment System serving a single family three bedroom home on the coast of Maine. This shows a dramatic reduction of BOD and TSS.

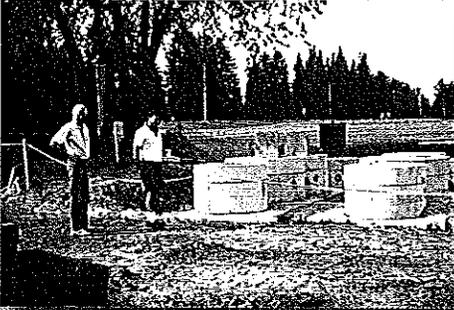


Output from an OxyPro 1000

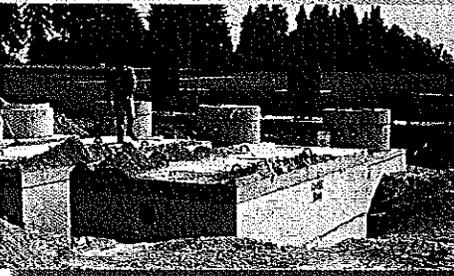
OxyPro 1000

About Our Company

We are environmental geologists and septic system designers with more than 40 years of experience designing and inspecting on-site wastewater disposal systems. Our products are designed to meet the needs of people experiencing the problems we have consulted on all these years. Our practical approach to problem solving helps us help you!



We design septic system products with simplicity, practicality, and low cost — our primary objectives. Please have a look at the information here and if you do not find the answers you need, do not hesitate to contact us by E-mail at aerationsys@aol.com or by telephone at 207-797-7351.



155 Gray Road
Falmouth, ME 04105
207-797-7351
www.septicaeration.com



AERATION SYSTEMS

Wastewater Technology

OxyPro

Owner's Manual



155 Gray Road
Falmouth, ME 04105
(207) 797-7351
Fax (207) 878-2364
www.septicaeration.com
email: aerationsys@aol.com

INTRODUCTION

Thank you for choosing the OxyPro Advanced Wastewater Treatment System to address your wastewater needs. Aeration Systems has made every attempt to design and build a high quality, efficient, and dependable product.

In this Owner's Manual you will find useful information about how your OxyPro treatment unit operates. There is also important information on the need for periodic inspections and maintenance. Please take the time to read over all this material. Do not hesitate to call Aeration Systems with any questions you might have about your OxyPro treatment unit or your septic system in general.

OPERATING CONDITIONS

The OxyPro 1000 Advanced Wastewater Treatment System is designed to treat wastewater produced by typical family activities in homes ranging from one to five bedrooms. Other OxyPro models are available to treat flows from restaurants, apartment buildings, community sewers, and other producers of wastewater.

GENERAL PROCESS DESCRIPTION

Septic Tank:

Wastewater from the house flows into a septic tank, sized according to State Code. In the septic tank settling occurs with the formation of sludge and scum. Clarified wastewater flows through a filter and into the OxyPro tank.

Aeration Treatment Unit - OxyPro:

In the OxyPro tank the wastewater is aerated using a high-efficiency, low-pressure blower and a bubble diffuser. The diffuser allows oxygen transfer and mixing of organic rich wastewater and oxygen. The aeration promotes the growth of aerobic microorganisms which convert and remove biodegradable organic matter. (The organics removed by the aerobic process are the constituents that are measured in the BOD₅ analysis).

To increase contact time the OxyPro treatment unit utilizes a biomedia in the aerobic sections. This plastic media is used to supply a support structure for the establishment of microorganisms and is specifically developed for optimal biological growth. The main advantage is that the microorganisms are attached to the media and do not get flushed out at high input flow rates. The biomedia also enhances the nitrification process, which requires a larger population of organisms due to the lower metabolic rate of the nitrifying bacteria.

- 9) No solvents, paints, or pesticides should be disposed of in the house drain system.
- 10) Your OxyPro treatment unit and the rest of your septic system are designed to handle a certain amount of wastewater every day. This maximum flow is usually significantly greater than that produced by average households. Continual high volume water use may decrease the treatment efficiency of your OxyPro treatment unit and will stress your disposal field, affecting its longevity.
- 11) Remove sludge and scum from the septic tank regularly (generally every three to five years) to prevent solid particles from entering the leach field and clogging the pipes and soil.
- 12) Normal household chemicals (soap, detergent, and drain cleaners) and other kitchen wastes (grease, oil, and ground garbage) should not have a noticeable short term adverse effect on your septic system if they are used in moderation.
- 13) Toilet tank tablets that contain antibacterial agents should not be used.
- 14) Toilet bowl cleaners should not be used more than once a week.
- 15) Water treatment systems, such as water softeners, should not back-flush into the septic tank.
- 16) An inspection of your OxyPro treatment unit every year will alert you to any developing problems with the system.

SYSTEM MAINTENANCE AND MONITORING

The OxyPro Advanced Wastewater Treatment System operates automatically. The only maintenance required from the homeowner is that the air intake for the compressor (if required) be kept clear of dirt, leaves, drifting snow, ice, and other debris. The owner is responsible for monitoring the status of the alarm signal located on the control cabinet and ensuring that the septic tank is regularly emptied of solids at an appropriate interval (every three to five years, depending on use).

Your OxyPro treatment unit is supplied with a two-year service contract which includes at least two service and inspection visits by a certified service technician each year. During service visits, each component of the treatment unit will be checked for proper operation. Effluent quality will also be checked either quantitatively or qualitatively to ensure optimal system performance.

Extended annual service policies are available from Aeration Systems. Your OxyPro treatment unit has been designed and constructed with durability and ease of operation as top priorities. By following the instructions contained in this manual your treatment unit should provide many years of service with minimal maintenance.

ALARM ACTIVATION

Your OxyPro treatment unit is equipped with an audible and visual alarm that will indicate failure of the air compressor or blockage of the air intake. If the alarm should sound, check the air intake for any signs of blockage. Do not attempt to access the blower unit or processor tank. These components are designed to be serviced by authorized personnel with protective equipment. Contact Aeration Systems or a certified service technician in the event of an alarm.

The audible alarm can be silenced using the small toggle switch located outside the control cabinet, on its right side.

ELECTRICAL POWER OUTAGE

Your OxyPro treatment unit will not operate during power outages. Prolonged outages will cause the aerobic bacteria in the processor tank to die from lack of oxygen. Care should be taken to limit water use in the house during outages to minimize the discharge of untreated wastewater to the disposal field. In pumped systems, excessive water use may also cause wastewater to back up into the processor tank and septic tank.

When electrical power returns, the OxyPro treatment unit should resume normal operation. After a short start-up period, the normal population of aerobic bacteria should be naturally reestablished and the system will again produce clear, odorless effluent.

NO USE FOR AN EXTENDED PERIOD

The OxyPro treatment unit can continue to operate normally during periods of no water use, lasting as long as two weeks. Power to the treatment unit should be left on during short periods when there is no water usage. The treatment unit may be shut off to conserve electricity during periods of extended disuse (greater than one month).

The unit must be reactivated when wastewater production is resumed. Failure to reactivate the treatment unit may cause damage to your disposal field. A short start-up period will be required after reactivation to reestablish the population of aerobic microorganisms. After this start-up period the treatment system should again produce clear, odorless effluent.

SPECIFICATIONS

OxyPro System Information:

Septic tank size _____

gallons

OxyPro Model # _____

Disposal Field Type and Size _____

Effluent Distribution Gravity Pressure

Number of Bedrooms _____

Rating _____ (gallons per day)

Installer _____

Plumber _____

Electrician _____

Site Evaluator _____

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Under no circumstances will Aeration Systems be responsible to the warrantee for any other direct or consequential damages, including but not limited to lost profits, lost income, labor charges, delays in production, and/or idle production, which result from defects in material and/or workmanship of the system. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty is expressly in lieu of any other expressed or implied warranty, excluding any warranty of merchantability or fitness, and of any other obligation on the part of Aeration Systems.

This warranty gives you specific legal rights. You may also have other rights which vary from state to state.