



Being inspired by the inventor, philosopher and visionary R. Buckminster Fuller, Clinton Ray Elston founded the Human Endeavors Company (HEC) in Winter Park, CO in the mid 1970's.

Challenged with water and wastewater issues in Colorado, Alaska and Minnesota the Human Endeavors Company pursued alternative environmental approaches and since then was awarded the prestigious US Department of Energy National Award for "Energy Innovations" in 1988, an Alaskan Legislative Award for its "Environmental Achievements" in 1990 and three US Environmental Process Patents in Water and Wastewater Treatment and Recycling, 1994 - 2002.

The Costa Rican Human Endeavors S.A. Corporation (HESA) was established in 2017 and is now consulting, training, importing, warehousing and distributing **Señor PEX Green** and **Attainable** technologies for existing and new residential and commercial projects.

1. Crosslinked polyethylene tubing, fittings and accessories for plumbing and radiant cooling.
2. Reverse osmosis onsite water filtration for whole house and business water purity and security.
3. Ozone and reverse osmosis for swimming pools and laundries in the reduction of the use and pollution of chemicals to the environment.
4. Rainwater and greywater treatment, filtration, disinfection and recycling in the need for water and the reduction of wastewater pollution to the environment.

Utilizing PEX, reverse osmosis for water and ozone for swimming pools and laundries to provide immediate economic and environmental solutions for Costa Rica, it is the HESA Corporation's long term goal to continue developing, distributing, installing, monitoring, servicing and eventually manufacturing its own inventions and technologies in and for Costa Rica as well as the World.





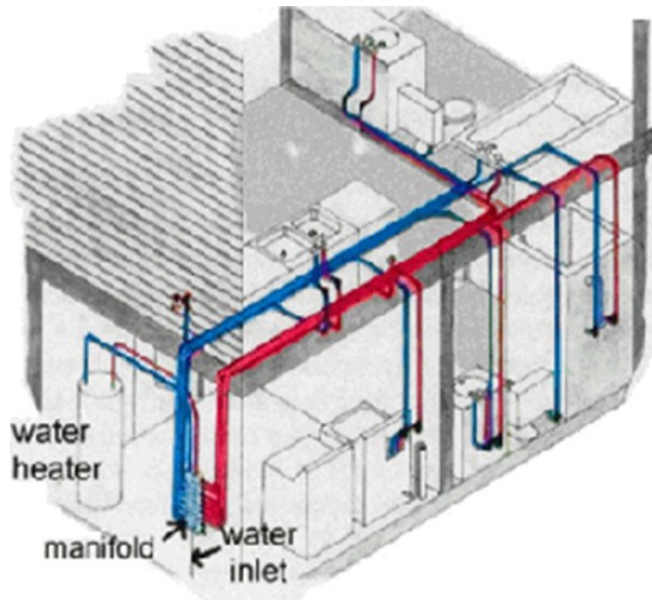
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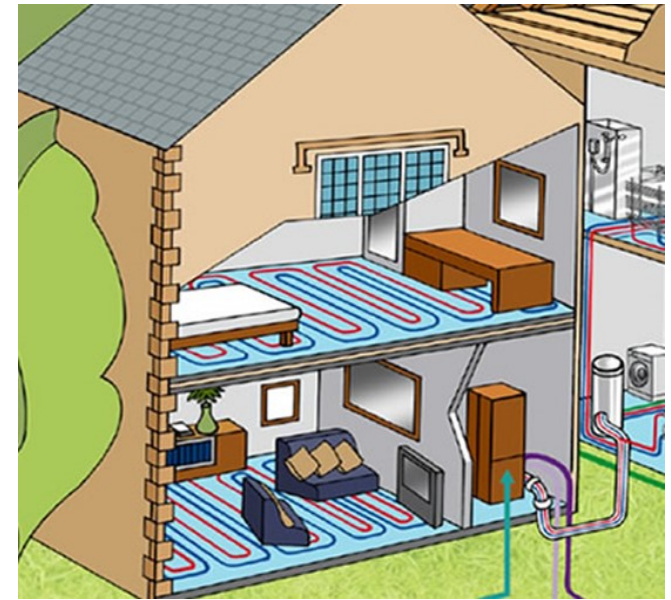


Señor PEX

Water Supply



Radiant Cooling



Crosslinked Polyethylene Tubing and Accessories



Does YOUR PVC plumbing look like this?

Multiple glued connections break and leak with inadequate preparation, gluing and earth movements

Approximate per foot prices at the local plumbing supply outlets in Costa Rica

1/2" - \$0.58

3/4" - \$0.99

1" - \$1.35

Requires more labor with multiple fittings

Additional Quantity Discounts = ?



YOUR plumbing can look like this using Señor PEX.

With crimped connections, flexible and long length Señor PEX tubing, breaks and leaks are reduced

Guaranteed per foot prices at the Señor PEX warehouse in Costa Rica

1/2" - \$0.34

3/4" - \$0.61

1" - \$1.08

Requires less labor with fewer fittings

Additional Quantity Discounts = 5% — 20+%

Call or email us to discuss any questions you may have concerning using and/or purchasing Señor PEX products.



Señor PEX Pricing Comparisons Page 2

<u>DESCRIPTION</u>	<u>Photo</u>	<u>Señor PEX</u>	<u>Comaco/PVC</u>	<u>Juturna</u>	<u>Amazon</u>	<u>Ebay</u>
100', 300', 500', 1000' Rolls of Non Barrier		\$0.34	\$0.58	\$0.45	\$1.16	\$1.39
1/2" PEX Tubing price per foot						
1/2" Brass Crimp Rings each		\$0.30	N/A	\$0.40	\$1.04	\$0.48
1/2" Brass Crimp Tee each		\$0.88	\$0.31	\$1.17	\$2.71	\$5.45
1/2" Brass Coupling each		\$0.56	\$0.25	\$0.75	\$2.33	\$2.38
1/2" Brass Elbow each		\$0.71	\$0.31	\$0.95	\$2.40	\$2.88
1/2" Brass Male NPT Adapter each		\$1.89	\$0.26	\$2.52	\$1.81	\$2.21
1/2" Brass PEX by PEX Ball Valve each		\$6.82	\$1.00	\$9.09	\$5.66	\$5.19
1/2" Plastic Tube Talons each		\$0.12	N/A	\$0.16	\$0.26	\$0.34

<u>DESCRIPTION</u>	<u>Photo</u>	<u>Señor PEX</u>	<u>Comaco/PVC</u>	<u>Juturna</u>	<u>Amazon</u>	<u>Ebay</u>
100', 300', 500', 1000' Rolls of Non Barrier		\$0.61	\$0.99	\$0.81	\$1.65	\$1.16
3/4" PEX Tubing price per foot						
3/4" Brass Crimp Rings each		\$0.41	N/A	\$0.54	\$0.71	\$0.50
3/4" Brass Crimp Tee each		\$2.57	\$0.72	\$3.42	\$3.79	\$6.10
3/4" Brass Coupling each		\$0.75	\$0.41	\$1.00	\$2.41	\$3.00
3/4" Brass Elbow each		\$0.98	\$0.64	\$1.30	\$3.04	\$5.83
3/4" Brass Male NPT Adapter each		\$2.70	\$0.52	\$3.60	\$2.30	\$5.24
3/4" Brass PEX by PEX Ball Valve each		\$9.59	\$1.22	\$12.78	\$19.93	\$7.18
3/4" Plastic Tube Talons each		\$0.19	N/A	\$0.	\$0.32	\$0.40

<u>DESCRIPTION</u>	<u>Photo</u>	<u>Señor PEX</u>	<u>Comaco/PVC</u>	<u>Juturna</u>	<u>Amazon</u>	<u>Ebay</u>
100', 300', 500', 1000' Rolls of Non Barrier		\$1.08	\$1.35	\$1.44	\$2.07	\$1.47
1" PEX Tubing price per foot						
1" Brass Crimp Rings each		\$0.54	N/A	\$0.72	\$1.18	\$0.85
1" Brass Crimp Tee each		\$2.16	\$1.65	\$2.88	\$17.29	\$10.41
1" Brass Coupling each		\$2.70	\$0.90	\$3.60	\$5.13	\$3.85
1" Brass Elbow each		\$1.76	\$1.33	\$2.34	\$4.44	\$2.87
1" Brass Male NPT Adapter each		\$5.03	\$1.00	\$6.71	\$18.68	\$15.89
1" Brass PEX by PEX Ball Valve each		\$16.88	\$1.90	\$22.50	\$29.62	\$14.73
1" Plastic Tube Talons each		\$0.28	N/A	\$0.	\$0.59	\$0.80
Tubing Cutter		\$13.50	\$12.50	\$18.00	\$25.50	\$26.23
3/8" - 1" Crimp Tool Kit		\$91.80	N/A	\$122.40	\$175.00	\$184.00



Purified Water Per Day for Your Home or Business



Does YOUR drinking water system look like this?

More than \$1.00 per gallon
Continuous expense purchasing and hauling heavy loads
No regulatory quality requirements — unknown water qualities
Water delivery trucks destroy the road and highway infrastructures
Pollutes the environment



YOUR drinking water system can look like this.

Less than \$.01 per gallon
Water quality digital readouts and maintenance pressure gauges indicating filter/membrane replacement servicing
Onsite drinking water systems reduce the destruction of the road and highway infrastructures
Decentralized technological water security

“Seeing is Believing”

Call or email us to set up an appointment to see for yourself our 400 gallon per day Reverse Osmosis System in operation.



Amazon.com and the Costa Rican Human Endeavors S.A. Corporation



iSpring RCS5T 500 GPD High Flow Residential and Light Commercial Tankless Reverse Osmosis Water Filter System with 1:1 Drain Ratio

<u>Amazon</u>	<u>Human Endeavors</u>
\$796.58	\$637.26



iSpring F15-500, 500 GPD Tankless RO System Replacement Filter Set, 2 year supply, fits RCS5T, White Piece

Price — \$235.52+ Shipping \$182.12 + Import Fees \$59.02 = \$476.66

\$476.66	\$381.33
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HM Didigital DM-1 In-Line Dual TDS Monitor, 0-9990 ppm range, +/-2% Readout Accuracy

Price — \$20.99 + Shipping \$7.69 + Import Fees \$4.06 = \$32.74 @ 2 each

\$65.48	\$52.39
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Malida Water Pressure Gauge Stainless for Aquarium Meter 0-1.6MPa 0-220psi Reverse Osmosis System Pump with 1/4" JG T

Price — \$10.99 + Shipping \$8.56 + Import Fees \$2.54 = \$22.09 @ 2 each

\$44.18	\$35.35
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US WATER PULSAR QUANTUM DISINFECTION & GAC CARTRIDGE FOR RO SYSTEMS Price — \$83.00 + Shipping \$ + Import Fees \$ = \$

\$83.00?	\$64.40?
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Malida 3/8" 3-Way Union Tee Tube Quick Connect Push Fit Water Purifiers Filters Reverse Osmosis Systems (Pack of 3)

Price — \$6.50 + Shipping \$7.14 + Import Fees \$3.31 = \$16.95

\$16.95	\$13.56
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Neeshow 3/8" Quick Connect Water Purifiers Tube Fittings for RO Water Reverse Osmosis System Pack Of 10 (Ball Valve+Y+L+I+T Type) +5 meters (15 feet) tubing hose pipe for RO Water Reverse Osmosis System

Price — \$13.99 + Shipping \$9.96 + Import Fees \$4.74 = \$28.69

\$28.69	\$22.95
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Aquatec (PSW260-00) Tank Shut Off Pressure Switch 60 PSI; 1/4"

Price — \$19.99 + Shipping \$7.73 + Import Fees \$3.92 = \$31.64

\$31.64	\$25.31
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Liquid/Water Push To Connect Inline Check Valve Union Fitting

Price — \$9. + Shipping \$ + Import Fees \$ = \$

\$9.00?	\$7.20?
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ROMATE RO-80 Reverse Osmosis Storage Tank Composite 80 Gal Liquid/Water Push To Connect Inline Check Valve Union Fitting

Price — \$754.99. + Shipping \$ + Import Fees \$ = \$

\$754.99?	\$604.00
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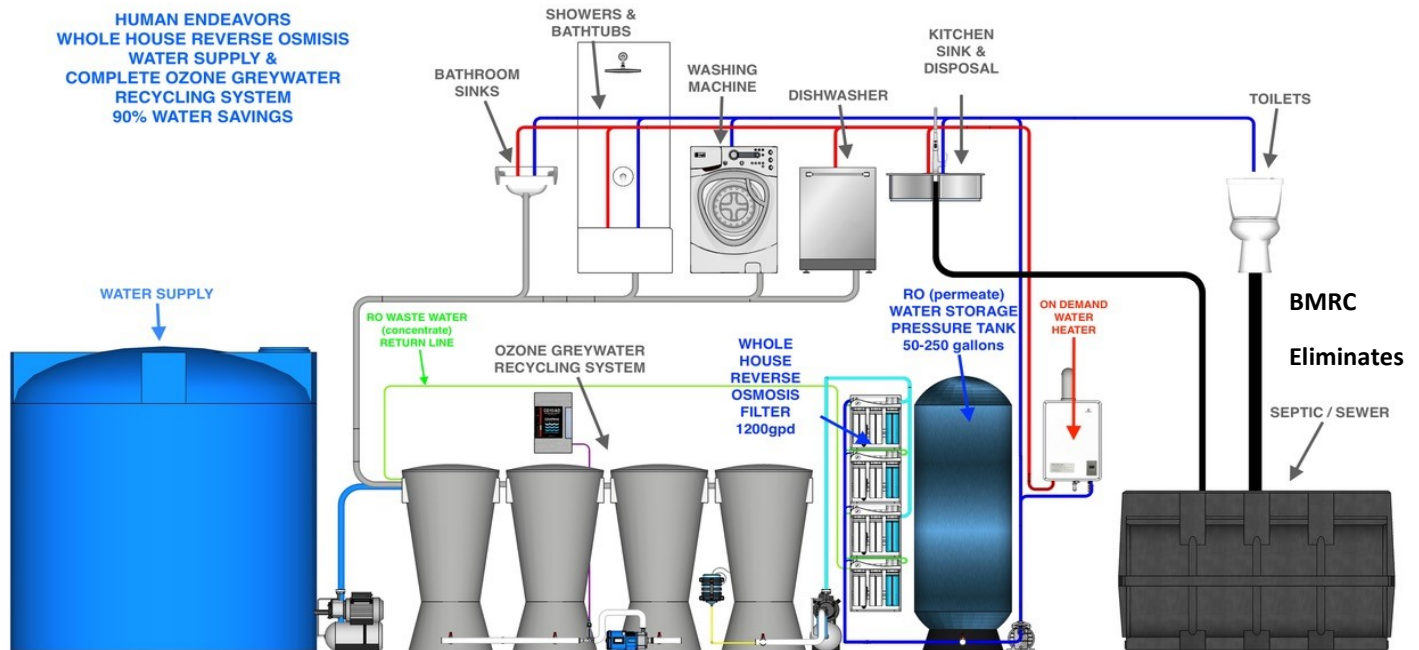


Utilizing ozone purification and reverse osmosis filtration

REDUCE your need for water by 40 — 80%

AND

PRODUCE over 1,200 gallons of pure and sanitized water for total household or business use per day



In household applications the toilet traditionally uses 40% of the residence's total water consumption.

In commercial applications the toilet traditionally uses 80% of the businesses total water consumption.

With the Human Endeavors Greywater Treatment and Recycling System (HEGTRS), all incoming water is first treated utilizing ozone/aerobic circulation and digestion technologies. That sanitized water is then filtered with four each reverse osmosis units capable of producing over 1,200 gallons of purified permeate (good) water per day. Normally discharged concentrate (bad) water is now recycled back into the HEGTRS with additional retreatment, thereby, achieving a 90% recovery of the concentrate water to permeate water qualities.

As the now "Total" household permeate water is utilized in the laundry washing machine, dishwasher, kitchen and bathroom sinks it then becomes "greywater". It is separately treated and sanitized utilizing the HEGTRS aerobic/ozone injection and circulation digestion technology. That treated, filtered and sanitized, "no longer", greywater water is then stored in any size pressure tank. It surpasses any water quality standard and provides digital and mechanical readout indicators during operation for monitoring and determining service requirements of the equipment. All plumbing fixtures, to including drinking water supplies, are supplied with the same quality, pure and safe water for all water needs.

The greywater tanks are easily maintained with valves and no filters to clog. All of the water has been thoroughly sanitized utilizing ozone oxidation and filtered with "Tap Water" reverse osmosis membrane technologies.

HEGTRS Package — Four Tank System with Ozone Generator, Air Dryer, Venturi Bypass Assembly, Circulation Pump, Piping and Fittings.

\$6,000 in Costa Rica

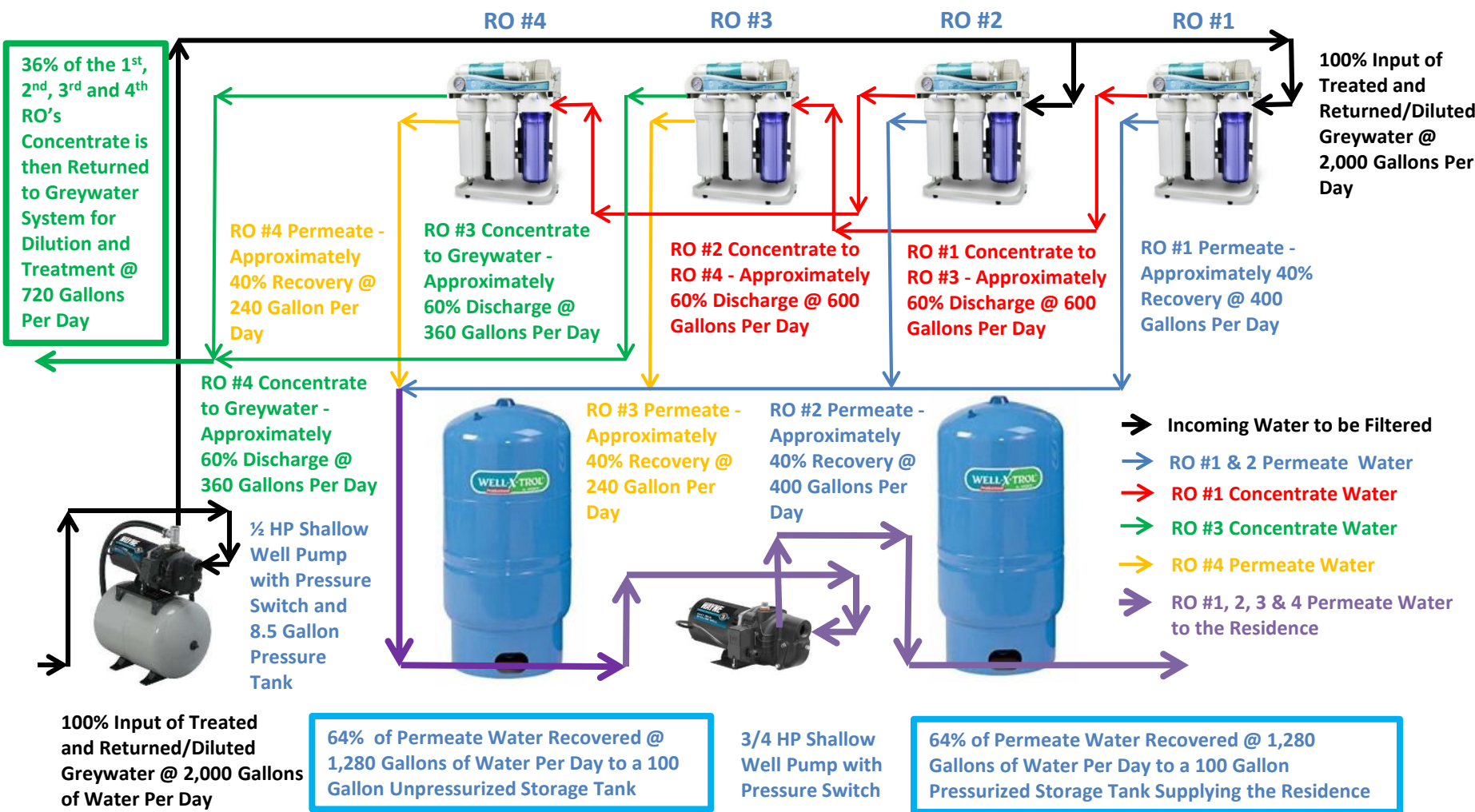
Additional reverse osmosis units, the pressure tanks and the other accessory prices are listed on the ISpring Marketing documents.

The Costa Rican Human Endeavors S.A. Corporation (HESA) has been in the Costa Rican water business since 2017. Three US Environmental Process Patents in Water and Wastewater Recycling.

Call or email us to discuss your existing or future water needs, uses and recycling potentials.



Human Endeavors Whole House Greywater/Rainwater Reverse Osmosis Filtration and Recovery Technology



Ozone Disinfection and Sanitation Technologies for Swimming Pools



Does YOUR swimming pool look like this using chemicals?

Does not kill everything
Hard to maintain and balance ph
Produces red eyes, swimmer's itch, bleached hair and faded bathing suits
Continuous expense purchasing chemicals and/or salt
Creates dangerous chloramine byproducts
Pollutes the environment



YOUR swimming pool can look like this using ozone.

Kills everything
Easy to maintain with automatic ozone injection
3,000 times faster to purify
Converts quickly back to oxygen
No harmful byproducts
Reduces chlorine by 60 — 80%

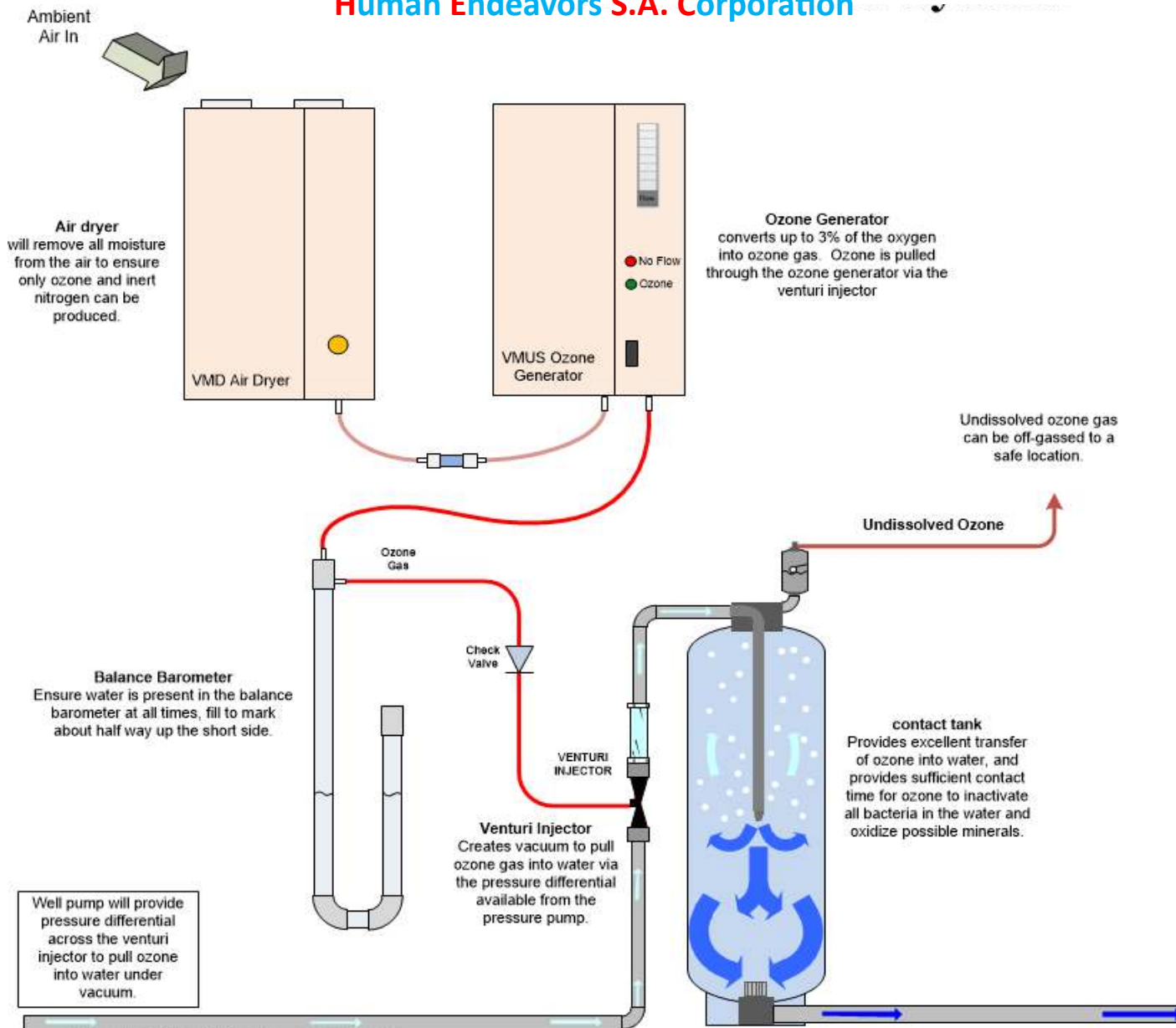
"Seeing is Believing"

Call or email us to set up an appointment to see for yourself our most recent ozone swimming pool installation.



Swimming Pool Ozone Dryer, Generator and Venturi Injection Technologies

Human Endeavors S.A. Corporation



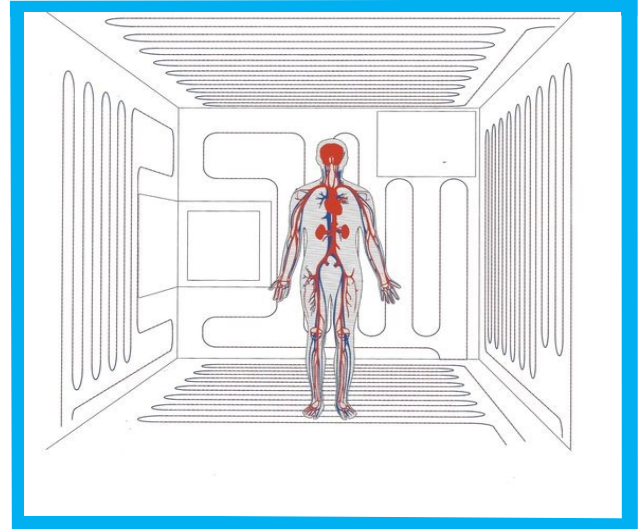
Retail Pricing for the Standard Human Endeavors Residential Swimming Pool Ozone Equipment

VMD Air Dryer	\$1,606.50
VMUS Ozone Generator	\$2,116.50
Air Vent	\$ 637.50
Balance Barometer, Check Valve, Venturi Injector, Tubing	\$ 340.00
Contact Tank	\$ 467.50
Shipping, Customs and all Fees	<u>\$ 500.00</u>
Total	\$5,668.00



Señor PEX

Radiant Cooling Technology Advantages Page 9



Most heating professions are very familiar with the principals of radiant floor heating systems and how they work. Ask many of those same engineers and contractors about radiant cooling systems and you will probably get a mix of confusion, fear of the unknown and dismissal.

Cooling with radiant however, offers many of the same benefits as radiant heating; cooling systems that are comfortable, efficient and quiet. Radiant cooling systems have been widely used in Europe for some time and they are starting to become more popular in North America, especially in the dry climates of Southwest USA.

Radiant cooling follows the same principles as radiant heating, but in reverse. Thermal energy is exchanged by radiant heat transfer between the heat loads present in the space and the cool floor or ceiling. Energy radiates from the objects, people, equipment and lights to the cool surface, which is opposite to what happens in heating mode, where the heated panel radiates to the objects and people. It is possible to have radiant panels that provide both heating and cooling, providing the best comfort and efficiency all year long.

There are two broad types of radiant cooling systems, which are chilled slabs and radiant panels. Chilled slabs offer benefits of integration into the building, lower installed cost and increased thermal mass. Often referred to as thermally activated building systems (TABS), this large thermal mass can be advantageous for some applications, where the mass can be “charged up” during times of off-peak electrical rates.

Radiant cooling slabs use similar design and sizing principles as a hydronic radiant floor system, using the same types of PEX pipes, manifolds and pumps as in heating. Chilled water between 55F to 58F is circulated through the pipes, which are embedded in either floor or ceiling. Radiant cooling slabs require a close tube spacing of six to nine inches on center, which is a little tighter than the nine to 12-in. normally required for radiant heating.

Radiant cooling can also be delivered through specialized panels, which would typically be attached to ceilings, but can also be attached to walls. Panels offer installation flexibility in terms of where they can be placed and how they are integrated with dropped ceilings, lights and other electrical systems. The lower thermal mass of panels allows them to react very rapidly to changing loads.



Señor PEX

Radiant Cooling Technology Advantages Page 10



It is easier to leave a ceiling exposed to the room below, which creates a better radiating surface to occupants and objects. As floors will often have coverings and furnishings, the effectiveness of the radiant cooling effect through the floor can be decreased. The ceiling will also come in contact with any rising warm air, creating greater convective heat exchange and a better cooling effect. Cooling delivered through the floor does make more sense when there is a high amount of solar gain directly onto the floor, because the cool floor can more easily remove those loads than the ceiling.

One of the most common questions asked about radiant cooling is “How do you deal with humidity in the air and the potential for condensation on the slab?” This probably leads to the most angst and uncertainty with engineers thinking about water damage, mold and safety issues. While this is an extremely critical design issue, it is one that is easily overcome with good design and controls.

A radiant cooling system will not deal with any latent heat removal (moisture in the air), so this must be handled by incorporating a separate air handling system to remove the latent moisture load in the space. The air handling system will usually also be required to provide ventilation and air quality control. Careful control of the humidity level must be maintained at all times in a radiant cooling system, to ensure that the dew point of the air does not get lower than the surface temperature of the slab or panel.

Controls will most often include multiple sensors embedded in the slab and air humidity sensors in the air space. Condensation issues can be avoided completely by constantly monitoring and controlling both humidity levels and slab temperatures. Important design criteria to follow include keeping floor surface temperatures no less than 66F, and a having a room set point temperatures in the range of 76F to 78F. The cooling capacity of the radiant cooling system is limited to about 12-15 btu/h/ft². The air handling system must handle the balance of the cooling load.

When radiant cooling is used in areas where solar gain will directly contact the floor, then the cooling capacity can increase substantially up to 25-32 Btu/h/ft². This makes radiant cooling in the floor very effective in buildings with large glass facades. Because the radiant cooling slab will handle the sensible load, the size of the air handling system is reduced substantially compared to a traditional cooling system. Smaller fans, ductwork and distribution systems results in significant installation savings, as well as reduced electrical operating costs. Smaller plenums can sometimes result in savings in building height, which makes architects happy.

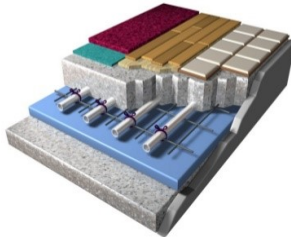
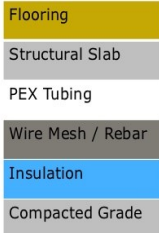


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Radiant Cooling Technology Advantages Page 11

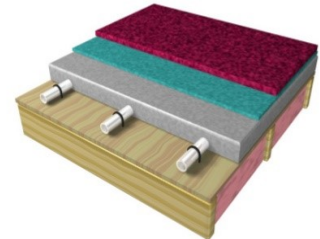
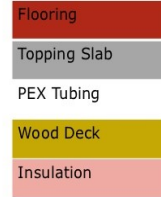
RADIANT COOLING Typical Construction

Slab on Grade



RADIANT COOLING Typical Construction

Wood Deck



One of the best advantages that radiant cooling systems offer is the potential to lower energy consumption compared to conventional cooling systems. Research conducted by the Lawrence Berkeley National Laboratory in California, has shown significant energy savings potential for radiant cooling, with the amount depending on the climatic area. Their research has shown on average across the USA, savings are in the range of 30 per cent compared to conventional systems. Cool, humid regions might have savings of 17 per cent while hot, arid regions have savings of 42 per cent.

There are several reasons for reduced energy consumption, with much having to do with the benefits of hydronics in general, as well as the unique nature of radiant heat transfer. It is a much easier task to pump water than to blow air; to move the same amount of Btu's the electrical consumption of a pump is much less than from a fan. Also, the air handling component in a radiant cooling system is much smaller than conventional cooling systems, resulting in lower electrical energy consumption.

That large cool surface of a radiant cooling system provides a heat sink to draw heat away from our bodies. With the majority of heat being radiated away, there is a reduction in the amount that must be moved by convection. This allows people to feel comfortable at a higher air temperature set point. This, of course, converts into energy savings as well as better overall comfort. Another possibility for energy savings exists in high mass systems, where radiant cooling can shift some cooling to off-peak nighttime hours when electricity is cheaper.

Typically, a radiant cooling system will incorporate a chiller for cooling mode.

Occupant comfort is another great benefit of radiant cooling systems. The large cool surface provides a heat sink to draw heat away from our bodies with a gentle cooling action creating a very comfortable, stable indoor climate. The volume of forced air flow is greatly reduced compared to convention air cooling systems. This reduces the potential for cold draughts and, also reduces dust and other allergens moving around. Radiant cooling systems operate very quietly, with a greatly reduces amount of noise from fans or blowers.

With building codes pushing to lower energy consumption in buildings, and a growing trend towards new green building technologies, radiant heating and cooling systems should continue to grow in popularity for many buildings. With benefits like high efficiency, high comfort levels, quiet and healthy operation, and building integration, there is a lot to like about radiant heating and cooling systems.



Señor PEX

Radiant Cooling Technology Advantages Page 12



Radiant Cooling vs. Forced Air

“What is the best way to cool my building?” Both technologies certainly answer that question but the angle of approach is rather different. There are positives and negatives associated with both systems in their quest to keep building occupants cool and comfortable. A look at radiant cooling uses a series of piping, pumps and control valves to deliver chilled or heated water through the floors, ceiling or walls. These temperature controlled surfaces reduce the indoor temperature by removing the sensible heat through thermal radiation.

With radiant exchange the heat from occupants, objects, lights and other equipment will flow to the cooled surface as long as the cooled surface has a lower temperature and is in line of sight. This radiant process has a negligible effect on air temperature. The air is in turn cooled when it comes into contact with the cooled surface through the process of convection. The method of cooling is widely used in net-zero-energy (NZE) buildings and other ultra-low energy builds. The system uses water as the main cooling fluid creating a hydronic system. Water is extremely effective as a cooling fluid and far surpasses air in this application.

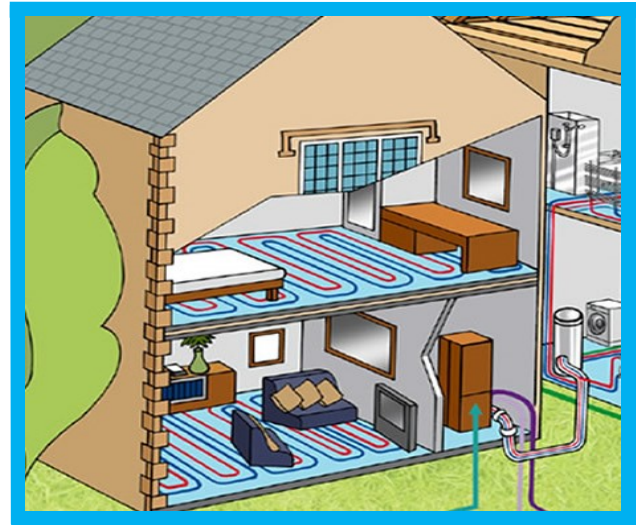
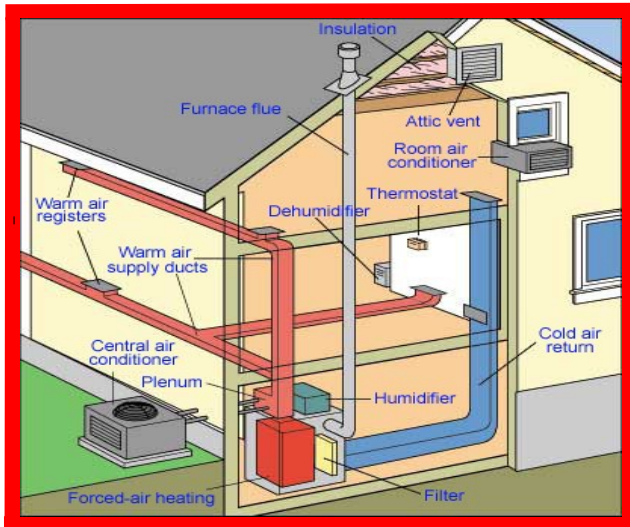
Radiant systems are still required to move air for ventilation purposes. Usually combined with Dedicated Outdoor Air Systems (DOAS), this space conditioning system still manages to reduce overall energy requirements when compared to HVAC systems. Savings of up to 50% can be achieved when compared to similar buildings using a standard forced air system. Results from a simulated study done by the Moore, T. Center for the Built Environment at the University of California Berkeley. The Radiant + DOAS reduced the HVAC cooling load from 10.6 mWh to 5 mWh, and energy savings was 58-66% over these commonly applied HVAC systems.

On new builds, radiant systems can lower building costs with the piping used for cooling incorporated into precast concrete flooring and the reduction of ceiling heights since only about 20% of the ducting is required as compared to traditional systems. A recent case study conducted on a Walmart Super Center in Las Vegas, that has installed prefabricated radiant mats, cited cost savings of approximately 60%. Thermal comfort is a vital part of any buildings cooling system. An all-air systems control only the air temperature while a radiant system combined with a ventilation system controls both the air and radiant temperature. The level of thermal comfort experienced by a building's occupants is dictated by both of these factors.



Señor PEX

Radiant Cooling Technology Advantages Page 13



A common problem faced in warm and humid climates is perspiration. People enter a building on a warm day and naturally perspire as their bodies attempt to cool down. In a building cooled with a traditional HVAC system there is a lot of air moving around. Although the temperature is correct, occupants are easily overcooled. A radiant system removes excess airflow and helps occupants cool down by absorbing their excess heat. It is efficient and comfortable.

A forced-air or HVAC system refers to one which uses air as its heat transfer medium. These systems rely on ductwork, vents, and plenums as means of air distribution, separate from the actual heating and air conditioning systems. The system carries the warm air from several large return grills (vents) to a central air handler for cooling. The air is then directed from the central unit to the rooms which the system is designed to cool. All of these systems consist of an air filter, blower, heat exchanger, and various controls. Like any other kind of central air conditioning system, thermostats are used to control forced air cooling systems.

Traditional forced air systems provide quick and effective cooling due to air flow. The effect of cooling is almost instantaneous when entering a building on a hot day and have the cooled air rush through the space. The risk faced with such rapid cooling or heating is overcooling or overheating. The ductwork installed for a forced air system can be utilized for both heating and cooling functions. The combination of a central heating furnace and air conditioning are widely available. Both systems utilize the same blower for air circulation and push heated or cooled air through the same labyrinth of ductwork. Catering for all seasonal comfort requirements by using a single system is particularly cost-effective.

This particular system benefits from being widely adopted as a standard means of cooling. Contractors and installers are well versed with this technology resulting in reduced installation and maintenance costs. This widespread adoption also means that parts are readily available for speeding up repairs and installation. Healthy indoor air quality is an important function of any comfort system. Forced air systems utilize air filters to improve the quality of air within a building.

The air circulated through the building via a series of ducts where the air filters are installed. The filters trap particles and airborne impurities returning cleaner air back into the building. An HVAC system will circulate a buildings entire volume of air several times a day ensuring air quality remains optimal.



Señor PEX

Radiant Cooling Technology Advantages Page 14



In 2011, the world's largest side-by-side comparison of radiant cooling and force air took place. Infosys, a leading software company in India, aimed to create lower energy buildings that better suited the needs of its employees. The experiment took place in Hyderabad, in Software Development Block1 (SDB-1), resulting in India's first radiant cooled building.

SDB-1, took a Jekyll and Hyde approach to cool. Half the building was optimized to use a variable air volume (VAV) system, while the other half had a radiant cooling system with a DOAS installed. Sophisticated measuring instruments were installed to track the impact of both systems. The image above shows the typical floor plan for SDB-1.

After two years the result was clear. The radiant system had used 34% less energy when compared to the VAV system. On top of that, the initial cost was also lower in the radiant system and a survey conducted of the building's occupants found that thermal satisfaction was higher in the section that utilized the radiant cooling system.

In summary, it is clear to see that both means of cooling have their strengths. A forced air system is widely adopted making parts and professional installers readily available. Its versatility as both heating and cooling system in one and air purification make it an attractive option indeed.

Radiant conditioning systems, however, seem to hold all the trump cards. With the drive to build better, greener buildings while providing occupants with optimal thermal comfort and keeping costs under control, it provides architects, engineers and owners with the perfect means to achieve the desired outcome.





NEWS

Afton inventor designs a self-contained home sewage treatment system



Clint Elston peers into his "bio-matter resequencing converter," containing billions of red worms eating human and household waste, in the basement of his Afton house on Wednesday September 12, 2007. The giant round tank converts the matter into rich soil, which he uses as compost for his tomatoes. 9/12/07

By [MARY DIVINE](#) | mdivine@pioneerpress.com | Pioneer Press
PUBLISHED: September 17, 2007 at 11:01 pm

Every time Clint and Bobbi Elston flush a toilet or turn on their tap, they make history.

Clint Elston has designed what he believes is the world's first self-contained sewage treatment system in the lower level of the couple's Afton home.

The new three-part system, the Elston's say, eventually could eliminate the need for piped water and sewer and drilled wells and septic systems. It reuses all dish, shower, sink and laundry water, recycling it into drinking water.



But the most interesting feature: it collects food scraps and toilet “matter” in a large tank where thousands of small red worms live. The worms eat the waste, and out comes soil.

“We literally make s*** disappear,” Clint Elston said. “It’s all Mother Nature. We really haven’t done anything; we’ve just automated Mother Nature.”

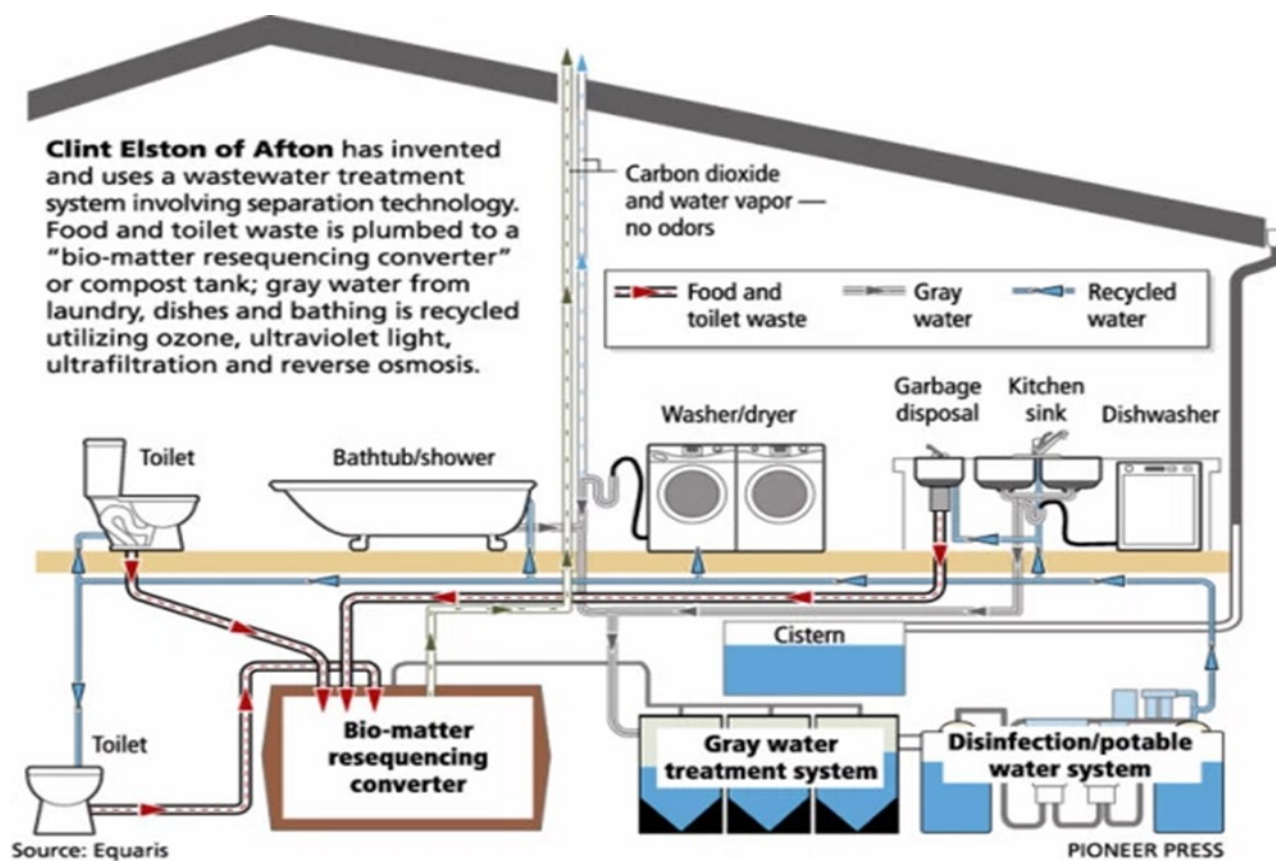


Elston named his composter the Bio-Matter Resequencing Converter after hearing the term on a “Star Trek” episode. Two agitators – picture a huge Cuisinart set on its lowest level – spin the waste and worms five to 20 minutes each day. “I came up with the idea after looking at manure spreaders,” Elston said.

The Elston’s remove about 10 gallons of soil from the tank each year and use it as compost around their ornamental shrubs. “The secret is, you’ve got to get the human waste and all the organic waste out of the wastewater,” he said.

Once that’s done, Elston said, you can recycle all the “gray water,” the dirty water that drains from your sink, bathtub, washing machine and dishwasher.





Elston's gray water-treatment system involves three huge cone-shaped water tanks where the water then goes through an extensive filtering process involving ozone, micron filters and reverse osmosis before it is stored in a large pressure tank.

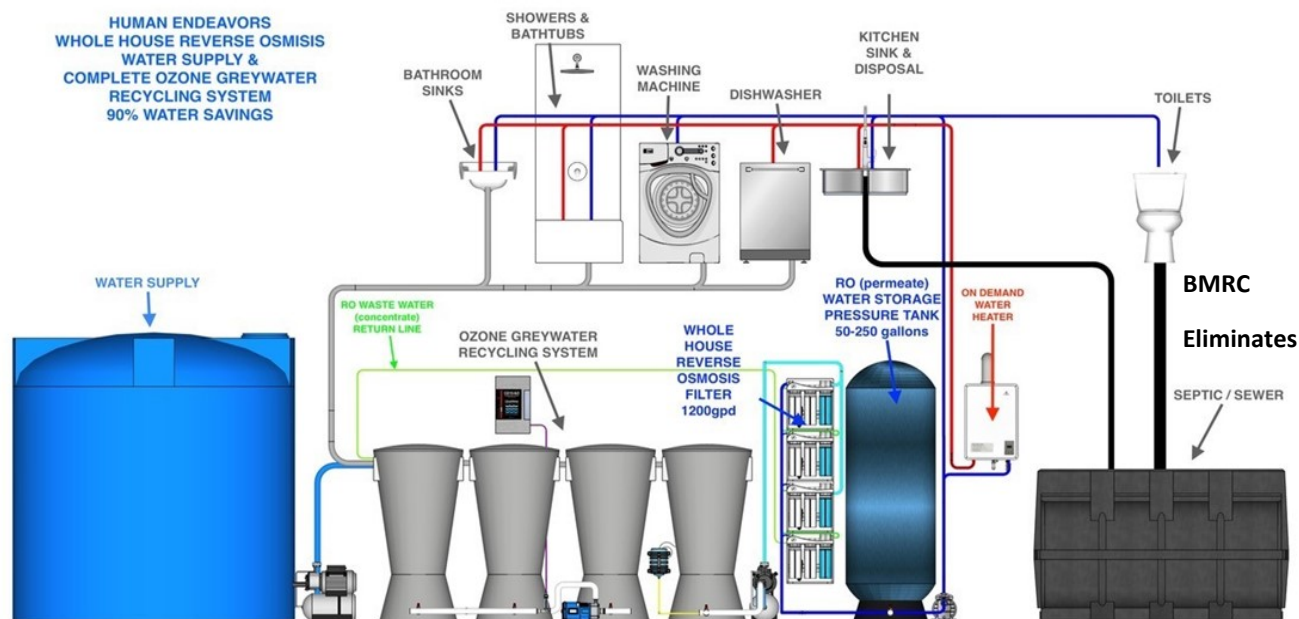
A computer system continually tests the water and alerts the Elston's to any problems. They can also monitor the system on the Internet, he said.

The finished product is purer than bottled water, Bobbi Elston said. "You don't have to worry about 3M chemicals," she said, referring to recent groundwater-contamination problems in south Washington County. "We're using what the Creator has given us, and it's much higher quality water."

She keeps two plastic Ziploc bags of ice cubes in the freezer. The clear ones are made from recycled gray water; the cloudy ones come from well water, she said. "There's a huge difference in quality," she said. A typical house goes through 75 gallons of water per person a day – none of it recycled. The Elston's need about three gallons of water per person a day to make up for the water they lose through flushing the toilets, evaporation and drinking.

That water comes from the sky. The Elston's use screened gutters to collect and pipe rainwater into two giant cisterns, where the water is filtered. "That's the best water in the world, because it's the softest water you can get," he said.





The three different systems that make up the self-contained, closed-loop zero-discharge sewage treatment system are sold through the Elston's' company, Human Endeavors.

Dave Stark, water plan coordinator for Cook County, Minn., said there is a huge need for technologies like Human Endeavors, especially along the North Shore. Stark, whose background is in water resources, installed a Human Endeavors system in his riverfront home about 10 miles outside Duluth.

“We live on the Lester River, a very sensitive river, and so I was looking for technologies to reduce pollution and alternatives to traditional mound septic systems,” Stark said. Stark said the gray water-recycling component makes the Human Endeavors system particularly unique. “That’s the stretch. That’s the part that makes it feel like the Starship Enterprise,” he said. “It’s more unique than anything that exists in the world on a household scale.

Elston, who holds three patents on the system, became interested in green design while building geodesic domes in Colorado in the early 1970s. He said he was influenced by the writings of R. Buckminster Fuller, inventor of the geodesic dome.

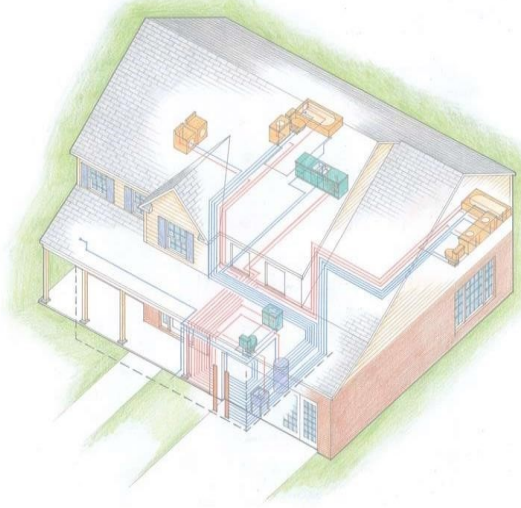
He began researching septic alternatives after installing a well and septic system on difficult soils near Winter Park, Colo. He later worked on composting toilet systems in Alaska and started the AlasCan Co., the predecessor to Human Endeavors. He moved to Minnesota in 1995.

He said he hopes his technology can help solve the world’s water woes. “There are 1.1 billion people in the world who don’t have access to clean, safe water, and 2.5 billion who don’t have access to proper sanitation,” he said. “We need to get more out of the water that we already have.”

Mary Divine covers Washington County. She can be reached at mdivine@pioneerpress.com or 651-228-5443.



Señor PEX



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