



Arsenic Solutions using **LayneRT**

“Arsenic is one of the highest environmental cancer risks.”
- Arsenic Health Effects Program,
University of California, Berkeley

Arsenic

The removal of arsenic from drinking water has become a hot topic across the country. This is due to the fact that arsenic has been shown to have health effects by the National Academy of Science and is present in over one million private wells. Arsenic raises the risk for many cancers, including bladder, lung and kidney.



A GreenPro Water System with LayneRT resin will reliably and efficiently reduce arsenic to safe consumption levels and comes with the service benefits that our GreenPro Water System program provides.

Frequently Asked Questions

Who makes GreenPro?

GreenPro is manufactured and supported by Layne Christensen, a U.S. company that is a world leader in water treatment technologies. Layne has years of successful experience providing advanced and economical solutions for consumer, municipal and industrial users. When you see “Layne at the Core,” you have arsenic removal technology at its best.

How do I know the system is working?

A sample kit is sent directly to your home at intervals based on your water chemistry. Using easy to follow instructions, you simply fill the sample bottle and return it using a pre-paid, pre-addressed return label. We continue to monitor performance by sending a sample kit to you as required by your water chemistry.

Who does the testing?

Using state-of-the-art technology, Layne chemists will analyze the sample to assure that your system is working at the optimum level.

LayneRT

LayneRT is the key component in the GreenPro POE system. LayneRT is proprietary, durable, arsenic-selective media, that has been developed as a significant improvement on the efficiency and longevity of adsorptive arsenic media. It is a reliable, high capacity technology that provides rapid adsorption kinetics without generating any fines and does not require backwashing.

What happens when the first column needs to be changed?

Your treatment specialist will simply replace the column with a pre-loaded column - no mess, no worries. That column is then sent back to Layne for disposal.

How well do you *know* your water?

Get to *know* it with **GreenPro™ Water Systems** and LayneRT.

Safe, Effective Arsenic Removal

The GreenPro Water System and LayneRT Advantages:

- Low cost, high quality resin that reduces arsenic to safe consumption levels
- We manage system wastes for you
- No connection to sewer or septic required
- Continuous testing and monitoring of your water to ensure performance
- All system components and sorbents are NSF/ANSI 61 or 44 certified
- Simple non-backwashing systems

Layne Water Treatment

Define
Develop
Deliver



Our Systems

We have systems for multiple flow rates and tank designs to meet any of your water treatment needs. Our water treatment specialists will work with you to find the system best fit for your water treatment needs.



	PDE-09S	PDE-09H	PDE-10S	PDE-10H	PDE-12S
Service Flow Rate	7.0 gpm	7.0 gpm	10 gpm	10 gpm	15 gpm
Max Gallons Per Day	1,000	1,000	1,400	1,400	2,160
Tank Size	9" x 48"	9" x 48"	10" x 54"	10" x 54"	12" x 52"
Redundant (Lag) Tank	-	YES	-	YES	-
Total Media Amount	.75 cuft	1.50 cuft	1.13 cuft	2.25 cuft	2.00 cuft
Underbed	<i>(not required)</i>				
Inlet/Outlet	1" MPT	1" MPT	1" MPT	1" MPT	1" MPT
System Rinse	<i>(not required)</i>				
Drain	3/4"	3/4"	3/4"	3/4"	3/4"
Temperature Range	33°F-100°F				
Dimensions W x H	9" x 57"	24" x 57"	10" x 62"	26" x 62"	12" x 61"
Shipping Weight	65 lbs	126 lbs	87 lbs	170 lbs	137 lbs

	PDE-12H	PDE-14S	PDE-14H	PDE-24S	PDE-24H
Service Flow Rate	15 gpm	25 gpm	25 gpm	25 gpm	25 gpm
Max Gallons Per Day	2,160	3,600	3,600	36,000	36,000
Tank Size	12" x 52"	14" x 54"	14" x 54"	24" x 50"	24" x 50"
Redundant (Lag) Tank	YES	-	YES	-	YES
Total Media Amount	4.0 cuft	3.5 cuft	7.0 cuft	7.0 cuft	14.0 cuft
Underbed	<i>(not required)</i>				
Inlet/Outlet	1" MPT	1.25" MPT	1.25" MPT	1.25" MPT	1.25" MPT
System Rinse	Manual or Auto				
Drain	3/4"	3/4"	3/4"	3/4"	3/4"
Temperature Range	<i>(not required)</i>				
Dimensions W x H	30" x 61"	14" x 62"	34" x 62"	24" x 59"	54" x 59"
Shipping Weight	272 lbs	213 lbs	423 lbs	446 lbs	886 lbs

For higher flow rates, contact Layne



Dedication to Service

Layne Christensen is committed to making water treatment as easy and as simple as possible. We monitor performance so you can always be confident that your system is working. All GreenPro Water Systems include waste disposal per EPA regulations..

Variables Affecting Arsenic Removal From Drinking Water

Media used for arsenic removal are affected by a number of water parameters. Layne requires a full water analysis that must include arsenite, arsenate, pH, silica, phosphate, iron and manganese.

Total Arsenic – Total arsenic concentration above 0.30 mg/L will reduce media life.

Arsenite As(III) – The arsenic removal media removes both As(III) and As(V), but has approximately four times the capacity for As(V) over As(III). If arsenite is present it is recommended to oxidize the water ahead of the arsenic removal media.

pH – Adsorption media operate most effectively between 5.5 and 8.5. The media will remove arsenic outside of this range but the capacity may be compromised. At elevated pH, silica becomes a more aggressive interfering species. Note: Do not use organic acids (such as citric or acetic) to adjust the pH ahead of the media.

Silica – Levels above 20 mg/L begin to interfere with media arsenic adsorption when combined with a pH above 7.5.

Phosphate – Levels above 0.15 mg/L will reduce media life for arsenic adsorption.

Iron & Manganese – Soluble iron and manganese may precipitate onto the media bed. If iron and manganese are above the secondary MCLs (0.30 mg/L and .050 mg/L respectively), it is recommended to filter them before the arsenic removal system.

Hardness – Does not affect the performance of the arsenic removal media.

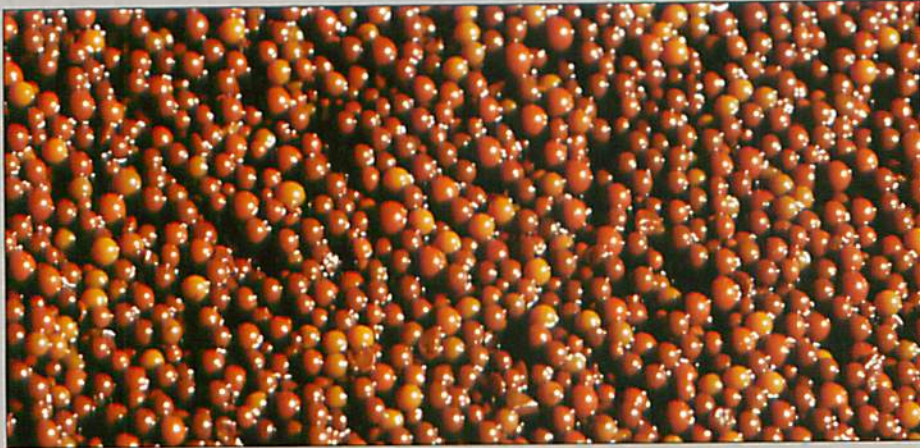
For **FREE** Arsenic Testing contact your water treatment specialist



Arsenic Removal



LayneRT™ Arsenic Removal Media



Meet the Arsenic MCL using the Best Arsenic Removal Media Available

The LayneRT™ difference: LayneRT has been developed as a significant improvement on the efficiency and longevity of adsorptive arsenic media, thus lowering the operating cost associated with removing arsenic (arsenate and arsenite) from water. Its ideal blend of selectivity and durability means that LayneRT can reliably and efficiently reduce arsenic to safe consumption levels.

LayneRT is a long lasting, high capacity technology that provides rapid adsorption kinetics without generating any fines. Not only does LayneRT provide optimal flow dynamics, no backwashing (no onsite residuals), and a low pressure drop, but it is also regenerable, thereby mitigating the liability associated with waste disposal.

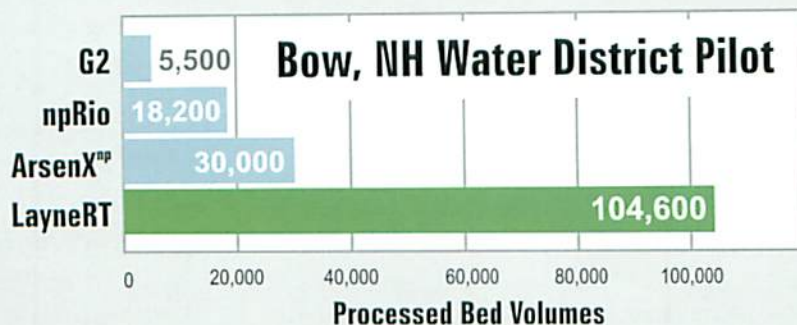
The LayneRT Difference:

- NSF/ANSI Standard 61 Certified
- Longest lasting
- Highest capacity
- Lowest operating cost
- Proven iron chemistry
- No fines
- No backwash
- Regenerable
- Limits liability associated with disposal
- Optimal flow dynamics
- Rapid adsorption kinetics
- Spent media passes Toxicity Characteristic Leaching Procedure (TCLP)
- Low pressure drop



Certified to NSF/ANSI 61

LayneRT™ Out-Performs All Current Technologies



Breakthrough to 10ppb with an influent of As~40ppb and a pH~7.6

ADI - G2 - Data from the EPA study at Bow EPA/600/R-08/006 (2007)



*Experienced
Equipped
Committed*



Comparison of Arsenic Sorbents

Sorbent	LayneRT	GFO/Sorb33	GFH	Adsorbisia
Company	SolmeteXWater	Severn Trent, AdEdge	US Filter	Dow
Material	Hybrid Resin Bead	Granular	Granular	Granular
Backwash	Not Required	Yes	Yes	Yes
Arsenic Residuals	No	Yes (backwashed fines)	Yes (backwashed fines)	Yes (backwashed fines)
Disposal	Regenerable/Return/Landfill	Landfill	Landfill	Landfill
Regenerable	Yes	No	No	No
Minimum Contact Time	2 minutes	4 minutes	4 minutes	2 minutes
Chemistry	Hydrous Iron Oxide	Hydrous Iron Oxide	Hydrous Iron Oxide	Titanium Dioxide

Material: LayneRT is comprised of a hybrid resin bead that is attrition resistant and does not generate fines. Media comprised of granulated materials are friable and generate fines, which can lead to increased backpressure during operation requiring backwash, additional system complexity and more frequent maintenance.

No Backwash Required: Backwash requirements add operational complexity, and generate fines containing an arsenic residual.

Arsenic Residuals: LayneRT requires no backwash and does not generate arsenic-containing fines.

Disposal: LayneRT may be returned for environmentally responsible disposal. Although most spent media pass TCLP, research supports that they leach arsenic under actual landfill conditions. "TCLP Underestimates Leaching of Arsenic from Solid Residuals Under Landfill Conditions" Ghosh A., Mukiibi M., Ela W., Environ. Sci. Technol., 2004, 38(17), pp 4677-82.

Regenerable: Regeneration lowers long-term operating and maintenance costs and reduces the volume of solid waste by a factor of ten!

Minimum Contact Time: A lower contact time enables systems using LayneRT to have a smaller system footprint, reducing facility requirements.

Chemistry: Hydrous metal oxides are the industry accepted chemistry for binding arsenic.

The Layne Media Assurance Program

The annual media regeneration costs of PES systems using LayneRT can be determined by completing a pilot test on the site to be treated. Our Pilot /Performance program is unique in the industry and is illustrative of our confidence in our technologies and in the systems that we install. Pilot evaluations, which are usually completed in 3-6 months, provide enough information for Layne to warrant your annual media regeneration costs under certain conditions.



Contact your regional
Layne Christensen Company
water treatment representative:

Western (800) 336-5374
Central (800) 407-4449
Eastern (800) 269-4590
Southern (800) 581-0081

For residential applications, contact:

SolmeteXWater
A Division of Layne Christensen Company

(800) 216-5505

www.solmetex.com
www.laynewater.com

Characteristic	Value
Structure	Macroporous Polystyrene Bead
Functional Group	Hydrous Iron Oxide
Bulk Density (as sold)	790-840 g/l (49-52 lb/cu.ft)
Specific Gravity	1.25-1.30 g/ml
Minimum Contact Time	2 minutes
Operating Temperature Range	1-80° C (33-172° F)
Particle Size	300-1200 microns
Operating pH Range	5.5-8.5

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All services and products of Layne Christensen Company are subject to change without notice.



Clean Water doesn't just appear

By Kevin Osborn

Hellenbrand, Inc. and Layne Christensen Company, Inc. partnered to provide the Hellenbrand Dealer network with the highly efficient and proprietary arsenic sorbent (LayneRT) removal technology. This value engineered system and full performance monitoring program, including testing and media disposal, is an all-in-one package called the GreenPro Water System. The GreenPro system utilizes the advanced diagnostics of the Hellenbrand software package to insure throughputs and day usage figures. Hellenbrand and Layne value American craftsmanship and the Hellenbrand control system brings value to the Layne GreenPro product line.

Water professionals can now treat for arsenic with the comfort of KNOWING that the Dealer and the Customers are protected from arsenic as well as the responsibility of having to dispose of the arsenic laden media waste. The GreenPro line of products includes POU and POE systems able to handle small residential to large commercial supplies. These systems currently supply thousands of homes with safe drinking water. Hellenbrand and Layne are committed to making water treatment as easy and as simple as possible for the Dealer. Layne manages the waste by-products and monitors system performance so the Dealer and end-user are confident in the system's arsenic removal performance. Included with each system is a sampling program to monitor the GreenPro's performance. There are no fees and the sample program is fully transferable to a new owner. Once the media is exhausted, just replace the tank with a brand new fully loaded one and send the old tank back to Layne for disposal in a safe environmentally friendly way. *Not only that, but because our systems require no backwashing, there is no arsenic laden waste generated at the home.*

Arsenic is tasteless, colorless and odorless. The only way to know arsenic is in the water is by testing. The current MCL for arsenic is 10 parts per billion, except in New Jersey, which is 5 ppb. Only a few states require testing on private wells but arsenic is found across the country, and a lot of home owners are unaware that their well may contain this harmful toxin that raises the risk for many cancers, including bladder, lung, kidney and skin.

Hellenbrand and Layne make it easy to find out if the Customers have arsenic in their well; Layne provides a **free** arsenic test kit for Dealers to offer to any homeowner. These test kits include a sample bottle, a registration card, a return envelope as well as a postage paid label to send the sample to Layne's R&D laboratory. Hellenbrand and Layne encourage Dealers to keep test bottles on hand and in the trucks. Since arsenic is naturally occurring in the ground that runs in veins, just because one house on the street does not have a high level does not mean their neighbor is arsenic free. Hellenbrand and Layne will assist you in sizing and developing the GreenPro system. When contacting a Hellenbrand representative for free test kits, ask to learn more about arsenic. Hellenbrand and Layne are visiting Dealers across the country providing training on the GreenPro line. As always, Hellenbrand is there for you. Find out when they will be in your area next. Everyone looks forward to seeing you at the National Dealer Meeting in September.