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IMPLEMENTING ARSENIC REMOVAL PROGRAMS: **THE RIGHT WAY**

Page 14

Also in this issue:

Chlorine testing and treatment.....page 24

Contaminant: Toluenepage 28



By Laura Maass

MORE INFORMATION

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Each project and situation is unique and should be evaluated taking into account the individual requirements and concerns of consumers.

Arsenic is a naturally occurring contaminant that is odorless, tasteless and colorless. Many consumers seem surprised when they receive a laboratory water analysis and find arsenic in their well water. Education and communication is key to a successful relationship between the consumer and water treatment service provider. When consumers understand what arsenic is, how it gets into their water, why it should be removed, how it's removed and why maintenance and monitoring of treatment systems is so important, they typically feel informed and appreciate the service you provide, understanding the costs associated with the necessary service.

Preparing for proposal

When designing an effective arsenic removal system, the following information should be evaluated and taken into consideration prior to presenting a proposal to the consumer:

- **Current water analysis.** Having a complete laboratory water analysis, including parameters that can negatively impact arsenic removal media, are extremely important. pH significantly impacts arsenic media performance in addition to competing ions that may include iron, manganese, vanadium, sulfate, phosphate, hardness, silica, total dissolved solids, suspended solids and hydrogen sulfide. Each arsenic media manufacturer has guidelines, which should be followed in order to obtain the greatest arsenic removal capacity. Pretreatment for the media's specific competing ions is recommended in

order to extend the arsenic removal media capacity and to reduce media replacement costs for the consumer.

- **Arsenic speciation.** There are two primary forms of arsenic in well water: Arsenic III and Arsenic V. Many arsenic removal media have a low removal capacity for Arsenic III and therefore, determining the ratio of Arsenic III versus Arsenic V during the design phase of the process will aid in assessing if oxidation pretreatment is warranted and cost effective for the consumer.
- **Consumer water usage and site information.** Sizing an effective treatment solution is important to optimize arsenic media performance and to streamline maintenance costs for the consumer. Key site specific information may include: Well pump size; well pump flow rate; the size of the incoming water line; space availability; electrical availability; discharge locations or restrictions; daily water demand; number of residents in the home, including children and pets; size of home (i.e., number of bathrooms/bedrooms); point-of-entry versus point-of use; and a complete water analysis.
- **Arsenic removal system design.** There are a couple of key components of an arsenic removal system that should be consid-

ered when designing an effective solution. Utilizing a meter within the system to provide flow rate and total gallons processed is important to determine the home's water demand. Gallonage readings also assist in diagnosing water leaks within the home, such as a running toilet, and provide specific onsite data regarding the capacities of the arsenic removal media. Due to the fact that arsenic levels and water usage may fluctuate — also, that arsenic is odorless, tasteless and colorless — having a minimum of two treatment vessels in series provides additional safeguards, preventing arsenic from getting into the treated water of the home. A "lead/lag" design optimizes the capacity of the media and allows for testing between the vessels. The additional arsenic reading between the vessels gives the service provider and consumer time to schedule the arsenic media replacement service without having an emergency situation where arsenic is getting into the home's water.

Moving forward with the right treatment solution

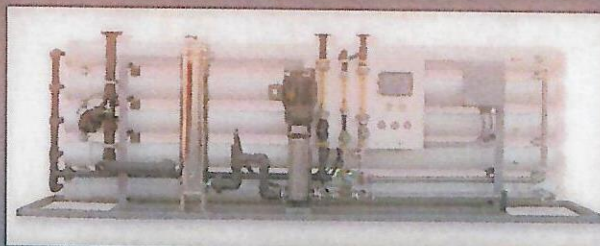
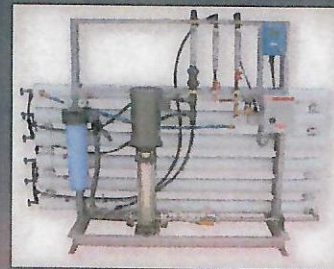
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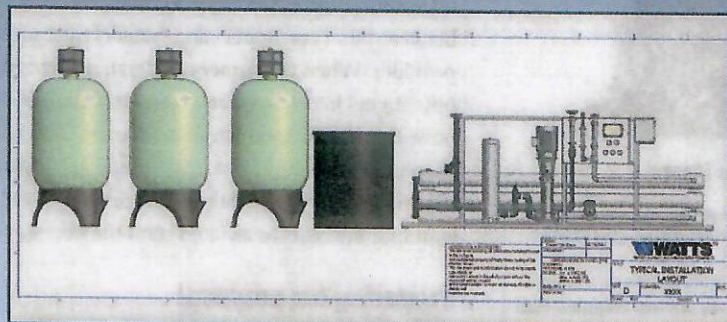
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Circle 217

treatment solution. Information that allows a consumer to make an informed purchase decision may include:

- Quotation for an arsenic removal system and a description of the equipment and its function.
- If applicable, quotation for pretreatment and description of equipment and func-

tions. When providing an option for oxidation pretreatment, providing a cost benefit analysis is often helpful for the consumer to see their maintenance cost savings over 10 years.

- Maintenance costs associated with all proposed equipment, including material replacement, labor and water testing monitoring fees. Depending on water quality and usage, arsenic removal media maintenance can be expensive. Taking the extra step to request a capacity estimate from the arsenic media manufacturer really provides credibility to the information you provide the consumer and allows them to budget ahead for this.

- Provide a monitoring program for the arsenic removal system and pretreatment. Without periodic testing of the raw water and treated water, the effectiveness of the arsenic removal system would be unknown. Frequency of testing should be based on arsenic levels and water usage. Conveying to the customer the significant impact that water usage, arsenic levels and competing ion levels have to the longevity of arsenic media is beneficial so that the consumer understands the correlated maintenance costs. A running toilet, leaky faucet or teenager that takes long showers are all examples of significant increased water usage that can deplete the capacity of an arsenic removal media prematurely. An increase in arsenic level, increase in pH or spike in iron can significantly deplete the capacity of arsenic removal media. Periodic and consistent testing is the only way to catch a change in water quality and the only way to know when arsenic removal media requires replacement.

When the consumer decides to move forward with the purchase of the recommended treatment solution, it is up to the consumer and water treatment professional to work together to maintain and monitor the water treatment equipment. Ultimately, it is the responsibility of the consumer to call for service, but it is the responsibility of the water treatment professional to be upfront with the recommended frequency of service and the costs associated with monitoring the water treatment equipment and consumable materials.

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Quality through the end and beyond

Having a trained installation and service staff who are knowledgeable specific to arsenic removal is important so that the consumer feels comfortable and confident when it comes time to purchase the expensive arsenic removal replacement media for their system. Some key steps to providing comprehensive and quality follow-up service may include:

- Training service technicians on the negative health implications of arsenic and other contaminants in well water as well as the various characteristics of well water. This education provides the service technician with the ability to answer consumer questions in real time while onsite. A knowledgeable staff, from the sales department, the installation crews to the service technicians, will undoubtedly leave consumers feeling confident about their purchase decision.
- Technician training on the importance of pretreatment and its impact on the performance on arsenic removal systems and savings to the consumer and service provider. During a service call, the detailed evaluation and testing of the pretreatment equipment is just as important as the attention needed to evaluate the arsenic removal system. Prior to taking water samples from an arsenic removal system, it is recommended that all pretreatment equipment be evaluated and tested to confirm it is properly functioning. A malfunctioning pretreatment system can result in misleading arsenic removal system test results. Skipping the pretreatment evaluation process can result in additional service calls and repeat water sampling, which are avoidable costs.
- Providing a service technician with an onsite checklist and procedure for servicing arsenic removal systems helps to provide consistency and complete service. Taking the time to evaluate and test each piece of equipment, record onsite data and total gallon meter readings, properly label sample bottles, completely fill out laboratory chain of custody forms and record media lot numbers and installation dates will minimize unnecessary service calls and reduce overall costs.
- Providing a quick response time to con-

sumers with laboratory test results and the importance of being armed with the right information. When laboratory test results indicate the arsenic media requires replacement, an immediate call to the consumer is recommended. Providing the consumer with laboratory results, a description and reason for the recommended follow-up ser-

vice and associated costs are very important. If media replacement occurred earlier than expected, determining the cause of the premature arsenic breakthrough will be

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very important to you and the consumer. Unfortunately, the high cost of arsenic removal media can cause consumers to feel like they are buying a whole new system because the bulk of the original system's cost is often the arsenic media itself.

• Follow-up with an unresponsive consumer whose system requires service. Situations may arise when the consumer does not return phone calls or return emails or decides they cannot afford the maintenance costs required for their arsenic removal system. With arsenic being a primary health contaminant, making contact with the consumer in writing by certified letter will provide the service provider with documentation of the notification necessary to minimize any potential liability issues in the future.

Each project and situation is unique and should be evaluated taking into account the individual requirements and concerns of consumers. Attention to detail and respond-

ing to specific needs of the consumer will ensure a successful and effective treatment system and long-term relationship. **WT**

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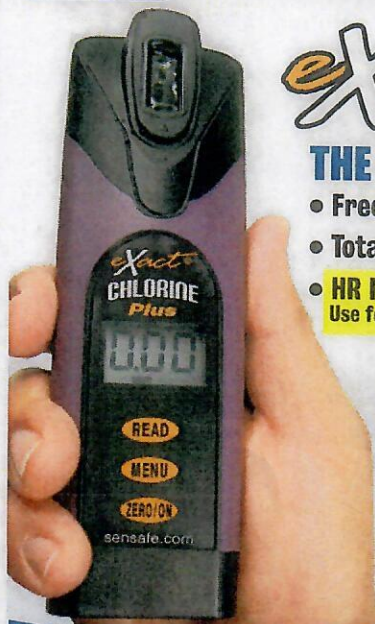
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