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Episode 56 Air It Out

Hosts: Michael Urbans and Tate Burckhardt of Better Water Industries

Episode Summary:

This episode provides valuable insights into advanced water treatment processes, emphasizing the importance of proper aeration, chlorination, and system design. Tate Burckhardt's expertise sheds light on innovative solutions for treating common water contaminants, ensuring improved water quality and safety for households.

Key Topics Discussed

The Open Air Process

Detailed Process

1. Aeration through Venturi:

The venturi introduces air into the water as it flows into the atmospheric tank from the existing pressure system, starting the aeration and oxidation process. This step is crucial for treating contaminants like iron, methane gas, and radon. As water enters the tank through the venturi, air is mixed into the water, promoting oxidation of contaminants.

2. Chlorination:

Using a Sentry 1 or similar system, chlorine pellets are added to the water to sanitize it and complete the oxidation process. Chlorination is essential to prevent bacterial growth in the aerated water. The chlorine tablets dissolve quickly, ensuring that the water is continuously sanitized. The system ensures that water has ample contact time with chlorine to achieve proper sanitation and oxidation of contaminants.

3. Tank Design:

The 130-gallon tank is designed with two chambers to provide adequate contact time for chlorination. Water flows from the first chamber to the second, where a submersible pump repressurizes it before sending it back to the household. This design ensures sufficient contact time for the chlorine to effectively sanitize the water.

4. Repressurization:

The system includes a submersible pump and a bladder tank, providing consistent water pressure to the household. This setup can improve water pressure compared to older well pumps. The repressurization process ensures that water pressure is restored to the same level as the original well system.

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Methane Gas and Safety

Methane Gas Treatment: Methane is naturally occurring and can be problematic in water systems. It needs to be removed before water enters treatment equipment to prevent buildup and potential hazards. Methane is colorless and odorless, and it can accumulate in water systems, posing a risk if not properly vented.

Ventilation: The system includes a 2-inch vent at the top of the tank to direct gases like methane outside the home. The vent should be treated like a sewer vent but not tied into the sewer vent or any vent, It should be installed ideally extending 12 inches above the lowest roofline. Proper ventilation is crucial to prevent the buildup of flammable gases inside the home.

Safety Measures: The system dilutes methane gas significantly, reducing the risk of ignition even in the presence of an ignition source near the vent. By diluting the methane with air, the concentration of methane is reduced to safe levels before being vented outside.

Water Temperature: Methane release from water is temperature-dependent, with complete release occurring at around 58 degrees Fahrenheit. Cooler climates can affect the efficiency of gas removal. Ensuring the system operates in an environment around 70 degrees Fahrenheit optimizes the removal of methane and other gases.

Treatment of Other Contaminants

Radon and VOCs: The system can also be adapted to treat radon and volatile organic chemicals (VOCs) by turning it into an air stripper. This involves using a vacuum to draw in fresh air through a bubbler tube, creating a jacuzzi-like effect inside the tank to enhance aeration. Radon and VOCs are removed by increasing the contact time with air, promoting their release from the water.

Importance of Chlorination

Sanitation: Introducing air into water creates a potential for bacterial growth, making chlorination essential. Chlorine provides a residual effect, continuously sanitizing the water in the system. The residual chlorine ensures ongoing protection against bacterial contamination.

Chlorination vs. Other Methods: Chlorine is chosen for its residual effect and ease of use. Alternatives like ozone and UV are mentioned but come with their own challenges. Ozone is a strong oxidizer but requires specific operational conditions, while UV can be effective as a final barrier but can be impeded by upstream bacterial growth.

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Repressurization and Low Yield Wells

Repressurization: The system includes a submersible pump and bladder tank to maintain household water pressure. This setup can provide higher pressure than older well pumps. Repressurization ensures that the household water pressure is restored to optimal levels, enhancing the performance of post-treatment equipment.

Low Yield Wells: For wells with low yield, an alternative setup with two 140-gallon tanks can provide additional water reserve, allowing the system to meet household demands even with limited well output. This setup ensures that there is always sufficient water available, even if the well has a low yield.

Testing and Tools

Importance of Testing: A comprehensive water analysis and flow rate testing is required before installing treatment systems. Understanding the well yield is crucial for designing an effective system. Accurate testing ensures that the system is tailored to the specific needs of the household.

Sentry Flow Meter: This flow meter was developed by Better Water Industries to measure well pump output and backpressure, helping to assess the well's capability to support the treatment system. The flow meter ensures that the well can provide sufficient water for the treatment system to operate effectively.

Episode show notes were completed with aid from ChatGPT.

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