Continuous monitoring simplifies NITRATE MANAGEMENT

PARAMETERS MEASURED

NITRATE

Nitrate in source water can be challenging to manage and lead to potential non-compliance issues. Continuous monitoring of nitrate enables you to keep a real-time pulse on nitrate concentrations from source water to finished water, offering many benefits:

- Compliance with drinking water standards for nitrate
- Optimized blending ratios to maximize water use
- Efficient nitrate treatment with ion exchange or reverse osmosis systems
- Secure water quality for public health and safety

Real Tech's affordable nitrate monitoring system provides accurate and reliable up-to-the-minute nitrate data that enables operators to make timely process control decisions and gives peace of mind effluent nitrate levels comply with drinking water standards.

Nitrate in Drinking Water

Being highly soluble in water, nitrates can seep through the soil layers and easily reach the groundwater level. Fertilizers typically contain high concentrations of nitrates, and agricultural, residential and commercial applications of fertilizers are major sources of nitrates in groundwater. Sewage disposal systems such as unmaintained septic tanks and leaking sewer pipes can also contribute to nitrate in groundwater.

Nitrate poses health risks if present in high levels in drinking water and is therefore a regulated water quality parameter. A maximum contaminant level (MCL) has been established by the USEPA of 10 mg/L as N and nitrite MCL of 1.0 mg/L.

It is important to monitor nitrates as often as possible in groundwater since nitrate levels can be difficult to predict and may indicate presence of other contaminants. Smart water management requires reliable and quick detection of nitrates to allow water utilities to take rapid action and protect public health against the hazards posed by nitrates.



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Lab Testing for Nitrate = Delayed Results & Missed Opportunities

When nitrate analysis of water involves sending samples to a third-party laboratory, certain issues are encountered: laboratory methods are lengthy, are expensive, and samples may be compromised during transportation. The amount of time it takes to report back to the client reduces the usefulness of the information, and the extra costs associated with laboratory testing reduce the frequency of sampling. This, in turn, makes the monitoring process even more blind to the spatial and temporal variations in nitrate concentration.

Advantages of Continuous Monitoring

Real Tech's real-time nitrate monitoring system provides far superior data both spatially and temporally by continuously analyzing the water onsite as opposed to laboratory testing methods which analyze small volumes that are widely spread over time. This allows the utility to better monitor trends and events, and provides far superior process control capabilities.

Benefits of Monitoring for Blending Applications

Blending multiple source waters is a common non-treatment option to reduce nitrate concentration below the regulated MCL. The process involves blending a high nitrate source with a low nitrate source to reduce nitrate below 10 mg/L before the point of entry (POE). Continuously monitoring provides the much-needed information WTP need to adjust source water ratios and control the blending process efficiently. By continuously ensuring water quality is maintained in compliance with regulations, real-time monitoring provides confidence and flexibility in water blending operations, and thus helps with blending process optimization. This in turn saves energy and reduces costs especially in water stressed regions. In cases where additional treatment is periodically required, optimized blending can delay the need for physical treatment saving the WTP costs.

Benefits of Monitoring for Nitrate Removal Systems

Ion Exchange (IX) and Reverse osmosis (RO) technologies are commonly used to remove nitrate from source water. For many utilities, it is not practical, nor is it required to remove all the nitrate through treatment. Physical treatment for nitrate is associated with high costs, therefore a practical and more cost-effective method often employed is bypassing only a portion of the water for treatment, removing just enough nitrate to keep the finished water from exceeding 10 mg/L nitrate-N.

While this method has many advantages, the ratio of water to be bypassed for treatment vs. non treatment must be carefully controlled. Continuous monitoring prior to treatment plays a key role in providing up-to-the-minute nitrate measurements that enable operators to confidently adjust the ratio while achieving treatment objectives and cost savings simultaneously.

Monitoring the outlet of the IX or RO system provides an early indication of exhaustion, fouling and/or breakthrough, enabling WTP to automate the regeneration or cleaning processes to ensure the system maintains effectiveness and also minimize regeneration and cleaning costs through more efficient use.

An additional monitoring point on the final effluent, which monitors a blend of the treated and untreated water, is essential to confirm treatment effectiveness and gain assurance nitrate concentration are below the MCL before entering the distribution system.

Accurate and Reliable Nitrate Measurements

Real Tech's nitrate monitoring system provides an absorbance-based measurement of nitrate. Nitrate ions have a natural peak absorbance in the light spectrum. An increase in absorbance in this distinct wavelength region is directly proportional to an increase in concentration, enabling nitrate to be measured simply and effectively. Unlike ISE nitrate instruments, Real Tech's nitrate sensor is able to compensate for interferences by measuring additional reference wavelengths where the interring compounds absorb but nitrates do not. The nitrate sensor combined with low maintenance automatic chemical cleaning results in a nitrate monitoring system that is highly accurate and stable over time.

Real Tech Inc.

1150 Champlain Court, Whitby, Ontario L1N 6K9 Canada TF: 1.877.779.2888 T: 1.905.665.6888 info@realtechwater.com