Taste and Odor Fact Sheet

Is the water safe to drink?

Yes. The taste and odor is a palatability issue. The palatability change that results from a naturally occurring algal bloom does not alter the quality of the water provided to the cities and the communities served. The water supply remains safe for use with no health risks created by these events.

What causes the taste and odor changes?

A natural occurrence in all surface water supplies, an "algal bloom", is responsible for the taste and odor changes in the treated drinking water supply. Algal blooms usually occur in Lavon Lake in late July and into August each year, but can occur at any time if the right conditions exist in the water supply reservoir.

What are the conditions for an algal bloom to occur in Lavon Lake?

- Nutrients must be present – such as nitrogen, phosphorus and calcium, which are derived from decaying vegetation in the lake.
- Turbidity has lessened – the turbidity or cloudiness of the lake water has cleared up, allowing the penetration of the sunlight. This occurs due to lack of rainfall.
- Temperature increase – the optimum temperature range of the lake water for an algal bloom to occur is between 80° - 85°. This is provided through many hot summer days.

When all conditions are met, photosynthesis will take place and the algae will grow and/or proliferate. Algal species, such as anabaena, secrete an "oily" substance from their cells that causes an odor in the water supply. Aquatic fungi, actinomycetes, grow on dead and decaying algae and cause an earthy taste in the water.

What steps does the NTMWD take to control the taste and odor?

Currently, NTMWD laboratory personnel perform algal counts to confirm the occurrence of an algal bloom and the algal species which are responsible for the changes in taste and odor. During an algal bloom, laboratory analysis of raw water samples can show high levels of geosmin. Geosmin and MIB (2-Methylisoborneol) are produced by an algal bloom, but geosmin is more predominant in the winter and MIB in the summer. Geosmin and MIB are organic compounds released during the decomposition of algal species. Utilizing current treatment processes, the NTMWD can reduce but not eliminate the taste and odor issues.

NTMWD utilizes several steps to control the taste and odor produced by the algal blooms. Once an onset of an algal bloom is confirmed, additional chemicals can be added to the treatment process to aid in the reduction of taste and odors. To reduce unpleasant taste caused by the algal bloom, activated carbon is used as an absorption media, and potassium permanganate is added as an oxidizing agent to reduce odor. Each of these chemicals is removed during the treatment process prior to delivery of treated water supply to NTMWD Member Cities and Customers. Throughout the treatment process, an oxidant is used as a strong disinfectant and also aids in reducing odors during times of algal blooms.

The NTMWD is pursuing the implementation of ozonation which is expected to significantly reduce and/or eliminate taste and odor issues caused by algal blooms. Previous studies and thorough testing have shown that the use of ozone, an oxidation process, to supplement the current treatment process can provide additional advantages including: micro-flocculation to reduce chemical usage, micro-constituent oxidation, and taste and odor control.

While no taste and odor control process is 100% effective, ozonation will eliminate or greatly minimize the palatability issue of the water supply. The NTMWD and consultants will continue to analyze the potential causes of taste and odor episodes, the source of heightened levels of geosmin, and additional methods to address the issue until the ozonation process is constructed and operational.

NTMWD Ozonation Implementation Plan

A preliminary engineering study for the utilization of ozonation as a primary disinfectant at the NTMWD Wylie Water Treatment Plants has been completed by the NTMWD staff and consulting engineer. The study provides the framework for the engineering design of ozonation facilities to be constructed at the Wylie Water Treatment Plant to meet the Texas Commission on Environmental Quality Stage 2 Disinfection Byproducts rules. A design contract has been executed with a consulting engineer, and the design has commenced. A purchase order has been issued for procurement of ozone generation equipment. The NTMWD anticipates completion of the design to allow for construction bids to be brought to the NTMWD Board of Directors for consideration in the fall of 2010. The project is estimated to cost $140-$150 million and will take several years to construct and place into operation. The current schedule includes implementation of the ozonation treatment process taking place in stages during the latter part of 2013 and early 2014.