



Summer Algal Blooms

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As hot temperatures remain prevalent, ideal conditions are set for an "algal bloom". Algal blooms, naturally occurring events, are common to surface water supplies such as Lavon Lake.

Summer algal blooms occur when high temperatures warm the reservoirs, little or no rainfall has occurred, and sunlight penetrates the water allowing photosynthesis to occur. When these conditions are present, the blue green algae species Nostoc and Anabaena will reproduce or "bloom".

As a result of summer algal blooms, the tendency to experience a grassy or earthy taste in the drinking water supply exists. 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.

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.