

EarthTec Eliminates Taste and Odor in Drinking Water

FIELD EXPERIENCE

A case study was undertaken to quantify the ability of EarthTec to reduce taste and odor issues at a municipal drinking water treatment plant in Tulsa, OK

REPEATABLE RESULTS

The results described are based on field data and experiences accumulated during a 12-year period, with about 7 years of dosing directly into the pipeline.

MORE INFORMATION

There is on-going research to establish the precise physico-chemical mechanism for destruction and removal of geosmin.



- Geosmin levels reduced by 80-99%
- Treatment occurs in the pipeline connecting source lake to water treatment plant
- Excellent water quality
- Cost savings and improved performance over previous methods for odor control

Summary

A municipal drinking water treatment plant (WTP) in the City of Tulsa, Oklahoma treats 100 million gallons per day (MGD) and was using copper sulfate to control taste and odor problems that originated from geosmin in their source lakes. Several months of the year are characterized by algal blooms (cyanobacteria of the genera *Anabaena* and *Cylindrosperma*) that contribute musty-smelling geosmin to the water. The problem peaked in 1999-2000 with geosmin levels exceeding 2,000 ng/L and overwhelming the WTP's methods of powdered activated carbon and potassium permanganate for odor reduction.

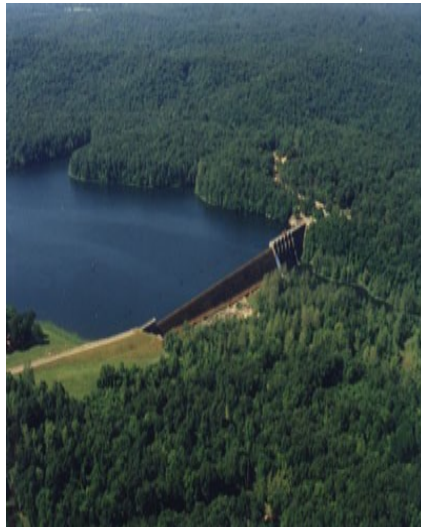
In 2001, water quality managers began using EarthTec instead of copper sulfate and saw an immediate and dramatic improvement in geosmin removal. Pre-treatment with EarthTec, followed by granulated activated carbon filters within the plant, has allowed operators to consistently achieve finished water with geosmin levels below human detection limits (<10 ng/L), essentially solving this persistent problem. Plant managers conclude that compared to previous methods, EarthTec is providing superior performance at reduced expense.



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Municipality Economically Reduces Taste and Odor

Application and Dosage



Prior to 2001, water quality managers were combating blue-green algae blooms by applying granular copper sulfate to the source lake, located about 50 miles north of the treatment plant, at a rate of approximately 10 lbs per acre. In 2001 they started dosing EarthTec in the delivery pipeline about 1 mile upstream from the WTP, which enabled operators to destroy the odor compounds immediately prior to the WTP rather than needing to kill all the algae in the lake. In 2006, operators began treating the water as it enters the intake pipe exiting the source lake, allowing treatment to occur in the 50-mile pipeline itself, with the benefits of thorough mixing and no exposure to the environment. At times of the year when taste and odor problems are prevalent, the product is metered into the raw water pipeline at a rate of 1 gal of EarthTec per MG gallons of water to control odors, algae, and biofilm. It is occasionally also used to control algae in the lakes.

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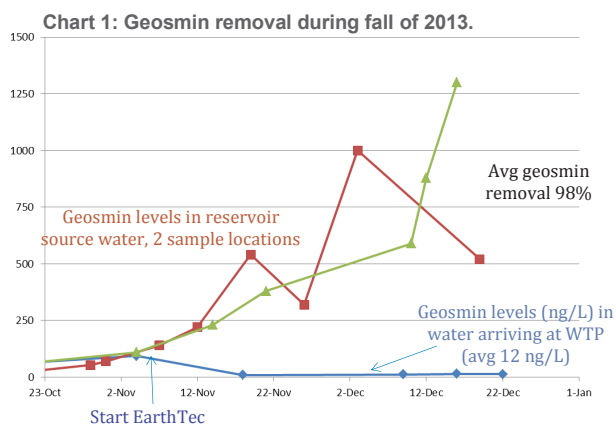
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Cost

The taste and odor problems could not be overcome with costly conventional methods such as potassium permanganate and powdered activated carbon; at times the city was forced to draw water from an entirely different source, at great expense. Now, during the periods of the year that treatment is required EarthTec reliably reduces geosmin to a manageable level at a cost of less than \$16 per million gallons (MG) treated. Additional cost savings accrue from keeping the pipes free of biofilm.

Performance

By the time the water has traveled through the source pipe and reaches the terminal holding reservoir (approximately 3-4 days), geosmin levels are reduced from anywhere between 200-2500 ng/L in the lake to between 10-40 ng/L at the pipe outfall. After entering the WTP, activated carbon filters further reduce concentrations below the human detection threshold of about 10 ng/L. Lake managers continue to occasionally treat blue-green algae blooms in the source lakes and terminal holding reservoir as needed, using EarthTec at a rate of about 1 gallon per surface acre.



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