



Optimization of Granular Activated Carbon Treatment of Algal Toxins

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Overview



- Microcystin is a toxin produced by certain freshwater blue-green algae.
- During algal blooms, microcystins may appear in large quantities which pose a major threat to drinking and irrigation water supplies.
- GHD performed a laboratory treatability study to remove algal toxins, such as microcystin from drinking water using granular activated carbon (GAC).
- Two different types of GAC were used, Calgon Carbon Filtrasorb 300 Acid-Rinsed (AR) and Filtrasorb 400 AR.
- Column tests were completed for the removal of algal toxins and potential of arsenic leaching from the GAC.
- Effluent was periodically monitored for total and soluble arsenic during 10 days of continuous operation.



Results



- The carbon that performed best for adsorption of microcystin was Filtrasorb 400.
- This column operated for 25 days of lab-scale operation without breakthrough.
- Through the laboratory tests, it was calculated that 21.5 mg of microcystin was absorbed per pound of GAC in the full-scale filter vessels.
- Results of the arsenic testing indicated that the initial arsenic concentrations in both columns were below the EPA MCL.
- Within 3 days of continuous flushing, effluent arsenic concentrations in both columns decreased to near the raw water (influent) concentration for the duration of the 10-day flush period.

