

# A case study to determine the efficacy of ozonation in purification processes

**S Morrison\*, A Venter and S Barnard**

*School of Environmental Sciences and Development: Botany, North-West University, Potchefstroom 2520, South Africa*

## **Abstract**

The aim of this study was to determine the efficacy of ozone in water purification processes at the Midvaal Water Company, which uses the hypertrophic Middle Vaal River for source water. It was found that pre- and intermediate ozonation had no significant effect on pH, conductivity, dissolved organic carbon (DOC) and total organic carbon (TOC). Chlorophyll-a, total chlorophyll, spectral absorbance coefficient (SAC 254) and total algal cells were not influenced by pre-ozonation (as desired) but were greatly reduced after intermediate ozonation. The dissolved air flotation step which occurs after pre-ozonation and prior to intermediate ozonation contributed to an average total chlorophyll removal of 74%. The effect of ozonation on the removal of manganese, iron and aluminium could not be determined during this study since these elements were present in relatively low concentrations in the source water. Intermediate ozonation had variable effects on the removal of Cyanophyceae, Dinophyceae, Euglenophyceae and Chlorophyceae, but Chrysophyceae, Bacillariophyceae and Cryptophyceae were greatly reduced after this stage.

**Keywords:** water treatment, pre-ozonation, intermediate ozonation, SAC254, chlorophyll, algal cells