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# Water Treatment Plant (WTP) Optimization Techniques

**ASI Technical Document #101**

## Introduction

Given the seemingly ubiquitous, yet episodic nature of pathogen presence in source waters, monitoring and optimizing the performance of water treatment plants is an increasingly important aspect in many suppliers' plans for maintaining water quality[1].

## Filtration Plant Optimization (FPO)

The Filtration Plant Optimization (FPO) analysis was developed by the EPA to replace the modified Microscopic Particulate Analysis (MPA) procedure that had been used to assess filter plant performance[2]. These methods are similar in that both involve concentration of large volume water samples using ten-inch (10≅) cartridge filters from the treatment plant's raw and finished water. These samples are analyzed and the data compared to assess the efficiency of removal of biological particulates due to treatment. Laboratory analysis involves elution of the particulates from the filter, concentration of the eluant by centrifugation and microscopic examination. The FPO procedure includes separating a portion of the filter extract and processing it according to a modified version of EPA Method 1623: *Giardia* and *Cryptosporidium* in Water by Filtration/Immunomagnetic Separation/Fluorescent Antibody Staining.

Bacteria and viruses are not detected by the FPO analysis. However, results from the FPO analysis do indicate the number and type of other microorganisms (*i.e.*, protozoa, algae) present in several size classes. This allows WTP managers an opportunity to review the performance of a particular filter, coagulation and flocculation scheme, etc. and a means of measuring performance improvement that result from optimization efforts.

Analytical Services, Inc. (ASI) has offered FPPE/FPO analyses since 1989. We supply sampling equipment and complete, detailed sample collection instructions and prompt turnaround time on the analyses. After you receive your report, our technical staff is available to review the tabulated results and log removal (by size class) data with you. We can also help you interpret the significance of these data in terms of WTP performance and the removal of *Giardia* and *Cryptosporidium*.

## References

1. Barsotti, M.G., et al. 1997. Using a Filtration Plant Performance Evaluation to Assess Treatment Effectiveness. *NEWWA*, 61:201-211.
2. USEPA. 1996. Microscopic Particulate Analysis (MPA) for Filtration Plant Optimization. EPA-910-R-96-001.