



Minnesota Pollution
Control Agency

Advanced Wastewater Treatment (Activated Sludge) Workshop Agenda

Offered by the Minnesota Pollution Control Agency

Registration: 7:30 a.m.

Seminar hours: 8:00 a.m. – 4:00 p.m.

Attendees: Wastewater operators

Hours: 6 wastewater contact hours per day (12 for both days)

Lunch: Provided

Please bring: Pencil(s), eraser, **microscope, slides, sample of mixed liquor** (on ice if collected over night) with air space at the top of the container

Day 1	Identify wastewater microorganisms in your plant and understand their function Gram stain and identify filamentous organisms How to monitor and control your facility operations using your microscope
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Day 2	<p>What nutrients are in wastewater and why we need to remove them</p> <ul style="list-style-type: none">– The forms of nitrogen and their sources– The forms of phosphorus and their sources– The effects of high nutrient levels in wastewater effluent and groundwater– Biological vs. chemical removal – advantages/disadvantages <p>Nitrogen Removal</p> <ul style="list-style-type: none">– The nitrogen cycle – nitrification and denitrification– Conditions necessary for optimal nitrogen removal <p>Phosphorus Removal</p> <ul style="list-style-type: none">– How biological phosphorus removal works – the chemistry and biology– Conditions necessary for optimal phosphorus removal– Configurations of wastewater facilities to remove nitrogen and phosphorus <p>Troubleshooting Biological Nutrient Removal Problems</p> <ul style="list-style-type: none">– Influent problems– Process problems– Dealing with recycle streams– System design problems– Reconfiguring existing facilities for phosphorus removal <p>Process Control and Monitoring</p>
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