Like a Rock or Like a Floc?

More Treatment and Better Clarification with Ballasted Activated Sludge

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PRESENTERS

SERGIO PINO-JELCIC

19 years in the wastewater industry

Technical Sales Manager for Biological Process Equipment at Evoqua

CASEY WHITTIER

23 years in the wastewater industry

Global Product Manager for Ballasted Settling Technologies at Evoqua

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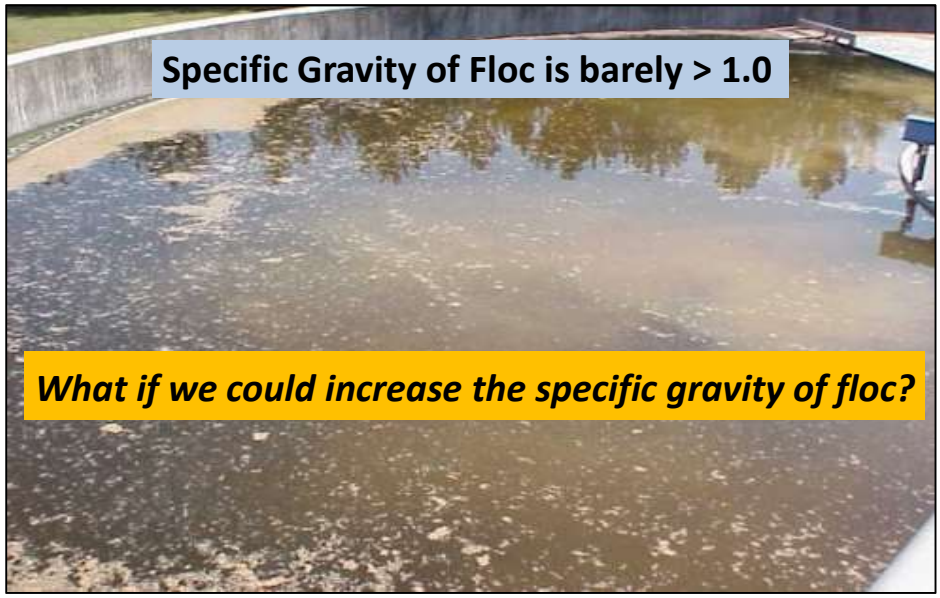
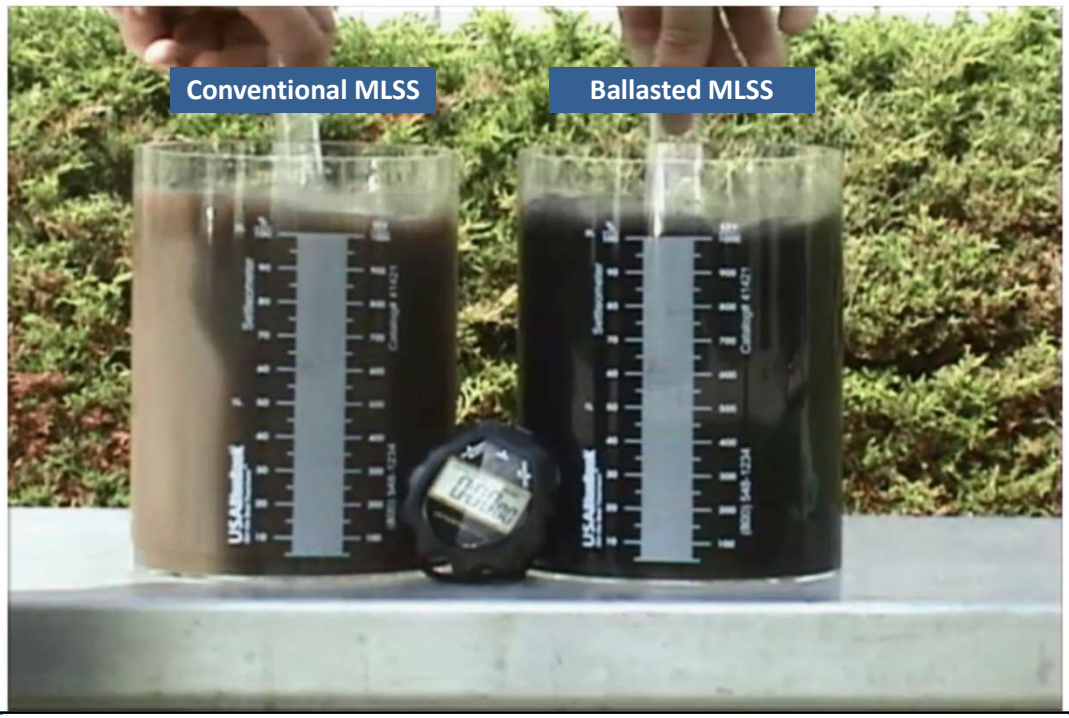
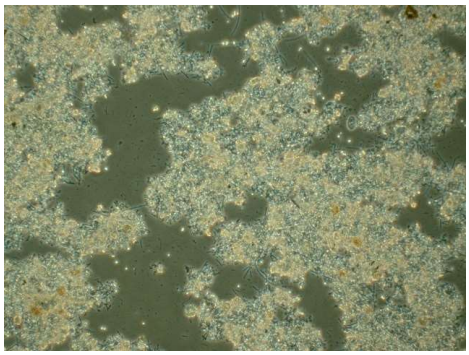
WHAT'S THE PROBLEM?



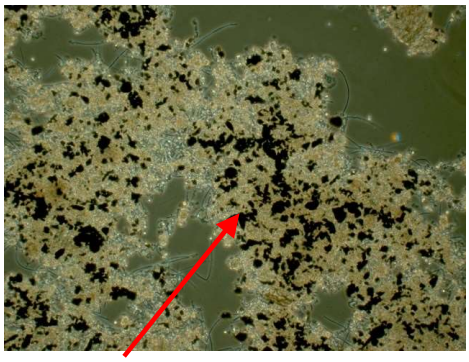


Rapid and Reliable Settling and Clarification

Conventional floc



Ballasted floc



Magnetite (Fe_3O_4)
Mined iron ore

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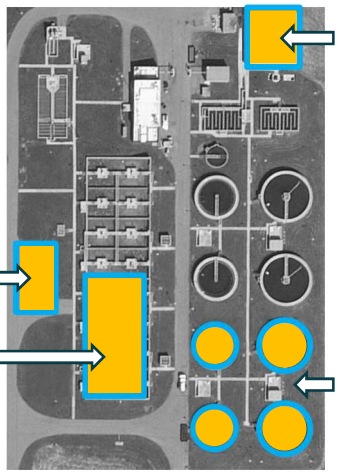
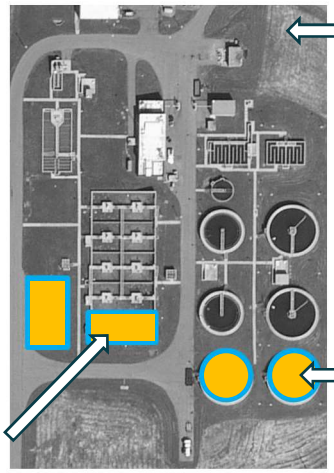
Plant Upgrades and Expansions

Credits: GHD

Conventional



BioMag® System



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Compatible with All Activated Sludge Systems

- Conventional
- High Rate
- Extended Air
- Oxidation Ditch
- Multistage BNR
- SBR

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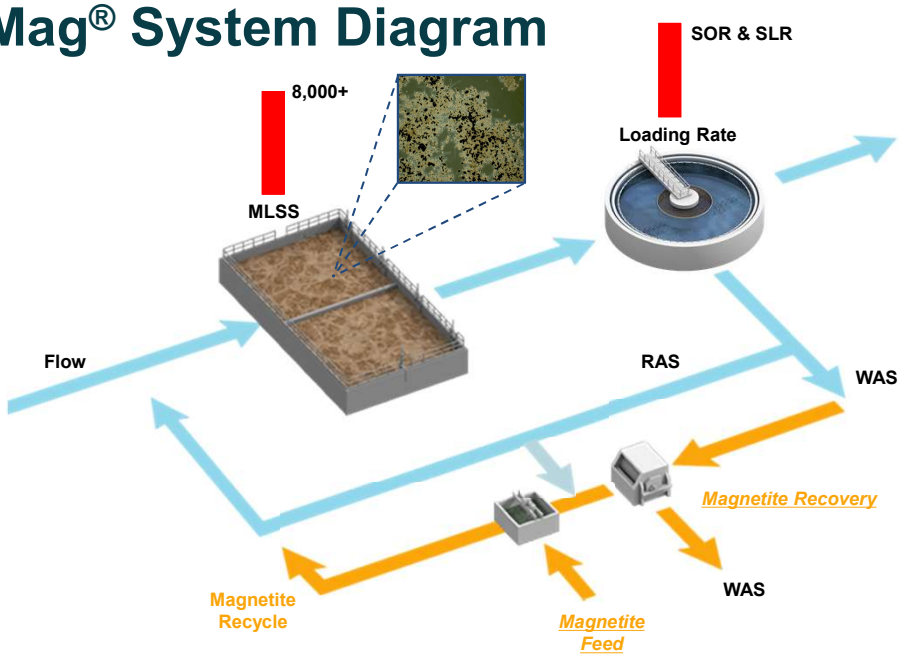
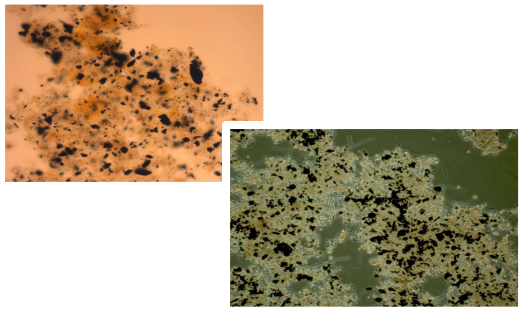
BioMag® System Diagram





Magnetite: Fe_3O_4

- ✓ Readily available iron ore (S.G. = 5.2)
- ✓ Hydrophobic: affinity to embed in floc
- ✓ Ballast chemical and biological floc
- ✓ Fully inert (NSF® Cert.)

Magnetite Ballast

- ✓ Inexpensive commodity
- ✓ Sustainable: 95% recovery
- ✓ Small particles (10-40 microns)

*NSF is a trademark of NSF International

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Stringent Limits without Filters

- Free up tankage for more treatment volume
- Longer SRT, higher MLSS in existing tanks
- < 3 mg/L TN and < 0.2 mg/L TP out of secondary clarifiers
- Need proper biological configuration for BNR
- Metal salt may be required for TP removal

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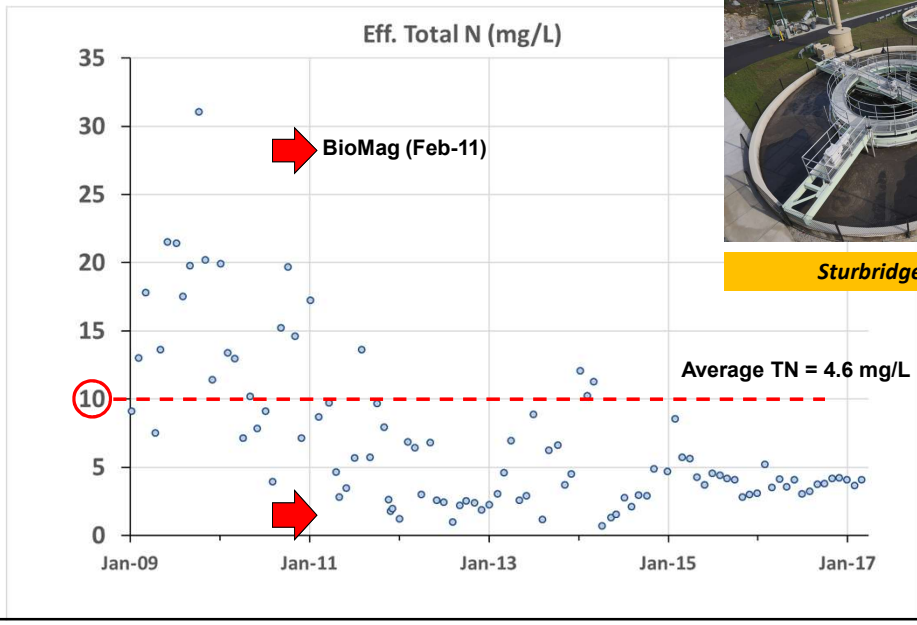
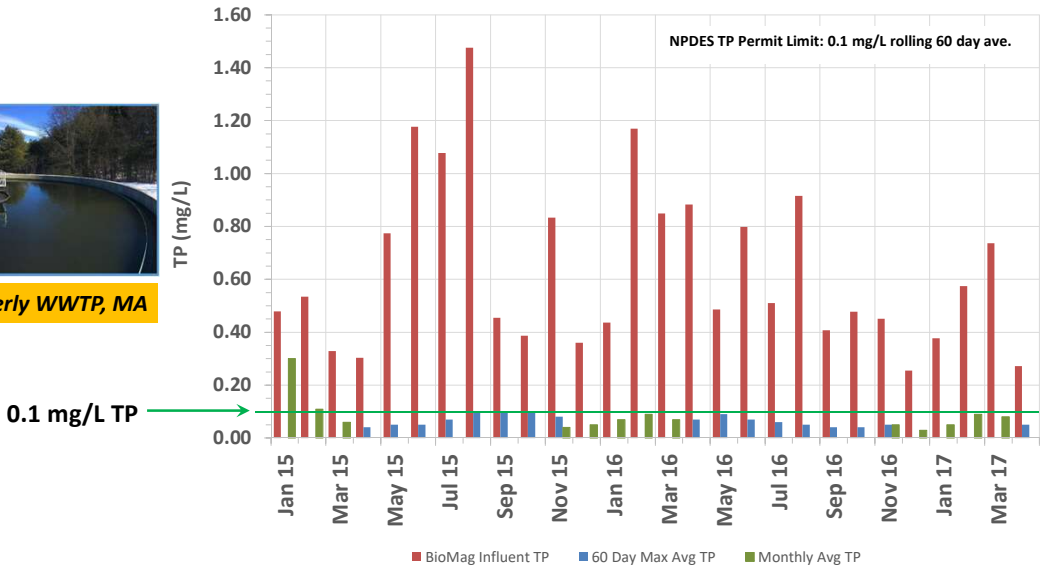
Nitrogen Removal

Sturbridge WWTP, MA



Phosphorus Removal

Marlborough Easterly WWTP, MA



Wet Weather Flow Management

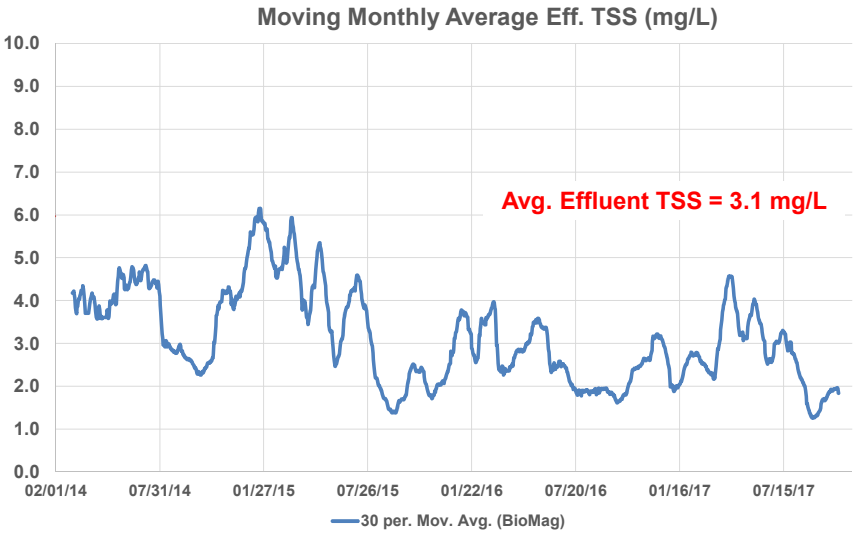
Upper Gwynedd Township, PA

Flow Rates
(2014-2017):

Avg = 2.5 MGD

Max = 16.9 MGD

Min = 1.3 MGD



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Process Stability

Allenstown, NH

20 MG/year of septic

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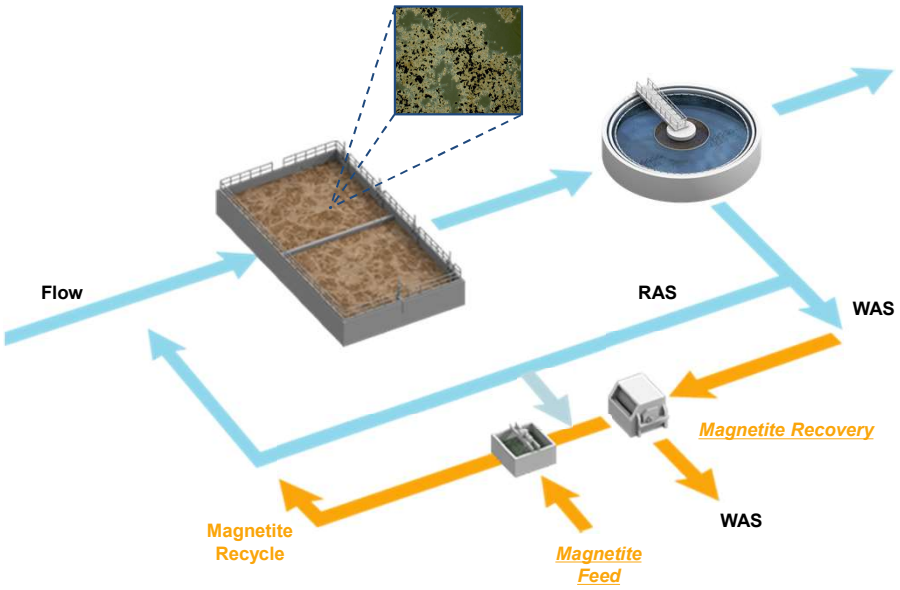
BioMag® Equipment – Feed and Recovery



BioMag® System Construction

Marlay Taylor, MD

Upper Gwynedd Township, PA

East Norrinton, PA

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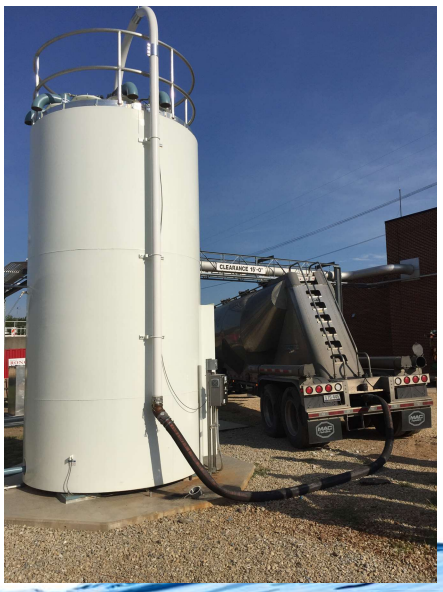
Magnetite Feed – Options



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Magnetite Recovery Drum

Equipment adapted from the mining industry

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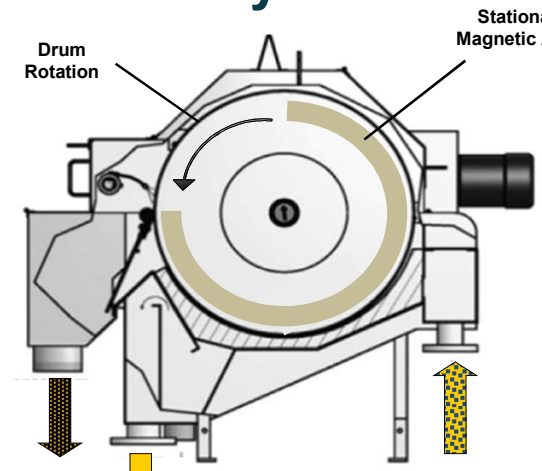
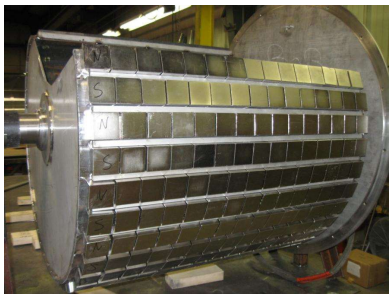
Magnetite Recovery Drum





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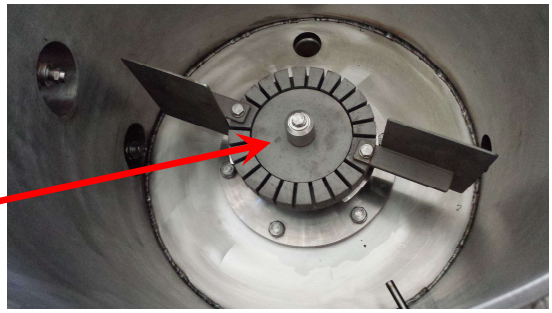
BioMag® Recovery Drum

BioMag® Shear Mill



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BioMag® System: Ballasted Activated Sludge

- Increase treatment capacity within existing tankage 2X-3X
- Achieve stringent permits without tertiary filtration
- Reduce costs for upgrades/expansions
- Improve clarifier performance
- Manage wet weather flows
- Provide process stability

26 references and counting…

Settle it like a Rock …not like a Floc!

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Thank You!

BioMag® System

biomag@evoqua.com

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