

Biofiltration Media Optimization

Andy Erickson, UMN SAFL

Jess Kozarek, UMN SAFL

Mike Isensee, Carnelian-Marine-St. Croix Watershed District

Mike Trojan, MPCA

ST. ANTHONY FALLS LABORATORY

<http://stormwater.safl.umn.edu/>



UNIVERSITY OF MINNESOTA

Driven to Discover®

Project Team

- Andy Erickson (Lead PI, Point of Contact), UMN, SAFL, eric0706@umn.edu, 612-239-2046
- Jess Kozarek (Co-Lead), UMN SAFL
- Laura Lewis, UMN SAFL
- Barbara Heitkamp, UMN SAFL
- John Chapman, UMN, BBE
- Mike Isensee (Co-Lead), Carnelian-Marine-St. Croix Watershed District
- Mike Trojan, MPCA
- David Fairbairn, MPCA
- Erin Anderson Wenz, Barr Engineering



ST. ANTHONY FALLS LABORATORY

<http://stormwater.safl.umn.edu/>



UNIVERSITY OF MINNESOTA

Driven to Discover®

Project Objectives – Phase I (April 2019 – June 2020)

- local sources, simple tests or metrics, and/or design specifications → biofiltration practices that function
 - filtration rate
 - supporting plant growth and microbial function
 - do not release phosphate



Types of Tests – Phase I (April 2019 – June 2020)

Mesocosms “medium world”

- Outdoor
- Trash Can Size (3' H x 1' Dia)
- Synthetic runoff dosing

*Measure phosphate capture
or release*



Media Components – Phase I (April 2019 – June 2020)

Organic

- Compost: food residue, leaf (10% or 20%)
- Peat: sphagnum, Reed/Sedge (20%)

Inorganic

- Biochar (15% + 20% leaf compost + sand)
- Iron (5% + 20% leaf compost + sand)
- Spent Lime (5% + 20% leaf compost + sand)



Types of Tests – Phase I (April 2019 – June 2020)

P Release Metrics/Tests

- Consider several tests (e.g., Solvita, Bray-P, Olsen-P, etc.)
- Measure relative difference for several media sources

Identify simple tests/metrics that link media to phosphorus release



Project Objective – Phase I (April 2019 – June 2020)

- local sources, simple tests or metrics, and/or design specifications → biofiltration practices that function
 - filtration rate
 - supporting plant growth and microbial function
 - do not release phosphate



Project Objectives – Phase II (May 2020– December 2022)

- evaluate the multi-year performance (extending Phase I),
- investigate the phosphate release and road salt,
- test plant growth in low-organic content (1% – 10%) mixes, and
- develop guidance and training to disseminate knowledge gained through this research.



Minnesota Stormwater Seminar Series

- Bringing nationally recognized experts of advanced stormwater innovation and knowledge to Minnesota
- Join online or in person
- <https://www.wrc.umn.edu/swseminars>



Thanks for your attention!



Andy Erickson eric0706@umn.edu

ST. ANTHONY FALLS LABORATORY

<http://stormwater.safl.umn.edu/>



UNIVERSITY OF MINNESOTA

Driven to Discover®