

# MMSD/Dane County Workgroup

- **Introductions**
- **Regulatory review**
- **Compliance options**
- **Costs**
- **Adaptive management pilot**
- **Next steps**
- **P Loading and lake response**
- **Other business**



# Phosphorus Regulatory Drivers

- NR 102-numeric water quality criteria
- NR 151-agricultural performance standard (PI)
- NR 217-implementation framework for point sources
- Rock River TMDL

## Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Rock River Basin

Columbia, Dane, Dodge, Fond du Lac, Green, Green Lake, Jefferson, Rock, Walworth, Washington, and Waukesha Counties, Wisconsin

July 2011

Prepared for:

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Agency  
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# Rock River TMDL

- Approved by EPA in September, 2011
- TP and TSS
- Contains allocations for:
  - Nonpoint
  - MS4s (stormwater)
  - Point sources
- TP and TSS reductions required for most MS4s and point sources





# WPDES Stormwater Dischargers (MS4s) With Outfalls in the Yahara Watershed

## Cities

Fitchburg  
Madison  
Middleton  
Monona  
**Stoughton**  
Sun Prairie

## Villages

**Cottage Grove**  
DeForest  
Maple Bluff  
McFarland  
Shorewood Hills  
Waunakee

## Towns

Blooming Grove  
**Bristol**  
Burke  
**Cottage Grove**  
**Dunkirk**  
**Dunn**  
Madison  
Middleton  
**Pleasant Springs**  
Westport  
Windsor

## Others

Dane County  
UW-Madison



Black = MAMSWaP Permittees

# MAMSWaP Permit TMDL Related Requirements

- **Develop plan if additional controls are needed.**
- **Submit plan to DNR within 3 years of TMDL approval.**
- **Plan needs to include an implementation schedule.**
- **Implemented as soon as practicable following DNR review.**



# Point Source Options for TP Compliance

- **Advanced treatment (filtration)**
- **Water quality trading**
- **Watershed adaptive management**
- **Combination**



# MS4 Options for TP Compliance

- Urban BMPs
- Water quality trading
- Watershed adaptive management-if under PS umbrella
- Combination



# CH2M Hill Nutrient Reduction Evaluation

- 9 different scenarios
  - TP alone (3)
  - TP + TN (6)
- Life cycle cost estimates
- Scenario 2      0.13 mg/l TP
  - \$78 Million total PW cost
  - \$3.9 Million annual cost
  - ~ 16% increase in service charges
  - ~ \$21 per year



# Cost Evaluation for Adaptive Management and Trading

- Use reasonably conservative assumptions
- Calculate 20 Year PW costs
- Compare to cost for advanced treatment
- Use cost as one factor in identifying a preferred P management strategy





# General Assumptions

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- Ag baseline from TMDL is updated per Yahara Clean
- BMPs implemented over a 7 year timeframe
- Other point sources and MS4s participate
- PI used to calculate P reductions
- P allocations per Rock River TMDL
- Robust water quality monitoring component
- Compliance determined by calculation
- Site specific TP criterion for Badfish Creek



# Agricultural BMPs and Related Information

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<b>BMP</b>	<b>Reduction Allocation</b>	<b>Change in PI</b>	<b>Trade Ratio<sup>(1)</sup></b>
Crop rotation	10%	2	2.0
No till	40%	2	1.3
Harvestable grass	10%	5	1.3
Cover crop	20%	2	2.0
Companion crop	10%	1	1.3
Contouring	10%	2	1.3

<sup>(1)</sup> Trade ratio is only applicable to trading options-it does not apply to adaptive management

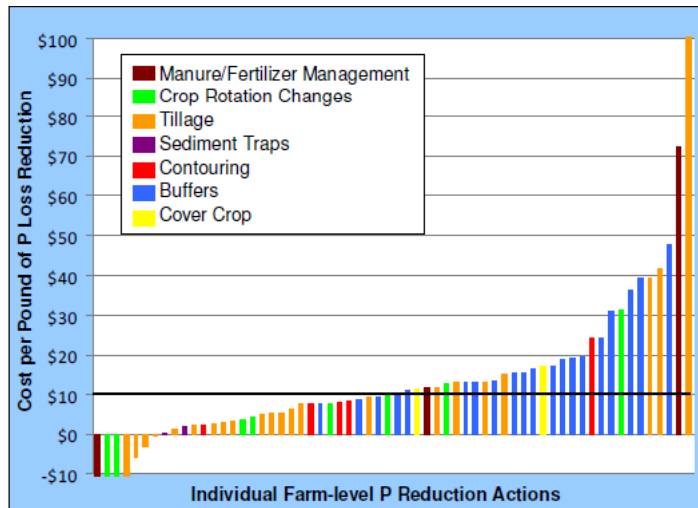
# Urban BMPs

- Sediment control
- Low TP yield
- High cost per lb of TP

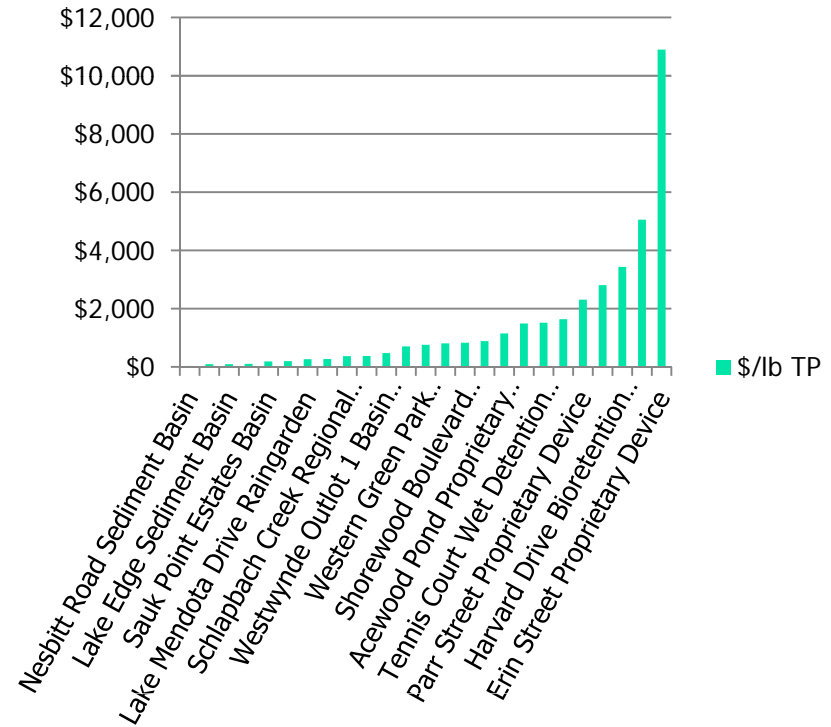


# Wide Range of Unit Costs for both Ag and Urban Management Practices

Iowa ag BMP Pilot Project



Urban Water Quality Grant Practices



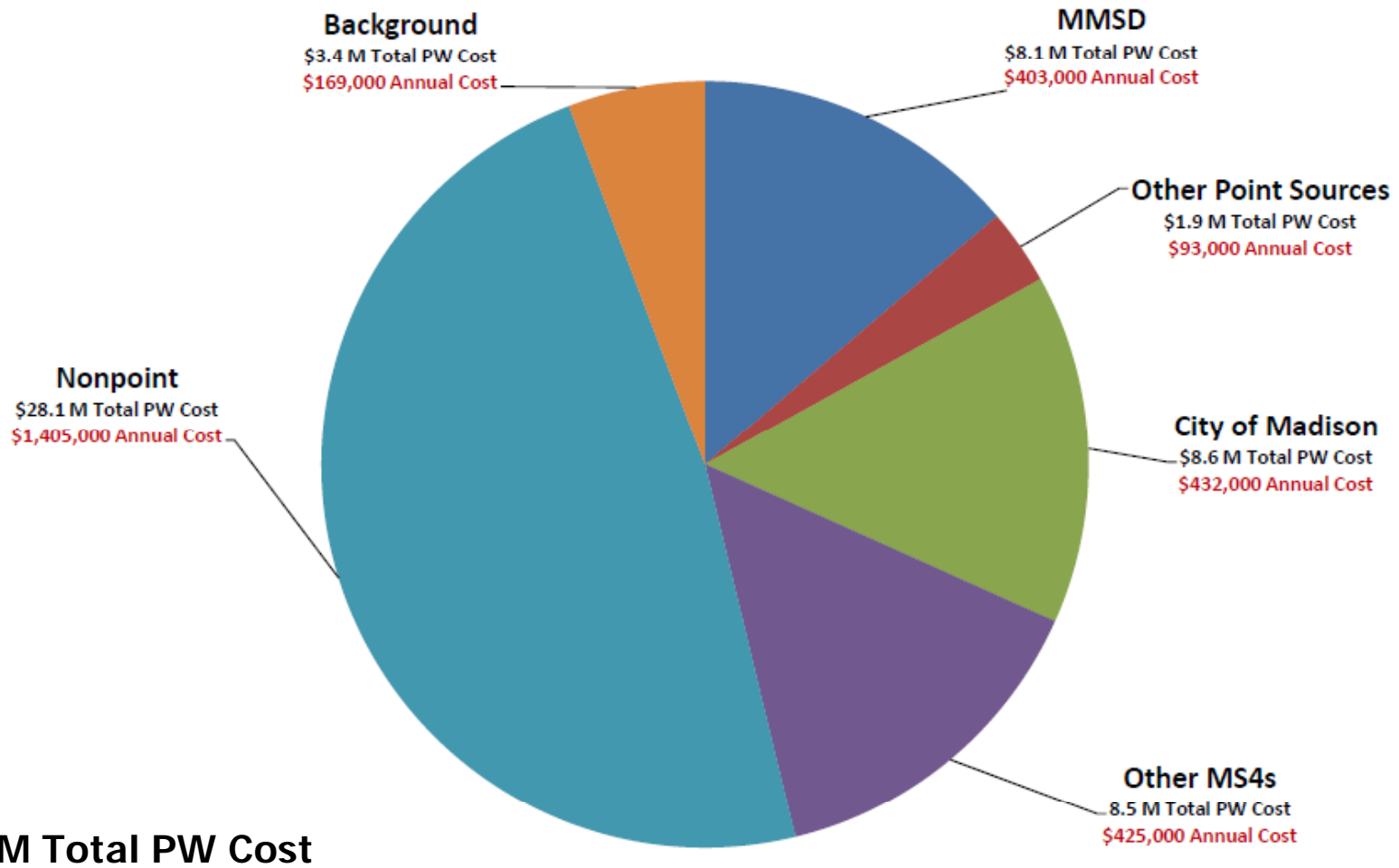
## Some Urban BMPs

### Urban Water Quality Grant Summary (2005-2009)

Practice	\$/lb TP	lb/yr TP
Nesbitt Road Sediment Basin	\$34	46.0
Farwell Street Sediment Basin	\$94	50.6
Lake Edge Sediment Basin	\$96	36.5
Commerce Park 1 Sediment Basin	\$105	36.8
Sauk Point Estates Basin	\$188	27.3
Cherrywood Acres Basin	\$203	46.7
Lake Mendota Drive Rain Garden	\$269	2.2
Eton Ridge Rain Garden	\$270	9.1
Schlapbach Creek Regional Basin	\$369	53.2
Inlet Filter Installation	\$373	1.1
Westwynde Outlot 1 Basin Retrofit	\$476	10.8
Dunn's Marsh Sediment Basin	\$707	14.1

Practice	\$/lb TP	lb/yr TP
Western Green Park Bioretention Basins	\$759	9.7
Commerce Park 2 Sediment Basin	\$807	6.4
Shorewood Boulevard Bioretention Basin	\$830	1.1
Marsh/Siggelkow Sediment Basin	\$886	6.2
Acewood Pond Proprietary Device	\$1,153	1.7
Circle Close Bioretention Basin	\$1,494	0.4
Tennis Court Wet Detention Basin	\$1,517	11.3
Pheasant Branch Sediment Basin	\$1,639	0.6
Parr Street Proprietary Device	\$2,308	1.3
Topping Road Bioretention Basin	\$2,811	0.3
Harvard Drive Bioretention Basin	\$3,434	0.3
Bioretention Basin - Kipp Corp.	\$5,055	0.3
Erin Street Proprietary Device	\$10,897	0.3

## Yahara Watershed Adaptive Management Cost Estimates (Point Sources at Current Phosphorus Loads)



# Adaptive Management Pilot Project

- MMSD and partners will conduct a pilot project.
- MOU between DNR, MMSD, City of Madison and Dane County.
- Other MS4s and point sources invited/encouraged to participate.



## Adaptive Management for the Yahara Watershed

Memorandum of Understanding (11/03/2011 draft)

**For Discussion Purposes Only-Not for Distribution**

Between Madison Metropolitan Sewerage District, Dane County, the City of Madison, and the Wisconsin Department of Natural Resources.

### 1. Background

The Wisconsin Department of Natural Resources (WDNR or the department) has developed numeric water quality criteria for phosphorus. These criteria were used as the basis for developing a total maximum daily load (TMDL) for the Rock River Basin. The TMDL was approved by EPA in September, 2010. The TMDL assigns phosphorus allocations for point sources, MS4s and nonpoint sources within the Rock River Basin. In most, but not all cases, point sources and MS4s will be required to reduce phosphorus loads to comply with the TMDL. Nonpoint sources will also be required to reduce phosphorus loads to comply with the TMDL.

Chapter NR 217 of the Wisconsin Administrative Code identifies the implementation framework for establishing effluent standards and limitations, including water quality based effluent limitations, for phosphorus in effluent discharged to surface waters of the state. NR 217.18 allows a point source regulated under NR 217 to use a watershed adaptive management option to comply with water quality criterion, subject to WDNR approval. WDNR may approve and authorize the adaptive management option if the point source demonstrates and the department concurs that all of the following conditions are met:

(a) The exceedance of the applicable phosphorus criterion in s. NR 102.06 is caused by phosphorus contributions from both point sources and nonpoint sources.

(b) Either the sum of the nonpoint sources and the permitted municipal separate storm sewer system contribution of phosphorus to the receiving water is at least 50 percent of the total contribution within the watershed of the receiving water where the applicable phosphorus criterion in s. NR 102.06 is exceeded; or the permittee demonstrates that the applicable phosphorus criterion cannot be met in the watershed without the control of phosphorus



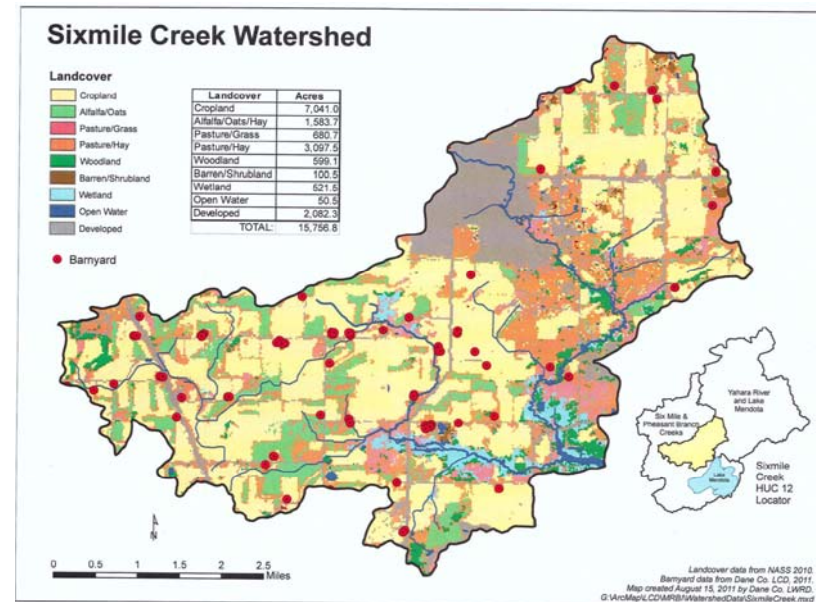
# Pilot Project Goals

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- Evaluate BMPs-cost, performance and ability to implement.
- Gain experience working with broker and farmers.
- Evaluate administrative issues.
- Assess water quality impacts.
- Develop supporting information for potential N credits.
- Assess the level of community support/acceptance.
- Evaluate funding mechanisms for nonpoint.
- Others.

# Pilot Project-Additional Details

- 3 year duration.
- Total cost ~ \$3 Million.
- Cost proportional to required TP reduction.
- No financial commitment for MS4s and other point sources until 2013.





# Pilot Project-Estimated Costs

<b>Entity</b>	<b>Total Cost</b>	<b>Annual Cost</b>	<b>Entity</b>	<b>Total Cost</b>	<b>Annual Cost</b>
Blooming Grove, Town	\$11,500	\$3,800	Shorewood Hills, Village	\$5,600	\$1,900
Bristol, Town	\$10,300	\$3,400	Stoughton, City	\$0	\$0
Burke, Town	\$28,600	\$9,500	Sun Prairie, City	\$15,900	\$5,300
Cottage Grove, Town	\$15,900	\$5,300	Waunakee, Village	\$27,400	\$9,100
Cottage Grove, Village	\$6,000	\$2,000	Westport, Town	\$23,600	\$7,900
Deforest, Village	\$21,000	\$7,000	Windsor, Town	\$33,900	\$11,300
Dunkirk, Town	\$0	\$0			
Dunn, Town	\$15,900	\$5,300	MMSD	\$380,600	\$126,900
Fitchburg, City	\$53,700	\$17,900	Oregon	\$56,900	\$19,000
Madison, City	\$408,100	\$136,000	Stoughton	\$14,200	\$4,700
Madison, Town	\$14,600	\$4,900	Arlington	\$800	\$300
Maple Bluff, Village	\$4,500	\$1,500	Middleton-Tiedemann	\$12,300	\$4,100
McFarland, Village	\$18,500	\$6,200	DNR-Nevin	\$2,700	\$900
Middleton, City	\$59,400	\$19,800	MGE	\$400	\$100
Middleton, Town	\$11,900	\$4,000			
Monona, City	\$21,600	\$7,200	Background	\$159,600	\$53,200
Pleasant Springs, Town	\$0	\$0	Nonpoint	\$1,326,400	\$442,100



## Adaptive Management Estimated Costs (Full Scale Implementation)

Entity	Total PW Cost	Annual Cost	Entity	Total PW Cost	Annual Cost
Blooming Grove, Town	\$240,000	\$12,000	Shorewood Hills, Village	\$120,000	\$6,000
Bristol, Town	\$220,000	\$11,000	Stoughton, City	\$0	\$0
Burke, Town	\$610,000	\$30,500	Sun Prairie, City	\$340,000	\$17,000
Cottage Grove, Town	\$340,000	\$17,000	Waunakee, Village	\$580,000	\$29,000
Cottage Grove, Village	\$130,000	\$6,500	Westport, Town	\$500,000	\$25,000
Deforest, Village	\$440,000	\$22,000	Windsor, Town	\$720,000	\$36,000
Dunkirk, Town	\$0	\$0			
Dunn, Town	\$340,000	\$17,000	MMSD	\$8,060,000	\$403,000
Fitchburg, City	\$1,140,000	\$57,000	Oregon	\$1,210,000	\$60,500
Madison, City	\$8,640,000	\$432,000	Stoughton	\$300,000	\$15,000
Madison, Town	\$310,000	\$15,500	Arlington	\$20,000	\$1,000
Maple Bluff, Village	\$100,000	\$5,000	Middleton-Tiedemann	\$260,000	\$13,000
McFarland, Village	\$390,000	\$19,500	DNR-Nevin	\$60,000	\$3,000
Middleton, City	\$1,260,000	\$63,000	MGE	\$10,000	\$500
Middleton, Town	\$250,000	\$12,500			
Monona, City	\$460,000	\$23,000	Background	\$3,380,000	\$169,000
Pleasant Springs, Town	\$0	\$0	Nonpoint	\$28,100,000	\$1,405,000

# Why should MS4s and other point sources participate?

- Ensure that their interests and questions are addressed.
- Preserve the opportunity to participate in a full scale project.
- Future cost savings.
- Regulatory certainty thru MOU.
- Not competing with each other.





# Next Steps

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- **Relationship between TP and TSS-compliance issue**
- **Finalize the MOU.**
- **Bring others under the adaptive management umbrella and add to MOU.**
- **Develop detailed scope for pilot project and begin putting pieces into place.**
- **Continue work on developing the adaptive management plan.**
- **Explore funding sources.**
- **Outreach + information sharing + education.**



# Previous Input on Importance Factors

## Commission

### Higher

WQ in Yahara lakes  
WQ in receiving streams  
Affordability  
Risk minimization

### Lower

Carbon footprint  
**Future effluent reuse**  
**Ancillary benefits**  
**Ease of operations**  
Staffing  
Partnerships

## Directors

### Higher

Affordability  
Risk minimization  
WQ in Yahara lakes  
Future effluent reuse

### Lower

WQ in receiving streams  
Partnerships  
Ease of operations  
**Carbon footprint**  
**Ancillary benefits**  
Staffing

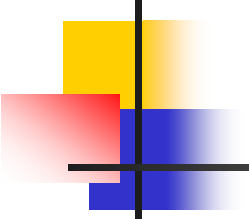
## Workgroup

### Higher

WQ in Yahara Lakes  
Affordability  
WQ in receiving streams  
Risk minimization

### Lower

Ease of operation  
**Ancillary benefits**  
**Carbon footprint**  
**Partnerships**  
Future effluent reuse  
Staffing



# Previous Input on Importance Factors

Commission	Directors	Workgroup
<p><b><u>Higher</u></b> Affordability Risk minimization WQ in Yahara lakes WQ in receiving streams</p>	<p><b><u>Higher</u></b> Affordability Risk minimization WQ in Yahara lakes Future effluent reuse</p>	<p><b><u>Higher</u></b> Affordability Risk minimization WQ in Yahara Lakes WQ in receiving streams</p>
<p><b><u>Lower</u></b> Carbon footprint Staffing Future effluent reuse Ancillary benefits Ease of operations Partnerships</p>	<p><b><u>Lower</u></b> Carbon footprint Staffing WQ in receiving streams Ancillary benefits Ease of operations Partnerships</p>	<p><b><u>Lower</u></b> Carbon footprint Staffing Future effluent reuse Ancillary benefits Ease of operation Partnerships</p>