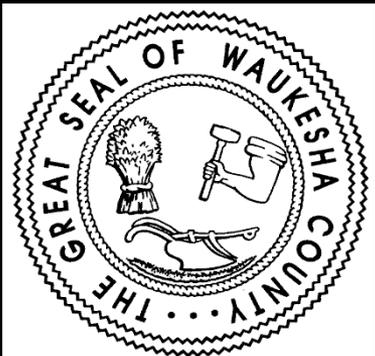


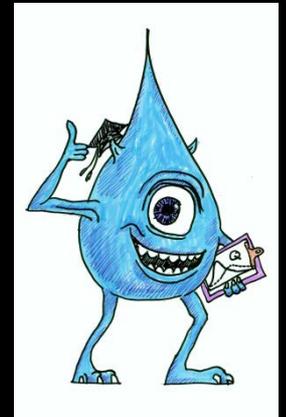
Storm Water U

Looking Ahead: Regulations and Digitals
Plan Submittals, County Storm Water Database & Website

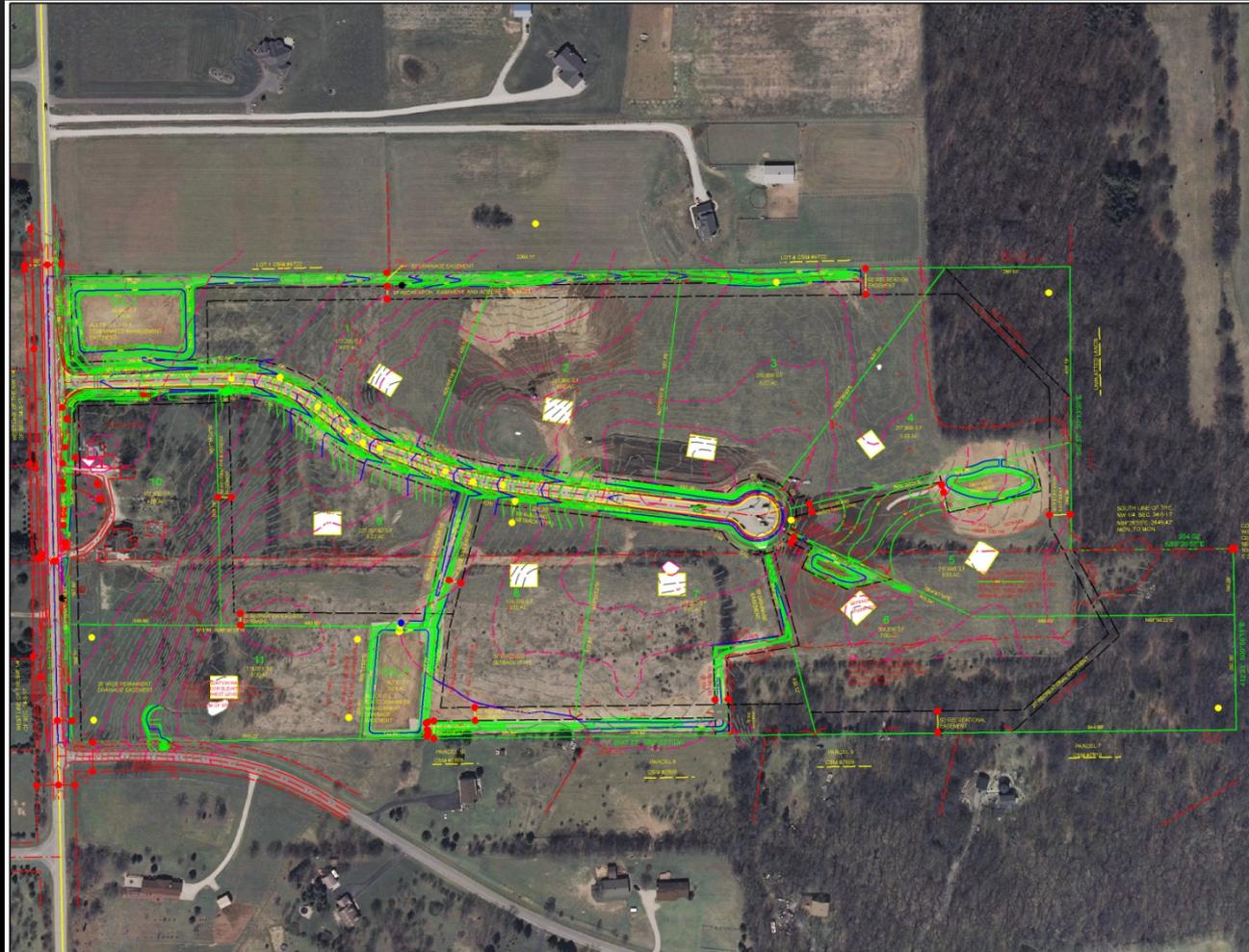
Waukesha County Storm Water Workshop
April 2014



Alan Barrows
Waukesha County



DIGITAL PLAN SUBMITTALS



- State Plane Coordinate System, Wisconsin South Zone, NAD 27, NGVD 29
- County requests a georeferenced as-built survey plan view of BMPs and easements

DIGITAL PLAN SUBMITTALS



Increased popularity of emailing .pdf copies of plans instead of submitting hard copies

THE PROS

- Reduces printing costs and paper;
- Reduces mailing & shipping costs;
- Speeds up the re-submittal process;
- Speeds up the response time (maybe);

THE CONS

- Adds to the regulator's responsibility of managing digital files;
- Adds to the County's responsibility for the costs of printing;
- Adds to the difficulty of tracking review deadlines;
- Difficult to review large scale maps;



Conclusion: Ask the reviewer ahead of time if emailed plans are okay

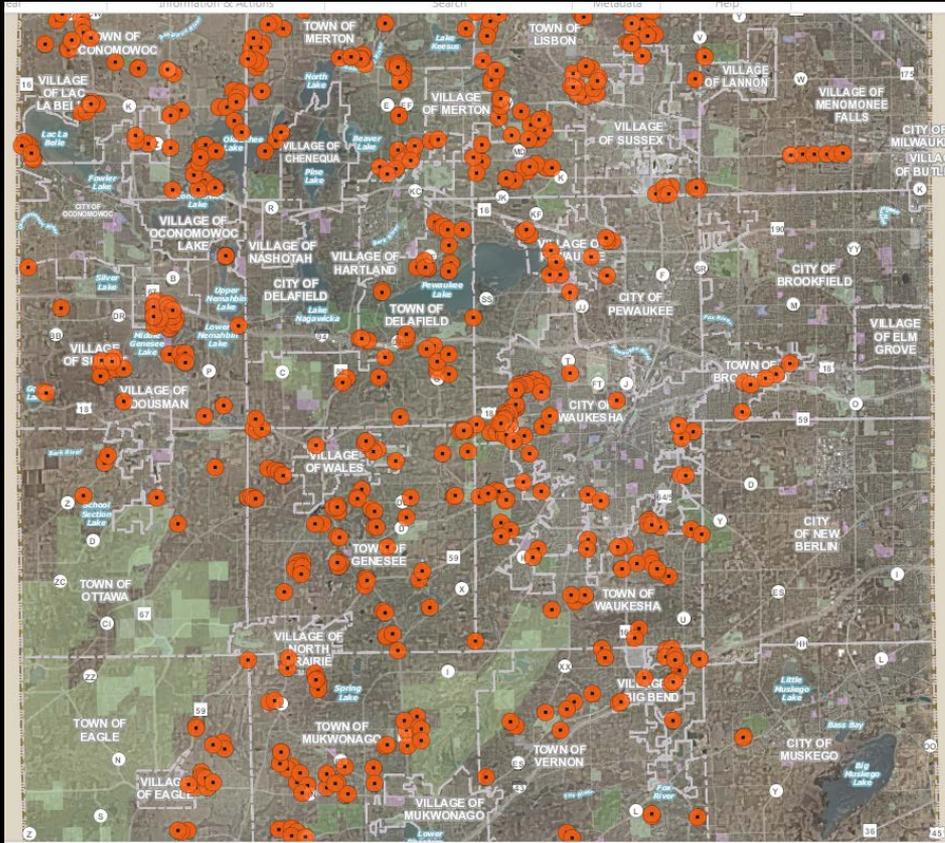
COUNTY'S STORM WATER DATABASE

UPDATE

- The County is currently working on resolving bugs associated with displaying and linking BMP images (photos, inspection logs, as-built surveys, etc.). This information is vital to our municipal partners and BMP owners;
- Currently pushing more information over the County's GIS website, including storm water permits as well as storm water BMPs;
- The County is evaluating upgrades to the storm water database to facilitate mobile compatibility (using tablets for construction and BMP inspection);

STORM WATER BMPs ON GIS

More than 650 Storm Water BMPs are on the County's GIS



- BMP Type
- Description
- Drainage Area (acres)
- Maintenance Responsibility
- Engineer / Firm
- Certification Date
- Last Inspection
- Next Inspection
- Links to Images
 - Photos
 - Maintenance Agreement
 - Inspection Logs

Available to municipalities in the County to use for free

WHAT'S NEW WITH GIS?

Waukesha County now has LiDAR data!

NEW LiDAR Derivatives

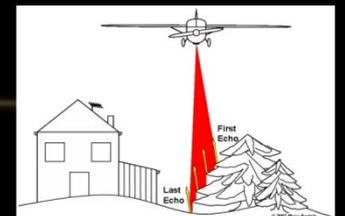
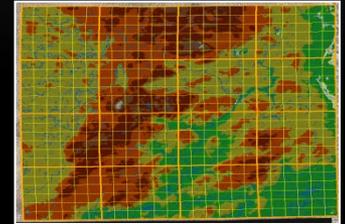
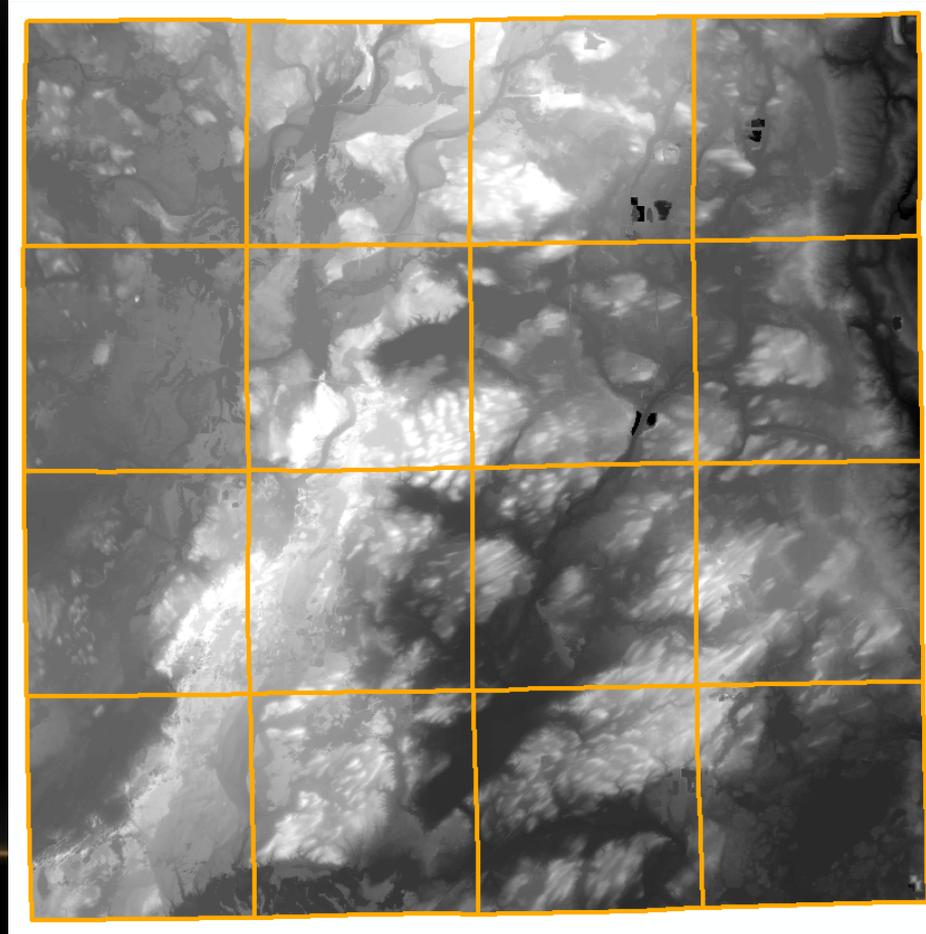
Elevation Models
Terrain Models
Contour Lines

Advanced Uses

Raster Analysis
3D Modeling

Datasets are available

For more information
contact the County's Land
Information Services office
at: (262) 896-8270



OTHER "NEW" GIS DATA LAYERS

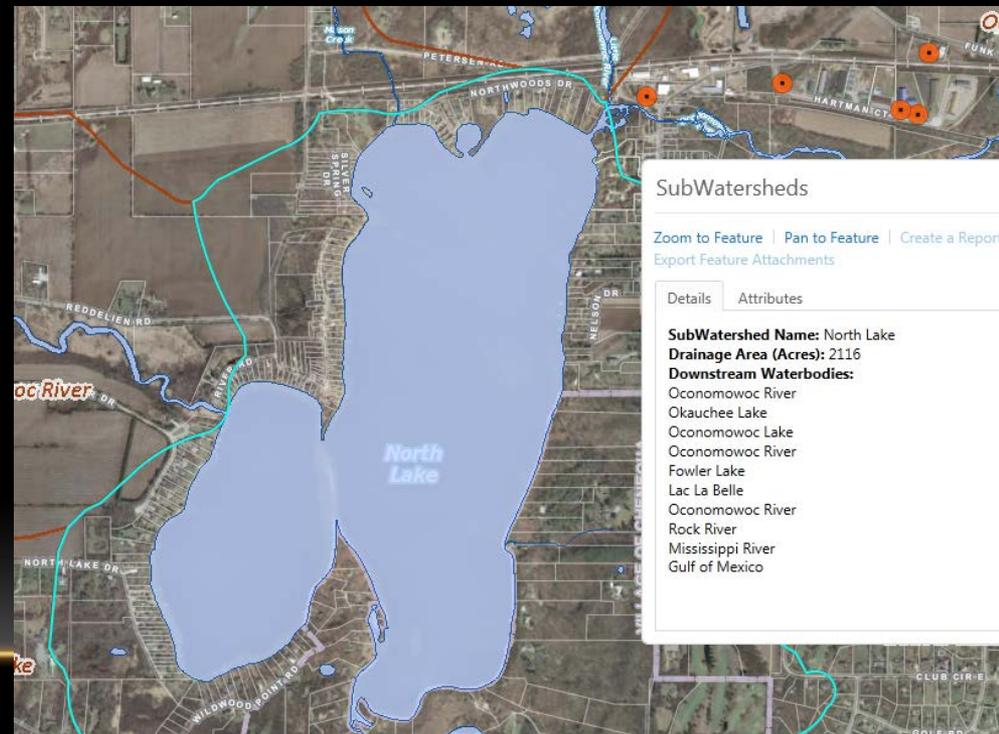
- Subwatersheds
 - Every named waterbody in the County has a mapped watershed;
 - Layer lists every downstream receiving waterbody to Lake Michigan or the Gulf of Mexico
- Lakes, Rivers, Streams & Ponds
 - Water feature names have been added
 - Links to DNR information and maps

Lake, River or Pond

[Zoom to Feature](#) | [Pan to Feature](#)
[Export Feature Attachments](#)

Details | Attributes | Links

Name: North Lake
Acres: 448.53
[DNR Information](#)
[DNR Lake Map](#)



SubWatersheds

[Zoom to Feature](#) | [Pan to Feature](#) | [Create a Report](#)
[Export Feature Attachments](#)

Details | Attributes

SubWatershed Name: North Lake
Drainage Area (Acres): 2116
Downstream Waterbodies:
Oconomowoc River
Okauchee Lake
Oconomowoc Lake
Oconomowoc River
Fowler Lake
Lac La Belle
Oconomowoc River
Rock River
Mississippi River
Gulf of Mexico

COUNTY WEBSITE – WHAT'S NEW?

Waukesha County Storm Water Management and Erosion Control Program



Department of Parks and Land Use
Land Resources Division (LRD)

Tri-fold informational brochure

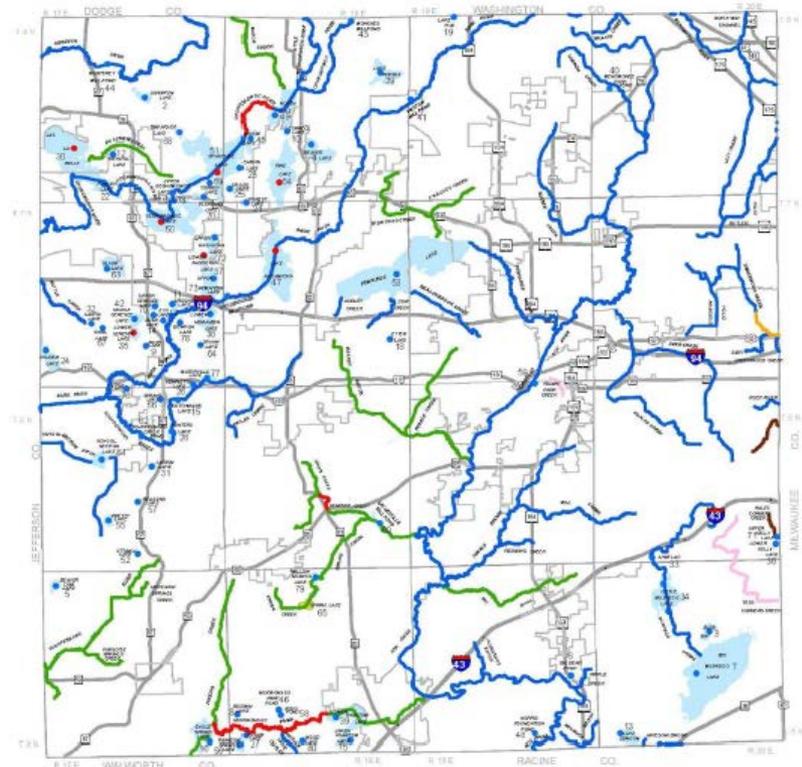
- County jurisdiction map;
- Permit triggers;
- Explanation of "ALP";
- Financial assurances;
- When is a PE needed?
- When is a LA needed?
- What is a maintenance agreement;
- How to get more information;

AVAILABLE RESOURCES ON THE WEBSITE

Waukesha County Land and Water Resource Management Plan 2012 Update



Waukesha County
Department of Parks & Land Use
Land Resources Division



Water Resource Classification Codes

- Outstanding Resource Water (ORW)
- Exceptional Resource Water (ERW)
- Lake Supports Fish and Aquatic Life (FAL)
- Lake Supports Cold Water Species (Cold)
- Cold Water Streams (Cold)
- Fish and Aquatic Life (FAL)
- Special Variance Waters
- Limited Forage Fish (LFF)
- Limited Aquatic Life (LAL)

Source: Waukesha County, SEWRPC & WDNR



AVAILABLE RESOURCES ON THE WEBSITE

Stream Name	Watershed	Township	Length (miles)	Classification Code(s)
15. Krueger Brook	Middle Fox	Vernon	2.1	FAL
16. Ripple Creek	Middle Fox	Vernon	1	FAL
17. Horseshoe Brook	Middle Fox	Vernon	1.5	FAL
18. Mill Brook	Middle Fox	Vernon	5.7	COLD, AQ-2 (RSH)
19. Pebble Brook	Middle Fox	Vernon	8.7	FAL, AQ-3
20. Redwing Creek	Middle Fox	Waukesha	1.4	FAL
21. Mill Creek	Middle Fox	Waukesha	5.1	FAL, AQ-3
22. Genesee Creek	Middle Fox	Waukesha	6.7	ERW, COLD, AQ-2 (RSH)
23. Spring Creek	Middle Fox	Mukwonago	6	COLD, 303(d)
24. White Creek	Middle Fox	Genesee	1.4	COLD
25. Beulah Lake Outlet	Mukwonago	Mukwonago	1.1	FAL
26. Mukwonago River	Mukwonago	Mukwonago	10.2	ERW, COLD, AQ-1 (RSH)
27. Jericho Creek	Mukwonago	Eagle	5.8	COLD, AQ-2 (RSH)
28. Battle Creek	Oconomowoc	Summit	2.8	FAL
29. Little Oconomowoc	Oconomowoc	Merton	3.5	FAL, AQ-3 (RSH)
30. Mason Creek	Oconomowoc	Merton	4.5	COLD, AQ-2 (RSH)
31. Oconomowoc River	Oconomowoc	Merton	14.3	ERW, FAL, AQ-3 (RSH)
32. Rosenow Creek	Oconomowoc	Oconomowoc	3.5	COLD, AQ-3
33. Hales Corners Creek	Root	New Berlin	1	LAL
34. Tess Corners Creek	Root	Muskego	5.5	LFF
35. Root River	Root	New Berlin	1.5	FAL, 303(d)
36. McKeawn Spring Creek	Scuppernong	Eagle	0.9	COLD
37. Paradise Springs Creek	Scuppernong	Eagle	1.6	COLD
38. Scuppernong River	Scuppernong	Eagle	7.4	COLD, AQ-2 (RSH)
39. Audley Creek	Upper Fox	Delafield	1.2	FAL
40. Brandy Brook	Upper Fox	Genesee	5	COLD, AQ-3
41. Deer Creek	Upper Fox	Brookfield	6.6	FAL, 303(d)

Streams Table w/ Classes

Lake	Watershed	Township	Surface Area (acres)	Max. Depth (feet)	Lake Type	Trophic State	Classification Code(s)
1. Applebecker Millpond	Bark	Delafield	12	5	DG	Eutrophic	FAL
2. Ashippun*	Ashippun	Oconomowoc	83	40	SP	Mesotrophic	FAL, AQ-2 (RSH)
3. Bass Bay	Muskego-Wind	Muskego	100	23		Eutrophic	FAL, AQ-3
4. Beaver	Oconomowoc	Merton	316	49	SP	Mesotrophic	FAL, AQ-3 (RSH)
5. Beaver Dam	Bark	Eagle	36		SE	Eutrophic	FAL
6. Big Bend Pond	Middle Fox	Vernon	7	10	SP	N/A	FAL
7. Big Muskego*	Muskego-Wind	Muskego	2,260	4	DG	Eutrophic	FAL, AQ-2 (RSH)
8. Brown	Mukwonago	Mukwonago	12	15	SP	Eutrophic	FAL
9. Buth	Bark	Summit	4	5	SE	N/A	FAL
10. Cornell	Oconomowoc	Merton	16	12	DG	Mesotrophic	FAL
11. Crooked	Bark	Summit	58	16	DG	Mesotrophic	FAL, AQ-2 (RSH)
12. Crystal	Oconomowoc	Oconomowoc	17	30		N/A	FAL
13. Denoon	Middle Fox	Muskego	162	55	SE	Mesotrophic	FAL, AQ-3 (RSH)
14. Duck	Bark	Summit	12	1	SE	N/A	FAL, AQ-3 (RSH)
15. Dutchman	Bark	Ottawa	33	43	SE	Eutrophic	FAL, AQ-2 (RSH)
16. Eagle Spring*	Mukwonago	Eagle	311	8	DG	Eutrophic	FAL, AQ-2 (RSH)
17. Egg	Bark	Summit	2	3	SE	N/A	FAL
18. Etter	Upper Fox	Delafield	11	5	SE	Eutrophic	FAL
19. Five	Oconomowoc	Merton	102	23	SE	Mesotrophic	FAL, AQ-3
20. Florence	Oconomowoc	Oconomowoc	21	48	SE	Mesotrophic	FAL
21. Forest	Oconomowoc	Merton	41	17	SE	Eutrophic	FAL, AQ-3 (RSH)
22. Fowlet*	Oconomowoc	Oconomowoc	99	50	DG	Mesotrophic	COLD, AQ-3
23. Garvin	Oconomowoc	Merton	17	36	SE	Mesotrophic	FAL
24. Golden	Bark	Summit	250	46	SP	Mesotrophic	FAL, AQ-2 (RSH)
25. Grass (Mud)	Oconomowoc	Merton	33		SE	N/A	FAL
26. Henrietta	Bark	Summit	15	7	SE	Eutrophic	FAL, AQ-3 (RSH)
27. Hogan	Mukwonago	Mukwonago	8	3	SE	N/A	FAL
28. Hunters	Bark	Ottawa	57	46	SP	Mesotrophic	FAL, AQ-2 (RSH)
29. Keesus*	Oconomowoc	Merton	237	42	SP	Mesotrophic	FAL, AQ-3
30. Lac La Belle*	Oconomowoc	Oconomowoc	1,117	45	DG	Eutrophic	FAL, 303(d), AQ-3
31. Larkin	Bark	Ottawa	57	4	SP	N/A	FAL, AQ-3 (RSH)
32. Leota (Laura)	Oconomowoc	Summit	8	11	DG	N/A	FAL
33. Limmie Lac*	Muskego-Wind	New Berlin	6	6	DG	Eutrophic	FAL
34. Little Muskego*	Muskego-Wind	Muskego	506	65	DG	Mesotrophic	FAL, 303(d)
35. Lower Genesee	Bark	Summit	66	45	SP	Mesotrophic	Cold, AQ-3 (RSH)
36. Lower Kelly	Root	New Berlin	3	36	SE	Eutrophic	FAL
37. Lower Nashotah	Bark	Summit	90	43	SP	Oligotrophic	Cold, AQ-2 (RSH)
38. Lower Nemahbin	Bark	Summit	271	36	DG	Eutrophic	FAL, AQ-2 (RSH)
39. Lower Phantom*	Mukwonago	Mukwonago	433	12	DG	Oligotrophic	FAL, AQ-1 (RSH)
40. Menomonee Park Pond		Menomonee Falls	15	50	SP	N/A	FAL
41. Merton Millpond	Bark	Lisbon	38	8	DG	Eutrophic	FAL, AQ-2 (RSH)
42. Middle Genesee*	Bark	Summit	109	40	SE	Mesotrophic	FAL, AQ-3 (RSH)
43. Monches Millpond	Oconomowoc	Merton	16	4	DG	Eutrophic	FAL
44. Monterey Millpond	Ashippun	Oconomowoc	30	8	DG	N/A	FAL
45. Moose	Oconomowoc	Merton	81	61	SP	Oligotrophic	FAL, AQ-3 (RSH)
46. Mukwonago Park Pond	Mukwonago	Mukwonago	1	5	SP	N/A	FAL, AQ-3 (RSH)
47. Nagawicka	Bark	Delafield	957	90	DG	Mesotrophic	FAL, AQ-1 (RSH)

Lakes Table w/ Classes

STORM WATER INDEX



LWC Programs

- Storm Water & Urban Runoff
- Water Conservation & Education
- Agricultural Conservation
- Nonmetallic Mining

Stormwater Info

- Index of Storm Water Documents
- Checklists
- County MS4 Permit Information
- Erosion Control Tools
- Financial Guarantee
- Maintenance Agreement
- Permit Application
- Rain Gardens & Barrels
- Staff Contacts
- Storm Water Tools
- Storm Water Workshops
- Technical Standards
- Water Resources Map

Index of Storm Water Documents

LAND CONSERVATION DIVISION (STORM WATER)

Index of Forms and Related Links:

If you have never been to this site before, we recommend you start by clicking [here](#). This will walk you through the storm water program. If you know what you're looking for, the index below should make finding it simple.

****** [For a quick overview of our storm water and erosion control program and its requirements, please click here for our handy reference guide.](#) ******

Attention: All documents are in PDF format; if you wish to obtain a document in Word format, please call 262-596-8300.

Application Forms:

- Storm Water Permit Application (fillable PDF)
- Small Site/Utility Installation Form* (fillable PDF) (* sites < one acre of total land disturbance and no storm water plan)
- General Requirements Agreement (Form)
- Permit Extension/Amendment Request Form (fillable PDF)
- Plan Implementation Sign-off (Form)

Checklists:

- #1 Site Plan Map Requirements
- #2 Erosion Control Plan Requirements
- #3 Storm Water Mgmt Plan Requirements
- #4 Certification of Compliance

Design Guidance/Summaries:

- Principles & Practices - Erosion Control
- Erosion Control Plan - Sample Narrative
- Erosion Control Plan - small sites (fillable PDF)
- Principles & Practices - Storm Water Management
- Storm Water Plan - Sample Narrative
- Summary of Watershed Data
- Wet Detention - Example
- Infiltration Basin - Example
- Infiltration Practice Vegetation - Establishment

Development Review Team:

- Development Review Team Information

Drawing Samples:

- Basin Cross Section
- Erosion Netting & Matting
- Inlet Protection
- In-line Water Level Control
- Rock-lined Channel
- Utility Installation

Financial Assurance:

- Fee Schedule
- Financial Assurance
- Financial Assurance Receipt/Release

Maintenance Agreements and Permit Termination:

- Certification of Compliance (fillable PDF) - internal use only)
- Minimum Covenants for CSM's & Subdivisions
- Sample Agreement - Single Lot
- Sample Agreement - Wet Detention
- Sample Maintenance Language - Infiltration
- Recording Procedures
- Permit Termination Procedures

Available Resources:

- Application materials
- Checklists
- Design Summaries
- Sample Drawings
- Maintenance Agreements
- Ordinance & Standards
- Web Links
- Closure Forms
- Link to info. brochure

Ordinance:

- Ordinance- Waukesha County Storm Water Management & Erosion Control
- Summary of Ordinance & Permit Flowchart
- Storm Water BMP Maintenance Ordinance
- County Ordinance Jurisdiction Map
- Intergovernmental Agreement Sample

Ordinance Admin. Standards:

- Basement Wetness & Flooding Prevention Standards
- Form A - Seasonal High Groundwater Determination Report
- Internally Drained Procedures
- First Half-Inch Infiltration Standard
- Late Season Stabilization Standard

Soils:

- Soil Evaluation Report Form

Stabilization Charts:

- Watershed slopes >8%
- Watershed slopes <8%
- Sample Completed Chart
- Slope Stabilization Chart

Storm Water Related Links:

- Storm Water Web Pages (DNR)
- Storm Water BMPs (EPA)
- Erosion & Sediment Control Technical Standards (DNR)
- Storm Water Management Technical Standards (DNR)
- DNR Wetland Identification Program (DNR)
- Runoff Information Web Pages (UWEX)
- Center for Watershed Protection
- Standards Oversight Council
- WISDOT - PAL
- NRCS Technical Standards
- TR-55 (NRCS)
- Minnesota Storm Water Manual
- Open Space Manual

Verification Forms, Construction Inspection, As-Built Standards:

- Construction Verification
- Planting Verification
- Construction Inspection Schedule
- As-Built Survey Standards
- Final Inspection Checklist

THE
END

