APPENDIX A
MEETING SUMMARIES

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
February 21, 2013 2 P.M.
Strand Associates, Inc.®
Kickoff Meeting Summary

Meeting Location: Strand Associates, Inc.®	Job No.: 1020-065
Meeting Purpose: Plan Kick-Off Meeting	

Meeting Handouts:	
Meeting Agenda	Attachment B: Summary of Scope
Attachment A: Steering/Issue Team Roles	Attachment C: Work Program–PowerPoint

Invitee	Representing	Present	Absent
Genesis Steinhorst	City of Madison	☒	☐
Greg Fries	City of Madison	☒	☐
Sue Ellingson, Alderperson	City of Madison	☒	☐
Steve Arnold, Chair	Friends of Lake Wingra	☒	☐
David Liebl	Friends of Lake Wingra	☒	☐
Jim Lorman	Friends of Lake Wingra	☒	☐
Rebecca Power	Friends of Lake Wingra	☒	☐
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☒	☐
Bret Shaw	UW-Madison	☒	☐
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐

Discussion:	**Action:**
1. <u>Review and Confirmation of Steering Team/Issue Team Roles</u> *Review of Attachment A:* The Steering Team reviewed Attachment A-Steering Team/Issue Team Roles. Membership on the Steering Team will be expanded to include a UW-Madison Arboretum representative, possibly Mark Wegener. The meeting frequency of the Steering Team will be every 7 weeks, with Issue Teams meeting between Steering Team meetings. These changes have been made to Attachment A. *Note: A 6-week frequency was discussed at the meeting. However, adjusting the Work Program according to discussions at the meeting shifts the meeting frequency to 7 weeks*. *Decision Making Protocol:* It was agreed that the decision making protocol will generally involve a "thumbs" approach with thumbs up, thumbs down, and sideways thumbs meaning in favor, not in favor, and more discussion necessary, respectively. Colored cards could also be used to accomplish the same objective. Generally, the Steering Team will operate under a "consensus" approach whereby gaining consensus on an issue should be achieved at the meeting.	Defined protocol for Meeting Summaries will be followed.

Discussion:	Action:
If general consensus cannot be reached, the issue would likely be tabled until the next meeting. When consensus is achieved on an issue, it will be summarized in the meeting summary. Opinions will be noted in the meeting summary if requested by the person with a different view. The Steering Team will help identify alternate opinions that should be documented in the meeting minutes. As appropriate, alternate opinions will also be noted in the draft and final reports. *Meeting Summaries Protocol:* The following items were agreed upon. Strand will take notes and provide meeting summaries. Meeting summaries will be provided via e-mail to Steering Team and Issue Team members within one week of a particular meeting. Steering Team and Issue Team members will provide comments on the submitted meeting summary within one week of receipt of the meeting summary. Revisions can be made with the sticky note function in Adobe Reader and e-mailed to Strand with the file name modified to include the author's name and date. Strand will then modify and submit the final meeting summary document to the Steering Team. Genesis will post the final meeting summary document to the City of Madison Web site.	
2. <u>Review and Confirmation of Critical Actions</u> *Review of Attachment B:* Strand provided a brief summary of Attachment B-Summary of Scope. The original schedule and a tentative schedule are included. The tentative schedule corresponds to the Work Program. Comments about the schedule are described under the Item 4. Work Program Components and Sequence Workshop heading below.	
3. <u>Status Update of Supporting Studies and Information</u> a. Lake Response Analysis (UW-Madison)–This study was started in 2012 and will continue through the summer of 2013 (data collection) with a final report expected in early 2014. Recoding of SWAT computer model to allow for use of subhourly rainfall data is complete. Strand will be using City of Madison's P8 computer model results and Strand-generated stormwater quality modeling for purposes of this study. Greg said P8 results are similar to the results in the Rock River Basin Total Maximum Daily Load (TMDL) document. The difference in results between the models is quite small. Once the Lake Response Analysis is complete, there will need to be discussion on what the results mean and how they will be incorporated into the Wingra Watershed Plan document.	

Discussion:	Action:
Genesis will make the most recent presentation on the Lake Response Analysis available on the City FTP site and e-mail the FTP password to the Steering Team.	Genesis will upload presentation to the City's FTP site and provide login information.
b. Leaf Collection Study (City of Madison)–This study began in the fall of 2012 and will continue beyond the end of 2014. The study was conducted in three basins, each with different leaf canopies (low/medium/high). The amount of leaves collected in each study basin was measured. Sampling/monitoring of the stormwater from these basins is also being conducted. Roger said the results will be transferable to other basins/watersheds. The initial phosphorus (P) concentrations from the sampling/monitoring show higher P concentrations than Roger has used in past modeling/calculations. One of the goals of the study is to determine the P reduction credit that municipalities can get for leaf collection to help meet TMDL requirements.	
c. Carp Study (UW-Madison)–David said that carp population currently in Lake Wingra was recently studied by sonar. Sonar was unable to identify an appreciable carp population in the lake. Previous estimates of the effectiveness of the midwinter carp seining indicated a 60 percent reduction in the carp population in the lake. The sonar study seems to indicate higher than a 60 percent reduction was achieved. David said that he has seen studies in Minnesota where it was shown that lakes with healthy panfish populations suppress the carp population. This is a hope for Lake Wingra.	
d. Monroe Street–The City is planning to reconstruct Monroe Street in 2016. There will be green street components to the project. The City's Green Street Committee has not been active to the point where its work would be relevant to the Wingra Watershed Plan.	
e. Various Studies–Jim mentioned the following projects: Aquatic Macrophyte Management w/WDNR (Jennifer Hauxwell), Update of Lake Wingra Aquatic Plant Management Plan by Dane County (Sue Jones), and various capstone projects (Monroe Street Green Street, Vilas Park, Vilas Corridor) though Edgewood College students. Jim said there may be pilot project candidates in some of these projects.	Jim will provide an e-mail update with attachments for various watershed-related studies and activity.

Discussion:	Action:
f. Wisconsin Urban Forestry Council (City of Madison and WDNR)–Roger said this committee has been discussing the use of trees in bioretention basins. Roger said there may be grant opportunities in this area. Marla Eddy, City Forester, is the contact at the City. g. Marion-Dunn/Glenway Alum Pilot Project–Greg said the City will be moving forward with a project to pilot the use of alum to reduce P at the Marion-Dunn/Glenway Pond along Monroe Street. The UW-Madison Arboretum has provided its support for the project. The City will be holding a stakeholder meeting at Edgewood College on March 7, 2013. Some asked whether the Friends of Lake Wingra could be provided information more in advance of the meeting.	Greg will send formal invites for the stakeholder meeting to the Steering Team.
4. <u>Work Program Components and Sequence Workshop</u> Tom led the Steering Team through a workshop using the draft Work Program. Agreed-upon changes to the Work Program include the following: a. Move the Lake Response Model Steering Team meeting to after the Pollutant Reduction Opportunities meeting. b. Move the Lake Response Analysis to be complete in early 2014. c. Generally, spread out the project to have the draft report and final draft report to be one month later, March and May, 2014, respectively. This will allow for better incorporation of the results of the Lake Response Analysis due to be completed in early 2014. It will push the Steering Team and Issue Team meetings to an approximate 7-week frequency. Discussions on stakeholder engagement include the following: a. Early stakeholder engagement will occur in the first part of the study where we include stakeholders and enlist their help in formulating solutions. b. Late stakeholder engagement will occur in the second part of the study and will focus on behavior change to a broader audience. The revised Work Program chart is attached to this meeting summary.	

Discussion:	Action:
5. Issue Team Membership Chloride Meeting: Greg said MG&E is required to participate in chloride reduction projects related to its infiltration facility at the Odana Golf Course and is anxious to initiate a project. Madison Metropolitan Sewerage District (MMSD) is currently undertaking a Chloride Reduction Plan that it intends to complete in about six months. MMSD has seen huge spikes in chlorides in its effluent (high of 500 mg/l recently). MMSD has been monitoring chlorides in a storm sewer pipe in the Wingra Watershed (by the Zoo downstream of the dam). This may be an opportunity to leverage project dollars with these utilities if the Steering Team wanted to pursue it. The coordination would have to start soon. MG&E contact is Bob Stoffs and the MMSD contact is Kathy Lake and/or Ralph Erickson. Roger thought that real time monitoring of chlorides around Lake Wingra would be a possibility for a project. Genesis said the Mayor is interested in investigating regulation of private applicators. Steering Team discussion via e-mail after the meeting resulted in the decision to invite Mark Barnes from Barnes, Inc., a private snow removal and deicing contractor/applicator, to the Chloride Meeting. Chloride Issue Team Membership: All on the Steering Team except Greg, Steve, and Rebecca would like to be on the Chloride Issue Team. The Chloride Meeting described above will begin the chloride discussion, but the formal Chloride Issue Team membership will be determined at a later time, likely at the next Steering Team meeting.	Jon will set up the Chloride Meeting in the next two weeks to engage MG&E and MMSD to explore options and possibilities. David will contact Mark Barnes.
6. Upcoming Schedule and Next Meeting The next Steering Team meeting will be on Thursday, April 4, 2013 from 3 to 5 P.M. at Strand. The remaining six Steering Team meetings are tentatively set up for Thursdays from 3 to 5 P.M. at Strand on the following days: May 23, July 11, August 29, October 17, December 5, 2013 and January 23, 2014. Issue Team meetings will be set up as instructed at the Steering Team meetings.	

c/enc: All Participants

ATTACHMENT A-STEERING TEAM/ISSUE TEAM ROLES

- Steering Team
  - Membership: Those invited to the Kickoff Meeting plus a UW-Madison Arboretum representative.
  - Role: Attend Steering Team meetings and Issue Team meetings, if interested. Provide review, comments and advice to the Strand team. Provide case studies and literature reviews to help guide the Strand team.
  - Meeting Frequency: Meetings every 7 weeks anticipated.
  - Decision Making Protocol: See Kickoff Meeting Summary document.

- Issue Team
  - Membership: Issue Teams would be made up of interested Steering Team members plus invited experts. Three Issue Teams are anticipated, one each for Chlorides, Phosphorus, and Infiltration.
  - Role: Delve deeper into specific issues.
  - Meeting Frequency: Generally every 7 weeks between Steering Team meetings, as necessary
  - Decision Making Protocol: See Kickoff Meeting Summary document.

ATTACHMENT B-SUMMARY OF SCOPE

1. Steering Team (8) and Issue Team (6) Meetings

- Work Program and Deliverables
- Pollutant Sources: Sediment and Total Phosphorus
- Pollutant Sources: Chlorides
- Pollutant Reduction Strategies
- Infiltration Opportunities
- University of Wisconsin-Madison Loading and Lake Response Model
- Pilot Project Recommendations
- Social Marketing Strategies

2. Identification of Critical Actions

- Pollutant Loading Analysis
  - Document Baseline and Existing Loads
  - 4 Strategies for 50% P Reduction
  - Incorporation of Social Science Methods
  - Deliverable: Prioritized List of Public/Private Practices, Policies, Procedures, Projects considering cost, cost-effectiveness, maintenance, responsible parties.

- Chloride Reduction
  - Document Current Road Salt Use
  - Mass Balance of Chloride Input and Output
  - Recommendations for Incrementally Meeting 40 mg/L Road Salt Concentration
  - Incorporation of Social Science Methods
  - Deliverable: Prioritized List of Public/Private Practices, Policies, Procedures, Projects

- Infiltration/Groundwater
  - Document Existing Infiltration in the Watershed and Set Achievable Infiltration Target
  - 5 Alternatives for Incremental Infiltration Increases In Watershed
  - Incorporation of Social Science Methods
  - Deliverable: Prioritized List of Public/Private Practices, Policies, Procedures, Projects considering cost, cost-effectiveness, maintenance, responsible parties.

- Pilot Project Recommendation
  - Identify one Pilot Project to Address one Critical Action (Pollutant Loading, Chlorides, and/or Infiltration)
  - Incorporation of Social Science Methods
  - Deliverable: Pilot Project Plan That Can Be Completed in One Year Considering Costs, Maintenance, and Responsible Parties

3. Stakeholder Engagement

- Identify Target Audiences for Each Critical Action Including Interaction With Them
- Develop Social Marketing Strategy
  - Present Potential Behavior Change Strategies to Steering Team

  - Develop Written Strategy For Engagement of Those Responsible for Critical Actions
  - Develop Framework for Unnamed Social Marketing Pilot Project
- Prepare Implementation Plan
  - Engagement of Those Responsible to for Critical Actions To Understand Techniques Most Likely to Result in Behavior Change
  - Deliverable: Written Implementation Plan Based on Feedback from Engagement Activities Including Roles and Responsibilities Memorandum Including Next Steps

4. Deliverables

- Draft and Final Plan
- GIS-based Watershed Inventory
  - TP and TSS Loading Reduction Opportunities in the Watershed
  - Known BMPs in the Watershed
  - Approx. Chloride Loading in Watershed
  - Historic and Current Spring Locations in the Watershed
- Prepare WDNR Urban Nonpoint Source and Stormwater Grant Application

5. Final Report Presentations (4 Presentations)

6. Social Marketing Strategies (Pilot Project): Detailed Scope of Services To Be Determined

7. Original/Tentative Schedule

Task	Original Completion Date	Tentative Completion Date
Notice to Proceed	November 1, 2012	January 4, 2013
Steering Team Meetings	December 2012 - August, 2013	February 21, 2013-February 2014
Issue Team Meetings	January, 2012 - August, 2013	March 2013-January 2014
Draft Pollutant Loading Analysis	May, 2013	January 2014
Draft Social Marketing Framework Strategy	May, 2013	May 2013
Draft Chloride Reduction Prioritization	July, 2013	August 2013
Draft Infiltration Prioritization	July, 2013	November 2013
Draft Pilot Project Recommendation	July, 2013	February 2014
Draft Implementation Plan	August, 2013	March 2014
Draft Watershed Plan	September, 2013	April 2014
GIS Based Watershed Inventory	September, 2013	April 2014
Final Watershed Plan	January, 2014	May 2014
Final Report Presentations	Winter, 2014	Summer 2014
Grant Application Submittal	Spring, 2014	Spring 2014
Social Marketing Pilot Project	Summer, 2014	Summer/Fall 2014

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
April 4, 2013 3 P.M.
Strand Associates, Inc.®
Steering Team Meeting No. 2–Chlorides

Meeting Location: Strand Associates, Inc.®	Job No.: 1020-065
Meeting Purpose: Steering Team Meeting No. 2-Chlorides	

Meeting Handouts:	
Meeting Agenda	

Invitee	Representing	Present	Absent
Genesis Steinhorst	City of Madison	☒	☐
Sue Ellingson, Alderperson	City of Madison	☒	☐
Rebecca Power	Friends of Lake Wingra	☒	☐
Steve Arnold	Friends of Lake Wingra	☒	☐
David Liebl	Friends of Lake Wingra	☒	☐
Jim Lorman	Friends of Lake Wingra	☒	☐
Paul Dearlove	Friends of Lake Wingra	☒	☐
Nancy Sheehan	Friends of Lake Wingra	☒	☐
Mark Wegener	University of Wisconsin-Arboretum	☐	☒
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☒	☐
Bret Shaw	University of Wisconsin–Madison	☒	☐
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐

Discussion:	**Action or Decision:**
1. <u>Kickoff Meeting Summary–Confirmation of Action Items</u> Jon presented the action items remaining from the first Steering Committee Meeting. The action column to the right indicates pending items.	City will post Kickoff Meeting summary on the City Web site. Genesis will check with Professor Chin to see if it is okay to upload the Lake Response Analysis to the City Web site. Jim Lorman will provide an e-mail to Strand with a written description of various watershed-related studies, and relevant attachments.
2. <u>Chlorides History, Guidance, Standards, Background</u> Jon presented nine slides summarizing the issue and history of chlorides in Lake Wingra. These slides included the following: a. *Wingra Watershed Plan Goal:* 40 milligrams per liter (mg/L), whereas it currently is closer to 100 mg/L. The increase in chlorides corresponds roughly to tons of road salt use. b. Chloride and sodium levels have been rising in Madison's water supply wells. The various regulatory limits on chloride are the following. Some Madison wells levels are starting to exceed 100 mg/L. (1) EPA Drinking Water Secondary Standard = 250 mg/L	

Discussion:	Action or Decision:
(2) EPA Chronic Toxicity Limit = 230 mg/L (3) WI Chronic Toxicity Limit = 395 mg/L c. Chloride Levels in the Area (1) There are high chloride level plumes near storm sewer outfalls, some as high as 3300 mg/L. (2) Odana pond monitoring data showed levels above 125 mg/L occurred in 7 of 12 months in 2012. 125 mg/L is when MG&E stops pumping from the pond into groundwater. (3) Chloride reduction strategies. d. Government Actions (1) In 2006-2008, recommendations from a report by the Commission on the Environment was circulated to Madison and Dane County committees. No official action was taken. It did result in some management practices and equipment upgrades, but no ordinance was enacted. (2) In 2013, the Dane County Lakes and Watershed Commission is reviewing salt use with prompting from Madison Metropolitan Sewerage District. They are reviewing water softener replacement regulations (for instance, when a house is sold). They are also looking at liability limits for private applicators, similar to what is occurring in New Hampshire. The commission is at the beginning of looking at these issues. (3) One person felt ordinances should again be advocated. While politically difficult to implement, they may be one of the most effective methods for getting a handle on salt use. A licensing procedure could be used. Dane County does have precedent in implementing ordinances, such as the phosphorus in fertilizer. Roger stated that even guidelines endorsed by the government would help.	
<u>Non-Agenda Item</u> Jon showed the Wingra Watershed boundaries in the project materials, compared with the actual watershed that flows into Lake Wingra. The effective watershed does not include the "head of the fish," which instead drains to Wingra Creek and does not influence water quality in Lake Wingra. One person asked if this was also true of groundwater flow; this is currently unknown. The group agreed that as the study evaluates pollutant contributors to Lake Wingra, only the area actually draining to Lake Wingra should be used in the calculations. The findings of the study, however, could be used across city watersheds.	For analysis purposes, Strand will only use the tributary area flowing into Lake Wingra, rather than the defined Lake Wingra Watershed area.

Discussion:	Action or Decision:
3. Critical Action-Chlorides a. Jon shared the percentage of types of impervious areas within the watershed that drain to Lake Wingra, excluding rooftops since they do not receive salt. About 54 percent of the impervious area draining to the lake is right-of-way (e.g. roads), while 20 percent is commercial properties. Strand then applied the typical application rates obtained from the City of Madison (salt and nonsalt routes, Dane County, and the UW). The application rates were preliminary and need to be further confirmed. b. Roger mentioned it might be possible to normalize rates for the Madison data by looking at the number of storm events per year of data. c. The rough analysis indicated that commercial properties (and commercial applicators) were a much larger contributor than originally expected. The initial analysis suggests the commercial properties could account for as much as 60 to 80 percent of the salt making it into the lakes. By contrast, road right-of-way contributes between 20 and 40 percent of the salt flowing towards Lake Wingra. d. Jon stated by the next meeting we would have the salt mass balance for the lake. Roger encouraged Strand not to underestimate the springflow in the mass balance equation. Springs flow 24/7 and they contribute a lot of water to Lake Wingra. e. The commercial application rates need to be confirmed and refined, but it appears there could be measurable gains by targeting commercial applicators. Tom stated we needed to contact more commercial applicators to fully understand application rates. f. Rebecca suggested that contacting commercial applicators could be an opportunity to engage these stakeholders employing social marketing methods. There was considerable discussion, including: (1) The need to contact owners to get permission to question the contractors they employ for snow removal. (2) The need to know which contractors are being used in the Wingra Watershed. (3) The opportunity to gain an understanding of leaf collection practices from these same contractors, because many of them probably also provide landscape services for these properties.	Strand will consider influence of springs in salt mass balance of Lake Wingra.

Discussion:	Action or Decision:
(4) Owners and property managers play a key role in the equation, and they should be part of the engagement. (5) The opportunity to follow-up with commercial applicators that participated in training that the City of Madison offered several years ago. (6) Connie Fortin (Fortin Consulting, Inc.) from Minnesota has had considerable experience in this area, and a phone conversation with her could provide insight into the challenges of changing salt practices on commercial properties. (Some of this discussion was then put on hold to be referred to in the next agenda item.)	
5. Stakeholder Engagement-Chlorides a. Tom outlined the stakeholder engagement that is being proposed for the project. The early stakeholder engagement would occur while the study is determining the dominant factors. Early stakeholder engagement would be performed with institutions to establish an understanding of their management practices as well as benefits and barriers. By engaging with them early, they will be more receptive to management changes because they have some ownership. He stated this early engagement would enlist these stakeholders in issue meetings and interviews, there would not be a social marketing campaign. Tom stated the late stakeholder engagement block would occur in the second half of the project and would focus on behavior change. b. Brett started the discussion by reviewing what social marketing intends to do. He stated information alone has little effect on changing behaviors. Social marketing is the use of marketing principles and techniques to change behaviors. It is laser focused on behavior change, not perception change or simply education. He went on to describe factors to consider in using community based social marketing, as well as social marketing tools, such as benefits and barriers, norms, prompts, effective message creation, and the encouragement of commitment. Brett said often a pilot study is used to test a social marketing strategy before it is more widely implemented. Most programs need to refine or "tweak" some methods. c. Tom stated the late stakeholder engagement would incorporate determining the audience, engaging them, and implementing a social marketing campaign, which will	

Discussion:	Action or Decision:
include a pilot project. Determining the desired behavior change will come from the analysis, and the committee. d. Discussion then turned to stakeholder engagement and chlorides. e. Did the committee want to investigate a social marketing pilot project with MG&E and the Odana pond since MG&E is motivated to do something? Genesis felt the City could work independently with MG&E and the Wingra study did not need to address it (but be aware of it.) f. Did the committee want to use social marketing techniques with commercial applicators? Brett state a lot of information could be gained by doing phone interviews. Genesis felt she and Brett could develop a strategy to interview commercial applicators that attended the City's workshop a few years ago. If the interviews were "follow-up" applicators may be less guarded and we may get better information. g. Tom asked if Strand could phone some of the applicators in the mean time to determine actual application rates.	Odana Pond will not be used as a pilot project for the Lake Wingra Watershed plan. Brett will work with Genesis to contact commercial applicators to get feedback on application rates, application techniques, benefits and barriers, including development of a questionnaire. Strand will contact three applicators to get application rates in order to finish their analysis.
6. <u>Work Program Schedule</u> At the next Steering Committee meeting we should have the chloride issue completed. This means the analysis is basically finished and there are a set of recommendations to present before the committee. Most in the group did not feel another issue team meeting was needed. The next Steering Committee meeting will discuss infiltration.	At the next meeting Strand will have their chlorides analysis complete and present a set of recommendations to the committee for discussion.

Prepared and respectfully submitted by Tom Lynch.

c/enc: All Participants

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
May 23, 2013 3 P.M.
Strand Associates, Inc.®
Steering Team Meeting No. 3

Meeting Location: Strand Associates, Inc.®	Job No.: 1020-065
Meeting Purpose: Steering Team Meeting No. 3	

Meeting Handouts:	
Meeting Agenda	

Invitee	Representing	Present	Absent
Genesis Steinhorst	City of Madison	☒	☐
Sue Ellingson, Alderperson	City of Madison	☒	☐
Rebecca Power	Friends of Lake Wingra	☒	☐
Steve Arnold	Friends of Lake Wingra	☒	☐
David Liebl	Friends of Lake Wingra	☒	☐
Jim Lorman	Friends of Lake Wingra	☒	☐
Paul Dearlove	Friends of Lake Wingra	☒	☐
Nancy Sheehan	Friends of Lake Wingra	☒	☐
Mark Wegener	University of Wisconsin-Arboretum	☐	☒
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☒	☐
Bret Shaw	University of Wisconsin–Madison	☒	☐
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐

Discussion:	**Action or Decision:**
1. Kickoff Meeting Summary–Confirmation of Action Items Jon presented the action items remaining from the first Steering Committee Meeting. The action column to the right indicates pending items. Jim said that there are two landscape architecture projects and a map of a proposed Vilas Park redevelopment by Lauren Brown.	City will post Steering Team and Issue Team Meeting summaries on the City Web site. Jim will provide an e-mail to Strand with a written description of various watershed-related studies and relevant attachments. Genesis will provide information on the Monroe Street Commercial/Business Development plan.
2. Stakeholder Engagement Bret summarized the findings from the telephone interviews completed by one of his grad students. Bret worked with Genesis and others on the Steering Team to develop a *Salt Application Interview Script.* The findings of the interviews are included in a document titled *Salt Use in Snow and Ice Removal by Private Applicators in the Madison Area*. Bret discussed the following. a. *Interviewees:* Eight private companies that attended the 2008 salt application training sponsored by the City of Madison were contacted. Five companies were interviewed. The other three were contacted several	

Discussion:	Action or Decision:
times but never reached. b. Numerous and candid responses were received. Some of the more noteworthy comments/findings are the following. (1) *Deicer Products Applied:* Three of the five used basic rock salt as the deicer of choice. Two companies used an "environmentally-friendly" mix. (2) *Barriers to Change:* Identified barriers included public safety, customer expectations, and liability. (3) *Common Sense Approach:* One respondent did not buy in to some of the training in 2008 stating that practical implementation of some of the techniques was not feasible in the field. The Steering Team acknowledged that credibility of the presenter is a key factor in change. Techniques to be used in the future should include testimonials of successful alternative salt application techniques by practitioners rather than educators. The idea of helping to move people along the adoption curve was stated as important. (4) *Client-Driven Application Methods/Rates:* It was found that in most cases the clients are driving what the applicators are doing in the field. The importance of engaging the property owners and inviting them to future training sessions was stated as an important next step. Genesis stated that the Madison Area Municipal Stormwater Partnership (MAMSWAP) has $5,000 earmarked for information and education that could potentially be leveraged for this training. It was noted that Minnesota has two different training sessions, one for private applicators and one for municipal applicators. Jim said that record keeping and sharing records of salt usage is important to this issue. (5) *Development of a Wisconsin-Specific Salt Application Rate Guide:* Development of a guide for Wisconsin was discussed as being important. The Minnesota salt application guide was referenced as was a Michigan guide that is currently under development.	
3. <u>Chlorides-Draft Report Section</u> Tom Lynch handed out Strand's draft report section on Chlorides and then presented PowerPoint slides of the findings. a. *Primary Contributors and Actual Use:* A table was	

Discussion:	Action or Decision:
presented showing the stated salt application rates per application of the various pavement maintainers in the watershed. The table compared stated rate per event with the actual rate per event derived from actual data received from the City of Madison and the Wisconsin Department of Transportation. It appears the salt application rate per event could be 4 to 7 times higher than the stated rate. It was acknowledged that salt is typically applied on the average of 3 to 4 times during each salting event, but as many as 7 applications is common. Strand's analysis indicates that the primary contributors (on a yearly tons of salt basis) are Commercial/Business/Institutional/Multifamily (45% to 50%), Madison Salt Routes (23% to 38%), and County-Maintained Roads of Fish Hatchery Road, Beltline, and Verona Road (12% to 17%). Rebecca stated the chloride concentrations in groundwater are not ambient; they result from salt applied on impervious surfaces in the watershed and surrounding area. b. *Chloride Mass Balance Predictive Tool:* Jon and Roger met on two occasions prior to the meeting to discuss and agree upon parameters used in Strand's Chloride Mass Balance Predictive Tool. Numerous assumptions were made within the predictive tool as described in the draft report section. Based on Roger's late winter 2008 chloride concentration readings, a factor was introduced to account for the vertical chloride gradient within the lake. The factor used accounts for the average lake chloride concentration. A factor of 3.25 times the surface concentration produced the best results in the modeling. A chart showing the predicted surface chloride concentration tracking closely with the observed surface chloride concentration was presented. The predicted and observed concentration diverged in 2007 and 2008 but tracked well in 2006, 2008, 2009, 2010, 2011, and 2012. Genesis said she thought that the City may have sold salt to surrounding communities in 2007 and 2008 which may have resulted in an overestimation of salt applied in the predictive tool.	Genesis will investigate what years and how much salt was sold to surrounding communities to attempt to resolve the discrepancy of surface chloride concentration in 2007 and 2008.
c. *Improvement Analysis:* Five management scenarios were presented showing the resultant long-term surface concentration in the lake. The predictive tool predicts that the resulting chloride concentration of a particular scenario will occur about 6 years after the scenario was fully implemented. Scenario 1 implemented a	

Discussion:	Action or Decision:
do-nothing approach that would result in a long-term 116 mg/L concentration in the lake. It was noted that a do-nothing approach is not really do-nothing, it means maintaining current application levels. Actually doing nothing would mean salt usage would continue to rise increasing chloride concentrations in the lake. Scenario 2 implemented a 70 percent reduction from all pavement maintainers, which resulted in a 41 mg/L surface chloride concentration. Scenario 3 implemented a 100 percent reduction from commercial applicators only which resulted in a 64 mg/L surface chloride concentration. Scenario 4 implemented a 50 percent reduction in every pavement applicator except the Beltline and resulted in a 68 mg/L surface chloride concentration. Scenario 5 implemented a 50 percent reduction from municipal and county applicators and a 75 percent reduction from commercial applicators that resulted in a 52 mg/L surface chloride concentration.	
David said the timing of chloride loadings to the lake could be discerned from the chloride concentrations being monitored at Odana Pond. Rebecca felt it would be useful to see the yearly chloride concentration profile.	Strand will show graphs illustrating yearly chloride concentration profiles.
d. *Draft Recommendations:* Tom presented proposed management changes including a feasibility rating and an implementation priority.	
It was noted that based on the results of the predictive tool and the various chloride contributors that perhaps the 40 mg/L goal for the lake was overly aggressive. Jim stated that in the 1950's and 1960's chloride levels were low and therefore it should be feasible. Roger said that studies have shown that a 50 percent reduction in salt usage is achievable and he believes that is an achievable goal in the Wingra watershed. This would equate to about a 68 mg/L long-term surface concentration in the lake.	
It was requested that Strand estimate a reduction per management change.	Strand will estimate production per management change.
e. *Social Marketing Issues:* It was discussed that the Improvement Analysis should include a true do nothing alternative that shows increasing snowfall/ice and resultant increasing salt usage. There was discussion that indicated the severity index could be used in the Worst-Case Projection. Perhaps using the average of the	

Discussion:	Action or Decision:
last 3 to 5 years of snowfall/precipitation to project to the future rather than using the statistical average year. The last 3 to 5 years have shown the steady increase in surface chloride concentrations. It was noted that the salt applicators need to know what part of the equation they can do something about. It should be conveyed that while they have no control over the weather, they certainly have control over their salt application behaviors. Salt applicators should be referred to as Problem Solvers rather than managers. A Chloride Pilot Project that would look at the various management changes to see whether 40 mg/l is possible or whether there is a level of chloride reduction that is feasible could be considered. The State of Michigan DOT has performed studies on the effectiveness of salt application with varying truck speeds (i.e., 25 miles per hour vs. 35 miles per hour) which show great potential for lower salt application rates with lower speeds because salt sticks to the road better at a lower speed. Canada has recently declared chloride as a toxic chemical.	
4. Infiltration Strand prepared seventeen slides to present initial findings and request guidance from the Steering Team on completion of the infiltration analysis. The discussion on Chlorides, however, took up the bulk of the meeting. It was decided that the initial infiltration findings will be presented at an Infiltration Issue Team meeting to be set up by Strand in a few weeks. It was decided that Mike Parsen and Ken Bradbury from the Wisconsin Geological and Natural History Survey should be invited to provide expertise on infiltration and groundwater issues in the Wingra Watershed and surrounding groundwatershed.	Strand will contact Mike and Ken to invite them to a meeting. A Doodle poll will be sent out to establish a date for the meeting.
5. Work Program Schedule An Infiltration Issue Team Meeting will be held before the next Steering Team Meeting. The next Steering Team meeting is scheduled for July 11, 2013. Initial findings of the Phosphorus Analysis will be presented as well as additional Infiltration Analysis findings.	

Prepared and respectfully submitted by Jon Lindert.

c/enc: All Participants

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
July 11, 2013, 3 P.M.
Strand Associates, Inc.®
Steering Team Meeting No. 4–Infiltration and Phosphorus

Meeting Location: Strand Associates, Inc.®	Job No.: 1020-065
Meeting Purpose: Steering Team Meeting No. 4-Infiltration and Phosphorus	

Meeting Handouts:	
Meeting Agenda	

Invitee	Representing	Present	Absent
Genesis Steinhorst	City of Madison	☒	☐
Greg Fries	City of Madison	☐	☒
Sue Ellingson, Alderperson	City of Madison	☐	☒
Rebecca Power	Friends of Lake Wingra	☐	☒
Paul Dearlove	Friends of Lake Wingra	☒	☐
David Liebl	Friends of Lake Wingra	☒	☐
Jim Lorman	Friends of Lake Wingra	☒	☐
David Thompson	Friends of Lake Wingra	☒	☐
Jim Baumann	Friends of Lake Wingra	☒	☐
Mark Wegener	University of Wisconsin-Arboretum	☐	☒
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☒	☐
Bret Shaw	University of Wisconsin–Madison	☐	☒
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐
Luke Hellermann	Strand Associates, Inc.®	☒	☐

Discussion:	**Action:**
1. <u>Confirmation of Action Items Completion</u> Action Items for Chlorides and Infiltration were discussed. Genesis previously e-mailed that the City does not sell salt to other communities including no sales in 2007 and 2008 to other communities. It is Strand's intent to complete the chloride and infiltration analysis by the next Steering Team meeting on August 29, 2013, contingent upon receipt of the infiltration information described below. a. *Chlorides:* Strand will modify Lake Wingra input of chlorides and runoff in the early winter months and review data from MG&E's monitoring of Odana Pond. Strand will also provide a chart showing worst-case scenarios of chloride concentrations. Strand will estimate resulting Lake Wingra chloride levels per management change. b. *Infiltration:* Genesis previously provided the City's GIS file that includes rain gardens from the City's 1,000 Rain Gardens Program and the Terrace Rain Garden Program. Strand has revised their maps to show number of rain gardens at each locating using information in the GIS	

Discussion:	Action:
database. Genesis previously provided the City's Potential Rain Garden Map (i.e., those with 10 foot wide terraces or greater). The following are yet to be completed. (1) Tim Troester will provide design drawings and stormwater calculations for the Westmorland Bioretention Basin. (2) Mike Parsen from WGNHS will provide information described in the June 28, 2013, Infiltration Issue Team Meeting summary. (3) Strand will contact David Benforado at MG&E to obtain an updated estimate of projected infiltration at the MG&E Infiltration Facility. (4) Strand will provide calculations on rain gardens serving residential roof areas and porous pavement serving non-residential area. (5) David Liebl will track down the Arbor Hills Greenway Infiltration Study P8 model and provide to Strand.	See responsibilities in the list to the left. Strand contacted David Benforado on July 5, 2013. David left a message that he will not be able to provide this information until the later part of July 2013 because of vacations and other commitments. He does intend to provide the information.
2. <u>Chlorides Update</u> It is Strand's intent to complete the chloride analysis by the next Steering Team meeting on August 29, 2013. There was considerable discussion on the Lake Wingra volume with recent calculations from Dr. Chin Wu showing the lake volume as 102,925,973 cubic feet compared to 211,888,000 cubic feet Strand had been using that was based on the best available information at the time. A July 2, 2013, e-mail from David L. provides an estimate of the amount of chloride in the lake in March 2008 as 346 tons compared to Strand's estimate of 4,015 tons. Genesis said that MAMSWAP and MMSD are planning to sponsor two workshops in the fall of 2013 targeting salt applicators as well as salt application contract writers for private properties. Genesis intends to have one of the presenters be an actual practitioner in the field that will bring credibility to the recommendations. There also will be discussion on practices that are occurring in McHenry County, Illinois, including certification and training.	Strand will review and revise predictive model based on new lake volume information.
3. <u>Infiltration Update</u> Because some of the Steering Team members were not able to be at the June 28, 2013, Infiltration Issue Team meeting, a condensed version (12 slides) of the PowerPoint presented at the June 28, 2013, meeting was presented. It is Strand's intent to complete the infiltration analysis by the next Steering Team meeting on August 29, 2013, contingent upon receipt of the information defined above.	

Discussion:	Action:
a. *Strategies to Increase Infiltration:* Infiltration best management practices (BMPs) will be considered as follows: (1) For source area-type BMPs at residential and nonresidential properties, BMPs only in the surface water watershed. (2) For larger infiltration-type projects, BMPs to be within the groundwater watershed but not necessarily within the surface water watershed. b. *Methods to Increase Groundwater to Lake by 25 Percent:* It was generally agreed that increasing infiltration in the surface water watershed/groundwater watershed by an amount equivalent to 25 percent of the current estimated groundwater flow to the lake is an appropriate assumption for trying to meet the 25 percent increase in spring flow target from the *Lake Wingra: A Vision for the Future* document. It was acknowledged by the group that the link between infiltration and spring flow rates is more complex but that increasing infiltration by the 25 percent amount is an understandable goal that will increase spring flow. c. Comments from the Steering Team (1) David said that he has heard complaints of increased artesian flows in low lying basements during the summer of 2012 in the Carver-Martin neighborhood. David thinks that the upstream marsh is creating additional head on the groundwater because of lack of maintenance on the marsh outlet. The proposed Arbor Hills Greenway infiltration project could be perceived to exacerbate this problem. (2) Jim Baumann provided information on the MG&E Infiltration Facility from a WDNR perspective. Jim said that because of chloride contamination concerns, MG&E was required to submit a Chloride Management Plan to the WDNR that modifies MG&E's pumping schedule. In general, the infiltration facility pumps continuously until the chlorides levels of the water exceed the Preventative Action Limit (PAL) of 125 mg/l. Jim said that the facility generally does not pump from the end of December through late June/early July, leaving approximately six months (July through December) to pump to the infiltration facility. Other limitations on pumping include maintaining certain minimum water surface elevations in the ponds as well as the actual capacity of the infiltration facility. After the meeting, Jim e-mailed Strand a spreadsheet of the chloride monitoring data that MG&E submitted to the WDNR.	

Discussion:	Action:
(3) *Potential Management Changes:* There was discussion relative to the desire to increase the amount of time that MG&E can infiltrate by reducing chloride use and increasing infiltration in the Odana Ponds watershed. It should be noted that, depending on the year, the chloride concentrations from January through mid-July can range from 16 mg/l to 120 mg/l in mid-July and from 280 mg/l to 2700 mg/l in March. It is questionable whether chloride reductions will significantly increase the number of days where the chloride concentrations in the ponds are less than the PAL of 125 mg/l (and thus pumping is allowed) though some level of increase would likely be expected. It was generally agreed that residential areas should be targeted for increasing infiltration because of the lower chloride concentration in residential areas. (4) *Infiltration Projects*-In addition to the MG&E Infiltration Facility, the Arbor Hills Greenway Infiltration Facility provides considerable promise for meeting the infiltration target in addition to decentralized/source area infiltration BMPs. There was discussion that even if the 25 percent infiltration goal could be met by a single facility (i.e., Arbor Hills Greenway), multiple strategies should be pursued. Strand also may want to consider bounding (0.3 in/hr as low and a higher number) the infiltration rates for proposed projects because there is little in-situ infiltration rate information available in the watershed. (5) For additional infiltration comments, please see the June 28, 2013, Issue Team Meeting No. 2 Infiltration summary.	
4. <u>Lake Response Model Update</u> Genesis said that the Lake Response Model is about 60 percent complete. It has been somewhat delayed because of the decision to collect additional samples (140 instead of 100) for phosphorus as a result of the above average rainfall in the spring and early summer of 2013. Genesis envisions that either Dr. Chin Wu or one of his students could give a presentation at the next Issue or Steering Team Meeting. Several of the Steering Team members would like to have the Lake Response Model predict the target total phosphorus reduction to be used in the Wingra Watershed Study rather than simply using the 50 percent reduction number in Strand's agreement with the City.	

Discussion:	Action:
5. USGS Leaf Study Update Roger said that the leaf study is ongoing and that results will be coming out over the next three years. For purposes of the Wingra Watershed Plan, Roger volunteered to present the results and findings to date on the project, similar to the presentation by Bill Selbig of the USGS at the Spring 2013 NASECA conference if desired by the City of Madison.	
6. Strand Presentation–Phosphorus Strand presented 15 slides on the preliminary phosphorus analysis. a. *Phosphorus Goals/Target:* The goal in Strand's agreement with the City is a 50 percent total phosphorus (TP) reduction compared to No Controls while accounting for existing controls. The Steering Team would like to see whether the Lake Response Model can help define a better target TP that will provide the needed reduction to benefit Lake Wingra water clarity. Genesis will check with Greg Fries and John Riemer to see whether they have calculated the total suspended solids (TSS) and TP reductions required by the Rock River TMDL for the Wingra Watershed. Jim L. felt the target should be a 50 percent reduction from existing controls rather than from a baseline number with no controls. A target coming from a combination of the Lake Response Model and the Rock River TMDL would go a long way in conveying the reasoning behind the target. In addition, it likely will be easier for the public to understand if stating phosphorus reductions in pounds rather than percent. b. *Modeled TSS and Phosphorus Loads:* Strand used the City's P8 model to show the existing TSS reduction is 57 percent and the existing TP reduction is 33 percent. Strand will be meeting with John Reimer on Thursday July 18, 2013, to ensure Strand is interpreting the model correctly. Strand will check that Pond 3 and Pond 4 are not in the calculations since they are in the watershed downstream of the lake that discharges to Wingra Creek. Strand will work with the City to estimate the watershed draining to and the water quality performance of the rain gardens, terrace rain gardens, and private bioretention basins in the watershed since they are not in the City's P8 model but are providing treatment. The City's P8 model is a regulatory model that cannot take credit for private BMPs unless a stormwater maintenance agreement is signed with the property owner. In the case of Terrace Rain Gardens, the City's program requires the homeowner to maintain the rain garden but there is nothing to stop the next owner of the property from filling in the rain	a. After the meeting, Strand reviewed the Rock River TMDL requirements. The TMDL requires a 78.9 percent TP reduction and a 83.4 percent TSS reduction. It was also confirmed that the Clean Lakes Alliance goal was a 50 percent reduction in existing total phosphorus loads from the water years 1996 to 2008 (i.e., reduction from existing TP loads (with existing controls), not from a baseline TP load with no controls) b. Strand will provide additional information described to the left.

Discussion:	Action:
garden (i.e., no deed restriction on the rain gardens). Strand will provide a graphic showing TP hot spots within the watershed under a no controls and existing controls condition including showing the subwatersheds. Strand will report on the performance of each modeled BMP in the watershed in a table. c. *Nonmodeled Phosphorus Loads:* Strand presented information on the potential TP reduction resulting from increased leaf collection, increased street sweeping, pet waste enforcement, active waterfowl management, streambank restoration, and wetland plant harvesting. It was agreed that the idea of a delivery factor is confusing and should not be used unless it is applicable to the Wingra Watershed Plan. Other comments include the following. (1) Increased Leaf Collection: Genesis will provide Strand with the City's 2011 and 2012 Leaf Collection and Street Sweeping quantities and costs. Strand will modify the Wingra Watershed to remove the golf courses and the Arboretum to get TP loads that are better comparable to the P8 generated phosphorus loads for the watershed. Leaf collection has the potential to close some of the phosphorus reduction gap to get to 50 percent phosphorus reduction. Because of this, several Steering Team members recommended proceeding with management changes that will increase the effectiveness of leaf collection including: (a) Modifying the leaf collection schedule and timing to collect leaves before they begin leaching phosphorus. (b) Bagging of leaves with compostable bags since Dane County accepts compostable bags at its compost site. Jim suggested contacting McHenry County, Illinois, to learn more about its requirement to bag leaves. Strand will contact McHenry County to obtain costs for bags, cost savings compared to conventional methods, and barriers to implementation. Champaign, Illinois also has a program in place. (c) Compost Bins–Paul said he would like the capital cost of compost bins documented in the plan. (2) *Streambank Restoration:* The Steering Team said there are very few streambank erosion areas. Strand has identified streambank erosion problems at the Glenway Golf Course, some bare slopes along the Southwest Commuter Bike Path ditches, and the Curtis Flume leading to Curtis Pond in the	

Discussion:	Action:
UW-Madison Arboretum which is being addressed by a UW-Madison Arboretum project. Jim suggested that Strand bring a board to his July 30, 2013, charette so that participants can draw the locations of known erosion on the map. (3) *Construction Site Erosion Control:* Several Steering Team Members recommended that construction site erosion control be added to the list. While it is difficult to quantify the size of redevelopment projects, it was recommended that an example construction site be used to provide an order of magnitude estimate of potential phosphorus load discharged from a site for comparison to other phosphorus contributors. Strand will provide an estimate of phosphorus load from an example construction site. It was discussed that enhanced construction site erosion control enforcement can be a cost-effective method and critical component of a strategy to keep phosphorus out of Lake Wingra.	Strand will provide additional information described to the left.
7. <u>Upcoming Schedule and Next Meeting</u> The work program schedule was reviewed. Upcoming steering team meetings are as follows. No additional issue team meetings have been identified at this time.	

Steering Team Meeting	Date	Topic
Meeting No. 1	March 21, 2013	Kickoff Meeting
Meeting No. 2	April 4, 2013	Chlorides/Social Marketing
Meeting No. 3	May 23, 2013	Chlorides/Infiltration
Meeting No. 4	July 11, 2013	Pollutant–Sediment and Phosphorus
Meeting No. 5	August 29, 2013	Pollutant–Reduction Opportunities
Meeting No. 6	October 17, 2013	Lake Response Model
Meeting No. 7	December 5, 2013	Social Marketing–Strategies
Meeting No. 8	January 23, 2014	Social Marketing–Pilot Project

Prepared and respectfully submitted by Jon Lindert.

c/enc: All Participants

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
October 17, 2013, 8 A.M.
Strand Associates, Inc.®
Steering Team Meeting No. 5–Pollutant Reduction Opportunities
Meeting Summary

Meeting Location: Strand Associates, Inc.®	Job No.: 1020-065
Meeting Purpose: Pollutant Reduction Opportunities	

Meeting Handouts:	
Meeting Agenda	Attachment A: Pollutant Reduction Graphs

Invitee	Representing	Present	Absent
Genesis Steinhorst	City of Madison	☒	☐
Greg Fries	City of Madison	☒	☐
Sue Ellingson, Alderperson	City of Madison	☒	☐
Paul Dearlove	Friends of Lake Wingra (FOLW)	☐	☒
David Liebl	Friends of Lake Wingra	☒	☐
Jim Lorman	Friends of Lake Wingra	☒	☐
Rebecca Power	Friends of Lake Wingra	☒	☐
Jim Baumann	Friends of Lake Wingra	☒	☐
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☒	☐
Mark Wegener	UW-Madison Arboretum	☐	☒
Bret Shaw	UW-Madison	☒	☐
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐

Discussion:	**Action:**
1. <u>Confirmation of Action Items Completion</u> *Infiltration:* All items complete except the City of Madison will provide Westmorland Bioretention Basin design drawings. *Phosphorus:* All items complete except Strand will provide the cost of compost bins in the plan. *Chlorides:* All items complete; some items in progress.	Received after the meeting. Strand will complete.
2. <u>Lake Response Model Update</u> Greg said the most recent update from the UW-Madison concludes that carp (around 80 percent) and wind/waves (around 6 percent) are the key contributors to sediment and phosphorus in Lake Wingra. Jim L. said that phosphorus loads from storm runoff (14 percent) will continue to build up in the lake and that storm-related phosphorus should not be discounted as a source.	
3. <u>USGS Leaf Study Update</u> This item was not discussed. The study is ongoing and an update will be included on the agenda of the next Steering Team Meeting.	

Discussion:	Action:

4. Infiltration Update

PowerPoint slides were presented discussing the infiltration goal and strategies for achieving the infiltration goal.

Discussion included the following:

a. Is the infiltration goal appropriate? Strand, as generally agreed upon at Steering Team No. 4, is using an infiltration target of infiltrating runoff equivalent to 25 percent of the Wisconsin Geological and Natural History Survey estimate of groundwater flow to the lake (25 percent x 39,010,105 cubic feet = 9,752,526 cubic feet). It was discussed that all the projects Strand presented would need to be constructed to achieve this goal. Jim L. asked whether an estimate could be made of the amount of predevelopment infiltration in the landscape for comparison purposes. After the meeting, Strand ran the City P8 model and arrived at an annual average "percolation/infiltration" rate under both existing conditions and predevelopment conditions as described in the table below.

Existing Conditions	**Volume (cf)**	**% of Annual Precipitation**
Annual Precipitation	401,844,360 cf (31 inches x 3,571 acres = 9,225 ac-ft)	100
Annual Runoff to Lake	82,842,408 cf	21
Annual Percolation/ Infiltration	278,400,672 cf	69
Other Losses	40,601,550 cf	10
Predevelopment Conditions		
Annual Percolation	377,634,700 cf	
Lost Infiltration: Difference in Existing and Predevelopment Percolation/ Infiltration	99,234,028 cf	
10% of Lost Infiltration	9,923,403 cf	
25% of Lost Infiltration	24,808,507 cf	

Discussion after the meeting with the City of Madison centered on setting two infiltration goals as follows. For purposes of the plan, Strand will provide analysis and costs for meeting the short-term goal only. The long-term goal will exist to guide future discussion of infiltration opportunities.

Discussion:	Action:
(1) *Short-Term Goal*: Recover 10 percent of the lost infiltration due to development. See table above. (2) *Proposed Long-Term Goal (Open For Discussion):* Recover 25 percent of the lost infiltration due to development. See table above. (It should be noted that Strand's agreement with the City of Madison calls for an achievable infiltration target to be set based on an estimate of current/baseline infiltration rates in the watershed.) b. Fourteen strategies/projects were presented that would all have to completed to meet the presented infiltration goal. It was discussed that Strand should add in bioretention/rain gardens for commercial properties. Strand should have an estimate of total amount of commercial roof area in the watershed from the City of Madison GIS layer.	Strand will add in bioretention/rain gardens for commercial properties.
5. <u>Phosphorus Update</u> PowerPoint slides were presented discussing the phosphorus goal and strategies for achieving the phosphorus goal. The goal as described in Strand's agreement is a 50 percent total phosphorus reduction compared to no controls. It was discussed that the Rock River total maximum daily load requires a 78.9 percent total phosphorus reduction compared to no controls. Greg said this is unachievable without chemical controls (e.g., alum). Also, the Clean Lakes Alliance calls for a 50 percent reduction in total phosphorus (TP) control compared to existing controls but relies heavily on agricultural best management practices for implementation. Discussion included the following: a. Is the phosphorus reduction goal appropriate? Jim L. stated the FOLW understanding was a 50 percent reduction compared to existing controls, not no controls. It was discussed that the 50 percent reduction from no controls goal (265 pounds TP reduction, a 50 percent reduction from no controls) could be a good 10-year or 20-year goal, but that a 50 percent reduction from existing controls goal (607 pounds TP reduction, a 50 percent reduction from no controls) could be a good 10-year or 20-year goal, but that a 50 percent reduction from existing controls goal (607 pounds TP reduction, a 50 percent reduction from no controls) could be a good 10–year or 20–year goal, but that a 50 percent reduction	

Discussion:		Action:
	from existing controls goal (607 pounds TP reduction, a 68 percent reduction from no controls) could be a longer 100-year type of goal. Jon said that modifying the goal would create additional work for Strand. Genesis and Greg requested that Strand conference call with them to discuss additional costs and efforts before proceeding with the additional work. Discussion after the meeting with the City of Madison centered on setting two phosphorus reduction goals as follows. For purposes of the plan, Strand will provide analysis and costs for meeting the short term-goal only. The long-term goal will exist to guide future discussion of phosphorus reduction opportunities. *Short-Term Goal*: Continue to use the 50 percent reduction compared to no controls. *Long-Term Goal*: To be consistent with the Rock River Total Maximum Daily Load (and the City's requirement for redevelopment sites), use an 80 percent total phosphorus reduction compared to no controls.	
b.	Sources of Phosphorus: A slide was presented showing the sources of phosphorus in the watershed. It was discussed that some of these sources are already accounted for in the P8 model. However, it was agreed the P8 model does not break them out specifically, so there is no way to know exactly how P8 is accounting for them. Strand will present this information in a different format showing that these are accounted for in the P8 model but only in a general fashion based on the program's routines. Roger said the team needed to be careful to not double-count reductions in phosphorus that would occur. For example, constructing a wet pond may remove the same phosphorus that was intended to be removed by modified leaf collection strategies.	
c.	Twenty five strategies and projects were presented that could be implemented to meet the phosphorus reduction goal. These projects include approximately 761 pounds of potential TP reduction (not accounting for double counting). Only Odana Pond Alum Addition or the Manitou Pond Alum Addition Project would probably be done rather than the Odana Pond Alum Addition Project because they both have about the same reduction effect. Also, Jim B. said it is possible the Odana Pond will be designated a water of the state in the future, thus removing it from consideration for alum addition.	

Discussion:	Action:
David requested the graphs of the potential TP and Infiltration projects be in order of smallest reduction to largest reduction. It was discussed that these graphs could include cost-effectiveness ($/pound removed) to aid in decision-making. Strand will do so once it begins the opinion of probable cost phase of the project.	Strand will reorder the project list and add cost/effectiveness to the graphs.
6. Chlorides Update This item was not discussed because time ran out at the meeting. Strand was requested to send the PowerPoint containing the chloride information, and a determination will be made by the City of Madison and FOLW on the need for a Chloride Issue Team Meeting before the next Steering Team Meeting.	
7. Upcoming Schedule and Next Meeting	

Steering Team Meeting	Date	Time	Topic
Meeting No. 1	March 21, 2013	3 pm	Kickoff Meeting
Meeting No. 2	April 4, 2013	3 pm	Chlorides/Social Marketing
Meeting No. 3	May 23, 2013	3 pm	Chlorides/Infiltration
Meeting No. 4	July 11, 2013	3 pm	Pollutant–Sediment and Phosphorus
Meeting No. 5	October 17, 2013	8 am	Pollutant–Reduction Opportunities
Meeting No. 6	December 11, 2013	8 am	Chlorides
Meeting No. 7	January 23, 2014	8 am	Social Marketing–Strategies
Meeting No. 8	March 13, 2014	8 am	Social Marketing–Pilot Project Lake Response Model

c/enc: All Participants

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
December 11, 2013, 8 A.M.
Strand Associates, Inc.®
Steering Team Meeting No. 6–Chlorides
Meeting Summary

Meeting Location: Strand Associates, Inc.®	Job No.: 1020-065
Meeting Purpose: Pollutant Reduction Opportunities: Chlorides	

Meeting Handouts:	
N/A	

Invitee	Representing	Present	Absent
Genesis Steinhorst	City of Madison	☒	☐
Greg Fries	City of Madison	☒	☐
Sue Ellingson, Alderperson	City of Madison	☒	☐
Paul Dearlove	Friends of Lake Wingra (FOLW)	☐	☒
David Liebl	Friends of Lake Wingra	☐	☒
Jim Lorman	Friends of Lake Wingra	☒	☐
Rebecca Power	Friends of Lake Wingra	☒	☐
Jim Baumann	Friends of Lake Wingra	☒	☐
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☒	☐
Mark Wegener	UW-Madison Arboretum	☐	☒
Bret Shaw	UW-Madison	☒	☐
Ben Jordan	UW–Madison	☒	☐
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐

Discussion:	**Action:**
1. <u>Confirmation of Action Items Completion</u> There were no comments.	
2. <u>Lake Response Model Update</u> Greg said the finalization of this study is delayed because of stolen monitoring equipment.	
3. <u>USGS Leaf Study Update</u> There were no comments.	
4. <u>Infiltration and Phosphorus Update</u> Strand is currently working on finalizing this analysis and draft report section based on comments received at Steering Team Meeting No. 5.	
5. <u>Chlorides Update</u> PowerPoint slides were presented discussing the chlorides goal and strategies for achieving the chlorides goal. The goal, as described in Strand's, agreement, is to recommend practices for reducing chloride levels in Lake Wingra to the target provided in *Lake*	

Discussion:	Action:
Wingra: A Vision for the Future (average annual level of 40 mg/L). Discussion included the following: a. Chloride Mass Balance Predictive Tool–This tool has been updated with the following new information received after completion of the original tool: new lake volume, monthly chloride data from the City of Madison Health Department, new P8 runoff volumes based on changes to the P8 model, and new groundwater inflow/outflow values from WGNHS. An adjustment factor of 0.18 (82 percent of the chloride is retained and does not reach the lake) was used to bring applied salt rates/amounts to a level reflective of observed chloride concentrations in the lake. It was requested that Strand do a literature search to see whether any other studies would support use of the 0.18 adjustment factor.	Strand will perform a literature search of similar chloride mass balance studies. Strand did so in mid-December including an e-mail on December 24, 2013, that suggests modifications to Strand's tool that would bring the adjustment factor to 0.22, an adjustment factor that is similar to the 0.23 adjustment factor used in a Twin Cities metropolitan area study.
b. End of Pipe Chloride Data–Roger requested that Strand work with him to develop a chloride load from the watershed based on end of pipe chloride concentrations that he has collected for comparison to the chloride mass balance predictive tool numbers. This number could provide an order of magnitude check on the adjustment factor.	Strand will work with Roger to develop a chloride load from end of pipe chloride concentration numbers.
c. WisDOT Brine Use on the Beltline–It was requested that Strand attempt to obtain this information from WisDOT.	Strand will request Beltline brine usage data from WisDOT.
d. City of Madison Salt Usage Data–Greg requested that Strand send its calculations regarding this information to the City of Madison (City). It was also requested that Strand provide some discussion on why there is a difference between the City data and the Dane County data. There was discussion about the City turning on GPS to track salt usage data on two city trucks to get better salt usage data than that contained in the City's yearly salt report.	Strand sent calculations to the City on December 23, 2013.
e. Future Refinements of Chloride Mass Balance Predictive Tool–Strand stated that numerous professional judgments and assumptions were made in crafting the tool. A considerable amount of refinements were made to the predictive tool over the past 5 months. Even with the refinements, the chloride retention rate within the watershed appears to be substantial. The report should include areas where additional information could be gathered in the future to refine the assumptions including the following:	

Discussion:	Action:
(1) Lake bottom sediment (interstitial water) sequestration of chloride. (2) Detention pond sequestration of chloride. (3) Wetland sequestration of chloride. (4) Continuous simulation (daily) rather than monthly timestep chloride calculations. (5) Sanitary sewer diversion of chloride from the watershed. (6) Infiltration of chlorides through pavements (7) Infiltration of chlorides through terraces. f. Do Nothing Alternatives–Two slides were presented showing the projected chloride levels if: (1) Salting continues at an average of 2006 to 2012 with average annual rainfall and snowfall amounts. (2) Salt at 2011 winter rates with 2011 rainfall and snowfall amounts. Scenario (1) results in chloride levels fluctuating between 90 and 150 mg/L over the next 10 years. Scenario (2) results in chloride levels fluctuating between 130 and 200 mg/L over the next 10 years. It was noted that after a couple of years, the concentrations stabilize because of the consistent inputs every year under this analysis. g. Chloride Reductions Necessary to Meet Goal–Slides were presented showing three scenarios of salt reduction including the following: (1) 50 percent commercial applicator reduction and 10 percent reduction for all others. (2) 65 percent commercial and residential applicator reduction and 20 percent reduction for all others. (3) 70 percent reduction for all applicators. These three scenarios resulted in a chloride concentration in the lake of 60 to 100 mg/L, 50 to 80 mg/L, and 30 to 50 mg/L, respectively. The feasibility of achieving a 70 percent reduction and thus meeting the FOLW 40 mg/L goal was discussed. Information was presented showing both a 35 percent (15 percent all others) and a 65 percent (20 percent all others) reduction in commercial application. These two scenarios are predicted to result in chloride concentration between 65 and 100 mg/L (stabilization of existing conditions) and 55 and 80 mg/L, respectively, basically maintenance of the status quo chloride concentration in the lake. h. Alternatives to Rock Salt (NaCl)–These should be well documented in the report. There is a good comparison table (Page 17) in *Minnesota's Winter Parking Lot and Sidewalk Maintenance Manual for Alternative Deicing Chemicals*	

Discussion:	Action:
including sodium chloride, magnesium chloride, calcium chloride, calcium magnesium acetate, and potassium acetate. The comparison discusses melting point, corrosivity, and other environmental issues. Genesis said the City is going to try beet juice (prewet dry salt) again in a pilot arraignment on the west side of the city by a detention basin though there are still concerns with phosphorus and BOD when using beet juice. i. Chloride Report Section–It was discussed that the report should be framed to focus on short-term and long-term goals. The short-term goals should be focused on what is achievable with current technologies and should include an implementation plan. The long-term goals should provide a vision as technologies evolve allowing for greater reductions. The overall philosophy of the report should include the following: (1) Public and private entities the opportunity to do good together. (2) Chloride reductions are ecologically important. (3) Improvement over time is important.	
6. <u>Stakeholder Engagement/Social Marketing</u> It was discussed that Steering Team Meeting No. 7 will bring the analysis for phosphorus, infiltration, and chlorides to conclusion which will allow for the stakeholder engagement/social marketing phase of this project to continue now that the main contributors to each pollutant are known. Draft report sections for phosphorus, infiltration, and chlorides will be sent out to Steering Team members on January 14, 2014. Issue Team Meeting No. 3 will be held approximately three weeks after Steering Team Meeting No. 7 to discuss social marketing and the pilot project. The possibility exists to do a SurveyMonkey survey to rate different pilot projects. Strand's contract (along with the Social Marketing Consultant) calls for the following to occur next. a. Pilot Project Recommendation (1) Identify pilot project to address one critical action. (2) Prepare pilot project plan. b. Stakeholder Engagement (1) *Identify/Interact With Target Audiences*–Identify, communicate, and interact with target audiences and identify those responsible for critical actions. Roger has been in contact with commercial managers responsible for salt application contracts and has learned some valuable information	

Discussion:	Action:
including the need to take liability away from salt applicators and property managers when using alternative strategies and application rates. (2) *Develop Social Marketing Strategy*–Identify potential behavior change strategies, develop written strategy for engagement with those responsible for critical actions, and develop a framework for social marketing pilot project. *(3)* *Implementation Plan*–Using the social marketing strategy, provide engagement activities with those responsible for critical actions to understand techniques most likely to be effective in creating behavior change. From these activities, provide an implementation plan for plan components including a roles and responsibilities memorandum. c. Social Marketing Strategies (Pilot Project Implementation)–This will consist of creation, management, and tracking of a pilot project potentially consisting of the following: identify barriers, partnerships, and current commitments, identify partners, recruit partners, obtain baseline data, assist with pilot project implementation, and evaluate pilot project.	
7. Upcoming Schedule and Next Meeting	

Steering Team Meeting	Date	Time	Topic
Meeting No. 1	March 21, 2013	3 pm	Kickoff Meeting
Meeting No. 2	April 4, 2013	3 pm	Chlorides/Social Marketing
Meeting No. 3	May 23, 2013	3 pm	Chlorides/Infiltration
Meeting No. 4	July 11, 2013	3 pm	Pollutant-Sediment and Phosphorus
Meeting No. 5	October 17, 2013	8 am	Pollutant Reduction Opportunities
Meeting No. 6	December 11, 2013	8 am	Pollutant Reduction Opportunities: Chlorides
Meeting No. 7	January 23, 2014	8 am	Draft Report Sections (Chlorides, P, Infil.) and Stakeholder Engagement/Social Marketing
Issue Team Meeting No. 3	February 27, 2014	9 am	Social Marketing (Pilot Project Discussion)
Meeting No. 8	March 13, 2014	8 am	Social Marketing-Pilot Project and Lake Response Model

c/enc: All Participants

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
January 23, 2014, 8 A.M.
Strand Associates, Inc.®
Steering Team Meeting No. 7–Chlorides, Phosphorus, Infiltration Draft Report Sections and Stakeholder Engagement/Social Marketing Framework
Meeting Summary

Meeting Location: Strand Associates, Inc.®	Job No.: 1020065
Meeting Purpose: Chlorides, Phosphorus, Infiltration Draft Report Sections and Stakeholder Engagement/Social Marketing Framework	

Meeting Handouts:	
Meeting attendees were provided with draft report sections one week before the meeting.	

Invitee	Representing	Present	Absent
Genesis Steinhorst	City of Madison	☒	☐
Greg Fries	City of Madison	☒	☐
Sue Ellingson, Alderperson	City of Madison	☐	☒
Paul Dearlove	Friends of Lake Wingra (FOLW)	☒	☐
David Liebl	Friends of Lake Wingra	☒	☐
Jim Lorman	Friends of Lake Wingra	☒	☐
Rebecca Power	Friends of Lake Wingra	☒	☐
Jim Baumann	Friends of Lake Wingra	☒	☐
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☒	☐
Mark Wegener	UW-Madison Arboretum	☐	☒
Ben Jordan	UW-Madison	☒	☐
Bret Shaw	UW-Madison	☐	☒
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐

Discussion:	**Action:**
1. Confirmation of Action Items Completion Seven items were discussed with four completed and the following three ongoing. a. Phosphorus–Strand will include the cost of the compost bins in the plan. b. Chlorides–The City of Madison (City) will review Strand's December 23, 2013, e-mail with calculations using the City's salt usage data. c. Chlorides–Strand will request brine usage data from the Wisconsin Department of Transportation (WisDOT).	See action items at left.
2. Lake Response Model Update Greg will speak with Professor ChinWu regarding the status of the model and will report back to the Steering Team.	See action item at left.
3. USGS Leaf Study Update Roger will be meeting with Bill Selbig to go over data collection to date and will report back to the Steering Team.	See action item at left.

Discussion:	Action:
4. Draft Infiltration Report Section Strand presented eight PowerPoint slides providing a summary of the draft infiltration report section. It was discussed that the total cost of a particular project should differentiate between the cost to the City, cost to the homeowner or business (i.e., the City incentive for terrace rain gardens where the City pays for 75 percent (minus the cost of plants) and the homeowner pays 25 percent (plus the cost of plants) of the construction cost through an assessment). The costs should also include, as appropriate, a 15 percent design contingency and a 15 percent construction contingency. If there is only an incremental cost over what would ordinarily be done, then the incremental cost should be broken out (i.e., traditional pavement needs to be replaced and porous pavement installed instead. What is the difference in cost?). Strand will meet with the City to work through the cost discussion. Discussion included the following. a. Porous Pavement Cost–The incremental cost should be used to replace traditional pavement with porous pavement rather than the total cost presented. This change would entail subtracting out the cost of the traditional pavement layer (i.e., asphalt only, assuming existing parking lots have an asphalt surface). Strand will revise the calculations to provide a 3:1 ratio of drainage area to paved area, which will increase the cost-effectiveness of the BMP. Also, Strand should see how this could affect chloride reductions using an assumed 70 percent reduction in salt usage for these areas. b. Rain Barrels–It was requested that Strand include the cost and effectiveness of rain barrels as part of the alternatives analysis. c. Downspout Disconnection–It was requested that Strand include the cost and effectiveness of downspout disconnection as part of the alternatives analysis. Greg believes the City ordinance states that downspouts must be connected to storm drains in downtown areas. Jim Lorman thought the City ordinance required disconnection. Greg will look into the City ordinances and provide to the Steering Team. d. Assumptions for Each BMP–Strand will include base assumptions for each recommended BMP in the report. e. Operation and Maintenance–Strand has accounted for operation and maintenance in the 20-Year Net Present Worth costs. BMPs that are not under City control (i.e.,	See Strand action items at left. Greg will look into existing City ordinances that address downspout disconnection and report back to the Steering Team.

Discussion:	Action:
not City-owned or non-stormwater-permitted facilities) present a challenge in terms of maintaining the performance of the BMPs over time. These same facilities are at risk of being removed or filled in over time (i.e., a home gets sold and the next homeowner it does not want the facility). This would also reduce their effectiveness. f. Incentives–The City Rate Adjustment Policy for the storm water utility currently provides incentives for various BMPs.	
5. <u>Draft Phosphorus Report Section</u> Strand presented thirteen PowerPoint slides providing a summary of the draft phosphorus report section. Discussion included the following. a. Phosphorus Goal–To better communicate the goals to the reader, Strand will include a bar chart in the report showing the existing phosphorus reduction and the short- and long-term goals for further reduction. b. Lake Wingra Watershed Plan as an EPA-Recognized TMDL Document–There was discussion that the Lake Wingra Watershed Plan could serve as a TMDL document to address the lake's 303 (d) designation. Jim Baumann has considerable experience in Wisconsin TMDLs and said he would look into this with key individuals at the Wisconsin Department of Natural Resources (WDNR). Jim followed up with an e-mail on January 23, 2014, with initial feedback from the key WDNR individuals and will provide additional information at the next Steering Team meeting. c. Figure 4.03-4–Switch the red watersheds to pink because the red seems to convey necessary action, when in reality they are Arboretum lands with low pollutant load. d. Figure 4.03-5–Switch the red watersheds to pink and the pink watersheds to more of a red. e. BMP Performance Table–Strand will insert this table into the report and the wetland basin and Pond 2 will be combined to be one BMP. f. MG&E Infiltration Facility at Odana Golf Course–It was requested that Strand account for the phosphorus reduction achieved from this facility. Jim Baumann said	See Strand action items at left.

Discussion:	Action:
he thought the reduction was probably in the 80 pound/year (lb/yr) range. After the meeting, Strand did a quick modification to the City P8 model and found that loss of 3.6 million cubic feet of water downstream of the East Odana Hills Pond would reduce the total phosphorus load by about 27 lb/yr (26.928 million gallons). Using an average Odana Pond TP concentration of 347 micrograms/liter (from Jim Baumann provided data) and an average of 3.6 million cubic feet of diverted water, the total annual reduced TP load is 77.5 pounds. Jon will contact MG&E and MMSD to see whether there are any monitoring numbers for the flow diverted to the sanitary sewers contributory to the MMSD WWTP. g. Phosphorus Performance of Alternative Components–Remove the infiltration rates from this table since each component is independent of infiltration rate at the location of the component. h. Construction Site Erosion Control–Greg and Genesis will provide an estimate of the area of land-disturbing construction activity that occurs on average each year in the Lake Wingra Watershed. i. Modified Leaf Collection Methods–It was requested that Strand work with the City to develop incremental costs for: (1) Increased street sweeping schedule; (2) Bagging of leaves. Ben Jordan will provide additional information on leaf collection from his and others experiences in Illinois. It was discussed that bagging leaves could ultimately be less expensive. j. Assumptions for Each BMP–Strand will include assumptions for each BMP in the report. k. Public Informational Meeting–It was requested that a public informational meeting be held soon now that the draft analysis is complete.	
6. <u>Draft Chloride Report Section</u> Strand prepared eleven PowerPoint slides providing a summary of the draft chloride report section. These slides were not presented because of time constraints. They will be presented at the next meeting; however, Ben Jordan and David Liebl provided comments after the meeting.	

Discussion:	Action:
7. Stakeholder Engagement/Social Marketing Framework This topic will be presented at the next meeting when Brett Shaw is able to attend.	
8. Urban Non-Point Source and Stormwater Grant Application Strand was directed by the City to prepare this grant application, which is part of the Scope of Services of the agreement for the streambank/channel restoration on city land at Thoreau Elementary School, which is located between the Nakoma Road/Cherokee Drive and Cherokee Drive/Naheda Trail intersections. This project is already in the City's Capital Improvement Plan. If there are any comments from Steering Team members regarding this grant application, please contact Greg, Genesis, or Jon.	
9. Upcoming Schedule and Next Meeting	

Steering Team Meeting	Date	Time	Topic
Meeting No. 1	February 21, 2013	2 pm	Kickoff Meeting
Issue Team Meeting No. 1	March 21, 2013	3 pm	Chlorides
Meeting No. 2	April 4, 2013	3 pm	Chlorides/Social Marketing
Meeting No. 3	May 23, 2013	3 pm	Chlorides/Infiltration
Issue Team Meeting No. 2	June 28, 2013	10 am	Infiltration
Meeting No. 4	July 11, 2013	3 pm	Pollutant-Sediment and Phosphorus
Meeting No. 5	October 17, 2013	8 am	Pollutant Reduction Opportunities
Meeting No. 6	December 11, 2013	8 am	Pollutant Reduction Opportunities: Chlorides
Meeting No. 7	January 23, 2014	8 am	Draft Report Sections (Infiltration and Phosphorus)
Issue Team Meeting No. 3 (3 Remaining After This)	February 27, 2014	9 am	Draft Chloride Report Section, Stakeholder Engagement/Social Marketing Framework, Social Marketing Pilot Project Discussion
Meeting No. 8	March 13, 2014	8 am	Social Marketing-Pilot Project and Lake Response Model

c/enc: All Participants

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
March 25, 2014, 10 A.M.
Strand Associates, Inc.®
Steering Team Meeting No. 8–Stakeholder Engagement/Social Marketing and Community Engagement Strategy Workshop

Meeting Location: Strand Associates, Inc.®	Job No.: 1020065
Meeting Purpose: Stakeholder Engagement/Social Marketing and Community Engagement Strategy Workshop	

Meeting Handouts:	
Meeting attendees were provided with draft report sections one week before the meeting.	

Invitee	Representing	Present	Absent
Genesis Steinhorst	City of Madison	☒	☐
Greg Fries	City of Madison	☒	☐
Sue Ellingson, Alderperson	City of Madison	☐	☒
Paul Dearlove	Friends of Lake Wingra (FOLW)	☒	☐
David Liebl	Friends of Lake Wingra	☒	☐
Jim Lorman	Friends of Lake Wingra	☐	☒
Rebecca Power	Friends of Lake Wingra	☒	☐
Jim Baumann	Friends of Lake Wingra	☒	☐
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☐	☒
Mark Wegener	UW-Madison Arboretum	☐	☒
Ben Jordan	UW-Madison	☐	☒
Bret Shaw	UW-Madison	☒	☐
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐

Discussion:	**Action:**
1. Confirmation of Action Items Completion Seven items were discussed with four completed and the following three ongoing. a. Phosphorus–Strand is finalizing the report section. The City will work with Strand on the cost for the increased street sweeping schedule. b. Infiltration–Strand is finalizing the report section. c. Chlorides–Strand is finalizing the report section. d. Community Engagement–Strand and Bret Shaw will work with the City and FOLW to set dates for community engagement activities including a public informational meeting. Genesis will add the timeline for the City's Project-Based and Management-Based Measures.	See action items at left.
2. Lake Response Model Update There was no discussion.	
3. USGS Leaf Study Update There was no discussion	

Discussion:	Action:
4. Final Infiltration, Phosphorus, and Chlorides Analysis Update Strand presented eight PowerPoint slides providing a summary of these analyses. a. Infiltration–Jon said the major changes to this analysis included the performance and number of terrace rain gardens, private rain gardens, commercial rain gardens, and porous pavement as shown in Slide 8. b. Phosphorus–David requested that Strand repeat the existing controls bar next to both the short-term goal and the long-term goal on Slide 9. See major changes in 4.a. above. c. Chlorides–Slide 14 Chloride Management Measures was discussed. (1) David Liebl suggested that BMPs and performance standards for chloride usage be established rather than seeking to meet a certain lake chloride level through efforts that could sacrifice public safety. (2) Dane County Lakes and Watershed Commission has taken on chlorides as an issue. (3) City of Madison–Well No. 14: The City is pursuing a chloride reduction pilot in the Well No. 14 ground watershed. This will require WisDOT's cooperation on University Avenue where it is responsible for deicing and plowing. The City is writing a white paper on proposed management change for deicing. Another option for the well is to case the well to separate the upper and lower aquifer, although this is a major expense that the City is trying to avoid. (4) Investigate Alternate Deicers–Calcium magnesium acetate was discussed as an alternative. The City's Streets Department is adverse to its use because it turns snow into "oatmeal" and is very corrosive. The City is considering beet juice again as an alternative to brine although it has an oxygen demand. The City is contemplating installation of air bubble diffusers in storm sewers to add oxygen before the beet juice reaches the lake. (5) There was strong support for certification and training of deicing applicators.	See action items at left.

Discussion:	Action:
5. Stakeholder Engagement/Social Marketing Framework And Critical Action Prioritization Exercise Strand presented six PowerPoint slides on this topic. Discussion included the following. a. Timeline–A timeline was presented showing this phase of the project and the remaining meetings. b. Identification of Critical Actions–The analysis portion of this project identified the actions necessary to meet the performance goals for infiltration, phosphorus, and chlorides. With this information now complete, the Stakeholder Engagement/Social Marketing portion of this project can continue. The discussion for this meeting will focus on possible engagement activities. c. Community Engagement Strategy–Strand's Agreement includes approximately 415 hours of work related to development of a social marketing/community engagement strategy, social marketing/community engagement implementation plan, identification of a pilot project, and implementation of a pilot project. There are two ways to use these hours and meetings. The first would be to use the hours and meetings to develop the community engagement implementation plan. The second would be to use the hours and meetings to implement the community engagement implementation plan. d. Critical Action Prioritization Exercise–Tom presented a slide showing the results of the Survey Monkey poll for infiltration, phosphorus, and chloride. The results of this prioritization exercise will be used to help focus the project's social marketing efforts. However, there was group consensus that the results should not be documented in the report as it was more of a "straw poll" of the steering team's direction than a definitive scientific survey. e. Pilot Project Discussion–Ongoing and potential pilot projects were presented in a table.	
6. Community Engagement Strategy Workshop As mentioned, there are two options for community engagement. a. Option No. 1–Community Engagement Before Implementation Plan: Information from engagement efforts (assumed to be six meetings) used by Strand and Bret Shaw to develop a social marketing implementation plan to be implemented by others in the future. The	

Discussion:	Action:
information gained from the engagement efforts will assist in identifying the best way to perform social marketing in the future on the various critical actions. Option No. 1 would have a broader focus on many of the higher priority critical actions. The pilot project is for a single action implemented as part of Strand and Bret Shaw's efforts. A draft table outlining Option No. 1 activities was presented. b. Option No. 2–Community Engagement After Implementation Plan: Develop a plan to social market the community while conducting the community engagement activities. This option would be more focused on critical actions that create meaningful behavior change as a result of the meeting(s). The pilot project would likely be introduced at the end of these engagement activities to transition the project into the pilot project stage. A draft table outlining Option No. 2 activities was presented. c. Community Engagement Discussion Groups–Bret Shaw collaborated with Strand on a slide that showed a possible agenda for the discussion group meetings that would maximize the social marketing content of the meetings. Bret said the meetings can be conducted with tools that work to convince the public they can be part of the solution. They can be used to build momentum (e.g., we did this well in 2013; we can do even better in 2014). Greg said these meetings should be as specific as possible. d. Public Information Meeting(s): Whereas Option No. 1 has a public informational meeting in early summer 2014, Option No. 2 has two public informational meetings, one in early summer 2014 and another in fall 2014. e. Selection of Community Engagement Option–It was discussed that Option No. 1 was redundant and that Option No. 2 is more appropriate for moving forward. In implementing Option No. 2, Strand, Bret Shaw, and the steering team should prioritize the actions that have the highest likelihood of success and then engage the public on the specific actions. Strand should proceed with completing a draft implementation plan for the next steering team meeting in May 2014. Some ideas for community engagement include the following: (1) Residential Social Marketing Package: Couple	

Discussion:		Action:
	the rain barrel, downspout disconnection, and residential rain garden activities as a suite of BMPs that are incentivized by Plant Dane and Rain Reserve/Sustain Dane.	
(2)	Leaves–All agreed this is a high priority and should be the focus of the pilot project. It was discussed that this could be a two-stage program (a) 2014–Increase Stewardship and Awareness (potentially coupled with Love Your Lakes, Don't Leaf Them). (b) 2015–Implement Bagging Pilot Project. Greg said the window of opportunity to do this right is small. Ideas for development of functional networks such as neighborhood captains, midblock signs, Facebook, ListServ, sign-up for text messages, and neighborhood groups in charge of notifications were discussed. Jim Bauman said the connection between leaves and water quality should be made at each engagement meeting.	Focus on leaf management in the community engagement implementation plan.
(3)	Monroe Street Reconstruction: Greg said the City has hired a facilitator who will engage the public and businesses. While Wingra Watershed objectives will be included in the visioning discussion, other factors such as businesses viability and vitality will also be part of the discussion. Greg said that Wingra efforts will not drive the Monroe Street process but that he invites steering team members to attend the Monroe Street reconstruction project public meetings to provide input. After further discussion, Greg said he will include a couple of slides in the Monroe Street reconstruction public informational meeting slides that specifically discuss how the Wingra Watershed Plan might be integrated into the Monroe Street reconstruction process. The current schedule is for Monroe Street to be reconstructed in 2016 with a two-phase bid process in late 2015 and early 2016.	
(4)	Meeting Notifications–Multiple notification modes (public notice, newspaper article, newsletter) should be employed for the community engagement activities.	
(5)	Public Meeting–Strand should work with the City and FOLW to set up for the first Public Informational meeting to be held in mid-June	Strand will work with the City and FOLW to set up the first public informational meeting to be held in

Discussion:		Action:
	2014. A location such as Edgewood College or the UW-Madison Arboretum would be ideal. The meeting should be to inform the public of the findings of the study and to introduce the pilot project and the framework of the community engagement activities.	mid-June
7.	<u>Urban Non-Point Source and Stormwater Grant Application</u> Strand will be submitting a grant application to the WDNR on April 15, 2014, for the Nakoma Park streambank restoration project.	
8.	<u>Upcoming Schedule and Next Meeting</u>	

Steering Team Meeting	Date	Time	Topic
Meeting No. 1	February 21, 2013	2 pm	Kickoff Meeting
Issue Team Meeting No. 1	March 21, 2013	3 pm	Chlorides
Meeting No. 2	April 4, 2013	3 pm	Chlorides/Social Marketing
Meeting No. 3	May 23, 2013	3 pm	Chlorides/Infiltration
Issue Team Meeting No. 2	June 28, 2013	10 am	Infiltration
Meeting No. 4	July 11, 2013	3 pm	Pollutant-Sediment and Phosphorus
Meeting No. 5	October 17, 2013	8 am	Pollutant Reduction Opportunities
Meeting No. 6	December 11, 2013	8 am	Pollutant Reduction Opportunities: Chlorides
Meeting No. 7	January 23, 2014	8 am	Draft Report Sections (Infiltration and Phosphorus)
Issue Team Meeting No. 3	February 27, 2014	9 am	Draft Chloride Report Section, Stakeholder Engagement/Social Marketing Framework, Social Marketing Pilot Project Discussion
Meeting No. 8	March 25, 2014	10 am	FINAL Infiltration, Phosphorus, Chloride Analysis AND Community Engagement Strategy Workshop
Issue Team Meeting No. 4	May 22, 2014	1 pm	Final Community Engagement Strategy and Draft Social Marketing Report Section
Community Engagement	June-August 2014		
Issue Team Meeting No. 5	Early Oct., 2014	TBD	Draft Report Presentation
Issue Team Meeting No. 6	Early Nov., 2014	TBD	Final Report Presentation
Final Report Presentations (4)	Nov. / Dec. 2014		
Social Marketing Pilot Project	Jan-June 2015		

c/enc: All Participants

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
May 22, 2014, 1 P.M.
Strand Associates, Inc.®
Steering Team Meeting No. 9–Stakeholder Engagement/Social Marketing Framework

Meeting Location: Strand Associates, Inc.®	Job No.: 1020065
Meeting Purpose: Stakeholder Engagement/Social Marketing Framework	

Meeting Handouts:	
Meeting attendees were provided with a draft report section prior to the meeting.	

Invitee	Representing	Present	Absent
Genesis Steinhorst	City of Madison	☒	☐
Greg Fries	City of Madison	☐	☒
Lucas Dailey District 13 Alderperson	City of Madison	☐	☒
Paul Dearlove	Friends of Lake Wingra (FOLW)	☒	☐
David Liebl	Friends of Lake Wingra	☒	☐
Jim Lorman	Friends of Lake Wingra	☒	☐
Rebecca Power	Friends of Lake Wingra	☐	☒
Jim Baumann	Friends of Lake Wingra	☒	☒
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☐	☒
Mark Wegener	UW-Madison Arboretum	☒	☐
Ben Jordan	UW-Madison	☐	☒
Bret Shaw	UW-Madison	☒	☐
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐

Discussion:	**Action:**
1. Confirmation of Action Items Completion Seven items were discussed with four completed and the following three ongoing. a. Phosphorus–Strand is finalizing the report section. The City will work with Strand on the cost for the increased street sweeping schedule. Slide 9 will be added to the report section and will include addition of an existing controls bar in multiple locations. b. Infiltration–Strand is finalizing the report section. c. Chlorides–Strand is finalizing the report section. d. Community Engagement–Strand and Bret will work with the City and FOLW to set dates for community engagement activities including a public informational meeting. Genesis will add the timeline for the City's project-based and management-based measures. Steering Team Meeting No. 9 rolled out the draft community engagement plan.	See action items at left.

Discussion:	Action:
2. Lake Response Model Update There was no discussion.	
3. USGS Leaf Study Update Roger said data will be available at the end of 2015 that will provide a better understanding of the leaf issue. 2013 is a baseline year, 2014 is an existing practices year, and 2015 is a modified practices year.	
4. Summary of March 25, 2014 Discussion Strand presented ten PowerPoint slides providing a summary of this discussion. a. Critical Action Prioritization Exercise–An informal poll of steering team members was conducted and was useful for helping to focus the project's social marketing efforts. Results were used to help create a draft of Section 5-Stakeholder Engagement of the report. b. Pilot Project–Modified leaf collection was selected as a pilot project and framework for the pilot project is included in the draft report (Section 5-Stakeholder Engagement). c. Community Engagement Strategy–Section 5 (draft) of the report was developed in a fashion that lays out a community engagement implementation plan, a portion of which will be implemented by Strand and Bret as part of their community engagement services. At Steering Team Meeting No. 8, the steering team decided on having community engagement meetings after the implementation plan was put in place rather than before.	
5. Stakeholder Engagement/Social Marketing Framework Strand presented eighteen PowerPoint slides on this topic which generally summarized draft Section 5-Stakeholder Engagement (May 19, 2014 Version). Discussion included the following. a. Timeline–A timeline will be developed for the next steering team meeting. Two meetings are to be scheduled as discussed below, one each for the construction site erosion control and chlorides measures. b. Critical Action Category–Critical actions were categorized as generally being project-based, management-based, and community-based measures. Some of the measures are cross-categorical, meaning they may be a combination of the three categories. Section 5 includes a stakeholder engagement plan for nine measures including those listed in the following paragraphs. After the meeting, Strand addressed the comments described below and is sending a revised draft	

Discussion:	Action:
of the stakeholder engagement plan (Section 5) to the City and steering team members. *Leaf Management (Pilot Project):* The steering team agreed that the fall of 2014 should be focused on building awareness and capacity for the 2015 program. It could include a simple checklist survey on existing practices when canvassing to establish a baseline. Strand and the City will work on defining the pilot project area that would be the same for the 2014 and 2015 programs. However, community engagement activities would recruit leaders and participants throughout the entire Lake Wingra watershed. Monitoring of effectiveness of the 2014 and 2015 programs will be both qualitative and quantitative for behavior change. Water quality monitoring will not be included since this is going on as part of a different project (USGS/City of Madison leaf study). Reference was made to a newspaper article that indicated the City will no longer be taking leaves to Dane County facilities, and therefore, the county mulch sites will be shutting down. Rather, the City will be contracting with a firm from DeForest for leaf disposal. Genesis will find more information and see whether this development impacts the Leaf Management Pilot Project. *Rain Gardens/Downspout Disconnections/Rain Barrels:* David said he would e-mail a downspout disconnection master thesis that Eric Booth completed. *Terrace Rain Gardens:* Genesis said the City is expanding its existing program to areas that are not in a street reconstruction area. A couple are being installed in 2014 through this new program. *Permeable Pavement:* No comments. *Certification Program for Salt Application Contractors Environmental Winter Maintenance Program:* Genesis said that in the past, the City has looked to the WDNR for leadership on this measure and would prefer the WDNR take the lead. *Maximum Salt Use Guidelines and Ordinances:* There appears to be political support for guidelines or ordinances with the current mayoral administration. Figure 5.08-1 and the text of this section indicate that maximum salt use guidelines would come after the	

Discussion:	Action:
Certification Program. Steering Team members thought that another option would be to implement Maximum Salt Use Guidelines concurrent with a certification program. *Reduce Residential Salt Use:* There were no comments. *Activities Needed for Project-Based Measures (Section 5.10):* Move this section to the front of the document. The City will add timing element to this section. *Activities Needed for Management–Based Measures (Section 5.11):* Move this section to the front of the document. The City will add timing element to this section. *Construction Site Erosion:* Add community engagement strategy for this tenth measure. Jim felt the implementation plan should not be limited to just community measures; it should also include management measures. Strand and the City should set up a meeting with the City's building inspection and engineering departments in June 2014 to better understand the benefits and barriers. *Reduce Municipal Salt Use:* Add an engagement strategy for this eleventh measure. Strand and the City should set up a meeting with City and county salt supervisors in June 2014 to better understand the benefits and barriers. c. Stakeholder Engagement Strategy (General Comments)– Discussion included the following. *Audience*: It was discussed that Strand should add an audience paragraph at the beginning of Section 5. This paragraph would describe that Section 5 is written for those who will be involved in moving the critical actions to completion (e.g., the City and potential partners such as Clean Lakes Alliance and FOLW). *Roles and Responsibilities Paragraph*: In Figure 5.01-2, change "co-leader" to "champion." Include the following sentence: "Developing ownership and maintaining leadership continuity will be important in seeing these actions to full fruition." *Benefits/Barriers:* Always list benefits first to keep a	

Discussion:	Action:
positive tone. Benefits and barriers will be described as through the eyes of those whose behavior we are trying to change. *Emphasis of Section 5:* There appears to be a lack of emphasis on commercial activities by categorizing measures as community-based. Strand will provide verbiage in the introduction to emphasize that community includes commercial, institutional, residential, and business. d. Strand/Bret Resources–Jon will develop a revised level of effort that fits targeted stakeholder engagement efforts (as defined in Section 5–Stakeholder Engagement) with the remaining budget and discuss with Genesis. Efforts not completed by Strand will fall under the leadership structure shown in Figure 5.01-2 Possible Critical Action Organization that identifies a collaborative Community Champion and City Champion arrangement. After completion of certain efforts by Strand and Bret, this same leadership structure would be responsible for sustaining these efforts. e. Executive Summary and Fact Sheets for Measures (2014/2015 Campaign Document)–It was discussed that for each of the eleven measures, or conversely for only the highest priority ones, a fact sheet could be developed as part of Strand and Bret's efforts and included in the appendix. The fact sheets could be used as public educational tools while doing stakeholder engagement. A comprehensive executive summary (outside of the engineering report) could also be an effective tool/deliverable. The executive summary could be supported by the various fact sheets. The Milwaukee Metropolitan Sewerage District Regional Green Infrastructure Plan may have some good examples of a potential format for the executive summary and fact sheets.	
6. <u>Urban NonPoint Source and Stormwater Grant Application</u> Strand submitted a grant application to the WDNR on April 15, 2014, for the Nakoma Park streambank restoration project. The total project cost is $276,075 with possibility of a grant for half of this amount. The WDNR typically announces grant awards in the fall of 2014 with monies available starting January 1, 2015.	

Discussion:	Action:

7. Upcoming Schedule and Next Meeting

Steering Team Meeting	Date	Time	Topic
Meeting No. 1	February 21, 2013	2 pm	Kickoff Meeting
Issue Team Meeting No. 1	March 21, 2013	3 pm	Chlorides
Meeting No. 2	April 4, 2013	3 pm	Chlorides/Social Marketing
Meeting No. 3	May 23, 2013	3 pm	Chlorides/Infiltration
Issue Team Meeting No. 2	June 28, 2013	10 am	Infiltration
Meeting No. 4	July 11, 2013	3 pm	Pollutant-Sediment and Phosphorus
Meeting No. 5	October 17, 2013	8 am	Pollutant Reduction Opportunities
Meeting No. 6	December 11, 2013	8 am	Pollutant Reduction Opportunities: Chlorides
Meeting No. 7	January 23, 2014	8 am	Draft Report Sections (Infiltration and Phosphorus)
Issue Team Meeting No. 3	February 27, 2014	9 am	Draft Chloride Report Section, Stakeholder Engagement/Social Marketing Framework, Social Marketing Pilot Project Discussion
Meeting No. 8	March 25, 2014	10 am	FINAL Infiltration, Phosphorus, Chloride Analysis AND Community Engagement Strategy Workshop
Meeting No. 9	May 22, 2014	1 pm	Draft Stakeholder Engagement/Social Marketing Report Section
Community Engagement	June-August 2014		Begin with: • Chlorides Meeting with County and City Winter Maintenance Supervisors in June 2014 • Erosion Control Meeting with City (Building Inspection and Engineering Dept. staff) • Public Meeting: Set up this meeting after Steering Team Meeting No. 10
Meeting No. 10	Mid-July 2014	TBD	Stakeholder Engagement
Meeting No. 11	TBD	TBD	Final Report Presentation
Final Report Presentations (4)	Nov./Dec. 2014		Possibly turn some of these into Steering Team Meetings
Social Marketing Pilot Project	Jan-December 2015		

c/enc: All Participants

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
August 13, 2014, 2:30 P.M.
Strand Associates, Inc.®
Steering Team Meeting No. 10–Stakeholder Engagement/Social Marketing/Pilot Project

Meeting Location: Strand Associates, Inc.®	Job No.: 1020065
Meeting Purpose: Stakeholder Engagement/Social Marketing Framework/Pilot Project	

Meeting Handouts:	
Meeting attendees were provided with a draft report section prior to the meeting.	

Invitee	Representing	Present	Absent
Genesis Steinhorst	City of Madison	☒	☐
Greg Fries	City of Madison	☒	☐
Lucas Dailey District 13 Alderperson	City of Madison	☐	☒
Paul Dearlove	Friends of Lake Wingra (FOLW)	☒	☐
David Liebl	Friends of Lake Wingra	☒	☐
Jim Lorman	Friends of Lake Wingra	☒	☐
Rebecca Power	Friends of Lake Wingra	☒	☐
Jim Baumann	Friends of Lake Wingra	☒	☐
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☐	☒
Mark Wegener	UW-Madison Arboretum	☐	☒
Ben Jordan	UW-Madison	☐	☒
Bret Shaw	UW-Madison	☒	☐
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐

Discussion:	**Action:**
1. Confirmation of Action Items Completion Eight items were discussed with three completed and the following four ongoing. a. Phosphorus–Strand is finalizing the report section. The City will work with Strand on the cost for the increased street sweeping schedule. Slide 9 will be added to the report section and will include addition of an existing controls bar in multiple locations. b. Infiltration–Strand is finalizing the report section. c. Chlorides–Strand is finalizing the report section. d. Community Engagement–Strand and Bret will work with the City and FOLW to set dates for community engagement activities including a public informational meeting. Genesis will add the timeline for the City's project-based and management-based measures. Steering Team Meeting No. 9 rolled out the draft community engagement plan.	See action items at left.
2. Lake Response Model Update Greg gave a summary of the results. Greg or Genesis will e-mail the most recent PowerPoint presentation from the UW. In essence, Carp dominate sediment and phosphorus suspension in sunny weather conditions (e.g., 90 percent), but	

Discussion:	Action:
not as much in rainy weather. As far as Orthophosphorus, stormwater runoff plays a greater role. For the yearly average contributors in both rain and sun for Total Phosphorus, it is Carp 60% ± 20%, Wind 10% ± 2%, and Runoff 30% ± 14%. For yearly average contributors in both rain and sun for Orthophosphorus, it is Carp 30% ± 18%, Wind 5% ± 1%, and Runoff 65% ± 22%.	
3. <u>USGS Leaf Study Update</u> Genesis said the leaf study is being extended another two years with monitoring ending in 2017 and the report being issued in 2018. Additional study will be done regarding leaves in the street. Preliminary findings seem to be indicating that leaves that fall in the street are a substantial problem. Right now the City is investigating the possibility of purchasing a special vacuum cleaner which would allow it to study this effect further.	
4. <u>Stakeholder Engagement Social Marketing</u> Strand presented six PowerPoint slides providing a summary of the July 21, 2014, Construction Site Stakeholder Meeting with Tim Toester, Jeff Benedict, and Scott Kerr. a. Construction Site Erosion Control Stakeholder Meeting Summary–This discussion revolved around barriers to improved construction site erosion control compliance and incentives or changes that could be made to the City's construction site erosion control program. (1) The challenge is that it is difficult to enforce proactive erosion control when the standards are reactive as they penalize only after there has been a failure. (2) The City can only enforce a stricter standard than the state in the Rock River TMDL zone. For single-family homes, the City also cannot require more than the Uniform Dwelling Code. (3) Future efforts could include a proactive code in the TMDL zone, using an incentive program such as Green Tier, and perhaps using a surety system that allows contractors to get money back for doing a good job. b. Chlorides Stakeholder Meeting Summary–Because of time constraints, this discussion was skipped. c. Partial Implementation of Social Marketing Plan: Efforts to Match Remaining Budget–A timeline of these efforts was presented that contemplated the following:	

Discussion:	Action:
(1) A public meeting in October 2014. (2) Development of three Lake Protection Action Sheets (Phosphorus, Chlorides, Infiltration). (3) Development of an Executive Summary for distribution to the public. (4) Canvassing of the community by champions with the Action Sheets in the fall of 2014 or spring of 2015. (5) Finalization of the report by the end of 2015. The Steering Team indicated it is not quite ready to have the public meeting in October. The team would like to push it back to obtain the maximum opportunity for neighborhood involvement (e.g., get on neighborhood organization schedules). Ideally it would be best if several neighborhood organizations would help sponsor the public involvement meeting. The team also would like the opportunity to be involved in the development of the meeting materials. It was decided to hold another Steering Team Meeting in early December to lay the groundwork for a spring 2015 Public Meeting and completion of the report after the spring 2015 public meeting. The purpose and design of the meeting was discussed at length. There was considerable discussion on the purpose of the public meeting–is it to involve the residents in the formulation of the plan in order to promote ownership and behavior change, or is it to have a watershed plan that is endorsed by the community so there is encouragement for the City (and alders) to fund it in the capital budget? It should be noted there are two Steering Team meetings remaining, the second of which will now be planned for late July or early August of 2015. The group also felt it would be best to wait for the finalization of the report until after the public meeting. Depending on the purpose of the public meeting, perhaps a draft could be distributed before it is endorsed by the various neighborhood organizations.	Strand will work with several Steering Team members to develop options for purpose/design of this meeting and ask for comments prior to the December Steering Team Meeting.
5. <u>Social Marketing-Based Pilot Project</u> Strand presented thirteen PowerPoint slides and Bret presented eighteen PowerPoint slides on this topic. There is continued agreement on using a two-year leaf management program as the pilot project. The first year will focus on leaves off the street, and the second year will introduce bags. The pilot area	

Discussion:	Action:
will be a 2 to 3 block subset of the total watershed. Discussion included the following.	
a. Potential Pilot Project Area–Three general locations (West, Central, and East) were shown on a map, each located in the neighborhood of some of the Steering Team members. The Steering Team decided to conduct the Leaf Management Pilot Project in the West location, which is in the vicinity of Roger Bannerman's house and a Strand employee's house.	Strand will contact Roger to better define this two to three block area to conduct the pilot project.
b. When asked whether the area should be a representation of a typical Madison neighborhood, or instead be an area with a high probability of success, the group eventually decided that having a success story was important for moving forward and implementing the management measure in other parts of the city.	
c. Implementation of Social Marketing-Based Pilot Project: Efforts to Match Remaining Budget–A timeline of 2014 efforts and 2015 efforts was presented. *2014 Pilot Project Efforts:* 2014 efforts contemplated a public meeting on September 18, 2014, at the Odana Hills Golf Course clubhouse, canvassing citizens in the Pilot Project boundary with a Lake Protection Action Sheet (Leaves), Action Sheet for Neighborhood Leaders (for Block Captains training), Evaluation Survey, Commitment Card and FAQ document, notification program by champions, and monitoring of leaf placement by Strand. The Steering Team decided to have the canvassing done before the Pilot Public Meeting as a way to advertise for the meeting. *2015 Pilot Project Efforts:* 2015 efforts will build on the capacity building from 2014 but will include the introduction of the bagged leaves pickup and the distribution of free bags.	Action items relative to 2014 efforts include the following: (1) Strand will reserve the Odana Hills Golf Course Clubhouse on September 18, 2014 (2) Strand and Bret will develop the verbiage for the signs and door hangers by the end of the day on August 22, 2014, and get to Genesis. (3) Genesis will format the sign and door hanger verbiage and submit to printer for printing at City cost. (4) Strand and Bret will finalize the Action Sheets, Survey, Commitment Card, and FAQ Document before its use in canvassing. (5) Strand will develop a database of addresses and a letter inviting the Pilot Project residents to the September 18, 2014, meeting by September 29, 2014. (6) The City will send out invite letters by the end of the day on September 29, 2014.
d. Bret led the group on a series of discussions and logistics for the pilot project. The discussion included the following issues: (1) Branding–The group agreed the pilot project branding will include the City and FOLW. (2) Changing injunctive norms are most effective; signs help provide trigger for action. Block	

Discussion:	Action:
competition might be effective. (3) Residents will need to see this pilot project as a long-term investment by the city, not just a one- or two-year event. (4) The e-mail database is valuable, and it should be treated as a foundational communication tool for future years. (5) The pilot project should focus on one behavior change item (e.g., leaves out of the street), not multiple items to be effective. (6) When questioned about potentially targeting people who mulch or allow their leaves to stay on the ground, Bret mentioned he felt these people are already eco-conscious and therefore would not necessarily be the target of the pilot project. Instead, the target would be the normative behavior of people who currently rake their leaves to the terrace. e. Tom referenced the materials that will be used for canvassing. The materials will be visually spruced up, but it would be good if the group could provide comments by August 22, 2014. Tom will send out electronic versions.	(7) Strand, Bret, and Roger will have a phone conference to define the canvassing dates (likely the week of September 8-12, 2014) and the message to convey. (8) Strand, Bret, and Roger will do the canvassing. (9) Strand and Bret will develop a PowerPoint presentation for use at the public meeting by the end of the day on September 8, 2014. (10) Strand will work with block captains on an e-mail notification program (including yard signs) to be used starting September 22, 2014. (11) Block captains will perform notifications as required from September 22 to November 21 according to the City schedule. (12) Genesis and Greg will check with Chris Kelley to see whether the City can commit to leaf pickup on exact dates given to the public in the Pilot Project Area.
6. <u>Urban Nonpoint Source and Stormwater Grant Application</u> Strand submitted a grant application to the WDNR on April 15, 2014, for the Nakoma Park streambank restoration project. The total project cost is $276,075 with possibility of a grant for half of this amount. On August 11, 2014, the WDNR e-mailed the scores for the grant applications received. The Nakoma Park streambank restoration project ranked 21 out of 31 applications. It appears the project is on the fringe of receiving funding if funding levels are similar to 2013. The WDNR typically announces grant awards in the fall with monies available starting January 1 of the following year.	

Discussion:	Action:

7. Upcoming Schedule and Next Meeting

Steering Team Meeting	Date	Time	Topic
Meeting No. 9	May 22, 2014	1 pm	Draft Stakeholder Engage./Social Market. Report Section
Community Engagement	July 15, 2014 July 21, 2014		• Chlorides Meeting with County and City • Erosion Control Meeting with City
Meeting No. 10	August 13, 2014	2:30 pm	Social Marketing/Stakeholder Engagement/Pilot Project
2014 Pilot Project Handouts	September 12, 2014		Final Leaves Action Sheets, Survey, Commitment Cards
Community Engagement	**September 17, 2014**	**TBD**	**Pilot Project Public Meeting**
2014 Pilot Project Efforts	Sept./Oct. 2014		Neighborhood Canvassing/Notification Program/Monitoring
Social Marketing Handouts	October 10, 2014		Final Chlorides, Phosphorus, Infiltration Action Sheets & Executive Summary
Pre-Social Marketing Monitoring of Practices	Late-October 2014 or Spring 2105		By Champions
Community Engagement	Oct./Nov. 2014 or Spring 2015		Champions Canvas Community with Action Sheets (Chlorides, Phosphorus, and Infiltration)
Meeting No. 11	December 2014	TBD	Discussion of 2014 Pilot Project Efforts and Spring Public Meeting
Community Engagement	**Spring, 2015**	**TBD**	**Wingra Watershed Plan Public Meeting**
Report Presentation	~~January 2015~~ Spring 2015?	~~TBD~~	~~Presentation to City Engineer and Assistant City Engineer~~
~~Final Report Presentation~~	~~Spring 2015~~	~~TBD~~	~~Presentation to Alderperson~~
Meeting No. 12 (Last One)	August 2015	TBD	Final Guidance Regarding 2015 Pilot Project Efforts
Community Engagement	**September 16, 2015**	**TBD**	**Pilot Project Public Meeting**
2015 Pilot Project Efforts	Sept./Oct. 2015		Neighborhood Canvassing/Enhanced Notification Program/Monitoring
Pilot Project Findings Report Supplement	December 2015		
Future Implementation of Social Marketing Plan By Champions	January 1, 2016 and Beyond		

c/enc: All Participants

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
December 18, 2014, 2:30 P.M.
Strand Associates, Inc.®
Steering Team Meeting No. 11–Leaf Pilot Project Update and
Spring 2015 Public Involvement Meeting

Meeting Location: Strand Associates, Inc.®	Job No.: 1020065
Meeting Purpose: Stakeholder Engagement/Social Marketing Framework/Pilot Project	

Meeting Handouts:	
Meeting attendees were provided with a draft report section prior to the meeting.	

Invitee	Representing	Present	Absent
Genesis Steinhorst	City of Madison (City)	☐	☒
Greg Fries	City of Madison	☒	☐
Lucas Dailey District 13 Alderperson	City of Madison	☐	☒
Paul Dearlove	Friends of Lake Wingra (FOLW)	☒	☐
David Liebl	Friends of Lake Wingra	☒	☐
Jim Lorman	Friends of Lake Wingra	☒	☐
Rebecca Power	Friends of Lake Wingra	☐	☒
Jim Baumann	Friends of Lake Wingra	☒	☐
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☒	☐
Mark Wegener	UW-Madison Arboretum	☐	☒
Ben Jordan	UW-Madison	☐	☒
Bret Shaw	UW-Madison	☒	☐
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐
Stephanie Thomsen	Strand Associates, Inc.®	☒	☐

Discussion:	**Action:**
1. Confirmation of Action Items Completion Eight items were discussed with three completed and the following four ongoing. a. Phosphorus–Strand is finalizing the report section. The City will work with Strand on the cost for the increased street sweeping schedule. Slide 9 will be added to the report section and will include addition of an existing controls bar in multiple locations. b. Infiltration–Strand is finalizing the report section. c. Chlorides–Strand is finalizing the report section. d. Community Engagement–Work with steering team members before Steering Team Meeting No. 11 to develop options for purpose/design of Steering Team Meeting No. 11 as well as the Spring 2015 Public Involvement Meeting. Rebecca gave input to Strand before the meeting. e. Pilot Project (fall 2014 efforts)–Complete. f. Report–Finalize the report after the Spring 2015 Public Involvement Meeting.	See action items at left.

Discussion:	Action:
2. Lake Response Model Update Greg will forward the final report to the steering team members. The report was finalized in December 2014.	
3. USGS Leaf Study Update The project is now a 5-year study (2013 through 2018). Monitoring will end in the fall of 2017 with a report issued in 2018. Roger said that fall 2014 rainfall was low. Because of the importance of leaves in the street, targeting/scheduling street cleaning/pickup should be considered based on the type of tree canopy. Roger will forward Bill Selbig's most current PowerPoint regarding the study to the steering team members. There was discussion that the study sites may be conducive to social marketing efforts.	
4. Leaf Collection Pilot Project Update Strand presented twenty-four PowerPoint slides regarding the leaf collection pilot project including the following. a. Survey Results–Survey was delivered to 84 homes in the pilot project area (Piper Drive, Orchard Drive, and Charles Lane between Tokay Boulevard and Odana Road) with a 51 percent response rate (43 surveys). The survey included five questions on leaf collection, five questions on winter maintenance, and two questions on stormwater. A summary of the results is as follows. (1) Leaf Management–47 percent of respondents raked leaves to the terrace, while 25 percent mulched, and 22 percent composted. (2) Leaf Management–For those that rake leaves to the terrace, 22 percent do so once in the fall, 31 percent do so twice, and 22 percent do so more than twice; 25 percent do so only when needed. (3) Leaf Management–The main factor that influences when to place leaves in the terrace is when most of the leaves fall from the trees. The second most important factor is knowing when leaf collection is scheduled. (4) Leaf Management–Most respondents reported that the length of time until leaves are collected by the City after being placed on the terrace is 1 to 2 weeks. (5) Leaf Management–Most respondents reported their main concern with leaf management issues are leaf piles spilling into the street and gutter, followed by leaves killing the terrace	

Discussion:	Action:
lawn, and leaves blowing from or onto their property. (6) Winter Maintenance–58 percent of respondents said they used a shovel or snow blower to clear snow from their sidewalk and driveway; 29 percent said they used salt/chemical ice melter, while 6 percent said others clear their snow. (7) Winter Maintenance–Most respondents said they typically use salt to clear pavement in icy conditions and are less inclined to do so during both light (1 to 3 inches) and heavy (greater than 3 inches) snowfalls. (8) Winter Maintenance–Most respondents indicated the two main factors that affect salt use are fear of others falling on their pavement, and fear of falling on their own pavement. (9) Winter Maintenance–57 percent of respondents said that their perception of snow clearing on local streets is satisfactory, while 19 percent said it could improve and 19 percent said it is excellent. (10) Winter Maintenance–39 percent of respondents said that their perception of snow clearing on City streets and highways is satisfactory, while 15 percent said it could improve, and 46 percent said it is excellent. b. September 18, 2014, Pilot Project Public Involvement Meeting–Seventeen people attended this meeting at the Odana Hills Golf Course Clubhouse. This meeting was the rollout of the Leaf Collection Pilot Project. c. Fall 2014 Pilot Project Efforts Recap–The following was discussed: (1) Study Area–A leaf collection pilot project area was supplemented by a leaf collection awareness area. Canvassing and active social marketing are occurring in the pilot project area while awareness building is occurring in the other areas to expand the influence of the pilot project. Canvassing occurred in early September as organized by Roger and included going door-to-door and handing out a bag of information including the following: commitment card, action card (refrigerator magnet), survey form (with stamped return	

Discussion:		Action:
	envelope), pilot area map, and notice of pilot project public information meeting. Jim B. said he was confronted by residents in his neighborhood (Fairway Street) that is in the awareness area. These residents accused the pilot project efforts of being responsible for the streets department handing out either warnings or $400 tickets (Jim was not sure) for not keeping their leaves out of the street. It appeared the City's Streets Department was putting orange door hangers that warned of a ticket if the resident did not keep leaves out of the street. Greg was unaware of the City Streets Department actions and said he would look into it. After the meeting, Greg found that it was building inspection who issued the notices and they were only doing so as a response to a complaint from someone in the neighborhood (e.g., they do not do this unless a complaint is received).	
(2)	Fall 2014 Pilot Project Protocol–Strand developed a protocol for administering the pilot project that consisted of a table with the following headings: Leaf Pickup Occurrence, Task, Responsible Party, and Date to Complete. This information guided the putting out of yard signs by block captains, e-mail notifications from the commitment card list by Strand, initiation of block captain/volunteer interaction with neighbors, and monitoring of the raking and leaf collection efforts via pictures and video. These actions were initiated once the City leaf collection District 2 Web page indicated that District 2 will be "NEXT."	
(3)	Fall 2014 Leaf Pickup Dates–A slide with the October and November 2014 calendars was presented showing the date of leaf pickup and the date of photos taken by Strand. There were four leaf pickups (October 6 and 20 and November 10 and 25). The fall 2014 pilot project protocol for the October 6 leaf pickup was not entirely followed because the City Web site was only updated to "NEXT" a few days before the collection.	

Discussion:	Action:
d. General Observations include the following. (1) In the pilot area, after the second round, and before the third pick up, it was observed that 46 out of 84 homes had put leaves on the terrace and 30 of the piles had no leaves on the curb. (2) It was observed that the control areas had more leaves in the street. (3) It was also observed that other streets in the general area had more leaves in the street (e.g., the entire pile raked into the street). (4) Overall, the City did a pretty good job picking up the leaves and sweeping the streets. (5) Roger was happy with the results of the 2014 pilot project efforts. 5. <u>Lessons Learned and Improvements for Fall 2015 Pilot Project Efforts</u> a. Lessons Learned–Because the control area was not in the same collection area as the pilot project area, the control area was moved west of the pilot project area (Woodburn Drive, Holiday Drive, and Sherwood Road between Wedgewood Way and Hilltop Drive). Also, the signs are difficult, if not impossible, to drive into the ground once the ground is frozen. b. Improvements for the fall 2015 Pilot Project Efforts–The following improvements can be made in 2015. (1) Enhance the notification protocol. (2) Improve the City notification. (3) Get better quantification of participation and results. (4) Put control area photos in the PowerPoint presentations to show the difference. (5) Craft a bagging protocol. Jim L. wondered whether having a fixed schedule for City leaf collection would be more effective and less costly than the current system. Jim B. said that leaf collection should go into December as some tree types (hickory) drop leaves with the snowfall. Paul said the Clean Lakes Alliance could potentially assist in the 2015 Pilot Project Efforts since leaf collection is a priority for them. It was	

Discussion:	Action:
discussed that it may be beneficial for the Clean Lakes Alliance to spread the message of ***Leaves Out of the Street*** rather than the City because of liability issues. Paul said he will share the results of the Clean Lakes Alliance Greater Madison Yard-Care Survey from fall 2014.	
6. Public Involvement Meeting in Spring 2015 Strand presented seven PowerPoint slides and the following was discussed. a. Meeting Date and Location–It was generally agreed the meeting should be held at Edgewood College as it is the most central to the watershed compared to the UW Madison Arboretum. The meeting should be held in late March 2015 (tentatively set at March 26, 2015). Spring breaks for UW Madison, Edgewood College, Madison College (MATC), and Madison Metropolitan School District are as follows: March 28 through April 5, March 16 through March 20, March 16 through March 20, and March 30 through April 6, respectively. b. Public Meeting Purpose and Invitees–It was discussed that the purpose of the meeting should be to: (1) Create community ownership in the watershed plan by giving residents the opportunity to comment on measures and to help establish priorities. (2) Demonstrate community support and priorities to elected officials for capital improvements by obtaining endorsement from neighborhood organizations. (3) Demonstrate community support for management changes. (4) Continue to build social infrastructure for community change. There was some discussion as to whether it is reasonable to establish priorities (in the hope of establishing ownership) when they have very little knowledge of the proposals. Perhaps a better goal is to get their support rather than give them ownership. Note: David gave some additional suggestions after the meeting that are outlined in an accompanying e-mail.	Action items relative to the public involvement meeting include the following: (1) Strand will reserve the Edgewood College venue for March 26, 2015. (2) Strand will develop a PowerPoint presentation and exhibits for review by the steering team by March 12, 2015. The steering team review comments will be due by the end of the day on March 19, 2015.

Discussion:	Action:
Invitations should be extended to neighborhood group leaders (those we are seeking endorsement of the final plan from) as well as other public and private leaders. It was stated that 40 of the most influential people should be invited to the meeting to get them to interact with neighborhood leaders. It was stated that personal or other types of creative invitations may be necessary. Greg said that this is an election year (election in April 2015) and that there will be a new alderperson. If the meeting is held before the election, all the individuals vying for the position need to be invited. c. Public Involvement Meeting Framework–There will be an open house with exhibits summarizing the need for new measures (both public and private), the proposed measures (chlorides, phosphorus, and infiltration), and what they and the City can do. This will be followed by a PowerPoint presentation. After the PowerPoint presentation, it was discussed that there could be a group exercise to establish priorities to identify the top 3 private and top 3 public institutional measures. Tom introduced a concept of trade-offs where each action is accompanied by a gradient of how much better or worse off than today each action would be that also addresses cost, cost-effectiveness, effort, and benefit. This "dashboard" can quickly educate attendees of the benefits and cost of the proposed measures. The steering team liked the idea of this concept. The idea of using dots and/or requesting a signature of commitment for certain actions was intended to provide ownership in a particular action. Some in the group discouraged the use of dots because we would be asking residents to prioritize without them fully understanding the benefits, effectiveness, and cost. David said the meeting purpose should be to develop consensus on which actions should be done first and which ones a particular individual or agency would be willing to personally support. He said that we should effectively convey the actions that are important, summarize the analysis that has been done, and request individuals/agencies to support and work on getting projects done.	

Discussion:	Action:
It was suggested that actions be tied to a result. Greg wants informed choice. He said a goal should be that when a known side effect occurs, an individual or agency would still support an action. It was discussed that the meeting should focus on a short-term (3 to 5 years) implementation plan, not all of the actions that are identified in the plan. It was discussed that salt actions were likely a longer-term action item. d. Plan Endorsement Strategy It was discussed that the plan should be finalized after the Public Involvement Meeting, but that there should be a Steering Team Meeting after the Public Involvement Meeting to discuss how the results of the meeting should be incorporated into the final plan. Jon said that one of the two final presentations would need to be shifted to an additional Steering Team Meeting to do so. Strand would finalize the plan after the additional Steering Team Meeting that will be held in April 2015. It was proposed that Strand send or e-mail the finalized plan in June 2015 to the various neighborhood groups seeking their endorsement by September 1, 2015, before the City takes the final plan to the Public Works/City Council for approval/adoption in the fall/winter of 2015.	
7. <u>Urban Nonpoint Source and Stormwater Grant Application</u> Strand submitted a grant application to the WDNR on April 15, 2014, for the Nakoma Park Streambank Restoration Project. The total project cost is $276,075 with the possibility of a grant for half of this amount. On September 25, 2014, the WDNR e-mailed the final scores for the grant applications received. The Nakoma Park Streambank Restoration Project ranked 18 out of 31 applications. The WDNR will only fund the first 11 applications ($1.2 million out of $3.2 million requested).	

8. Upcoming Schedule and Next Meeting

Steering Team Meeting	Date	Time	Topic
Meeting No. 10	August 13, 2014	2:30 pm	Social Marketing/Stakeholder Engagement/Pilot Project
2014 Pilot Project Handouts	September 12, 2014		Final Leaves Action Sheets, Survey, Commitment Cards
Community Engagement	**September 17, 2014**	**TBD**	**Pilot Project Public Meeting**
2014 Pilot Project Efforts	Sept./Oct. 2014		Neighborhood Canvassing/Notification Program/Monitoring
Social Marketing Handouts	October 10, 2014		Final Chlorides, Phosphorus, Infiltration Action Sheets & Executive Summary
Pre-Social Marketing Monitoring of Practices	Late-October 2014 or Spring 2105		By Champions
Community Engagement	Oct./Nov. 2014 or Spring 2015		Champions Canvas Community with Action Sheets (Chlorides, Phosphorus, and Infiltration)
Meeting No. 11	December 18, 2014	TBD	Discussion of 2014 Pilot Project Efforts and Spring Public Meeting
Send Meeting Invite Letter	**March 5, 2015**		**Strand draft letter, City to send letter**
Personal Invitation Calls to Identified Leaders	**March 9-10, 2015**		**Strand to make personal phone calls to identified leaders**
Send Powerpoint for Meeting to Steering Team	**March 12, 2015**		**Strand**
Steering Team Provides comments on Powerpoint to Strand	**March 19, 2015**		**Steering Team**
Community Engagement	**March 26, 2015**	**6:30 pm**	**Wingra Watershed Plan Public Involvement Meeting @ Edgewood College**
Meeting No. 12	April 16, 2015	TBD	Discuss How Comments from Community Engagement should be incorporated into Final Report
Report Finalization	June 1, 2015		Incorporate Comments from Community Engagement. Send/email final report to Neighborhood Groups seeking endorsement by September 1, 2015.
Final Report Presentation	June 2015	TBD	To City and Asst. City Engineer and Alderperson (2nd presentation deleted to allow for additional Steering Team Meeting). City takes final report to Public Works/City Council in Fall/Winter 2015 for approval/adoption.
Meeting No. 13	July 16, 2015	TBD	Final Guidance Regarding 2015 Pilot Project Efforts
Community Engagement	**September 16, 2015**	**TBD**	**Pilot Project Public Meeting**
2015 Pilot Project Efforts	Sept./Oct./Nov. 2015		Neighborhood Canvassing/Enhanced Notification Program/Monitoring
Pilot Project Findings Report Supplement	December 2015		
Future Implementation of Social Marketing Plan By Champions	January 1, 2016 and Beyond		

c/enc: All Participants

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
April 23, 2015, 1:30 P.M.
Strand Associates, Inc.®
Steering Team Meeting No. 12–Discussion on Remaining Efforts

Meeting Location: Strand Associates, Inc.®	Job No.: 1020065
Meeting Purpose: Stakeholder Engagement/Social Marketing Framework/Pilot Project	

Meeting Handouts:	
Meeting attendees were provided with a draft report section prior to the meeting.	

Invitee	Representing	Present	Absent
Phil Gaebler	City of Madison (City)	☒	☐
Greg Fries	City of Madison	☒	☐
Sara Eskrich District 13 Alderperson	City of Madison	☒	☐
Paul Dearlove	Friends of Lake Wingra (FOLW)	☐	☒
David Liebl	Friends of Lake Wingra	☐	☒
Jim Lorman	Friends of Lake Wingra	☒	☐
Rebecca Power	Friends of Lake Wingra	☒	☐
Jim Baumann	Friends of Lake Wingra	☒	☐
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☒	☐
Mark Wegener	UW-Madison Arboretum	☐	☒
Ben Jordan	UW-Madison	☐	☒
Bret Shaw	UW-Madison	☐	☒
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐
Stephanie Thomsen	Strand Associates, Inc.®	☐	☒

Discussion:	**Action:**
1. Confirmation of Action Items Completion Eight items were discussed with three completed and the following four ongoing. a. Phosphorus–Strand is finalizing the report section. The City will work with Strand on the cost for the increased street sweeping schedule. Slide 9 will be added to the report section and will include addition of an existing controls bar in multiple locations. b. Infiltration–Strand is finalizing the report section. c. Chlorides–Strand is finalizing the report section. d. Community Engagement–Add timeline to City of Madison Project-Based and Management-Based Measures.	See action items at left.
2. Standing Agenda Items a. Lake Response Model Update: After the meeting, Greg will forward the March 4, 2015, draft report to Strand. The City will post this to the City's Wingra Watershed Plan Web site. b. USGS Leaf Study Update: The fall of 2014 was very dry, limiting the number of events where meaningful data could be collected. In the fall of 2015, the study	

Discussion:	Action:
will try to find a way to get to summertime phosphorus levels in the fall (i.e., keep streets free of leaves including street sweeping once per month). c. UNPS Grant (Nakoma Park Streambank Restoration): City of Madison recently received word from the WDNR this project will be funded when previously it was not. Greg said that the City design and public involvement efforts for this project have already begun. The design concept includes minimal rock and much biostabilization, and the historic stairs will be rebuilt across the channel.	
3. <u>Review of March 25, 2015, Public Information Meeting (PIM)</u> Strand presented three PowerPoint slides regarding the PIM including the following. a. Meeting Invitees/Attendees/Framework–The City sent out postcards inviting all parcel owners in the watershed to the public meeting. Strand e-mailed and called the leader of 18 neighborhood associations and salt, infiltration, and phosphorus leaders; 35 attendees signed the sign-in sheet and a box was provided to ask whether attendees were interested in supporting Lake Wingra and how (infiltration, phosphorus, and chlorides). The meeting consisted of an interactive presentation on the various proposals and feedback from the attendees was requested. b. Strengths and Opportunities–Tom presented the strengths of the format used as well as opportunities for change (attached). Jim Bauman said that he recently presented on the Lake Wingra Watershed Plan at the Dudgeon-Monroe Neighborhood Association Annual Meeting. Jim found that attendees at that meeting generally wanted to learn more, were interested in viewing relevant materials, and were wondering how to comment on the plan but needed to "digest" plan components. Jim B. will be drafting an article for the Friends of Lake Wingra newsletter regarding the Lake Wingra Watershed Plan. Tyler Leper (Owner of Wingra Boats) is the incoming President of the Dudgeon-Monroe Neighborhood Association. Greg said the City will add functionality to the Lake Wingra Watershed Plan Web site allowing for comments to be made. Information on the plan is also available on the Web site. c. PIM Comments–Numerous useful comments were received and recorded. A summary of the comments	City will add functionality to the Lake Wingra Watershed Plan Web site allowing for comments to be posted regarding the plan.

Discussion:	Action:
was listed in the PowerPoint presentation but in respect of time were not gone through in detail at the Steering Team No. 12 meeting.	
4. Overview of Watershed Plan Measures/Audience Strand presented nine PowerPoint slides seeking guidance on where to focus the remaining efforts on the project: report finalization, Fall 2015 Pilot Project, or Outreach/Implementation. a. Outreach/Implementation–Tom presented Word Cloud diagrams that highlighted the expected effectiveness of implementation measures for each specific stakeholder group (Residents, Commercial, Municipal Departments, and Municipal Government). The word clouds focused on action item's effectiveness for infiltration, phosphorus, and chlorides. The following are points of discussion on this topic. (1) Wingra-Specific Issue vs. City-Wide Issue–Jim Lorman wanted to be mindful of where an issue is a Wingra-Specific Issue vs. a City-Wide Issue and thus the responsibility for action technically extends beyond the Wingra Watershed boundary. Jim stated that chlorides are a heightened issue in the Wingra Watershed because of the much higher concentrations of chloride in Lake Wingra compared to other Madison-area lakes. Leveraging existing efforts/organizations to further the cause of Lake Wingra will provide synergies (MMSD, Yahara WINs, MAMSWAP, Clean Lakes Alliance, Dane County Lakes and Watershed Committee). (2) There was discussion that there is merit in having a City-endorsed plan. It does not guarantee funding, but it lays out a framework that is considered with City actions. (3) There was discussion on how to define roles. Is it possible to identify who (in terms of a person and/or an organization) that is best-suited to advocate and implement specific measures? (4) Catalyst/Action Teams–There was significant, positive discussion on the role of Catalyst/Action Teams for each of the Lake Wingra Watershed Plan goals: Chlorides, Infiltration, and Phosphorus. These Catalyst/Action Teams would be "populated" with champions that push on all fronts (residential, municipal government, municipal	

Discussion:	Action:
departments, commercial) for the Lake Wingra cause. As mentioned above, there may be existing team infrastructure that can be leveraged. The Lake Wingra Watershed Plan existing infrastructure (Chloride Issue Team, Phosphorus Issue Team, and Infiltration Issue Team) could also be adapted into the catalyst/action teams and could either integrate into other teams or interact with existing groups for the cause of Lake Wingra. Roger said that it was important that these Catalyst/Action Teams be provided with some level of technical support by Strand to provide momentum, assistance, and continuity over the years. He also did not want to overcomplicate the methods of implementing the plan. A catalyst team could chose to work with partners they deem might be most effective. Examples of what these catalyst teams could look like include the following. (a) Multi-Agency Chloride Reduction Campaign: This is an existing campaign with partners that include Dane County, City of Madison, Dane County Lakes and Watersheds, Madison Water Utility, Public Health Madison/Dane County, UW-Madison, and Madison Metropolitan Sewerage District in an outreach campaign to encourage chloride use reduction. The target audience is winter maintenance professionals, homeowners, public works and emergency services, motorists, and civic leaders. For more information, see the following Web site: https://wisaltwise.com/. It was stated that while these organizations could be part of a catalyst team, they have a broader interest than just the Wingra Watershed. For instance, MMSD is primarily concerned about reducing chloride entering its pipes. The steering team questioned whether there is a natural champion for this issue, specifically within the watershed. (b) Phosphorus Catalyst/Action Team– Right now, Greg has become the City	

Discussion:	Action:
champion by default because of the involvement and action on the Leaf Collection/Bagging Pilot project. This Team could be expanded to include the FOLW, Clean Lakes Alliance, Yahara WINs, and MAMSWAP to continue action in this area. Again, keeping the focus on Wingra Watershed. (c) Infiltration Catalyst/Action Team–Again, the City of Madison has taken a leadership role here with its rain gardens and terrace rain gardens initiative. Others interested in this are the FOLW, UW-Madison Arboretum, and USGHS, among others. (5) Pilot Projects–Roger said the Wingra Watershed is a great place to pilot certain actions prior to their more-widespread implementation. Other organizations may want to participate in the catalyst teams because it provides opportunities for pilot projects in a neighborhood that generally is receptive to environmental stewardship. (6) Based on these discussions, Strand will revise Section 5 of the watershed plan to reflect catalyst teams.	Strand will revise Section 5 of Watershed Plan.
b. Neighborhood Association PIMs–Based on the discussions above, the Steering Team decided to have Strand set up two PIMs for representatives of the various neighborhood associations in the Lake Wingra Watershed. These meetings should be held in June 2015. Two meetings will be held to allow those that cannot make one meeting to be able to make the second meeting. One meeting will be held at Edgewood College (Washburn Heritage Room–Regina Hall) and the other should be held at the Sequoya Library (4340 Tokay Blvd.) to provide easy access to a meeting based on where an attendee lives in the watershed. Tentative dates for the meetings are: Edgewood (Monday, June 8, 2015, 6:30 to 8 P.M.) and Sequoya Library (Wednesday, June 24, 2015). Strand will make arrangements at each facility, e-mail an invite letter to the City for sending out, and prepare a presentation based on the March 26, 2015, PIM.	Strand will make arrangements for two neighborhood group public meetings. City will send out invites for the two meetings.

Discussion:	Action:
The meetings should be set up to seek endorsement of the various actions in the plan including seeking input on the alternative to move forward with/recommend for meeting the Phosphorus Short-Term Goal. After the meetings and after compiling feedback on the alternatives from the PIM (and sharing with Steering Team), Strand will send out a Doodle Poll to Steering Team Members requesting a vote on an alternative to meet the Phosphorus Short-Term Goal. One alternative could be to not make a decision and in effect endorse all the alternatives as a means to achieve phosphorus reduction moving forward. c. Plan Endorsement/Adoption/Approval Process–Greg said that at the City, the Committee on the Environment, Board of Public Works, and the Common Council would be interested in the recommendations in the Lake Wingra Watershed Management Plan. However, the Common Council would spend less than 30 seconds on an approval request unless it is accompanied by a specific funding request. The Board of Estimates would become involved if there is an operational expense involved but would not be involved in a capital expense request. Greg said that stormwater plans are typically used as guidance to the engineering department for recommended capital projects. In the case of the Lake Wingra Watershed Plan, Greg envisioned taking the plan to the Common Council for approval in a fashion similar to a neighborhood plan or the Madison Sustainability Plan. Then, as proposals come in in the future, the plan is consulted to determine its consistency with the Lake Wingra Watershed Plan. It was agreed that Common Council approval should be sought in late winter 2016 or early Spring 2016. From an endorsement standpoint, actions in the plan should seek endorsement from the various neighborhood groups. Summer 2015 PIMs with neighborhood groups will be set up to seek this endorsement.	Strand will send out Doodle poll after PIMs regarding alternatives to meet Short-Term Phosphorus Goal.
5. <u>Report Finalization/Implementation Plan</u> The following was discussed. a. Report Section 5–Strand will send out to the Steering Team by the end of the day on May 23, 2015. It will	Strand will send report Section 5 by end of day on May 23, 2015. Strand

Discussion:	Action:
include a Strategy/Framework for the Catalyst/Action Teams for Chlorides, Phosphorus, and Infiltration with roles and names/titles identified. The following are guiding principles for these teams. 1. How does change occur related to specific actions? 2. Group thinking is good. 3. Let's find a way through team approach (i.e., push and work together). 4. How can Strand assist and provide continuity to what others do, moving forward? b. Full Report–Strand will send out by the end of the day on June 5, 2015. This will include a Section 6 with Conclusions and Recommendations with an Action Schedule similar to the one presented by Tom. Strand will send out a Doodle Poll for purposes of voting on the option to recommend to achieve the Phosphorus Short-Term Goal.	will send a full report by end of day on June 5, 2015.
6. <u>Next Steps</u> In addition to the Report Finalization and PIMs with neighborhood groups discussed above, the following are the next steps. a. Agenda for Steering Team Meeting No. 13 (tentatively set for the week of July 13-17, 2015) 1. Report Sections and Recommendations 2. Catalyst/Action Team Strategy 3. Endorsement/Adoption/Approval Process 4. Fall 2015 Pilot Project (Phase 2) Logistics/Protocol 5. Public Comment Perspective (including deadline for receipt of comments) b. Fall 2015 Pilot Project Logistics/Protocol–Greg has begun and will continue to discuss the logistics/protocol internally and with City's leaf contractor. According to the follow-up e-mail from Greg on May 7, 2015, the City received buy-in from its leaf contractor. Next steps will be figuring out the number of bags to provide to residents based on an estimated quantity of leaves per 50-year-old residential home, revised social marketing protocol similar to last year, Pilot Project Informational Meeting, and Public Relation Plan (according to Greg's e-mail).	

7. Upcoming Schedule and Next Meeting

Item	Date	Time	Topic
Public Involvement Meeting #1	**March 26, 2015**	**6:30 pm**	**Wingra Watershed Plan Public Involvement Meeting @ Edgewood College**
Steering Team Meeting No. 12	April 23, 2015	1:30 pm	Discussion of Remaining Efforts.
PIM Arrangements Completed	**May 13, 2015**		**Strand**
PIM #2 and #3 Invite to City	**May 13, 2015**		**Strand**
City Sends out Invites for PIM #2 and #3	**May 19, 2015**		**City of Madison**
Report Section 5 Finalization for Steering Team Review	May 23, 2015		Strand
Full Report Finalization for Steering Team Review	June 8, 2015		Strand (Incl/Draft Section 6-Conclusions and Recommendations)
Public Involvement Meeting #2-Neighborhood Associations	**June 8, 2015**	**6:30 pm**	**Edgewood College (Washburn Heritage Room-Regina Hall)**
Public Involvement Meeting #3-Neighborhood Associations	**June 24, 2015**	**6:30 pm**	**Sequoya Library (4340 Tokay Blvd.)**
Steering Team Voting on Alternative for meeting Phosphorus Short-Term Goal	July 1, 2015		Strand to send out Doodle Poll after compiling PIM feedback on alternatives and sharing with Steering Team
Steering Team Meeting No. 13	Week of July 13-17, 2015	TBD	Final Steering Team Meeting: Strand to Send out Doodle Poll for Best Date
2015 Pilot Project Efforts	Sept./Oct./Nov. 2015		Neighborhood Canvassing/Enhanced Notification Program/Monitoring **[Pilot Project Public Meeting tentatively on Sept. 17, 2015]**
Pilot Project Findings Report Supplement	December 2015		
Final Report Presentation and Common Council Approval	Winter/Spring 2016	TBD	To City and Asst. City Engineer and Alderperson (2nd presentation deleted to allow for additional Steering Team Meeting). City takes final report to Board of Public Works/Committee on the Environment/City Council in Winter/Spring 2016 for approval.
Future Implementation of Social Marketing Plan By Champions	January 1, 2016 and Beyond		

c/enc: All Participants

Public Involvement Meeting Review 3-26-2015

PIM Characteristic	Strength	Opportunity for Change
Audience	Many people interested - 35 signed in. (Attendance closer to 45) during tournament game. Many asked questions or provided feedback.	Are we attracting the right people?
Room	Excellent audio-visual facilities. Table arrangement conducive for presenter format.	Too small for exhibits and presentation. Table arrangement did not allow breakout groups. Projector shuts off after 1 hour.
Presentation Format	Able to communicate many ideas quickly. Slideshow graphics generally large enough for audience to see. Lots of information presented. Most attendees appreciated information.	Fewer opportunities for feedback. Sheer number of people vs time available for interaction Possible attendee inhibitions regarding speaking in front of a large group. Presentation generally too long. Could smaller groups have been used?
Exhibits	Contained good information. Trade-off analysis good.	Information too small to use in a break-out section. Too much information?
Presenters	Generally knew information.	Could FOLW have hosted the meeting or been part of the presentation?
Staff Attenders	Provided valuable background information on city policies.	Some interpreted staff responses as defending the status-quo.

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
October 22, 2015, 2:30 P.M.
Strand Associates, Inc.®
Steering Team Meeting No. 13–Report Finalization and Catalyst Team Strategy

Meeting Location: Strand Associates, Inc.®	Job No.: 1020065
Meeting Purpose: Report Finalization and Catalyst Team Strategy	

Meeting Handouts:

Prior to the meeting, attendees were provided with documents highlighting Strand's responses to Public Involvement Meeting and Draft Final report comments. A draft Fall 2015 Pilot Project survey was also e-mailed out before the meeting.

Invitee	Representing	Present	Absent
Phil Gaebler	City of Madison (City)	☒	☐
Greg Fries	City of Madison	☒	☐
Sara Eskrich District 13 Alderperson	City of Madison	☐	☒
Paul Dearlove	Friends of Lake Wingra (FOLW)	☐	☒
David Liebl	Friends of Lake Wingra	☒	☐
Jim Lorman	Friends of Lake Wingra	☒	☐
Rebecca Power	Friends of Lake Wingra	☒	☐
Jim Baumann	Friends of Lake Wingra	☒	☐
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☒	☐
Mark Wegener	UW-Madison Arboretum	☐	☒
Ben Jordan	UW-Madison	☐	☒
Bret Shaw	UW-Madison	☒	☐
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐
Stephanie Thomsen	Strand Associates, Inc.®	☐	☒

Discussion:	**Action:**
1. Standing Agenda Items a. Lake Response Model Update: Greg has been in contact with professor Chin Wu. A final report will be issued that is cut down some from the student draft report. A positive outcome from this study and other efforts is that the City will be installing a gauge to monitor the Lake Wingra water level and discharge in the fall of 2015. b. USGS Leaf Study Update: The fall of 2015 has been very dry, limiting the number of events where meaningful data could be collected. However, a large approximate 2-inch rainfall event was captured in early fall. In the fall of 2015, the study will try to find a way to get to summertime phosphorus levels in the fall (i.e., keep streets free of leaves including street sweeping more often). The 2015 efforts will seek to find what the maximum benefit could be. c. Nakoma Park Streambank Restoration: This project was bid out in June 2015 and constructed in summer/fall 2015. It is now complete and Greg feels that accomplished the goal of environmentally sensitive streambank/channel stabilization.	

Discussion:	Action:
2. Public Involvement Meeting (PIM) and Final Draft Report Comments Strategy Strand presented four PowerPoint slides and the following were discussed. a. Public Involvement Meeting Comments–Public Involvement meetings were held on March 26, 2015 (general public), June 24, 2015 (neighborhood association-specific), and July 14, 2015 (neighborhood association-specific). Numerous comments were received at these meetings. Responses to these comments were e-mailed to Steering Team members prior to the meeting. Responses will become Appendix F in the report and generally consist of the following responses: "Comment acknowledged and discussed in Section XXXX" or Comment acknowledged and Catalyst Teams to further consider." Three black and white copies of the report, with highlighting showing modifications made, were distributed at the Steering Team meeting. b. Draft Final Report Comments–Comments were received from Jim Baumann, David Liebl, and Perry Sandstrom. The City will address Perry Sandstrom's comments separately through the Park Department. Responses to these comments were e-mailed to Steering Team members prior to the meeting. Responses will become Appendix F in the report and generally consist of modifications to report to address the specific comment. More significant comments include request to create an Executive Summary, an Appendix D showing how the report is consistent with USEPA Nine Minimum Elements for Section 319-Funded Watershed Plans, an Appendix E including the Trade-off Handouts from the PIMs, retention of three catalyst teams rather than merging infiltration and TP teams, and development of Alternatives 6 and 7 in report Section 4-Phosphorus contemplating 75 percent and 50 percent implementation of infiltration BMPs. David Liebl suggested that funding requests for implementation might benefit from associating them with Climate Change, possibly related to icing-issues that may increase because of Climate Change. Greg Fries shared that there are positive developments happening on the chlorides front regarding City of Madison Well No. 14. Dane County and the City of Madison have agreed to modifications to winter snow and ice operations in the vicinity of Well No. 14. The City has purchased two more anti-icing vehicles and will be	

Discussion:	Action:
expanding anti-icing activities in the Well No. 14 watershed. The County will begin anti-icing on its University Avenue salt route which is both in and outside of the Well No. 14 watershed. The County will also make a change from implementing WisDOT recommended salt rates to using the City of Madison recommended salt rates (150 lbs per lane mile per application). c. Additional Public Information Meetings–Jim Baumann said he presented briefings on the Wingra Watershed Plan at the Dudgeon Monroe Neighborhood Association, at a Wingra Boats sponsored event, and at the Dane County Lakes and Watershed Commission in the summer/fall of 2015. These presentations were well-received. Phil said he also presented to the Committee on the Environment in September 2015. A positive outcome of the Dane County presentation was that Dane County requested a proposal from Roger Bannermann for monitoring the outfalls entering Lake Wingra for chlorides. Roger said he submitted the proposal and is awaiting a response from the County. Roger will continue to monitor the springs on his own. After the meeting, Jim Baumann provided the following web links to his presentation and requested feedback from Steering Team members on possible improvements. (https://dane.legistar.com/View.ashx?M=M&ID=436768&GUID=A5DD3F04-8314-4AF8-9DA7-16AE175CBB77) (http://www.danewaters.com/resource/research_reports.aspx) .	
3. <u>Report Finalization and Endorsement/Adoption/Approval Process</u> Strand presented one PowerPoint slide discussing that the report will be finalized by addressing the PIM and Final Report comments as described above. A .pdf of the final report will be transmitted to the City for posting on the City Wingra Watershed Plan webpage. Strand is planning to do so by the end of the day on Friday, October 30, 2015. Once the Pilot Project is complete, a short Appendix G–Pilot Project Results will be provided. At that time, four hard copies (in accordance with the Engineering Services Agreement) of the final report will be printed and transmitted to the City and Friends of Lake Wingra (two to each). Greg said that typically a report of this nature would be introduced to the Common Council and then referred to the Committee on the Environment which would then be subsequently referred to the Board of Public Works prior to going back to Council. See 6. Next Steps below that describes the remaining steps.	

Discussion:	Action:
4. Catalyst Teams Strategy Strand presented eleven Power Point slides discussing how the Lake Wingra Watershed Management Plan addresses the Catalyst Teams Strategy. Prior to the meeting, Jim Baumann e-mailed a FoLW Catalyst Group handout to Steering Team members. The following was discussed. a. General–A lead organization needs to be identified for each Catalyst Team. This may take the form of identifying two or three lead organizations for each Catalyst Team. (1) Chloride Catalyst Team–Greg said he envisioned the Chlorides Catalyst Team should be led by either the Mayor's office or the Dane County Lakes and Watersheds Commission. If the City leads, then he would envision that a Memorandum of Understanding could be drafted to further define the arrangement. If Dane County leads, he would envision that he would appoint individuals to the Team. (2) Infiltration Catalyst Team–No comments. (3) Phosphorus Catalyst Team–No comments. There was discussion that the steering team should continue as the "Lake Wingra Advisory Committee" which could meet biyearly. Catalyst teams would then report to the advisory committee. The easiest way to establish both the advisory committee and the catalyst teams would be to make it part of the city resolution that adopts the Watershed Plan. The resolution could establish the committee and teams and their representation and commit to staffing the committee and teams. This method probably provides the easiest way to establish the committee and teams.	
5. Fall 2015 Pilot Project Update Strand presented fourteen slides discussing the differences between the Fall 2014 efforts and the Fall 2015 efforts. Strand along with City and Friends of Lake Wingra representatives met twice to develop the Fall 2015 protocol. A Public Involvement Meeting was held at the Odana Golf Course Club House on September 17, 2015. Roger Bannermann has developed a rating system and total phosphorus calculation that he is implementing to have better metrics for the Fall 2015 efforts. Both Phil and Roger are taking pictures to document leaf cover and resident efforts.	
6. Next Steps The following are the next steps. a. Neighborhood Association Letters of Support Request–Jim Baumann and Greg will collaborate on a letter from the City seeking Neighborhood Association support of the Lake Wingra Watershed Management Plan. Strand will finalize the report (with the exception of	

Discussion:	Action:
Appendix G–Pilot Project Results) and get to the City of Madison for posting on the City's Wingra Watershed Plan webpage. It is envisioned that letters of support would be requested to be sent to the City by the end of 2015 so that they can be mentioned and be part of the Strand Final Report Presentation. b. City Resolution Committing Staff to Convene and Organize the Lake Wingra Management Advisory Committee (formerly Lake Wingra Steering Team) and use of Lake Wingra Watershed Management Plan to Guide City Actions Relative to Reducing Chloride Usage (Road Salt), Increasing Infiltration, and Reducing Total Phosphorus–The resolution could also establish the catalyst teams–Greg will work with the FoLW to craft resolution verbiage that will accompany the Strand Final Report Presentation. Greg said that he envisioned that the City would be the organizing entity for convening the Lake Wingra Advisory Committee (formerly Lake Wingra Steering Team) for the foreseeable future. c. Strand Final Report Presentation–Greg will discuss internally at the City and let Strand and the Steering Team know when and to whom they want present to this presentation. Greg mentioned the possibility of an informational meeting prior (5 to 6 P.M.) to a Common Council meeting may be a possibility. Typically, he has seen up to one-third of the Council members in attendance at these. The presentation will be in early 2016 (January or February) after Fall 2015 budget deliberations are complete. d. Presentation of Plan to WDNR (for consideration as a DNR/USEPA-approved USEPA Nine Minimum Elements for Section 319-Funded Watershed Plan)–Jim Baumann will organize this presentation and request a formal review from the WDNR. It is envisioned the presentation would take place after the Strand Final Report Presentation. Jim said he knows of four or five WDNR individuals at the WDNR that would be appropriate for presenting to, including Andrew Craig. e. Catalyst Teams–The Lake Wingra Management Advisory Committee (formerly Lake Wingra Steering Team) should meet to populate the three Catalyst Teams and set a course for implementation of the plan and collaboration with other entities. Bret Shaw said he was interested in staying involved and advising on Pilot Projects including	

Discussion:	Action:
how they might be "scaled-up" for more-widespread implementation.	

7. Upcoming Schedule and Next Meeting

Item	Date	Time	Comments
Public Involvement Meeting #1	**March 26, 2015**	**6:30 pm**	**Wingra Watershed Plan Public Involvement Meeting @ Edgewood College**
Steering Team Meeting No. 12	April 23, 2015	1:30 pm	Discussion of Remaining Efforts.
Full Report Finalization for Steering Team Review	June 5, 2015		
Fall 2015 Pilot Project Planning Meeting	June 18, 2015	1:30 pm	@ Strand
Public Involvement Meeting #2-Neighborhood Associations	**June 24, 2015**	**6:30 pm**	**@ Sequoya Library (4340 Tokay Blvd.)**
Public Involvement Meeting #3-Neighborhood Associations	**July 14, 2015**	**6:30 pm**	**@ UW-Madison Arboretum**
Fall 2015 PIlot Project Planning Meeting	August 25, 2015	2:00 pm	@ Strand
2015 Pilot Project Efforts	Sept./Oct./Nov. 2015		Neighborhood Canvassing/Enhanced Notification Program/Monitoring
Meeting to Discuss PIM and Report Comments	Sept. 16, 2015	3:30 pm	@ Strand
Fall 2015 Pilot Project PIM	Sept. 17. 2015		@Odana Golf Course Club House
Steering Team Meeting No. 13	October 22, 2015	2:30 pm	Final Steering Team Meeting
Pilot Project Findings Report Supplement-Appendix G	December 2015		
Submit Final Report	January 2016		
Final Report Presentation and Common Council Approval	Winter/Spring 2016	TBD	To City and Asst. City Engineer and Alderperson (2nd presentation deleted to allow for additional Steering Team Meeting). City takes final report to Board of Public Works/Committee on the Environment/City Council in Winter/Spring 2016 for approval.
Future Implementation of Social Marketing Plan By Catalyst Teams	January 1, 2016 and Beyond		

c/enc: All Participants

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
March 21, 2013 3 P.M.
Strand Associates, Inc.®
Issue Team Meeting No. 1–Chlorides

Meeting Location: Strand Associates, Inc.®	Job No.: 1020-065
Meeting Purpose: Issue Team Meeting No. 1-Chlorides	

Meeting Handouts:	
Meeting Agenda	

Invitee	Representing	Present	Absent
Genesis Steinhorst	City of Madison	☒	☐
Sue Ellingson, Alderperson	City of Madison	☒	☐
George Dreckman	City of Madison	☒	☐
Steve Arnold	Friends of Lake Wingra	☒	☐
David Liebl	Friends of Lake Wingra	☐	☒
Jim Lorman	Friends of Lake Wingra	☒	☐
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☒	☐
Bob Stoffs	Madison Gas and Electric (MG&E)	☒	☐
Don Peterson	Madison Gas and Electric (MG&E)	☒	☐
Dave Benforado	Madison Gas and Electric (MG&E)	☒	☐
Kathy Lake	Madison Metropolitan Sewerage District (MMSD)	☒	☐
Ralph Erickson	Madison Metropolitan Sewerage District (MMSD)	☒	☐
Steve Kamps	Barnes, Inc.	☒	☐
Jim Montgomery	Barnes, Inc.	☐	☒
Bret Shaw	University of Wisconsin–Madison	☒	☐
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐

Discussion:	**Action:**
1. <u>Wingra Watershed Plan Chloride Reduction Goals</u> Jon presented five PowerPoint slides discussing the chloride reduction goals of the Wingra Watershed Plan. The plan includes identifying strategies to work toward the goal of a Lake Wingra chloride concentration of 40 milligrams per liter (mg/L) as described in the document *Lake Wingra: A Vision for the Future.* Despite significant efforts to reduce road salt usage by the City of Madison, chloride levels in Lake Wingra continue to climb. 2. <u>City of Madison Strategies</u> George provided commentary on the City of Madison's chloride reduction efforts. a. *Anti-icing:* The City applies a salt-brine along major streets when conditions dictate their beneficial use. These efforts seem to be working. The City has tried beet juice but has significant concerns relative to oxygen demand of the beet juice once it reaches waterbodies.	

Discussion:	Action:
b. *De-icing:* The City has two main methods of deicing. After plowing, the City either applies salt (along major streets referred to as the salt route) or applies sand mixed with 5 percent salt (in residential areas). Use of anti-icing agents has slightly reduced the deicer usage. Salt is not used once the temperature drops below 12 degrees Fahrenheit. c. *Road Salt Application Rate:* George said the City applies salt at approximately a 300 lb/lane mile rate. It was mentioned that Dane County applies salt at between a 600-1200 lb/lane mile rate. d. *Budget:* The City's procedures are not linked to a budget, per se, but rather are dictated by the appropriate techniques and procedures to manage the specific storm. e. *Road Salt Report 2012:* The City has been tracking its road salt usage in an annual road salt report. f. Other Salt Reduction Options (1) *Lowered Driving Public Expectations:* It was discussed that to get true reductions in salt usage, the driving public's expectations for street conditions must be lowered. This lowered expectation must be coupled with slower vehicle speeds. Signs, such as those in the Arboretum, may be effective in conveying the message and beginning to alter the driving public's expectations. (2) *Incrementally Less Salt Application:* Roger thought that incrementally decreasing salt application rates may have the effect of slowly lowering the driving public's expectations. (3) *Street Sweeping:* Spring sweeping helps to pick up some of the salt. (4) *Cost to the Environment:* It was agreed that the cost to the environment must be used in evaluating the trade-offs of salt usage. (5) *Beltline:* Because of WisDOT's safety-based bare pavement policy on the Beltline, it is unlikely to expect lowered salt application rates 3. <u>MG&E's Cogen Permit and Odana Golf Course Infiltration Project</u> Don Peterson of MG&E provided the following information: a. *Cogen Facility:* This facility draws water from Lake Mendota for use in cooling towers on the UW-Madison campus. The facility's permit requires that the withdrawal of water be offset by pumping groundwater into the Yahara River during low flow periods. Likewise, the groundwater withdrawal used for supplementing Yahara River flows must be offset by infiltrating water at the Odana Golf Course infiltration facility located near the top of the hill along the Beltline.	Genesis will email the Salt Route GIS shapefile to Strand. Strand will confirm road salt application rates with the City of Madison, Town of Madison, City of Fitchburg, and Dane County. Note: Kathy Lake took this picture of a "Low Salt Usage" sign in the Arboretum after the meeting.  

Discussion:	Action:
b. *Odana Infiltration Facility:* This facility was operable in 2006 and is designed to recharge up to 80 million gallons per year (MGPY) of groundwater. Water from the Odana Ponds is pumped to the facility. The highest the facility has operated at is 71 MGPY in 2008. The highest groundwater pumping to the Yahara River was 154 MGPY in 2012. To date, the COGEN facility has withdrawn 221 MG and the infiltration facility has infiltrated 305 MG. c. *Chloride Issues:* The infiltration facility pumps continuously until the chloride levels of the water exceed the Preventive Action Limit (PAL) of 125 mg/L. The chloride level is monitored in real time by conductivity readings and the measurements are taken after the filter. The chloride concentration in the Odana Ponds drops off quickly with spring rains. Test wells also exist at the infiltration facility to monitor levels beneath the infiltration beds.	
4. <u>MMSD's Chloride Issues and Plans</u> Ralph and Kathy presented nine PowerPoint slides as follows: a. Environmental Impacts (1) WWTP chloride discharge has steadily increased with a high of 400 mg/L during a 2013 snow melt. (2) EPA Chronic Toxicity Limit = 230 mg/L. (3) WI Water Quality Standard = 395 mg/L. (4) Ecosystem and Drinking Water Impacts. b. Chloride Sources (1) Water Softener Regeneration: Ongoing contribution of approximately 1 pound of salt per day per household. (2) Industrial Usage: Oscar Mayer is a large contributor. (3) Deicing Salt: Deicing salt from snow melt events accounts for 3 to 8 percent of the chloride inflow. (4) WWTP weekly inflow of chlorides is one million pounds. c. Possible Mitigation (1) Monitoring–MMSD is currently monitoring slat concentrations at a sanitary sewer in the Wingra Watershed (east of the zoo) and one near West Towne Mall. Data collection and evaluation will be expanded. (2) Water Softener Optimization Pilot Study–MMSD is proceeding with a paired watershed study to determine the effect of replacing old water softeners with newer technology water softeners that use less salt. New softeners (concentrators, evaporators, and no salt softeners) are in development but are not yet technologically feasible. There is one study area in the Wingra Watershed and one study area by Spring Harbor near Lake Mendota. Monitoring of the sanitary sewer	

Discussion:	Action:
from these areas will be completed. Timeline is homeowner survey in summer 2013 and monitoring from August through November 2013. (3) Regulatory and Policy Alternatives– New Hampshire has a private applicator certification that, if trained, the private applicator has some level of protection (reduced liability) against lawsuits stemming from reduced deicing usage. (4) Industrial User Pretreatment. (5) Information and Education Initiatives. (6) Deicing Salt Reduction (households, municipal streets, private applicators). (7) Treatment at WWTP with Reverse Osmosis (expensive).	
5. <u>Private Applicator Perspective</u> Steve shared the following information: a. *Anti-icing Pre-application:* He has not traditionally used these, but is looking into its use for private properties. b. *Deicing:* He uses 100 percent road/rock salt. c. *Road Salt Application Rate*: No rates were mentioned. Steve said lower salt rates are used in later-winter as the sun angle increases. d. *Training:* Barnes, Inc. participated in the salt application training that the City of Madison sponsored a few years ago. e. *Factors Affecting Salt Usage:* Steve said public education is huge in terms of public acceptance of lowered salt usage. Also, private applicators are in court every year because of slip and fall incidents and thus are reluctant to reduce salt usage. Steve was not aware of an acceptable salt application rate stemming from these lawsuits. Many private applicator contracts are written based on the amount of salt used, which would work against salt reduction efforts. f. *Potential Pilot Projects* (1) Salt Usage Tracking–Roger asked if there would be resistance from private applicators to have voluntary or required tracking/reporting of application rates and total salt usage each winter. Steve said that Barnes would be willing to participate in this and that Barnes tracks this information already. Barnes does not have a lot of data in the Wingra Watershed. Steve said other applicators would probably be resistant to tracking salt usage because it requires extra effort. (2) State or County Program–Similar to the New Hampshire program described above, the state or country could require training of private applicators, which would reduce their liability when implementing a reduced salt application program.	Strand will confirm road salt application rates with Steve for commercial, institutional, multi-family, and possibly residential application rates and yearly totals

Discussion:	Action:
g. Other Discussin Steve was asked if it would be helpful to have ordinances limiting the amount of salt applied. He said it would, because in a lawsuit they try and show they were not negligent. Others stated it may be difficult to pass a salt application ordinance in Dane County. Others maintained it was worth pursuing.	
6. <u>Possible Synergies Between Programs and Other Ideas</u> a. *Public Information and Education for Lowered Winter Driving Expectations*–The City of Madison, MG&E, and MMSD all have vested interest in chloride reductions and a collaborative effort would be beneficial to the greater cause. Ideas discussed included low salt zones signage, social marketing and social media campaigns to alter expectations. This in turn could affect driving habits and reduced homeowner salt usage (road salt and water softener replacement/optimization). It was discussed that these efforts would be most effective in January, in the midst of winter.	Discuss the possible synergies and other ideas at the next Wingra Watershed Steering Team Meeting.
b. *Municipal Streets Salt Usage Reduction*–There is potential to reduce salt usage coinciding with Public Information and Education efforts that lower winter driving expectations and alter driving habits. Madison's annual Road Salt Report is important to convey Madison's efforts at road salt reduction.	Gain a better understanding of the City's operations by creating a figure showing the City's Salt Routes. Correspond with the County to understand its road salt usage procedures and rates.
c. *Private Applicator Salt Usage Reduction*–A pilot project could be initiated that would require private applicators to track their salt application rate and overall salt usage during the winter using a normal application and a reduced salt usage application rate. A Private Applicator Salt Application Rate Handout could be developed.	
d. *Homeowner Salt Usage Reduction*–A Homeowner Salt Application Rate Handout could be developed from existing information. Public information and education efforts would be important.	Eventually, develop clear guidelines for salt usage for municipal, homeowner, and private applicators.
e. *MG&E's Monitoring of Odana Pond*–Any salt application reduction efforts could be monitored in the Odana Pond watershed for effectiveness.	
f. *Porous Pavement*–Roger said expanding the usage of porous pavement in parking lots and other appropriate locations could lead to less areas that need salt. Porous pavement performs well in the winter and road salt typically is not needed nor recommended.	
g. *Regulation of Salt Usage*– The City of Madison or county could pass an ordinance requiring application of salt according to certain guidelines and standards. In New Hampshire, there is a program that limits the liability for	Further investigate New Hampshire's private applicator training program for salt usage reduction and related liability issues.

Discussion:	Action:
trained private applicators that are implementing a reduced salt application program.	
7. Next Steps Many thought there was potential to leverage the effort of multiple entities in the Odana Pond watershed. To see if the Odana Pond could be the focus of a pilot project, the following actions will be made. a. Determine the relative salt contribution to the pond from: the Beltline, City salt routes, commercial properties, and private residences. b. Develop an understanding of the salt reduction measures proposed in the New Hampshire study. c. Explore if application guidelines could have a measureable impact on chloride levels.	
8. Upcoming Schedule and Next Meeting All participants will be notified via e-mail should another Issue Team meeting be scheduled. Otherwise, the information discussed at this meeting and summarized in this meeting summary will be considered by the steering team and incorporated into the Wingra Watershed Plan as appropriate.	

Prepared and respectfully submitted by Jon Lindert.

c/enc: All Participants

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
June 28, 2013 10 A.M.
Strand Associates, Inc.®
Issue Team Meeting No. 2–Infiltration

Meeting Location: Strand Associates, Inc.®	Job No.: 1020-065
Meeting Purpose: Issue Team Meeting No. 2-Infiltration	

Meeting Handouts:	
Meeting Agenda	

Invitee	Representing	Present	Absent
Genesis Steinhorst	City of Madison	☒	☐
Sue Ellingson, Alderperson	City of Madison	☒	☐
Rebecca Power	Friends of Lake Wingra	☐	☒
Steve Arnold	Friends of Lake Wingra	☐	☒
David Liebl	Friends of Lake Wingra	☒	☐
Jim Lorman	Friends of Lake Wingra	☐	☒
Mark Wegener	University of Wisconsin-Arboretum	☐	☒
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☒	☐
Mike Parsen	Wisconsin Geologic and Natural History Survey	☒	☐
Bret Shaw	University of Wisconsin–Madison	☐	☒
Tom Lynch	Strand Associates, Inc.®	☐	☒
Jon Lindert	Strand Associates, Inc.®	☒	☐
Luke Hellermann	Strand Associates, Inc.®	☒	☐

Discussion:	**Action:**
1. <u>Strand Presentation</u> Jon presented 29 PowerPoint slides discussing infiltration-related information for the Wingra Watershed Plan. Sue asked who owns the groundwater. Consensus indicated that the WDNR/state administers state codes that protect the groundwater and thus controls/owns the groundwater. a. *Goals from Lake Wingra: A Vision for the Future:* The goal stated in this plan is "Cool, clean spring water replenishes the lake, and maintains year-round flows into Wingra Creek. Lake Wingra becomes predominantly replenished by groundwater." The stated target in the plan is "A 25% increase in spring flow." For purposes of the Wingra Watershed Plan, the 25 percent target will be used.	Genesis will e-mail Strand information relative to the City's 2013 and 2014 street reconstruction projects that incorporate terrace rain gardens as well as the City's potential rain garden map (i.e., those with 10-foot-wide terraces).
b. *Groundwater Contours and Spring Locations:* Jon presented a figure showing the surface water watershed, groundwater watershed (provided by WGNHS), and spring locations (provided by the UW-Madison Arboretum). The groundwater watershed extends significantly farther southwest than the surface water watershed divide and also does not extend to the west	

Discussion:		Action:
	end of the surface water watershed. It was agreed by all in attendance that proposed business and residential projects to improve infiltration should be located within both watersheds. However, larger infiltration improvement projects can be identified outside of the surface water watershed. Eleven spring locations were shown on the figure with two of these locations each having two springs (Golf Course Spring and Council Spring).	
c.	*Existing, Proposed, and Potential Recharge Locations:* Jon presented a table showing existing and potential future infiltration projects in the watershed. The figure included existing rain gardens and existing permitted bioretention facilities (provided by the City of Madison), the MG&E Infiltration Facility on Odana Golf Course, and the proposed Arbor Hills Greenway Infiltration Facility. Genesis indicated some of the rain garden and bioretention locations actually represent more than one rain garden/bioretention site. Strand will update relevant maps with this information. The potential future infiltration projects were identified based on analysis of soils in the watershed including the hydrologic soils group, soil makeup (silty, sandy, clayey), and possible expected infiltration rates. David said that water from Leyton Lane discharges into a permeable area (i.e., the surface runoff disappears) and that this should be mentioned in the report. Genesis said the City tracks the number of street reconstructions that incorporate terrace rain gardens each year. Genesis will e-mail Strand this information. Genesis will also e-mail the City's map of potential rain garden sites (i.e., those with 10-foot-wide terraces). A table was presented showing the amount of surface runoff that was infiltrated by the MG&E Infiltration Facility on the Odana Golf Course. This information showed that the average yearly infiltration between 2005 and 2012 was 5,862,867 cubic feet with a high of 9,491,351 cubic feet in 2008. David and Roger both said the average number is high because over the last few years MG&E has reduced the amount infiltrated to guard against chloride contamination of the groundwater. David and Roger both recommended contacting David Benforado of MG&E to get an estimate of the projected yearly infiltration amount for Strand's infiltration analysis.	Strand will update relevant maps with City information on number of rain garden/bioretention facilities at each location contained in the shapefile database. Strand will contact David Benforado of MG&E for an estimate of the projected infiltration amount to be used in Strand's infiltration analysis.

Discussion:		Action:
	Information relative to the Arbor Hills Greenway Infiltration Facility that was studied by UW students was presented. A simple RECARGA model was developed by Strand using the data in the student report which showed that the annual recharge per year is approximately 3,726,084 cubic feet, which is about 76 percent of the annual runoff from the 145-acre watershed. This estimate will be refined after David tracks down the P8 model used for the study.	David will track down the P8 model used in the Arbor Hills Greenway Infiltration Facility study and provide to Strand.
d.	*Methods to Increase Groundwater to Lake by 25 Percent:* It was agreed by all in attendance that increasing infiltration in the surface water watershed/groundwater watershed by an amount equivalent to 25 percent of the current estimated groundwater flow to the lake is an appropriate assumption for trying to meet the 25 percent increase in spring flow target from the *Lake Wingra: A Vision for the Future* document. It was acknowledged by the group that the link between infiltration and spring flow rates is more complex but that increasing infiltration by the 25 percent amount is an understandable goal that will increase spring flow. Jon presented a slide showing the annual surface runoff to the lake is 82,968,732 cubic feet. The yearly groundwater recharge estimate to the lake is 37,892,637 cubic feet according to Ken Bradbury's WGNHS estimate. Mike Parsen confirmed the yearly groundwater recharge estimate does not include the infiltration from the MG&E Infiltration Facility. An increase in groundwater recharge of 25 percent would be 9,473,159 cubic feet. Increased recharge would need to come from increased infiltration of surface runoff. It should be noted that the combination of the MG&E Infiltration Facility (5,862,867 cubic feet) and the proposed Arbor Hills Greenway Infiltration Facility (3,726,084 cubic feet) would meet this 25 percent increase. However, it is expected that the estimated MG&E Infiltration Facility contribution will decrease after the discussions with MG&E described above. It is expected then that additional infiltration facilities besides the MG&E Infiltration Facility and the Arbor Hills Greenway Infiltration Facility will be needed. Jon then presented eight options for meeting the 25 percent increase including distributed infiltration facilities such as new rain gardens or bioretention at	

	Discussion:	Action:
	residential homes and nonresidential properties. These numbers will have to be recalculated once the new MG&E estimate of yearly infiltration is obtained. All agreed that the options for meeting this goal need to be practical. It was suggested that Strand provide the area of residential rooftops and how those might be infiltrated in addition to roadside terrace rain gardens. Strand will also provide calculations on porous pavement. Roger suggested use of a 3:1 watershed to porous pavement area ratio for parking lot facilities. Roger has seen other states using a 2:1 ratio. It was discussed that the Wisconsin Urban Forestry Council as been discussing the use of trees in bioretention areas. The thought is that as ash trees die and are removed, they could be replaced with a terrace rain garden with a tree in the rain garden. Another suggestion was to slightly depress terraces to retain water but otherwise leave them as turf.	Strand will provide calculations on residential roof areas and porous pavement.
e.	*Infiltration Examples:* Jon presented three slides showing examples of rain gardens, bioretention, and porous pavement. A discussion was held relative to planting trees in rain gardens because Madison wants to continue to be a Tree City. Jon showed an example of a bioretention facility in Cincinnati, Ohio, that Strand designed that had numerous trees.	
f.	*Synergies with Other Initiatives:* Jon presented a slide showing other projects in the watershed including Vilas Park and Lake Wingra Shoreline Vision, 2012; Monroe Street Commercial District Plan, 2006; and the Monroe Street and Wingra Park, Design for Healthy Neighborhoods and Lakes, May 2013. It was discussed that, to the extent possible, the Wingra Watershed Plan should be coordinated with these plans to identify collaborative opportunities. To this end, an invitation was given to Jim Lorman's upcoming charrette. Wingra Watershed Design Charrette: Visioning a Sustainable Wingra Watershed When: Tuesday, July 30, 3:30 to 5 P.M. Where: Washburn Heritage Room, Regina Hall Edgewood College	

Discussion:	Action:
2. <u>Wisconsin Geological and Natural History Survey (WGNHS)-Mike Parsen Presentation</u> Mike's presentation titled "A New Groundwater Flow Model for Dane County" focused on the Wingra Watershed area. It is important to note that the Tunnel City formation is generally believed to be the formation that is most connected to/contributes most water to the majority of the area springs. Also, much of the recharge to Lake Wingra is likely unseen and occurs through the lake bottom rather than at known/visible springs. Mike discussed improvements to the Dane County Regional Groundwater Flow Model that have been made. The model will be released soon to the public and will be useful for many projects and studies. The new model is much more refined than the previous version and the model could be used to identify the potential source areas or recharge areas of specific springs. David said that one drawback of increased infiltration in the watershed could be basement seepage issues. Mike agreed to do the following with the model by the end of 2013. a. Provide results of particle tracking simulations and identify groundwater flow to each of the springs surrounding Lake Wingra. b. Provide the well shapefile to Strand for wells in the vicinity of the Lake Wingra watershed that may impact the Lake Wingra springs (provide in July 2013). c. Run the model with various well pumping scenarios and report the effect on spring flow. Take certain wells off-line and report the effect. Wells discussed to model as being off-line were nearby City well(s) and the Nakoma Golf Course and Odana Hills Golf Course wells. d. Incorporate the MG&E Infiltration Facility at Odana Hills Golf Course into the groundwater model to determine its effect. Mike ended with a discussion on things he feels are important to gain a better understanding of the Lake Wingra Springs and to promote a better public understanding of groundwater in the watershed. He suggested the following. a. Mike suggested a social way for the public to connect to groundwater would be to instrument the springs so that the public can take a reading and text in the spring flow	Mike Parsen will provide the information identified by the end of 2013, with the exception of the well shapefile that he will provide in July 2013.

Discussion:	Action:
rate or surface water level when they visit the spring. b. Mike suggested establishing a spring flow monitoring program that will demonstrate changes in spring flow over time to help gauge the impact of different management techniques. Mike has pursued this in the past year or so but met resistance from the UW-Madison Arboretum because of the intrusive nature of the instrumentation in the Arboretum's natural areas. Selling the instrumentation as a way to protect and enhance these natural areas may be a way to appease some of these concerns. Mike will provide information regarding potential grant programs for spring monitoring/instrumentation to Strand. c. Mike and others suggested the potential for the designation of a Spring Protection Zone as a recommendation in the report.	Mike will provide grant information regarding spring monitoring/instrumentation to Strand.
3. <u>Upcoming Schedule and Next Meeting</u>: The work program schedule was reviewed. Upcoming steering team meetings are as follows. No additional issue team meetings have been identified at this time.	

Steering Team Meeting	Date	Topic
Meeting No. 1	March 21, 2013	Kickoff Meeting
Meeting No. 2	April 4, 2013	Chlorides/Social Marketing
Meeting No. 3	May 23, 2013	Chlorides/Infiltration
Meeting No. 4	July 11, 2013	Pollutant–Sediment and Phosphorus
Meeting No. 5	August 29, 2013	Pollutant–Reduction Opportunities
Meeting No. 6	October 17, 2013	Lake Response Model
Meeting No. 7	December 5, 2013	Social Marketing–Strategies
Meeting No. 8	January 23, 2014	Social Marketing–Pilot Project

Prepared and respectfully submitted by Jon Lindert.

c/enc: All Participants

Wingra Watershed Plan
City of Madison and Friends of Lake Wingra
February 27, 2014, 9 A.M.
Strand Associates, Inc.®
Issue Team Meeting No. 3–Draft Chlorides Report Section and
Stakeholder Engagement/Social Marketing Framework
Meeting Summary

Meeting Location: Strand Associates, Inc.®	Job No.: 1020065
Meeting Purpose: Draft Chlorides Report Section and Stakeholder Engagement/Social Marketing Framework	

Meeting Handouts:	
Meeting attendees were provided with meeting handouts before the meeting.	

Invitee	Representing	Present	Absent
Genesis Steinhorst	City of Madison	☒	☐
Greg Fries	City of Madison	☒	☐
Sue Ellingson, Alderperson	City of Madison	☒	☐
Paul Dearlove	Friends of Lake Wingra (FOLW)	☒	☐
David Liebl	Friends of Lake Wingra	☒	☐
Jim Lorman	Friends of Lake Wingra	☒	☐
Rebecca Power	Friends of Lake Wingra	☒	☐
Jim Baumann	Friends of Lake Wingra	☒	☐
Roger Bannerman	Wisconsin Department of Natural Resources (WDNR)	☒	☐
Mark Wegener	UW-Madison Arboretum	☐	☒
Ben Jordan	UW-Madison	☒	☐
Bret Shaw	UW-Madison	☒	☐
Tom Lynch	Strand Associates, Inc.®	☒	☐
Jon Lindert	Strand Associates, Inc.®	☒	☐

Discussion:	**Action:**
1. Confirmation of Action Items Completion Four items were discussed with one completed and the following three in progress. a. Infiltration–Analysis, cost, and report modifications described in Steering Team Meeting No. 7 Summary are in progress. b. Phosphorus–Analysis, cost, and report modifications described in Steering Team Meeting No. 7 Summary are on-going. c. Phosphorus–The City of Madison (City) will work with Strand to develop a cost for an increased street sweeping schedule.	See action items at left.
2. Lake Response Model Update Greg provided a brief summary. The model is basically on hold until new flow monitoring can be installed. Four flow monitors are scheduled for installation this spring.	
3. USGS Leaf Study Update Roger provided a brief summary. The initial results are	

Discussion:	Action:
somewhat surprising. It appears that leaves could be contributing double the phosphorus than what was originally thought (up to 40 percent of the phosphorus draining to the lake). The study is also providing an awareness of the phosphorus contribution of spring leaf bud and pollen. Greg mentioned that street sweeping routes/frequency could be modified to address the spring buds that drop on the street and that there is a mechanism with which to estimate the best time to do so.	
4. Infiltration and Phosphorus Analysis Update Strand presented eleven PowerPoint slides providing a summary of updates since Steering Team Meeting No. 7. The changes came in the form of revised costs and calculations for certain measures, addition of rain barrel and downspout disconnection programs, and incorporation of the Odana Hills Infiltration Facility and the WisDOT pond (constructed in 2013) into the P8 model. Discussion included the following. Phosphorus Goal–In addition to the goal as a percent reduction from no controls, add as a percent from existing controls. Change colors to better convey the concepts.	
5. Draft Chloride Report Section Strand presented eleven PowerPoint slides providing a summary of the draft chlorides report section. Discussion included the following. a. High Flow Periods–An inverse exponential function had to be added to address high flow periods. The lake measurements show that chloride levels, even during high flushing periods, remain. During these events, there must not be a thorough mixing. b. WisDOT Salt Application Rate–Recent numbers from WisDOT indicate the county may have higher application rates than originally thought. WisDOT is double-checking the figures. c. Groundwater Chloride Levels–Have the groundwater chloride levels seen a similar upward trend similar to the lake levels? If so, could groundwater contribution of chlorides be higher? It was mentioned that groundwater chloride levels around Odana Pond are in the 200 milligrams per liter (mg/L) range. d. Slide 23–Add that chloride levels are also linked to application rate, not just the number of events.	

Discussion:	Action:
e. Figure 2.06-1 in report–The City has increased its application rate per road mile per event through the last four decades. Greg said that in the last 40 years there has been significant development surrounding Madison that has caused additional traffic on existing city roads. The road networks are very similar to the way they existed 40 years ago. This may be a contributing factor in why salt application has increased to provide safe travels for the ever increasing demand. f. Slide 25–Slide 25 showed a 30 percent municipal and 50 percent commercial salt reduction is necessary as a short-term goal. Sixty percent across the board reduction is necessary to achieve the 40 mg/L chloride concentration. Ben said that a 20 to 30 percent reduction in chlorides may be feasible but that a 60 percent reduction would require change to a different deicer and could be limited by technological issues. g. Slide 26 Possible Salt Reduction Measures–Slide 26 showed the feasibility and effectiveness of possible salt reduction measures. Jim B. said he thought the potential effectiveness of a commercial certification program would be a medium instead of a low and was probably in the 80 pound per year range.	
6. <u>Stakeholder Engagement/Social Marketing Framework</u> Strand presented ten PowerPoint slides and Bret presented nineteen PowerPoint slides regarding stakeholder engagement and social marketing framework. Discussion included the following. a. During the meeting, Steering Team members were given one red dot to identify their highest priority measure to pursue for the Social Marketing Pilot Project. The nonbinding results were: (1) Modified Leaf Collection Methods (5 Votes). (2) Monroe Street Reconstruction with Green Features (2 Votes). (3) Certification Program for Commercial Salt Applicators (2 Votes). (4) Maximum Salt Ordinance (1 Vote). Jim L. stated that the pilot project did not need to involve social marketing and that he would like the discussion broadened. Tom said the total project prioritization exercise might capture his concern. He suggested the group complete the exercise through e-mail and it could be discussed at the next meeting.	

Discussion:		Action:
b.	Nonbinding Prioritization Exercise–Strand will e-mail an Excel file of the Action Items Matrix for Infiltration, Phosphorus, and Chlorides. Steering team members are asked to identify their top six priorities from among the project-based, management-based, and community-based measures identified in the matrix. Strand may use Survey Monkey instead. These priorities will be used to develop a draft Community Engagement Strategy and a draft Social Marketing Implementation Plan.	Strand will e-mail an Excel file of the Action Items Matrix for Infiltration, Phosphorus, and Chlorides. Steering team members are asked to identify their top six priorities from among the project-based, management-based, and community-based measures identified in the matrix.
c.	Leaf Bagging Pilot Project–Dane County is willing to implement a pilot project in 2015. Several on the steering team requested that the team calculate how large of an area would be needed to produce the quantity of leaves that Dane County will require (500 to 800 cubic yards) for the pilot project. Jim L. wondered whether a social marketing strategy was necessary for this action since it has been proven elsewhere that it can work (i.e., why not pass an ordinance requiring bagging of leaves). Several Steering Team members indicated that social norms and acceptance of a practice need to change before an ordinance can receive the support it needs to pass. This pilot project would help to show the need and help educate both residents and City staff. Several steering team members said there may be multiple strategies to keep leaves out of the street besides bagging including composting leaves on the lawn or in compost bins. If a leaf bagging pilot project is chosen, it would make sense to interact holistically with the community. At the same time, downspout disconnection, rain barrels, rain gardens, and reduced salt usage could be discussed as an overarching message.	
d.	Slide 55 (Draft Community Engagement Strategy)–This slide shows a public informational meeting and five Focus Group meetings that comprise a possible draft Community Engagement Strategy. These engagement activities will provide the basis for how Strand and Bret will craft the Social Marketing Implementation Plan as well as provide additional information for choosing a Social Marketing Pilot Project. Jim B. said the location of the focus group meeting should be matched to where a particular action may be best-suited for implementation. For instance, terrace rain gardens might	

Discussion:		Action:
	be more applicable to the Orchard Ridge Neighborhood (because of the wide terraces) than the Nakoma Neighborhood. Rebecca wondered whether these focus groups should target a single action to implement a social marketing strategy or multiple actions (as is shown on Slide 55) to develop a social marketing strategy. More discussion is needed on this.	
	Rebecca said that Strand and Bret should start developing the written report section on social marketing, with a draft for review at the April 24, 2014, meeting. It is envisioned that Steering Team Meeting No. 8 on March 13, 2014, will provide an overview of the final analysis as well as a Community Engagement Strategy Workshop. Strand and Bret will develop a basic framework for how each of the six meetings could be run and what action items they could cover. The steering team will provide feedback and ideas for modifications to the framework.	Strand and Bret will develop a basic framework for how each of the six meetings could be run and what action items they could cover. The steering team will provide feedback and ideas for modifications to the framework.
	Sue, Genesis, Greg, and Jon will interact to set the date for the Public Informational Meeting tentatively set for May 7, 2014. Sue will need to be at this meeting, but not necessarily at all of the others.	Sue, Genesis, Greg, and Jon will interact to set the date for the Public Informational Meeting tentatively set for May 7, 2014.
e.	Slide 56 and 57–These slides show the process for the City's Project-Based and Management-Based measures. It shows the number of stakeholders and the interdependent relationships involved in implementing new projects and management changes. Sue requested the timeline for these processes be included in the slide.	Genesis will add the timeline for these processes to the slides.
f.	Messaging–After the meeting, Paul said the message of what residents can expect if the short-term goals are met should be conveyed at the community engagement activities.	

7. Upcoming Schedule and Next Meeting

Steering Team Meeting	Date	Time	Topic
Meeting No. 1	February 21, 2013	2 pm	Kickoff Meeting
Issue Team Meeting No. 1	March 21, 2013	3 pm	Chlorides
Meeting No. 2	April 4, 2013	3 pm	Chlorides/Social Marketing
Meeting No. 3	May 23, 2013	3 pm	Chlorides/Infiltration
Issue Team Meeting No. 2	June 28, 2013	10 am	Infiltration
Meeting No. 4	July 11, 2013	3 pm	Pollutant-Sediment and Phosphorus
Meeting No. 5	October 17, 2013	8 am	Pollutant Reduction Opportunities
Meeting No. 6	December 11, 2013	8 am	Pollutant Reduction Opportunities: Chlorides
Meeting No. 7	January 23, 2014	8 am	Draft Report Sections (Infiltration and Phosphorus)
Issue Team Meeting No. 3	February 27, 2014	9 am	Draft Chloride Report Section, Stakeholder Engagement/Social Marketing Framework, Social Marketing Pilot Project Discussion
Meeting No. 8	March 13, 2014	8 am	FINAL Infiltration, Phosphorus, Chloride Analysis AND Community Engagement Strategy Workshop
Issue Team Meeting No. 4	April 24, 2014	TBD	Final Community Engagement Strategy and Draft Social Marketing Report Section
Implement Social Marketing Strategy	May-June 2014		
Issue Team Meeting No. 5	August 21, 2014	TBD	Draft Report Presentation
Issue Team Meeting No. 6	October 2, 2014	TBD	Final Report Presentation
Final Report Presentations (4)	October / Nov. / Dec. 2014		
Social Marketing Pilot Project	Jan-June 2015		

c/enc: All Participants

APPENDIX B
COST SPREADSHEETS

Lake Wingra Watershed Management Plan
City of Madison, Wisconsin
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL
Glenway Golf Course Wet Pond/Infiltration Basin

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
	Miscellaneous/Wet Detention Basin				
1	Mobilization	1	LS	$5,000.00	$5,000
2	Clearing and Grubbing	1	LS	$10,000.00	$10,000
3	Stone Tracking Pad	1	EA	$500.00	$500
4	Erosion Control and Maintenance (Includes Silt Fence Around Temporary Stock Piles)	1	LS	$1,000.00	$1,000
5	Silt Fence	2,000	LF	$5.00	$10,000
6	Inlet Protection	4	EA	$90.00	$360
7	Dewatering	1	LS	$1,000.00	$1,000
8	Unclassified Excavation	11,616	CY	$13.00	$151,008
9	Clay Liner	11,616	CY	$30.00	$348,480
10	Outlet Control Structure	1	LS	$20,000.00	$20,000
11	Construction Staking (By Contractor).....entire project	1	LS	$1,500.00	$1,500
12	Rip Rap at Channel Outfall	100	SY	$40.00	$4,000
13	Topsoil Stripping and Removal (6")	968	CY	$4.00	$3,872
14	Topsoil Stripping and Stockpile (6")	290	CY	$5.00	$1,452
15	6-IN Salvaged Topsoil Placement 100%	1,742	SY	$2.00	$3,485
16	Erosion Control Mat - Class I, Urban Type A	1,742	SY	$3.00	$5,227
17	WisDOT Type 20 Seed and fertilizer	1,742	SY	$1.50	$2,614
18	Native Seeding and Plugs (672plugs @ $6/plug in 224 SY and $4/SY native seeding)	1,742	SY	$22.00	$38,333
	Pumping Station/Force Main				
19	Pump House Building	1	LS	$175,000.00	$175,000
20	Pump House Equipment	1	LS	$350,000.00	$350,000
20	8" HDPE Force Main	870	LF	$80.00	$69,600
21	Pond Intake	1	EA	$20,000.00	$20,000
21	Sod Restoration	483	SY	$4.25	$2,054
22	Watering	1	LS	$200.00	$200
	Infiltration Basin				
23	Excavation (0.25 acres x 3.5 feet deep)	1,412	CY	$20.00	$28,233
24	Backfill with #2 Washed Stone	1,210	CY	$50.00	$60,500
25	Geotextile	1,210	SY	$5.00	$6,050
26	6" SCH 80 PVC Underdrains (100 x 100 area, so 4 rows at 100 feet long = 400 ft)	400	LF	$45.00	$18,000
27	Silt Fence	450	LF	$5.00	$2,250
28	Junction Chamber 1	1	EA	$10,000.00	$10,000
29	6-IN Salvaged Topsoil Placement 100%	1,573	SY	$2.00	$3,146
30	Sod Restoration with Protective Fence	1,573	SY	$4.00	$6,292
31	Monitoring Equipment	1	LS	$25,000.00	$25,000

Subtotal Project Cost	**$1,384,200**
Construction Contingency (15%)	**$207,600**
Construction Cost	**$1,591,800**
Design Contingencey (15%)	**$207,600**
Soil Borings	**$20,000**
Total Project Cost	**$1,819,400**

Lake Wingra Watershed Management Plan
City of Madison, Wisconsin
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL
Monroe Street Green Street Reconstruction

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
	Bioretention				
1	Mobilization	1	LS	$5,000.00	$5,000
2	Clearing and Grubbing	1	LS	$1,000.00	$1,000
3	Unclassified Excavation	815	CY	$13.00	$10,593
4	Bioretention	4,400	SF	$100.00	$440,000

	Subtotal Project Cost	**$456,600**
	Construction Contingency (15%)	**$68,500**
	Construction Cost	**$525,100**
City will do design so no design contingency	**Design Contingency (0%)**	**$0**
	Soil Borings	**$7,000**
	Total Project Cost	**$532,100**

Lake Wingra Watershed Management Plan
City of Madison, Wisconsin
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL
Wingra Park Underground Wet Detention

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
	Wet Detention Basin				
1	Mobilization	1	LS	$5,000.00	$5,000
2	Clearing and Grubbing	1	LS	$1,000.00	$1,000
3	Stone Tracking Pad	1	EA	$1,000.00	$1,000
4	Erosion Control and Maintenance (Includes Silt Fence Around Temporary Stock Piles)	1	LS	$2,000.00	$2,000
5	Silt Fence	1,100	LF	$5.00	$5,500
6	Inlet Protection	5	EA	$100.00	$500
7	Dewatering	1	LS	$5,000.00	$5,000
8	8' Underground Detention Material & Freight Cost **(StormTrap)**	1	LS	$750,000.00	$750,000
9	Underground Detention Installation	1	LS	$75,000.00	$75,000
10	Unclassified Excavation (Hauled off)	21,537	CY	$17.00	$366,135
11	Unclassified Excavation (Salvaged)	4,728	CY	$8.00	$37,822
12	Stone Bedding	2,388	CY	$26.00	$62,081
13	Select Granular Fill	4,775	CY	$10.00	$47,755
14	4'x3' RCB	30	LF	$2,000.00	$60,000
15	36" RCP	60	LF	$150.00	$9,000
16	Diversion Structure	1	LS	$20,000.00	$20,000
17	Outlet Structure	1	LS	$20,000.00	$20,000
18	Construction Staking (By Contractor).....entire project	1	LS	$1,500.00	$1,500
19	Topsoil Stripping and Stockpile (6")	1,492	CY	$4.00	$5,969
20	6-IN Salvaged Topsoil Placement 100%	8,954	SY	$2.00	$17,908
21	Erosion Control Mat - Class I, Urban Type A	8,954	SY	$3.00	$26,862
22	Seed and fertilizer	8,954	SY	$1.50	$13,431
23	Watering	1	LS	$500.00	$500

	Subtotal Project Cost	**$1,534,000**
	Construction Contingency (15%)	**$230,100**
	Construction Cost	**$1,764,100**
City would do design so no design contingency	**Design Contingencey (0%)**	**$0**
	Soil Borings	**$7,000**
	Total Project Cost	**$1,771,100**

Lake Wingra Watershed Management Plan
City of Madison, Wisconsin
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL
Westmorland Park Bioretention

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
	Bioretention				
1	Mobilization	1	LS	$5,000.00	$5,000
2	Clearing and Grubbing	1	LS	$1,000.00	$1,000
3	Stone Tracking Pad	1	EA	$1,000.00	$1,000
4	Erosion Control and Maintenance (Includes Silt Fence Around Temporary Stock Piles)	1	LS	$1,000.00	$1,000
5	Silt Fence	110	LF	$5.00	$550
6	36" RCP	200	LF	$150.00	$30,000
7	6-FT DIA MH	2	EA	$6,000.00	$12,000
8	Outlet Structure	1	LS	$10,000.00	$10,000
9	Construction Staking (By Contractor).....entire project	1	LS	$1,500.00	$1,500
10	Rip Rap at Outfalls	50	SY	$40.00	$2,000
11	Topsoil Stripping and Haul Off (6")	154	CY	$4.00	$616
12	Unclassified Excavation	1,541	CY	$13.00	$20,030
13	Bioretention	8,320	SF	$15.00	$124,799
14	Erosion Control Mat - Class I, Urban Type A	231	SY	$3.00	$693
15	Seed and fertilizer	231	SY	$1.50	$347
16	Watering	1	LS	$200.00	$200

	Subtotal Project Cost	**$210,700**
	Construction Contingency (15%)	**$31,600**
	Construction Cost	**$242,300**
City would do design so no design contingency	**Design Contingency (0%)**	**$0**
	Soil Borings	**$7,000**
	Total Project Cost	**$249,300**

Lake Wingra Watershed Management Plan
City of Madison, Wisconsin
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL
Nakoma Park/Thoreau School Streambank Restoration

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
	Nakoma Park/Thoreau School Streambank Restoration				
1	Mobilization	1	LS	$10,000	$10,000
2	Clearing and Grubbing	1	LS	$15,000	$15,000
3	Dewatering	1	LS	$10,000	$10,000
4	Stone Tracking Pad	2	EA	$1,500	$3,000
5	Erosion Control and Maintenance (Includes Silt Fence Around Temporary Stock Piles)	1	LS	$4,500	$4,500
6	Silt Fence	200	LF	$5	$1,000
7	Inlet Protection	4	EA	$100	$400
8	Unclassified Excavation (Assume 4-ft deep by 10-ft wide for length of channel+riffle pool)	1025	CY	$25	$25,625
9	Salvaged topsoil placement (6-inches thick)	600	SY	$3.00	$1,800
10	Channel Seeding (Native)	1	LS	$15,000	$15,000
11	Vegetation Maintenance	1	LS	$3,000	$3,000
12	Erosion Mat, Class II, Type C (Assume 12' on each side of channel for length of channel)	600	SY	$2.50	$1,500
13	Vegetated Boulder Revetment	850	LF	$155	$131,750
14	In-Stream Sediment Trap	2	EA	$150	$300
15	In-Stream Boulder	2	EA	$600	$1,200
16	Field Stone Riprap & Riffle Pool Sequence (Assume 2- 8' wide by 20' length by 2' deep)	25	CY	$40	$1,000
17	43-Inch x 68-Inch Storm Sewer Discharge Modifications	1	LS	$5,000	$5,000
18	24-Inch Storm Sewer Discharge Modifications	1	LS	$5,000	$5,000
19	38-Inch x 60-Inch Outlet Structure Modifications	1	LS	$5,000	$5,000

Total Project Cost	**$240,075**
Construction Contingency (15%)	**$36,000**
Total Construction Cost	**$276,075**

Lake Wingra Watershed Management Plan

City of Madison, Wisconsin

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL

Cherokee Drive (Yuma to Chippewa) Streambank Restoration

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
Streambank Restoration On Cherokee Drive from Yuma to Chippewa					
1	Mobilization	1	LS	$5,000.00	$5,000
2	Clearing and Grubbing	1	LS	$1,000.00	$1,000
3	Stone Tracking Pad	1	EA	$500.00	$500
4	Erosion Control and Maintenance (Includes Silt Fence Around Temporary Stock Piles)	1	LS	$1,000.00	$1,000
5	Silt Fence	100	LF	$5.00	$500
6	Inlet Protection	4	EA	$90.00	$360
7	Streambank Restoration (Centerline Length)	540	LF	$500.00	$270,000

Subtotal Project Cost	**$278,400**
Construction Contingency (15%)	**$41,800**
Construction Cost	**$320,200**
Design Contingencey (15%)	**$41,800**
Soil Borings	**$7,000**
Total Project Cost	**$369,000**

Lake Wingra Watershed Management Plan
City of Madison, Wisconsin
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL
Manitou Pond Diversion

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
	Miscellaneous/Storm Sewer				
1	Mobilization	1	LS	$5,000.00	$5,000
2	Clearing and Grubbing (Remove 3 Trees Total)	1	LS	$1,000.00	$1,000
3	Stone Tracking Pad	1	EA	$1,000.00	$1,000
4	Erosion Control and Maintenance (Includes Silt Fence Around Temporary Stock Piles)	1	LS	$2,000.00	$2,000
5	Silt Fence	110	LF	$5.00	$550
6	Dewatering	1	LS	$1,000.00	$1,000
7	Diversion Structure	1	LS	$25,000.00	$25,000
8	Pretreatment Device	1	LS	$50,000.00	$50,000
9	Backwater Valve (Tideflex)	1	LS	$15,000.00	$15,000
8	Construction Staking (By Contractor).....entire project	1	LS	$1,500.00	$1,500
9	4-FT DIA MH with Casting	1	EA	$2,300.00	$2,300
10	24-IN RCP	470	LF	$100.00	$47,000
11	24-IN RCP Apron Endwall	2	EA	$900.00	$1,800
12	Rip Rap at 24-IN Outfall	50	SY	$40.00	$2,000
13	Topsoil Stripping and Stockpile (6")	95	CY	$4.00	$381
14	6-IN Salvaged Topsoil Placement 100%	156	SY	$2.00	$312
15	Erosion Control Mat - Class I, Urban Type A	156	SY	$3.00	$469
16	Seed with Fertilizer	156	SY	$1.50	$234
17	Curb and Gutter Removal	400	LF	$5.00	$2,000
18	Sidewalk Removal	225	SY	$2.50	$563
19	Curb and Gutter Restoration, 24-inch	400	LF	$25.00	$10,000
20	Asphalt Restoration	70	TON	$65.00	$4,550

Subtotal Project Cost	**$173,700**
Construction Contingency (15%)	**$26,100**
Construction Cost	**$199,800**
Design Contingency (15%)	**$26,100**
Soil Borings	**$7,000**
Total Project Cost	**$232,900**

Lake Wingra Watershed Management Plan
City of Madison, Wisconsin
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL
Devolis Park Bioretention

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
	Bioretention				
1	Mobilization	1	LS	$5,000.00	$5,000
2	Clearing and Grubbing	1	LS	$1,000.00	$1,000
3	Stone Tracking Pad	1	EA	$1,000.00	$1,000
4	Erosion Control and Maintenance (Includes Silt Fence Around Temporary Stock Piles)	1	LS	$2,000.00	$2,000
5	Silt Fence	100	LF	$5.00	$500
6	2'x3' Inlet with Casting	4	EA	$2,000.00	$8,000
7	12" RCP	100	LF	$60.00	$6,000
8	4-FT DIA MH	1	EA	$3,500.00	$3,500
9	24" RCP	50	LF	$100.00	$5,000
10	Asphalt Replacement	30	TON	$65.00	$1,950
10	Outlet Structure	1	LS	$10,000.00	$10,000
11	Construction Staking (By Contractor).....entire project	1	LS	$1,500.00	$1,500
12	Rip Rap at Outfalls	25	SY	$40.00	$1,000
13	Topsoil Stripping and Haul Off (6")	244	CY	$4.00	$978
14	Unclassified Excavation	2,444	CY	$13.00	$31,775
15	Bioretention	13,199	SF	$15.00	$197,980
16	Erosion Control Mat - Class I, Urban Type A	367	SY	$3.00	$1,100
17	Seed and fertilizer	367	SY	$1.50	$550
18	Watering	1	LS	$200.00	$200
19	Curb and Gutter Removal	50	LF	$5.00	$250
20	Sidewalk Removal	28	SY	$2.50	$69
21	Curb and Gutter Restoration, 24-inch	50	LF	$25.00	$1,250
22	Sidewalk Restoration	28	SY	$45.00	$1,250

Subtotal Project Cost	**$281,900**
Construction Contingency (15%)	**$42,300**
Construction Cost	**$324,200**
Design Contingency (0%)	**$0**
Soil Borings	**$7,000**
Total Project Cost	**$331,200**

City would design this so no design contingency.

Lake Wingra Watershed Management Plan

City of Madison, Wisconsin

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL

Grandview Boulevard Bioswales

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
	Bioretention				
1	Mobilization	1	LS	$7,500.00	$7,500
2	Clearing and Grubbing	1	LS	$1,000.00	$1,000
3	Stone Tracking Pad	1	EA	$1,000.00	$1,000
4	Erosion Control and Maintenance (Includes Silt Fence Around Temporary Stock Piles)	1	LS	$1,000.00	$1,000
5	Silt Fence	200	LF	$5.00	$1,000
6	Rip Rap at Outfalls	50	SY	$40.00	$2,000
7	Topsoil Stripping and Haul Off (6")	460	CY	$4.00	$1,839
8	Erosion Control Mat - Class I, Urban Type A	2,759	SY	$3.00	$8,276
9	Seed and fertilizer	2,759	SY	$1.50	$4,138
10	Watering	1	LS	$200.00	$200
11	Manhole w/Casting	5	EA	$1,500.00	$7,500
12	Storm Sewer Inlets w/Casting	10	EA	$1,500.00	$15,000
13	12" RCP	10	SY	$1.50	$15
14	6" Directionally Drilled Underdrain	900	LF	$40.00	$36,000
15	Curb Cuts	10	EA	$250.00	$2,500
16	Watermain Modifications	1	LS	$5,000.00	$5,000
17	Unclassified Excavation	4,598	CY	$13.00	$59,774
18	Bioretention	24,829	SF	$15.00	$372,438

	Subtotal Project Cost		**$526,200**
	Construction Contingency (15%)		**$78,900**
		Construction Cost	**$605,100**
City would design this so no design contingency	**Design Contingency (0%)**		**$0**
	Soil Borings		**$7,000**
		Total Project Cost	**$612,100**

Lake Wingra Watershed Management Plan

City of Madison, Wisconsin

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL

Arbor Hills Greenway Infiltration

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
	Infiltration				
1	Mobilization	1	LS	$10,000.00	$10,000
2	Clearing and Grubbing	1	LS	$1,000.00	$1,000
3	Stone Tracking Pad	2	EA	$1,000.00	$2,000
4	Erosion Control and Maintenance (Includes Silt Fence Around Temporary Stock Piles)	1	LS	$2,000.00	$2,000
5	Silt Fence	500	LF	$5.00	$2,500
6	Inlet Protection	4	EA	$100.00	$400
7	Unclassified Excavation	14,300	CY	$13.00	$185,900
8	Engineered Soil	3,850	CY	$68.00	$261,800
9	Flow Splitter	3	EA	$2,000.00	$6,000
10	Outlet Structure 15" Pipe	65	LF	$100.00	$6,500
11	Rip Rap	50	SY	$40.00	$2,000
12	Construction Staking (By Contractor).....entire project	1	LS	$5,000.00	$5,000
13	Concrete Removal	115	CY	$25.00	$2,875
14	Topsoil Stripping and Stockpile (6")	1,900	CY	$4.00	$7,600
15	6-IN Salvaged Topsoil Placement 100%	11,230	SY	$2.00	$22,460
16	Seed and fertilizer	11,230	SY	$1.50	$16,845
17	Plants (1 Plant/SF)	32,250	EA	$6.00	$193,500
18	ECRM	11,230	SY	$3.00	$33,690
19	Sawcutting	45	LF	$2.00	$90

	Subtotal Project Cost	**$762,200**
	Construction Contingency (15%)	**$114,300**
	Construction Cost	**$876,500**
The City would design this, so no design contingency	**Design Contingency (0%)**	**$0**
	Soil Borings	**$7,000**
	Total Project Cost	**$883,500**

Lake Wingra Watershed Management Plan

City of Madison, Wisconsin

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL

1,000 Private Residential Rain Gardens (Serving roofs only)

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
1000 Private Residential Rain Gardens (Serving Roofs Only)					
1	Mobilization	1,000	EA	$25.00	$25,000
2	Clearing and Grubbing	1,000	EA	$25.00	$25,000
3	Unclassified Excavation (2' depth, 1' ponding and 1' engineered soil)	8,667	CY	$13.00	$112,667
4	Raingarden (117 SF per house)	117,000	SF	$5.00	$585,000
5	Downspout Modifications	1,000	EA	$250.00	$250,000

Subtotal Project Cost	**$997,700**
Construction Contingency (5%)	**$49,900**
Construction Cost	**$1,047,600**
Design Contingencey (0%)	**$0**
Soil Borings	**$0**
Total Project Cost	**$1,047,600**

Lake Wingra Watershed Management Plan

City of Madison, Wisconsin

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL

60 Private Commercial Rain Gardens (Serving roofs only)

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
60 Private Commercial Rain Gardens (Serving Roofs Only)					
1	Mobilization	60	EA	$150.00	$9,000
2	Clearing and Grubbing	60	EA	$75.00	$4,500
3	Unclassified Excavation (3' depth, 1' ponding, 1' engineered soil, and 1' stone layer)	1,553	CY	$13.00	$20,193
4	Raingarden (233 SF per Building)	13,980	SF	$11.00	$153,780
5	Downspout Modifications	60	EA	$500.00	$30,000

Subtotal Project Cost	**$217,500**
Construction Contingency (15%)	**$32,600**
Construction Cost	**$250,100**
Design Contingency (15%)	**$32,600**
Soil Borings	**$7,500**
Total Project Cost	**$290,200**

Lake Wingra Watershed Management Plan

City of Madison, Wisconsin

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL

1,000 Terrace Rain Gardens

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
1,000 Terrace Rain Gardens					
1	Mobilization	1,000	EA	$0.00	$0
2	Clearing and Grubbing	1,000	EA	$0.00	$0
3	Curb Cut	1,000	EA	$250.00	$250,000
4	Unclassified Excavation (8' x 13' x 3' depth=312 cf/27=11.55 cy): 1' ponding, 2' engineered soil, and 0' stone layer	11,550	CY	$14.00	$161,700
5	Rain Garden (8' x 13' planted = 104 sf per Rain Garden)	104,000	SF	$7.50	$780,000

	Subtotal Project Cost	**$1,191,700**
	Construction Contingency (5%)	**$178,800**
	Construction Cost	**$1,370,500**
Delete per Madison on 2/5/14	**Design Contingencey (0%)**	**$0**
Delete per Madison on 2/5/14	**Soil Borings**	**$0**
	Total Project Cost	**$1,370,500**

Lake Wingra Watershed Management Plan
City of Madison, Wisconsin
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL
Porous Pavement

4 Acres of Porous Pavement (Serving 12 Acre Watershed)					
1	Mobilization	8	EA	$5,000.00	$40,000
2	Excavation (12"+6"=18")	9,680	CY	$20.00	$193,600
3	Porous Concrete (6" Depth)	19,360	SY	$76.05	$1,472,328
4	Aggregate Storage Layer (12")	6,453	CY	$50.00	$322,667
5	Geotextile	20,533	SY	$5.00	$102,665
6	Underdrain	7,200	LF	$30.00	$216,000
7	Cleanout	48	EA	$325.00	$15,600
8	Connect Cleanout to Existing Structure	16	EA	$800.00	$12,800
7	Stone Tracking Pad	8	EA	$1,000.00	$8,000
8	Erosion Control and Maintenance (Includes Silt Fence Around Temporary Stock Piles)	8	EA	$1,000.00	$8,000
9	Silt Fence	800	LF	$5.00	$4,000
10	Inlet Protection	24	EA	$90.00	$2,160

				Subtotal Project Cost	**$2,397,800**
				Construction Cost/SY	**$123.85**
1	Traditional Asphalt (4" Depth)	19,360	SY	$25.00	$484,000
2	Traditional Removal of Existing Asphalt (4" Depth)	2,130	CY	$15.00	$31,944
				Subtotal Traditional Cost	$515,944

Incremental Construction Cost	$1,881,856
Construction Contingency (15%)	**$282,278**
Construction Cost	**$2,164,134**
Construction Cost/SY w/Contingency	**$111.78**
Design Contingency (15%)	**$282,278**
Soil Borings	**$25,000**
Total Project Cost	**$2,471,413**
Overall Cost/SY	**$127.66**

Lake Wingra Watershed Management Plan

City of Madison, Wisconsin

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL

Rain Barrels

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
				Total Res. Parcels in Watershed	4,620
				Participation Rate	25%
				# Parcels Participating	1,155
	Rain Barrels				
1	Mobilization	0	EA	$0.00	$0
2	Clearing and Grubbing	0	EA	$0.00	$0
3	Rain Barrel	1,155	EA	$100.00	$115,500
4	Downspout Modifications	1,155	EA	$25.00	$28,875

Subtotal Project Cost	**$144,400**
Construction Contingency (5%)	**$7,200**
Construction Cost	**$151,600**
Design Contingency (0%)	**$0**
Soil Borings	**$0**
Total Project Cost	**$151,600**

Lake Wingra Watershed Management Plan

City of Madison, Wisconsin

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST: PLANNING-LEVEL

Downspout Disconnection

ITEM NO.	DESCRIPTION	Quantity	Units	Unit Price	Total
				Total Res. Parcels in Watershed	4,620
				Participation Rate	35%
				# Parcels Participating	1,617
Downspout Disconnection					
1	Mobilization	0	EA	$150.00	$0
2	Clearing and Grubbing	0	EA	$75.00	$0
3	Downspout Modifications	1,617	EA	$275.00	$444,675

Subtotal Project Cost	**$444,700**
Construction Contingency (5%)	**$22,200**
Construction Cost	**$466,900**
Design Contingency (0%)	**$0**
Soil Borings	**$0**
Total Project Cost	**$466,900**

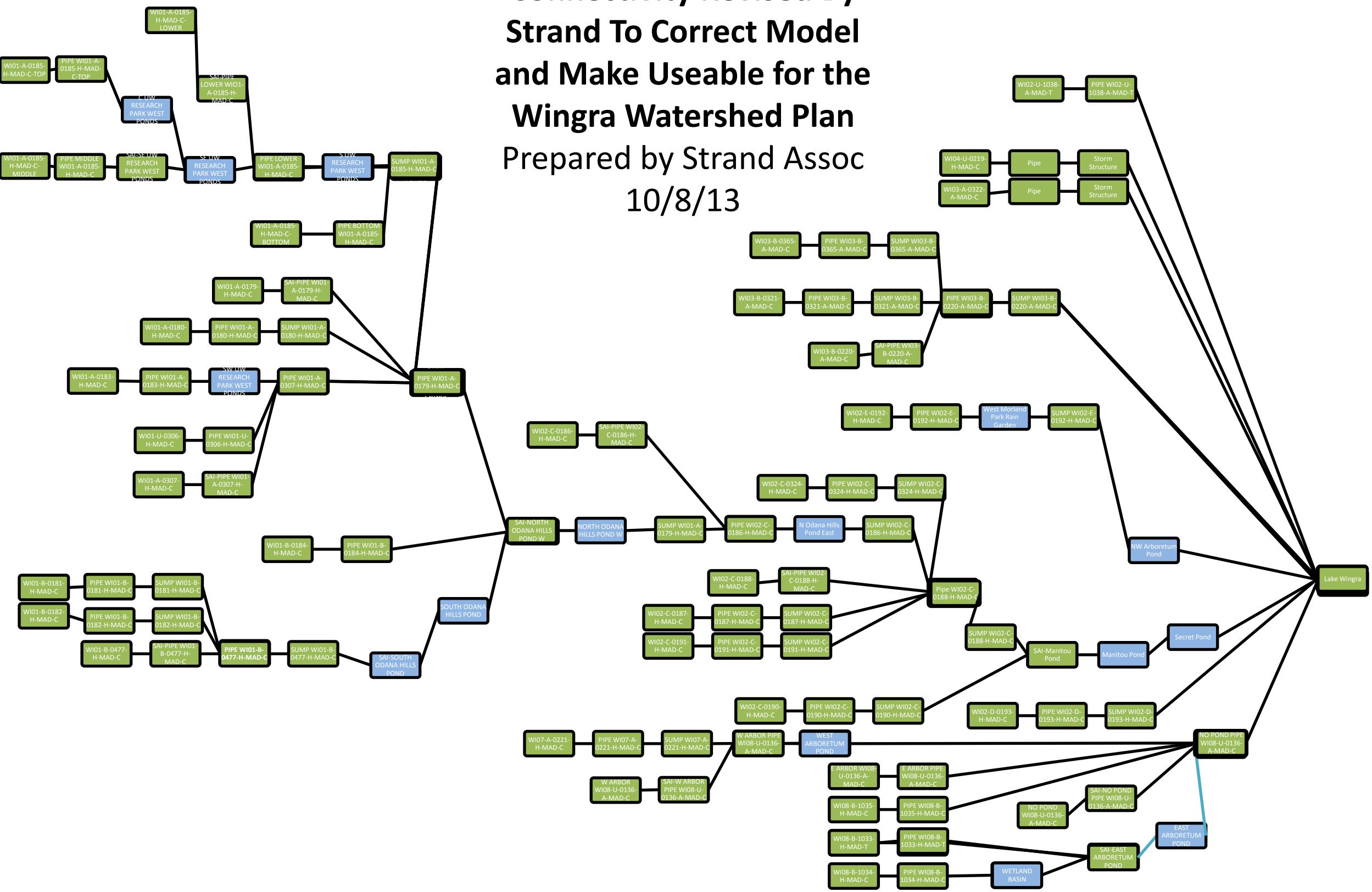
APPENDIX C
WATERSHED MODEL SCHEMATIC

City of Madison

P8 Model Schematic: Connectivity Revised By Strand To Correct Model and Make Useable for the Wingra Watershed Plan

Prepared by Strand Assoc

10/8/13

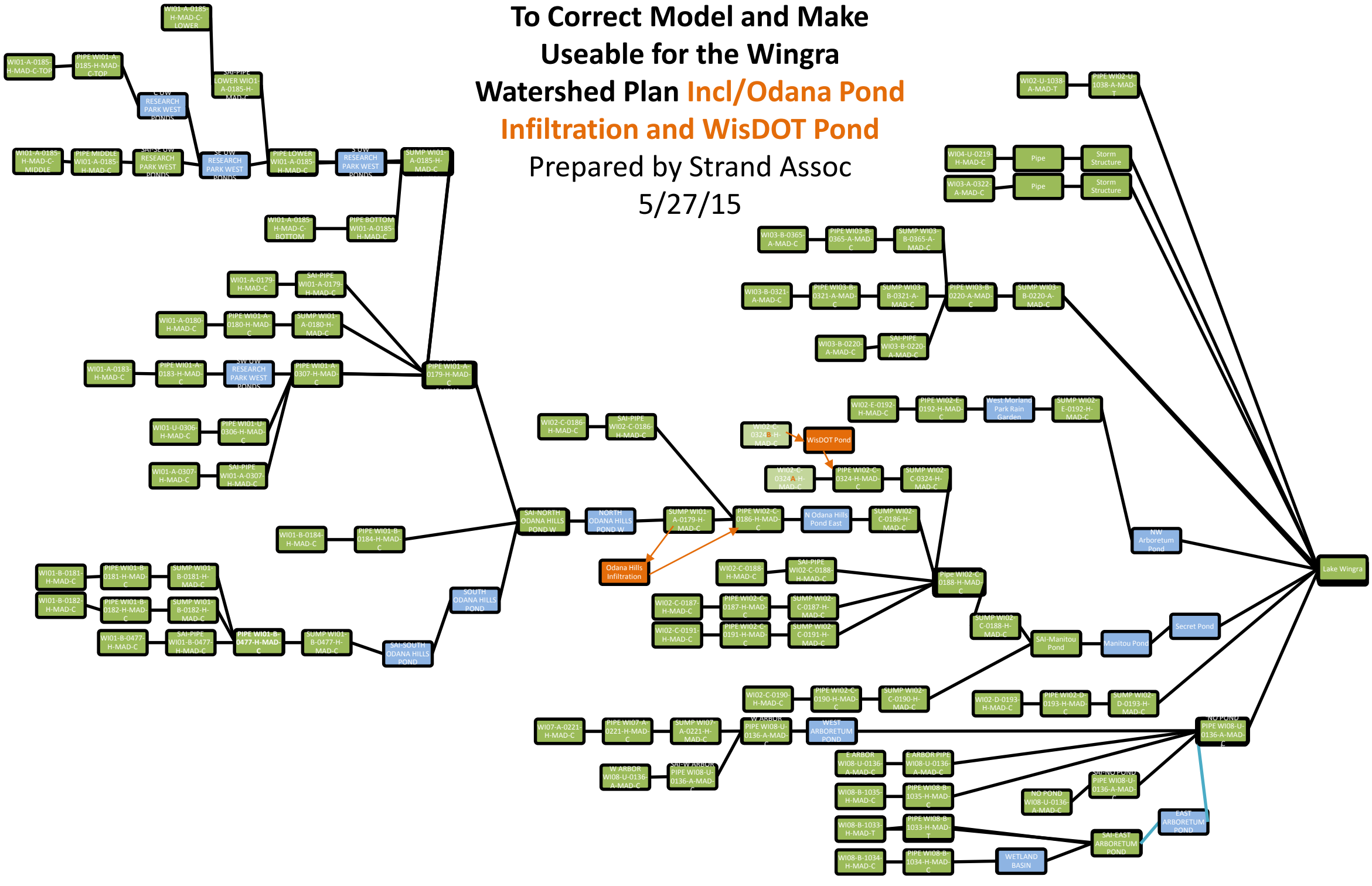


City of Madison

P8 Model Schematic: Connectivity Revised By Strand To Correct Model and Make Useable for the Wingra Watershed Plan Incl/Odana Pond Infiltration and WisDOT Pond

Prepared by Strand Assoc

5/27/15



APPENDIX D
USEPA NINE MINIMUM ELEMENTS FOR SECTION 319-FUNDED WATERSHED PLANS

D.01 INTRODUCTION

The United State Environmental Protection Agency (USEPA) identifies six Steps in the Watershed Planning and Implementation Process as shown in Figure D.01-1. Fitting within these six Steps are the nine minimum elements to be included in Section 319-funded watershed plans for threatened or impaired waters. USEPA's watershed planning guidance in its entirety is included in *A Quick Guide to Developing Watershed Plans to Restore and Protect Our Waters, May 2013*, available at the following link http://water.epa.gov/polwaste/nps/upload/watershed_mgmnt_quick_guide.pdf.

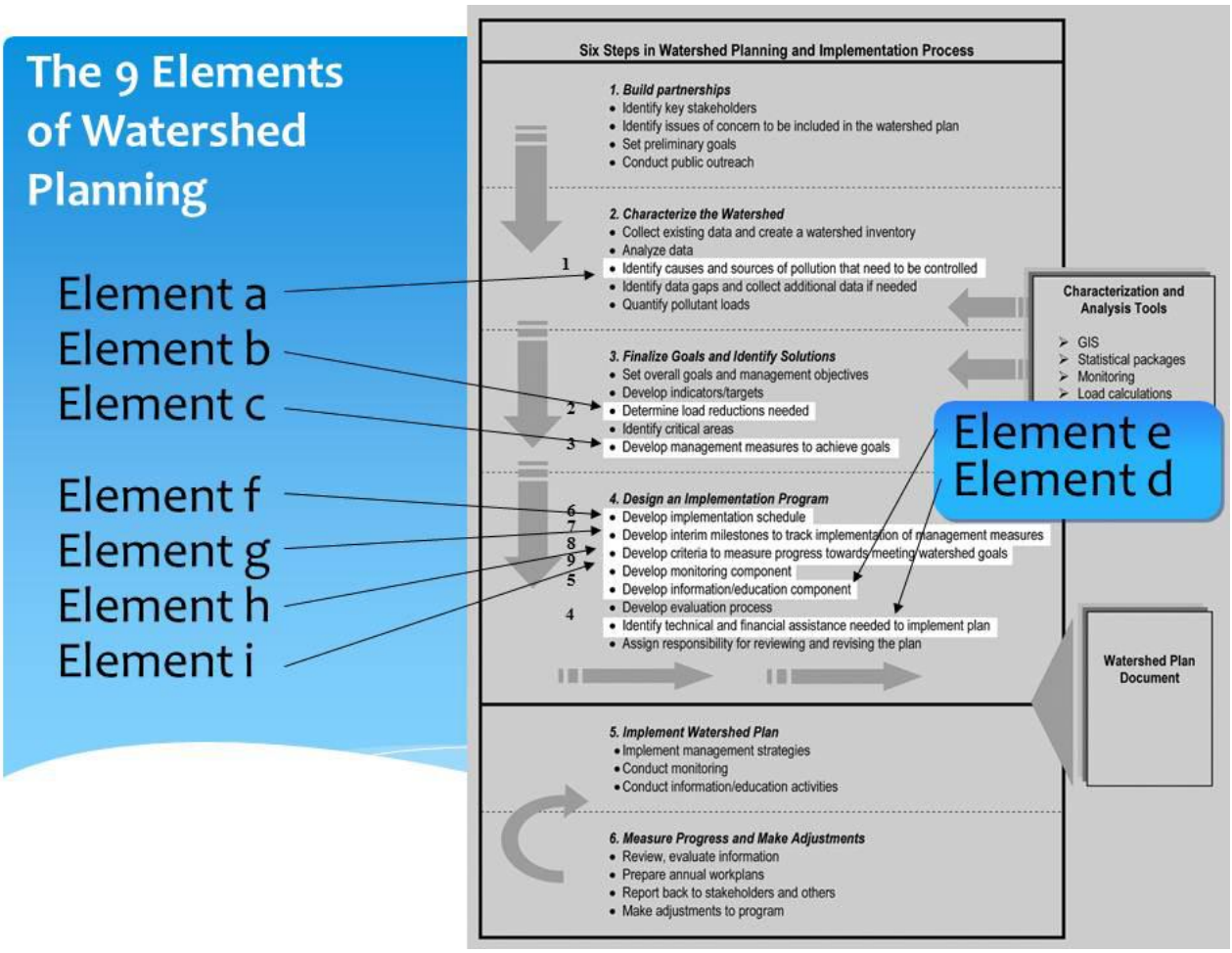


Figure D.01-1 USEPA's Six Steps and Nine Minimum Elements in Watershed Planning and Implementation Process

Should the City of Madison pursue federal funds for Best Management Practice (BMP) implementation in the Lake Wingra Watershed, a plan consistent with the nine minimum elements would be required. Presently in Wisconsin, there is not a requirement for a watershed plan to be consistent with the nine minimum elements to receive funding from the WDNR's main funding mechanism for urban stormwater

projects, namely the WDNR Urban Nonpoint Source and Stormwater Grant Program. Table D.01-1 shows the Six Steps in Watershed-Based Plans, the Nine Minimum Elements for Section 319-Funded Watershed Plans, and information showing how the Lake Wingra Watershed Plan is consistent with both.

It should be noted that the Lake Wingra Watershed Plan is focused on chloride reductions, increases in infiltration to promote increases in groundwater and spring flow at Lake Wingra, and phosphorus reductions. Chlorides and phosphorus are considered USEPA pollution sources. Increases in infiltration are not considered USEPA pollution sources and are thus referred to as a watershed issue in Table D.01-1.

Table D.01-1 Lake Wingra Watershed Management Plan's Consistency With USEPA's Six Steps and Nine Minimum Elements

Six Steps in Watershed-Based Plans	Nine Minimum Elements for Section 319-Funded Watershed Plans	Lake Wingra Watershed Management Plan (Consistency with Six Steps and Nine Minimum Elements)
1. Build Partnerships	N/A	This project was completed by a partnership between the City of Madison and Friends of Lake Wingra. The project is guided by a Steering Team with representatives of the City of Madison, Friends of Lake Wingra, Clean Lakes Alliance, Wisconsin DNR, University of Wisconsin-Madison, and the University of Madison-Arboretum as shown in Table 1 of the Foreword. Likewise, two Issue Team meetings were held (Meeting No. 1-Chlorides and Meeting No. 2-Infiltration) that brought together representatives from additional organizations including Madison Gas and Electric, Madison Metropolitan Sewerage District, and a local snow removal company. See Appendix A for Steering and Issue Team Meeting summaries. Section 5.02 described Collaborative Efforts that are envisioned for future watershed plan engagement and implementation efforts.
2. Characterize the Watershed	a. Identify causes and sources of pollution that need to be controlled.	Plan Section 2 and Section 4 address the causes and sources of pollution for chlorides and phosphorus and Section 3 addresses the watershed issues related to infiltration/groundwater flow/spring flow. As described in Section 2.04, a Chlorides Mass Balance Predictive Tool was developed to understand chloride sources and factors affecting chloride levels in Lake Wingra. As described in Section 3.02 D. and Section 3.03 E., F, and G., the Dane County Regional Groundwater Model and the City's Program for Predicting Polluting Particle Passage Through Pits, Puddles, and Ponds (P8) model were used to understand historic and current infiltration and groundwater/spring flows to Lake Wingra. As described in Section 4.03, the City's P8 model was used to understand phosphorus sources and factors affecting phosphorus loads from the watershed reaching Lake Wingra.
3. Set Goals and Identify Solutions	b. Determine load reductions needed. c. Develop management measures to achieve goals.	The Steering Team described above was instrumental in setting goals for the chloride and phosphorus pollution sources and the infiltration/groundwater/spring flow watershed issue as further described in Section 2.01, Section 3.01, and Section 4.01. Each of the models/tools described above were used to help set goals for the chloride and phosphorus pollution sources and infiltration/groundwater/spring flow watershed issues as further described in Section 2.01, Section 3.01, and Section 4.01. Load reductions and infiltration increases needed to meet the goals are described in Section 2.05 D. (Chlorides), Section 3.03 G. (Infiltration), and Sections 4.03 D. (phosphorus). An Alternatives Analysis describing management measures to achieve the goals are described in Section 2.08 (Chlorides), 3.03 I. and 3.04 (Infiltration), and Section 4.04 B., C., D., and E (phosphorus).
4. Design and Implementation Program	d. Identify technical and financial assistance needed to implement plan	d. The Implementation Plan in Table 6.03-1 provides costs for capital improvements and whether a project is grant eligible. The City already provides funding /incentives for many of the described existing initiatives, some of which are recommended for expansion. Catalyst teams will work with appropriate entities to identify needs and request/secure appropriate funding. Section 6.02 4 recommends that the City of Madison budget monies for implementation of infiltration and phosphorus-based recommended projects. Section 6.02 10 recommends applying for grants for implementation of projects. Section 6.02-11 recommends that the City of Madison budget monies for technical assistance by a consultant to support the Catalyst Team Activities.
	e. Develop information/education component.	e. Section 5-Engagement and Implementation provides a comprehensive engagement plan that will be implemented by the catalyst teams. The catalyst teams will interact with various entities as further described in Section 5.03 including pilot projects to gauge effectiveness of certain initiatives before their more widespread implementation and use of social marketing techniques to affect behavior change in the watershed. As part of this plan, four public information meetings were held including a March 26, 2015, Public Information Meeting (PIM) at Edgewood College, a June 24, 2015, Neighborhood Association PIM, a July 14, 2015, Neighborhood Association PIM to obtain feedback from stakeholders on the draft Lake Wingra Watershed Management Plan. In addition, PIMs specifically related to the 2014-2015 Leaf Management Improvement Pilot Project were held on September 18, 2014, and September 17, 2015, that provided information/education on leaf management improvement efforts requested of residents in the pilot project area.
	f. Develop implementation schedule.	f. Section 6.03 includes an Implementation Plan as Table 6.03-1 including implementation schedule.
	g. Develop interim milestones to track implementation of management measures.	g. Section 5.03 recommends the use of catalyst teams for implementing recommendations of the watershed plan and engaging the appropriate entities for the recommended critical actions. These catalyst teams are recommended to be formed in late 2015, to meet quarterly thereafter, and to track their activities and progress each year. Sections 6.02 1, 2, and 3, recommend creation and initiation of Chlorides, Infiltration, and Phosphorus Catalyst Teams. Section 6.02-5 recommends that the City tract yearly Catalyst Team activities and progress.
	h. Develop criteria to measure progress towards meeting watershed goals.	h. As described in Section 2.02 B., the UW-Madison Limnology Department's North Temperate Lakes Long Term Ecological Research program monitors Lake Wingra chloride concentrations by collecting samples approximately 5 times yearly. This data collection efforts allows the City to measure progress towards meeting the chloride reduction goal. In addition, Section 6.02 9 recommends that the City maintain the Chlorides Mass Balance Predictive Tool to track progress on chloride reductions. Regarding both infiltration and phosphorus, the City tracks projects that are implemented as part of on-going programs including biannual reporting under their MS4 permit. Section 6.02 9 recommends that the City maintain the City's P8 model to track progress on phosphorus reductions and infiltration increases.
	i. Develop monitoring component.	i. As described above, long-term Lake Wingra chloride concentration monitoring is in place. It is recommended that the Phosphorus Catalyst Team work with the UW-Madison Limnology Department's North Temperate Lakes Long Term Ecological Research program to add monitoring/sampling for total phosphorus.
5. Implement the Watershed Plan	N/A	Catalyst teams are responsible for implementation of the Watershed Plan.
6. Measure Progress and make Adjustments	N/A	Catalyst teams are responsible for implementation of Watershed Plan, measurement of progress, and adjustments to recommendations.

APPENDIX E
TRADE-OFF HANDOUTS

Chloride Reduction Initiatives

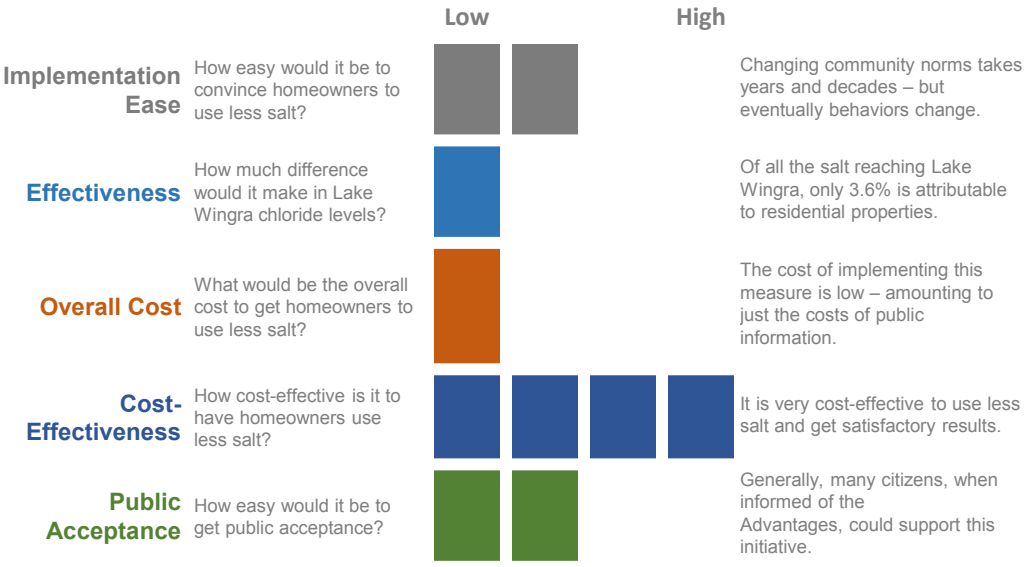
Residents
- Homeowner education

Commercial Applicators
- Applicator training/certification programs
- County-wide application guidelines/ordinances

Municipal Based
- Expand anti-icing
- Explore alternate de-icers
- Explore different snow clearing techniques

Resident Based Initiatives
Salt Reduction

Homeowners apply less salt



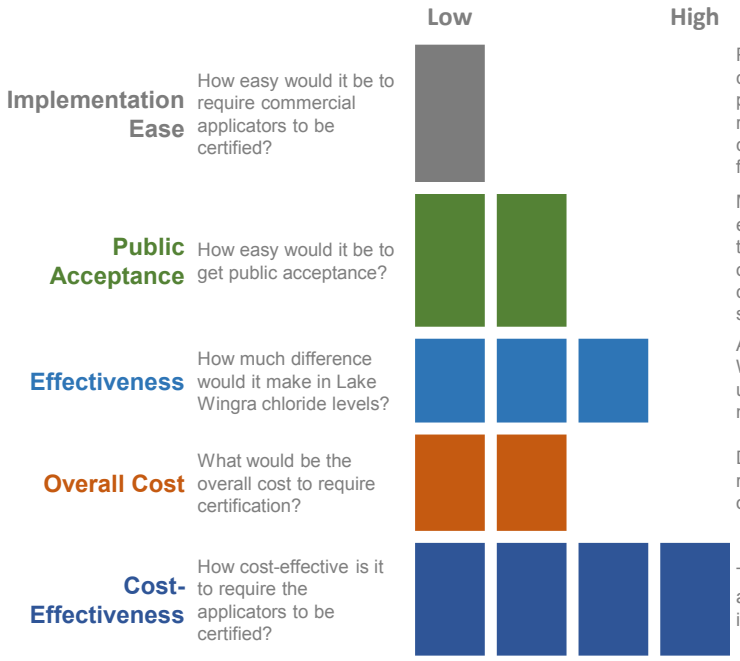
While residential salt use is not a major chloride contributor to Lake Wingra, changing salt use behavior with residents is essential for changing the community and government attitudes toward salt use. This initiative would seek to educate residential property owners so that they use alternate materials (e.g., sand) or limit their salt application rate to 5 pounds per 1,000 square feet.

http://nihseniorhealth.gov/falls/homesafety/sand_popup.html

Apply sand instead of salt

Commercial Applicator Based Initiatives
Salt Reduction

Certification Program for Commercial Applicators



Previous training efforts by the city and county have had relatively low participation rates. Unless there are requirements or access to special contracts, there may not be incentives for contractors to receive certification.

Many property owners would support environmental stewardship efforts by their contractors. Other property owners may value over-application and clear pavements over environmental stewardship.

Almost half the salt reaching Lake Wingra comes from pavements that use commercial applicators for winter maintenance

Developing, administrating, and recruiting participants would require on-going staff support.

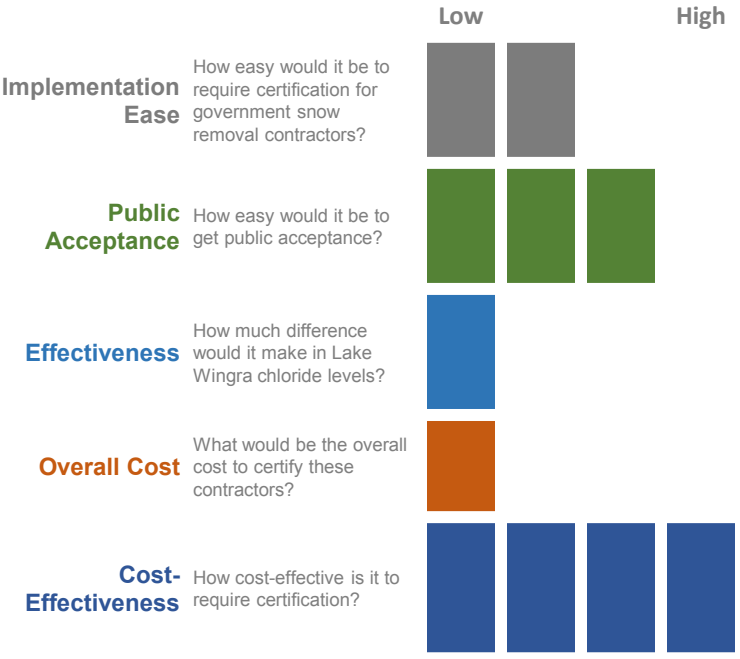
The cost is low and certified applicators would use less salt, which is a cost savings.

Almost half the salt reaching Lake Wingra comes from commercial applicators. A small survey of commercial applicators indicates some apply up to 5 times more salt than what is currently recommended by the WDNR. Other states have had success with enacting a certification program for commercial salt applicators, either led by the city or the WDNR. Commercial applicators have been able to use their certification in marketing efforts. The certification program provides measurable reductions quicker when property owners also attend training events.

http://www.cityofmadison.com/engineering/sto rmwater/RoadSaltWorkshop.cfm

2007 Workshop

Required Certification for Government Snow Removal Contractors



This would require a certification program to be in place, which has challenges. Once in place, the council may support required contractor certification.

Many government employees and city patrons, when informed of the environmental stewardship benefits, may support this initiative.

While almost half of the salt reaching Lake Wingra is from commercial applicators, government pavements make up only a small portion of that.

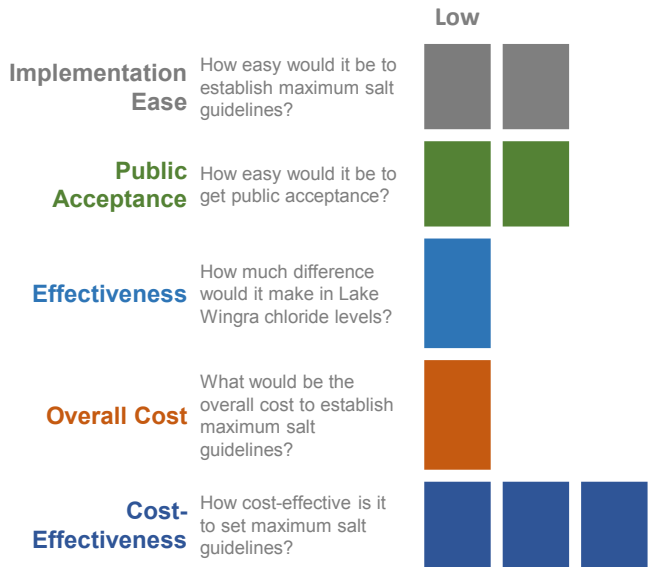
Cost would be limited to administrating the certification program and modifying contract documents.

Once the certification program is in place, costs for requiring certification for government contracts would be relatively low.

As mentioned, half the salt reaching Lake Wingra comes from commercial applicators. This measure would provide an incentive for contractors to get certification by requiring that all government contractors go through the certification program and maintain their certification while working on government contracts. Commercial contractors clear many state and municipal buildings, and they also provide almost half the labor force for clearing streets during a major snow event. The required certification could be implemented together or independently at state, county, and local government levels.

Commercial Applicator Based Initiatives
Salt Reduction

Establish Maximum Salt Guidelines



Establishing salt use guidelines would require staff time and governing body support.

Many citizens would either be unconcerned or support maximum salt use guidelines.

The fear of tort litigation occursfor many commercial applicators. This measure provides some background information for tort litigation defense.

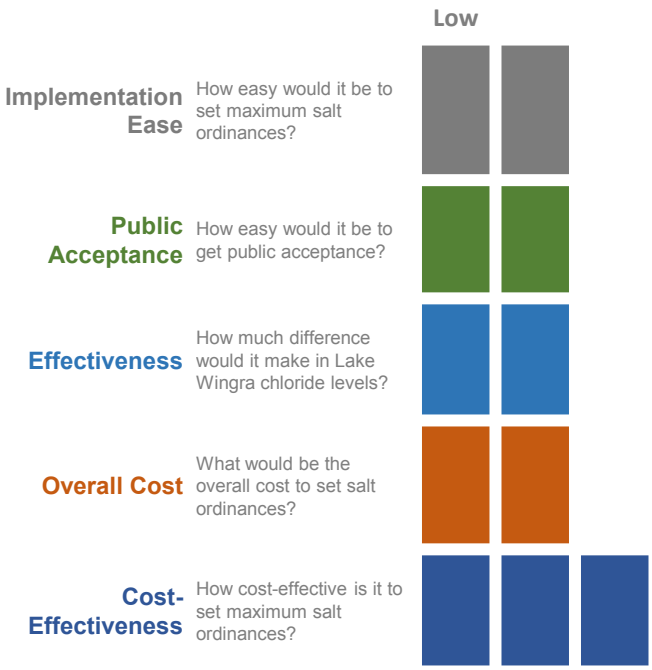
The cost of implementing this measure is low. There would be a cost savings due to less salt being used.

It is very cost-effective to use less salt and get satisfactory results.

This measure seeks to establish maximum salt use guidelines for either the City of Madison, Dane County, or both. The fear of tort litigation is a factor in the amount of salt commercial applicators use. While not binding, guidelines could help change expectations and provide background information in tort litigation.

http://www.chrisfosscontractor.com/snowremoval.php

Establish Maximum Salt Ordinances



This measure would require drafting the ordinance and gaining support from government bodies, which could be challenging. Additionally, enforcement would be difficult.

Many would support this stewardship measure. However, mandatory measures could provoke push-back from community members.

The fear of tort litigation occurs for many commercial applicators. This measure provides application justification for tort litigation defense.

The cost of implementing this measure is low – amounting to the costs of public information materials and meetings. Enforcing this measure would be challenging.

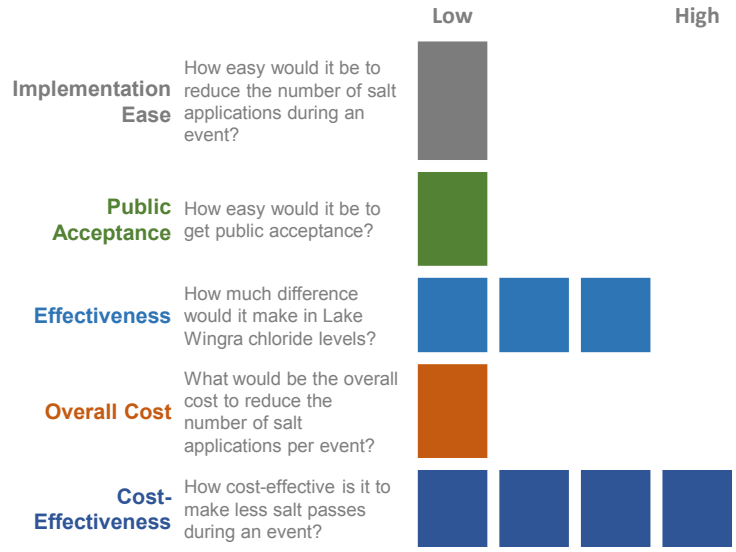
There would be a cost savings when using less salt per event.

This measure seeks to establish maximum salt use ordinances for either the City of Madison, Dane County, or both. The fear of tort litigation is a factor in the amount of salt commercial applicators use. These ordinances would help shift public opinion on acceptable winter management practices. They would also provide better background information for tort litigation.

http://www.wbez.org/series/curious-city/how-much-road-salt-ends-lake-michigan-109814

Municipal Based Initiatives
Salt Reduction

Reduce Number of Salt Applications per Snow Event

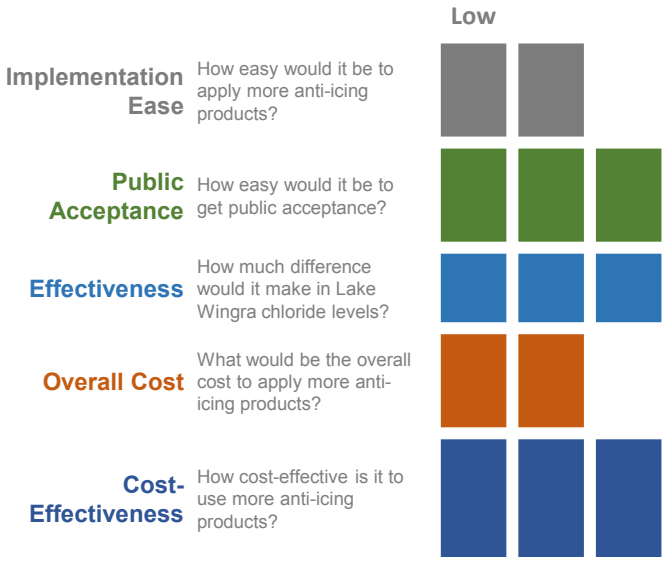


This initiative would reduce the number of salt applications per event by local governments. Currently up to 35 percent of the salt reaching Lake Wingra originates from Madison Salt Routes and about 11 percent originates from County-maintained routes, such as the Beltline. Both governments are trying to reduce salt use. Reducing the number of salt applications per event would need several coordinated efforts to be effective. These include:

- Potentially expanding the practice of anti-icing
- Exploring the use of alternative deicers
- Changing/reducing public expectations

All of these measures include their own challenges.

Expand Practice of Anti-Icing



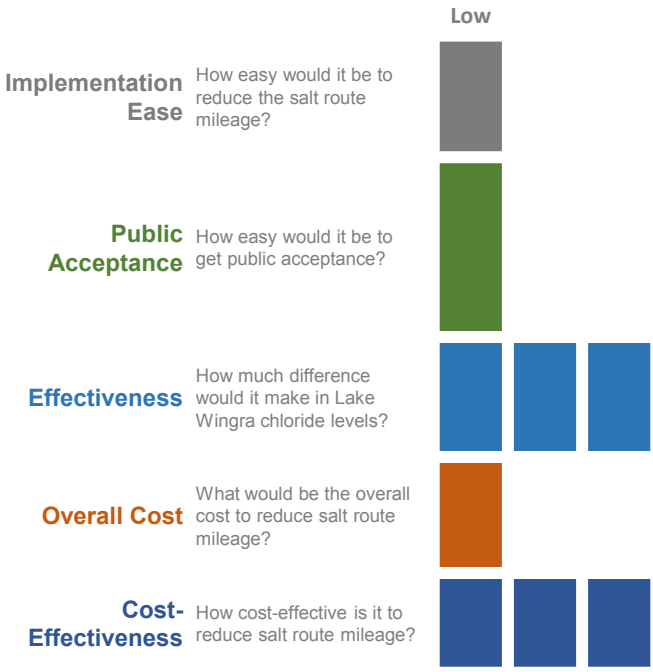
Anti-icing is the practice of spraying a salt brine on pavements in advance of a winter storm. It helps prevent ice and snow from fusing to the pavement, and operators say it helps them get ahead of the storm. Madison and Dane County already use anti-icing equipment, and Madison is in the process of purchasing more anti-icing equipment. This initiative would purchase more equipment and expand the practice to include more streets.

http://www.ci.janesville.wi.us/index.aspx?page=425

Apply anti-icing liquid before storm events to reduce amount of salt needed for winter maintenance

Municipal Based Initiatives
Salt Reduction

Reduce Salt Route Mileage



Changing public expectations for clear pavement is a significant implementation barrier.

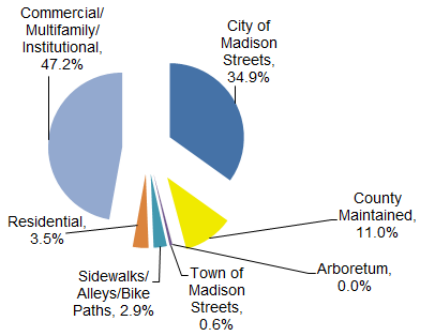
Citizens have expectations of cleared winter pavements. These expectations have risen during the last several decades. The majority of complaints to the streets department have to do with too little salt being applied, rather than too much salt being applied.

Almost half of the salt reaching Lake Wingra comes from city- and county-maintained streets. Reductions in salt route mileage would directly reduce lake chlorides.

Current salt routes could be changed to sand routes. Sand is less expensive than salt.

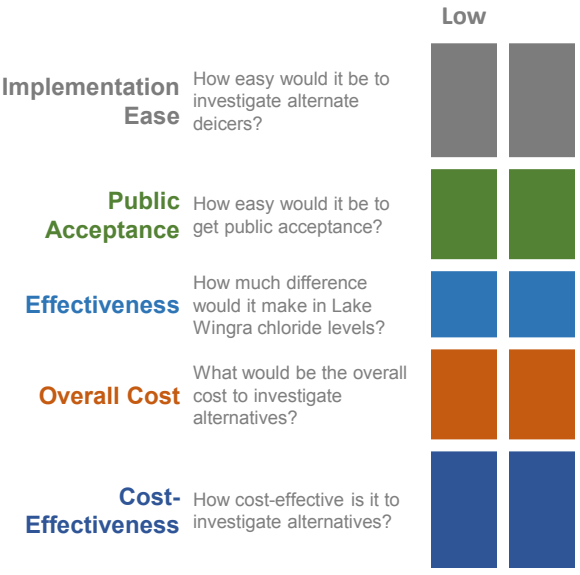
It is cost-effective to reduce salt route mileage and get satisfactory results.

Madison's most traveled collectors and arterials are designated salt routes. All other streets, primarily residential, are plowed and sanded. This initiative would convert some currently designated salt routes to sand routes for winter maintenance. For this measure to be implementable, public expectations regarding snow clearance on pavements would have to change.



Approximate Chloride Contributions 2006-2012

Use Alternate Deicers



Depending on the type of deicer, different equipment may need to be purchased. Most deicers are more expensive than sodium chloride

Some deicers are more effective, yet more corrosive. Acetates and agricultural byproducts could detrimentally affect aquatic life.

Using other deicing products reduces the amount of chloride in the lake.

The cost of this initiative would include investing in the alternate deicers and equipment necessary for application.

While many deicers have lower melting temperatures, many are several times more expensive than salt.

Sodium chloride is the predominant deicer being used by the City of Madison as well as municipalities. There are many different deicers that could be used that would reduce chloride levels in Lake Wingra. Potential deicers and considerations are listed below:

- Inhibited Magnesium Chloride – lower melting temperature yet more expensive and more corrosive.
- Calcium Chloride – lower melting temperature, three times more expensive.
- Potassium Acetate – lower melting temperature, can lead to oxygen depletion in soil and water bodies.
- Calcium Magnesium Acetate – similar melting temperature, twenty times more expensive, can lead to oxygen depletion in soils and water bodies.
- Agricultural byproducts (beet juice and others) – often mixed with anti-icing brine, may increase residual retention time, can create a substantial oxygen demand in water bodies.

http://www.deeproot.com/blog/blog-entries/deicing-with-beet-juice

Infiltration Initiatives

Community Based Measures

- Downspouts
- Rain gardens
- Rain barrels
- Permeable pavements

Project Based Measures

- Infiltration basins
- Bioretention ponds/Bioswales
- Terrace rain gardens
- Green streets/permeable pavements

Community Based Measures
Infiltration

Private Commercial Rain Gardens

Implementation Ease	How easy would it be to find 60 private commercial properties agreeing to participate?	Finding agreeable property owners may be challenging but only 11% of the total nonresidential parcels in the watershed are needed.
Public Acceptance	How easy would it be to get public acceptance?	Most citizens would support this initiative once they are informed of the advantages.
Effectiveness	How much stormwater (ft^3) will infiltrate at 0.5 in/hour? (130,680 ft^3/yr; Range: 0.13 to 1.1 million ft^3/year)	The rain gardens will infiltrate 130,680 ft^3 of stormwater per year.
Overall Cost	What would be the overall construction cost?	The cost of the rain gardens is relatively low and requires minimal maintenance once installed.
Cost-Effectiveness	How cost-effective is it to implement the program? ($0.16/$ft^3$: Low-$0.36/ft^3 to High-$0.04/$ft^3$)	Minimal cost-effectiveness.

Up to 60 private commercial rain gardens would be implemented. This would entail rerouting 25% of a building's roof area to a rain garden. Opportunities exist for reduced cost native plants through Dane County's Plant Dane program. Rain garden average size would be around 225 square feet (15 feet x 15 feet).

Land Use	Parcels in the Watershed	Rooftop Area (acres)
Residential (Single-Family and Duplex)	4,620	183
Nonresidential (Commercial, Business, Institutional, and Multi-family Residential)	460	178

Porous Pavement-Commercial

Implementation Ease	How easy would it be to find 8 commercial properties willing to install porous pavement?	Installing porous pavement could be an incentive to promote redevelopment in the area.
Public Acceptance	How easy would it be to get public acceptance?	Porous pavement is visually pleasing and helps reduce ponding of water on sidewalks and parking lots.
Effectiveness	How much stormwater (ft^3) will infiltrate at 0.5 in/hour? (888,600 ft^3/yr; Range: 0.13 to 1.1 million ft^3/year)	Porous pavement provides 888,600 ft^3 of infiltration/year.
Overall Cost	What would be the overall cost to install this pavement?	The cost of porous pavement is high compared to other infiltration facilities.
Cost-Effectiveness	How cost-effective is it to implement the program? ($0.18/$ft^3$: Low-$0.36/ft^3 to High-$0.04/$ft^3$)	Porous pavement is a more costly alternative but is necessary to reach the short-term infiltration goal.

Up to 4 acres of porous pavement serving 12 acres of drainage area would be implemented. This would entail retrofitting commercial, business, or institutional parking lots. Opportunities exist for cost sharing through the WDNR's Urban Nonpoint Source grant program and Dane County's Urban Water Quality grant program. An equivalent of 8 projects would be sought with a pervious pavement footprint of 150 feet x 150 feet, each.

Water quickly infiltrates through porous pavement.

Community Based Measures
Infiltration

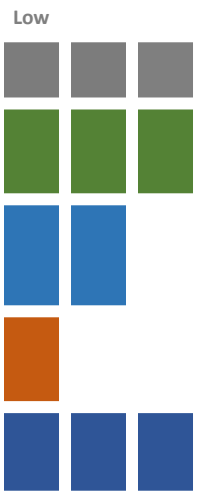
Downspout Disconnection Program

Implementation Ease	How easy would it be to implement this program?	Receiving 40% resident participation may take time.
Public Acceptance	How easy would it be to get public acceptance?	Generally, most citizens when informed of the advantages would support this initiative. May be concerns regarding basement flooding.
Effectiveness	How much infiltration would be created? (950,890 ft^3/yr; Range: 0.13 to 1.1 million ft^3/year)	This program redirects rooftop flow from entering the sewer system to being infiltrated through the ground and allows 950,890 ft^3/year of infiltration.
Overall Cost	What would be the overall cost to implement this program?	The cost of this initiative is relatively low – amounting to public education, information materials, and minor labor and materials.
Cost-Effectiveness	How cost-effective is it to implement the program? ($0.05/$ft^3$: Low-$0.36/ft^3 to High-$0.04/$ft^3$)	It is very cost-effective to implement this program for infiltration reductions but less so for phosphorus reductions.

Disconnecting downspouts is an easy process.

Forty percent of the homes in the watershed (1,617 homes) would be disconnected. This would entail rerouting 25% of a home's roof area to a turf area (i.e., 1 of 4 downspouts), rather than a paved area.

Rain Barrel Program



Implementation Ease	How easy would it be to implement this program?	Receiving 25% resident participation may take time.
Public Acceptance	How easy would it be to get public acceptance?	Generally, most citizens when informed of the advantages would support and participate in this initiative.
Effectiveness	How much stormwater (ft^3) will infiltrate at 0.5 in/hour? (339,605 ft^3/yr; Range: 0.13 to 1.1 million ft^3/year)	This program allows infiltration of 339,605 ft^3 /year. Citizens would need to drain down the rain barrel periodically.
Overall Cost	What would be the overall construction cost?	The cost of this program is relatively low – amounting to public education, information materials, and minor labor and materials.
Cost-Effectiveness	How cost-effective is it to implement the program? ($0.06/$ft^3$: Low-$0.36/ft^3 to High-$0.04/$ft^3$)	It is a cost-effective measure to increase infiltration but less so to reduce TP levels.

Twenty-five percent of the homes in the watershed (1,155 homes) would be routed to a rain barrel. This would entail routing 25% of a home's roof area to a rain barrel (i.e., 1 of 4 downspouts).

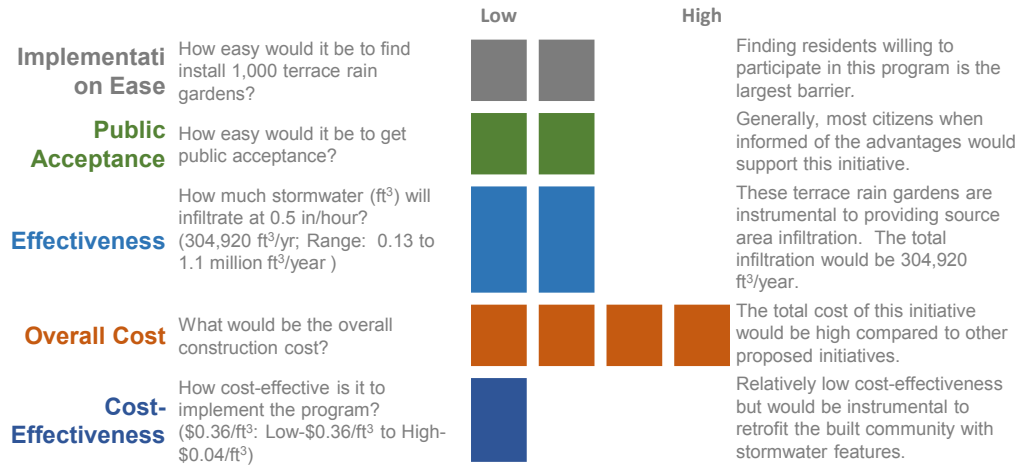
Community Based Measures
Infiltration

1,000 Terrace Rain Gardens

Up to 1,000 terrace rain gardens would be implemented. The City's terrace rain garden program requires a homeowner contribution of $500 on a terrace rain garden that generally costs about $1,400 to construct as part of a City reconstruction project. A homeowner can either have the City plant the rain garden or homeowner can do on their own. Opportunities exist for reduced cost native plants through Dane County's Plant Dane program. Maintenance of the terrace rain garden is homeowner responsibility. There are currently 12 terrace rain gardens in the Wingra Watershed.

http://www.cityofmadison.com/engineering/stormwater/raingardens/terraceraingardens.cfm

Residential terrace rain garden

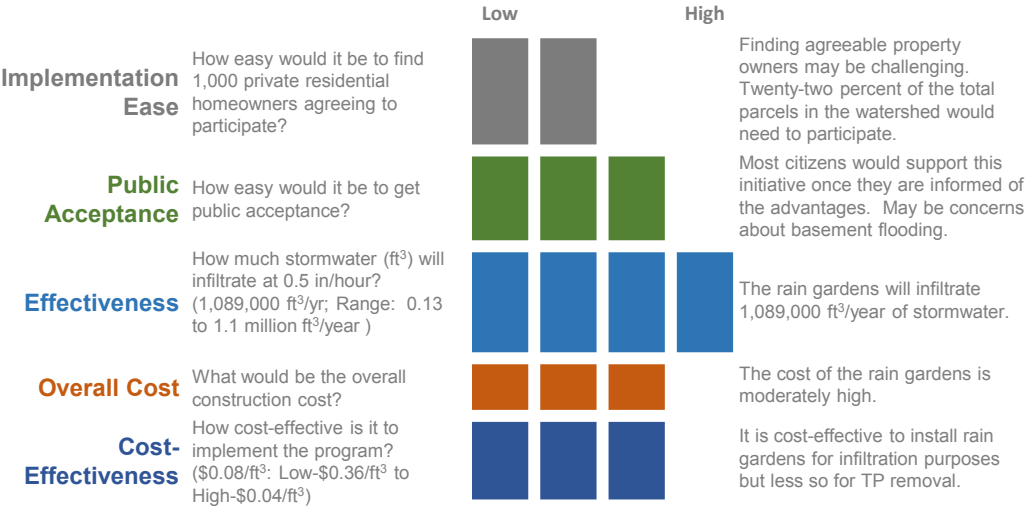


Private Residential Rain Gardens

Up to 1,000 private residential rain gardens would be implemented. This would entail rerouting 25% of a building's roof area to a rain garden (i.e., 1 of 4 downspouts). Opportunities exist for reduced cost native plants through Dane County's Plant Dane program. Rain garden average size would be around 120 square feet (10 feet x 12 feet). There are currently 65 existing private residential rain gardens in the Wingra Watershed.

http://www.cityofmadison.com/engineering/stormwater/raingardens/1000raingardens.cfm

Residential rain garden



Project Based Measures
Infiltration

Arbor Hills Infiltration Facility

Implementation Ease	How easy would it be to construct this infiltration facility?	This construction would have minimal traffic, bicycle, or pedestrian interruptions.
Public Acceptance	How easy would it be to get public acceptance?	Previous opposition to the project may deter implementation. Stormwater treatment and infiltration retrofit opportunity in the built environment important factor to consider where few large-scale opportunities exist.
Effectiveness	How much stormwater (ft^3) will infiltrate at 0.5 in/hour? (535,788 ft^3/yr; Range: 0.13 to 1.1 million ft^3/year)	This facility would provide 535,788ft^3 of infiltration/year.
Overall Cost	What would be the overall construction cost?	This facility has a large upfront cost.
Cost-Effectiveness	How cost-effective is it to implement the project? ($0.12/$ft^3$: Low-$0.36/ft^3 to High-$0.04/$ft^3$)	It is moderately cost-effective to pursue this facility but less so for phosphorus control.

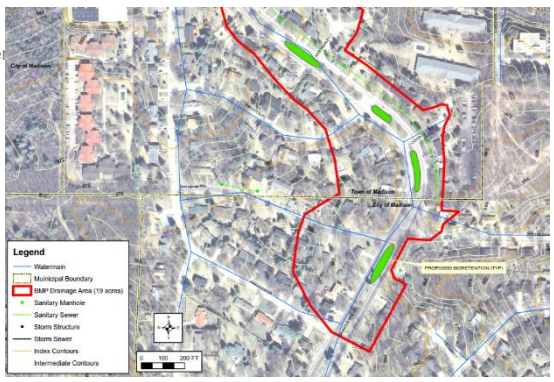
Located outside of the surface watershed but inside the groundwater watershed, this proposed facility would consist of 3 infiltration basins serving a 145-acre watershed. It would provide valuable stormwater for recharge of the groundwater aquifer and spring flow. Other than street sweeping and sumps, this 145-acre watershed currently discharges untreated stormwater to the storm sewer system. Opportunities for funding include the Dane County's Urban Water Quality grant program and the WDNR's Urban Nonpoint Source grant program.

Possible Arbor Hills Infiltration Facility

Grandview Boulevard Bioswales

Implementation Ease	How easy would it be to construct the bioswales?	Constructing the bioswales will cause minor disturbances in vehicle and bicycle traffic.
Public Acceptance	How easy would it be to get public acceptance?	Generally, most neighborhood residents when informed of the advantages would support this initiative. Much of the existing boulevard would remain unchanged.
Effectiveness	How much stormwater (ft^3) will infiltrate at 0.5 in/hour? (335,400 ft^3/yr; Range: 0.13 to 1.1 million ft^3/year)	These bioswales will infiltrate 335,400 ft^3/year.
Overall Cost	What would be the overall construction cost?	Cost is moderate compared to other opportunities.
Cost-Effectiveness	How cost-effective is it to implement the program? ($0.13/$ft^3$: Low-$0.36/ft^3 to High-$0.04/$ft^3$)	Cost-effectiveness is moderate for Infiltration compared to other opportunities less so for phosphorus.

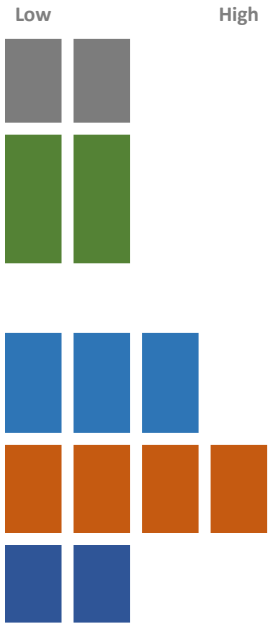
Other than street sweeping and sumps, this 19-acre watershed currently discharges untreated stormwater to the storm sewer system which drains through the UW-Madison Arboretum before reaching Lake Wingra. This proposed facility would consist of 5 bioretention basins depressed into the 40-foot-wide boulevard. It would provide valuable stormwater for recharge of the groundwater aquifer and spring flow. Opportunities for funding include the Dane County's Urban Water Quality grant program and the WDNR's Urban Nonpoint Source grant program.



Grandview Boulevard Bioswales

Project Based Measures
Infiltration

Glenway Golf Course Wet Pond and Infiltration



Implementation Ease — How easy would it be to construct the wet pond and infiltration facility?

This initiative would require significant design and relatively large construction costs. Access would be difficult.

Public Acceptance — How easy would it be to get public acceptance?

High effectiveness for infiltration and phosphorus may offset significant costs and other concerns. There may be concerns about basement flooding.

Infiltration:

Effectiveness — How much stormwater (ft^3) will infiltrate at 0.5 in/hour? (779,700 ft^3/yr; Range: 0.13 to 1.1 million ft^3/year)

This initiative provides 779,700 ft^3/year of infiltration.

Overall Cost — What would be the overall construction cost?

The cost of this initiative is high compared to other infiltration facilities.

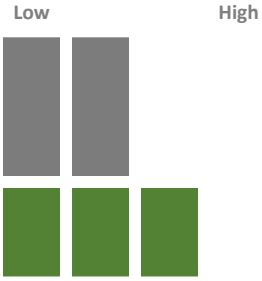
Cost-Effectiveness — How cost-effective is it to implement the project? ($0.13/$ft^3$: Low-$0.36/ft^3 to High-$0.04/$ft^3$)

Project is essential to meet short-term infiltration goal.

Similar to MG&E's Infiltration Facility in the Odana Hills Golf Course, this proposed facility would consist of a wet detention basin that would pretreat stormwater prior to pumping flows uphill to an underground infiltration facility. Other than street sweeping and sumps, this 159-acre watershed currently discharges untreated stormwater to Lake Wingra. Opportunities for funding include the Dane County's Urban Water Quality grant program and the WDNR's Urban Nonpoint Source grant program.

Possible Glenway Golf Course Wet Pond and Infiltration

Monroe St. Reconstruction with Green Features



Implementation Ease — How easy would it be to do this construction?

Project is currently in design phase. Construction of project is budgeted for by city in 2017. Pavement/Utilities replacement only in Wingra Watershed portion of the project.

Public Acceptance — How easy would it be to get public acceptance?

The public would gain aesthically pleasing features, as well as improved roadways and sidewalks.

Infiltration:

Effectiveness — How much stormwater (ft^3) will infiltrate at 0.5 in/hour? (226,500 ft^3/yr; Range: 0.13 to 1.1 million ft^3/year)

The reconstruction would provide 226,500 ft^3/year of infiltration.

Overall Cost — What would be the overall cost to complete this construction?

Incorporation of green features into a project that is already going to occur keeps the cost to a moderate level.

Cost-Effectiveness — How cost-effective is it to implement the program? ($0.18/$ft^3$: Low-$0.36/ft^3 to High-$0.04/$ft^3$)

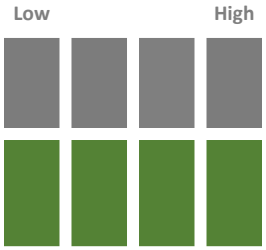
Low cost-effectiveness for infiltration and moderate cost-effectiveness for phosphorus but minimal opportunities for retrofit elsewhere.

Reconstruction of Monroe Street provides an opportunity to incorporate green features (bioretention, porous pavement) within the street right-of-way. Narrow right-of-way limits the opportunities.

Example of street reconstruction with green features

Project Based Measures
Infiltration

Devolis Park Bioretention Facility

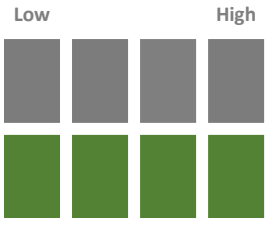


Implementation Ease	How easy would it be to construct the bioretention facility?	This facility has minimal effect on vehicle and bicycle traffic.
Public Acceptance	How easy would it be to get public acceptance?	Generally, most citizens when informed of the advantages would support this initiative. Loss of trees a concern but may be able to work around some of the trees.
Infiltration:		
Effectiveness	How much stormwater (ft^3) will infiltrate at 0.5 in/hour? (248,300 ft^3/yr; Range: 0.13 to 1.1 million ft^3/year)	This bioretention facility will provide infiltration of 248,300 ft^3/year.
Overall Cost	What would be the overall cost to install this facility?	Relatively low cost compared to other proposed infiltration facilities.
Cost-Effectiveness	How cost-effective is it to implement the project? ($0.10/$ft^3$: Low-$0.36/ft^3 to High-$0.04/$ft^3$)	It is cost-effective to construct this facility.

Located outside of the surface watershed but inside the groundwater watershed, this proposed facility would consist of a 115-foot by 115-foot bioretention basin. It would provide valuable stormwater for recharge of the groundwater aquifer and spring flow. Other than street sweeping and sumps, this 11-acre watershed currently discharges untreated stormwater to the storm sewer system. Opportunities for funding include the Dane County's Urban Water Quality grant program and the WDNR's Urban Nonpoint Source grant program.

East side of Devolis Park

Westmorland Park Bioretention Basin



Implementation Ease	How easy would it be to convert the proposed area to a bioretention basin?	This bio-basin expansion is a relatively straightforward construction project with minimal traffic interruptions.
Public Acceptance	How easy would it be to get public acceptance?	Generally, most citizens when informed of the advantages would support this initiative.
Infiltration:		
Effectiveness	How much stormwater (ft^3) will infiltrate at 0.5 in/hour? (431,200 ft^3/yr; Range: 0.13 to 1.1 million ft^3/year)	This bioretention basin expansion will increase infiltration by 431,200 ft^3/year.
Overall Cost	What would be the overall construction cost?	Comparably, this expansion is a low cost improvement.
Cost-Effectiveness	How cost-effective is it to implement the project? ($0.04/$ft^3$: Low-$0.36/ft^3 to High-$0.04/$ft^3$)	It is cost-effective to construct this facility.

Eighty-six acres of this 159-acre watershed currently discharge to an existing bioretention basin in Westmorland Park. This depressional area presents an opportunity to expand the facility. Opportunities for funding include the Dane County's Urban Water Quality grant program and the WDNR's Urban Nonpoint Source grant program.

Westmorland Park-General location of existing bioretention basin.

Phosphorus Reduction Initiatives

Management Based – Non-Structural BMPs

- Modified leaf collection methods
- Modified street sweeping
- Wetland harvesting
- Waterfowl management

Enforcement Based – Non-Structural BMPs

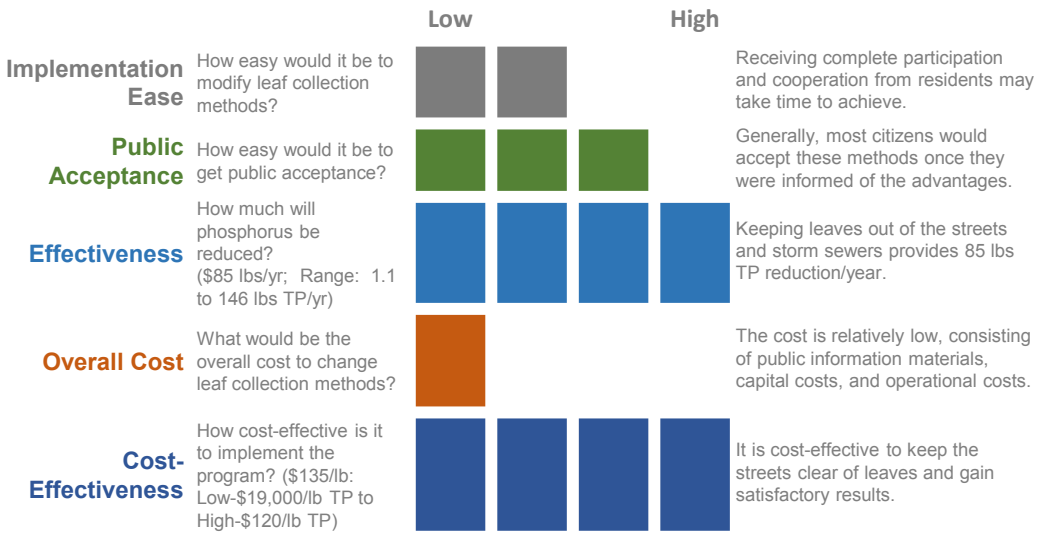
- Construction site erosion
- Pet waste

Basin Based – Structural BMPs

- Constructing basins
- Alum treatment
- Streambank restoration

Management Based Measures
Phosphorus Reduction

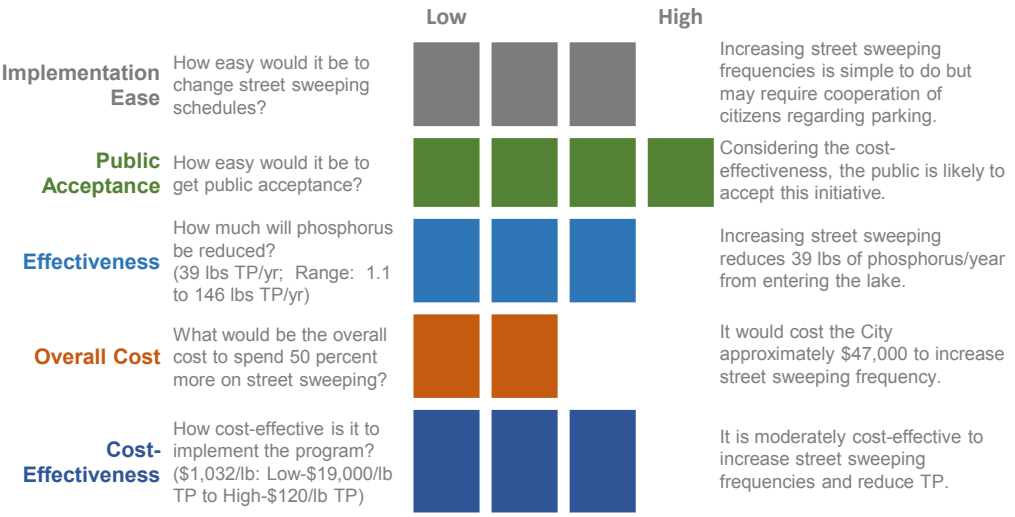
Modified Leaf Collection Methods



The City of Madison and Friends of Lake Wingra, as part of the Wingra Watershed Plan, are performing a Leaf Collection Pilot Project north of the Odana Golf Course in 2014 and 2015. In 2014, this pilot project sought to improve both the notification of and management of leaves by residents. In 2015, the pilot project will further improve notification of residents and provide bags for bagging of leaves. Both initiatives are intended to improve leaf collection methods and reduce phosphorus loads to the lake with the potential to expand the pilot to a larger area.

Fall Leaf Collection using compostable paper bags

Modified Street Sweeping Methods/Schedule



Studies show that targeted street sweeping can provide significant phosphorus load reductions in consideration of the following.

- Phosphorus-laden pollen/buds in the spring.
- Higher phosphorus loads in commercial/business areas.
- Timing of street sweeping considering weather.
- Fall sweeping alongside leaf collection.

Enhancing current street sweeping efforts is a cost-effective means of decreasing phosphorus loads to the lake.

Street Sweeper

Management Based Measures
Phosphorus Reduction

Wetland Harvesting

Implementation Ease	How easy would it be to harvest wetlands?	This initiative is likely to gain public approval but does involve additional maintenance commitments.
Public Acceptance	How easy would it be to get public acceptance?	Most citizens would support this initiative once informed on the numerous advantages. Timing is critical to avoid wildlife impacts.
Effectiveness	How much will phosphorus be reduced? (41 lbs/yr: Range: 1.1 to 146 lbs TP/yr)	Harvesting will reduce TP by 41 lbs/year as well as improve stormwater quality.
Overall Cost	What would be the overall cost of harvesting wetlands?	The cost would include the purchase of necessary equipment and labor.
Cost-Effectiveness	How cost-effective is it to implement the program? ($119/lb; Low-$19,000/lb TP to High-$120/lb TP)	It is very cost-effective to reduce TP while enhancing wildlife habitat and improving stormwater quality.

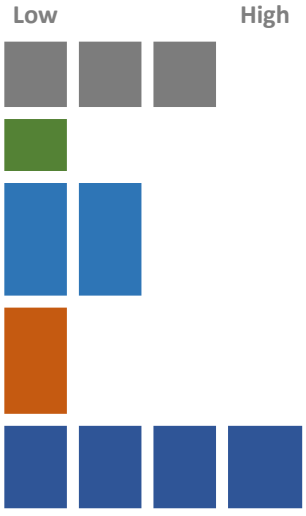
Wetlands clean stormwater, provide green space in an urban environment, and provide wildlife habitat. The accumulation of phosphorus in the wetland soils occurs as the wetland cleanses stormwater. Some of this phosphorus is taken up by wetland plants, which provides an opportunity to lower the level of phosphorus in the soil by "mining down" soil phosphorus levels through harvesting the plants. Harvested plants could be beneficially reused by a biomass aggregator (e.g.: Virent, Inc.) or other end user.

This initiative proposes to harvest 20 percent (4.6 acres) of the 23 acres of wetlands that surround Lake Wingra.


Canadian researcher Richard Grosshans built this cattail harvester that's towed by an 8-wheel Argo amphibious vehicle.

Cattail Harvester

Waterfowl Management



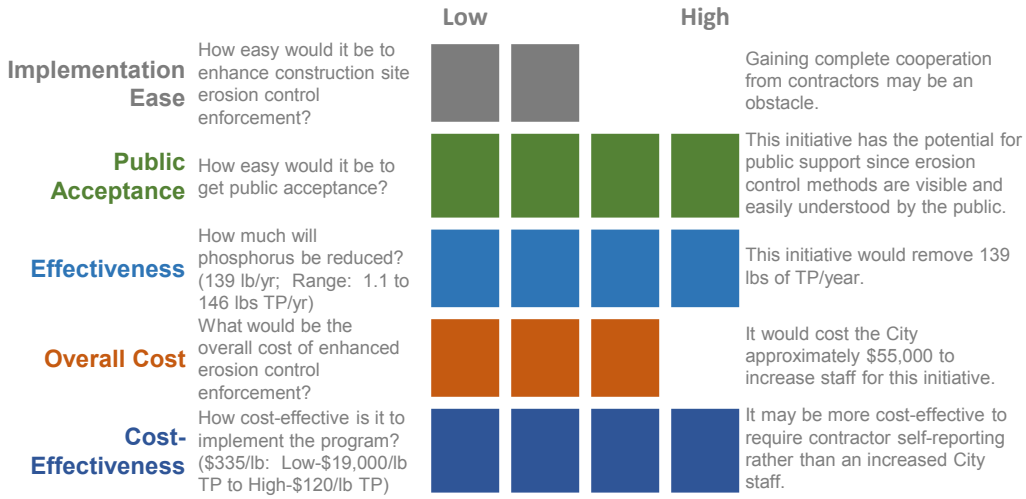
Implementation Ease	How easy would it be to manage geese?	This initiative would be easy to implement, public opposition notwithstanding.
Public Acceptance	How easy would it be to get public acceptance?	This initiative has the potential for public opposition.
Effectiveness	How much will phosphorus be reduced? (9 lb/yr; Range: 1.1 to 146 lbs TP/yr)	Goose droppings contain a small amount of phosphorus; therefore, a large number of geese would need to be managed. Fifty geese managed equals 8.5 lbs TP/year.
Overall Cost	What would be the overall cost to actively manage geese?	The cost is low for managing 50 geese but a larger number of geese to be managed is most likely necessary for significant reductions.
Cost-Effectiveness	How cost-effective is it to implement the program? ($119/lb: Low-$19,000/lb TP to High-$120/lb TP)	This is a very cost-effective means to achieve phosphorus reductions.

Active management of geese or other waterfowl is an effective strategy to remove what might be considered a nuisance, to reduce bacteria levels near beaches, and to reduce phosphorus loads to the lake. The City of Madison actively managed 200 geese in the summer of 2011 with some level of public opposition. One measure being considered is to actively manage up to 50 geese per year in the Wingra Watershed.

Geese along the shore of Lake Wingra

Enforcement Based Measures Phosphorus Reduction

Construction Site Erosion Control Enforcement



Significant amounts of sediment and phosphorus are released from construction sites when erosion control provisions are not properly installed and maintained. From 2009 to 2013, an average 12.3 acres were disturbed on construction sites in the Wingra Watershed.

In 2014, the City of Madison piloted an enhanced compliance monitoring program in areas of the City draining to the Yahara River through a 2013 MMSD Yahara WINs grant, including lands in the Wingra Watershed. Under this initiative, the pilot would be implemented and expanded specifically in the Wingra Watershed.

Inlet protection prevents sediment from entering the storm sewer system.

Pet Waste Enforcement

Although our citizens already do a very good job of collecting pet waste in the watershed, even further reduction could be seen through increased regulation/enforcement or improved access to pet waste disposal locations in popular dog walking areas. A stricter ordinance combined with better education, a convenient way to dispose of the waste, and enforcement could reduce phosphorus loadings significantly.

A social marketing campaign whereby public behaviors are changed may provide better cost-effectiveness than hiring enforcement staff.

Example Pet Waste Signage

Basin Based Initiatives
Phosphorus Reduction

Alum Addition to Marion Dunn and Manitou Ponds

Marion-Dunn Pond:

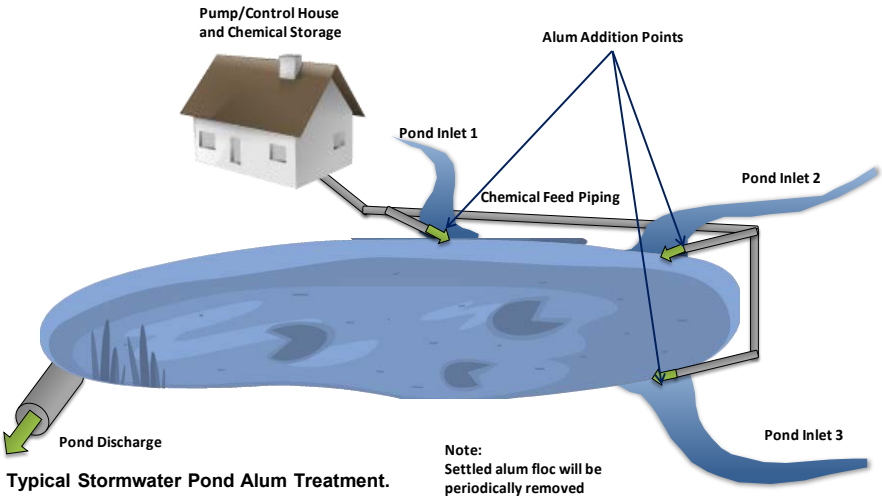
		Low – High	
Implementation Ease	How easy would it be to implement alum additions to these three ponds?	■ ■	Alum additions would require minor construction and pilot projects before it can be implemented in Lake Wingra.
Public Acceptance	How easy would it be to get public acceptance?	■ ■ ■	Most citizens, once informed of the advantages, would support this treatment.
Effectiveness	How much will phosphorus be reduced? (65 lb/yr; Range: 1.1 to 146 lbs TP/yr)	■ ■ ■ ■	Alum treatment removes large levels of phosphorus, as well as bacteria and dissolved and suspended solids.
Overall Cost	What would be the overall cost of the alum treatment?	■ ■	Alum treatment can be costly, including the construction of an alum dosing facility for each pond.
Cost-Effectiveness	How cost-effective is it to implement the project? ($557/lb: Low-$19,000/lb TP to High-$120/lb TP)	■ ■ ■	Even with a higher cost, alum treatment is cost-effective when looking at long-term benefits.

The City of Madison is currently undertaking the Marion-Dunn Pond Alum Treatment Pilot Project. Alum is a coagulant often used for coagulation, flocculation, and settling in drinking water and wastewater treatment processes. Alum treatment of stormwater has been used in Florida at over 60 locations. This method of treatment enhances a wet detention basin's ability to remove phosphorus.

City of Madison's Alum Treatment Pilot Project Marion-Dunn Pond

Manitou Pond:

		Low – High	
Implementation Ease	How easy would it be to implement alum additions to these two ponds?	■ ■	Alum additions would require minor construction and pilot projects before it can be implemented in Lake Wingra.
Public Acceptance	How easy would it be to get public acceptance?	■ ■ ■	Most citizens, once informed of the advantages, would support this treatment.
Effectiveness	How much will phosphorus be reduced? (139 lb/yr; Range: 1.1 to 146 lbs TP/yr)	■ ■ ■ ■	Alum treatment removes large levels of phosphorus, as well as bacteria and dissolved and suspended solids.
Overall Cost	What would be the overall cost of the alum treatment?	■ ■ ■	Alum treatment can be costly, including the construction of an alum dosing facility for each pond.
Cost-Effectiveness	How cost-effective is it to implement the project? ($293/lb: Low-$19,000/lb TP to High-$120/lb TP)	■ ■ ■ ■	Even with a higher cost, alum treatment is cost-effective when looking at long-term benefits.

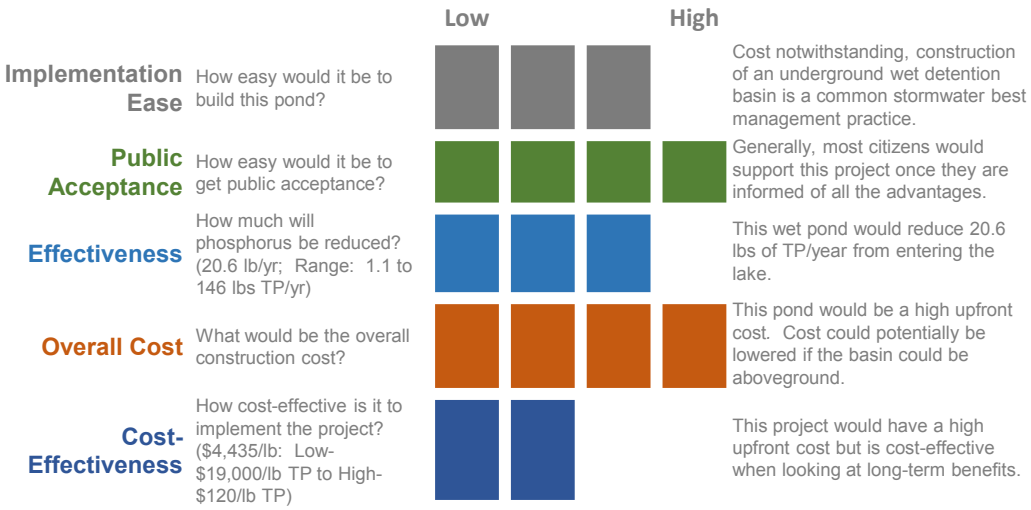


Typical Stormwater Pond Alum Treatment.

Note:
Settled alum floc will be periodically removed and land applied.

Basin Based Initiatives
Phosphorus Reduction

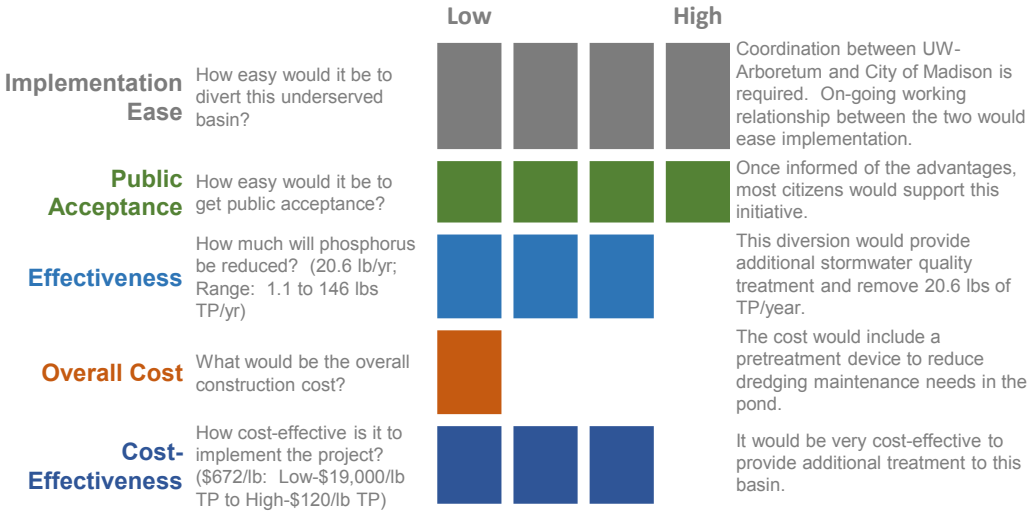
Wingra Park Wet Pond



Other than street sweeping and sumps, this 112.5-acre watershed currently discharges untreated stormwater to Lake Wingra. The opportunity exists to provide an underground wet detention basin in the park treating up to a 2-year storm event. Being an underground basin, it will not be visible in the park but will provide valuable stormwater treatment prior to discharge to the lake. Opportunities for funding include the Dane County's Urban Water Quality grant program and the WDNR's Urban Nonpoint Source grant program.

Open area in Wingra Park.

Diversion of Basin to Manitou Pond

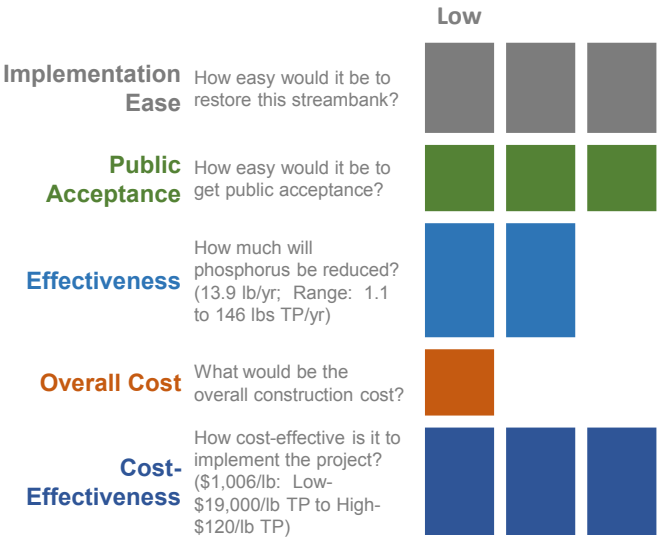


Other than street sweeping and sumps, this 121-acre watershed currently discharges untreated stormwater to the UW-Madison Arboretum and Lake Wingra. With the construction of the Manitou Pond and Channel Restoration in 2011, the opportunity exists to divert low flows from this watershed to Manitou Pond for treatment. This would entail installing a diversion structure, a stormwater pretreatment device, and diversion pipe to divert flows. Flows larger than a 2-year storm event would continue to discharge along the channel on the north side of Nakoma Golf Course. Opportunities for funding include the Dane County's Urban Water Quality grant program and the WDNR's Urban Nonpoint Source grant program.

Manitou Pond constructed in 2011.

Basin Based Initiatives
Phosphorus Reduction

Streambank Restoration at Henry David Thoreau School



Access to the project may be difficult. City of Madison has already budgeted for construction of this project.

Generally, once informed of the advantages, most citizens would support this initiative.

The restoration would provide a direct TP reduction of 13.9 lbs/year to Manitou Pond, which ultimately reduces the TP in Wingra.

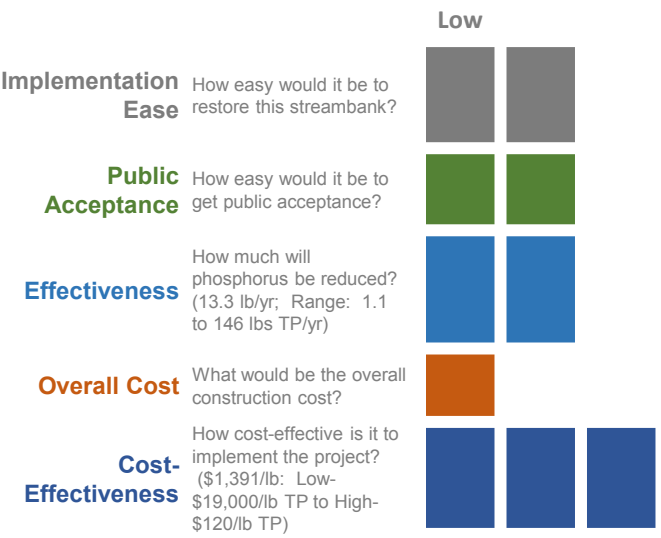
The cost is relatively low compared to other proposed initiatives.

Upfront costs offset by low long-term costs making it cost-effective for the long-term.

Streambank erosion along Cherokee Drive (Thoreau Elementary School Property)

Length of Streambank Restored = 850 lf
TP Reduction = 13.9 lbs
Eroding streambanks would be stabilized and restored with native vegetation and hard armoring, as appropriate.

Streambank Restoration on Cherokee Drive



Easy access to channel for construction purposes. Saving existing vegetation for screening purposes may be difficult.

Generally, once informed of the advantages, most citizens would support this initiative.

The restoration would provide a direct TP reduction of 13.3 lbs/year to Manitou Pond, which ultimately reduces the TP in Lake Wingra.

The cost is relatively low compared to other proposed initiatives.

Upfront costs offset by low long-term costs making it cost-effective for the long-term.

Streambank erosion along Cherokee Drive (Yuma Drive to Chippewa Drive)

Length of Streambank Restored = 1,080 lf
TP Reduction = 13.3 lbs
Eroding streambanks would be stabilized and restored with native vegetation and hard armoring, as appropriate.

Restored Stream Channel downstream of Manitou Pond

APPENDIX F
PIM AND REPORT COMMENTS RESPONSE

Appendix F1
Wingra Watershed Plan
Public Involvement Meetings (PIMs) Comments-Strand Response
10/20/15

3/26/15 Meeting	Comment	Catalyst Team Address	Strand Report Address/How?	Supportive of TP Alternative #	Non-supportive of TP Alternative #
Chlorides	1. Residential Salt Reduction • Advertising on salt containers is deceptive. (Should there be regulations on that?) • What does governance mean? Responding to constituent complaints, or doing what is right for the City • Salt burns dog's feet	Yes	Comment acknowledged and catalyst teams to further consider.	N/A	N/A
	2. Certification for Commercial Salt Applicators • Certification is good and should be required, not voluntary. • There should be maximum salt application rates (how to enforce?). • New Hampshire tried to enact certification/maximum rates, and the bill provided immunity to certified winter maintenance contractors. The bill did not pass, but the concepts were good. • Property management companies might be able to circumvent the certification requirements since they are just maintaining their own properties.	Yes	Comment acknowledged and catalyst teams to further consider.	N/A	N/A
	3. Required certification for Winter Maintenance Contractors working on Government Properties • (Note: on city streets contractors only plow, they do not place materials). • A pilot program would be good. By doing the pilot program, success could be documented and used to build support for broader implementation. • Certified contractors should have different performance standards. Instead of (or in addition to) clearing pavements, there should be a stewardship ethos.	Yes	Comment acknowledged and Catalyst Teams to further consider.	N/A	N/A
	4. Reduce the number of salt applications per event • There should be a date limit on when salt can be applied - for instance no salt after March 1. • Need more public announcements/information to moderate driver expectations. • Education is key. • When complaints are made regarding snow removal, there should be follow-i with information regarding how salt affects our lakes and subsurface waters.	Yes	Additional text regarding public education was incorporated in Section 5.08.	N/A	N/A
	5. Alternate De-Icers • Before there is a discussion, should differentiate between biological and nonbiological deicers. • When FOLW helped scope the Watershed Plan, they wanted bold action. This discussion seems a justification of existing actions. What would it take for bold action? The status quo is not OK - how can this be much more aggressive?	Yes	Section 2.05 contains information regarding different deicers and differentiates between biological and nonbiological deicers. Comment acknowledged. Continued community advocacy before elected and appointed officials will help shape priorities and management measures.	N/A	N/A
	6. Maximum Salt Guidelines and Ordinances • Great idea - but how to enforce? • Should consider building support first. Moves that are too aggressive maybe could be overturned by the legislature.	Yes	Comment acknowledged. Additional text added to Section 5.08.	N/A	N/A
Infiltration	1. Porous Pavement and Infiltration • MG&E, as part of its cogeneration permit, was supposed to infiltrate 50,000,000 gallons a year. That has not been met (due to chlorides in the winter months). That requirement should still be enforced; MG&E should not get a pass. • What incentive could be used for porous pavement. • People that install rain gardens, porous pavement, etc. should get a credit toward it on their stormwater bill. Currently they are treated the same.	Yes	Comment acknowledged and discussed in Section 3-Infiltration (Sections 3.03 H. 4, 3.03 I. 3, and 3.04 B.).	N/A	N/A

3/26/15 Meeting	Comment	Catalyst Team Address	Strand Report Address/How?	Supportive of TP Alternative #	Non-supportive of TP Alternative #
Phosphorus	1. Leaf Collection • Why doesn't the city use leaf vacuums? • What are the environmental effects of bags. Is there a method that does not require a manufactured product that consumes resources. • Can covering the leaves with a tarp produce the same effects? • Communication of pickup times is key.	Yes	Comment discussed in Section 4-Phosphorus (Sections 4.04 B. 5.).	N/A	N/A
	2. Street Sweeping • Winter parking regulations should be in effect all year to support the street sweeping effort (note - city supports - it's part of the clean streets program). • Enact winter parking restrictions year-round in areas where there are not ponds.	Yes	Comment discussed in Section 4-Phosphorus (4.04 B. 6.).	N/A	N/A
	3. Wetland Harvesting • Great idea - wetlands can be a source of phosphorus. • We have UW here, what if we tried floating eco-islands that collect phosphorus and then harvested the islands? • What happens to the harvested wetland materials?	Yes	Comment acknowledged and Catalyst Teams to further consider.	Alternative 5	N/A
	4. Alum Treatment • What problems will it cause, introducing a chemical into a natural system. • It's a proven technology that's been around for quite a while. Florida uses it extensively. • Where does the dredged sediment go that has the alum (Dane County Landfill).	Yes	Comment acknowledged and Catalyst Teams to further consider.	Alternatives 2 and 3	N/A
	5. Wet Ponds • It's one thing to build them, but then the city has to commit to maintaining them.	Yes	Comment acknowledged and Catalyst Teams to further consider.	N/A	N/A
	6. Diversion of Basin to Manitou Pond • Could stormwater utility funds be used for this measure?	Yes	Comment acknowledged and Catalyst Teams to further consider.	N/A	N/A

6/24/15 Meeting	Comment	Catalyst Team Address	Strand Report Address/How?	Supportive of TP Alternative #	Non-supportive of TP Alternative #
General	1. General • Is the City working with the County on this plan? Seems like the County has its own phosphorus goals. • How much of the sand mixture that Madison uses is salt? • One resident said her biggest concern is infiltration because of the upcoming Monroe Street reconstruction project and redevelopments along the corridor.	Yes	Note: The Catalyst groups set up in a manner so as to foster interaction with County.	N/A	N/A
	2. Strand Draft Report • In report and during presentation to City, provide a more-comprehensive statement of need that sets the stage for efforts in the watershed. FOLW's Vision for the Future does a nice and comprehensive job of this.	No	Strand will expand on statement of need in Section 1-Introduction while referencing FOLW document. Strand will also provide an executive summary that also highlights the need.	N/A	N/A
	3. Watershed Sustainability Audit/BMP Synergy/Rallying of Residents • Much like an energy audit conducted by MG&E, one social marketing strategy could be sending out letters offering volunteers/block leaders to perform watershed sustainability audits at residential or commercial properties. These audits would document things being done and things that could be done and possible incentives for their implementation.	Yes	Created Section 5.11 to discuss these ideas.	N/A	N/A

6/24/15 Meeting	Comment	Catalyst Team Address	Strand Report Address/How?	Supportive of TP Alternative #	Non-supportive of TP Alternative #
	• This effort would explain and promote the positive synergistic effect on Lake Wingra of multiple practices on-site as well as throughout the watershed. It would also connect their own source area controls to positive effect at Lake Wingra. • MLS Listings-It was suggested that MLS listings in the City should include what watershed the home is in as well as the closest watershed-related advocacy group. Greg thought that this information exists or could be added to the assessor's database. • Watershed Competitions-It was suggested that the various major watersheds in the City (Greg thought there was probably 10 of them) could annually compete in a competition of some sort to highlight watershed issues and accomplishments. Perhaps this could be done in combination with the Clean Lakes Alliance activities.				
Chlorides	1. Chlorides and Infiltration • It was discussed that the interrelationship between chlorides and infiltration should be further developed and explained.	Yes	The interrelationship between chlorides and infiltration is discussed in Sections 2.02 A. and 2.03 D.	N/A	N/A
	2. Maximum Salt Guidelines and Ordinances • It was discussed that the City didn't have the authority to do so but that the County might. This should be confirmed.	Yes	Comment acknowledged and Catalyst Teams to further consider.	N/A	N/A
	3. Maximum Salt Guidelines and Ordinances • It was discussed that the City didn't have the authority to do so but that the County might. This should be confirmed.	Yes	Comment acknowledged and Catalyst Teams to further consider.	N/A	N/A
Infiltration	1. Porous Pavement • One possible location for porous pavement is at the southern end of the Odana Hills Golf Course Parking lot (approximately one-half acre). Other prime locations are at parks and locations of overflow parking. • The City should develop a porous pavement program/strategy that incentivizes incorporation of porous pavement in redevelopment projects.	Yes	Comment is discussed in Section 3-Infiltration (3.03 I. 3.).	N/A	N/A
	2. Rain Barrels • One resident said that she just lets her rain barrel drain out because her system was too complex.	Yes	Comment acknowledged and Catalyst Team to further consider.	N/A	N/A
	3. Terrace Rain Gardens • Promotion–It was discussed that the City should improve its promotion of terrace rain gardens to residents, rather than only disseminating information regarding them. This could be a good social marketing strategy whereby neighborhood block leaders could canvas neighborhoods that are slated for street reconstruction. This year, the City prepared a map showing terraces that are conducive to terrace rain gardens to go along with its informational letter. The City could prepare this map for each street reconstruction project moving forward to assist block leaders in canvassing efforts. In general, it was thought that the City should be more persuasive/convincing in signing up residents for terrace rain gardens. It was suggested that all homes with feasible locations of rain gardens be required to have one such that a homeowner would have to opt-out in order to not have one. Because terrace rain gardens require homeowner maintenance, a revised promotion strategy should consider the possibility of maintenance not being completed by residents that have not fully bought in to having a terrace rain garden. Greg said that his department could determine the number of streets up for reconstruction in the next 20 years, when he was asked. The following timeline was also discussed. o Hold PIM for Street Reconstruction Project. o Send out flyer after PIM, inviting residents in the reconstruction area to a Neighborhood Association meeting where the City of Madison will present on Terrace Rain Gardens in more detail. o Block leaders canvas the reconstruction area promoting terrace rain gardens. • Incentive Program–The City's Terrace Rain Garden program currently requires 25% (up to $400) of the cost to be paid by the resident and the City pays the remaining 75%. In 2015, the $400 has been reduced to $100 resident contribution. • Ash Tree Removal–Removal of ash trees in City terraces creates additional opportunities for terrace rain gardens. 4. Redevelopment/Street Reconstruction Standards	Yes	Comment acknowledged and discussed in Section 3-Infiltration (3.03 I. 2.).	N/A	N/A

6/24/15 Meeting	Comment	Catalyst Team Address	Strand Report Address/How?	Supportive of TP Alternative #	Non-supportive of TP Alternative #
	• It was suggested that redevelopment and street reconstruction projects be required to provide infiltration.	Yes	Comment is discussed in Section 3-Infiltration (3.03 I. 9.).	N/A	N/A
Phosphorus	1. Leaf Collection • Could a leaf mulcher/bagger be owned by the Friends of Lake Wingra and rented out at the library? • Offer the local high schools the opportunity for students needing service hours to volunteer to bag leaves for elderly or disabled in the watershed.	Yes	Comment is discussed in Section 4-Phosphorus (4.04 B. 5.).	N/A	N/A

7/14/15 Meeting	Comment	Catalyst Team Address	Strand Report Address/How?	Supportive of TP Alternative #	Non-supportive of TP Alternative #
General	1. General				
	• It was suggested that the Wingra Watershed Plan be consistent with EPA requirements.	Yes	See Appendix D.		
	• Put map with leaders showing project locations.	No	Plan already includes call-outs of projects.		
	• Suggestion to include interpretive signage on all “structural” projects to engage the public. Reference was made to effective signage at Dunn’s Marsh.	Yes	Comment acknowledged and discussed in Section 3-Infiltration (3.03 I.) and Section 4-Phosphorus (4.04 B.).		
	• Suggestion to construct Watershed Boundary signs at numerous locations along the Wingra Watershed boundary.	Yes	Comment acknowledged and catalyst team to further consider.		
	• Suggestion to have City, Friends of Lake Wingra, or Strand give a summary of the Wingra Watershed Plan at neighborhood association meetings.	Yes	FOLW has already started doing this.		
	• Suggested using a recognition program for corporate Environmental stewardship.	Yes	Potential certification and recognition program discussed in Section 5.11		
Chlorides	1. Homeowner Education • The title “homeowner education” is flat; it needs to be more action-oriented. • There is a need to have a system of incentives and motivators to get it going. Providing information is not enough. • A campaign, similar to the pilot project measures, might be a good way to provide momentum. (But this takes resources.) • Add neighborhood associations to the information provision. • A YouTube video might be one communication method that could help. • There needs to be some information for snow removal geared toward homeowners. Most are not informed.	Yes	Title changed to Public Norm Changing in Section 5.08 C.3. of the report.	N/A	N/A
	2. Commercial Application Certification • Consider having a hotline to report overapplication. (But what is overapplication under today’s regulations?) • Is there a tracking mechanism to measure commercial salt application? Enforcement of ordinances could be difficult. • Any effort also needs to include property managers because many of them have their owner snow clearing crews. • Are site deficiencies contributing to salt overuse? For example, some commercial sites might have a specific area that ices up more frequently. • Property managers/owners need to be educated on winter maintenance contract setup. If applicators are paid per pound they apply to pavements, they have a monetary incentive to use extra salt. • A program that recognizes the environmental stewardship of commercial and rental properties might help. (Note - this type of recognition program has been considered in the draft report but was removed.)	Yes	Enforcement would be difficult and without an ordinance is a nonissue. Enforcement briefly discussed in Section 5.08.B. Winter maintenance contract setup is discussed in Sections 2.06, 2.08, and 5.08.B.	N/A	N/A

7/14/15 Meeting	Comment	Catalyst Team Address	Strand Report Address/How?	Supportive of TP Alternative #	Non-supportive of TP Alternative #
	3. Establishing Maximum Salt Guidelines • Perhaps consider the chloride contribution of salt storage facilities. Sometimes there is runoff from salt piles. • Guideline could consider being variable according to season - e.g., late winter/early spring would have more stringent guidelines because the melt off is likely to be sooner. Others countered that sometimes the worst ice conditions come late in the season - e.g., freezing rain. Guidelines based on conditions would be a better measure. • We should just adopt Minnesota's guidelines now and stop talking about it.		Potential certification and recognition program discussed in Section 5.11 Yes Comment acknowledged and Catalyst Teams to further consider.	 N/A	 N/A
	4. Establishing Maximum Salt Ordinance • Questionable as to whether the City has the legal authority to do it. The county may be able to implement. • Salt ordinances need to include storage and disposal guidelines. • There may be a safety and tort pushback(?) • In order to implement salt use ordinances, there needs to be data that supports the ordinances. Data/science based. • How to enforce? Very difficult to measure salt application without sweeping a parking lot. • Again, incentives and recognition may be as or more effective than ordinances.		Yes Comments acknowledged. Catalyst teams will need to explore legal authority for ordinances further. The challenges of enforcement are briefly discussed in Section 5.08.B. A potential certification and recognition program discussed in Section 5.11	N/A	N/A
	5. Reduce the Number of Salt Routes • Madison drivers would need to be "educated" to lower expectations. • There could be two tiers of salted routes, with one tier having less salt applied. Monroe Street could be a second tier salt route. • Group supported this initiative.		Yes Further public education, or norm changing, for salt use is discussed briefly in Section 5.08.C. Catalyst team would need to discuss feasibility of two-tiered salt route structure. Consideration of it added to Section 5.08.C. of the report.	N/A	N/A
	6. Use of Alternative Deicers • City should perform a pilot project on a nonstreet pavement, perhaps a parking lot. • Some opposed the measure. Alternate deicers will just present currently unknown problems in the future. We just need to kick the salt habit.		Yes Alternate deicers are discussed in Sections 2.05, 2.08, and 5.08. Pilot projects are discussed in Section 5.02 and 5.08.	N/A	N/A
Infiltration	1. Terrace Rain Gardens • General consensus that terrace rain gardens are a good thing. • Depress terraces when ash trees are removed. Ash tree removal provides synergies for expansion of the terrace rain garden program. Communication with the parks department would help expand this program. • Suggestion to have City provide a 10- to 15-minute presentation at neighborhood meetings.	Yes	Comment is discussed in Section 3-Infiltration (3.03 I. 2.).	N/A	N/A
Phosphorus	1. Leaf Collection • Suggestion to return to previous system with regularly scheduled leaf pickup. • Suggestion to use a vacuum system to better collect leaves with less disturbance to terraces. • Suggestion to have City shred leaves on-site for homeowner to reuse on-site. • Suggestion to have City or others provide on-site management training for leaf collection and yard BMPs. • Suggestion to inform public of the significant cost of leaf collection and that on-site management of leaves at a homeowner's property can reduce those costs.	Yes	Comment acknowledged and Catalyst Teams to further consider.	N/A	N/A
	2. Street Sweeper • Suggestion to have drivers go slower.	Yes	Comment acknowledged and Catalyst Teams to further consider.	N/A	N/A
	3. Wetland Harvesting • Sensitivity to the timing of the harvesting regarding wildlife impacts is necessary. • Align harvesting with invasive species control.	Yes	Comment is discussed in Section 4-Phosphorus (4.04 B. 8.).	N/A	N/A

7/14/15 Meeting	Comment	Catalyst Team Address	Strand Report Address/How?	Supportive of TP Alternative #	Non-supportive of TP Alternative #
	• Align program with harvestable buffer program regarding end-use of materials. • Potential to feed a biodigester.				
	4. Waterfowl Management • There are too many geese. • Use of actively managed geese at food pantries/soup kitchens needs to consider bioaccumulation of heavy metals in urban geese. • Suggested egg oiling as a less controversial method of waterfowl control.	Yes	Comment acknowledged and Catalyst Teams to further consider.	N/A	N/A
	5. Erosion Control • Promote and provide better details on the City's hotline for reporting erosion control concerns.	Yes	Comment acknowledged and Catalyst Teams to further consider.	N/A	N/A
	6. Pet Waste • Environmental concern with bagging of pet waste (i.e., bag and waste, not just waste). • Concerns regarding logistics of flushing pet waste down the toilet.	Yes	Comment is discussed in Section 4-Phosphorus (4.04 B. 7.).	N/A	N/A
	7. Wet Detention Basins • Comment that these were the most cost-effective in reducing phosphorus.	Yes	Comment acknowledged and Catalyst Teams to further consider.	Alternatives 1, 3, and 5	N/A
	8. Alum Treatment • At the Marion-Dunn alum treatment pilot project, a slight sulfur smell was reported but also less scum on the pond. • One attendee said that alum usage is a good idea.	Yes	Comment acknowledged and Catalyst Teams to further consider.	Alternatives 2 and 3	N/A
	9. Streambank Restoration • Suggestion to implement Regenerative Stormwater Conveyance (RSC) concepts similar to the City of Madison's recent project in Owen Park. This is a relatively new stormwater management concept consisting of a step pool conveyance system incorporating specially designed media (i.e.., wood chips and sand) focused on nutrient removal. • Glenwood Park–Streambanks in this park are in need of restoration. Consensus is needed on restoration technique.	Yes	Comment is discussed in Section 4-Phosphorus (4.04 B. 3.).	Alternatives 1, 3, and 5.	N/A

Appendix F2
Strand Responses to Comments on the Draft Final Report (DRAFT)
Lake Wingra Watershed Management Plan
10/20/15

Within this document are Strand responses to Perry Sandstrom, Jim Baumann, and David Liebl comments on Strand's 6/5/15 Lake Wingra Watershed Management Plan (Draft Final).

Perry Sandstrom (8/24/15 email)

"Hi David,
Thanks for the reminder!
One of the reasons I contacted the city was as public input to this report. I was concerned that there didn't seem to be any mention of the SW path at all, and it was not noted on any of the maps (e.g. 2.03.02) showing salt routes and bike paths. I thought it a good opportunity to bring up the fact that the plan (and first decade of operations) for the path had NO salt being used.

See item #8 here:
http://www.dmna.org/1999lettermayor
In initial years they used a rotary brush, which worked great. Then they switched to the Zamboni-like plows and a habit of going over and over it with every flurry. Then about five years ago, they started putting uncontrolled and undocumented amounts of plain *rock salt* on the path, sometimes up and down the entire length of it. A ~200 year old white oak right below a low spot on the path was an immediate casualty of this change. The summer before it died, it was completely healthy and hosted a colony of tree frogs as it had for countless years prior to that.

The excessive plowing and consequent "need" for salting began about the same time they decided to put high-glare overhead lights in.

I will review that report again about salt- thanks!
-Perry"

Strand Response: City will discuss and address internally with the Parks Department.

Comments on Draft Final "Lake Wingra Watershed Management Plan – Jim Baumann (September 4, 2015)

1. Possible Management Change Tables

   More than any other item in the draft plan, I've received comments on the inconsistencies and lack of discussion on the proposed management changes tables, 2.08-1, 3.06-1 and 4.06-1. I concur. Specifically:

   - Table 2.08-1 has a column on "potential effectiveness" while tables 3.06-1 and 4.06-1 have "implementation priority".
     - ***Strand Response:*** *See text in below paragraphs which provide measures that address these comments. Alternately, these tables could be eliminated from the report if there is concern that they only convey a qualitative assessment.*

- There are no criteria for rating "potential effectiveness" or "implementation priority" offered in the plan. It appears the ratings are arbitrary.
    - ***Strand Response:*** *These ratings are qualitatively based to assist the reader understand their priority during implementation. Propose to have the following columns in each table (Table 2.08-1, Table 3.06-1, and Table 4.06-1): Implementation Feasibility, Potential Effectiveness, and Implementation Priority to make each of these tables consistent. Also, the following paragraphs will be modified to read as follows.*
        - *Section 2.08 (3rd and 4th Paragraph): "Table 2.08-1 describes potential additional management measures that could be implemented to achieve the necessary salt application reductions to achieve the targeted chloride concentration in Lake Wingra. The table also rates their implementation feasibility and potential effectiveness in reducing Lake Wingra chlorides. Implementation feasibility is a qualitative assessment based on interviews with City Department managers, commercial applicators, and property owners. Potential effectiveness also is a qualitatively assessment based on anticipated participation levels and the actual salt contribution the targeted audience. For example, "Establish Maximum Salt Guidelines" was given a "low" rating in potential effectiveness because it was anticipated that fewer than 25 percent of commercial applicators would participate and they are just guidelines. Yet "Establish Maximum Salt Application Rates by Ordinance" was given a "medium" rating because a law is more likely to garner participation.*

          A third column is provided for implementation priority and is left blank. Catalyst teams (See Section 5) can determine the priority of the potential measures. The management changes could be implemented in any order, yet if the target chloride concentrations to be achieved, it is likely that multiple or most measures will need to be implemented. Any combination that provides significant reductions in commercial and municipal application rates will help lower chloride inputs to Lake Wingra."

        - *Section 3.06: "Table 3.06-1 describes potential management measures that could be implemented to achieve the short-term infiltration goal in the Lake Wingra watershed. The table also rates their implementation feasibility, potential effectiveness, and implementation priority. These ratings are a qualitative assessment to an understanding of potential prioritization. As can be seen, each of these measures rank high for each category. Table 3.03-11 shows the necessary projects to meet the short-term infiltration goal. Each of the measures identified in Table 3.06-1 will be necessary to implement the corresponding facilities shown in Table 3.03-11."*

        - *Section 4.06: "Similar to management measures described in Section 3.06 for meeting the short-term infiltration goal, Table 4.06-1 describes potential management measures that could be implemented to achieve the short-term phosphorus reduction goal in the Lake Wingra watershed. The table also rates their implementation feasibility, potential effectiveness, and implementation priority. These ratings are a qualitative assessment to help provide an understanding of potential prioritization. Table 4.04-10 describes the five alternatives considered for meeting the short-term phosphorus reduction goal. Management changes from Table 4.06-1 necessary to implement the recommended alternative should be given the highest priorities."*

- There is no discussion of the ratings in the text.
    - ***Strand Response:*** *See text in above paragraph.*

- For chlorides, it is difficult to agree with a "low" rating for establishing salt guidelines and implementing certificate programs. With the exception of establishing maximum salt application rates by ordinance, the only management measures rated medium or high relate to municipal use of deicers. It would seem that certification programs might be necessary to adequately implement an ordinance. There are many examples of ordinances being passed and never implemented due to a lack of an implementation program.
    - ***Strand Response:*** *In Table 2.08-1, we will change the Feasibility rating for Establish Maximum Salt Application Rates By Ordinance from "Low" to "Medium." Note that even with an ordinance, enforcement of that ordinance presents a formidable challenge. It would be difficult to accurately assess compliance without sweeping and measuring a recently salted surface and weighing the sweepings.*

- The first sentence in section 4.06 appears to be an incomplete thought and should be clarified. For example, is the intent for the same ratings in table 3.06-1 to apply for phosphorus as well as for infiltration? The sentence only refers to listing of management measures and not their rating.
    - ***Strand Response:*** *See Section 4.06 text modifications in paragraphs above.*

- I don't see how fully complying with the city's state mandated construction site erosion control ordinance is a low implementation priority.
    - ***Strand Response:*** *We will add a High Implementation Priority Ranking to Table 4.06-1 for construction site erosion control.*

2. Targeting Implementation

Targeting is a key concept for effectively and efficiently implementing the watershed plan. The draft plan has good information for targeting and in some locations actually uses the words "target" or targeting". But overall it is difficult to quickly and clearly identify portions of the watershed or activities that should receive emphasis. Specifically:

Chlorides

- Section 2.05 D is labeled "Target Reduction Scenario" and would appear to be a relatively complete list of land use/land management locations or activities. Yet there is no description of what is included in the 67 acres of single-family residential. Obviously, this is not the entire amount of single-family residential land use in the watershed and would appear to be a relatively small percent. What is meant by "sidewalk in right or way"? There is no description of what this includes.
    - ***Strand Response:*** *The acreage equals the amount of impervious area in residential parcels. Similarly, sidewalk in right of way refers to sidewalks that are not on private property, but are in public right of way (Note, most sidewalk adjacent to streets are on public right of way). Note added to table.*

- Given that alleys constitute 1 acre of the watershed and 0.0% of the chloride contribution, it is difficult to see how alleys should be targeted.
    - ***Strand Response:*** *Correct. They are not targeted, but simply included in the calculations because they are part of the impervious surfaces in the watershed. If omitted, there probably would be requests to incorporate them in the analysis.*

- Given that bike paths constitute 14 acres of the watershed and 0.2% of the chloride contribution, it is difficult to see how bike paths should be a priority. This is especially true if the application rates of 1.0 lbs/1,000 sq ft is representative. This is much lower that the suggested 4 to 5 lbs/1,000 sq. ft.
    - ***Strand Response:*** *Correct. They are not targeted, but simply included in the calculations because they are part of the impervious surfaces in the watershed. If omitted, there probably would be requests to incorporate these pavements.*
    - *Strand will add notes to the bottom of Table 2.05-2 clarifying these issues.*

Infiltration

There is no section on targeting in the Infiltration chapter. One could or should infer that the management measures listed in section 3.05 and 3.06, for example, are to be applied in the groundwater watershed. This is not clear in these sections.

- ***Strand Response:*** *We will add the following paragraphs to the end of the 1st paragraph of Section 3.03 I.: "As shown on Figure 3.02-4, the Lake Wingra ground water watershed extends only approximately two-thirds of the way to the western bounds of the surface water watershed. For this reason, additional source-area-type BMPs (downspout disconnection program, rain barrel program, private residential rain gardens, commercial rain gardens, porous pavement, and terrace rain gardens) should be targeted for the eastern two-thirds of the surface water watershed and within the Lake Wingra ground water watershed".*

Phosphorus

This chapter has much information, such as model results and other analysis, that can and should be used for targeting. Yet, it is difficult to impossible for the reader to know which maps and tables to use.

For example, is Figure 4.03-5 the best one to use to target phosphorus control efforts? It is unclear whether this is a map that should be used. For example, the Odana Pond subwatershed has the greatest reduction from existing management practices, but also had some of the highest phosphorus yields for the "no controls" base analysis. It would appear that one would need to take the information on Table 4.03-1, apply the reductions from Table 4.03-2 and then make a map. However, it doesn't appear that the watershed descriptions match. Take, for example, the drainage area labeled WI02-C-0190-H-MAD-C. In Table 4.03-1 it is described as a drainage area with 11.6 acres and a baseline load of 8.5 pounds. In Table 4.03-2, this same area is described as having an incoming load of 1034 pounds.

One way of looking at the watershed is as follows:

a. Commercial areas, such as those along and north of Odana and west of Segoe will remain relatively significant contributors of phosphorus given their areas and yields even after taking into account the reduction from existing practices. The same may apply to the commercial areas along the beltline. <u>But, none of the management practices described in the plan apply well to these areas.</u>

b. The drainage areas listed below would seem to also be priority areas for residential management practices since there are no structural management practices in place or planned. All of these are colored red on Figure 4.03-6.

Wl03-B-0321-A-MAD-C	0.8 lb/ac	Lower Monroe Street, Fox, Keyes

Wl03-A-0322-A-MAD-C	0.6 lb/ac	Monroe Street and north of Edgewood (possible Wingra Park pond?)
Wl04-U-0219-H-MAD-C	0.7 lb/ac	Vilas neighborhood
Wl-02-D-0193-H-MAD-C	0.6 lb/ac	East of Nakoma

c. All areas for street leaf management to address the soluble phosphorus component.

Strand Responses: *Section 4.03 C. paragraph 2 provides the targeting verbiage requested and reads:*

"Figure 4.03-5 also shows drainage basins that are underserved in terms of stormwater quality treatment, namely basins W102-D-0193-H-MAD-C, W103-B-0220-A-MAD-C, W103-A-0322-A-MAD-C, and W104-U-0219-H-MAD-C. It should be noted that the basins (W102-U-1038-A-MAD-T, W108-U-0136-A-MAD-C_NP, EARB W108-U-0136-A-MAD-C) in the UW-Madison Arboretum show little treatment; however, because of their location in the UW-Madison Arboretum, they have little pollutant load. Targeting the underserved basins for proposed stormwater controls will allow additional stormwater quality treatment to be pursued for areas in need. Figure 4.03-6 shows the same condition as Figure 4.03-5 but also shows potential projects to gain additional stormwater quality treatment for underserved basins."

We will also add the following paragraph to the end of the 1st paragraph of Section 4.04 B.: "Potential projects to gain additional stormwater quality treatment for underserved basins are described in Section 4.03 C. and shown on Figure 4.03-6. Identification and analysis of structural improvements has targeted these areas to the extent possible. Additional non-structural-type BMPs (wetland harvesting, modified leaf collection methods, waterfowl management, enhanced construction site erosion control enforcement, modified street sweeping methods/schedule, and pet waste enforcement) should be targeted for the following basins since they currently haven't been analyzed to be served by a structural BMP: W103-B-0321-A-MAD-C and W104-U-0219-H-MAD-C. In general, modified leaf collection methods and modified street sweeping methods/schedule that address dissolved phosphorus should target all basins."

Note that a pond at Wingra Park (W103-A-0322-A-MAD-C) is analyzed as described in Section 4.04 B. 4. and shown in Figure 4.04-9.

Note that a diversion of flows from basin W102-D-0193-H-MAD-C is analyzed as described in Section 4.04 B. 2. and shown in Figure 4.04-5.

3. Odana Pond

See e-mail describing that the pond is clearly a water of the state and possibly a water of the US. Also Figure 4.04-4 is missing the sewer pipe from the intersection of Wedgewood Way and Milward to the pond.

Strand Response: *For some reason, the City's GIS/CAD layer is missing the pipe from Wedgewood Way/Milward Drive intersection to Odana Pond. We will add this pipe in Figure 4.04-4, 4.04-3, and 4.03-1 and add an additional dosing location to Figure 4.04-4. We will also modify paragraph 4.04 B. 1. c. to read as follows: "Odana Pond is located on the west side of the Odana Hills Municipal Golf Course near the intersection of Whitney Way and the Beltline Highway. The pond has <u>four</u> inlets and one outlet. For this project, one alum dosing facility would be constructed and alum would be pumped to each of the <u>four</u> inlets (if deemed necessary). Figure 4.04-4 shows the vicinity of Odana Pond and the proposed dosing facility and dosing locations. It should be noted that there are two Odana Ponds, the upstream Main Odana Pond and the downstream Secondary Odana Pond. The upstream Main Odana Pond is considered a water of the state and is the pond from which water is drawn to feed the Odana Golf Course Infiltration Facility. As a water of the state, it is anticipated*

that there would be significant regulatory hurdles associated with an alum treatment facility at the upstream Main Odana Pond. Likewise, chemical dosing of water that will feed the Odana Golf Course Infiltration Facility is also a concern. For purposes of this plan, the upstream Main Odana Pond has been removed from further consideration as an alum treatment facility. However, chemical dosing of the downstream Secondary Odana Pond may still present opportunities for chemical treatment of stormwater based on the understanding that it is not a water of the state and it water isn't drawn from it for the Odana Golf Course Infiltration Facility."

4. Residential Rain Gardens

Although I like rain gardens and have three on my property, from the phosphorus perspective I question the appropriateness of 1,000 rain gardens to deal with roof runoff the reaches the storm sewer system. A more representative number is needed. I also question whether 35% of residence with downspout redirection is appropriate.

In the western portion of the watershed the properties tend to be larger and less than 25% (possibly 10%) of the houses have downspouts connected to driveways or other impervious surfaces. In most cases where there is a connection, downspout re-direction is a viable and more cost-effective management practice. One could argue that rain gardens are important from the infiltration perspective, but much of the far western portion of the watershed is not in the groundwater watershed.

It would appear that the use of rain gardens would need to be emphasized in the eastern half of the watershed and especially in the drainage areas identified in the table in comment #2. However, much of this area has smaller lots where installing an effective rain garden is not practical for many sites.

Strand Response: *As shown in Table 3.03-11, from an infiltration perspective, residential rain gardens and downspout disconnection are two of the more cost-effective measures to achieve additional infiltration in the watershed.*

As described previously above, we will add the following paragraphs to the end of the 1st paragraph of Section 3.03 I.: "As shown on Figure 3.02-4, the Lake Wingra ground water watershed extends only approximately two-thirds of the way to the western bounds of the surface water watershed. For this reason, additional source-area-type BMPs (downspout disconnection program, rain barrel program, private residential rain gardens, commercial rain gardens, porous pavement, and terrace rain gardens) should be targeted for the eastern two-thirds of the surface water watershed and within the Lake Wingra ground water watershed.

We will add the following paragraph to the end of Section 3.03 I. 1.: "It is recommended that the Infiltration and Phosphorus Catalyst Teams further investigate the assumptions used for the analysis shown in Table 3.03-13 and adjust the relative contribution of these measures toward meeting the short-term infiltration and phosphorus goals."

We will add the following paragraph to the end of Section 3.03 I. 10.: "It is recommended that the Infiltration/Phosphorus Catalyst Team further investigate the assumptions used for the analysis shown in Table 3.03-16 and adjust the relative contribution of these measures toward meeting the short-term infiltration and phosphorus goals."

5. Catalyst Teams

Since there is so much overlap between the infiltration management measures and the phosphorus management measures, consolidating the two teams into one should be considered.

Strand Response: *We will add the following sentence to the end of the 1st paragraph of both Sections 5.03 and 5.04: "Because of significant overlap between infiltration and phosphorus management measures, consideration should be given to coordination between infiltration and phosphorus catalyst teams."*

Comments on Draft Final Lake Wingra Watershed Management Plan – David Liebl (September 7, 2015)

1. Cover:
I know it's your standard cover…but how about an image of the watershed instead?

Strand Response: *Strand will revise the front cover and include the suggested photo of Lake Wingra on the front cover.*

2. Front:
Needs an executive summary, or, move 6.01-6.03 to above section 1.0.

Strand Response: *Strand will provide an Executive Summary.*

3. 1.01, pg.1-1:
I know you guys did most of the heavy lifting…but the City and FOLW should get top billing.

Strand Response: *The first sentence of Section 1.01 will be revised to read: "This report summarizes the methods and results of the Lake Wingra Watershed Management Plan commissioned by the City of Madison (City) and the Friends of Lake Wingra (FOLW) to develop a Lake Wingra Watershed Management Plan"*

4. Table 1.01-1:
Source of data?
Total P = 0.056mg/L (ppm)

Strand Response: *We will add the following note to Table 1.01: "Source: 2014 State of the Lakes Annual Report, Clean Lakes Alliance"*

5. Pg 1-5:
UW-Madison Arboretum Facility Stormwater Management Plan, ~~WI DOA/DSF and~~ UW-Madison, July 2006

Strand Response: *Change will be made.*

Lake Wingra Watershed Management Plan-Storm Water, Friends of Lake Wingra, August 2003

Strand Response: *This document will be added.*

6. Figure 3.02-2:
Credit?

Strand Response: *The following will be added in Figure 3.02-2: "Source: Groundwater Status Report Prepared for Friends of Lake Wingra, Sustainability Leadership Program, Edgewood College, Maribeth Kniffin, August 2011."*

7. Fig. 3.03-12:
Credit Roger Bannerman

Strand Response: *The following will be added to Figure 3.03-12: "Source: Roger Bannerman"*

8. Fig.3.03-12:
Credit Nancy Zolidas

Strand Response: *The following will be added to Figure 3.03-14: "Source: Nancy Zolidis"*

9. Fig. 4.02-3:
Credit Mike Kakuska

Strand Response: *The following will be added to Figure 4.02-3: "Source: Mike Kakuska"*

10. Fig. 4.02-1, -2,-6:
Credit David S. Liebl

Strand Response: *Figures 4.02-1 and 4.02-2 already credit David Liebl. The following will be added to Figure 4.02-6: "Source: David Liebl"*

11. Pg 4-5 2.a. :
….carp-induced sediment re-suspension, and improved aquatic vegetation coverage.

Strand Response: *Last sentence of paragraph 4.02 C. 2. a. will be revised to read: "Lake Wingra water quality in the past five years has been noticeably improved resulting from a reduction in carp-induced sediment resuspension and improved aquatic vegetation coverage."*

12. Missing? is a short bio of the FOLW with webpage URL

Strand Response: *We will add the following short bio as Section 1.05: "The Friends of Lake Wingra was formed in 1998 with an interest in improving the health of Lake Wingra through coordinated watershed management and by engaging the watershed community in stewardship of the lake and its watershed*

The Friends of Lake Wingra mission, vision, and goals reflects the belief that sustaining the balance of a healthy lake ecosystem requires the participation and collaboration of many citizens, agencies and organizations. FOLW's approach to watershed protection therefore involves partnerships with numerous stakeholders who live, work, and play in the Lake Wingra watershed.

The Friends of Lake Wingra's goals are in the following areas.

Citizen Stewardship—Grow present and future generations of watershed stewards.
Integrated Watershed Management—Protect and improve the 'lake as a system' through innovative and coordinated management practices.
Long-term monitoring and research—Ensure that the information needed to address the mission is available on an ongoing basis.
Organizational Capacity and Resources—Build the internal capacity to achieve the mission

Friends of Lake Wingra is currently engaged in a variety of projects aimed at improving the health of Lake Wingra. Our projects include both outreach to the watershed community and on-the-ground restoration and stewardship efforts.

The Friends of Lake Wingra could not work without the help of our friends and partners — dedicated volunteers, members, and organizations contribute essential time and labor to the preservation and protection of Lake Wingra and the Wingra Watershed

To learn more about the Friends of Lake Wingra or to get involved in one of the Friends of Lake Wingra projects, please visit the FOLW website: http://www.lakewingra.org

APPENDIX G
PILOT PROJECT RESULTS *(FORTHCOMING)*

For more location information
please visit www.strand.com

Office Locations

Brenham, TX | 979.836.7937

Cincinnati, Ohio | 513.861.5600

Columbus, Indiana | 812.372.9911

Columbus, Ohio | 614.835.0460

Indianapolis, Indiana | 317.423.0935

Joliet, Illinois | 815.744.4200

Lexington, Kentucky | 859.225.8500

Louisville, Kentucky | 502.583.7020

Madison, Wisconsin* | 608.251.4843

Milwaukee, Wisconsin | 414.271.0771

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