Commercial Properties BMP Retrofit Study

Clean Water Fund Grant
CWF ID #C14-5195

Presentation of Process and Findings

Prepared for
Ramsey-Washington Metro Watershed District

June 2015

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1.0 Project Overview

1.1 Initial Project Abstract

The Ramsey-Washington Metro Watershed District (District) has determined that large impervious sites (like churches, commercial sites, and schools) are more economical for stormwater management retrofit projects than distributed small projects along roadways. Our analysis of the watershed land use indicates that large impervious sites are typically commercial properties (primarily retail), churches, and schools. The District began assessing church sites for retrofit BMP opportunities in 2013 and plans to continue this effort moving forward. Church congregations tend to be receptive to partnering with watershed districts, as environmental stewardship tends to be a part of their ideology and congregations can rally capital campaigns for cost share projects with the District. Commercial and school property owners, however, are often harder to access, and can also be harder to motivate into partnerships that result in implementation of stormwater management BMPs.

The purpose of this grant was to assist the District in identifying and assessing commercial retail centers and strip malls in high priority drainage areas (especially in subwatersheds with impaired or "at risk" waters) for retrofit BMPs that will assist the District in meeting stormwater volume and nutrient reduction goals. This project was not only to identify promising sites for retrofit BMPs on commercial sites with large impervious areas (roofs and parking lots) throughout the District, but also to conduct a series of conversations with commercial property owners about the potential for partnering on project implementation, now and into the future. An important part of this project involved interaction with the commercial property owners to introduce the District and its goals, determine their willingness to partner with the District, identify barriers to installation and maintenance of stormwater BMPs, identify ways to reduce or eliminate barriers, and to generally lay the groundwork for the District to effectively work with commercial property owners into the future.

1.2 Project Goals

The District goal is to reduce phosphorus loadings to our District lakes in order to meet state water quality standards or protect current high quality resources. The total watershed load reduction goal for Kohlman Lake, for example, is 209 lbs. of phosphorus per growing season (source: *Kohlman Lake Total Maximum Daily Load Report*, Barr Engineering Company for the Ramsey-Washington Metro Watershed District, 2010a). The Wakefield and Bennett Lake TMDL studies, currently in process, will also indicate that significant watershed phosphorus load reductions will be required for the lakes to meet state standards and are expected to have TMDL Implementation Plans that are very similar to that of Kohlman Lake.

The *Kohlman Lake TMDL Implementation Plan* (Barr Engineering Company for the Ramsey-Washington Metro Watershed District, 2010b) calls for continued implementation of our District Rules, which require volume reduction on sites that disturb more than 1 acre of land. However, we have identified through land use and redevelopment studies that the rules alone will not be adequate to meet the reductions needed to meet our reduction goal within a reasonable timeframe, due to slower redevelopment rates expected in the coming years. This points to the need for retrofitting existing impervious areas

throughout the watershed, which, unless the District intervenes to educate, partner and help fund retrofit projects, commercial property owners have little reason to implement on their own.

Our first major retrofit effort on a private, commercial property was the stormwater retrofit project at Maplewood Mall. Our next largest impervious land uses include schools, churches, smaller commercial retail centers, and strip malls. Our current rules and programs do not allow us to directly affect these sites. These landowners are not required to improve their sites and reduce pollutant loads unless they are redeveloping. This project provides us with an approach to solicit their voluntary involvement and participation.

Our long-range goal is to retrofit sites with large impervious surface areas to infiltrate or filter the first 1.1-inches of stormwater runoff through implementation of BMPs on new and redeveloped sites and to retrofit existing developed sites wherever possible.

1.3 Process Development and Overview

This project used LiDAR, GIS, hydrologic and water quality modeling, as well as a series of collaborative meetings with stakeholders to discuss goals and opportunities. With the completion of this study and analysis, the District has prioritized sites identified for construction of cost-effective BMPs on commercial property sites in 2015 and beyond. Several rain gardens are set for construction in the summer 2015 with additional projects already identified for construction in 2016.

A key element of this process was the advance coordination with commercial retail centers and strip mall owners and their maintenance personnel. The advanced approval and identification of implementation and maintenance requirements allowed for the rapid design, approval, and construction of BMPS when funds are available.

The process for the project was as follows:

Task 1: Commercial Site Inventory and Assessment. After mapping all of the commercial retail centers and strip mall properties in impaired waters watersheds, GIS information was used to choose 54 sites for a site visit. Site visits culminated in the creation of a site suitability scoring sheet that allowed staff to decide which sites have the greatest potential for retrofit BMPs when comparing between sites back in the office.

Task 2: Commercial Property Owner and Maintenance Staff Collaboration. Commercial property owners, managers, and staff associated with the most promising sites were interviewed and engaged in a discussion about the opportunities on their sites for retrofit BMPs (especially rain gardens) and for future collaboration with the District. Photos of typical retrofit BMPs that have been implemented on similar sites were distributed at the meeting to help educate property owners about what to expect.

Task 3: Develop Site Scoring and Priority Matrix. Sites from Task 1 and impressions of the enthusiasm/motivation of the commercial property owners, managers, and staff interviewed in Task 2

were considered together to prioritize sites that were not only the most promising from a site BMP perspective, but also from a partnership standpoint.

Task 4: Develop Preliminary Site Designs, Costs, and Pollutant Reduction Potential. Preliminary designs were made for BMPs in the top 10 sites coming out of the exercise in Task 3, including planning level cost estimates for implementation, and an evaluation of the treatment potential (in costs per pound of phosphorus removed) that the BMPs would provide.

Task 5: Presentation of Findings and Recommendations to Priority Sites. Preliminary designs, costs, cost effectiveness, and conceptual plans of what the BMPs were presented to commercial property owners, managers and staff, and future plans were discussed for implementation.

Task 6: Summarize Project Process for Future Projects and other Natural Resources Organizations. Create report summarizing study process and findings for use by other natural resources organizations such as watershed and conservation districts.

2.0 Data Compilation and Initial Site Screening

2.1 GIS Screening

This project used available GIS data compiled in a manner that would allow us to easily screen site characteristics. Compiled data was collected from numerous agencies and sources and included the MnDNR, MnDOT, Mn Dept. of Health, USDA, Mn Electrical Transmission Mapping Project, MPCA, and the National Wetlands Inventory database. The initial site database listed 1,285 unique commercial sites throughout the District.

Parcel analysis data included:

- Property ID
- Primary tax address
- Site address
- Land use classification
- Acreage
- Percent impervious
- Total impervious acreage
- Total pervious acreage
- Transit routes with 0.5 mi of site
- Stormsewers within 150 ft.
- FEMA floodplain boundaries
- Public Waters Inventory
- National Wetland Inventory
- District wetland inventory
- Regional trails including snowmobile and State trails within 0.5 mi.
- Wellhead protection areas
- Railroads within 0.5 mi.
- Gas or oil pipelines
- Electrical transmission lines
- Daily traffic counts
- Hydrologic soil groups
- Mean slope
- Mean water table depth
- Mean depth to bedrock

In order to reduce the total number of sites to a manageable amount of which our team could visit, certain site characteristics such as total acreage and percent impervious surfaces were weighted above others. Sites that have previously been required to receive a permit from the District due to land disturbance construction activities or have a future development planned that will require a permit were eliminated from the preliminary ranking. Undeveloped sites were ruled out as were sites that were located

in a subwatershed identified as "Protect-Stable." Additionally sites that had a land use history that may have caused contamination of the soil such as a service station or car wash were eliminated due to the potentially expensive nature of remediation that may be required as part of site retrofit.

Applying the entire site characteristics filters listed above, the initial list of 1,285 sites was narrowed down to 54 sites for site visits and further ranking.

3.0 Site Visits and Grading

3.1 Site Visit Analysis

In order to verify that a site has real potential for BMP retrofit our team visited the top 54 sites as indicated by our initial GIS screening and aerial photography analysis process. In order to inventory and rate sites in a manner that is universally applied, and can be collected and analyzed in real-time, we utilized a GIS based data collection application called ArcGIS Collector. The application (app), which runs on mobile devices including iPads and smartphones, was preloaded with all the applicable data layers that the field teams may need while on site. The displayed selectable data was chosen to assist field inspectors in locating the site, understanding local and regional watershed connections through piping and topography, and identifying utility information such as local storm sewer networks.

The app was customized to be highly functional and user friendly in the field in order to allow for efficient site analysis. Teams of two staff members were able to utilize pre-loaded drop down menus containing 'yes' or 'no' options, pull down menus containing multiple choice options, and blank comment fields for input. Individual pins could be "set" onto the aerial image or one of several other GIS-based data layers at the precise geo-synched BMP location in the field (Figure 3-1). Areas such as contributing impervious surfaces could be measured for rough calculations related to rain garden sizing and available space square footage. All the data collected in the field was wirelessly synched to in-office servers for real-time tracking of the site analysis process (Figure 3-2).

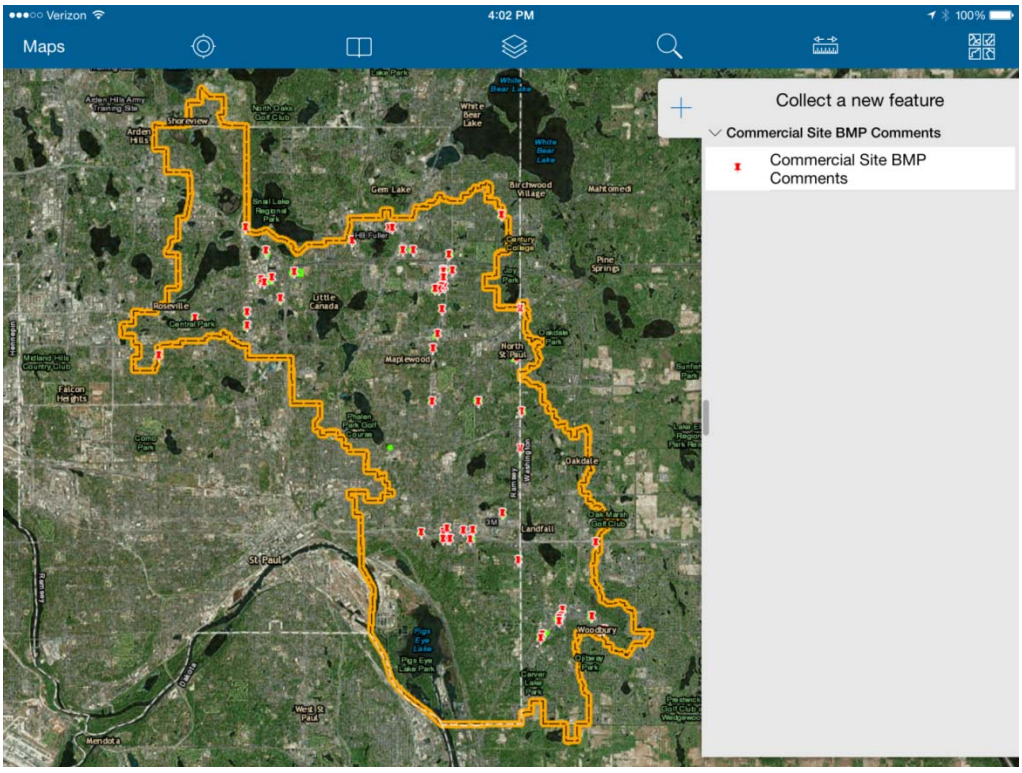

Figure 3-1 ArcGIS Collector App with "Pins" at BMP Locations

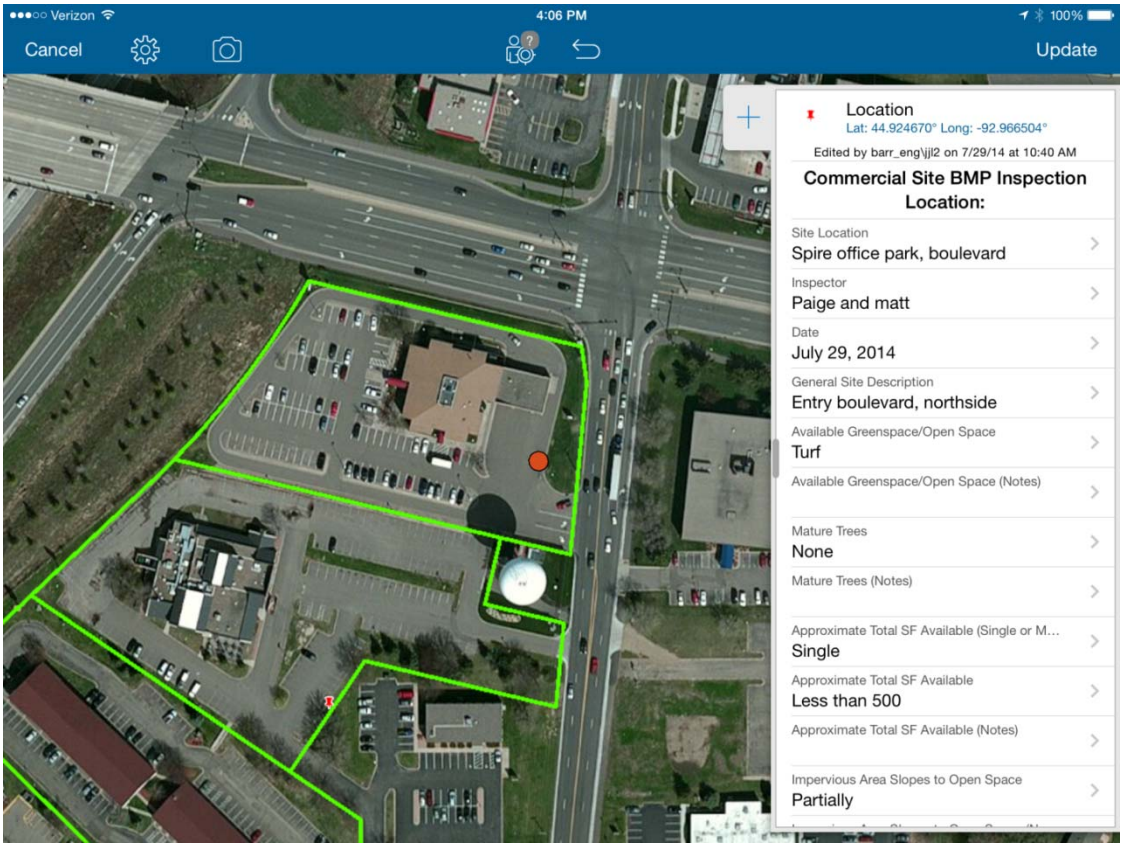

Figure 3-2 Site criteria being entering in ArcGIS Collector.

3.2 Site Grading Criteria

To prioritize and rank the visited sites, a grading criteria was developed. We applied a letter grade (A through F, no pluses or minuses) to each of the inventoried potential BMP sites. The grade was based on a summary of initial impressions of observed site characteristics including perceived stormwater quality benefit, constructability (potential construction expense), required property owner concessions, and potential educational value. Grades reflected the suitability of the site for a retrofit project, and did not reflect the willingness or suitability of the site owner to engage in a partnered project with the District.

All the criteria listed below are based on brief field assessments and were considered 'likely' or 'unlikely' based on available information. A 'likely' answer to any of the statements below would be worth 1 or 2 points. An 'unlikely' answer would be worth 0 points. Any unknowns would be listed as 'unlikely' or 0 points or until more information is available and the score can be adjusted as needed. It is important to note that the way the grading criteria were created tended to skew a site's level of suitability toward rain-garden only options (as opposed to tree trenches, or other BMPs that are implemented in areas without significant existing pervious areas). The project team decided that this was appropriate, given that rain gardens tend to be the least expensive BMP option, and that sites with good locations for rain gardens would be the most desirable places to invest in implementation.

3.2.1 Grade Values

Grade Value	Points
A	20-17 Points
B	16-12 Points
C	11-7 Points
D	6-3 Points
F	3-0 Points

1. Stormwater Quality Benefit	
a. Potential BMP is at least 10% of the contributing impervious area.	**+1**
b. Impervious catchment area consists primarily of surface pavements (Not roof runoff).	**+1**
c. Infiltration (as opposed to filtration) appears likely (as judged by no immediate proximity to wetlands, no standing water, no bulging tree roots, and/or knowledge of soils from adjacent project.	**+2**
d. Filtration can be accomplished with an adjacent catch basin.	**+1**
e. Adjacent, untreated streets could be treated in a BMP	**+1**
f. Impervious runoff drains directly to a catch basin without passing over pervious areas.	**+2**
2. Stormwater Quality Benefit	
a. Impervious area drains directly to potential BMP location (no trench drains or piping needed to deliver runoff).	**+1**
b. No pavement removal/relocation required (parking lot, sidewalks, curbing to be relocated).	**+2**
c. No existing storm sewer infrastructure to be relocated or significantly retrofitted (more than just tie-in).	**+1**
d. No retaining wall or significant grading beyond the BMP footprint required to create flat bottomed basin.	**+1**
e. No work-around or relocation of existing utilities required.	**+1**
3. Stormwater Quality Benefit	
a. No parking loss (or required reconfiguration).	**+2**
b. No loss (or required relocation) of usable space (seating/waiting area, playground, patios, etc.).	**+1**
c. No existing desirable tree or landscaping removal required.	**+1**
d. No reconfiguration of traffic patterns (pedestrian or other) required.	**+1**
4. Stormwater Quality Benefit	
a. Highly visible (at entrance or heavily visited location).	**+2**

3.3 Site Grading Results

After applying grades to each of the 54 sites visited during the field inspection process we were able to easily identify the first top 10 sites that we would reach to the owners and attempt to organize a meeting. All sites achieving an "A" grade were prioritized while the "B's" were categorized as secondary options. As a result of the site grading process we were able to identify eight "A's" and twelve "B's" that would be our basis for the site meetings with property owners.

4.0 Development and Presentation of Conceptual Plans

4.1 Meeting with Property Owners

Contacts were gathered for the sites prioritized by the grading process. Only sites with A's or B's were called. In addition, eight B's were never contacted since the project had reached its goal before reaching their property on our list. These sites will be contacted in the future.

A total of 16 contacts were called. A series of attempts were made to set up meetings between District staff and property owners or representatives of the property owners that would be able to make decision regarding a site retrofit project. A process of contact attempts and follow-ups was predetermined in order to be efficient with District staff's time. For instance, if two unanswered contact attempts were made then the site was considered unlikely for retrofit and the next highest graded site was selected for owner contact. This was the case for seven of the properties (these contacts never returned the District's calls). At meetings with the property owners, conceptual site plans were shared (Figure 4-1) which highlighted locations for BMPs. Precedent photos of similar stormwater BMPs in the area were also assembled (Figure 4-2) to help the decision makers understand what their retrofitted sites would look like, including planting palette options.

The site meetings were designed in order to inform and educate the property owners of the District's overall goals as well as describing the potential partnership and installation of a BMP on their property. Ideally after the meeting the District would receive an indication that the property owner is either willing to partner and allow a BMP installed on their site; or if they are not interested and are then removed from the property list.

The conceptual plans included a site aerial with known stormsewers and LiDAR topography to help the owners understand their site drainage. BMP locations and extents were shown in context with the help of the precedent photos to help the property owners understand what the BMP may look like on their sites. Planting options including complex through simple schemes and the expected maintenance requirements were discussed in detail. At this point the District's requirement to sign a 20 year maintenance agreement is discussed with the property owners should they allow for a BMP to be built on their sites.

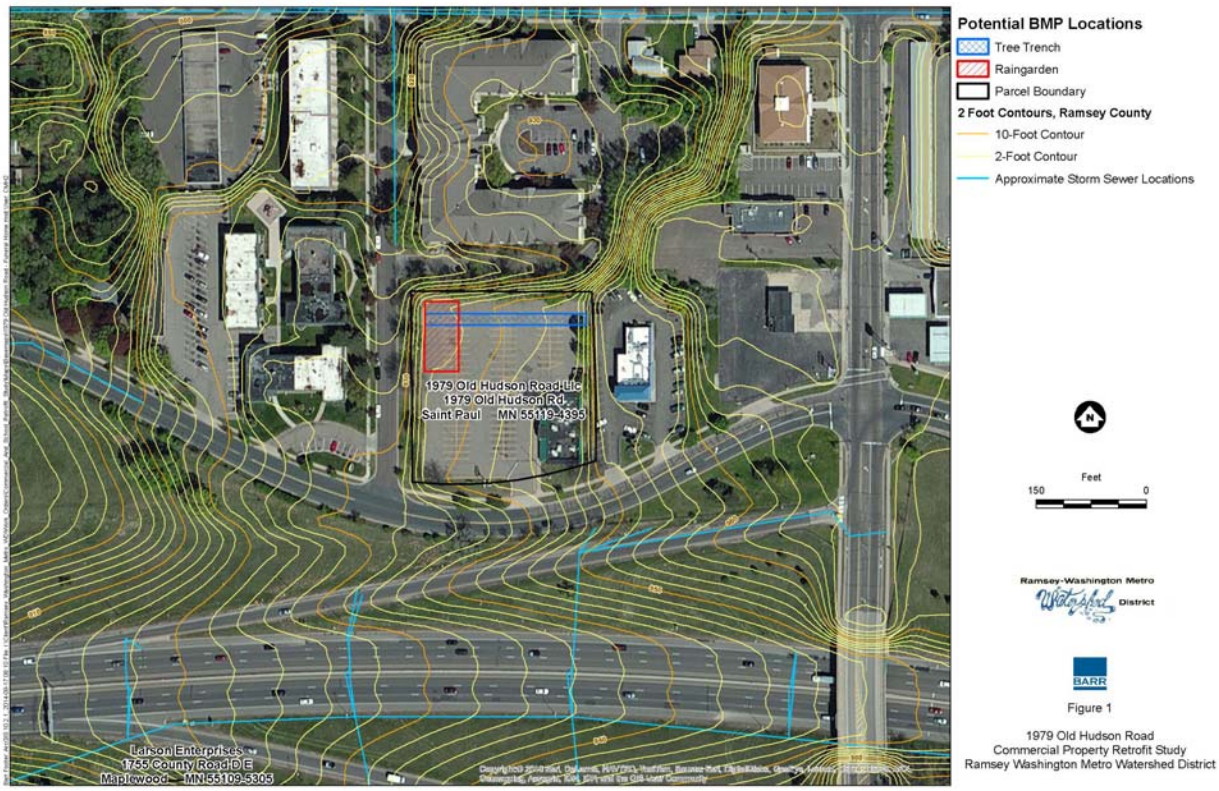

Figure 4-1 BMP retrofit location options as shown on conceptual plan

Figure 4-2 BMP precedent photos highlighting planting options

5.0 Study Results and Conclusions

As a direct result of this project, nine commercial properties will have rain garden retrofits in 2015 and 2016 (Table 5-1).

In addition to these properties, Grandma's Bakery, TCF Bank, Red Lobster (owned by General Mills), and parcel #536 (small strip mall at 1690 White Bear Ave N undergoing a transition of ownership at the time of the study) were also identified as being potential candidates for retrofits in 2017.

Throughout the course of this project, we made the following observations:

- Commercial property owners are aware of the District but not always of their responsibilities or obligations.
- Field visits are invaluable, and don't have to be overly time-consuming, especially if visiting multiple sites at once.
- Field iPad application was very useful for the project.
- The decision not to include sites with prior permits from RWMWD (including those from before the implementation of the District's volume reduction rule) was a difficult one. Going forward, those sites permitted before 2007 should be re-evaluated if the District continues to pursue retrofit opportunities on commercial properties.
- Long-term maintenance did not seem to be a big issue in discussing whether or not a site would be retrofitted, perhaps because property owners are already doing their own site maintenance. It remains to be seen, however, whether maintenance on these projects will actually be done as needed. Some property owners welcomed the idea of having less green space to mow.
- Interested partners will respond right away and often have other green initiatives for their businesses.
- Green infrastructure such as rain gardens is generally acceptable to commercial property owners and they often have prior knowledge with a few items of misinformation such as mosquitoes that can easily be explained.
- The biggest barrier was getting the interested decision maker on the phone – if you can get a meeting scheduled, the owner is probably interested in moving forward.
- "Free" is a really big selling point. Owners were often interested but hesitant until they heard there would be no installation cost for them, after which they had fewer reservations about the project.

- Trees are not usually a selling point for commercial properties – they see them as maintenance burdens. During several meetings, owners mentioned trees they had removed or encouraged us to remove existing trees. One owner was more hesitant about tree installation than the garden installation.

- Peer pressure and/or collaboration can be a motivator – it helps to have multiple sites close together to either motivate owners to be interested because their neighbor is having a BMP installed or to be able to share site staging/parking areas on tight commercial sites.

- It was important to be ready to respond quickly to property owners' interest. Business owners made quick decisions with less need for consensus-building than larger institutions. We learned not to offer a rain garden if we were not prepared to deliver! (This is, in fact, the reason that only nine sites are officially on board for construction, as opposed to the project's goal of 10—we did not want to start communications with a property owner for a rain garden to be constructed 2 years from now.)

- The general condition of existing plantings on a site can be a good judge of a property owners' willingness to accept and maintain green infrastructure.

- It was helpful to contact owners with multiple properties in order to maximize treatment with fewer administrative costs.

- Commercial properties were often >90% impervious surface, limiting the extent of lower-cost rain gardens that could be retrofit into existing green space. Compared to the school properties we were visiting at the same time, a commercial site was more likely to be rated a B (or lower) than the school properties, which had significantly more green space to work with.

- Renderings were not ultimately needed for the project—property owners generally needed less persuasion than we anticipated.

During the course of the study, staffs were asked to participate in a brainstorming session for the redevelopment of Sunray Mall. This property was not on our priority list for this project, however, the experience gained during the course of this project allowed staff to be well-versed in the topics that came up during the meeting.

Table 5-1 Status of Priority Commercial Properties for 2015-2016

Commercial Property	Downstream Waterbody	Status of Retrofit Project as of May, 2015	Size of Rain Garden (sf)	Anticipated Annual TP Removal in Rain Garden (from MIDs)
American Legion 700 County Road C W, Roseville	Owasso Lake (Protect-At Risk)	Moving to construction in 2015	2,059	1.33
Dey Distributing 1401 Willow Lake Blvd, Vadnais Heights	Willow Creek/ Kohlman Lake (Protect-At Risk)	Moving to construction in 2015	666	0.22
Taurus Engineering 1375 Willow Lake Blvd	Willow Creek/ Kohlman Lake (Protect-At Risk)	Moving to construction in 2015.	638	0.10
Advanced Masonry 2958 Yorkton Blvd, Little Canada	Gervais Creek/Gervais Lake (Protect-At Risk)	On track for construction in 2016.	3,626	1.11
Slumberland 3080 Centerville Road,	Gervais Creek/Gervais Lake (2) (Protect-At Risk) Battle Creek (1) (Impaired)	On track for construction (3 sites) in 2016. (Initially discussed 4 different Slumberland sites within the District, but only 3 were ultimately deemed a priority)	2,215	0.50
Slumberland Owasso Boulevard			1,745	0.49
Slumberland Suburban Avenue			18,782 (Imperv. Reduction)	1.80
Wells Fargo 7525 Currell Blvd, Woodbury	Battle Creek Lake (Protect-At Risk)	On track for construction (1 site) in 2016. (Initially discussed 2 sites within the District, but only 1 was ultimately deemed a priority)	8,448	1.1
United Scientific 15 Yorkton Ct, Little Canada	Gervais Creek/Gervais Lake (Protect-At Risk)	On track for construction in 2016.	3,406	0.54

1. Calculations for rain gardens that have not yet been officially bid upon are planning-level estimates based conceptual designs, using * per sf.

6.0 References

Barr Engineering Company for the Ramsey-Washington Metro Watershed District. 2010a. *Kohlman Lake Total Maximum Daily Load Report*

Barr Engineering Company for the Ramsey-Washington Metro Watershed District. 2010b. *Kohlman Lake TMDL Implementation Plan*