RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

January 2019
Board Packet

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Agenda

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RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

Regular Board Meeting Agenda

Wednesday, January 2, 2019
6:30 P.M.
District Office Board Room
2665 Noel Drive, Little Canada, MN

1. Call to Order – 6:30 PM
2. **Approval of Agenda**
3. **Consent Agenda**
    A. Approval of Minutes December 5, 2018
4. **Treasurer's Report and Bill List**
5. Visitor Presentations
6. Permit Program
    A. Applications
        i. **19-01 McDonald's Suburban Ave – St. Paul**
        ii. **19-02 Valley Creek Retail – Woodbury**
        iii. **19-03 Keller Practice Range Phase 2 – Maplewood**
        iv. **19-04 Hiway Federal Credit Union - Woodbury**
    B. Enforcement Action Report
    C. 2018 Permit Program Statistics and Technical Advisory Committee (TAC) Update
7. Stewardship Grant Program
    A. Applications
        i. **19-01 CS North Park Condo Association, infiltration basin**
        ii. **19-02 CS DeVine, shoreline restoration**
        iii. **19-03 CS Ames Lake Community Sculpture, public art**
    B. Budget Status Update
8. Action Items
9. Administrator's Report
    A. Meetings Attended
    B. Upcoming Meetings and Dates
    C. Citizen Advisory Committee (CAC) Update – Carrie Magnuson
    D. Annual Meeting Reminder

E. Administrator's Review

10. Project and Program Status Reports

A. Project Technical Reports and Presentations: Battle Creek, Beaver and Owasso Lake Subwatershed Feasibility Studies – Josh Phillips, Barr Engineering

B. Ongoing Project and Program Updates

i. Owasso Park Stormwater Master Plan
ii. Beltline Resiliency Study
iii. District Office Parking Lot Retrofit
iv. Lake Owasso Emergency Response Plan
v. Grass Lake/Snail Lake Area Emergency Response Plan
vi. FEMA Flood Mapping
vii. West Vadnais Lake Outlet Permitting
viii. 500-Year Atlas 14 Modeling
ix. Auto Lake Monitoring Systems
x. Maplewood Mall Monitoring
xi. 2018 Grant Applications
xii. Kohlman Basin Weir Test System
xiii. Wakefield Park/Frost Avenue Project
xiv. Targeted Retrofit Projects
xv. Roseville High School Campus Project
xvi. BMP Design Assistance and Review
xvii. Aldrich Arena Site Design
xviii. Beltline/Battle Creek Tunnel
xix. CIP Maintenance and Repair 2019 Project
xx. Natural Resources Program
xxi. Education Program
xxii. Communications Program

11. Informational Items

12. Report of Managers

13. Adjourn

Items in **bold signify that an action needs to be taken by the Board.*

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Consent Agenda

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Ramsey-Washington Metro Watershed District
Minutes of Regular Board Meeting
December 5, 2018

The Regular Meeting of December 5, 2018, was held at the District Office Board Room, 2665 Noel Drive, Little Canada, Minnesota, at 6:30 p.m.

PRESENT:
Marj Ebensteiner, President
Cliff Aichinger, Vice President
Dianne Ward, Treasurer
Dr. Pam Skinner, Secretary
Lawrence Swope, Manager

ABSENT:

ALSO PRESENT:
Tina Carstens, District Administrator
Amanda Staple, Recording Secretary
Brad Lindaman, Barr Engineering
Bill Bartodziej, Natural Resource Specialist
Maureen Hoffman, Washington County
Paige Ahlborg, Project Manager
Tracey Galowitz, Attorney for District
Nicole Soderholm, Permit Inspector
Chris O'Brien, Communications Coordinator

1. CALL TO ORDER
The meeting was called to order by President Ebensteiner at 6:20 p.m.

2. APPROVAL OF AGENDA
Motion: Cliff Aichinger moved, Lawrence Swope seconded, to approve the agenda as presented. Motion carried unanimously.

3. CONSENT AGENDA
~~A. Approval of Minutes from November 7, 2018~~
B. 2019 BMP Program Service Agreement with Washington Conservation District
C. 2019 BMP Program Service Agreement with Ramsey County Soil and Water Conservation District

Tina Carstens requested to pull Item A from the Consent Agenda for additional discussion.

Motion: Cliff Aichinger moved, Dr. Pam Skinner seconded, to approve the consent agenda as amended. Motion carried unanimously.

A. Approval of Minutes from November 7, 2018

Tina noted that Manager Ward stated that there was some discussion missing for Item 8A**,** found on the bottom of page two and the top of page three, regarding the temporary versus permanent fix. Manager Ward believed that additional detail should be added. She noted that she could add a few extra sentences with that detail.

Tina noted on the bottom of page three, it should state, "…~~He~~ The."

Motion: Dianne Ward moved, Lawrence Swope seconded, to approve the Minutes from the November 7, 2018 meeting as amended. Motion carried unanimously.

4. TREASURER'S REPORT AND BILL LIST

Motion: Cliff Aichinger moved, Dr. Pam Skinner seconded, to approve the December 5, 2018, bill list as submitted. Motion carried unanimously.

5. VISITOR PRESENTATIONS There were none.

6. PERMIT PROGRAM

A. Applications

Permit #18-28: RWMWD 2019 Maintenance and Repair Project – Various Cities

Nicole Soderholm stated that this is the erosion control permit for the annual maintenance and repair project, which will be further discussed later on tonight's agenda.

Motion: Dr. Pam Skinner moved, Cliff Aichinger seconded, to approve Permit #18-28. Motion carried unanimously.

Permit #18-29: Larpenteur-Prosperity Filtration BMP – St. Paul

Nicole Soderholm stated that Ramsey County is doing this project to acquire volume reduction banking credits for use on future projects. This project will construct an enhanced regional filtration basin which will use spent lime. She stated that this basin would be designed to catch water from 125 acres, 50 of which are impervious. She stated that the spent lime will need to be properly maintained in order for the credits to be used in the future. Manager Aichinger asked if the County owned this land or purchased the land. Nicole replied that the County purchased this land.

Motion: Cliff Aichinger moved, Dianne Ward seconded, to approve Permit #18-29. Motion carried unanimously.

Permit #18-30: Morrie's Mercedes Benz – Maplewood

Nicole Soderholm stated that there is an existing dealership off Highway 61 and noted that the proposal would be to demolish that building and construct a larger building and parking lot. She stated that there is a variance request and provided additional information on the filtration system proposed that is not typically applied under our rules. Manager Aichinger stated that in the past the Board has reviewed this type of system under new technologies and it is ranked highly.

Brad Lindaman noted that using the system in this fashion is a new thing. He explained that although this is not a traditional variance, in that a rule is not specifically being met, but there is thought as to whether the system would function in the intended manner if not properly maintained. Manager Aichinger asked if this permit would be required to submit proof of annual maintenance. Nicole stated that part of the approval would require a more rigorous operations and maintenance plan to be submitted and agreed that documentation of annual maintenance should be provided.

Brad asked what would happen if the system is not maintained, specifically the enforcement the District would have. Tracey Galowitz stated that the District could take action if the maintenance agreement is not followed. Tina Carstens noted that the maintenance agreement would be between the applicant, the District, and City of Maplewood. Brad said that his experience with this type of system is that there is a lot of maintenance required because of the cartridges that need to be replaced. Manager Aichinger stated that perhaps staff reach out to the City of Maplewood to express their concern with this type of system and the maintenance that is required. Nicole stated that from the standpoint of the applicant this route would be less risky than the other method that would be available, noting that if the other method fails the entire parking lot would need to be ripped up in order to replace it. Tracey stated that an additional paragraph could be added that would address the liability of the applicant, should the system not be maintained properly, and a hold harmless and indemnification statement for

the District. She confirmed that she could also add language that would state that if this system were to fail the applicant would need to put in a new system.

Nicole confirmed the consensus of the Board that they would continue to support this type of system as a variance going forward. President Ebensteiner stated that this approval will set forward a model for what would need to be included in future requests in terms of additional language. She stated that she would err on the side of being more inclusive with language rather than less inclusive in terms of required maintenance. Manager Skinner stated that this request includes a variance for the buffer, but noted that there would be a larger buffer in some areas. She stated that it would be nice to have something that would guarantee that the additional buffer area is kept to keep that average buffer.

It was the consensus of the Board that the following items should be added: manufacturer's recommended maintenance schedule, site specific operations plan, indemnification and hold harmless paragraph, failure to maintain would require replacement of the system, and the average buffer must be kept in place.

Motion: Cliff Aichinger moved, Dr. Pam Skinner seconded, to approve Permit #18-30 with the added special provisions and approving the variance requests. Motion carried unanimously.

B. Monthly Enforcement Report

During November, 16 notices were sent to address: install/maintain inlet protection (4), install/maintain perimeter control (3), install/maintain construction entrance (3), sweep streets (1), stabilize exposed soils (1), contain liquid/solid wastes (1), remove discharged sediment (1), and protect/maintain permanent BMPs (2).

7. STEWARDSHIP GRANT PROGRAM

A. Applications None.

B. Budget Status Update No comments.

C. 2018 Program Overview and 2019 Program Review and Approval

Paige Ahlborg stated that 2018 was a very busy year which included 26 unique applications from individual property owners and two retrofit projects. She reviewed the 2018 allocation by category, noting that there were a lot of large projects within the priority areas. She noted that the maximum amount for residential projects was raised to $15,000 and that property owners have the opportunity to present their case to the Board if the price exceeds the $15,000 maximum. She stated that the maintenance grant has received positive feedback and a lot of interest from property owners. Paige identified the locations of the 320 cost-share projects that have been constructed since the program began in 2006. She stated that 25 retrofit projects have been constructed since that program began in 2014. She stated that the District intern inspected the cost-share projects and provided a summary of the results, noting that the projects with a grade of A have increased. She stated that all four projects ranked with a C applied for the maintenance grant which will help to improve the quality of the project. She stated that 2019 is gearing up to be a busy year through both the retrofit program and stewardship grant program and provided examples.

Paige provided details on the Snail Lake shoreline restoration project, noting that all properties identified in red have agreed to be a part of the project and has a total project area of 67,750 square feet. She said that it will be a two-year project which will be put out for bid in 2019. She noted that, once complete, the contractor would complete two years of maintenance on the project as well.

Paige stated that the maintenance program will go out for RFQ in February, with a two-year contract. She reviewed the required maintenance period for different projects. She stated that for 2019 staff is not requesting any changes to the program and would propose the same priority subwatersheds, which are based on the TMDL and WRAPP studies. The 2019 cost share coverage amounts would be proposed to stay the same as well.

Motion: Cliff Aichinger moved, Dr. Pam Skinner seconded, to approve the 2018 priority areas as the following subwatersheds: Battle Creek Lake, Battle Creek, Beaver Lake, Bennett Lake, Carver Lake, Fish Creek, Gervais Creek, Kohlman Creek, Kohlman Lake, Lake Emily, Lake Owasso, Shoreview Pond, Wakefield Lake and Willow Creek; approve 2019 coverage amounts as shown in table one; and approve staff to continue watershed maintenance, equity initiative, and aquatic plant harvesting grants. Motion carried unanimously.

8. ACTION ITEMS

A. 2019 CIP Maintenance and Repair Project Bid Review and Award

Brad Lindaman distributed the bid results to the Board. He stated that the preliminary plans and specifications for the project were presented at the last meeting with direction provided to staff to finalize the documents and put the project out for bid. He noted that a number of items were pulled from the base project to create alternates, explaining that the Board could then make the decision on whether to move forward on those elements. He stated that four bids were received with a wide range in price. He noted that the alternates were not part of the lowest base bid process. He reported that the lowest bidder was Fitzgerald Excavating and Trucking, who did complete the 2017 and 2018 projects.

Tracey Galowitz stated, as was suggested at the last meeting, a letter was to go out to Fitzgerald notifying they may not be considered a responsible bidder, based on work delays on the last project. The letter did not get to Fitzgerald before they produced a bid. However, Fitzgerald was notified after it was determined they were the low bidder on the project. She stated that staff met with Jason Fitzgerald prior to tonight's District meeting and he understands if he is chosen for this project and does not meet the deadline this may be his last opportunity to complete a project for the District. Tracey stated, the District has the right to obtain liquidated damages should the project run over the project deadline. She used the example of $200 per day for each day a project is over the deadline, based on her time, as well as the engineer's time on the project. She stated, Fitzgerald does quality work and because of the price difference between this bidder and the next lowest bidder, she would recommend choosing Fitzgerald, with the clear understanding that this may be his last opportunity should he run past the deadline.

Brad estimated about $25,000 in Barr's fees were incurred by the district after the deadlines on the two projects completed by Fitzgerald in 2018. These costs, in addition to the costs associated with Dave Vlasin's time and Tracey Galowitz's time on these two projects after the deadlines, results in an extra total cost of $40 000 to $50,000 in working with this contractor in 2018. Brad also noted that there is a big gap between the Fitzgerald bid and the next lowest bidder that far exceeds this extra cost. President Ebensteiner stated the District has had problems with the contractor, but in the end the result of the project was good. She noted there is no guarantee there would not be similar hassle with other contractors.

Manager Ward stated, perhaps it would be helpful for staff to identify priorities which would help the contractor schedule appropriately. Manager Aichinger stated he has been in meetings where Tracey Galowitz has talked with contractors and if the contractor looked her in the eye and agreed, he believes that is the honest response. He agreed that perhaps more of a schedule is requested from the contractor upfront to help the contractor with his problem with organization. He stated these are small individual maintenance projects rather than a large CIP project and therefore he is not worried with the exact timing.

Manager Skinner asked if some of the costs were recovered through the retainage. Brad replied that the Board ultimately chose not to go down that path. Manager Skinner stated that perhaps it should be made clear that the District incurred those expenses in the past and did not take that from the retainage, but if the deadline is missed this time, the District will pursue funds from the retainage. President Ebensteiner stated the bid is so low, she tends to want to choose Fitzgerald.

Motion: Dr. Pam Skinner moved, Cliff Aichinger seconded, to accept the bids and award the 2019 CIP Maintenance and Repair Project to Fitzgerald Excavating and Trucking and to direct staff to prepare and mail the notice of award,

prepare the draft agreements and review the required submittals. Motion carried 4-1 (Aichinger, Ebensteiner, Skinner, Swope in favor. Ward opposed).

Brad noted that there was a discussion with Ramsey County Parks and the City of Shoreview regarding the alternate items. He provided additional details on alternate A which makes changes to the Snail Lake overflow. Currently if the lake were to overflow it would travel down the "backdoor route" towards the Crestview Addition. The work in alternate A would change that flow path to direct the water to Wetland A. He stated that all the partners involved agreed to complete alternative A work as part of the District's contract.

He next provided additional details on alternate B which includes the construction of a stop log structure in the pedestrian tunnel under Gramsie Road. This would allow the city to block the flow of water from Grass Lake to the north through the tunnel and into the NW Gramsie Road pond thus taking the pressure off the groundwater system around Suzanne Pond.

Tina Carstens noted that the City of Shoreview is interested in cost-sharing for both alternates A and B. Brad noted that once the stop log structure is installed, Shoreview has agreed to be responsible for the operation.

Brad provided additional details on alternate C, noting that in the meeting with the County and City it was learned that there will be a trail project and the County/City will include that trail raising in their project and alternate C will not be necessary. He provided additional details on alternate D which includes the building up and connecting a ridge to take away the possibility of water to travel to and from Wetland A to the west. Tina that ultimately it was decided that alternate D would be a District responsibility because it completes the overflow path work we started in the last project.

President Ebensteiner commended staff for working out the details on the alternates and the cost-shares.

Motion: Cliff Aichinger moved, Dr. Pam Skinner seconded, to approve alternates A, B and D and direct staff to continue discussions with the City of Shoreview and the County on cost-share amounts. Motion carried unanimously.

B. 2019 Budget and Levy Final Approval – Resolution 18-08

Tina Carstens stated that she outlined a few changes that were made, which slightly reduced the overall levy amount from the preliminary levy in September.

Manager Swope referenced the flood response line item and asked when or how that would be used. Tina noted that the fund was used for the Grass Lake berm project. She stated that if additional opportunities should arise or there was an event that needed immediate action, those funds would be available.

Motion: Dianne Ward moved, Lawrence Swope seconded, to approve the FY 2019 General Fund and CIP budgets and adopt Resolution 18-08. Motion carried unanimously.

9. ADMINISTRATOR'S REPORT

A. Meetings Attended No comments.

B. Upcoming Meetings and Dates

Tina Carstens noted that the office holiday party will be held on Thursday, December 20, and invited the Managers to attend.

Manager Aichinger asked for input on the District health benefits. Tina noted that there was a moderate increase of seven percent. She stated that there is an additional buy-up option that was also offered to employees.

C. Upcoming Project Coordination Update

Tina Carstens provided an update, beginning with Aldrich Arena. Paige Ahlborg noted that additional information will come to the Board in February or March for Aldrich Arena. President Ebensteiner noted that perhaps this would be a good location for a public art element to be added due to the high amount of traffic at that location.

Tina provided an update on the rapid transit routes which will run through the District.

10. PROJECT AND PROGRAM STATUS REPORTS

A. Project Technical Report: West to East Vadnais Lake Gravity Flow Feasibility Evaluation

Brad Lindaman stated that there has been discussion on this topic for the past few months. He stated that the information from the soils, piezometers, and ground water modeling has shown that there is not nearly as much flow through the berm that was original speculated. He stated that the study has shown that this option is not a practical approach. He stated that now that it is known that there is clear separation between the lakes, the lowering of the outlet of West Vadnais could be pursued. Manager Skinner stated that she would still be curious to see the results of the water quality testing that was done.

B. Project Report: Lake Owasso Emergency Response Plan and Snail Lake/Grass Lake Area Flood Risk Reduction Projects

Brad Lindaman provided additional details on the emergency response plan, noting that trigger points will be created to when the cities should be on alert and when the cities should take action. President Ebensteiner commented that some entity has the obligation to alert the homeowner that their property is at risk for flooding. Brad noted that there is often a discrepancy between the FEMA information and the District information. He stated that even though flood insurance may not be required from FEMA, the homeowner may benefit from having flood insurance. Tina stated that the District shares the information with the city, who would then be responsible to share that information/notification with the property owners. Tracey Galowitz stated that, on the other side, some of those properties have not flooded in the past and providing a notice to the property owner could actually decrease their property value because of the known risk.

Motion: Cliff Aichinger moved, Dr. Pam Skinner seconded, to direct staff to continue discussions with the cities to finalize the emergency response plans for their review and approval. Motion carried unanimously.

C. Ongoing Project and Program Updates

i. Owasso Park Stormwater Master Plan
ii. Beltline Resiliency Study
iii. At Risk Subwatershed Feasibility Studies
iv. District Office Parking Lot Retrofit
v. FEMA Flood Mapping
vi. West Vadnais Lake Outlet Permitting
vii. 500 Year Atlas 14 Modeling
viii. Auto Lake Monitoring Systems
ix. Maplewood Mall Monitoring
x. Wakefield Park/Frost Avenue Project
xi. Targeted Retrofit Projects
xii. BMP Design Assistance and Review
xiii. Beltline/Battle Creek Tunnel
xiv. New Technology Case Study: NutrimaxTM Advanced Vegetated Bioretention
xv. Natural Resources Program
xvi. Education Program
xvii. Communications Program

Manager Skinner requested that groundwater be added to the list in the future.

11. INFORMATIONAL ITEMS

Tina Carstens noted that the MAWD conference occurred the previous week and there were some nice changes to the format which were well received. She reported that the nine proposed resolutions passed as proposed.

12. REPORTS OF MANAGERS None.

13. ADJOURN

Motion: Dr. Pam Skinner moved, Cliff Aichinger seconded, to adjourn the meeting at 8:49 p.m. Motion carried unanimously.

Respectfully submitted,

Dr. Pam Skinner, Secretary

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Bill List

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RWMWD BUDGET STATUS REPORT
Administrative & Program Budget
Fiscal Year 2018
12/31/18-Unaudited

Budget Category	Budget Item	Account Number	Original Budget	Budget Transfers	Current Month Expenses	Year-to-Date Expenses	Current Budget Balance	Percent of Budget
Manager	Per diems	4355	$6,500.00	-	255.00	4,180.00	$2,320.00	64.31%
	Manager expenses	4360	3,500.00	-	-	782.59	2,717.41	22.36%
Committees	Committee/Bd Mtg. Exp.	4365	3,500.00	-	245.50	3,072.24	427.76	87.78%
Employees	Staff salary/taxes/benefits	4010	1,300,000.00	-	90,378.28	1,213,357.26	86,642.74	93.34%
	Employee expenses	4020	10,000.00	-	484.39	5,134.94	4,865.06	51.35%
	District training & education	4350	25,000.00	-	1,098.97	21,038.20	3,961.80	84.15%
Administration/	GIS system maint. & equip.	4170	15,000.00	-	-	4,101.02	10,898.98	27.34%
Office	Data Base/GIS Maintenance	4171	15,000.00	-	-	1,300.00	13,700.00	8.67%
	Equipment maintenance	4305	3,000.00	-	277.00	1,707.83	1,292.17	56.93%
	Telephone	4310	8,000.00	-	358.22	3,390.18	4,609.82	42.38%
	Office supplies	4320	5,000.00	-	216.72	4,183.30	816.70	83.67%
	IT/Internet/Web Site/Software Lic.	4325	42,000.00	-	3,957.25	30,989.82	11,010.18	73.79%
	Postage	4330	10,000.00	-	142.47	3,417.06	6,582.94	34.17%
	Printing/copying	4335	8,000.00	-	285.67	5,100.46	2,899.54	63.76%
	Dues & publications	4338	11,000.00	-	344.00	10,152.00	848.00	92.29%
	Janitorial/Trash Service	4341	17,000.00	-	1,138.15	13,067.44	3,932.56	76.87%
	Utilities/Bldg.Contracts	4342	18,000.00	-	2,083.45	16,667.47	1,332.53	92.60%
	Bldg/Site Maintenance	4343	70,000.00	-	630.49	29,092.25	40,907.75	41.56%
	Miscellaneous	4390	5,000.00	-	74.99	400.18	4,599.82	8.00%
	Insurance	4480	35,000.00	-	-	34,295.00	705.00	97.99%
	Office equipment	4703	40,000.00	-	-	14,892.97	25,107.03	37.23%
	Vehicle lease, maintenance	4810-40	43,000.00	-	157.92	33,728.33	9,271.67	78.44%
Consultants/	Auditor/Accounting	4110	50,000.00	-	1,454.08	48,721.60	1,278.40	97.44%
Outside Services	Engineering-administration	4121	93,000.00	-	7,166.84	71,652.91	21,347.09	77.05%
	Engineering-permit I&E	4122	15,000.00	-	1,513.36	4,668.36	10,331.64	31.12%
	Engineering-eng. review	4123	55,000.00	-	2,389.50	52,082.06	2,917.94	94.69%
	Engineering-permit review	4124	50,000.00	-	3,699.50	40,730.00	9,270.00	81.46%
	Project Feasibility Studies	4129	735,000.00	-	20,258.11	307,647.43	427,352.57	41.86%
	Attorney-permits	4130	10,000.00	-	-	1,161.28	8,838.72	11.61%
	Attorney-general	4131	40,000.00	-	3,480.00	17,282.47	22,717.53	43.21%
	Outside Consulting Services	4160	40,000.00	-	-	7,832.00	32,168.00	19.58%
Programs	Educational programming	4370	60,000.00	-	2,336.06	32,223.57	27,776.43	53.71%
	Communications & Marketing	4371	25,000.00		156.17	6,691.37	18,308.63	26.77%
	Events	4372	50,000.00	-	72.65	37,313.06	12,686.94	74.63%
	Water QM-Engineering	4520-30	513,000.00	-	9,420.14	148,180.50	364,819.50	28.89%
	Project operations	4650	140,000.00	-	458.55	91,763.07	48,236.93	65.55%
	SLMP/TMDL Studies	4661	115,000.00	-	-	18,725.17	96,274.83	16.28%
	Natural Resources/Keller Creek	4670-72	100,000.00	-	1,331.82	87,364.59	12,635.41	87.36%
	Outside Prog.Support/Weed Mgmt.	4683-84	70,000.00	-	431.14	38,947.41	31,052.59	55.64%
	Research Projects	4695	100,000.00	-	25,324.00	65,834.63	34,165.37	65.83%
	Health and Safety Program	4697	2,000.00	-	-	2,747.54	(747.54)	137.38%
	NPDES Phase II	4698	20,000.00	-	836.84	10,261.90	9,738.10	51.31%
	Atlas 14 Watershed Modeling	4732	-	-	-	-	-	0.00%
GENERAL FUND TOTAL			**$3,976,500.00**	**$0.00**	**$182,457.23**	**$2,545,881.46**	**$1,430,618.54**	64.02%
CIP's	CIP Project Repair & Maintenance	516	1,000,000.00	-	18,863.97	741,894.27	258,105.73	74.19%
	Targeted Retrofit Projects	518	800,000.00	-	108,612.09	197,211.29	602,788.71	24.65%
	District Office Building Solar Energy Retrofit	519	150,000.00	-	-	96,818.00	53,182.00	64.55%
	Flood Damage Reduction Fund	520	2,000,000.00	-	973.78	84,730.93	1,915,269.07	4.24%
	Debt Services-96-97 Beltline/MM/Battle Creek	526	448,951.00	-	-	387,618.43	61,332.57	86.34%
	Stewardship Grant Program Fund	528-529	800,000.00	-	55,826.24	556,272.73	243,727.27	69.53%
	Impervious Surface Volume Reduction Opportunity	531	1,500,000.00	-	-	-	1,500,000.00	0.00%
	Beltline & Battle Creek Tunnel Repair	549	-	-	454.50	1,631,693.58	(1,631,693.58)	---
	Frost/Kennard Enhanced WQ BMP	550	400,000.00	-	188.00	299,171.21	100,828.79	74.79%
	Markham Pond Dredging & Aeration	551	25,000.00	-	-	-	25,000.00	0.00%
	Wakefield Park Project	553	1,100,000.00	-	1,903.20	51,869.13	1,048,130.87	4.72%
	Willow Pond CMAC	554	400,000.00		7,783.23	415,012.78	(15,012.78)	103.75%
	District Office Bond Payment	585	194,885.00	-	-	196,983.53	(2,098.53)	101.08%
CIP BUDGET TOTAL			**$8,818,836.00**	**-**	**$194,605.01**	**$4,659,275.88**	**$4,159,560.12**	52.83%
TOTAL BUDGET			**$12,795,336.00**	**$0.00**	**$377,062.24**	**$7,205,157.34**	**$5,590,178.66**	**56.31%**

Current Fund Balances:

Fund:	Beginning Fund Balance @ 12/31/17	Fund Transfers	Year to date Revenue	Current Month Expenses	Year to Date Expense	Unaudited Fund Balance @ 12/31/18
101 - General Fund	$4,329,903.56	-	2,764,254.31	182,457.23	2,545,881.46	4,548,276.41
516 - CIP Project Repair & Maintenance	615,041.00	-	1,040,525.68	18,863.97	741,894.27	913,672.41
518 - Targeted Retrofit Projects	836,989.00	-	350,214.08	108,612.09	197,211.29	989,991.79
519 - District Office Building Solar Energy Retrofit	129,623.00	-	-	-	96,818.00	32,805.00
520 - Flood Damage Reduction Fund	1,118,749.00	-	831,141.03	973.78	84,730.93	1,865,159.10
526 - Debt Services-96-97 Beltline/MM/Beltline-Battle Creek Tunnel Repair	359,578.00	-	442,716.73	-	387,618.43	414,676.30
528/529 - Stewardship Grant Program Fund	561,388.00	-	409,445.48	55,826.24	556,272.73	414,560.75
531 - Impervious Surface Volume Reduction Opportunity	1,484,215.00	-	-	-	-	1,484,215.00
549 - Beltline & Battle Creek Tunnel Repair	2,407,984.00	-	-	454.50	1,631,693.58	776,290.42
550 - Frost/Kennard Enhanced WQ BMP	119,513.00	-	24,652.85	188.00	299,171.21	(155,005.36)
551 - Markham Pond Dredging & Aeration	110,411.00	-	-	-	-	110,411.00
553 - Wakefield Park Project	351,874.00	-	803,008.26	1,903.20	51,869.13	1,103,013.13
554 - Willow Pond CMAC	-	-	394,445.48	7,783.23	415,012.78	(20,567.30)
580 - Contingency Fund	476,100.94	-	-	-	-	476,100.94
585 - Certificates of Participation	133,637.00	-	192,178.76	-	196,983.53	128,832.23
Total District Fund Balance	**$13,035,006.50**	**-**	**$ 7,252,582.66**	**$ 377,062.24**	**$7,205,157.34**	**$13,082,431.82**

Ramsey Washington Metro Watershed Dist.
Check Register
For the Period From Dec 1, 2018 to Dec 31, 2018

Check #	Date	Payee ID	Payee	Description	Amount
EFT	12/01/18	met003	MetLife	Employee Benefits	$1,196.21
EFT	12/11/18	hea002	HealthPartners	Employee Benefits	12,063.11
70405V	12/13/18	qwe001	CenturyLink - VOID	VOID	(223.53)
70421	12/10/18	bei001	Anna D. Beining	Employee Reimbursement	46.33
70422	12/10/18	cit011	City of Roseville	Telephone/IT/Website/Software	4,045.82
70423	12/10/18	gru001	Gruber's Power Equipment	Natural Resources Project	18.01
70424	12/10/18	hom001	Home Depot Credit Services	Natural Resources Project	43.94
70425	12/10/18	kil001	Killmer Electric Co., Inc.	Construction Imp.-Willow Pond	2,925.00
70426	12/10/18	kin001	FedEx Office	Events	32.65
70427	12/10/18	min008	Minnesota Native Landscapes, Inc.	Construction Imp.-Willow Pond	690.00
70428	12/10/18	pit001	Pitney Bowes Global Financial Serv LLC	Postage	142.47
70429	12/10/18	pre003	Premium Waters, Inc.	Utilities/Bldg. Contracts	22.00
70430	12/10/18	ram002	Ramsey County	Natural Resources Project	1,245.00
70431	12/10/18	reg002	Regents of the University of Minnesota	Communications & Marketing	46.73
70432	12/11/18	pet001	Peterson Companies, Inc.	Construction Imp.-Willow Pond	3,408.61
70433	12/26/18	ada002	Adam's Pest Control, Inc.	Utilities/Bldg. Contracts	79.00
70434	12/26/18	ahl001	Paige Ahlborg	Employee Reimbursement	230.86
70435	12/26/18	all004	allstream	Project Operations	64.97
70436	12/26/18	att002	AT & T Mobility - ROC	IT/Website/Software	43.22
70437	12/26/18	aws001	AWS Service Center	Janitorial/Trash Service	188.15
70438	12/26/18	bar001	Barr Engineering	November/December Engineering	77,446.26
70439	12/26/18	bar002	Bill Bartodziej	Employee Reimbursement	102.81
70440	12/26/18	bar004	Deborah Barnes	Employee Reimbursement	26.00
70441	12/26/18	bre003	Bremer Bank	Employee Benefits	7,437.50
70442	12/26/18	che001	Cherokee Hills Association No. II	Stewardship Grant Fund	599.65
70443	12/26/18	che002	Cherokee Hills Association No. I	Stewardship Grant Fund	577.15
70444	12/26/18	cit002	City of Maplewood	Stewardship Grant Fund	39,436.50
70445	12/26/18	cit009	City of St. Paul	Stewardship Grant Fund	8,125.00
70446	12/26/18	cit011	City of Roseville	IT/Website/Software	75.00
70447	12/26/18	dtd001	D & T Development, LLP	Dev Escrow-General	15,520.00
70448	12/26/18	fle002	Fleur Royale Condominium Association	Stewardship Grant Fund	1,000.00
70449	12/26/18	gal001	Galowitz Olson, PLLC	November/December Legal Fees	4,940.00
70450	12/26/18	geo002	George's Contracted Services, Inc.	Janitorial/Trash Service	400.00
70451	12/26/18	hen002	Henriksen Ace Hardware	Natural Resources Project	4.90
70452	12/26/18	hom001	Home Depot Credit Services	Natural Resources Project	19.97
70453	12/26/18	inn002	Innovative Office Solutions LLC	Office Supplies	119.27
70454	12/26/18	inn003	Innovational Concepts, Inc.	Utilities/Bldg. Contracts	446.75
70455	12/26/18	int001	Office of MN, IT Services	Telephone Expense	55.40
70456	12/26/18	kor001	Eric Korte	Employee Reimbursement	68.23
70457	12/26/18	lea003	L. Tracy Leavenworth	Edcuational Program	2,209.43
70458	12/26/18	lio002	Lionsgate Academy	BMP Cost Share Program	98,853.66
70459	12/26/18	mel001	Michelle L. Melser	Employee Reimbursement	164.85
70460	12/26/18	nar001	Nardini Fire Equipment	Bldg./Site Maintenance	259.00
70461	12/26/18	nor016	Northland Trust Services, Inc.	Construction-Beltline/Battle	268,381.25
70462	12/26/18	nor018	NorthPoint Development	Dev Escrow-General	12,770.00
70463	12/26/18	nsp001	Xcel Energy	Utilities/Project Operations	1,924.14

Ramsey Washington Metro Watershed Dist.
Check Register
For the Period From Dec 1, 2018 to Dec 31, 2018

Check #	Date	Payee ID	Payee	Description	Amount
70464	12/26/18	obr001	Christopher O'Brien	Employee Reimbursement	86.34
70465	12/26/18	pac001	Pace Analytical Services, Inc.	Water QM Staff	753.00
70466	12/26/18	par004	Park View Terrace HOA	Stewardship Grant Fund	1,000.00
70467	12/26/18	pas002	Sage Passi	Employee Reimbursement	294.07
70468	12/26/18	pro003	Lyndsey R. Provos	Employee Reimbursement	170.74
70469	12/26/18	qwe001	CenturyLink	Project Operations	228.67
70470	12/26/18	red002	Redpath & Company, Ltd	November Accounting	1,454.08
70471	12/26/18	sel001	Select Synthetics	Bldg./Site Maintenance	200.00
70472	12/26/18	sku001	Nancy & Glen Skuta	Stewardship Grant Fund	3,447.96
70473	12/26/18	sod001	Nicole Soderholm	Employee Reimbursement	140.00
70474	12/26/18	tim002	Timesaver Off-Site Secretarial, Inc.	Committee/Board Meeting Exp.	245.50
70475	12/26/18	uni006	University of Minnesota	Research Projects	25,000.00
70476	12/26/18	usb002	U.S. Bank	Monthly Credit Card Expense	3,050.55
70477	12/26/18	usb003	US Bank St. Paul	Debt Services-Cert.of Particip.	191,353.76
70478	12/26/18	usb005	US Bank Equipment Finance	Printing Expense	285.67
70479	12/26/18	van001	Vanguard Cleaning Systems of Minnesota	Janitorial/Trash Service	550.00
70480	12/26/18	vik001	Viking Industrial Center	Water QM Staff	184.39
70481	12/26/18	vla002	VLAWMO	Edcuational Program	117.00
70482	12/26/18	voy001	US Bank Voyager Fleet Sys.	Vehicle Expense	138.60
70483	12/26/18	was002	Washington Conservation District	Stewardship Grant Fund	495.50
70484	12/26/18	wet001	Wetland Professionals Association	Dues & Publications	30.00
Total					**$796,497.10**

Ramsey Washington Metro Watershed Dist.
Cash Disbursements Journal
For the Period From Dec 1, 2018 - Dec 31, 2018

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	Check Detail
12/01/18	EFT	met003	MetLife			1,196.21	
				4040-101-000	Employee Benefits-General		988.14
				2015-101-000	Employee Health-General		208.07
12/11/18	EFT	hea002	HealthPartners			12,063.11	
				4040-101-000	Employee Benefits-General		10,416.30
				2015-101-000	Employee Health-General		1,646.81
12/10/18	70405V	qwe001	CenturyLink	4650-101-000	Project Operations-General	(223.53)	
12/10/18	70421	bei001	Anna D. Beining	4020-101-000	Employee Expenses-General	46.33	
12/10/18	70422	cit011	City of Roseville			4,045.82	
				4325-101-000	IT/Website/Software		2,211.00
				4310-101-000	Telphone-general		302.82
				4325-101-000	IT/Website/Software		1,202.00
				4325-101-000	IT/Website/Software		330.00
12/10/18	70423	gru001	Gruber's Power Equipment	4670-101-000	Natural Resources Project-General	18.01	
12/10/18	70424	hom001	Home Depot Credit Services	4670-101-000	Natural Resources Project-General	43.94	
12/10/18	70425	kil001	Killmer Electric Co, Inc.	4630-554-000	Construction Imp.-Willow Pond	2,925.00	
12/10/18	70426	kin001	FedEx Office	4372-101-000	Events	32.65	
12/10/18	70427	min008	Minnesota Native Landscape, Inc.	4630-554-000	Construction Imp.-Willow Pond	690.00	
12/10/18	70428	pit001	Pitney Bowes Global Financial Service, LLC	4330-101-000	Postage	142.47	
12/10/18	70429	pre003	Premimum Waters, Inc.	4342-101-000	Utilities/Building Contracts	22.00	
12/10/18	70430	ram002	Ramsey County			1,245.00	
				4670-101-000	Natural Resources Project-General		1,095.00
				4670-101-000	Natural Resources Project-General		150.00
12/10/18	70431	reg002	Regents of the University of Minnesota	4371-101-000	Communications & Marketing	46.73	
12/11/18	70432	pet001	Peterson Companies, Inc.	4630-554-000	Construction Imp.-Willow Pond	3,408.61	
12/26/18	70433	ada002	Adam's Pest Control	4342-101-000	Utilities/Building Contracts	79.00	
12/26/18	70434	ahl001	Paige Ahlberg			230.86	
				4040-101-000	Employee Benefits-General		78.12
				4020-101-000	Employee Expenses-General		152.74
12/26/18	70435	cad002	allstream	4650-101-000	Project Operations-General	64.97	
12/26/18	70436	att001	AT&T Mobility	4325-101-000	IT/Website/Software	43.22	
12/26/18	70437	aws001	AWS Service Center	4341-101-000	Janitorial/Trash Service	188.15	
12/26/18	70438	bar001	Barr Engineering			77,446.26	
				4121-101-000	Engineering Admin-General Fund		7,166.84
				4698-101-000	Engineering-NPDES Phase II		836.84
				4123-101-000	Engineering-Review		2,389.50
				4129-101-000	Project Feasability-General		1,315.50
				4129-101-000	Project Feasability-General		45.00
				4129-101-000	Project Feasability-General		1,117.00
				4129-101-000	Project Feasability-General		428.00
				4129-101-000	Project Feasability-General		780.00

Ramsey Washington Metro Watershed Dist.
Cash Disbursements Journal
For the Period From Dec 1, 2018 - Dec 31, 2018

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	Check Detail	
				4129-101-000	Project Feasability-General		1,219.00	
				4129-101-000	Project Feasability-General		1,780.50	
				4129-101-000	Project Feasability-General		1,410.62	
				4129-101-000	Project Feasability-General		1,829.86	
				4129-101-000	Project Feasability-General		941.00	
				4129-101-000	Project Feasability-General		8,362.50	
				4129-101-000	Project Feasability-General		945.13	
				4129-101-000	Project Feasability-General		84.00	
				4520-101-000	Water QM-Engineering		8,704.75	
				4520-101-000	Water QM-Engineering		55.00	
				4122-101-000	Engineering-Permit I & E		1,513.36	
				4124-101-000	Engineering-Permit Review		3,699.50	
				4695.101-000	Research Projects-General		84.00	
				4695.101-000	Research Projects-General		240.00	
				4128-553-000	Engineering-Wakefield		1,903.20	
				4128-550-000	Engineering-Frost/Kennard		188.00	
				4128-518-000	Engineering-School/Commer Retrofit		1,782.00	
				4128-518-000	Engineering-School/Commer Retrofit		1,586.43	
				4128-518-000	Engineering-School/Commer Retrofit		88.00	
				4128-518-000	Engineering-School/Commer Retrofit		72.00	
				4682-529-000	Stewardship Grant Program		1,042.48	
				4128-528-000	Engineering-Faith Based		102.00	
				4128-554-000	Engineering-Willow Pond		672.00	
				4128-520-000	Engineering-Flood Damage		973.78	
				4128-518-000	Engineering-School/Commer Retrofit		6,230.00	
				4128-549-000	Engineering-Beltline/Battle Creek		454.50	
				4128-516-000	Engineering-Projects Maint. & Repair		3,753.50	
				4128-516-000	Engineering-Projects Maint. & Repair		454.00	
				4128-516-000	Engineering-Projects Maint. & Repair		13,196.47	
12/26/18	70439	bar002	Bill Bartodziej			102.81		
				4040-101-000	Employee Benefits-General		57.03	
				4020-101-000	Employee Expenses-General		45.78	
12/26/18	70440	bar004	Deborah Barnes			26.00		
				4040-101-000	Employee Benefits-General		20.00	
				4020-101-000	Employee Expenses-General		6.00	
12/26/18	70441	bre003	Bremer Bank	4040-101-000	Employee Benefits-General	7,437.50		2019
12/26/18	70442	che001	Cherokee Hills Association No II	4682-529-000	Stewardship Grant Program	599.65		
12/26/18	70443	che002	Cherokee Hills Association No I	4682-529-000	Stewardship Grant Program	577.15		
12/26/18	70444	cit002	City of Maplewood	4682-529-000	Stewardship Grant Program	39,436.50		
12/26/18	70445	cit009	City of St. Paul	4682-529-000	Stewardship Grant Program	8,125.00		
12/26/18	70446	cit011	City of Roseville	4325-101-000	IT/Website/Software	75.00		
12/26/18	70447	dtd001	D & T Development, LLP	2024-101-000	Dev Escrow-General	15,520.00		
12/26/18	70448	fle002	Fleur Royale Condominium Association	4682-529-000	Stewardship Grant Program	1,000.00		
12/26/18	70449	gal001	Galowitz Olson, PLLC			4,940.00		
				4131-101-000	Attorney General-General Fund		3,480.00	
				4131-516-000	Attorney General-Maint. & Repair		1,460.00	

Ramsey Washington Metro Watershed Dist.
Cash Disbursements Journal
For the Period From Dec 1, 2018 - Dec 31, 2018

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	Check Detail	
12/26/18	70450	geo002	George's Contracted Services, Inc.	4341-101-000	Janitorial/Trash Service	400.00		
12/26/18	70451	hen002	Henriksen Ace Hardware	4670-101-000	Natural Resources Project-General	4.90		
12/26/18	70452	hom001	Home Depot Credit Services	4670-101-000	Natural Resources Project-General	19.97		
12/26/18	70453	inn002	Innovative Office Solutions, LLC	4320-101-000	Office Supplies-General	119.27		
12/26/18	70454	inn003	Innovational Concepts, Inc.	4342-101-000	Utilities/Building Contracts	446.75		
12/26/18	70455	int001	Office of MN, IT Services	4310-101-000	Telephone-General	55.40		
12/26/18	70456	kor001	Eric Korte	4040-101-000	Employee Expense-General	68.23		
				4040-101-000	Employee Benefits-General			
12/26/18	70457	lea003	L. Tracy Leavenworth	4370-101-000	Educational Program-General	2,209.43		
12/26/18	70458	lio002	Lionsgate Academy	4682-518-000	BMP Cost Share Program	98,853.66		
12/26/18	70459	mel001	Michelle Melser			164.85		
				4040-101-000	Employee Benefits-General		93.73	
				4020-101-000	Employee Expenses-General		71.12	
12/26/18	70460	nar001	Nardini Fire Equipment	4343-101-000	Bldg./Site Maintenance	259.00		
12/26/18	70461	nor016	Northland Trust Services, Inc.	4630-549-000	Construction-Beltline/Battle	268,381.25		2019
12/26/18	70462	nor018	NorthPoint Development	2024-101-000	Dev Escrow-General	12,770.00		
12/26/18	70463	nsp001	Xcel Energy			1,924.14		
				4342-101-000	Utilities/Building Contracts		1,535.70	
				4650-101-000	Project Operations-General		388.44	
12/26/18	70464	obr001	Christopher O'Brien			86.34		
				4371-101-000	Communications & Marketing		29.44	
				4040-101-000	Employee Benefits-General		40.00	
				4020-101-000	Employee Expenses-General		16.90	
12/26/18	70465	pac001	Pace Analytical Services, Inc.			753.00		
				4530-101-000	Water QM Staff-General		189.00	
				4530-101-000	Water QM Staff-General		287.00	
				4530-101-000	Water QM Staff-General		277.00	
12/26/18	70466	par004	Park View Terrace HOA	4682-529-000	Stewardship Grant Program	1,000.00		
12/26/18	70467	pas002	Sage Passi			294.07		
				4370-101-000	Educational Program-General		9.63	
				4040-101-000	Employee Benefits-General		118.00	
				4020-101-000	Employee Expenses-General		126.44	
				4372-101-000	Events		40.00	
12/26/18	70468	pro003	Lyndsey R. Provos			170.74		
				4840-101-000	Vehicle Misc.-General		19.32	
				4040-101-000	Employee Benefits-General		132.34	
				4020-101-000	Employee Expenses-General		19.08	
12/26/18	70469	qwe001	CenturyLink	4650-101-000	Project Operations-General	228.67		
12/26/18	70470	red002	Redpath & Company, Ltd.	4110-101-000	Accounting & Auditing	1,454.08		
12/26/18	70471	sel001	Select Synthetics	4343-101-000	Bldg./Site Maintenance	200.00		
12/26/18	70472	sku001	Nancy & Glen Skuta	4682-529-000	Stewardship Grant Program	3,447.96		
12/26/18	70473	sod001	Nichole Soderholm	4040-101-000	Employee Benefits-General	140.00		
12/26/18	70474	tim002	Timesaver Off-Site Secretarial, Inc.	4365-101-000	Committee/Board Meeting Expense	245.50		
12/26/18	70475	uni006	University of Minnesota	4695-101-000	Research Projects-General	25,000.00		

Ramsey Washington Metro Watershed Dist.

Cash Disbursements Journal

For the Period From Dec 1, 2018 - Dec 31, 2018

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	Check Detail	
12/26/18	70476	usb002	U.S. Bancorp			3,050.55		
				4350-101-000	Training & Education-General		16.50	
				4350-101-000	Training & Education-General		13.98	
				4350-101-000	Training & Education-General		179.00	
				4320-101-000	Office Supplies-General		27.06	
				4343-101-000	Bldg./Site Maintenance		57.09	
				4325-101-000	IT/Website/Software		96.03	
				4338-101-000	Dues & Publications		144.00	
				4343-101-000	Bldg./Site Maintenance		(7.38)	
				4390-101-000	Miscellaneous Expense		(5.91)	
				4320-101-000	Office Supplies-General		12.86	
				4350-101-000	Training & Education-General		179.87	
				4320-101-000	Office Supplies-General		20.04	
				4320-101-000	Office Supplies-General		7.99	
				4343-101-000	Bldg./Site Maintenance		121.78	
				4630-554-000	Construction Imp.-Willow Pond		87.62	
				4350-101-000	Training & Education-General		84.62	
				4350-101-000	Training & Education-General		5.00	
				4350-101-000	Training & Education-General		20.00	
				4320-101-000	Office Supplies-General		29.50	
				4350-101-000	Training & Education-General		180.00	
				4390-101-000	Miscellaneous Expense		80.90	
				4350-101-000	Training & Education-General		20.00	
				4350-101-000	Training & Education-General		400.00	
				4338-101-000	Dues & Publications		200.00	
				4630-516-000	Construction Imp.-Maint. & Repair		1,000.00	2019
				4371-101-000	Communications & Marketing		80.00	
12/26/18	70477	usb003	US Bank St. Paul	4700-585-000	Debt Service-Cert. of Participation	191,353.76		2019
12/26/18	70478	usb005	US Bank Equipment Finance	4335-101-000	Printing-General	285.67		
12/26/18	70479	van001	Vanguard Cleaning Systems of Minnesota	4341-101-000	Janitorial/Trash Service	550.00		
12/26/18	70480	ves001	Viking Industrial Center			184.39		
				4530-101-000	Water QM Staff-General		104.40	
				4530-101-000	Water QM Staff-General		79.99	
12/26/18	70481	via002	VLAWMO	4370-101-000	Educational Program-General	117.00		
12/26/18	70482	voy001	US Bank Voyager Fleet Sys.	4830-101-000	Vehicle Expense-Fuel	138.60		
12/26/18	70483	was007	Washington Conservation District	4682-529-000	Stewardship Grant Program	495.50		
12/26/18	70484	wet001	Wetland Professionals Association	4338-101-000	Dues & Publications	30.00		2019
						$796,497.10		

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Summary of Professional Engineering Services During the Period
November 17, 2018 through December 14, 2018

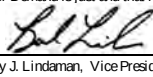
	Total Budget* (2018)	Total Fees to Date (2018)	Budget Balance (2018)	Fees During Period	District Accounting Code	Plan Implementation Task Number
Engineering Administration						
General Engineering Administration	$76,000.00	$71,652.91	$4,347.09	$7,166.84	**4121-101**	DW-13
RWMWD Health and Safety/ERTK Program	$2,000.00	$1,385.43	$614.57		**4697-101**	DW-13
Educational Program/Educational Forum Assistance	$20,000.00	$9,861.90	$10,138.10	$836.84	**4698-101**	DW-11
Engineering Review						
Engineering Review	$55,000.00	$52,082.06	$2,917.94	$2,389.50	**4123-101**	DW-13
Project Feasibility Studies						
Aquifer Recharge Site Search and Feasibility Study	$15,000.00	$0.00	$15,000.00		**4129-101**	DW-10
Owasso County Park Stormwater Master Plan and Detailed Design: Phase 1 and Phase 2	$75,000.00	$14,886.28	$60,113.72	$1,315.50	**4129-101**	DW-5
Beltline Resiliency and Phalen Chain Water Level Management	$250,000.00	$32,446.23	$217,553.77	$45.00	**4129-101**	BELT-3
Beaver Lake Subwatershed Feasibility Study	$15,000.00	$12,941.35	$2,058.65	$1,117.00	**4129-101**	BL-1
Owasso Lake Subwatershed Feasibility Study	$15,000.00	$15,543.35	-$543.35	$428.00	**4129-101**	LO-3
Battle Creek Lake Subwatershed Feasibility Study	$15,000.00	$19,318.23	-$4,318.23	$780.00	**4129-101**	BCL-3
Create an Emergency Response Plan for Twin Lake	$15,000.00	$13,575.56	$1,424.44	$1,219.00	**4129-101**	DW-19
Create an Emergency Response Plan for Grass Lake	$15,000.00	$4,219.50	$10,780.50	$1,780.50	**4129-101**	DW-19
Create an Emergency Response Plan for Snail Lake	$15,000.00	$4,411.83	$10,588.17	$1,410.62	**4129-101**	DW-19
Create an Emergency Reponse Plan for Lake Owasso	$5,000.00	$7,557.36	-$2,557.36	$1,829.86	**4129-101**	LO-2
MnDNR Floodplain Map Update	$109,720.00	$1,771.00	$107,949.00	$941.00	**4129-101**	DW-9
West Vadnais Lake to East Vadnais Lake Water Quality Treatment	$24,400.00	$36,601.80	-$12,201.80		**4129-101**	DW-9
West Vadnais Lake to East Vadnais Lake Gravity Flow	$66,000.00	$36,936.75	$29,063.25	$8,362.50	**4129-101**	DW-9
Snail Lake to Sucker Lake Reverse Pumping Evaluation	$9,100.00	$9,715.50	-$615.50		**4129-101**	DW-9
Snail, Grass, and West Vadnais outlet permitting with the MnDNR	$10,000.00	$39,182.05	-$29,182.05	$945.13	**4129-101**	DW-9
Modeling of 95% Confidence Limit Atlas 14 District-wide (Climate Change Scenario); Flood Map Generation for Future Outreach	$129,500.00	$58,540.64	$70,959.36	$84.00	**4129-101**	DW-9
GIS Maintenance						
GIS Maintenance	$5,000.00	$1,564.00	$3,436.00		**4170-101**	DW-13
Monitoring Water Quality/Project Monitoring						
Lake Water Quality Monitoring (Misc QA/QC)	$10,000.00	$878.50	$9,121.50		**4520-101**	DW-2
Grass Lake WOMP station	$10,000.00	$0.00	$10,000.00		**4520-101**	DW-3
Battle Creek longitudinal monitoring of TSS	$15,000.00	$843.00	$14,157.00		**4520-101**	BC-3
Auto Lake monitoring systems (5)	$50,000.00	$26,290.49	$23,709.51	$8,704.75	**4520-101**	DW-18
Maplewood Mall Monitoring	$20,000.00	$18,404.95	$1,595.05	$55.00	**4520-101**	DW-12
Permit Processing, Inspection and Enforcement						
Permit Application Inspection and Enforcement	$15,000.00	$4,668.36	$10,331.64	$1,513.36	**4122-101**	DW-7
Permit Application Review	$50,000.00	$40,730.00	$9,270.00	$3,699.50	**4124-101**	DW-7
Lake Studies/WRPPs/TMDL Reports						
2018 Grant Applications	$30,000.00	$1,270.50	$28,729.50		**4661-101**	--
Tanners Flood Response Tool Model Update	$3,000.00	$2,232.00	$768.00		**4661-101**	TaL-1
Evaluate water quality benefit of removing accumulated sediment from south end of Wakefield Lake to improve Lake Phalen water quality	$10,000.00	$15,222.67	-$5,222.67		**4661-101**	WL-5
Research Projects						
New Technology Mini Case Studies (average 6 per year)	$12,000.00	$4,323.50	$7,676.50	$84.00	**4695-101**	DW-12
Kohlman Permeable Weir Test System - Implement Monitoring Plan	$15,000.00	$11,884.13	$3,115.87	$240.00	**4695-101**	DW-12
Project Operations						
2018 Tanners Alum Facility Monitoring	$15,000.00	$14,378.12	$621.88		**4650-101**	TaL-3
Capital Improvements						
Wakefield Park/Frost Avenue Stormwater Project	$75,000.00	$51,869.13	$23,130.87	$1,903.20	**4128-553**	WL-1
Frost Kennard Spent Lime BMP	$24,000.00	$25,516.71	-$1,516.71	$188.00	**4128-550**	WL-1
Commercial Sites Retrofit Projects 2018	$55,000.00	$25,093.79	$29,906.21	$1,782.00	**4128-518**	DW-6
School Sites Retrofit Projects 2018	$55,000.00	$22,444.66	$32,555.34	$1,586.43	**4128-518**	DW-6
Church Sites Retrofit Projects 2018	$55,000.00	$20,239.68	$34,760.32	$88.00	**4128-518**	DW-6
Roseville High School Campus Stormwater Retrofit (Bennett Lake Subwatershed)	$30,000.00	$13,449.50	$16,550.50	$72.00	**4128-518**	DW-6
BMP Incentive Fund: General BMP Design Assistance and Review	$30,000.00	$48,961.86	-$18,961.86	$1,042.48	**4682-529**	DW-6
BMP Incentive Fund: Faith-Based Organizations	$20,000.00	$3,176.93	$16,823.07	$102.00	**4128-528**	DW-6
Willow Pond CMAC Implementation	$100,000.00	$127,307.11	-$27,307.11	$672.00	**4128-554**	BeL-4
Grass Lake Berm Construction Administration	$75,000.00	$61,070.15	$13,929.85	$973.78	**4128-520**	GrL-1
Phase 1 implementation from Owasso Basin Improvements Feasibility Study	$75,000.00	$9,420.00	$65,580.00		**4128-520**	GC-3
District Office Solar Energy Retrofit	$20,000.00	$12,899.00	$7,101.00		**4128-519**	DW-13
Aldrich Arena Stormwater Retrofit	$145,000.00	$6,230.00	$138,770.00	$6,230.00	**4128-518**	
CIP Project Repair & Maintenance						
2017-2018 Beltline Repairs Construction Services	$360,000.00	$451,183.07	-$91,183.07	$454.50	**4128-549**	BELT-2
Routine CIP Inspection and Unplanned Maintenance Identification	$75,000.00	$71,572.14	$3,427.86	$3,753.50	**4128-516**	DW-5
2018 CIP Maintenance and Repairs	$90,000.00	$92,667.12	-$2,667.12	$454.00	**4128-516**	DW-5
2019 CIP Maintenance and Repairs	$150,000.00	$33,654.43	$116,345.57	$13,196.47	**4128-516**	DW-5

*For projects carried over from previous years, the total budget reflects the total project budget, and not just the 2018 portion.

Subtotal **$77,446.26**

TOTAL PAYABLE FOR PERIOD 11/17/2018 - 12/14/2018 **$77,446.26**

Barr declares under the penalties of Law that this Account, Claim, or Demand is just and that no part has been paid.



Bradley J. Lindaman, Vice President

Galowitz Olson, PLLC
10390 39th Street North
Lake Elmo, Minnesota 55042
Office: (651) 777-6960
Fax: (651) 777-8937

December 20, 2018
File No: 9M

Ramsey-Washington Metro Watershed District
C/O Tina Carstens
2665 Noel Drive
Little Canada MN 55117

	Balance
General Account	$3,480.00
2018 CIP	$620.00
2019 CIP	$840.00
	$4,940.00

****

Permit Program

****

Permit Application Coversheet

Date January 02, 2019

Project Name McDonald's Suburban Ave **Project Number** 19-01

Applicant Name Charlie Miller, McDonald's USA, LLC

Type of Development Commercial/Retail

Property Description

This project is located near White Bear Ave & Suburban Ave in the City of St. Paul. The applicant is proposing to demolish an existing McDonald's restaurant and construct a new restaurant and parking lot. The total site area is 1.46 acres. The applicant is proposing to construct an underground filtration system with an isolator row for pretreatment. Due to site constraints, the applicant is short on treatment volume by 400 cubic feet and is requesting to submit a payment into the District's Stormwater Impact Fund in the amount of $4,008. The proposed design meets District rate control requirements.

Watershed District Policies or Standards Involved:

- ☐ ***Wetlands***
- ☑ ***Erosion and Sediment Control***
- ☑ ***Stormwater Management***
- ☐ ***Floodplain***

Water Quantity Considerations

The proposed stormwater management plan is sufficient to handle the runoff from this site.

Water Quality Considerations

Short Term

The proposed erosion and sediment control plan is sufficient to protect downstream water resources during construction.

Long Term

The proposed stormwater management plan is sufficient to protect the long term quality of downstream water resources.

Staff Recommendation

Staff recommends approval of this permit with the special provisions.

Attachments:

- ☑ **Project Location Map**
- ☑ **Project Grading Plan**

#19-01 McDonalds Suburban Ave

Wetlands
- Manage A
- Manage B
- Manage C
- Lake
- Sediment Pond
- Not Assessed

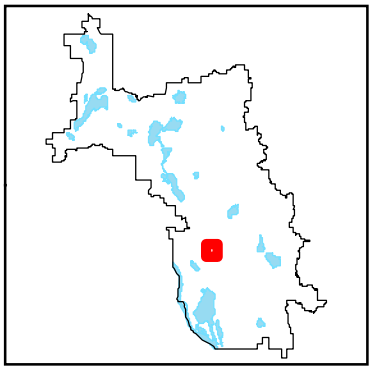
- Permits
- RWMWD Boundary
- Subwatersheds
- Creeks
- Washington Co Parcels
- City Boundaries

Highlighted Areas Represent Active Permit

0 250 500
Feet

0 0.05 0.1
Miles

N



19-01

Special Provisions

1. The applicant shall submit the escrow fee of $7,300.

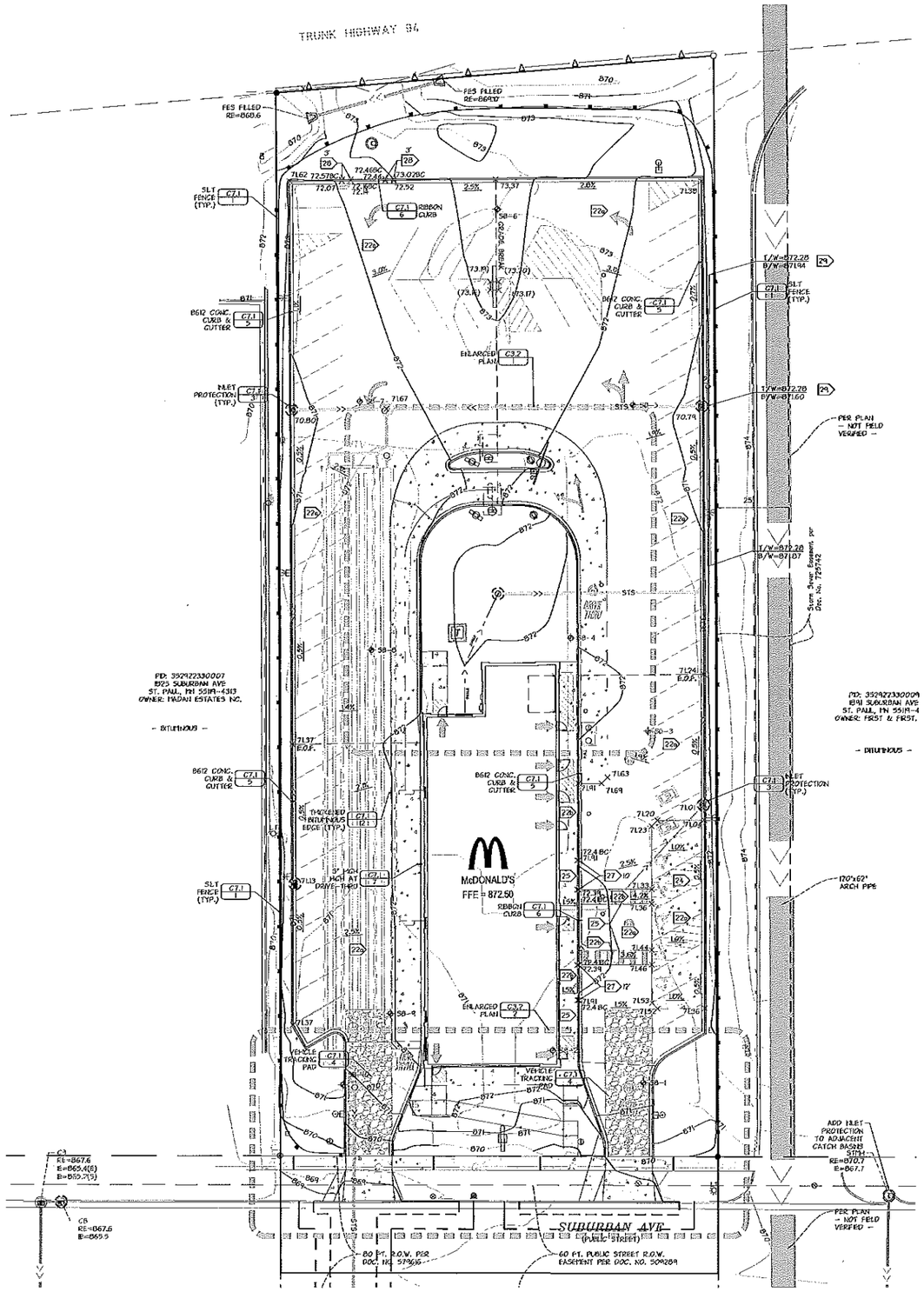
2. The applicant shall submit a final copy of the signed construction plans.

3. The applicant shall submit an executed maintenance agreement for the proposed stormwater facility.

4. The applicant shall provide contact information for the trained erosion control coordinator responsible for implementing the Stormwater Pollution Prevention Plan (SWPPP).

5. The applicant shall provide a copy of the approved Minnesota Pollution Control Agency's NPDES Construction Permit.

6. The applicant shall submit the Stormwater Impact Fund payment of $4,008.



DRY CAST RETAINING WALL NOTES

24. DRYCAST CONCRETE SEGMENTAL RETAINING WALL, COLOR TO BE DETERMINED BY OWNER OR ARCHITECT. VERIFY WITH MCDONALD'S AREA CONSTRUCTION MANAGER.

RWMWD NOTES

30. NOTIFY NICOLE SODERHOLM, RAMSEY-WASHINGTON METRO WATERSHED DISTRICT, AT 651-792-7976 PRIOR TO BEGINNING ANY AND ALL CONSTRUCTION IN ORDER TO SCHEDULE AN INITAL SWPPP INSPECTION.

31. NOTIFY NICOLE SODERHOLM, RAMSEY-WASHINGTON METRO WATERSHED DISTRICT, AT 651-792-7976 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION OF THE UNDERGROUND FILTRATION SYSTEM.

LEGEND

SYMBOL	DESCRIPTION	ESTIMATED QUANTITY
	:INLET PROTECTION	6 EACH
	:SILT FENCE	860 FEET
	:TIP OUT CURB	
	:PAVEMENT SAWCUT	
	:CONSTRUCTION LIMITS	
	:PEDESTRIAN CURB RAMP	

EROSION PREVENTION AND SEDIMENT CONTROL NOTES

1. PERIMETER SEDIMENT CONTROLS SHALL BE INSTALLED AND INSPECTED PRIOR TO BEGINNING WORK. MAINTAIN FOR DURATION OF CONSTRUCTION. REMOVE CONTROLS AFTER AREAS CONTRIBUTING RUN OFF ARE PERMANENTLY STABILIZED AND DISPOSE OF OFF SITE.
2. LIMIT SOIL DISTURBANCE TO THE GRADING LIMITS SHOWN. SCHEDULE OPERATIONS TO MINIMIZE LENGTH OF EXPOSURE OF DISTURBED AREAS.
3. MANAGEMENT PRACTICES SHOWN ARE THE MINIMUM REQUIREMENT. INSTALL AND MAINTAIN ADDITIONAL CONTROLS AS WORK PROCEEDS TO PREVENT EROSION AND CONTROL SEDIMENT CARRIED BY WIND OR WATER.
4. REFER TO SWPPP NOTES ON SHEET C3.2 FOR ADDITIONAL REQUIREMENTS.
5. CONTRACTOR SHALL PREVENT SEDIMENT LADEN WATER FROM ENTERING THE FILTRATION SYSTEM UNTIL THE SITE IS COMPLETELY STABILIZED.
6. ALL EXPOSED SOIL AREAS MUST BE STABILIZED WITHIN 72 HOURS OF COMPLETION OF WORK IN EACH AREA.
7. SEED, SOD, MULCH AND FERTILIZER SHALL MEET THE FOLLOWING SPECIFICATIONS, AS MODIFIED.

ITEM	SPECIFICATION NUMBER
SOD	MNDOT 3878
SEED	MNDOT 3876
	MN TYPE 22-111 @ 32.5 LB/AC – TEMPORARY EROSION CONTROL
	MN TYPE 25-151 @ 120 LB/AC – PERMANENT TURF
MULCH	MNDOT 3882
	(MNDOT TYPE 1 @ 2 TON/AC, DSC ANCHORED)
FERTILIZER	MNDOT 3881
GENERAL PLACEMENT	MNDOT 2575

8. SEE LANDSCAPE SHEETS FOR PERMANENT TURF AND LANDSCAPE ESTABLISHMENT.
9. SCRAPE ADJACENT STREETS CLEAN DAILY AND SWEEP CLEAN WEEKLY.

GRADING NOTES

10. CONTACT UTILITY SERVICE PROVIDERS FOR FIELD LOCATION OF SERVICES 72 HOURS PRIOR TO BEGINNING GRADING.
11. REMOVE TOPSOIL FROM GRADING AREAS AND STOCKPILE SUFFICIENT QUANTITY FOR REUSE. MATERIALS MAY BE FIXED FROM LANDSCAPE AREAS FOR USE ON SITE AND REPLACED WITH EXCESS ORGANIC MATERIAL WITH PRIOR OWNER APPROVAL.
12. REMOVE SURFACE AND GROUND WATER FROM EXCAVATIONS. PROVIDE INITIAL LIFTS OF STABLE FOUNDATION MATERIAL IF EXPOSED SOILS ARE WET AND UNSTABLE.
13. REFER TO STRUCTURAL SPECIFICATIONS FOR EARTHWORK REQUIREMENTS FOR BUILDING PADS.
14. AN INDEPENDENT TESTING FIRM SHALL VERIFY THE REMOVAL OF ORGANIC AND UNSUITABLE SOILS, SOIL CORRECTION AND COMPACTION AND PROVIDE PERIODIC REPORTS TO THE OWNER.
15. PLACE AND COMPACT FILL USING LIFT THICKNESSES MATCHED TO SOIL TYPE AND COMPACTION EQUIPMENT TO OBTAIN SPECIFIED COMPACTION THROUGHOUT THE LIFT.
16. COMPACT MATERIAL IN PAVED AREAS TO 95% OF MAXIMUM DRY DENSITY, STANDARD PROCTOR (ASTM D698) EXCEPT THE TOP 3 FEET WHICH SHALL BE COMPACTED TO 100%. COMPACT TO 90% DENSITY WHERE FILL DEPTH EXCEEDS 10 FEET.
17. COORDINATE WITH ARCHITECTURAL FOR BUILDING STOOP LOCATIONS, SLOPES SHOWN ON ADJACENT WALKS AND PAVEMENT SHOULD CONTINUE OVER STOOPS.
18. AVOID SOIL COMPACTION OF FILTRATION PRACTICES. ANY EQUIPMENT USED IN FILTRATION AREAS SHOULD BE SMALL SCALED AND TRACKED.

PAVING NOTES

19. SPOT ELEVATIONS AT CURBLINES INDICATE FLOWLINES UNLESS NOTED OTHERWISE. SEE SHEET C4.1 FOR RIM ELEVATIONS OF CATCH BASINS.
20. GRADES BETWEEN PROPOSED SPOT ELEVATIONS SHALL BE CONTINUOUS AND NONVARIABLE. SPOT ELEVATIONS SHALL GOVERN OVER CONTOUR LINES.
21. MEET AND MATCH EXISTING CURB. TRANSITION THROUGH.
22. PAVING SECTIONS
    a. BITUMINOUS PAVING
       2.0-INCH BITUMINOUS WEAR (MNDOT 2360, SPWEA240B)
       TACK COAT (MNDOT 2357)
       2.0-INCH BITUMINOUS BASE (MNDOT 2360 SPNWB230D)
       8-INCH AGGREGATE BASE (MNDOT 3138, CLASS 5)
    b. CONCRETE WALKWAYS
       4-INCH CONCRETE, 4,000 PSI, 5%-8% AIR ENTRAINED, MAX. 4" SLUMP (MNDOT 2301)
       4-INCH AGGREGATE BASE (MNDOT 3138, CLASS 5)
       COMPACTED SUBSOIL
       JOINTING TO BE DESIGNED AND INSTALLED BY CONTRACTOR
    c. CONCRETE DRIVES, APRONS, AND EXTERIOR SLABS
       6-INCH CONCRETE, 4,000 PSI, 5%-8% AIR ENTRAINED, MAX. 4" SLUMP (MNDOT 2301)
       6-INCH AGGREGATE BASE (MNDOT 3138, CLASS 5)
       COMPACTED SUBSOIL
    d. PUBLIC CONCRETE WALKWAYS
       6-INCH CONCRETE, 4,000 PSI, 5%-8% AIR ENTRAINED, MAX. 4" SLUMP (MNDOT 2301)
       4-INCH AGGREGATE BASE (MNDOT 3138, CLASS 5)
       COMPACTED SUBSOIL
       JOINTING TO BE DESIGNED AND INSTALLED BY CONTRACTOR
23. CONCRETE JOINTS
    JOINTING TO BE DESIGNED AND INSTALLED BY CONTRACTOR.
    INSTALL JOINTS ACROSS SIDEWALKS, CURBS AND PAVEMENTS, PAYING ATTENTION TO SPACING OF EXPANSION JOINTS. JOINT SPACING SHALL BE AS FOLLOWS:
    a. TOOLED JOINTS: DIVIDE PANELS INTO NOMINALLY EQUAL AREAS.
    b. EXPANSION JOINTS: SIDEWALKS – 40 FEET MAX.; CURBS – 60 FEET MAX.; PAVEMENT: 80 FEET MAX.; ADJACENT TO BUILDING FOUNDATIONS AND STOOPS.
    c. CONTRACTION JOINTS: SIDEWALKS – 8 TO 10 FEET; CURBS AND APRONS – 12 TO 15 FEET.
24. ACCESSIBLE PARKING STALLS AND ADJACENT ACCESS AISLES SHALL NOT EXCEED A 2.00% SLOPE IN ANY DIRECTION. THESE AREAS OF THE SITE HAVE BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA). CONTRACTOR WILL BE HELD TO THESE REQUIREMENTS. IF A DISCREPANCY IS DISCOVERED BETWEEN THE PLANS AND THE FIELD, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.
25. ACCESSIBLE ROUTES SHALL HAVE A MAXIMUM CROSS SLOPE OF 2.00% AND A MAXIMUM RUNNING SLOPE OF 5.00%. THESE AREAS OF THE SITE HAVE BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA). CONTRACTOR WILL BE HELD TO THESE REQUIREMENTS. IF A DISCREPANCY IS DISCOVERED BETWEEN THE PLANS AND THE FIELD, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.
26. 10' TRANSITION FROM 3' HIGH CURB TO 6' CONCRETE CURB.
27. TRANSITION FROM B612 CONCRETE CURB AND GUTTER TO CONCRETE RIBBON CURB. REFER TO DETAIL C7.1/9 – "TYPE A".
28. TRANSITION FROM B612 CONCRETE CURB AND GUTTER TO CONCRETE RIBBON CURB. REFER TO DETAIL C7.1/9 – "TYPE B".

NORTH
0 20 40

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LANDFORM
From Site to Finish
105 South Fifth Avenue Suite 513 Minneapolis, MN 55401
Tel: 612-252-9070 Fax: 612-252-9077 Web: landform.net

REV	DATE	REVISION HISTORY
	04/20/18	CUP/VARIANCE APPLICATION RESUBMITTAL
	10/17/18	CUP/VARIANCE APPLICATION RESUBMITTAL
	11/21/18	SITE PLAN REVIEW
	12/04/18	WATERSHED SUBMITTAL
	12/19/18	WATERSHED RESUBMITTAL

CERTIFICATION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.

Christopher N. Call

License Number 46224

Date 12/19/18

McDONALD'S USA, LLC.

THESE DRAWINGS AND SPECIFICATIONS ARE THE CONFIDENTIAL AND PROPRIETARY PROPERTY OF MCDONALD'S CORPORATION AND SHALL NOT BE COPIED OR REPRODUCED WITHOUT WRITTEN AUTHORIZATION. THE CONTRACT DOCUMENTS WERE PREPARED FOR USE ON THE SPECIFIC SITE IN CONJUNCTION WITH A SPECIFIC PROJECT AND ARE NOT SUITABLE FOR REUSE IN ANY OTHER CIRCUMSTANCE OR ON ANY EXTENSION OF THAT PROJECT. ANY REUSE, REFERENCE OR EXAMPLE ON ANOTHER PROJECT REQUIRES THE SERVICES OF PROPERLY LICENSED ARCHITECTS AND ENGINEERS. REPRODUCTION OF THE CONTRACT DOCUMENTS FOR REUSE ON ANOTHER PROJECT IS NOT AUTHORIZED.

STATE	MN
COUNTY	RAMSEY
DRAWN BY	DB
PROJECT ISSUED	
REVIEWED BY	CNC
DATE REVIEWED	11/21/18
DATE ISSUED	12/19/18
STATE NUMBER	022-0086

CITY: ST. PAUL
STREET ADDRESS: 1841 SUBURBAN AVE
SHEET NAME: GRADING, DRAINAGE, PAVING, & EROSION CONTROL
NATIONAL NUMBER: 05617

SHEET NO. C3.1
FILE NAME: C3.01MCD3513.DWG
PROJECT NO. MCD13513

© LANDFORM 2018

Permit Application Coversheet

Date January 02, 2019

Project Name Valley Creek Retail **Project Number** 19-02

Applicant Name Mark Krogh, Java Development

Type of Development Commercial/Retail

Property Description

This project is located near the southwest corner of I-494 and Valley Creek Rd in the City of Woodbury. The applicant is proposing to construct a retail building with associated parking and landscaping improvements. The total site area is 1.46 acres. The applicant is proposing to construct an underground detention with a Kraken filtration cartridge manhole. Pretreatment will include hooded sumps with SAFL baffles. The proposed facility meets water quality treatment standards and is sized to capture the required volume but differs from standard filtration. The applicant has submitted a variance request for District Rule C for board approval of an alternative filtration media. Filtration is being proposed due to soil contamination concerns as the site was formerly a gas station.

Watershed District Policies or Standards Involved:

- ☐ ***Wetlands***
- ☑ ***Erosion and Sediment Control***
- ☑ ***Stormwater Management***
- ☐ ***Floodplain***

Water Quantity Considerations

The proposed stormwater management plan is sufficient to handle the runoff from this site.

Water Quality Considerations

Short Term

The proposed erosion and sediment control plan is sufficient to protect downstream water resources during construction.

Long Term

The proposed stormwater management plan is sufficient to protect the long term quality of downstream water resources.

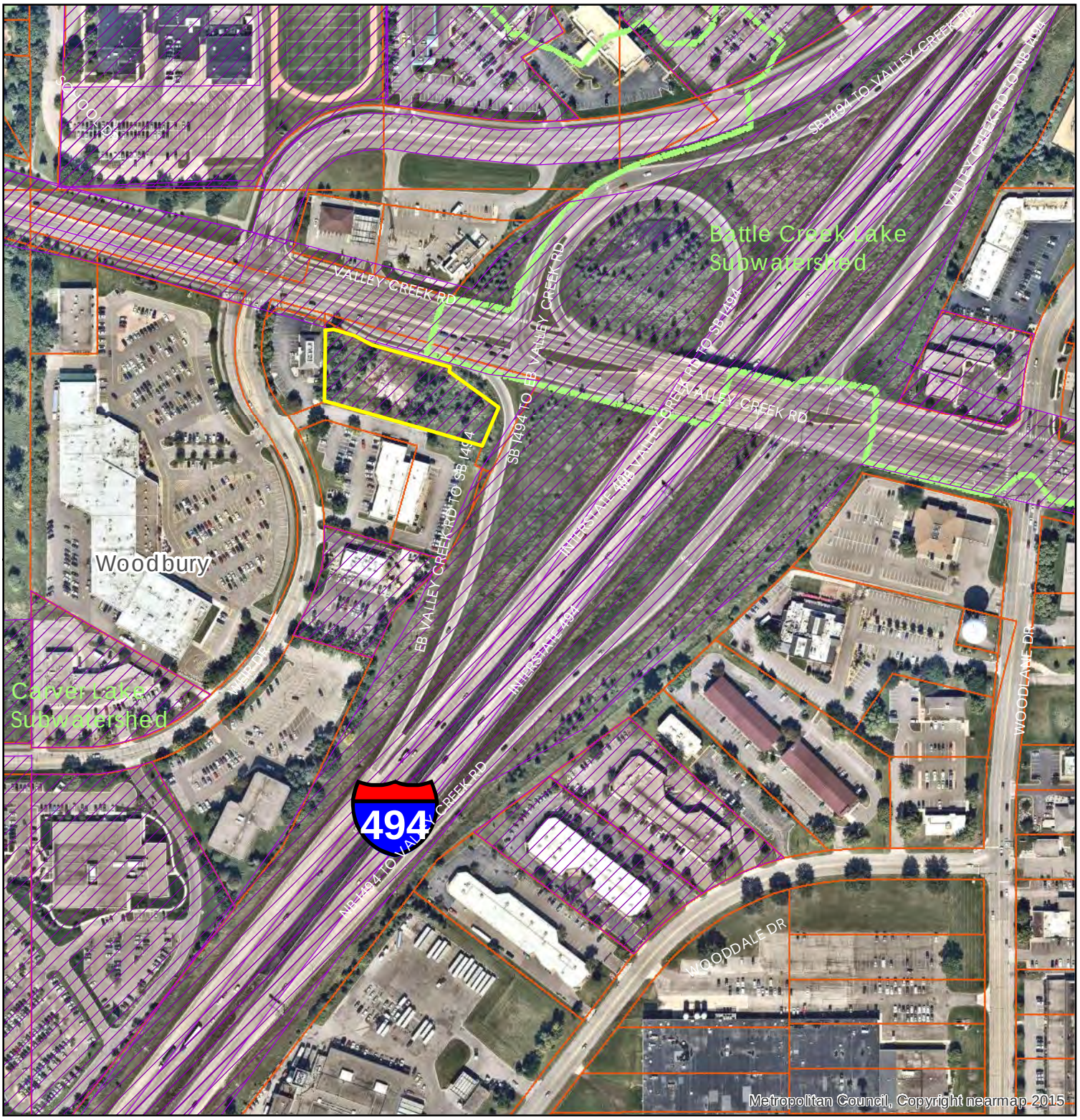
Staff Recommendation

Staff recommends approval of this permit with the special provisions and variance request.

Attachments:

- ☑ **Project Location Map**
- ☑ **Project Grading Plan**

#19-02 Valley Creek Retail



Wetlands
- Manage A
- Manage B
- Manage C
- Lake
- Sediment Pond
- Not Assessed

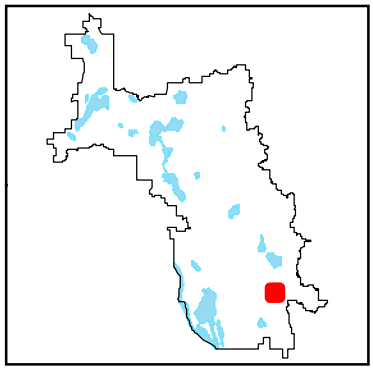
- Permits
- RWMWD Boundary
- Subwatersheds
- Creeks
- Washington Co Parcels
- City Boundaries

Highlighted Areas Represent Active Permit

0 225 450
Feet

0 0.05 0.1
Miles

N



19-02

Special Provisions

1. The applicant shall submit the escrow fee of $7,000.

2. The applicant shall add notes to the plans:
A. Include direction to the contractor on best practices for constructing the underground filtration system, including keeping the system offline and protected from sediment until contributing areas are fully restored.
B. Notify Nicole Soderholm, Ramsey-Washington Metro Watershed District, at 651-792-7976 prior to beginning any and all construction in order to schedule an initial SWPPP inspection.
C. Notify Nicole Soderholm, Ramsey-Washington Metro Watershed District, at 651-792-7976 at least 48 hours prior to construction of the underground filtration system.

3. The applicant shall submit details for the proposed detention and filtration structures, including outlets, emergency overflows, and typical cross-section.

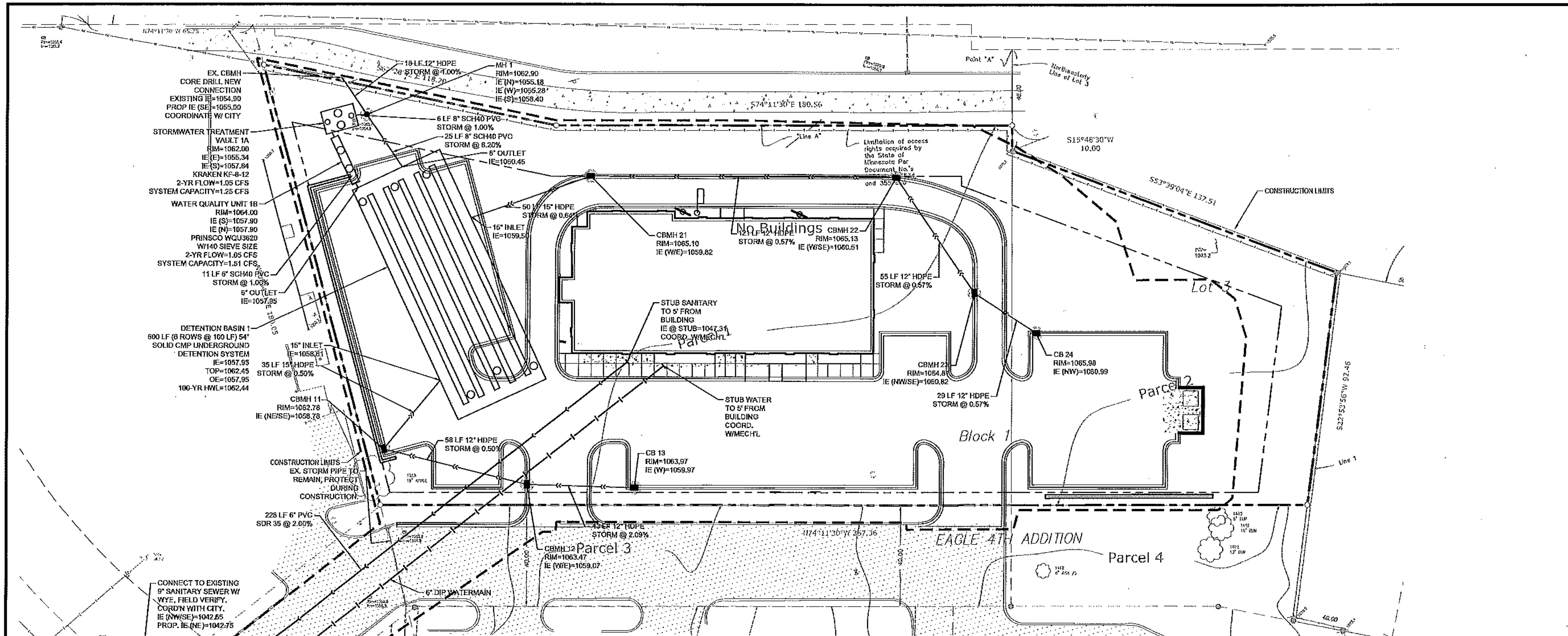
4. The applicant shall submit a final copy of the signed construction plans.

5. The applicant shall submit a detailed, site-specific Operations & Maintenance Plan that includes processes for visual inspection, maintenance locations/methods/frequencies, etc.

6. The applicant shall submit an executed maintenance agreement for the proposed stormwater facilities.

7. The applicant shall provide contact information for the trained erosion control coordinator responsible for implementing the SWPPP.

8. The applicant shall provide a copy of the approved Minnesota Pollution Control Agency's NPDES Construction Permit for the project.



GENERAL UTILITY NOTES:

1. SEE SITE PLAN FOR HORIZONTAL DIMENSIONS AND LAYOUT.
2. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES AND TOPOGRAPHIC FEATURES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF DISCREPANCIES OR VARIATIONS FROM THE PLANS.
3. ALL EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE. CONTACT "GOPHER STATE ONE CALL" (651-454-0002 OR 800-252-1166) FOR UTILITY LOCATIONS, 48 HOURS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY UTILTIES THAT ARE DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.
4. UTILITY INSTALLATION SHALL CONFORM TO THE CURRENT EDITION OF "STANDARD SPECIFICATIONS FOR WATER MAIN AND SERVICE LINE INSTALLATION" AND "SANITARY SEWER AND STORM SEWER INSTALLATION" AS PREPARED BY THE CITY ENGINEERS ASSOCIATION OF MINNESOTA (CEAM), AND SHALL CONFORM WITH THE REQUIREMENTS OF THE CITY AND THE PROJECT SPECIFICATIONS.
5. CASTINGS SHALL BE SALVAGED FROM STRUCTURE REMOVALS AND RE-USED OR PLACED AT THE DIRECTION OF THE OWNER.
6. ALL WATER PIPE SHALL BE CLASS 52 DUCTILE IRON PIPE (DIP) AWWA C151, ASME B16.4, AWWA C110, AWWA C153 UNLESS OTHERWISE NOTED.
7. ALL SANITARY SEWER SHALL BE SDR 26 POLYVINYL CHLORIDE (PVC) ASTM D3034 & F679, OR SCH 40 ASTM D1785, 2665, ASTM F794, 1866) UNLESS OTHERWISE NOTED.
8. ALL STORM SEWER PIPE SHALL BE HDPE ASTM F714 & F2306 WITH ASTM D3212 SPEC FITTINGS UNLESS OTHERWISE NOTED.
9. PIPE LENGTHS SHOWN ARE FROM CENTER TO CENTER OF STRUCTURE OR TO END OF FLARED END SECTION.
10. UTILTIES ON THE PLAN ARE SHOWN TO WITHIN 5' OF THE BUILDING FOOTPRINT. THE CONTRACTOR IS ULTIMATELY RESPONSIBLE FOR THE FINAL CONNECTION TO BUILDING LINES. COORDINATE WITH ARCHITECTURAL AND MECHANICAL PLANS.
11. CATCH BASINS AND MANHOLES IN PAVED AREAS SHALL BE SUMPED 0.04 FEET. ALL CATCH BASINS IN GUTTERS SHALL BE SUMPED 0.15 FEET PER DETAILS. RIM ELEVATIONS SHOWN ON THIS PLAN DO NOT REFLECT SUMPED ELEVATIONS.
12. ALL FIRE HYDRANTS SHALL BE LOCATED 5 FEET BEHIND BACK OF CURB UNLESS OTHERWISE NOTED.
13. HYDRANT TYPE, VALVE, AND CONNECTION SHALL BE IN ACCORDANCE WITH CITY REQUIREMENTS. HYDRANT EXTENSIONS ARE INCIDENTAL.
14. A MINIMUM OF 8 FEET OF COVER IS REQUIRED OVER ALL WATERMAIN, UNLESS OTHERWISE NOTED. EXTRA DEPTH MAY BE REQUIRED TO MAINTAIN A MINIMUM OF 18" VERTICAL SEPARATION TO SANITARY OR STORM SEWER LINES. EXTRA DEPTH WATERMAIN IS INCIDENTAL.
15. A MINIMUM OF 18 INCHES OF VERTICAL SEPARATION AND 10 FEET OF HORIZONTAL SEPARATION IS REQUIRED FOR ALL UTILITIES, UNLESS OTHERWISE NOTED.
16. ALL CONNECTIONS TO EXISTING UTILITIES SHALL BE IN ACCORDANCE WITH CITY STANDARDS AND COORDINATED WITH THE CITY PRIOR TO CONSTRUCTION.
17. CONNECTIONS TO EXISTING STRUCUTRES SHALL BE CORE-DRILLED.
18. COORDINATE LOCATIONS AND SIZES OF SERVICE CONNECTIONS WITH THE MECHANICAL DRAWINGS.
19. COORDINATE INSTALLATION AND SCHEDULING OF THE INSTALLATION OF UTILITIES WITH ADJACENT CONTRACTORS AND CITY STAFF.
20. ALL STREET REPAIRS AND PATCHING SHALL BE PERFORMED PER THE REQUIREMENTS OF THE CITY. ALL PAVEMENT CONNECTIONS SHALL BE SAWCUT. ALL TRAFFIC CONTROLS SHALL BE PROVIDED BY THE CONTRACTOR AND SHALL BE ESTABLISHED PER THE REQUIREMENTS OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD) AND THE CITY. THIS SHALL INCLUDE BUT NOT BE LIMITED TO SIGNAGE, BARRICADES, FLASHERS, AND FLAGGERS AS NEEDED. ALL PUBLIC STREETS SHALL BE OPEN TO TRAFFIC AT ALL TIMES. NO ROAD CLOSURES SHALL BE PERMITTED WITHOUT APPROVAL BY THE CITY.
21. ALL STRUCTURES, PUBLIC AND PRIVATE, SHALL BE ADJUSTED TO PROPOSED GRADES WHERE REQUIRED. THE REQUIREMENTS OF ALL OWNERS MUST BE COMPLIED WITH. STRUCTURES BEING RESET TO PAVED AREAS MUST MEET OWNERS REQUIREMENTS FOR TRAFFIC LOADING.
22. CONTRACTOR SHALL CORDINATE ALL WORK WITH PRIVATE UTILITY COMPANIES.
23. CONTRACTOR SHALL COORDINATE CONNECTION OF IRRIGATION SERVICE TO UTILITIES. COORDINATE THE INSTALLATION OF IRRIGATION SLEEVES NECESSARY AS TO NOT IMPACT INSTALLATION OF UTILITIES.
24. CONTRACTOR SHALL MAINTAIN AS-BUILT PLANS THROUGHOUT CONSTRUCTION AND SUBMIT THESE PLANS TO ENGINEER UPON COMPLETION OF WORK.
25. ALL JOINTS AND CONNECTIONS IN STORM SEWER SYSTEM SHALL BE GASTIGHT OR WATERTIGHT. APPROVED RESILIENT RUBBER JOINTS MUST BE USED TO MAKE WATERTIGHT CONNECTIONS TO MANHOLES, CATCHBASINS, OR OTHER STRUCTURES.
26. ALL PORTIONS OF THE STORM SEWER SYSTEM LOCATED WITHIN 10 FEET OF THE BUILDING OR WATER SERVICE LINE MUST BE TESTED IN ACCORDANCE WITH MN RULES, CHAPTER 4714, SECTION 1109.0.

CITY OF WOODBURY UTILITY NOTES:

1. RESERVED FOR CITY SPECIFIC UTILITY NOTES.

UTILITY LEGEND:

- CATCH BASIN
- MANHOLE
- GATE VALVE AND VALVE BOX
- PROPOSED FIRE HYDRANT
- WATER MAIN
- SANITARY SEWER
- STORM SEWER
- FES AND RIP RAP

GOPHER STATE ONE CALL
WWW.GOPHERSTATEONECALL.ORG
(800) 252-1166 TOLL FREE
(651) 454-0002 LOCAL

1" = 20'-0"

CivilSite GROUP
Civil Engineering · Surveying · Landscape Architecture
4931 W. 35th Street, Suite 200
St. Louis Park, MN 55416
civilsitegroup.com 612-615-0060

Lampert Architects, P.A.

JAVA PROPERTIES

PROJECT

VALLEY CREEK RETAIL

6661 VALLEY CREEK RD, WOODBURY, MN 55125

JAVA PROPERTIES
2110 NICOLLET AVE, MINNEAPOLIS, MN 55404
WWW.JAVAPROP.COM - PH: (952) 403-6595

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Matthew R. Pavek
DATE 12/19/18 LICENSE NO. 44263

ISSUE/SUBMITTAL SUMMARY

DATE	DESCRIPTION
11.5.18	CITY SUBMITTAL
11/27/18	CITY RESUBMITTAL
12/19/18	WATERSHED RESUBMITTAL

DRAWN BY: JWB REVIEWED BY: DCR
PROJECT NUMBER: 18177

REVISION SUMMARY

DATE	DESCRIPTION

UTILITY PLAN

C4.0

12/19/2018 5:00 PM

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Memorandum

TO: Board of Managers
Ramsey-Washington Metro Watershed District
2665 Noel Drive
Little Canada, MN 55117

FROM: David Knaeble, PE.
Civil Site Group

DATE: 12/19/18

RE: Valley Creek Retail, Stormwater Variance Request
6661 Valley Creek Rd
Woodbury, MN 55125

Board of Managers,

This memorandum is a request for a Variance to the Watershed District Rule C. This project can meet the requirement for runoff volume for sites that cannot infiltrate by using filtration of a 2.0" event, but because an underground stormwater system will not be allowed by the City of Woodbury, a system of proprietary devices will be used and will require a variance. Infiltration is not feasible due to the site constraints related to soil conditions and soil contamination.

We have proposed a system of proprietary devices as an alternative design to a sand filter device. The following devices will be utilized:

Stormwater Quality Unit - Prinsco WQU3620 (80% TSS Removal Efficiency)
Filtration Manhole – Kraken KF-8-12 (85% TSS Removal Efficiency)

Combined these devices will provide water quality treatment to a level that is greater than a sand filter. The requirement for alternative compliance to the Runoff Volume requirement is to provide stormwater filtration for 2.0" runoff volume from impervious surfaces. The proposed device achieves that objective.

Please refer to the Stormwater Management Report for further details and information on the specific proprietary devices from the manufacturer.

David J. Knaeble P.E.

Permit Application Coversheet

Date January 02, 2019

Project Name Keller Practice Range Phase 2 **Project Number** 19-03

Applicant Name Brett Blumer, Ramsey County Parks and Recreation

Type of Development Parking Lot

Property Description

This project is located at Keller Golf Course in the City of Maplewood. The applicant is proposing to realign the existing practice range and parking/drive areas to achieve ADA-compliant accessibility and improve conditions for neighboring residential properties. The Board of Managers previously approved a stormwater management plan for the site in May 2018 (permit #18-09), but the design has since changed. Permit #18-09 is now considered Phase 1 with erosion control only. For Phase 2, the applicant is proposing to construct a filtration basin and three sections of permeable asphalt. Filtration is being proposed due to poor soils.

Watershed District Policies or Standards Involved:

- ☐ ***Wetlands***
- ☑ ***Erosion and Sediment Control***
- ☑ ***Stormwater Management***
- ☐ ***Floodplain***

Water Quantity Considerations

The proposed stormwater management plan is sufficient to handle the runoff from this site.

Water Quality Considerations

Short Term

The proposed erosion and sediment control plan is sufficient to protect downstream water resources during construction.

Long Term

The proposed stormwater management plan is sufficient to protect the long term quality of downstream water resources.

Staff Recommendation

Staff recommends approval of this permit with the special provisions.

Attachments:

- ☑ **Project Location Map**
- ☑ **Project Grading Plan**

#19-03 Keller Practice Range Phase 2

Wetlands
- Manage A
- Manage B
- Manage C
- Lake
- Sediment Pond
- Not Assessed

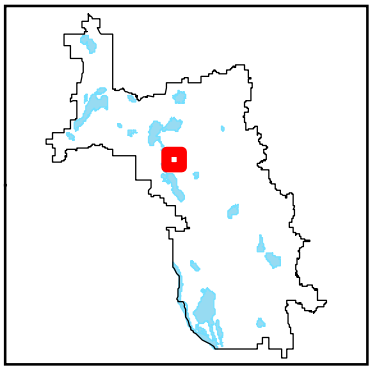
- Permits
- RWMWD Boundary
- Subwatersheds
- Creeks
- Washington Co Parcels
- City Boundaries

Highlighted Areas Represent Active Permit

0 300 600
Feet

0 0.05 0.1
Miles

N



19-03

Special Provisions

1. The applicant shall revise the volume reduction table to be consistent with the BMP storage provided in the model.

2. The applicant shall label the 100-year water surface elevation for the proposed filtration basin on the plans.

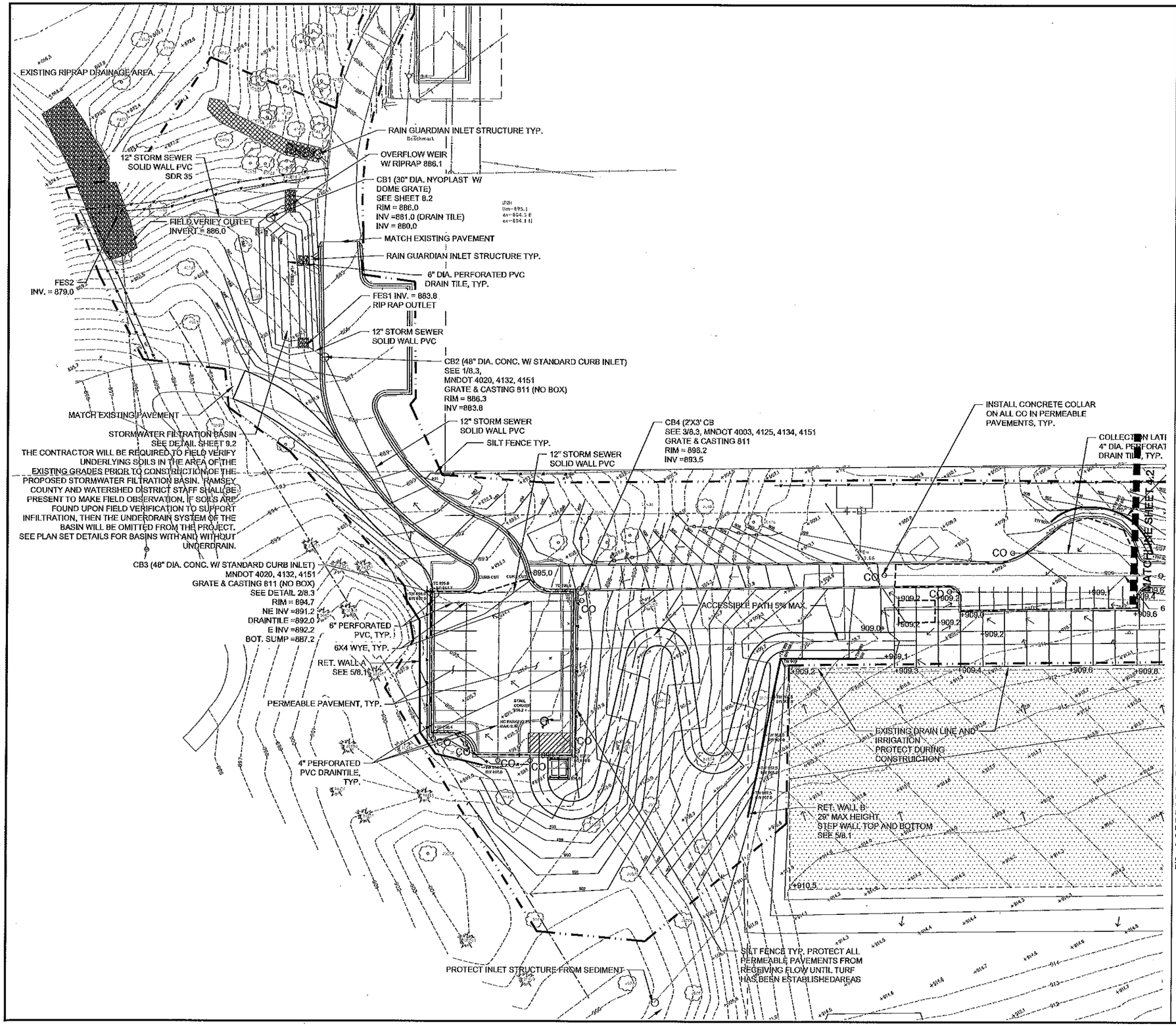
3. The applicant shall provide contact information for the trained erosion control coordinator responsible for implementing the Stormwater Pollution Prevention Plan (SWPPP).

4. The applicant shall revise the match lines on Sheets BD4.1 and BD4.2.

5. The applicant shall clarify the different hatched/shaded sections on the plans with labels and/or add to the legend.

6. The applicant shall submit a final copy of the signed construction plans.

7. The applicant shall provide a copy of the approved Minnesota Pollution Control Agency's NPDES Construction Permit for the project.



GENERAL GRADING PLAN NOTES:

CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES AND TOPOGRAPHIC CONDITIONS PRIOR TO CONSTRUCTION START. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE LANDSCAPE ARCHITECT OF ANY DISCREPANCIES OR VARIATIONS FROM THE PLANS. ANY DISCREPANCIES FOUND THAT AFFECT THE WORK SHALL BE REPORTED TO THE OWNER or OWNER'S REPRESENTATIVE FOR CLARIFICATION PRIOR TO ANY ADDITIONAL WORK BEING COMPLETED.

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OTHER NOTES
N.I.C. = NOT IN CONTRACT

RAMSEY COUNTY
Parks & Recreation
2015 VAN DYKE STREET
MAPLEWOOD, MN 55109
TEL (651)748-2500
FAX (651)748-2508

CONTACT INFORMATION:
B. Gus Blumer, Landscape Architect
2015 Van Dyke Street
Maplewood, MN 55109
bgus.blumer@co.ramsey.mn.us
651.748.2530

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Landscape Architect under the laws of the State of Minnesota.

Registration:	Landscape Architect
State:	Minnesota
Number:	42944
Signature:	B. Gus Blumer

NO.	DATE:	DESCRIPTION:
1	5/22/18	BID DOCUMENTS

DESIGN PHASE:

REVIEW DOCUMENTS

KELLER GOLF COURSE PRACTICE RANGE ACCESS IMPROVEMENT PROJECT

RAMSEY COUNTY PARKS AND RECREATION DEPARTMENT
KELLER REGIONAL PARK

DATE: DECEMBER 2018

DESIGNED BY:	BGB
DRAWN BY:	BGB
CHECKED BY:	SAY

TITLE

GRADING & DRAINAGE PLAN

BD 4.1

SHEET 7 OF 28

URB INLET)

RM SEWER
ALL PVC

CB4 (2'X3' CB
SEE 3/8.3, MNDOT 4003, 4125, 4134, 4151
GRATE & CASTING 811
RIM = 896.2
INV =693.5

INSTALL CONCRETE COLLAR
ON ALL CO IN PERMEABLE
PAVEMENTS, TYP.

COLLECTION LATERAL
4" DIA. PERFORATED
DRAIN TILE, TYP.

RET. WALL C
SEE 5/8.1

CONSTRUCTION LIMITS TYP.

SILT FENCE TYP.

DAYLIGHT W/ RIPRAP IN
VEGETATED AREA

3:1 MAX
SLOPE

6" DIA. PERFORATED
DRAIN TILE, TYP. SEE X/XX

INSTALL CONCRETE COLLAR
ON ALL CO IN PERMEABLE
PAVEMENTS, TYP.

6X4 WYE, TYP.

ACCESSIBLE PATH 5% MAX

MATCHLINE SHEET 4

EXISTING DRAIN LINE AND
IRRIGATION
PROTECT DURING
CONSTRUCTION

EXISTING DRAIN LINE AND
IRRIGATION
PROTECT DURING
CONSTRUCTION

RET. WALL B
29" MAX HEIGHT
STEP WALL TOP AND BOTTOM
SEE 5/8.1

SILT FENCE TYP. PROTECT ALL
PERMEABLE PAVEMENTS FROM
RECEIVING FLOW UNTIL TURF
HAS BEEN ESTABLISHEDAREAS

A SEDIMENT

NG
ET

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OTHER NOTES
N.I.C. = NOT IN CONTRACT

DRAINAGE ARROW
CONSTRUCTION LIMITS
SILT FENCE
TREE FENCING

0 10' 20' 40' 50'

RAMSEY
COUNTY
Parks & Recreation
2015 VAN DYKE STREET
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FAX (651)748-2508

CONTACT INFORMATION:
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bruce.blumer@co.ramsey.mn.us
651.748.2500

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Landscape Architect under the laws of the State of Minnesota.

Registration:	Landscape Architect
State:	Minnesota
Number:	43914
Signature:	B. Gus Blumer

NO.	DATE:	DESCRIPTION:
1	5/22/18	SID DOCUMENTS

DESIGN PHASE:

REVIEW DOCUMENTS

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RAMSEY COUNTY PARKS AND RECREATION DEPARTMENT
KELLER REGIONAL PARK

DATE:	DECEMBER 2018
DESIGNED BY:	BGB
DRAWN BY:	BGB
CHECKED BY:	SAY

TITLE

GRADING & DRAINAGE PLAN

BD 4.2

SHEET 8 OF 28

Permit Application Coversheet

Date January 02, 2019

Project Name Hiway Federal Credit Union **Project Number** 19-04

Applicant Name Russ Schramm, HTG Architects

Type of Development Institutional

Property Description

This project is located near the northeast corner of I-494 and Valley Creek Rd in the City of Woodbury. The applicant is proposing to demolish an existing liquor store and construct a new bank building with associated parking. The total site area is 1.15 acres. Volume reduction and rate control will be provided through construction of an underground infiltration system. Pretreatment will include sumped manholes.

Watershed District Policies or Standards Involved:

- ☐ ***Wetlands***
- ☑ ***Erosion and Sediment Control***
- ☑ ***Stormwater Management***
- ☐ ***Floodplain***

Water Quantity Considerations

The proposed stormwater management plan is sufficient to handle the runoff from this site.

Water Quality Considerations

Short Term

The proposed erosion and sediment control plan is sufficient to protect downstream water resources during construction.

Long Term

The proposed stormwater management plan is sufficient to protect the long term quality of downstream water resources.

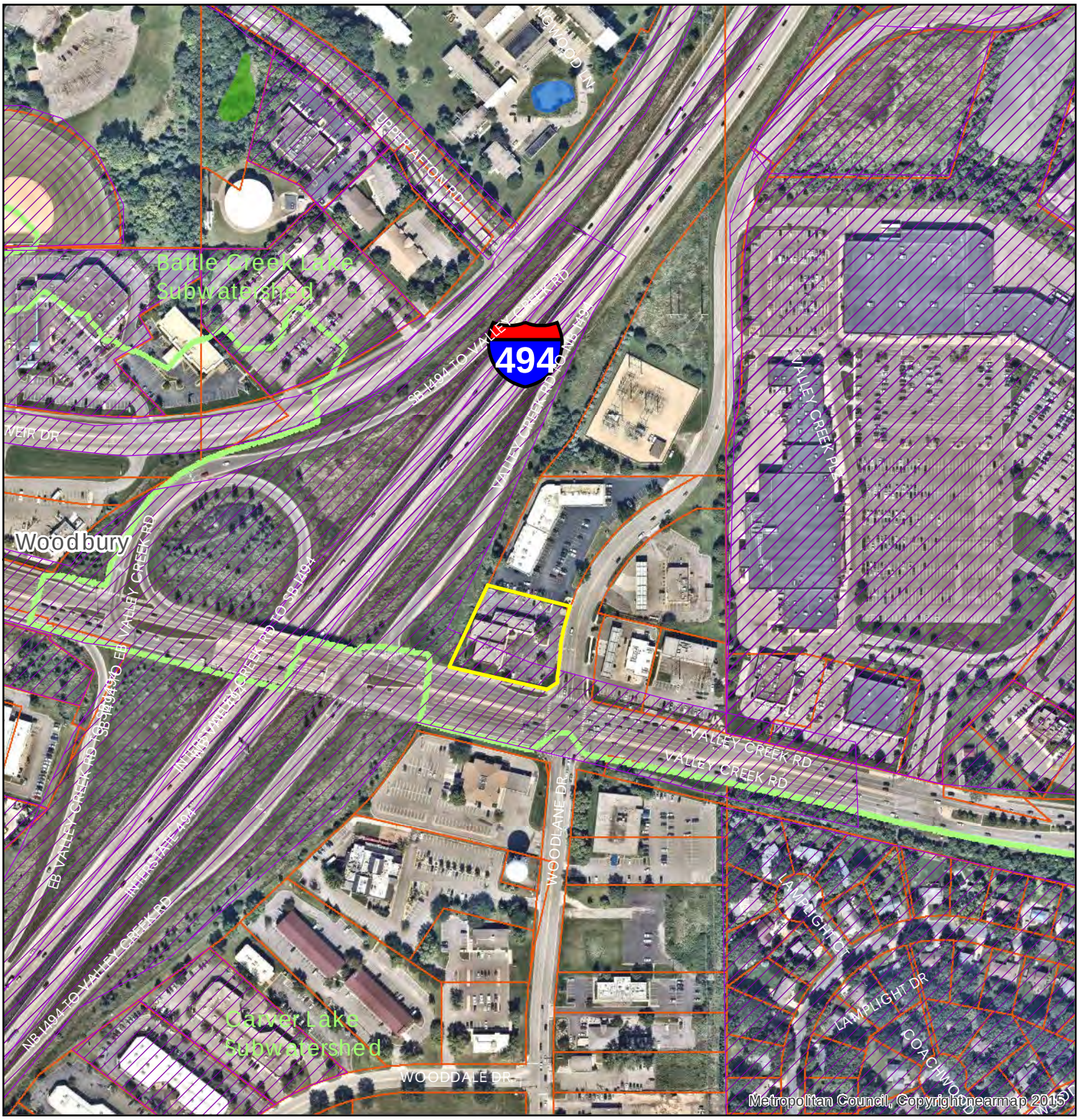
Staff Recommendation

Staff recommends approval of this permit with the special provisions.

Attachments:

- ☑ **Project Location Map**
- ☑ **Project Grading Plan**

#19-04 Hiway Federal Credit Union



Wetlands
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- Manage C
- Lake
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- Not Assessed

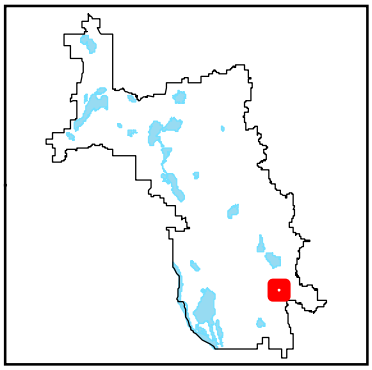
- Permits
- RWMWD Boundary
- Subwatersheds
- Creeks
- Washington Co Parcels
- City Boundaries

Highlighted Areas Represent Active Permit

0 250 500
Feet

0 0.05 0.1
Miles

N



19-04

Special Provisions

1. The applicant shall submit revised modeling/calculations to demonstrate 48-hour drawdown requirements are met for the proposed infiltration BMP.

2. The applicant shall include a detail in the plans for an impermeable liner or membrane for the proposed infiltration BMP that extends to 2 feet below the basement floor elevation to provide the required separation necessary to meet District freeboard requirements.

3. The applicant shall submit a final copy of the signed construction plans.

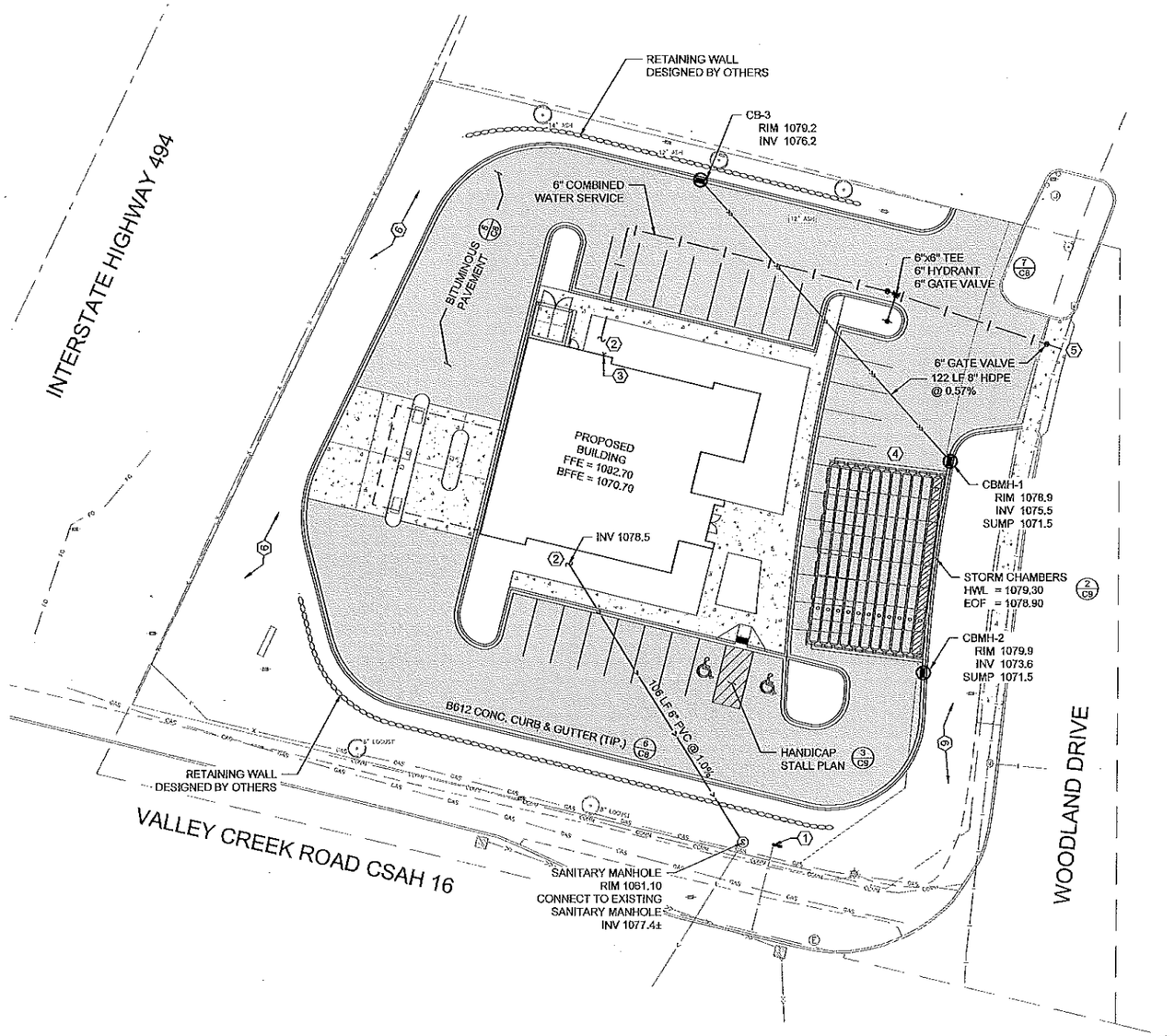
4. The applicant shall submit an executed stormwater maintenance agreement.

5. The applicant shall submit the final geotechnical report.

6. The applicant shall provide a copy of the approved Minnesota Pollution Control Agency's NPDES Construction Permit for the project.

7. The applicant shall provide contact information for the trained erosion control coordinator responsible for implementing the Stormwater Pollution Prevention Plan (SWPPP).

8. The applicant shall submit the escrow fee of $5,750.



N

0 20' 40'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED DRAINTILE
- PROPOSED WATERMAIN FITTING
- PROPOSED SANITARY MANHOLE AND CLEANOUT
- PROPOSED STORM INLETS

CONTRACTOR NOTES

1. ALL CONSTRUCTION SHALL COMPLY WITH RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER UNLESS DIRECTED OTHERWISE.
2. ALL CONSTRUCTION SHALL COMPLY WITH CITY OF WOODBURY, MINNESOTA ENGINEERING STANDARDS AND THE 2005 EDITION OF MNDOT SPECIFICATIONS, UNLESS DIRECTED OTHERWISE.
3. ALL CONSTRUCTION SHALL COMPLY WITH APPLICABLE MUNICIPAL, WATERSHED DISTRICT, COUNTY, MPCA, DEPT. OF HEALTH, AND MNDOT PERMITS. VERIFY RECEIPT OF ALL REQUIRED PERMITS PRIOR TO CONSTRUCTION.
4. EXISTING TOPOGRAPHIC AND UTILITY INFORMATION PROVIDED BY THE OWNER ON A SURVEY PREPARED BY ANDERSON ENGINEERING, 2018. BE ADVISED THAT THE LOCATION AND TYPE OF EXISTING UTILITIES SHOWN ON THE PLANS ARE FOR GENERAL INFORMATION ONLY. THE INFORMATION IS NOT WARRANTED TO BE ACCURATE OR COMPLETE. THE CONTRACTOR, IN COOPERATION WITH THE APPROPRIATE UTILITY COMPANY OR MUNICIPALITY, IS RESPONSIBLE FOR VERIFYING THE LOCATION, SIZE, AND DEPTH OF ALL UNDERGROUND UTILITIES.
5. ALL HANDICAPPED STALLS AND ACCESS RAMPS SHALL COMPLY WITH CURRENT ADA STANDARDS. SEE ARCHITECTURAL PLANS FOR EXACT LOCATION OF BUILDING ENTRANCES.
6. WATER LINES ARE REQUIRED TO BE INSTALLED AT 8 FEET MINIMUM DEPTH AND PROVIDE MINIMUM 10' HORIZONTAL AND 18" VERTICAL SEPARATION OF ALL WATERMAIN CROSSINGS FROM STORM OR SANITARY SEWER. WATERMAIN TO BE INSULATED PER C.E.A.M. SPECIFICATIONS, WHERE COVER DEPTHS CANNOT BE ACHIEVED. CONTRACTOR SHALL CONTACT THE ENGINEER IF THERE ARE AREAS WHERE MINIMUM COVER DEPTH CANNOT BE MET.
7. WATER SERVICE MATERIALS SHALL BE PVC C900. CONTRACTOR SHALL VERIFY EXISTING SERVICE SIZE AND MATERIALS PRIOR TO CONSTRUCTION. ALL INSTALLED PIPE WILL REQUIRE TESTING PER CITY AND STATE REQUIREMENTS, THIS WILL INCLUDE, AT A MINIMUM, CONDUCTIVITY AND PRESSURE TESTING, AS WELL AS TESTING FOR BACTERIA AND PROPER DISINFECTION. FOLLOW C.E.A.M. STANDARD SPECIFICATIONS UNLESS NOTED OTHERWISE. INSTALL NO 8 SOLID CORE TRACER WIRE PER CITY STANDARD. JOINT RESTRAINTS AND THRUST BLOCKING ON ALL WATERMAIN PIPE AND FITTING, PER CITY OF WOODBURY, MINNESOTA STANDARDS.
8. SANITARY SEWER PIPE MATERIALS SHALL BE PVC SDR 26. PIPE SHALL BE INSULATED PER CITY AND C.E.A.M. STANDARDS WHERE 7.5 FOOT COVER DEPTHS ARE NOT ACHIEVED. THIS APPLIES TO ALL PROPOSED NEW PIPE FOR THIS PROJECT. ALL SANITARY SEWER PIPE WILL REQUIRE TESTING PER CITY AND C.E.A.M. STANDARDS. THIS WILL INCLUDE, AT A MINIMUM, LEAKAGE AND ALIGNMENT TESTING.
9. ALL JOINTS AND CONNECTIONS IN THE STORM SEWER SYSTEM SHALL BE WATER TIGHT. APPROVED RESILIENT RUBBER JOINTS MUST BE USED TO MAKE WATER TIGHT CONNECTIONS TO MANHOLES AND CATCH BASINS.

KEY NOTES

1. CONTRACTOR TO LOCATE AND CAP EXISTING WATER SERVICE
2. UTILITY CONNECTION PROVIDED 5' FROM BUILDING. SEE MECHANICAL FOR CONTINUATION OF UTILITIES
3. FIRE DEPARTMENT CONNECTION (FDC) - COORDINATE WITH MECHANICAL
4. STORMTECH CHAMBERS - SEE DETAILS
5. CONNECT TO EXISTING WATERMAIN PER CITY STANDARDS
6. SNOW STORAGE AREA

CALL 48 HOURS BEFORE DIGGING
Utilities Underground Location Center
DIAL 811
811.
Know what's below, Call before you dig.

HTG architects
www.htg-architects.com
Minneapolis Tampa Bismarck
9300 Hennepin Town Road
Minneapolis, MN 55347
Tel: 952.278.8880
Fax: 952.278.8822

PROJECT

HIWAY FEDERAL CREDIT UNION

NEW BUILDING

WOODBURY, MINNESOTA

ISSUED SET	
REVISIONS	
DATE	NO.

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION, AND THAT I AM A DULY LICENSED ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

NOT FOR CONSTRUCTION

EDWIN J. BRODMARKLE, PE (MN)

55409	12.20.2018
REG. NO.	DATE

ANDERSON
13605 1st Ave N. #100
Plymouth, MN 55441
P 763.412.4000 | ae-mn.com

C4

DRAWN BY: BJF CHECKED BY: EJB

UTILITY PLAN

181177 (AE 15243)

COPYRIGHT © BY HTG ARCHITECTS

RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

MEMORANDUM

Date: January 2, 2019

To: Board of Managers and Staff

From: Nicole Soderholm, Permit Coordinator

Subject: December Enforcement Action Report

During December 2018:

Number of Violations: **0**

Ongoing Activities:

Erosion/sediment control inspections, permitting assistance to private developers and public entities, permit review with Barr Engineering, miscellaneous inquiries, MnDOT preconstruction meeting, WCA administration

Project Updates:

Permit #17-31 Met Council Beltline Sanitary Sewer Rehab, St. Paul

Work began this fall on the Met Council's Beltline sanitary sewer project near Highway 61 and Warner Road in the City of St. Paul. The applicant has submitted a dewatering permit to the DNR to allow for some pipe work. District staff provided comments to the application in November with concerns about movement or settling of the District's Betline storm interceptor due to the proximity of the proposed dewatering. The DNR permit includes language to the effect that the Met Council and their contractor will be responsible for repairing any damage that may occur to the Beltline as a result of the dewatering. A pre-dewatering walk-through of the potentially affected section of tunnel was completed by Barr staff on December 21st. The Met Council and their contractor did not feel that conditions were safe enough to participate in the walk-through and have agreed to accept Barr's findings. A post-dewatering walk-through will occur afterward with Barr to assess any potential changes and/or damage to the tunnel.

Permit #18-24 Roseville Luxury Apartments

The permit for the Roseville Luxury Apartments project off Lexington Ave & County Rd C was issued on December 27th. Demolition of the existing houses and tree removal will occur this winter, but mass grading will be delayed until the spring. The contractor has scheduled an initial inspection of the site for late March prior to soil disturbance.

Permit #18-26 MnDOT I694/I494/I94 Loop, Oakdale/Woodbury

Staff attended a preconstruction meeting for MnDOT's upcoming loop project on December 6th. The permit for the project was issued on December 17th. Per MnDOT's contractor, the majority of southbound work will occur in 2019 and northbound sections in 2020. Some minor work will take place over the winter. An initial erosion control inspection is tentatively scheduled with MnDOT staff for early January.

Permit #13-16 Havencrest, Maplewood

The Havencrest subdivision off McKnight Rd and County Rd D is now complete. A final inspection of the site was completed on December 19th. A few administrative items were requested from the developer. Once these items have been received, the permit can be closed and the escrow refunded. The infiltration basin constructed for the project will be maintained by the adjacent homeowners.

Permits Closed in December 2018:

15-03 Cardinal Place, Oakdale
16-31 NorthPoint Development Storage Facility, Maplewood

Permit Summary 2016-2018

	2016	2017	2018
Open Permits	95	92	97
Board-Approved Applications	37	33	30
ESC Inspections	296	351	316
Violations	170	301	160
Verbal Warnings	10	11	1
Surety Deductions	$2,700	$3,480	$1,560
Non-Compliant Inspection Reports	45	58	26
Permits Closed	23	24	27
Active Sites	35	43	52
WCA Applications	20	22	23

Common Violations*

*Indicates 3 most common ESC violations observed in 2018

- Install/Maintain Inlet Protection* (35 violations)
- Install/Maintain Perimeter Control* (35 violations)
- Install/Maintain Construction Exit* (22 violations)
- Sweep Streets
- Stabilize Exposed Soils
- Contain/Dispose of Liquid and Solid Wastes
- Repair Erosion
- Remove Discharged Sediment
- Implement Proper Dewatering Practices
- Control Dust
- Maintain/Protect Permanent BMPs
- Install Up-Gradient BMPs
- Install Energy Dissipation
- Maintain Temporary Sediment Basin
- General Permit Violation (Admin/Recordkeeping)

Trends/Observations

1. Permit applications slightly decreasing
2. WCA applications slightly increasing
3. More active sites this year
4. Verbal warnings remain low compared to number of inspections
5. Non-compliant reports (letter grade C or worse) decreased significantly from previous years

RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

MEMORANDUM

Date: January 2, 2019

To: RWMWD Board of Managers

From: Nicole Soderholm, Permit Coordinator

Subject: 2018 Rule Revision Update

Ramsey-Washington and Capitol Region watershed districts initiated a permit rules revision process in 2018, culminating in a Joint Rules Technical Advisory Committee (TAC) meeting on September 19th, 2018. Including staff from the watershed districts, 25 individuals attended to learn about the proposed rule changes and offer informal comments.

District staff will provide a draft copy of the revised rules to the TAC for informal review (tentatively early 2019) prior to going out for an official 60-day review period this spring.

Rule Change Highlights:

- Revise language under freeboard requirements to provide added clarification
- Increase the runoff cap to BMPs from 2" to 2.5"
- Increase Stormwater Impact Fund contribution from $40,000 per acre of impervious to $100,000 per acre of impervious
- Increase linear cost cap from $30,000 per acre of impervious to $75,000 per acre of impervious
- Add language to allow for regional compliance
- Revise language to reflect electronic submittals
- Miscellaneous minor corrections, clarifications

Staff will continue to provide updates on this process, and the board will have an opportunity to review any and all proposed changes to the rules. There is no requested action from the board at this time.

(651) 792-7950
fax (651) 792-7951
office@rwmwd.org
rwmwd.org
2665 Noel Drive
Little Canada, MN 55117

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Stewardship Grant Program

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BMP Incentive Application Summary

Project Name: North Park Condo Association **Application Number:** 19-01 CS

Board Meeting Date: 1/2/2019

Applicant Name: Michael Gomez

Residential ☐ **Commercial/Government** ☑

Project Overview:

This project is located off Ruth St N and Burns Ave in the City of St. Paul. This is a joint project between Townhouses of Pathways and North Park Condominiums. The drainage area shared behind both complexes takes runoff from multiple properties. This system offers little stormwater treatment and has suffered from significant erosion issues. The applicant is proposing to modify the existing drainage area into a large infiltration basin. A retaining wall, slope stabilization, and native plants will all be used to stop erosion and treat stormwater. This project is located in a priority subwatershed and is eligible for 100% funding. Because this is a joint project which will treat runoff from multiple properties, staff are recommending the project be awarded the full request. Grant funding will also be provided by Ramsey Conservation District.

BMP type(s):

Infiltration Basin(1)

Grant Request:

$200,000.00

Recommendation:

Staff recommends approval of this application.

Subwatershed:

Battle Creek

Location Maps:


VALLEYSIDE DR
Battle Creek Subwatershed
FAIRWAYS DR
Parcels
Roads
Subwatersheds
Cost Share
RWMWD Boundary
Major Flow Arrows
Flow Arrows
Wetlands
Manage A
Manage B
Manage C
Not Assessed
Water Quality Pond
Lake
N
Feet
0 50 100 200
Highlighted areas (blue outline) represent proposed cost share site.

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the Laws of the State of Minnesota.

James A. Landini Date: 07/31/2018

James A. Landini Reg. No. 44939

Ramsey Conservation District

RAMSEY CONSERVATION DISTRICT
1425 PAUL KIRKWOLD DR
ARDEN HILLS, MN 55112
651-266-7274
www.ramseyconservation.org

PROJECT: NORTH PARK / PATHWAYS

LOCATION:
124 RUTH ST N
ST PAUL, MN 55119

WATERSHED DISTRICT:

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

DESIGNER: MPS
DATE: 06/27/18
REVISION:
REVISION:
REVISION:
REVISION:
REVISION:
CHECKED BY: JAMES LANDINI, P.E.
TAA: JAMES LANDINI, P.E.

NOTES:
ORIGINAL SHEET SIZE: 11" x 17"

SCALE: 1"=60'0"

SITE PLAN

N

L-101

BMP Incentive Application Summary

Project Name: DeVine **Application Number:** 19-02 CS

Board Meeting Date: 1/2/2019

Applicant Name: Mark DeVine

Residential ☑ **Commercial/Government** ☐

Project Overview:

This project is located off County Rd C and Highway 61 in the City of Maplewood. The applicant lives on Kohlman Lake and is proposing a 1,500 sq ft shoreline restoration for his property. This restoration will help with erosion issues on the property and filter runoff before it enters Kohlman Lake. The applicant will be hiring the contractor to perform two years of maintenance after the project is installed.
This project is eligible for 100% funding.

BMP type(s):

Shoreline Restoration(1)

Grant Request:

$12,000.00

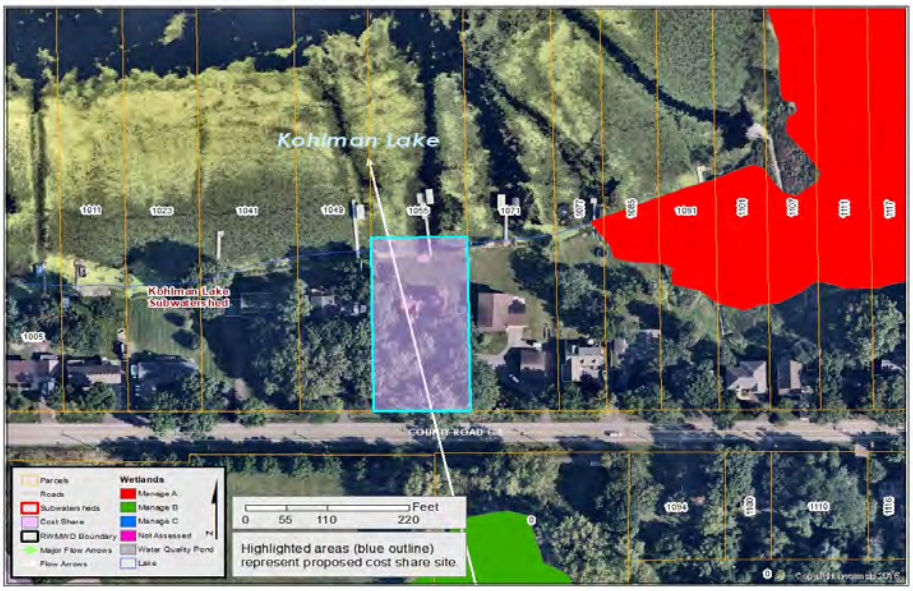
Recommendation:

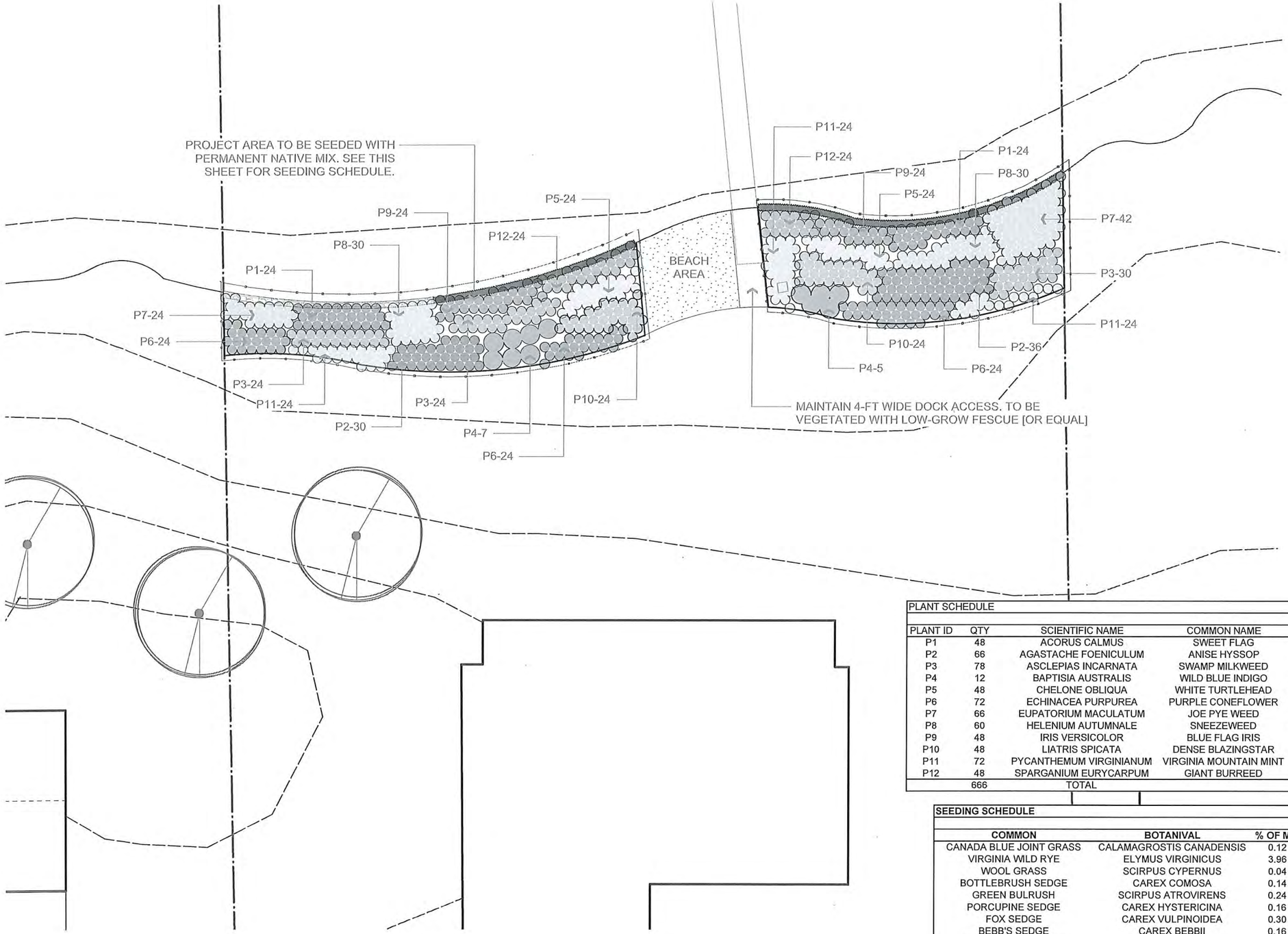
Staff recommends approval of this application.

Subwatershed:

Kohlman Lake

Location Maps:





PLANT SCHEDULE

PLANT ID	QTY	SCIENTIFIC NAME	COMMON NAME	SIZE	SPACING
P1	48	ACORUS CALMUS	SWEET FLAG	4" POT	18" O.C.
P2	66	AGASTACHE FOENICULUM	ANISE HYSSOP	4" POT	18" O.C.
P3	78	ASCLEPIAS INCARNATA	SWAMP MILKWEED	4" POT	18" O.C.
P4	12	BAPTISIA AUSTRALIS	WILD BLUE INDIGO	4" POT	30" O.C.
P5	48	CHELONE OBLIQUA	WHITE TURTLEHEAD	4" POT	18" O.C.
P6	72	ECHINACEA PURPUREA	PURPLE CONEFLOWER	4" POT	18" O.C.
P7	66	EUPATORIUM MACULATUM	JOE PYE WEED	4" POT	18" O.C.
P8	60	HELENIUM AUTUMNALE	SNEEZEWEED	4" POT	18" O.C.
P9	48	IRIS VERSICOLOR	BLUE FLAG IRIS	4" POT	18" O.C.
P10	48	LIATRIS SPICATA	DENSE BLAZINGSTAR	4" POT	18" O.C.
P11	72	PYCANTHEMUM VIRGINIANUM	VIRGINIA MOUNTAIN MINT	4" POT	18" O.C.
P12	48	SPARGANIUM EURYCARPUM	GIANT BURREED	4" POT	18" O.C.
	666	TOTAL			

SEEDING SCHEDULE

COMMON	BOTANIVAL	% OF MIX	SEEDS/SQ-FT
CANADA BLUE JOINT GRASS	CALAMAGROSTIS CANADENSIS	0.12	6.20
VIRGINIA WILD RYE	ELYMUS VIRGINICUS	3.96	3.10
WOOL GRASS	SCIRPUS CYPERNUS	0.04	12.50
BOTTLEBRUSH SEDGE	CAREX COMOSA	0.14	11.80
GREEN BULRUSH	SCIRPUS ATROVIRENS	0.24	1.30
PORCUPINE SEDGE	CAREX HYSTERICINA	0.16	0.90
FOX SEDGE	CAREX VULPINOIDEA	0.30	5.50
BEBB'S SEDGE	CAREX BEBBII	0.16	0.90
AWL-FRUITED SEDGE	CAREX STIPATA	0.16	0.90
COVER CROP			
OATS [SPRING PLANTING]	AVENA SATIVA	47.52	10.60
WINTER WHEAT [FALL PLANTING]	TRITICUM AESTIVUM	47.52	6.20

RECOMMENDED PERMANENT NATIVE SEED MIX
[SEEDING RATE: 50.50 LB/ACRE (58 SEEDS/SQUARE FOOT)

Ramsey Conservation District
RAMSEY CONSERVATION DISTRICT
1425 PAUL KIRKWOLD DR
ARDEN HILLS, MN 55112
651-266-7274
www.ramseyconservation.org

PROJECT: DIVINE RESIDENCE
LOCATION:
1055 COUNTY RD C E
MAPLEWOOD, MN 55109

WATERSHED DISTRICT:

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

DESIGNER: MPS
DATE: 08/13/18
REVISION:
REVISION:
REVISION:
REVISION:
REVISION:
CHECKED BY:
TAA:

NOTES:
SUBSTITUTIONS TO DESIGN AND/OR MATERIALS SHALL RECEIVE FORMAL APPROVAL BY RCD STAFF PRIOR TO INSTALLATION.

ORIGINAL SHEET SIZE: 11" x 17"

SCALE: 1/16"=1'0"

#19-02CS

PLANTING PLAN

N

L1.4

BMP Incentive Application Summary

Project Name: Ames Lake Community Sculpture **Application Number:** 19-03 CS

Board Meeting Date: 1/2/2019

Applicant Name: Randee Edmundson

Residential ☐ **Commercial/Government** ☑

Project Overview:

This grant application is to fund a new sculpture at Ames Lake on St. Paul's East Side to replace a sculpture that was stolen in 2016. The group working on the new sculpture is hoping to create an art piece to celebrate reclamation of the wetlands, clean water, and stewardship by involving various voices of the community. The group has already secured funds for the sculpture prototype materials and in-kind resources including labor, insurance, and the installation and maintenance costs of the sculpture. This project falls in an area of high diversity and is one of the highest areas of concentrated poverty in Ramsey County. In the past, RWMWD has offered 50% cost share assistance for public art and signage. In this instance, the applicant is requesting the full $5,000 to cover the cost for the sculpture.

BMP type(s):

Public Art/Signage(1)

Grant Request:

$5,000.00

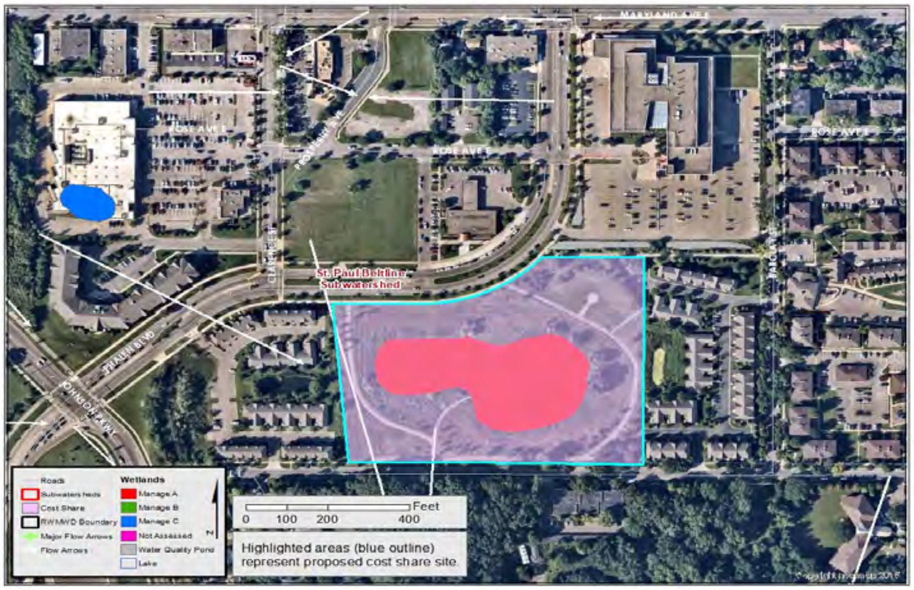
Recommendation:

Staff recommends approval of this application.

Subwatershed:

Lake Phalen

Location Maps:


MARYLAND AVE E
ROSE AVE E
St. Paul Beltline
Subwatershed
JOHNSON PKWY
Roads
Subwatersheds
Cost Share
RWMWD Boundary
Major Flow Arrows
Flow Arrows
Wetlands
Manage A
Manage B
Manage C
Not Assessed
Water Quality Pond
Lake
N
Feet
0 100 200 400
Highlighted areas (blue outline)
represent proposed cost share site.

Stewardship Grant Program Budget Status Update

January 2, 2019

Homeowner	Coverage	Number of Projects	Funds Allocated
Habitat Restoration and rain garden w/o hard surface drainage	50% Cost Share $15,000 Max	0	$0
Rain garden w/hard surface drainage, pervious pavement, green roof	75% Cost Share $15,000 Max	0	$0
Shoreland Restoration (below 100-year flood elevation w/actively eroding banks)	100% Cost Share $15,000 Max	0	$0

Commercial, School, Government, Church, Associations, etc.	Coverage	Number of Projects	Funds Allocated
Habitat Restoration	50% Cost Share $15,000 Max	0	$0
Shoreland Restoration (below 100-year flood elevation w/actively eroding banks)	100% Cost Share $100,000 Max	0	$0
PRIORITY AREAS:	100% Cost Share $100,000 Max	0	$0
NON-PRIORITY AREAS:	75% Cost Share $50,000 Max	0	$0
Aquatic Veg Harvest	50% Cost Share $15,000 Max	0	$0
Maintenance	50% Cost Share $5,000 Max for 5 Years	0	$0
Consultant Fees			$0
Total Allocated			**$0**

2018 Stewardship Grant Program Budget	
Budget	$1,250,000.00
Total Funds Allocated	$0
Total Available Funds	**$1,250,000.00**

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Administrator's Report

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MEMO

TO: Board of Managers and Staff

FROM: Tina Carstens, Administrator

SUBJECT: January Administrator's Report

DATE: December 27, 2018

A. Meetings Attended

Monday, December 3	9:00 AM	Staff Training – MN Deferred Comp
Wednesday, December 5	6:30 PM	Board Meeting
Thursday, December 6	1:00 PM	Metro MAWA Meeting
Tuesday, December 11	6:30 PM	CAC Meeting
Wednesday, December 12	8:00 AM	Water Resources Conference Meeting
Monday, December 17	1:00 PM	Watershed-Based Funding Meeting
Thursday, December 20	11:30 AM	Office Holiday Party

B. Upcoming Meetings and Dates

Metro MAWD Meeting	Tuesday, January 22, 2019
February Board Meeting – Annual Meeting	Wednesday, February 6, 2019
Phalen Freeze Fest	Saturday, February 23, 2019
RWMWD CAC Meeting	Tuesday, February 26, 2019
March Board Meeting	Wednesday, March 6, 2019

C. Citizen Advisory Committee (CAC) Update – Carrie Magnuson

Carrie Magnuson has been leading the CAC meetings from the District staff and, new for 2019, I have asked her to provide me updates to include in the board packet for your information. I have also asked her to be sure the CAC minutes get uploaded to our website document library. The following is Carrie's update from the December CAC meeting.

On December 22th, the CAC met to recognize accomplishments of 2018 and draft a work plan for 2019. In the past year, the CAC has provided valuable citizen feedback on a number of District projects including;

- The RWMWD website redesign – The CAC suggested content changes, found errors, typos, and bad links and suggested general improvements.

- Shallow Lakes Video – CAC continued on the 2017 efforts to draft an outline for the video, and suggest locations, events and residents for interviews. Early in 2018, members reviewed drafts of the video and gave detailed constructive feedback that was used in the final editing. Mid-2018, the CAC provided suggestions on how to distribute the video, most of which were pursued.
- WaterFest 20th Anniversary planning – CAC members gave suggestions for displays and exhibitors for the next WaterFest.
- Equity Initiative – CAC have kept up-to-date with the initiative and one member has been continually active, attending meetings with staff at local organizations like the East Side Business Association, Kitty Anderson Science Center and more. This has helped us to broaden our outreach to underserved populations.
- Shoreline Restoration – the CAC volunteered to help with the Keller Creek Restoration by planting aquatic native plants. This type of planting could not be done by student groups because students were not allowed to actually be in the water.
- Grass Lake and Snail Lake study – CAC residents from the area provided insight to what the lake association and neighborhood goals and expectations were. In turn this member acted as a liaison to bring information back to these groups about the strategies we were doing to manage flood risk.
- Recognition – The CAC was vital for finding and nominating people and places to be recognized at our annual awards dinner. Furthermore, they were active participants in designing the award, finalizing winners, and preparing speeches to be given at the dinner.
- Communication Plan – The CAC worked with Chris O'Brien to review and understand the draft Communication Plan. They provided valuable feedback.

The Citizen Advisory Commission will convene in February 2019 to solidify their work plan for the year.

D. Annual Meeting Reminder

The District Annual Meeting is typically held at the February board meeting. At this meeting we review the general performance of the District; staff, consultants and manager interactions. We can discuss any issues or concerns and also reflect on accomplishments.

The annual meeting also requires the election of officers and designation of official newspapers and banks. I would like to be sure that we will have a full board at the February meeting if possible. If you have any known conflicts, let me know. Thank you!

E. Administrator's Review

My administrator annual review is typically held in January prior to the February board annual meeting. Manager Aichinger is the Vice President and therefore also the board's designated personnel manager (if the officer appointments stay the same for 2019). Typically, a date is set for a special closed meeting to hold my review with the full board. Ahead of that meeting, I meet with the personnel manager to review the year and any comments, praises and concerns. The summary of that meeting is then shared with the full board by the personnel manager to the full board at the meeting. As I have in the past, I will provide the board ahead of the review, my memo summarizing the year's accomplishments and analysis of goals. I will send a doodle poll to the board to find a date that works for everyone.

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Project and Program Status Reports

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resourceful. naturally.
engineering and environmental consultants

BARR

Draft technical memorandum

To: Tina Carstens—Ramsey-Washington Metro Watershed District
From: Josh Phillips, Sean Campbell, and Erin Anderson Wenz—Barr Engineering Co.
Subject: Battle Creek Lake subwatershed feasibility study for BMP systems (**draft**)
Date: December 21, 2018
Project: 23621200.18
c: Paige Ahlborg—Ramsey-Washington Metro Watershed District

1.0 Introduction

This memorandum summarizes the conceptual designs for several proposed best management practices (BMPs) in the Battle Creek Lake subwatershed of the Ramsey-Washington Metro Watershed District (RWMWD). The identified BMPs aim to improve and maintain the water quality in Battle Creek Lake and downstream Battle Creek by retaining or filtering runoff to remove sediment, nutrients, debris, and other pollutants. Barr identified BMP retrofit opportunities based on guidance from the Beaver Lake Watershed Management Plan, the Battle Creek Lake status report (BCLSR), the Clean Water Fund accelerated implementation project, the RWMWD watershed restoration and protection strategy (WRAPS) report, and the RWMWD watershed management plan (Plan). Barr considered more than 50 potential BMP retrofit sites in the subwatershed. This memo summarizes conceptual designs for five of those potential BMPs and recommends design and implementation of one of these BMPs in the near future.

2.0 Background information

The Battle Creek Lake subwatershed covers 2,635 acres in the cities of Oakdale, Landfall, and Woodbury. The Battle Creek Lake subwatershed has varied land use, including residential, commercial, mixed-use industrial, parks, and some undeveloped areas. Much of the undeveloped areas border Battle Creek Lake. There are also two large wetland areas in the subwatershed; one in the southern portion of the subwatershed and the other in the northeastern portion of the subwatershed. Based on future land-use projections, much of the remaining undeveloped non-wetland areas will be converted to commercial or industrial development. The subwatershed drains to Battle Creek Lake, which is the only RWMWD-managed waterbody in the subwatershed, located in the city of Woodbury and Washington County.

Battle Creek Lake is a Minnesota Department of Natural Resources (DNR) public water (MDNR# 82-0091P) with a surface area of approximately 103 acres, an average depth of 4 feet, and a maximum depth of 15 feet. By definition, the Minnesota Pollution Control Agency (MPCA) considers Battle Creek Lake a shallow lake (a maximum depth of less than 15 feet and/or at least 80 percent of the lake less than 15 feet deep). The lake is used for a variety of recreational purposes, including boating, canoeing, fishing, picnicking, and aesthetic viewing and there is a public boat access at the southwest corner of the lake in Shawnee Park.

The City of Woodbury operates an aeration system during the winter to prevent winterkill. In addition to runoff from the Battle Creek subwatershed, Battle Creek Lake receives flows from Tanners Lake to the north. Battle Creek Lake discharges through a 72-inch reinforced concrete pipe to the west into Battle Creek, which eventually flows into the Mississippi River in St. Paul.

In 2002, the MPCA added Battle Creek Lake to the impaired waters 303(d) list for excess nutrients, based on water-quality modeling data from the 1995 Beaver Lake Watershed Management Plan. The main pollutant of concern in Battle Creek Lake is phosphorus, measured as total phosphorus (TP). The RWMWD performed additional water quality modeling in 2009 as part of the BCLSR. Based on improved water quality and revised water-quality standards for shallow lakes, the MPCA removed Battle Creek Lake from the impaired waters list in 2014. In 2016, the RWMWD updated the BCLSR water-quality modeling as part of the WRAPS report. Figure 1 shows the results of the WRAPS report water-quality modeling and indicates that watershed runoff and release from lake sediments are the two largest sources or phosphorus loading.

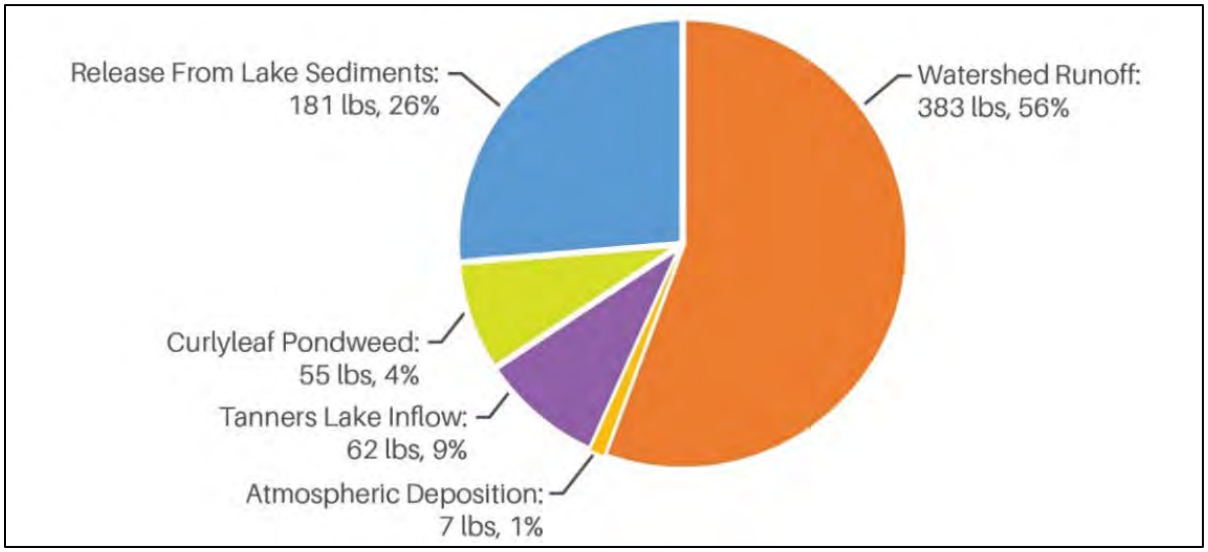

Figure 1. Phosphorus-loading breakdown for Battle Creek Lake (source: RWMWD watershed management plan, 2017)

The RWMWD samples the water quality of Battle Creek Lake every two weeks between the months of May and September, and has assigned a water-quality classification of "at risk" to Battle Creek Lake based on its recent removal from the impaired waters list and recent water-quality data.

3.0 Proposed improvements

The goal of this study is to identify possible improvements that the RWMWD could implement throughout the Battle Creek Lake subwatershed to treat runoff and improve water quality. Where feasible, Barr prioritized opportunities for infiltration BMPs as they are generally the most cost effective solution to treating stormwater runoff. Where infiltration was not feasible, we recommended filtration or detention

BMPs. This study also qualitatively considers the potential for educational features or partnership to promote continued awareness and mindfulness for improving water quality.

3.1 Site selection for BMP retrofits

Barr investigated the Battle Creek Lake subwatershed to identify potential locations for BMP retrofit projects. The primary method for site evaluation was a desktop analysis. Barr used elevation data, storm-sewer data, imperviousness data, national wetland inventory data, aerial imagery, and Google Street View™ imagery to identify potential sites. Additionally, Barr reviewed the RWMWD's map of cost-share and permitted projects to identify locations where BMPs have already been implemented.

The desktop analysis identified 50 sites with significant impervious areas and space for an adjacent BMP. Barr considered sites with larger impervious areas more desirable, as the BMP would have a larger treatment impact. We also gave higher priority to sites with high public traffic, since they have more opportunity for public engagement and education. In addition, we considered sites owned by the city or county more promising, as a partnership with public entities is generally favorable over a partnership with a private company or landowner. From this initial list, Barr prioritized sites by eliminating locations with no immediate access for storm-sewer connections, limited direct drainage area, unfavorable grade change, complex grading in the BMP footprint, or significant required tree removals in the BMP footprint. This prioritization exercise narrowed down the list of 50 sites to 12 preferred sites. Barr staff visited these 12 sites for further analysis, and distilled the list to five locations for conceptual design.

3.2 Proposed BMP Retrofits

The following section discusses the concept designs Barr developed for the five prioritized locations. Table 1 includes the estimated average annual phosphorus removal for each BMP using the MPCA minimal impact design standards (MIDS) calculator. Figure 2 shows the locations of the identified BMP retrofit locations in the Battle Creek Lake subwatershed.

Table 1. Summary of water-quality benefits for BMPs in the Battle Creek Lake subwatershed

Proposed BMP	Estimated annual TP reduction (lb/year)
1. Allina Health Woodbury Clinic rain garden	1.00
2. Barnes and Noble rain garden	0.44
3. Century Office Park rain garden	1.12
4. Shawnee Park rain garden	0.50
5. I-94/I-494/I-694 Interchange stormwater pond	36.3

3.2.1 BMP 1: Alina Health Woodbury Clinic rain garden

Proposed BMP 1 is a bioretention basin (rain garden) at the Allina Health Woodbury Clinic parking lot at 8675 Valley Creek Road in Woodbury. The RWMWD could construct the Allina Health Woodbury Clinic rain garden in the southwest corner of the property to capture runoff from the southwest parking lot, as shown in Figure 3. The location receives runoff from 0.69 acres, including 0.52 acres of impervious area. Barr sized the rain garden to capture 1.1 inches of runoff from the contributing impervious area, resulting in a footprint of 2,550 square feet. Depending on the infiltration capacity of the soils, the rain garden could either infiltrate the volume within 48 hours or filter runoff through an underdrain connected to the existing catch basin along the curb line.

The benefits of constructing this rain garden include a reduction in downstream TP loading by 1.00 pounds per year and moderate visibility for the BMP. The challenges to constructing a BMP at this location include coordination with and buy-in from the property owner and limited education potential due to the rain garden's location at the back of the parking lot.

3.2.2 BMP 2: Barnes and Noble rain garden

Proposed BMP 2 is a rain garden adjacent to Barnes and Noble at the Woodbury Village shopping center. Woodbury Village shopping center is located in the northeast quadrant of the intersection of I-494 and Valley Creek Road in Woodbury, MN. The RWMWD could construct the Barnes and Noble rain garden along Valley Creek Plaza, just north of Barnes and Noble to capture runoff from the building, loading dock, and entrance drive, as shown in Figure 4. The location receives runoff from 0.30 acres, including 0.26 acres of impervious area. Barr sized the rain garden to capture 1.1 inches of runoff from the contributing impervious area, resulting in a footprint of 1,150 square feet. Depending on the infiltration capacity of the soils, the rain garden could either infiltrate the volume within 48 hours or filter runoff through an underdrain connected to an existing catch basin along Valley Creek Plaza.

The benefits of constructing this rain garden include a reduction in downstream TP loading by 0.44 pounds per year and some visibility for the BMP. This site could also be part of a larger treatment system at the Woodbury Village shopping center (see section 3.2.7). The challenges to constructing a BMP at this location include coordination with and buy-in from the property owner and limited educational potential due to the rain garden's location along an access road with no nearby sidewalks and limited foot traffic.

3.2.3 BMP 3: Century Office Park rain garden

Proposed BMP 3 is a rain garden at the 6043 building of the Century Office Park. The 6043 building is located along Hudson Road, southeast of the intersection of I-94 and Century Avenue North in Woodbury. The RWMWD could construct the Century Office Park rain garden in the greenspace between the north parking lot and Hudson Road, as shown in Figure 5. The location receives runoff from 1.02 acres, including 0.77 acres of impervious area. Barr sized the rain garden to capture 1.1 inches of runoff from the contributing impervious area, resulting in a footprint of 1,600 square feet. Depending on the infiltration

capacity of the soils, the rain garden could either infiltrate the volume within 48 hours or filter runoff through an underdrain connected to the existing storm sewer in the middle of the proposed rain garden. In order to effectively retain water in the rain garden, this project may require modification of the existing catch basin.

The benefits of constructing this rain garden include a reduction of downstream TP loading by 1.12 pounds per year and some visibility for the BMP from building tenants, however the rain garden's location at a small office building with no nearby sidewalks and limited foot traffic may limit the public engagement and education potential. The challenges to constructing a BMP at this location include coordination with and buy-in from the property owner and, if the project extends into the right-of-way of Hudson Road, coordination with the city or county.

3.2.4 BMP 4: Shawnee Park rain garden

Proposed BMP 4 is a rain garden at the south parking lot of Shawnee Park on the southwest side of Battle Creek Lake. The RWMWD could construct the Shawnee Park rain garden on the east edge of the south parking lot in the triangular green space between the parking lot and bituminous paths, as shown in Figure 6. The location receives runoff from 1.07 acres, including 0.17 acres of impervious area. Barr sized the rain garden to capture 1.1 inches of runoff from the contributing impervious area, resulting in a footprint of 870 square feet. Depending on the infiltration capacity of the soils, the rain garden could either infiltrate the volume within 48 hours or filter runoff through an underdrain which would outlet to the existing stormwater pond to the southeast.

The benefits of constructing this rain garden include a reduction of downstream TP loading by 0.50 pounds per year and opportunities for education and public engagement. The challenges to constructing a BMP at this location include the requirement of a berm on the downstream side of the BMP to prevent the rain garden from becoming a flow-through system. Additionally, the currently proposed location for the BMP is partially within the drip line of a large bur oak tree, which could limit the size of the BMP. However, a preliminary inspection of the tree indicated that the tree may be in poor health or suffering from oak wilt, which may allow for removal of the tree to protect other bur oaks in the area.

3.2.5 BMP 5: I-94/I-494/I-694 Interchange stormwater pond

Proposed BMP 5 is a stormwater pond at the I-94/I-494/I-694 interchange. The Minnesota Department of Transportation (MnDOT) plans to perform pavement and stormwater improvements to the I-94/I-494/I-694 interchange in 2018/2019. While MnDOT is not interested in partnering with the RWMWD to create additional water quality improvements as part of its current project, which is well underway, MnDOT has engaged in initial discussions for a proposed BMP for a later time, indicating that a project and partnership may be feasible. The potential project involves partnering with MnDOT to construct a stormwater pond in the southeast cloverleaf of the interchange, as shown in Figure 7. A stormwater system, which runs below the interchange, conveys stormwater from subwatersheds northeast

of the interchange toward Battle Creek Lake to the southwest, therefore the location receives runoff from approximately 90 acres, including approximately 34 acres of impervious area, although various ponds, swales, etc. provide stormwater treatment upstream. Barr maximized the size of the proposed stormwater pond for the available space with a proposed depth of 3 feet and proposed area of up to 0.50 acres at the normal water level. The proposed design would daylight the existing storm sewer to provide treatment in the pond. The RWMWD could install an outlet structure to route stormwater back into the existing storm sewer toward Battle Creek Lake.

The benefits of constructing this proposed stormwater pond include a reduction of downstream TP loading by 36.3 pounds per year. The challenges to constructing this proposed stormwater pond include coordination and buy-in from MnDOT for both planning and construction. Load reduction estimates for this option are based on uncalibrated P8 modeling results. If this option is pursued in the future, it would be advisable to do some basic water quality monitoring in the area (even if only grab samples) to verify the flows and water quality parameters that we expect in this location.

3.2.6 Woodbury Village assessment

Woodbury Village is a regional shopping center located near the intersection of I-494 and Valley Creek Drive, towards the southern end of the Battle Creek Lake subwatershed. Barr targeted this shopping center for proposed BMPs because it has a high level of imperviousness and the Metropolitan Council has proposed this location as a park and ride for a future Bus Rapid Transit (BRT) line. The RWMWD could incorporate BMPs into the parking lot areas of Woodbury Village shopping center to improve water quality and provide educational opportunities. The desktop review identified potential locations for implementing rain garden BMPs, although a site visit revealed that most identified locations would require significant excavation and had smaller drainage areas than anticipated. The RWMWD could pursue other BMPs such as tree trenches, subsurface storage and reuse, impervious reduction, etc., at this site and install educational signage or interactive features, similar to the Maplewood Mall project, to engage the public. We did not perform a quantitative analysis for this location, but continued partnership with the Metropolitan Council could lead to a potential stormwater quality project at this site.

3.3 Planning-level opinions of probable cost

Barr developed planning-level cost estimates for each conceptual design and performed a cost-benefit analysis. As feasibility-level concepts, there is significant cost uncertainty associated with the proposed projects. The planning-level opinion of costs include a 25-percent contingency and estimated cost ranges of -30 percent to +50 percent. Additionally, we estimated the engineering cost for the design of each proposed BMP as 40 percent of the total cost. This 40-percent fee includes 30-percent engineering and design and 10-percent construction observation and administration. These costs assume that no wetland mitigation will be required as part of these projects, no contaminated soils will be encountered, and no purchase of easements or properties will be required. Table 2 summarizes the planning-level opinions of probable costs for BMPs in the Lake Owasso subwatershed.

Table 2. Summary of planning-level opinions of probable costs for BMPs in the Battle Creek Lake subwatershed

Proposed BMP	Planning-level opinion of construction cost[1]	Estimated engineering cost[2]	Total opinion of cost
Allina Health Clinic Woodbury rain garden	$63,900 ($44,70-$95,900)	$20,400	$84,300 ($65,100-$116,300)
Barnes and Noble rain garden	$28,700 ($20,100-$43,000)	$9,100	$37,800 ($29,200-$52,100)
Century Office Park rain garden	$40,000 ($28,000-$60,000)	$12,800	$52,800 ($40,800-$72,800)
Shawnee Park rain garden	$21,800 ($15,300-$32,700)	$7,000	$28,800 ($22,300-$39,700)
I-94/I-494/I-694 Interchange stormwater pond	$295,000 ($258,200-$553,200)	$118,000	$413,500 ($376,200-$671,200)

[1] Costs include 25-percent contingency. These do not include costs related to education and outreach, legal, long-term maintenance, or monitoring. Costs are represented as a feasibility-level class 4 cost estimate as defined by the Association for the Advancement of Cost Estimating with a +50-percent/-30-percent uncertainty.

[2] Engineering cost is estimated to be 40 percent of the construction cost, excluding the purchase of properties and/or easements. This cost includes engineering and design and construction observation and administration.

To estimate the cost benefit for each proposed BMP retrofit project, Barr calculated annualized costs for each proposed BMP per pound of phosphorus removed. Table 3 presents the annualized costs as a range for BMP lifespans of 20 to 35 years. The capital cost used for each BMP includes the opinion of probable cost and the engineering design cost. Annual costs include an estimated annual maintenance cost for the BMPs and an assumed interest of 4 percent.

Table 3. Summary of annualized costs for BMPs in the Battle Creek Lake subwatershed

Proposed BMP	Annual cost per pound of TP removed ($/lb.)[1]
Allina Health Clinic Woodbury rain garden	$5,500-$7,200
Barnes and Noble rain garden	$6,800-$8,500
Century Office Park rain garden	$3,400-$4,400
Shawnee Park rain garden	$5,100 - $6,200
I-94/I-494/I-694 Interchange stormwater pond	$530 - $690

[1] Range represents the annualized cost based on a 35-year and 20-year BMP lifespan at an interest rate of 4 percent and annual maintenance estimate of $1000.

3.4 Permits

The following permits may be required for one or more of the proposed BMP retrofit projects:

- **Right of way permit (City of Woodbury):** Any work in the City owned right of way requires a right of way permit.
- **Land disturbance permit (City of Woodbury):** A land disturbance permit is required for any land disturbing activities that exceed one acre or are part of a larger common plan of development over one acre, or the total volume of earth material disturbed, stockpiled, disposed of, or used as fill exceeds 50 cubic yards.
- **Right of way permit (City of Oakdale):** Any work in the right of way required a right of way permit.
- **Erosion and sediment control (RWMWD):** An erosion and sediment control permit is required if the proposed land disturbance is greater than 1 acre or if the proposed land disturbance is within the 100-year floodplain and greater than 10,000 square feet. If required, an erosion and sediment control plan must be submitted with the permit application.

3.5 Meetings

Discussion related to meetings with the City of Woodbury, the City of Oakdale, or other property owners will be included in this section, if they occur.

4.0 Summary and recommendations

This memo includes conceptual design for five BMP retrofit opportunities which would improve water quality of runoff entering Battle Creek Lake from the Battle Creek Lake subwatershed. Of the five concepts, the I-94/I-494/I-694 Interchange stormwater pond provides the best cost benefit for removing TP in the watershed, but is also the most expensive option. The Century Office Park rain garden provides the second best cost benefit for removing TP in the watershed and the Shawnee Park rain garden provides the third best cost benefit for removing TP in the watershed, but also has the highest potential for educational opportunities.

We recommend reaching out to MnDOT about the stormwater pond and performing some water quality monitoring in the area to confirm our assumptions. We also recommend reaching out to the Century Office Park management about that rain garden and the City of Woodbury about the Shawnee Park rain garden to gage their respective reaction and interest in the projects. If MnDOT, the Century Office Park management, and/or the City is in favor of a project, the next steps would include a site survey, utility locate, and soil borings. Unless additional site investigation identifies significant design constraints, the RWMWD could push the project(s) toward final design.

Woodbury Village shopping center holds BMP opportunities that the RWMWD could pursue depending on RWMWD's level of interest in the site. While opportunities to retrofit small aspects of the site appear scarce, RWMWD could pursue BMPs such as tree trenches subsurface storage and reuse, or impervious reduction. These concepts generally require a higher level of involvement and coordination.

While structural BMPs can help reduce TP loading to Battle Creek Lake, we also recommend considering other activities that could improve the water quality of Battle Creek Lake, including:

- Inspection and maintenance of approximately 80 ponds and wetlands (stormwater pond and wetland performance study, 2016) within the subwatershed. Barr's 2016 RWMWD stormwater pond and wetland performance study prioritized three ponds, located at Woodbury Village, within the top 30 percent of the inspection list, as shown in Figure 8. Recommended maintenance activities include dredging, inlet cleanout, and/or chemical treatment of the water or sediments.
- Further public education and outreach about stormwater runoff and at-home practices that can be adopted to improve runoff water quality.
- Regular maintenance of existing BMPs including rain garden vegetation trimming, inlet maintenance, cleanout of hydrodynamic structures, etc.
- Water sampling of Tamarack Wetlands to evaluate water quality and contributing nutrient load to Battle Creek Lake.

5.0 References

Association for the Advancement of Cost Estimating. Rev. 2016. AACE International Recommended Practice NO. 18R-97, March 1, 2016.

Barr Engineering Co. 2017. *Ramsey-Washington Metro Watershed District Watershed Management Plan*. Prepared for Ramsey-Washington Metro Watershed District.

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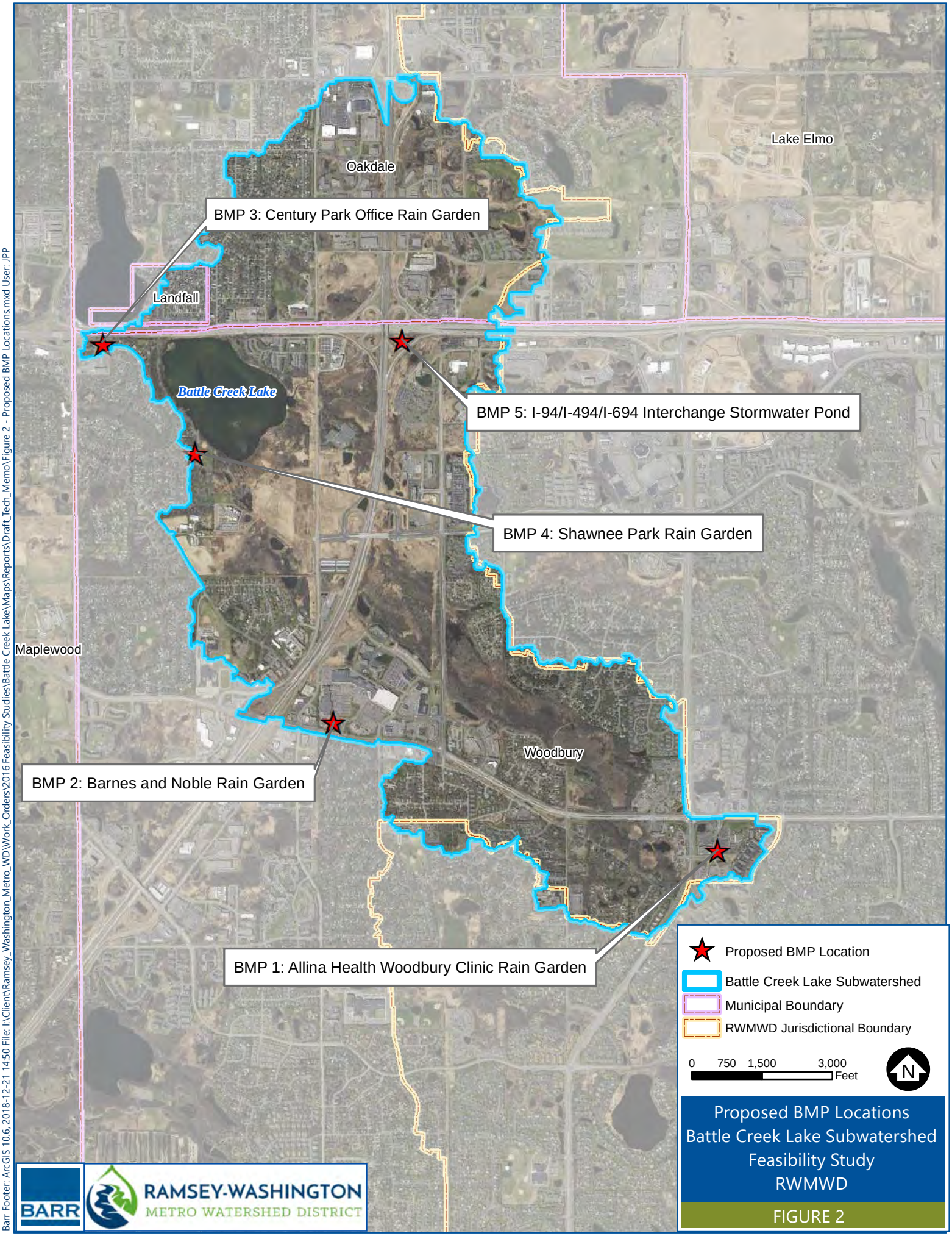
Minnesota Pollution Control Agency. 2016. *Ramsey-Washington Metro Watershed District Watershed Restoration and Protection Strategies (WRAPS)*. Prepared by Barr Engineering Company.

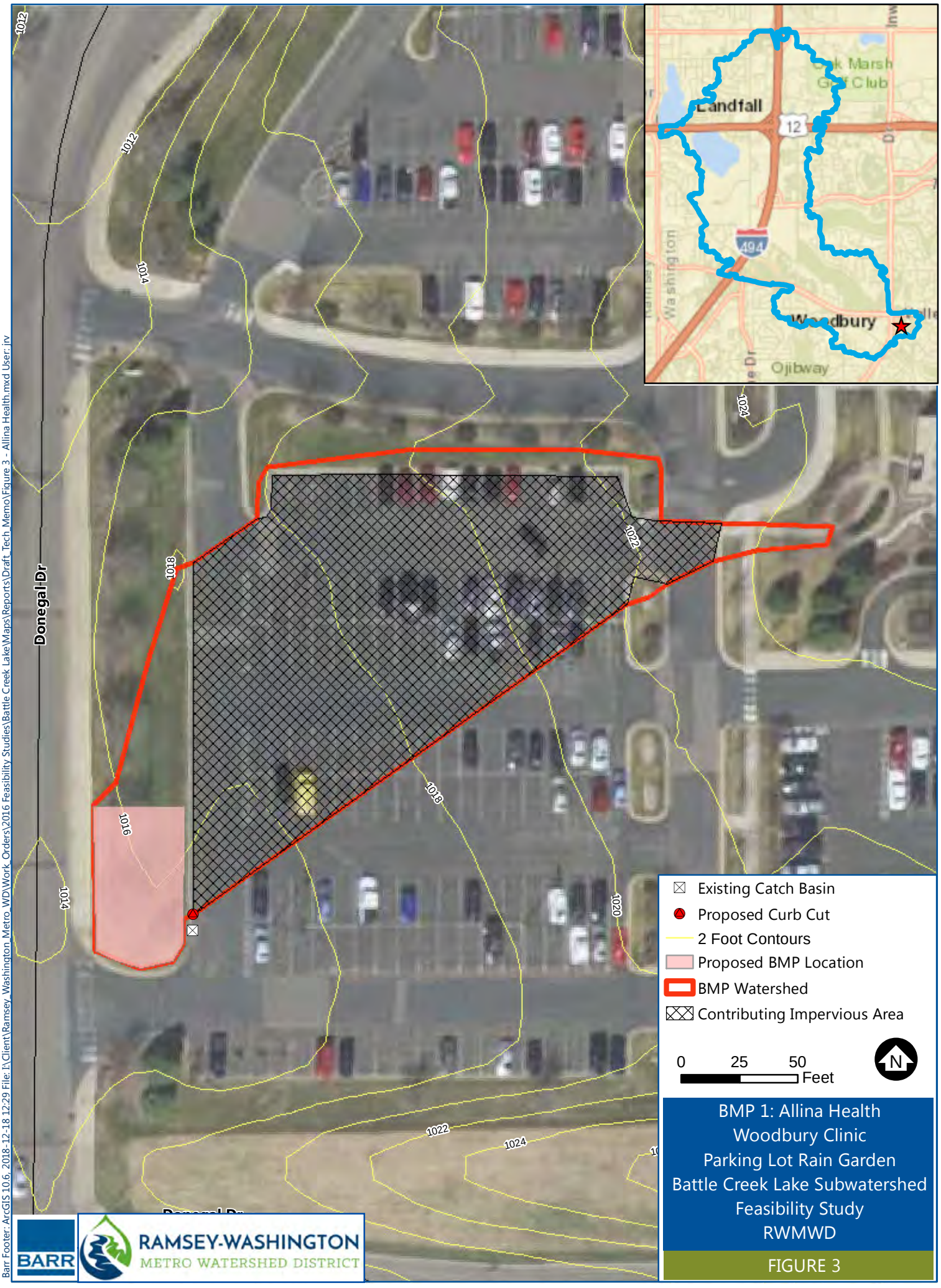
Groundwater/Surface Water Interaction Study (Barr, 2015)

Stormwater Best Management Practices Manual, Chapter 5, 2000, Minnesota Pollution Control Agency (MPCA), https://www.pca.state.mn.us/water/stormwater-best-management-practices-manual

Design Build Program, Book 2, Minnesota Department of Transport (MnDOT) http://www.dot.state.mn.us/designbuild/documents/online/procurementtemplates/book2/book2-section12-drainage.docx



Barr Footer: ArcGIS 10.6, 2018-12-21 14:50 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Battle Creek Lake\Maps\Reports\Draft_Tech_Memo\Figure 2 - Proposed BMP Locations.mxd User: JPP



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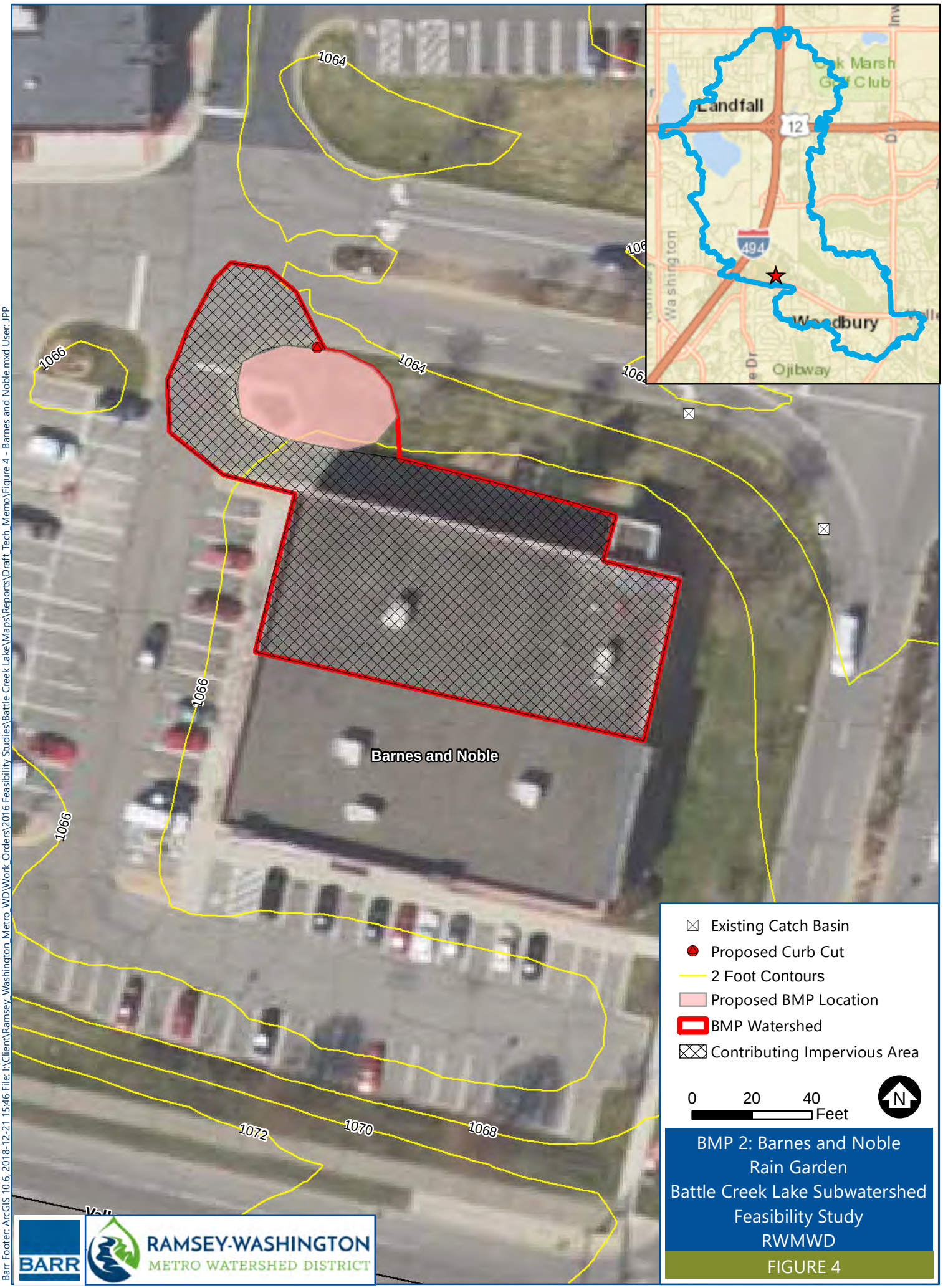

BMP 2: Barnes and Noble
Rain Garden
Battle Creek Lake Subwatershed
Feasibility Study
RWMWD

FIGURE 4

BARR

RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

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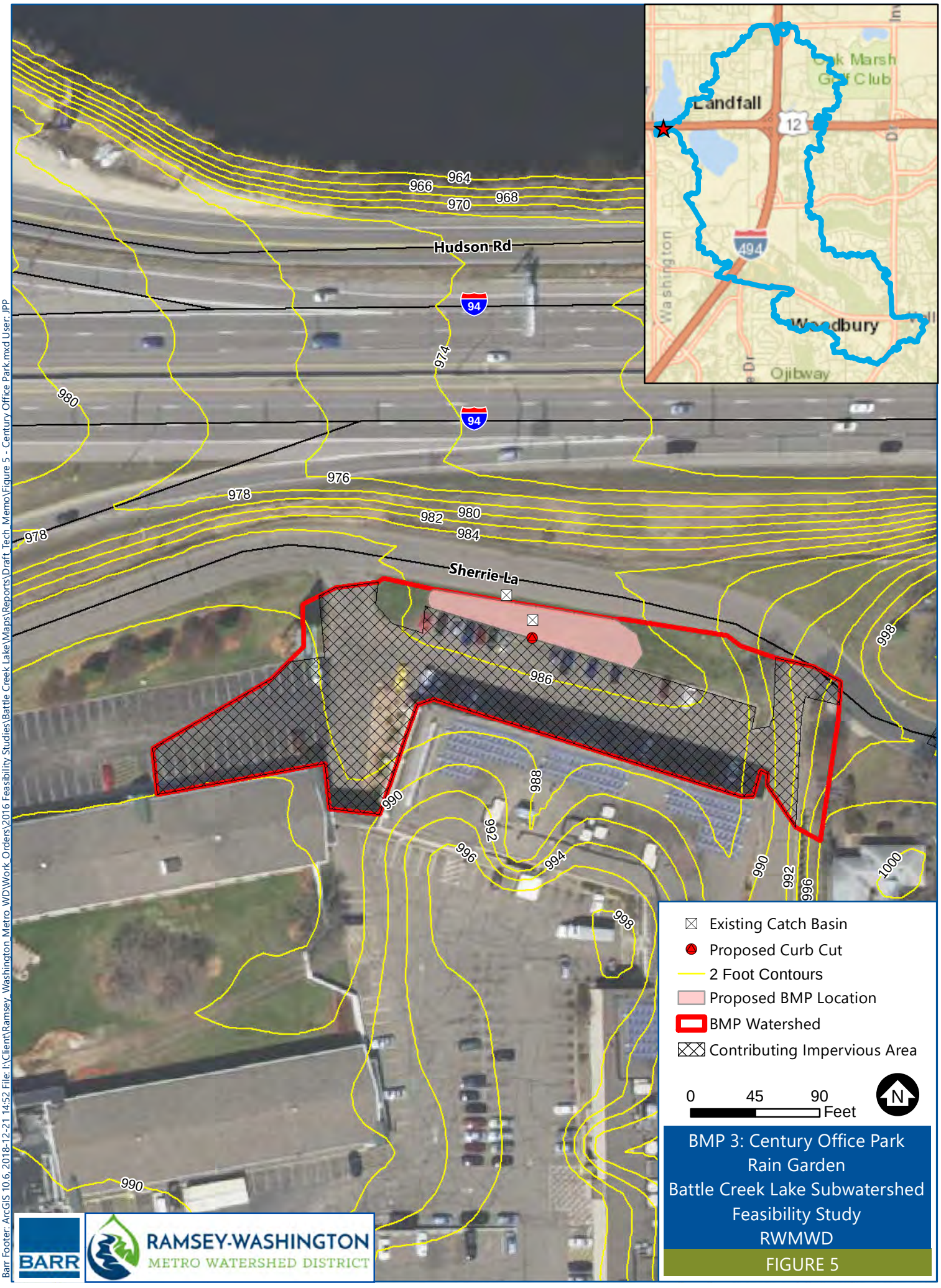


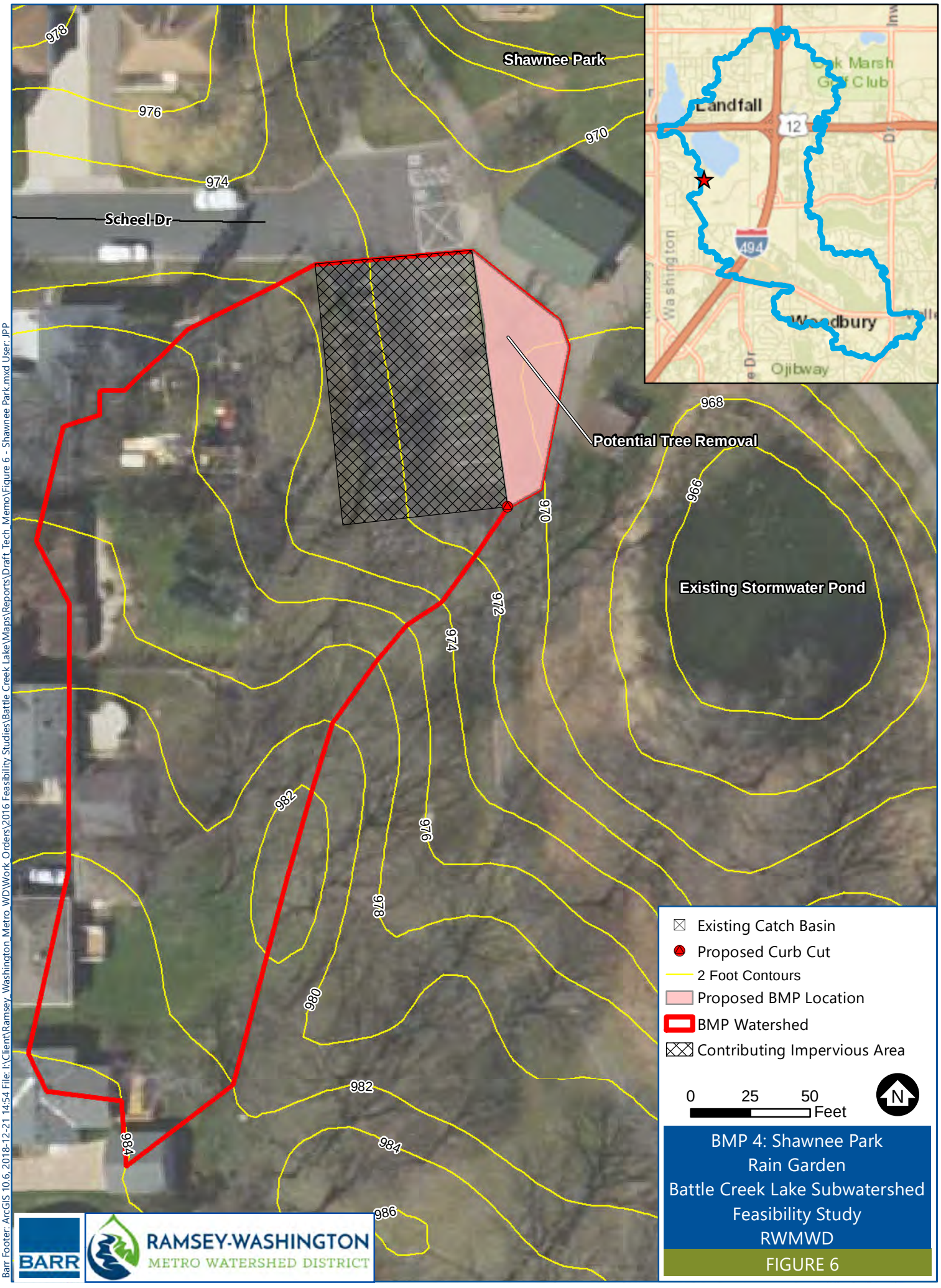
BMP 3: Century Office Park Rain Garden
Battle Creek Lake Subwatershed Feasibility Study
RWMWD

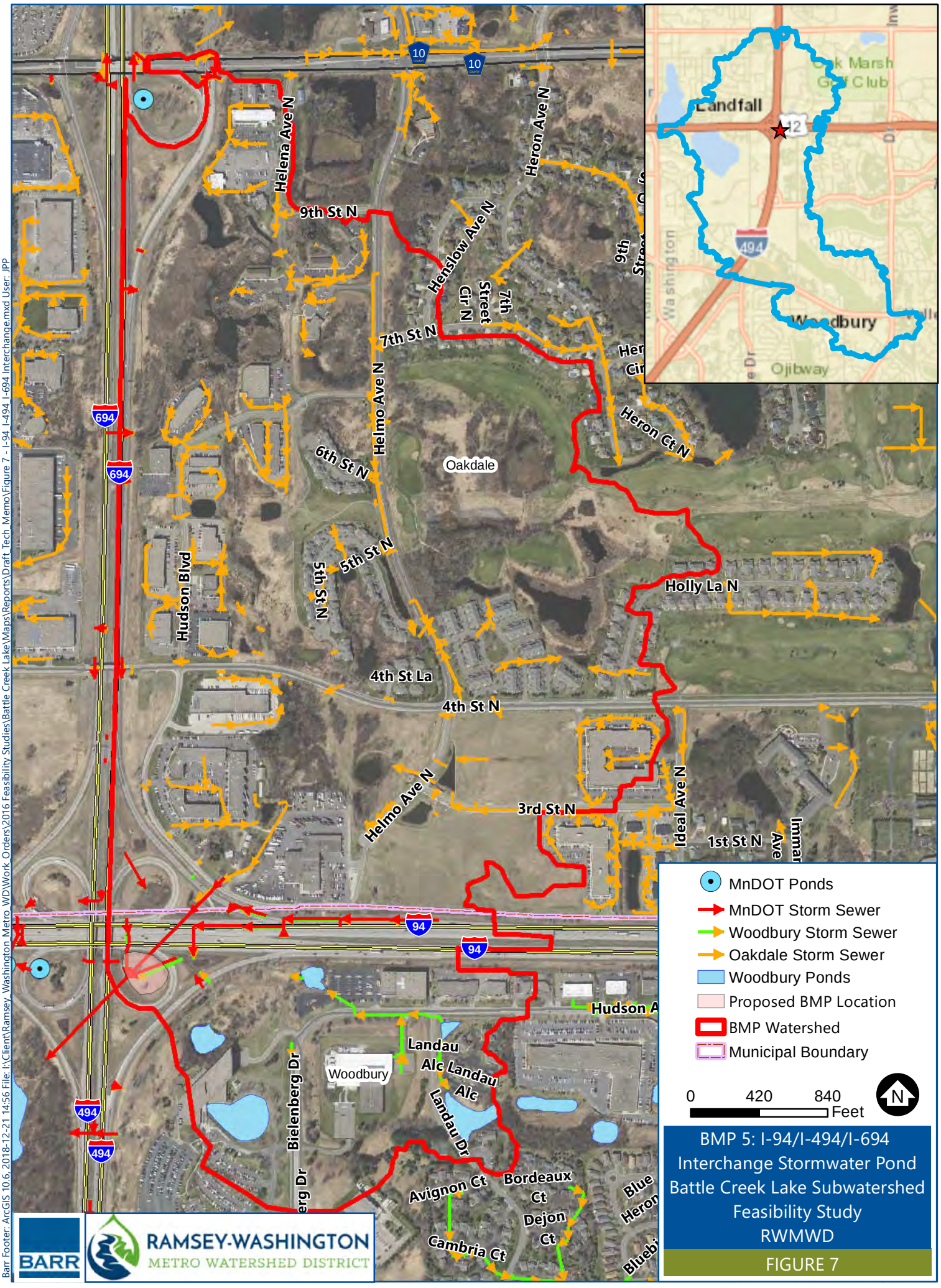
FIGURE 5

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

Barr Footer: ArcGIS 10.6, 2018-12-21 14:52 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Battle Creek Lake\Maps\Reports\Draft_Tech_Memo\Figure 5 - Century Office Park.mxd User: JPP


Shawnee Park
Scheel Dr
Potential Tree Removal
Existing Stormwater Pond
978
976
974
970
968
966
972
974
976
978
980
982
984
986
Landfall
12
494
Ojibway
Existing Catch Basin
Proposed Curb Cut
2 Foot Contours
Proposed BMP Location
BMP Watershed
Contributing Impervious Area
0
25
50
Feet
N
BMP 4: Shawnee Park
Rain Garden
Battle Creek Lake Subwatershed
Feasibility Study
RWMWD
FIGURE 6
BARR
RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT
Barr Footer: ArcGIS 10.6, 2018-12-21 14:54 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Battle Creek Lake\Maps\Reports\Draft_Tech_Memo\Figure 6 - Shawnee Park.mxd User: JPP



BMP 5: I-94/I-494/I-694 Interchange Stormwater Pond
Battle Creek Lake Subwatershed Feasibility Study
RWMWD

FIGURE 7

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

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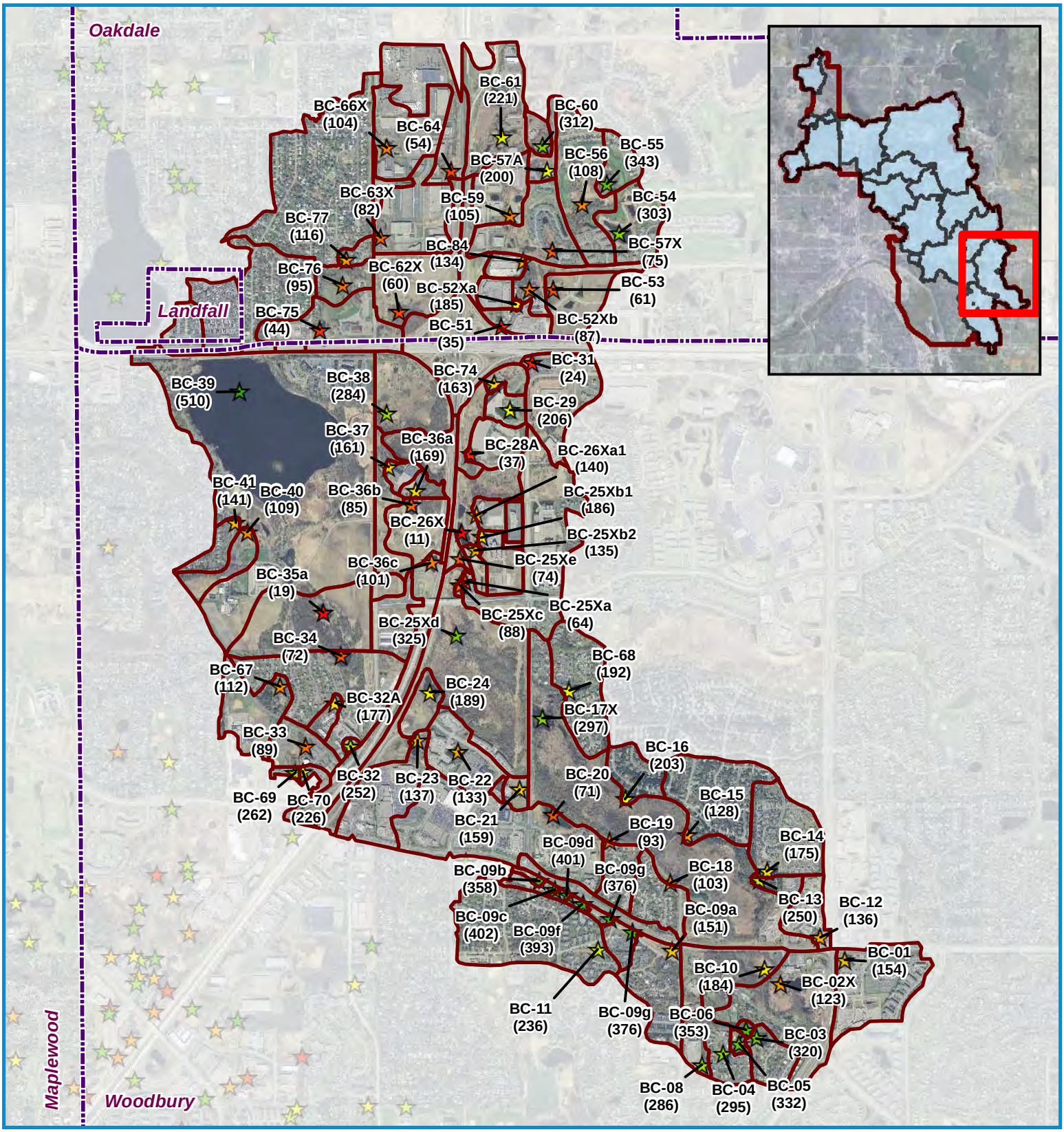

P8 Modeled Waterbodies

Higher inspection priority

Lower inspection priority

Battle Creek Lake Drainage Areas

Municipal Boundary

Label Legend

C-67 → Waterbody ID

(205) → (District Priority Ranking, #)

0 1,100 2,200

Feet

Assessment Priority Ranking: Pond and Wetland Performance Study

Adapted for: Beaver Lake Subwatershed Feasibility Study RWMWD

Figure 8 (Adapted from Figure B-02)

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resourceful. naturally.
engineering and environmental consultants

BARR

Draft technical memorandum

To: Tina Carstens—Ramsey-Washington Metro Watershed District
From: Josh Phillips, Tyler Olsen, and Erin Anderson Wenz—Barr Engineering Co.
Subject: Beaver Lake subwatershed feasibility study for BMP systems (**draft**)
Date: December 21, 2018
Project: 23/62-1200.18
c: Paige Ahlborg, Ramsey-Washington Metro Watershed District

1.0 Introduction

This memorandum summarizes the conceptual designs for several proposed best management practices (BMPs) identified in the Beaver Lake subwatershed of the Ramsey-Washington Metro Watershed District (RWMWD). The identified BMPs aim to improve and maintain Beaver Lake's water quality by retaining or filtering runoff to remove sediment, nutrients, debris, and other pollutants. Barr identified BMP retrofit opportunities based on guidance from the Beaver Lake strategic lake management plan (SLMP), the Clean Water Fund accelerated implementation project, the watershed restoration and protection strategies (WRAPS) report, and the RWMWD watershed management plan (Plan). Barr considered more than 50 potential BMP retrofits in the watershed. This memo summarizes conceptual designs for five of those BMPs, and recommends design and implementation of two of the BMPs in the near future.

2.0 Background information

The Beaver Lake subwatershed covers 1,908 acres in the cities of St. Paul, Maplewood, and Oakdale. Approximately three quarters of the subwatershed is located in Ramsey County, and one quarter is in Washington County. The Beaver Lake subwatershed is fully developed and consists of primarily residential land uses. Other land uses within the subwatershed include park, recreational, preserve, and industrial. The subwatershed drains to Beaver Lake, which is a RWMWD-managed lake located in Ramsey County, primarily in the city of Maplewood.

Beaver Lake is a Minnesota Department of Natural Resources (DNR) public water (DNR ID: 62-0016P) with a surface area of approximately 87 acres, including the wetlands that fringe the lake. The lake has a maximum depth of 11 feet and a mean depth of 4 feet, but most of the lake is less than 8 feet deep. By definition, the Minnesota Pollution Control Agency (MPCA) considers Beaver Lake a shallow lake (a maximum depth of less than 15 feet and/or at least 80 percent of the lake less than 15 feet deep). A Ramsey County park occupies most of the north and west shoreline of Beaver Lake and the public primarily uses the lake for canoeing, fishing, picnicking, wildlife habitat, and aesthetic viewing. There is no public boat access to the lake, but there is a fishing pier on the west shoreline within the county park. Outflows from Beaver Lake discharge to the Beltline Interceptor storm sewer system.

In 2002, the MPCA added Beaver Lake to the impaired waters 303(d) list for excess nutrients. The main pollutant of concern in Beaver Lake is phosphorus, measured as total phosphorus (TP). The RWMWD performed water-quality modeling of Beaver Lake as part of the 2005 Beaver Lake SLMP and developed a draft total maximum daily load (TMDL) report for the lake. However, based on improved water quality and revised water-quality standards for shallow lakes, the MPCA removed Beaver Lake from the impaired waters list in 2014. The RWMWD updated the water quality modeling in 2016 as part of the WRAPS report and Figure 1 shows the results of the WRAPS report water quality modeling and indicates that release from lake sediments and watershed runoff are the two largest sources of phosphorus loading for Beaver Lake.

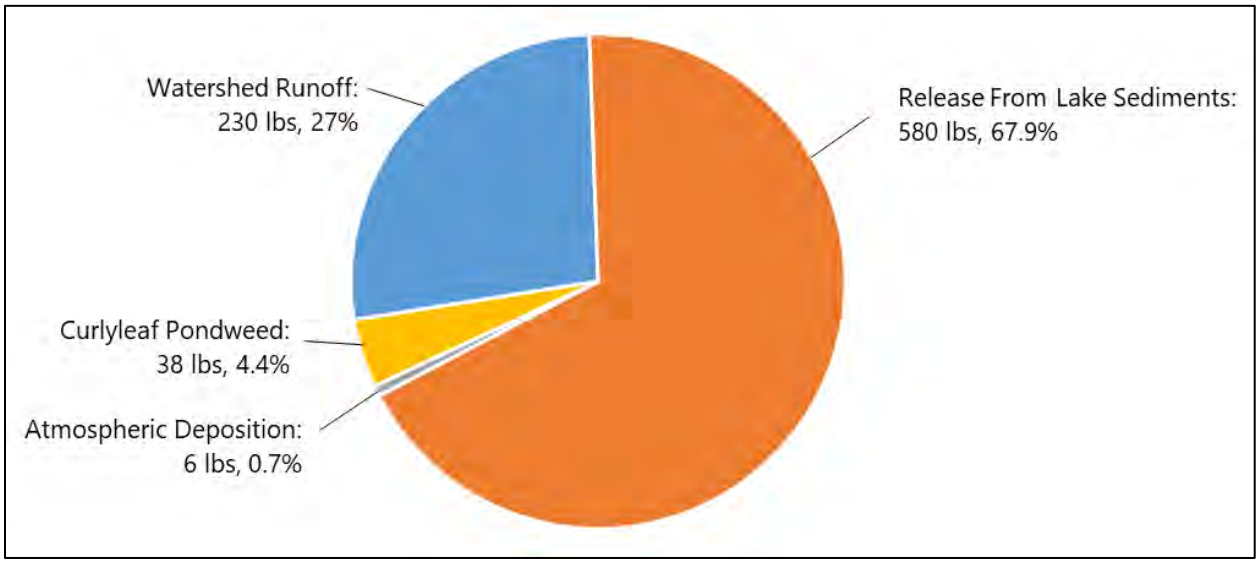

Figure 1: Phosphorus load breakdown for Beaver Lake (source: RWMWD watershed management plan, 2017)

The RWMWD assigned a water-quality classification of "at risk" to Beaver Lake based on its recent water-quality data at or near the MPCA and RWMWD nutrient water-quality standards.

3.0 Proposed improvements

The goal of this study is to identify possible improvements that the RWMWD could implement throughout the Beaver Lake subwatershed to treat runoff and improve water quality. The 2005 SLMP recommended prioritization of "on-site infiltration practices" when implementing BMPs throughout the watershed, specifically for the direct drainage area to Beaver Lake, as 66 percent of the watershed contribution of phosphorus to Beaver Lake came from the lake's direct drainage area. Where feasible, Barr prioritized infiltration BMPs based on the SLMP recommendation and because they are generally the most cost effective solution to treating stormwater runoff. Where infiltration was not feasible, we recommended filtration or detention BMPs. This study also qualitatively considers the potential for educational features or partnership to promote continued awareness and mindfulness for improving water quality.

3.1 Site selection for BMP retrofits

Barr investigated the Beaver Lake subwatershed to identify potential locations for BMP retrofit projects. The preliminary method for site evaluation was a desktop analysis. Barr used elevation data, storm-sewer data, imperviousness data, national wetland inventory data, aerial imagery, and Google Street View™ imagery to identify potential sites. Additionally, Barr reviewed the RWMWD's map of cost-share and permitted projects to identify locations where BMPs have already been implemented.

The desktop analysis identified 56 sites with significant impervious areas and space for an adjacent BMP. Barr considered sites with larger impervious areas more desirable, as the BMP would have a larger treatment impact. We also gave higher priority to sites with high public traffic, since they have more opportunity for public engagement and education. In addition, we considered sites owned by the city or county more promising, as a partnership with public entities is generally favorable over a partnership with a private landowner. From this initial list, Barr prioritized sites by eliminating locations with no immediate access for storm-sewer connections, limited direct drainage area, unfavorable grade change, complex grading in the BMP footprint, or significant required tree removals in the BMP footprint. This prioritization exercise narrowed down the list of 56 sites to eight preferred sites. Barr staff visited these eight sites for further analysis, and distilled the list to four locations for conceptual design.

3.2 Proposed BMP retrofits

The following section discusses the concept designs Barr developed for the four prioritized locations. Table 1 includes the estimated average annual phosphorus removal for each BMP using the MPCA's minimal impact design standards (MIDS) calculator. Figure 2 shows the locations of the identified BMP retrofit locations in the Beaver Lake subwatershed.

Table 1. Summary water-quality benefits for BMPs in the Beaver Lake subwatershed

Proposed BMP	Estimated annual TP reduction (lb/year)
1. Knowlan's Fresh Foods impervious reduction and rain garden	1.46
2. Maplewood Apartments rain garden	1.73
3. Reaney Avenue rain garden	0.37
4. Midvale neighborhood regional underground filtration system	14.51
5. Beaver Lake living streets	11.54

3.2.1 BMP 1: Knowlan's Fresh Foods impervious reduction and rain garden

Proposed BMP 1 is an impervious reduction and bioretention basin (rain garden) at Knolan's Fresh Foods. Knowlan's Fresh Foods is a small grocery store located east of Beaver Lake at 2720 Stillwater Road East in Maplewood. The Knowlan's Fresh Foods parking lot appears to be to be oversized for the property. Most parking stalls on the west side of the lot appear to be mostly unused and portions of the west side of the parking lot have crumbling asphalt. The northwest corner of the site appears to be used for winter snow storage and contained significant amounts of deposited sediment during the field investigation.

The RWMWD could convert approximately 0.15 acres of the northwest corner of the Knowlan's Fresh Foods parking lot to pervious area and construct a rain garden to capture runoff from majority of the building and parking lot, as shown in Figure 3. The location receives runoff from 1.61 acres, including 1.35 acres of impervious area. Barr sized the rain garden to capture 1.1 inches of runoff from the contributing impervious areas, resulting in a footprint of 2,500 square feet. Depending on the infiltration capacity of the soils, the rain garden could either infiltrate the volume within 48 hours or filter runoff through an underdrain connected to the existing storm sewer near Stillwater Road. In order to effectively retain water in the rain garden, this project would require modification of the existing storm sewer inlet. The RWMWD could design the remainder of the impervious reduction area, outside the rain garden footprint, to drain to the rain garden and include resilient vegetation if the property owner wishes to continue to use the area for snow storage.

The benefits of this impervious reduction and rain garden include a reduction in downstream TP loading by 1.46 pounds per year and significant visibility for the BMP, although the educational impact may be limited by the rain garden's location at the back of a commercial parking lot. The challenges to constructing a BMP at this location include coordination with and buy-in from the property owner, maintained access to the building's loading dock, and possible parking lot reconfiguration.

3.2.2 BMP 2: Maplewood Apartments rain garden

Proposed BMP 2 is a rain garden near the entrance to Maplewood Apartments at 2391 Larpenteur Avenue East in Maplewood. The RWMWD could construct the Maplewood Apartments rain garden along Larpenteur Avenue East on the east of the entrance drive to capture runoff from the entrance drive and parking lot directly to the north, as shown in Figure 4. The location receives runoff from 1.5 acres, including 0.78 acres of impervious area and is already a grassed depression with a catch basin at grade. Barr sized the rain garden to capture 1.1 inches of runoff from the contributing impervious area, resulting in a footprint of 3,050 square feet. Depending on the infiltration capacity of the soils, the rain garden could either infiltrate the volume within 48 hours or filter runoff through an underdrain connected to the existing storm sewer in the middle of the rain garden. In order to effectively retain water in the rain garden, this project may require modification of the existing catch basin.

The benefits of constructing this rain garden include a reduction in downstream TP loading by 1.73 pounds per year and some visibility for the BMP from residents, however the educational impact may be limited by the rain garden's location at an apartment complex with no nearby sidewalks and limited foot traffic. The challenges to constructing a BMP at this location include coordination with and buy-in from the property owner and, if the project extends into the right-of-way of Larpenteur Avenue East, coordination with the city or county.

3.2.3 BMP 3: Reaney Avenue rain garden

Proposed BMP 3 is a rain garden along Reaney Avenue East between Stillwater Road and McKnight Road North in St. Paul on the southern edge of the Beaver Lake subwatershed. The RWMWD could construct the Reaney Avenue rain garden in the green space between the State Farm Insurance office parking lot and Reaney Avenue East to capture runoff from the State Farm Insurance office building and parking lot and a portion of Reaney Avenue East, as shown in Figure 5. The location receives runoff from 0.33 acres, including 0.16 acres of impervious area. Barr sized the rain garden to capture 1.1 inches of runoff from the contributing impervious area, resulting in a footprint of 3,050 square feet. Depending on the infiltration capacity of the soils, the rain garden could either infiltrate the volume within 48 hours or filter runoff through an underdrain connected to an existing catch basin in Reaney Avenue East, near Stillwater Road.

The benefits of constructing this rain garden include a reduction in downstream TP loading by 0.37 pounds per year. The challenges to constructing a BMP at this location include coordination with and buy-in from the property owner and city, which may be particularly difficult if future development is planned for the area. In addition, that parking lot is approximately 2-3 feet higher in elevation than Reaney Avenue East, which will likely require the rain garden to act as a flow-through system and can lead to washout during large rainfall events. Lastly, the location appears to have limited visibility and foot traffic, which limits the educational potential for the BMP.

3.2.4 BMP 4: Midvale neighborhood regional underground filtration system

Proposed BMP 4 is a regional underground filtration system in the Midvale neighborhood of Maplewood near the dead end of Bartelmy Lane North, north of Stillwater Road, and east of Beaver Lake. The RWMWD could construct the Midvale neighborhood regional underground filtration system within the Bartelmy Lane right-of-way, north of the dead end, below the existing trail, and capture runoff from the neighborhood to the east, as shown in Figure 6. The storm sewer at this location receives runoff from 21 acres within the Beaver Lake subwatershed, including 9.35 acres of impervious area. Barr developed a concept design that includes a diversion structure to direct low flows into the filter system but allow high flows to bypass. We sized the filter based on the available space, and assumed footprint of 1,500 square feet and a depth of six feet, include 2 feet of filtration media. The size of the existing storm sewer in this location is unknown, but RWMWD could survey the area prior to design.

The benefits of constructing this regional underground filtration system include a reduction in downstream TP loading by up to 13.4 pounds per year, depending on the filtration media used (spent lime, sand, iron-enhanced sand, etc.). The challenges of constructing this regional underground filtration system include avoiding utility conflicts, including gas mains, water main, overhead electric, and sanitary sewer, which all run through the project area. Additionally, there are steep slopes between Bartelmy Lane and the wetland downstream of the existing storm-sewer. This could prove challenging for constructability of the proposed system. A full survey would be required to identify other nearby utilities and advance the design of this BMP. Lastly, the underground system would provide limited educational value.

3.2.5 BMP Concept 5: Beaver Lake living streets

Proposed concept 5 is a broader approach to neighborhood street reconstruction projects, which includes improving the livability and environmental function of a neighborhood by viewing a street as more than a road. The Beaver Lake SLMP identified Lincoln Park neighborhood, west of Beaver Lake, as contributing a high proportion of direct runoff to Beaver Lake. The neighborhood contains about 2 miles of roads that are currently 30 feet wide and includes two lanes of parking on either side of the street, which is similar to the pre-project conditions from the Maplewood Living Streets project. The neighborhood includes 280 residential lots covering approximately 70 acres, including 32 acres of impervious area. Most of the east-west streets in this neighborhood have sidewalks and grassed boulevards.

The Beaver Lake living streets project could build upon concepts developed as part of the Maplewood Living Streets project, which RWMWD completed in 2012, by reducing street widths, installing sidewalks and trees, and providing stormwater treatment systems in the Lincoln Park neighborhood. Figure 7 shows locations with ample green space for rain gardens. RWMWD could also install smaller rain gardens along boulevards or on individual properties to meet treatment goals. RWMWD could also construct example rain gardens with signage and educational features at Beaver Lake Park, which is located on the east edge of the neighborhood, near the Lake.

The benefits of constructing the Beaver Lake Living Streets project include an estimated reduction in TP loading to Beaver Lake by up to 11.5 pounds per year. Furthermore, the project could improve neighborhood function, pedestrian safety, aesthetics, and provide opportunities for education and public engagement. The challenges of constructing the Beaver Lake Living Streets project include significant coordination with the city for implementation as part of a street reconstruction project, and coordination with and buy-in from property owners.

3.3 Planning-level opinions of probable cost of BMP retrofits

Barr developed planning-level cost estimates for each conceptual design and performed cost-benefit analyses, as shown in Table 2. As feasibility-level concepts, there is significant cost uncertainty associated with the proposed projects. The planning-level opinion of costs include a 25-percent contingency and

estimated cost ranges of -30 percent to +50 percent. Additionally, we estimated the engineering cost for the design of each proposed BMP as 40 percent of the total cost. This 40-percent fee includes 30-percent engineering and design and 10-percent construction observation and administration. These costs assume that no wetland mitigation will be required as part of these projects, no contaminated soils will be encountered, and no purchase of easements or properties will be required. As a planning-level estimate, we assumed that the cost for the Beaver Lake living streets project would be directly comparable to the Maplewood living streets project, as adjusted for inflation. Table 2 summarizes the planning-level opinions of probable costs for BMPs in the Lake Owasso subwatershed.

Table 2. Summary of planning-level opinions of probable costs for BMPs in the Beaver Lake subwatershed

Proposed BMP	planning-level opinion of cost[1,2]	estimated engineering cost[3]	total project cost
1. Knowlan's Fresh Foods impervious reduction and rain garden	$209,000 ($146,000-$313,000)	$83,500	$292,500 ($229,500-$396,500)
2. Maplewood Apartments rain garden	$55,500 ($38,900-$83,300)	$22,200	$77,200 ($61,100-$105,500)
3. Reaney Avenue rain garden	$46,600 ($32,600-$70,000)	$18,600	$65,200 ($45,600-$97,900)
4. Midvale neighborhood regional underground filtration system	$394,000 ($275,300-$590,000)	$157,600	$551,600 ($385,600-$826,400)
5. Beaver Lake living streets[4]	$4,730,000 ($3,300,000-$7,100,000)	$1,890,000	$6,620,000 ($5,190,000-$8,990,000)

[1] Costs include 25-percent contingency. These do not include costs related to education and outreach, legal, long-term maintenance, or monitoring. Costs are represented as a feasibility-level class 4 cost estimate as defined by the Association for the Advancement of Cost Estimating with a +50-percen-percent/-30% uncertainty.

[2] These costs assume that no wetland mitigation will be required as part of these projects, and that contaminated soils will not be encountered.

[3] Engineering cost is estimated to be 40 percent of the construction cost, excluding the purchase of properties and/or easements. This cost includes engineering and design and construction observation and administration.

[4]Cost estimate is from the Maplewood living streets project. Costs have been adjusted for inflation.

To estimate the cost benefit for each proposed BMP retrofit project, Barr calculated annualized costs for each proposed BMP per pound of phosphorus removed. Table 3 presents the annualized costs as a range for BMP lifespans of 20 to 35 years. The capital cost used for each BMP includes the opinion of probable cost and the engineering design cost. Annual costs include an estimated annual maintenance cost for the BMPs and an assumed interest rate of 4 percent.

Table 3. Summary of annualized costs for BMPs in the Beaver Lake subwatershed

Proposed BMP	Annual cost per pound of TP removed ($/lb.)[1]
1. Knowlan's Fresh Foods impervious reduction and rain garden	$12,100-$16,100
2. Maplewood Apartments rain garden	$3,900-$4,800
3. Reaney Avenue rain garden	$12,700-$16,200
4. Midvale neighborhood regional underground filtration system	$3,200-$4,100
5. Beaver Lake living streets	$3,200-$4,000 ($22,800-$30,900) [2]

[1] Range represents the annualized cost based on a 35-year and 20-year BMP lifespan at an interest rate of 4 percent.

[2]Annualized cost estimated from Maplewood living streets project. The first cost range does not include cost of street or sidewalk reconstruction, only BMP construction. The second cost range includes the entire project cost. Costs have been adjusted for inflation.

3.4 Permits

The following permits may be required for one or more of the proposed BMP retrofit projects:

- **Excavating and grading permit (City of Maplewood):** An excavating and grading permit application, along with an erosion control plan, must be submitted with the final grading plans to the City of Maplewood any time a significant amount of soil is being displaced or a drainage pattern is being altered. If disturbed area is greater than 1 acre, watershed and National Pollutant Discharge Elimination System permits will be required.
- **Right-of-way permit (City of Maplewood):** Any work in the public rights of way requires a city right-of-way permit.
- **Grading permit (City of St. Paul):** For any grading, excavation, and filling to change the level, slope, or contour of the ground surface, a completed general building permit application with designated grading activity and list of cubic yards moved is required, along with a site plan with existing and proposed conditions, 1-foot contours and elevation points, and ponding areas for stormwater retention. A required fee is also to be submitted to the City of St. Paul.
- **Obstruction, excavation, and transportation right-of-way permits (City of St. Paul)**: Obstruction, excavation, and transportation right-of-way permits are required whenever an object or equipment is placed, excavation or underground work is planned, or oversized or overweight equipment travels on roadways or bridges within the city's right of way. The city's right of way is defined as streets, sidewalks, alleys, and other rights of way.
- **Erosion and sediment control (RWMWD):** An erosion and sediment control permit is required if the proposed land disturbance is greater than 1 acre or if the proposed land disturbance is within the 100-year floodplain and greater than 10,000 square feet. If required, an erosion and sediment control plan must be submitted with the permit application.

4.0 Meetings

Discussion related to meetings with the City of St. Paul, City of Maplewood, City of Oakdale, or other property owners will be included in this section, if they occur.

5.0 Summary and recommendations

This memo includes conceptual design of four BMP retrofit opportunities and one high-level concept which would improve water quality entering Beaver Lake from the Beaver Lake subwatershed. Of the five concepts, the Midvale neighborhood regional underground filtration system and the Beaver Lake living streets concept provide the best cost benefit for reducing TP loading to the lake. However, the Beaver Lake living streets concept is only cost effective if coupled with a street reconstruction project, and the City of St. Paul has indicated that there are no street reconstruction projects in the area in the next five years.

The Maplewood Apartments rain garden provides similar cost benefit and moderate visibility, therefore we recommend reaching out to the City of Maplewood about the underground filtration system and reaching out to the Maplewood Apartments management about the rain garden to gage their respective reaction and interest in the projects. If the city and/or apartment management is in favor of a project, the next steps would include a site survey, utility locate, and soil borings. Unless additional site investigation identifies significant design constraints, the RWMWD could push the project(s) toward final design.

While structural BMPs can help reduce TP loading to Beaver Lake, we also recommend considering other activities that could improve the water quality of Beaver Lake, including:

- Regular maintenance of existing BMPs including rain garden vegetation trimming, inlet maintenance, cleanout of hydrodynamic structures, etc.
- Continued public education and outreach in the subwatershed about stormwater runoff and at-home practices that can be adopted to improve runoff water quality.
- Inspection and maintenance of stormwater ponds within the subwatershed. Recommended maintenance activities include dredging, inlet cleanout, and/or chemical treatment of the water or sediments.
    - In 2016, Barr completed a stormwater pond and wetland performance study for RWMWD to develop assessment prioritization for ponds and wetlands. The study ranked Beaver Lake's tributary water bodies by determining their capacity and relative water-quality impact.
    - There are 37 stormwater ponds within the Beaver Lake subwatershed. Five of these ponds are ranked in the top 10 percent in the RWMWD for assessment priority, including: BL-120N, BL-123, BL-121, and BL-122, and BL-125, as shown in Figure 8.

6.0 References

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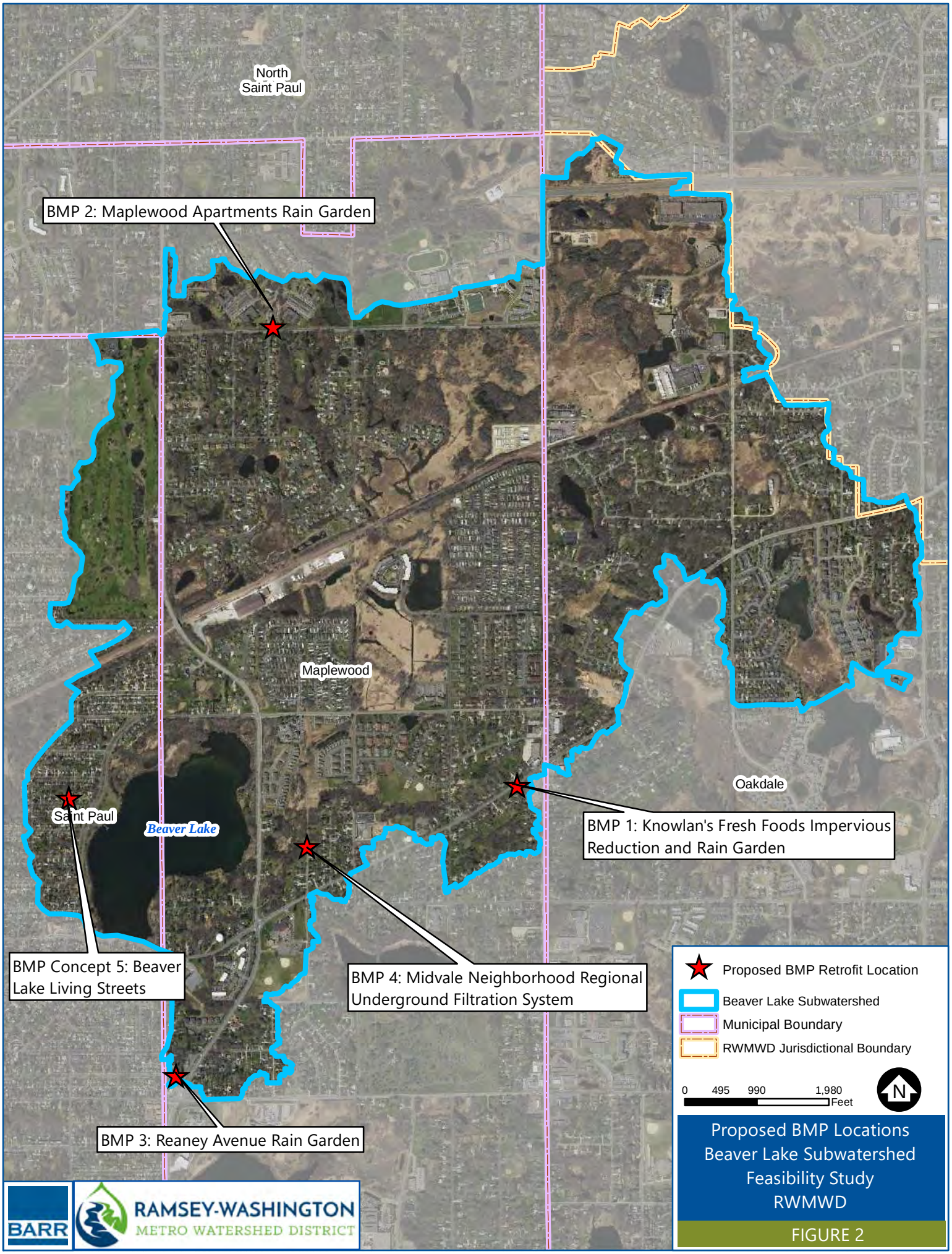
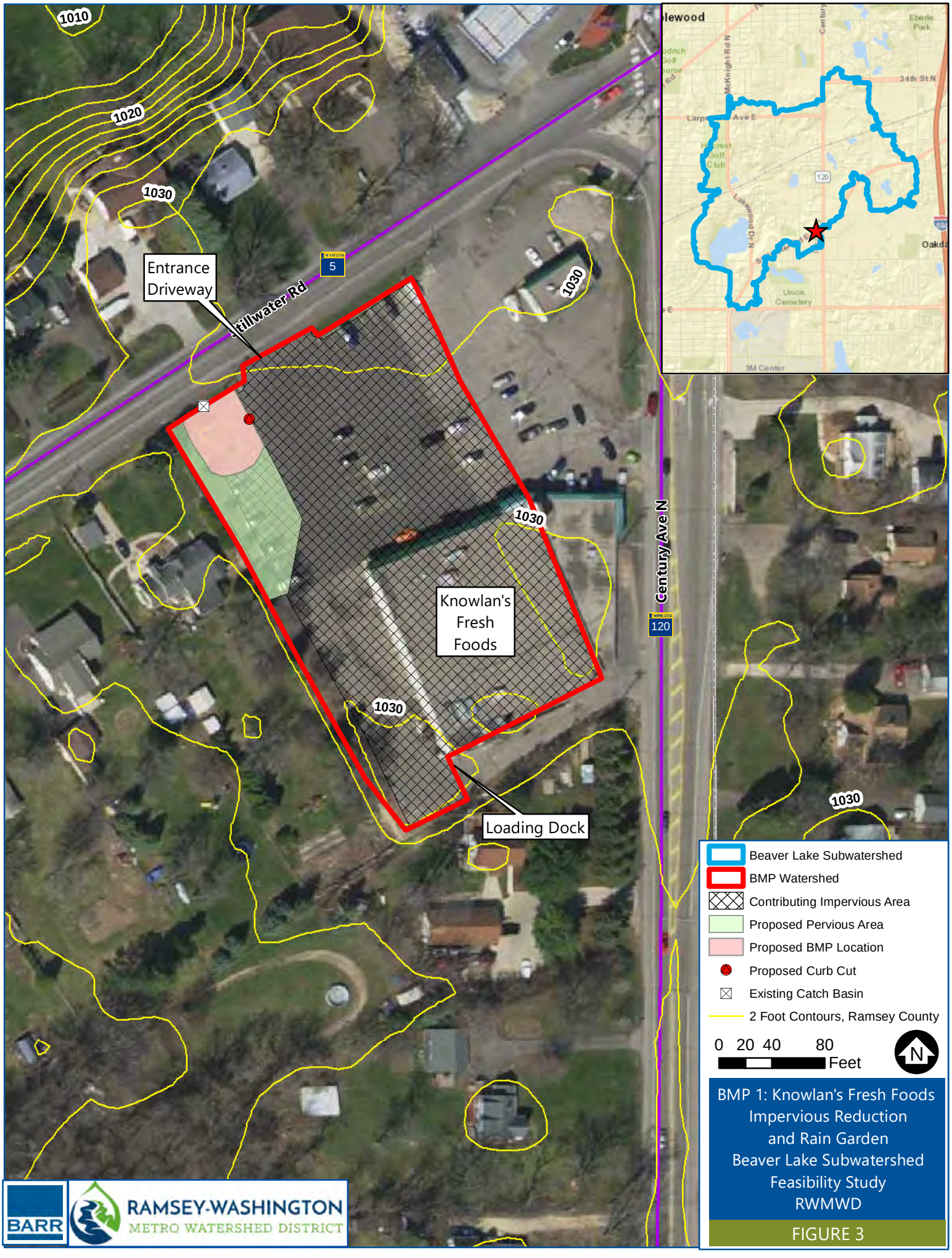
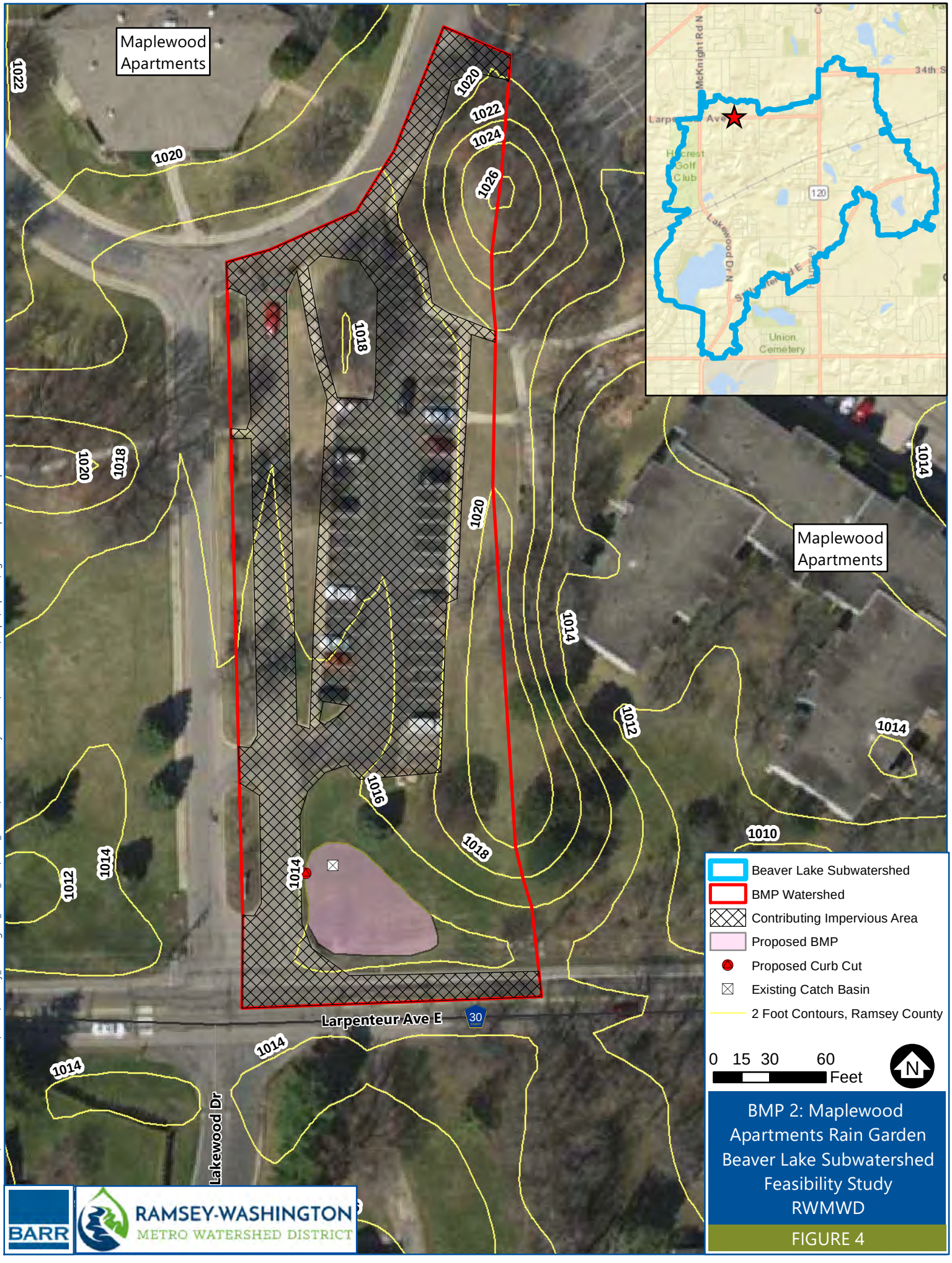


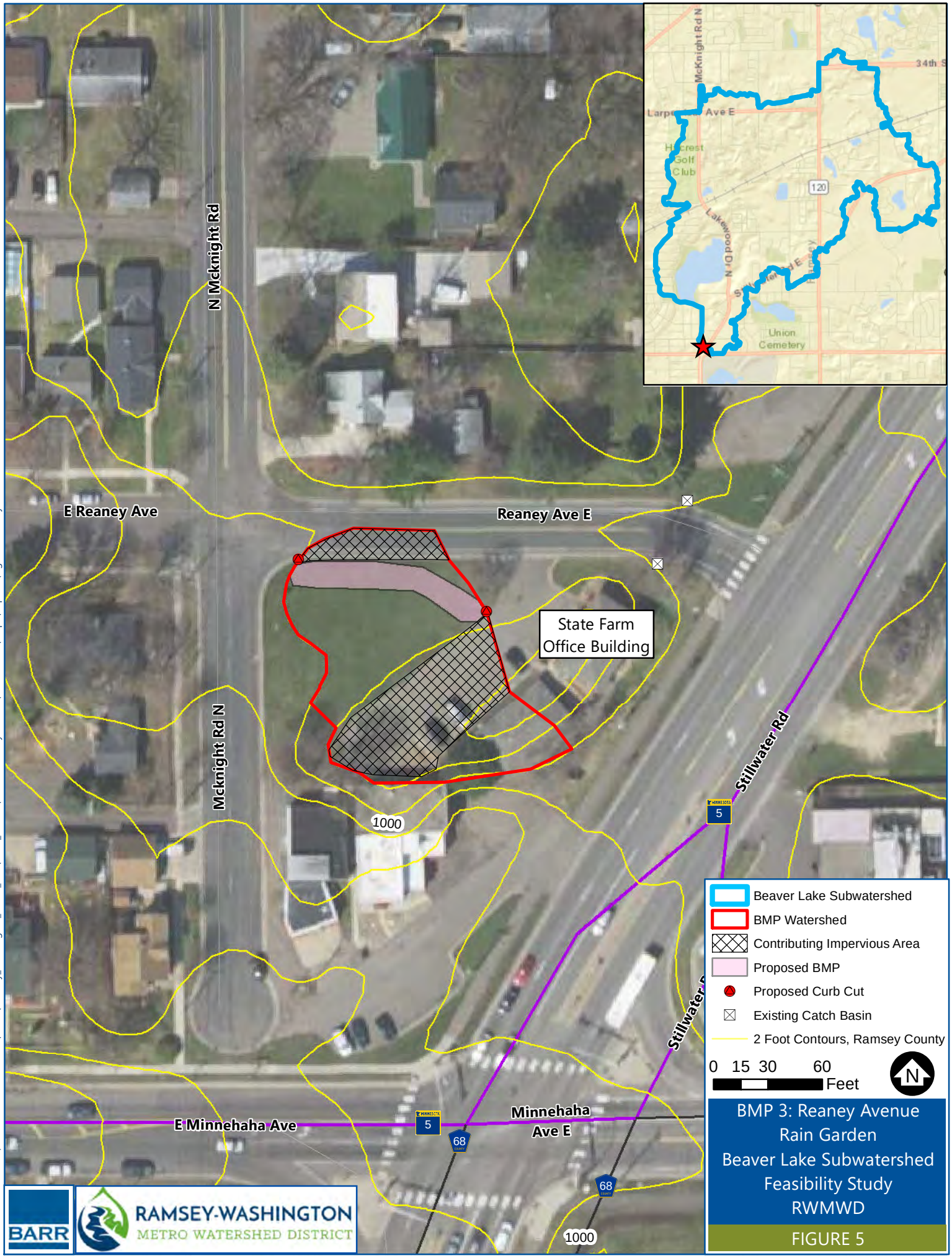
Barr Footer: ArcGIS 10.6, 2018-12-21 15:03 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Beaver Lake\Maps\Reports\Figure 2 Proposed BMP Retrofit Locations.mxd User: JPP



Barr Footer: ArcGIS 10.6, 2018-12-17 15:54 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Beaver Lake\Maps\Reports\Figure 3 Knowlans Fresh Foods.mxd User: JPP



Barr Footer: ArcGIS 10.6, 2018-12-17 15:55 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Beaver Lake\Maps\Reports\Figure 4 Maplewood Apartments.mxd User: JPP



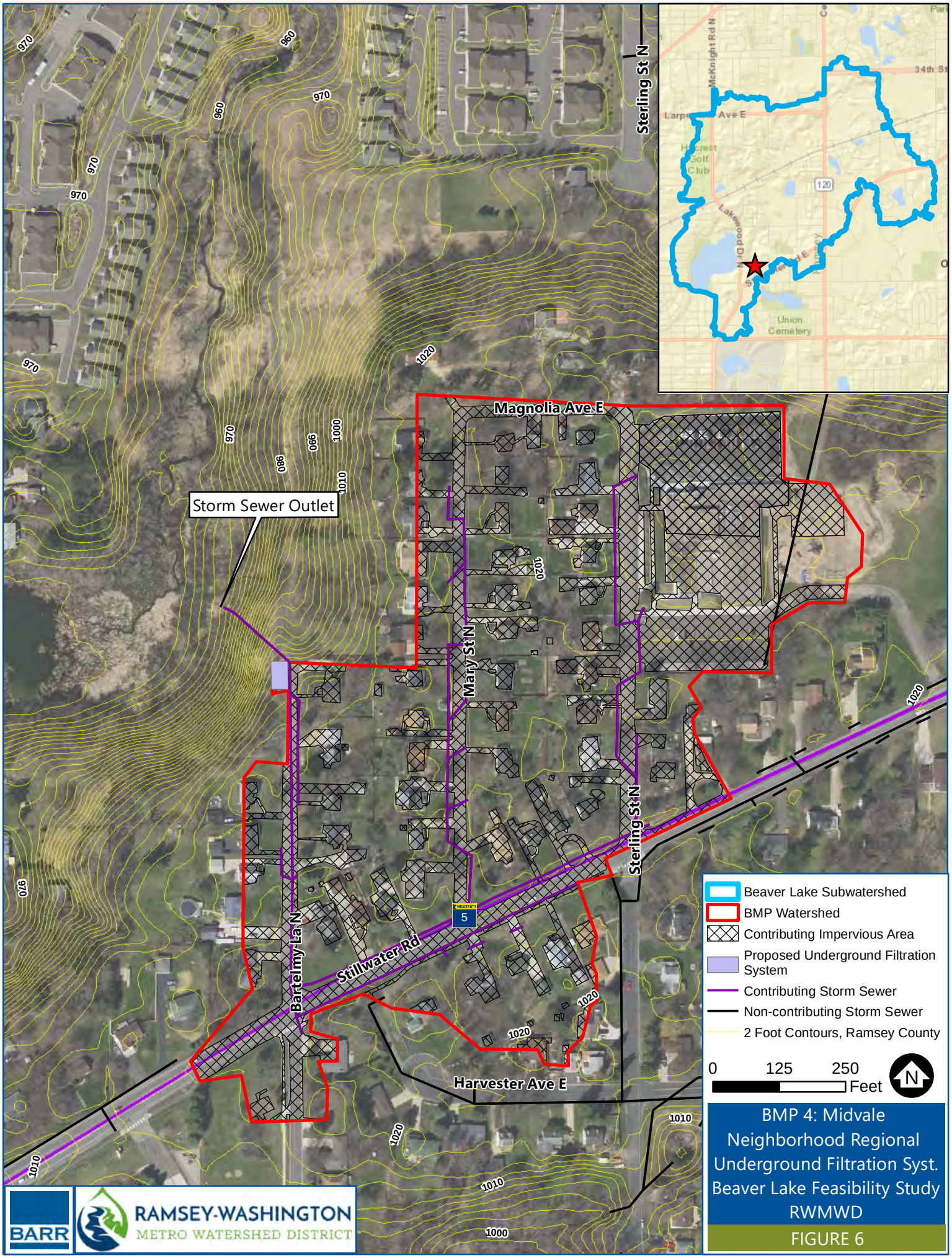
BMP 3: Reaney Avenue Rain Garden
Beaver Lake Subwatershed Feasibility Study
RWMWD

FIGURE 5

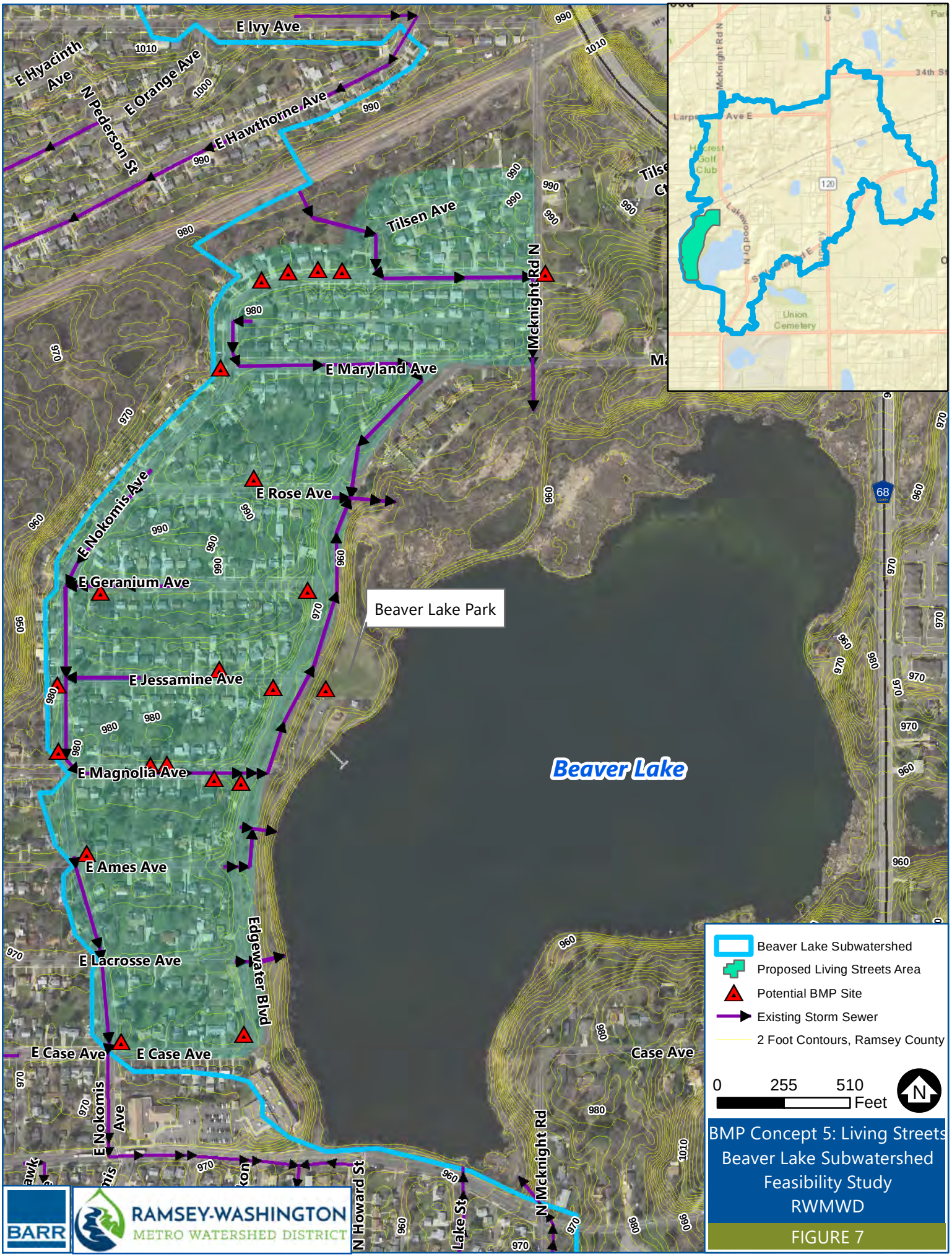
BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

Barr Footer: ArcGIS 10.6, 2018-12-17 15:58 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Beaver Lake\Maps\Reports\Figure 5 Reaney Avenue.mxd User: JPP



Barr Footer: ArcGIS 10.6, 2018-12-17 16:09 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Beaver Lake\Maps\Reports\Figure 6 Midvale Neighborhood.mxd User: JPP



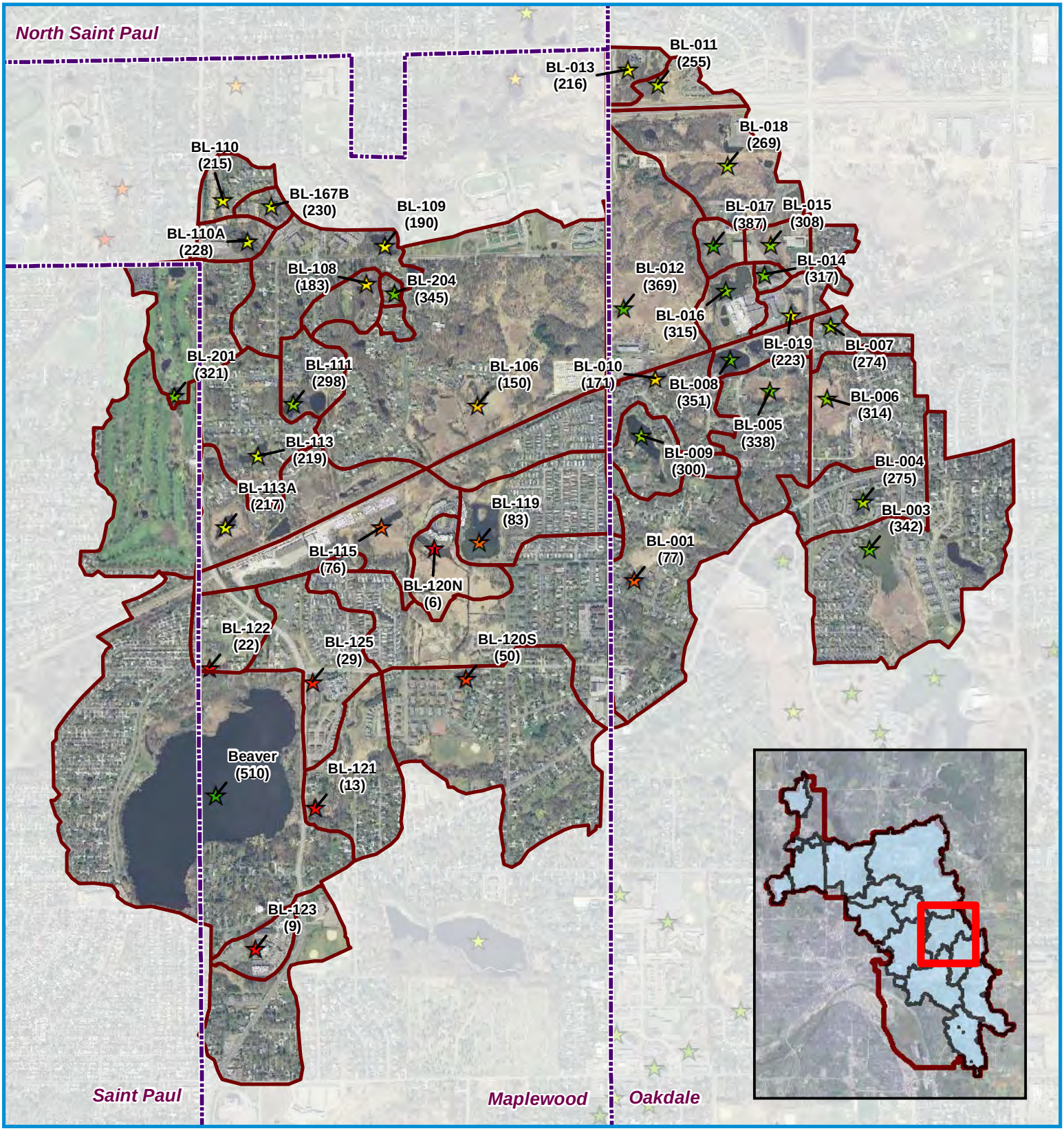
BMP Concept 5: Living Streets
Beaver Lake Subwatershed
Feasibility Study
RWMWD

FIGURE 7

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

Barr Footer: ArcGIS 10.6, 2018-12-17 16:11 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Beaver Lake\Maps\Reports\Figure 7 Beaver Lake Living Streets.mxd User: JPP



Barr Footer: ArcGIS 10.6, 2018-12-21 15:07 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Beaver Lake\Maps\Reports\Figure 8 Assessment Priority Ranking Ponds (Figure B-03).mxd User: JPP

P8 Modeled Waterbodies

- Higher inspection priority
- Lower inspection priority
- Beaver Lake Drainage Areas
- Municipal Boundary

Label Legend

- **C-67** → Waterbody ID
- **(205)** → (District Priority Ranking, #)

0 850 1,700
Feet

Assessment Priority Ranking: Pond and Wetland Performance Study

Adapted for:
Beaver Lake Subwatershed Feasibility Study
RWMWD

Figure 8
(Adapted from Figure B-03)

resourceful. naturally.
engineering and environmental consultants

BARR

Draft technical memorandum

To: Tina Carstens—Ramsey-Washington Metro Watershed District
From: Josh Phillips, Kim Baker, and Erin Anderson Wenz—Barr Engineering Co.
Subject: Lake Owasso subwatershed feasibility study for BMP systems (**draft**)
Date: December 21, 2018
Project: 23/62-1200.18
c: Paige Ahlborg—Ramsey-Washington Metro Watershed District

1.0 Introduction

This memorandum summarizes the conceptual designs for several proposed best management practices (BMPs) in the Lake Owasso subwatershed of the Ramsey-Washington Metro Watershed District (RWMWD). The identified BMPs aim to improve and maintain Lake Owasso's water quality by retaining or filtering runoff to remove sediment, nutrients, debris, and other pollutants. Barr identified BMP retrofit opportunities based on guidance from the Lake Owasso use attainability analysis (UAA), Clean Water Fund accelerated implementation project, watershed restoration and protection strategies (WRAPS) report, and the RWMWD watershed management plan (Plan). Barr considered more than 40 potential BMP retrofit sites in the subwatershed. This memo summarizes conceptual design for three of those BMPs, and recommends design and implementation of all three BMPs in the near future.

2.0 Background information

The Lake Owasso subwatershed covers 3,060 acres in the cities of Roseville and Shoreview. The watershed is fully developed, and the majority of the watershed is low-density residential, with portions of open water and wetlands. The Soil Survey Geographic Database (SSURGO) classifies majority of the soils within the subwatershed as hydrologic soil group (HSG) Type B soils, which are generally conducive to some infiltration. The subwatershed drains to Lake Owasso, which is a RWMWD-managed lake located near the north end of the subwatershed.

Lake Owasso is a Minnesota Department of Natural Resources (DNR) public water (DNR# 62-0056P) with a surface area of approximately 375 acres, a mean depth of 11 feet, and a maximum depth of nearly 40 feet. By definition, the Minnesota Pollution Control Agency (MPCA) considers Lake Owasso a deep lake (maximum depth greater than 15 feet). Lake Owasso is a major regional recreational resource used for fishing, boating, waterskiing, and swimming. The City of Roseville's Central Park North (along the south shore of the lake) and Owasso County Park (on the north side of the lake) provide two public access points on the lake and include a boat launch and a public swimming beach. The lake discharges to a wetland area on the northwest side of the lake under North Owasso Boulevard.

The Grass Lake Watershed Management Organization (GLWMO) published the Lake Owasso UAA in April 2009, which analyzed the water quality of Lake Owasso. The main pollutant of concern in Lake Owasso is phosphorus, measured as total phosphorus (TP). The RWMWD updated the Lake Owasso UAA water-quality modeling in 2016 as part of the WRAPS report. Figure 1 shows the results of the WRAPS report water-quality modeling and identifies that curlyleaf pondweed dieback and watershed runoff are the two largest sources of phosphorus loading to Lake Owasso.

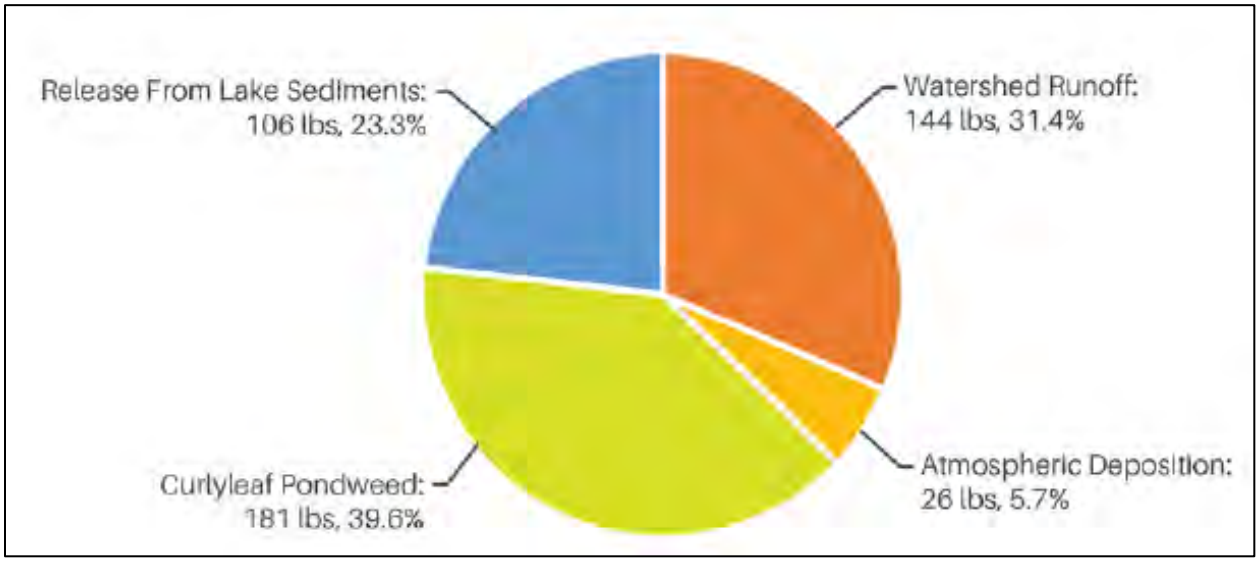


Figure 1. Phosphorus load breakdown for Lake Owasso (source: Watershed Management Plan, 2017)

The Ramsey County Department of Public Works samples the water quality of Lake Owasso about seven times per year on average, between the months of May and September. The RWMWD assigned a water-quality classification of "at risk" to Lake Owasso based on recent water-quality data at or near the MPCA and RWMWD nutrient water-quality standards.

In addition to this feasibility study, RWMWD is currently collaborating with Ramsey County Parks and Recreation Department and the City of Shoreview on a stormwater management project in the Lake Owasso subwatershed. The project provides stromwater management assistance for the reconstruction of Lake Owasso Park (completed in 2018) and Owasso Boulevard (proposed for 2019/2020). RWMWD has helped integrate the two separate projects by providing stromwater management master planning services and engineering support for design of stromwater features. The proposed stormwater management system will include a suite of stormwater management BMPs, including: storm sewer, pretreatment, pervious pavement (pavers), filtration basins, underground aggregate stormwater storage and a subsurface tree irrigation system.

3.0 Proposed improvements

The goal of this study is to identify possible improvements that the RWMWD could implement throughout the Lake Owasso subwatershed to treat runoff and improve water quality. Where feasible, Barr prioritized infiltration BMPs as they are generally the most cost effective solution to treating stormwater runoff. Where infiltration was not feasible, we recommended filtration or detention BMPs. This study also qualitatively considers the potential for educational features or partnership to promote continued awareness and mindfulness for improving water quality.

While the proposed BMPs could provide some water quality benefit, the 2009 UAA report indicated that Lake Owasso's internal loading is a more significant contributor of phosphorus than watershed runoff. An excerpt from the UAA report summarizes the limitation of BMPs for stormwater treatment:

> *"Runoff from the majority of the Lake Owasso watershed is routed through stormwater pond[s] or natural wetlands prior to discharging to the lake. Therefore the watershed runoff was identified being less important than other sources of phosphorus to Lake Owasso. As a result, a variety of structural BMPs in the watershed were shown to have limited impacts on the water clarity of Lake Owasso. However, watershed and in-lake water quality modeling was done evaluating the implementation of infiltration practices throughout the watershed, demonstrating that the BMPs can result in the improvement of water quality in Lake Owasso. Though no one specific project is currently recommended, it is recommended that the GLWMO and the Cities of Roseville and Shoreview continue to promote the implementation of infiltration BMPs throughout the Lake Owasso watershed as opportunities arise as the result of redevelopment and infrastructure improvement projects." (Barr. 2009. Lake Owasso Use Attainability Analysis)*

Although internal loading is the primary contributor to nutrient loading in Lake Owasso, RWMWD continues to look for opportunities to improve the water quality of the lake by implementing BMPs in the subwatershed.

3.1 Site selection for BMP retrofits

Barr investigated the Lake Owasso subwatershed to identify potential locations for BMP retrofit projects. The primary method for site evaluation was a desktop analysis. Barr used elevation data, storm-sewer data, imperviousness data, national wetland inventory data, aerial imagery, and Google Street View™ imagery to identify potential sites. Additionally, Barr reviewed the RWMWD's map of cost-share and permitted projects to identify locations where BMPs have already been implemented.

The desktop analysis identified 41 sites with significant impervious areas and space for an adjacent BMP. Barr considered sites with larger impervious areas more desirable, as the BMP would have a larger treatment impact. We also gave higher priority to sites with high public traffic, since they have more opportunity for public engagement and education. In addition, we considered sites owned by the city or

county more promising, as a partnership with public entities is generally favorable over a partnership with a private landowner. From this initial list, Barr prioritized sites by eliminating locations with no immediate access for storm-sewer connections, limited direct drainage area, unfavorable grade change, complex grading in the BMP footprint, or significant required tree removals in the BMP footprint. This prioritization exercise narrowed down the list of 41 sites to 10 preferred sites. Barr staff visited these 10 sites for further analysis, and distilled the list to three locations for conceptual design.

3.2 Proposed BMP retrofits

The following section discusses the concept designs Barr developed for the three prioritized locations. Table 1 includes the estimated average annual phosphorus removal for each BMP using the MPCA minimal impact design standards (MIDS) calculator. Figure 2 shows the locations of the identified BMP retrofit locations in the Lake Owasso subwatershed.

Table 1. Summary of water-quality benefits for BMPs in the Lake Owasso subwatershed

Proposed BMP	Estimated annual TP reduction (lb/year)
1. Acorn Park rain garden	0.49
2. Muriel Sahlin Arboretum rain garden	0.64
3. Wildlife Rehabilitation Center of Minnesota rain garden	1.05

3.2.1 BMP 1: Acorn Park rain garden

Proposed BMP 1 is a bioretention basin (rain garden) at Acorn Park. Acorn Park is located south of County Road C and west of Rice Street in Roseville, MN. The 44-acre park includes athletic fields, walking paths, a playground, a disc-golf course, and a large wooded area. The RWMWD could construct the Acorn Park rain garden in the northwest corner of the park, near County Road C, to capture runoff from the northwest parking lot, as shown in Figure 3. The location receives runoff from 0.33 acres, including 0.27 acres of impervious area. Barr sized the rain garden to capture 1.1 inches of runoff from the contributing impervious area, resulting in a footprint of 1,096 square feet. Depending on the infiltration capacity of the soils, the rain garden could either infiltrate the volume within 48 hours or filter runoff through an underdrain connected to the existing storm sewer at the parking lot entrance drive.

The benefits of constructing this rain garden include a reduction in downstream TP loading by 0.49 pounds per year and opportunities for public engagement and educational features, since it is a public park with various amenities. The challenges to constructing a BMP at this location include a possible tree removal and significant excavation to remove mounded soil in the BMP footprint. Additionally, both the tree and mounded soil in this area act as a natural boundary between County Road C and the park,

therefore the City of Roseville may be hesitant to modify grades in this area. Lastly, the parking lot appears to be very flat and it could prove difficult to route runoff to the proposed BMP.

3.2.2 BMP 2: Muriel Sahlin Arboretum rain garden

Proposed BMP 2 is a rain garden at the Muriel Sahlin Arboretum, which is part of Roseville's Central Park. The arboretum is located along Dale Street North, halfway between County Road B2 West and County Road C West, and includes approximately 8 acres of gardens, walkways, and maintained grounds. The RWMWD could construct the Muriel Sahlin Arboretum rain garden on the north side of the parking lot entrance drive to capture runoff from the existing parking lot, as shown in Figure 4. The location receives runoff from 1.28 acres, including 0.19 acres of impervious area. Barr sized the rain garden to capture 1.1 inches of runoff from the contributing impervious area, resulting in a footprint of 800 square feet. Depending on the infiltration capacity of the soils, the rain garden could either infiltrate the volume within 48 hours or filter runoff through an underdrain connected to the existing storm sewer on the north side of the parking lot.

The benefits of constructing this rain garden include a reduction in downstream TP loading by 0.64 pounds per year and potential to design the BMP as an additional attraction for visitors by providing interactive and/or educational components. The challenges to constructing a BMP at this location include the requirement of a berm on the north edge to provide storage and restrict overtopping and the possible requirement of a swale or elongated inlet structure on the south end to route runoff from the parking lot into the basin. Minor tree removal may also be required, but should be confirmed in final design.

3.2.3 BMP 3: Wildlife Rehabilitation Center of Minnesota rain garden

Proposed BMP 3 is a rain garden at the Wildlife Rehabilitation Center (WRC) of Minnesota, which is located across Dale Street North from the Muriel Sahlin Arboretum. The WRC is one of the largest wildlife rehabilitation centers in the country with more than 600 volunteers. The RWMWD could construct the WRC of Minnesota rain garden on the north side of the parking lot entrance drive to capture runoff from the existing parking lot, as shown in Figure 5. The location receives runoff from 1.94 acres, including 0.34 acres of impervious area. Barr sized the rain garden to capture 1.1 inches of runoff from the contributing impervious area, resulting in a BMP footprint of 1,377 square feet. Depending on the infiltration capacity of the soils, the rain garden could either infiltrate the volume within 48 hours or filter runoff through an underdrain connected to the existing storm sewer on the north side of the parking lot.

The benefits of constructing this rain garden include a reduction in downstream TP loading by 1.05 pounds per year and high vehicle traffic and visibility. The challenges of constructing a BMP at this location includes the required pruning or removal of a large tree in the vicinity of the proposed BMP and limited foot traffic near the BMP, which limits the educational potential.

3.3 Planning-level opinions of probable cost

Barr developed planning-level cost estimates for each conceptual design and performed a cost-benefit analysis. As feasibility-level concepts, there is significant cost uncertainty associated with the proposed projects. The planning-level opinion of costs include a 25-percent contingency and estimated cost ranges of -30 percent to +50 percent. Additionally, we estimated the engineering cost for the design of each proposed BMP as 40 percent of the total cost. This 40-percent fee includes 30-percent engineering and design and 10-percent construction observation and administration. These costs assume that no wetland mitigation will be required as part of these projects, no contaminated soils will be encountered, and no purchase of easements or properties will be required. Table 2 summarizes the planning-level opinions of probable costs for BMPs in the Lake Owasso subwatershed.

Table 2. Summary of planning-level opinions of probable costs for BMPs in the Lake Owasso subwatershed

Proposed BMP	Planning-level opinion of cost[1,2]	Estimated engineering cost[3]	Total
1. Acorn Park rain garden	$44,100 ($30,800-$66,200)	$14,100	$58,200 ($44,900-$80,300)
2. Muriel Sahlin Arboretum rain garden	$43,800 ($30,600-$65,600)	$14,000	$57,800 ($44,600-$79,600)
3. Wildlife Rehabilitation Center of Minnesota rain garden	$55,300 ($38,700-$82,900)	$17,700	$73,000 ($56,400-$100,600)

[1] Costs include 25-percent contingency. These do not include costs related to education and outreach, legal, long-term maintenance, or monitoring. Costs are represented as a feasibility-level class 4 cost estimate as defined by the Association for the Advancement of Cost Estimating with a +50-percent/-30-percent uncertainty.

[2] These costs assume that no wetland mitigation will be required as part of these projects, and that contaminated soils will not be encountered.

[3] Engineering cost is estimated to be 40 percent of the construction cost, excluding the purchase of properties and/or easements. This cost includes engineering and design and construction observation and administration.

To estimate the cost benefit for each proposed BMP retrofit project, Barr calculated annualized costs for each proposed BMP per pound of phosphorus removed. Table 3 presents the annualized costs as a range for BMP lifespans of 20 to 35 years. The capital cost used for each BMP includes the opinion of probable cost and the engineering design cost. Annual costs include an estimated annual maintenance cost for the BMPs and an assumed interest of 4 percent.

Table 3. Summary of annualized costs for BMPs in the Lake Owasso subwatershed

Proposed BMP	Annual cost per pound of TP removed ($/lb)[1]
1. Acorn Park rain garden	$7,268-$9,644
2. Muriel Sahlin Arboretum rain garden	$5,520-$7,325
3. Wildlife Rehabilitation Center of Minnesota rain garden	$4,249-$5,638

[1] Range represents the annualized cost based on a 35-year and 20-year BMP lifespan at an interest rate of 4 percent.

3.4 Permits

The following permits may be required for one or more of the proposed BMP retrofit projects:

- **Right-of-Way Permit (City of Roseville):** Any work performed in the City of Roseville within the street Right-of-Way requires a permit. Right-of-Way is the property on which the street is located and that extends behind the curb approximately 10 to 15 feet.
- **Erosion Control Permit (City of Roseville):** Construction activity resulting in 5,000 square feet or more of land disturbance and/or within the shoreland overlay requires an Erosion Control permit.
- **Stormwater Permit (City of Roseville):** A Stormwater permit is required if any of the following occur:
    - Construction activity resulting in 5,000 square feet or more of new or reconstructed impervious surface area
    - Surface soil disturbance or removal of vegetative cover on:
        - One half acre or more of land, regardless of location
        - Any land alteration within the wetland/shoreland management district
    - Constructing, improving, repairing or altering the hydraulic characteristics of a utility, bridge or culvert
    - Constructing, improving, repairing, or altering an existing or new public or private drainage system (open or tiled).
- **Transportation Permit (City of Roseville)**
- **Erosion and sediment control (RWMWD):** An erosion and sediment control permit is required if the proposed land disturbance is greater than one acre or if the proposed land disturbance is within the 100-year floodplain and greater than 10,000 square feet. If required, an erosion and sediment control plan must be submitted with the permit application.

4.0 Meetings

Discussion related to meetings with the City of Roseville, City of Shoreview, or other property owners will be included in this section, if they occur.

5.0 Summary and recommendations

This memo includes conceptual design for three BMP retrofit opportunities which would improve water quality of runoff entering Lake Owasso from the Lake Owasso subwatershed. Of the three concepts, the Muriel Sahlin Arboretum rain garden provides the best cost benefit for removing TP loading to the lake and also the highest potential for public engagement and education. However, all three proposed BMPs provide visibility and educational opportunities in addition to treatment of stormwater runoff. The RWMWD could also consider combining the three projects into a single bid package to save costs.

We recommend reaching out to the City of Roseville about the Acorn Park and Muriel Sahlin Arboretum rain gardens and reaching out to the WRC of Minnesota about a rain garden to gage their respective reaction and interest in the projects. If the city and/or WRC is in favor of a project, the next steps would include a site survey, utility locate, and soil borings. Unless additional site investigation identifies significant design constraints, the RWMWD could push the project(s) toward final design.

While structural BMPs can help reduce TP loading to Lake Owasso, we also recommend considering other activities that could improve the water quality of Lake Owasso, including:

- Regular maintenance of existing BMPs in the subwatershed including rain garden vegetation trimming, inlet maintenance, cleanout of hydrodynamic structures, etc.
- Continued public education and outreach in the subwatershed about stormwater runoff and at-home practices that can be adopted to improve runoff water quality.
- In-lake treatment to address internal loading.
- Inspection and maintenance of ponds and wetlands within the subwatershed, include dredging, inlet cleanout, and/or chemical treatment of the water or sediments.
    - In 2016, based on guidance from the UAA, Barr completed a stormwater pond and wetland performance study for RWMWD to develop assessment prioritization for ponds and wetlands. The study ranked Lake Owasso's tributary water bodies by determining their capacity and relative water-quality impact.
    - There are 26 stormwater ponds within the Lake Owasso subwatershed, but the study did not rank any of the stormwater ponds in the Lake Owasso subwatershed in the in the top 10 percent of stormwater ponds in the RWMWD. The three ponds and wetlands with the highest assessment priority in the Lake Owasso subwatershed were Dschg23, LO_S_1, and LO_E_1k, as shown in Figure 6.
- Further analysis of Victoria Wetlands and Frog Pond to identify possible locations that are exporting TP to Lake Owasso (see Figure 6).

6.0 References

Association for the Advancement of Cost Estimating. Rev. 2016. AACE International Recommended Practice NO. 18R-97, March 1, 2016.

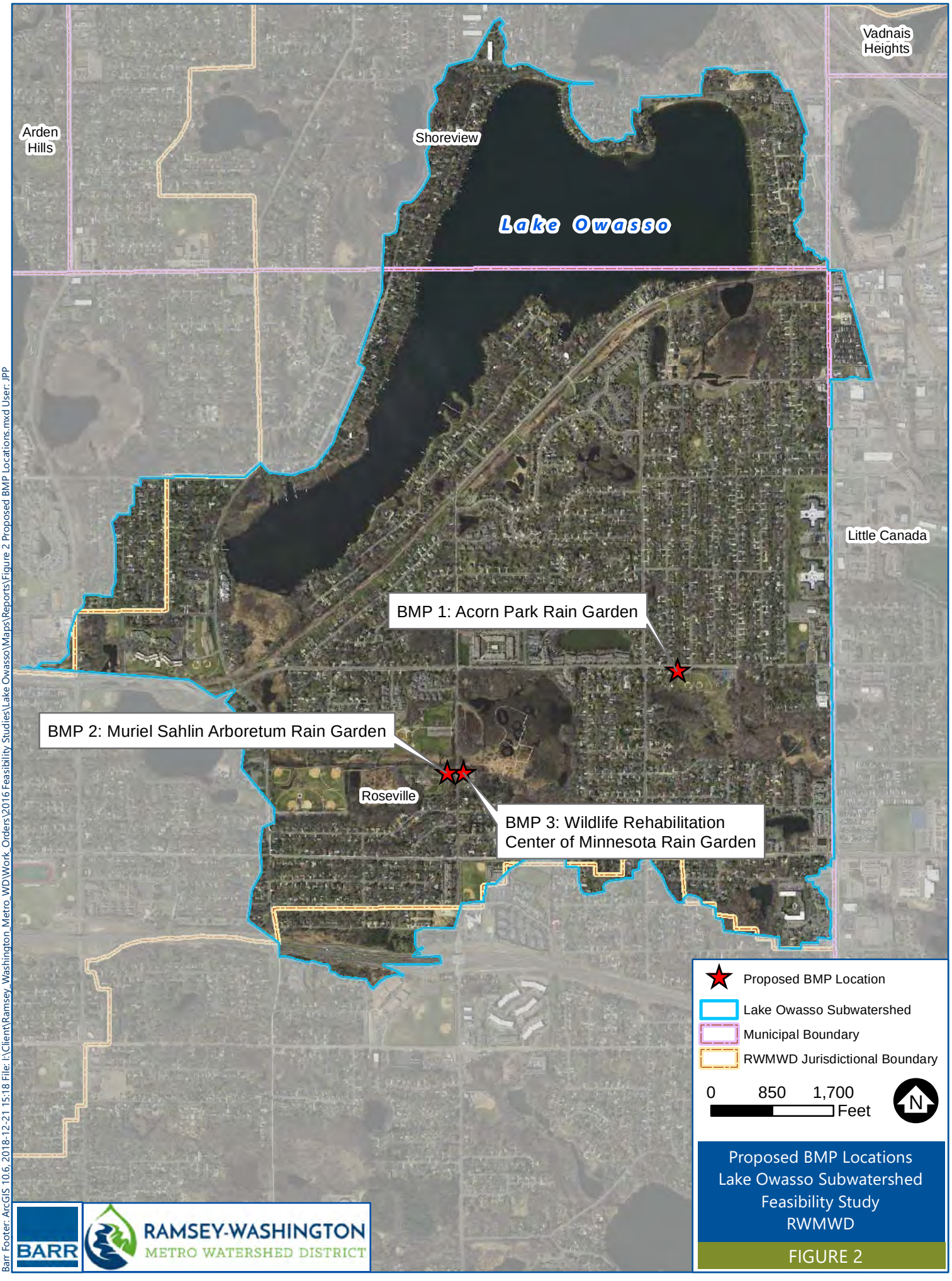
ASTM E2516-11, Standard Classification for Cost Estimate Classification System, ASTM International, West Conshohocken, PA, 2011, www.astm.org

Barr Engineering Co. 2009. *Lake Owasso Use Attainability Analysis.* Prepared for Grass lake Watershed Management Organization.

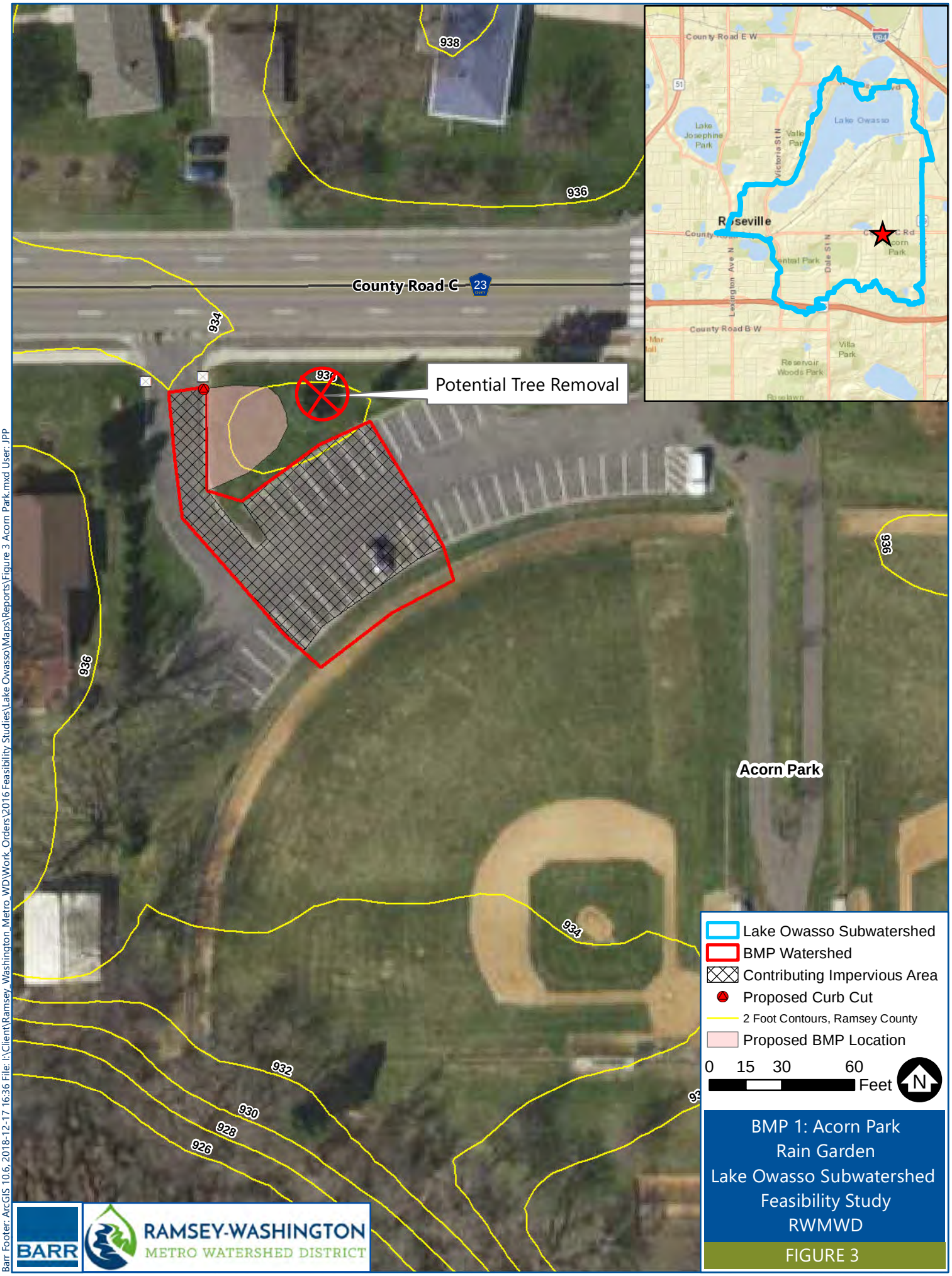
Barr Engineering Co. 2016. *Stormwater Pond and Wetland Performance Study*. Prepared for Ramsey-Washington Metro Watershed District.

Barr Engineering Co. 2017. *Ramsey-Washington Metro Watershed District Watershed Management Plan*. Prepared for Ramsey-Washington Metro Watershed District.

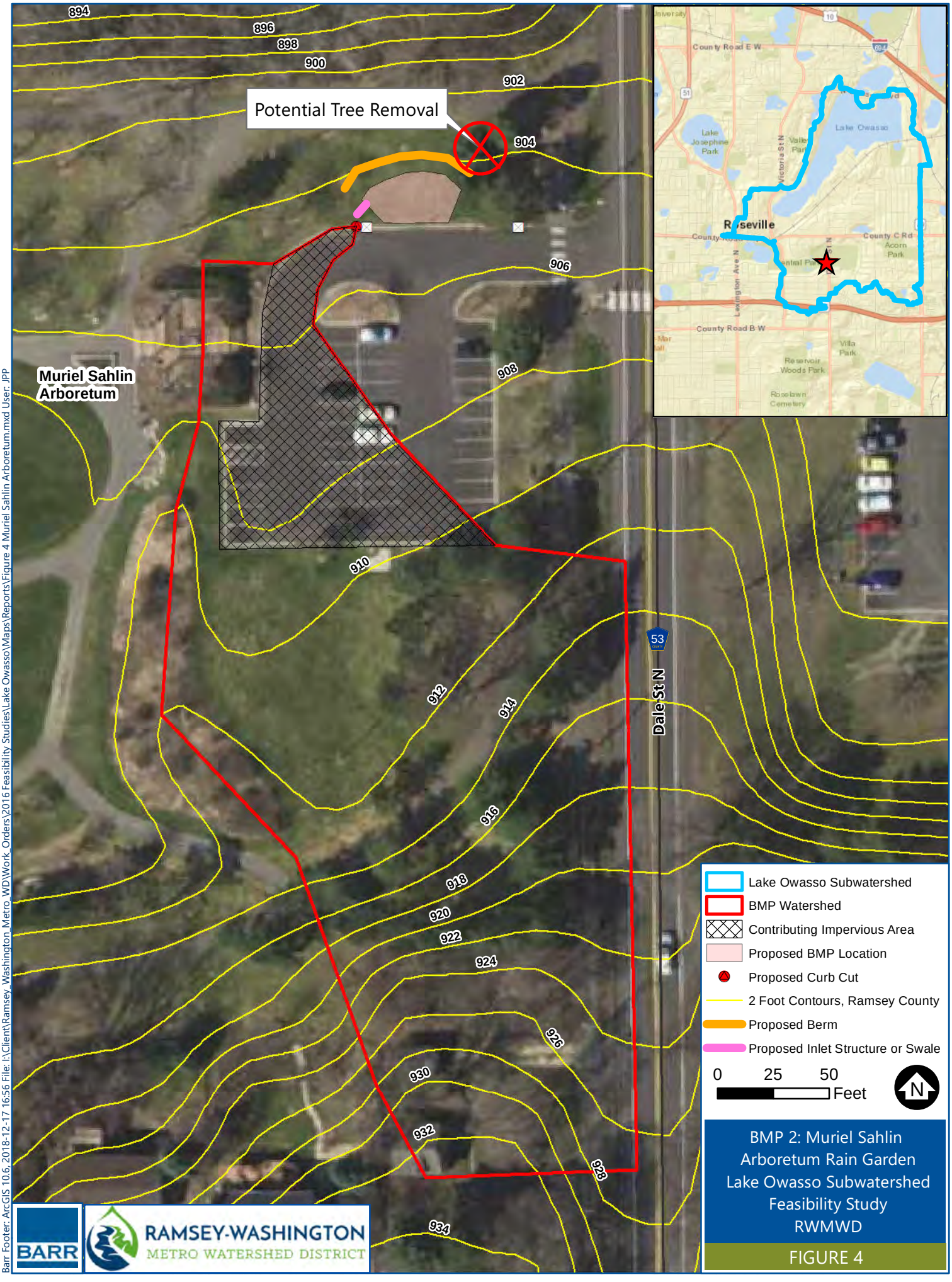
Board of Water and Soil Resources (BWSR). 2005. *Minnesota Routine Assessment Method (MnRAM) Evaluating Wetland Function.*



Barr Footer: ArcGIS 10.6, 2018-12-21 15:18 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Lake Owasso\Maps\Reports\Figure 2 Proposed BMP Locations.mxd User: JPP



Barr Footer: ArcGIS 10.6, 2018-12-17 16:36 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Lake Owasso\Maps\Reports\Figure 3 Acorn Park.mxd User: JPP



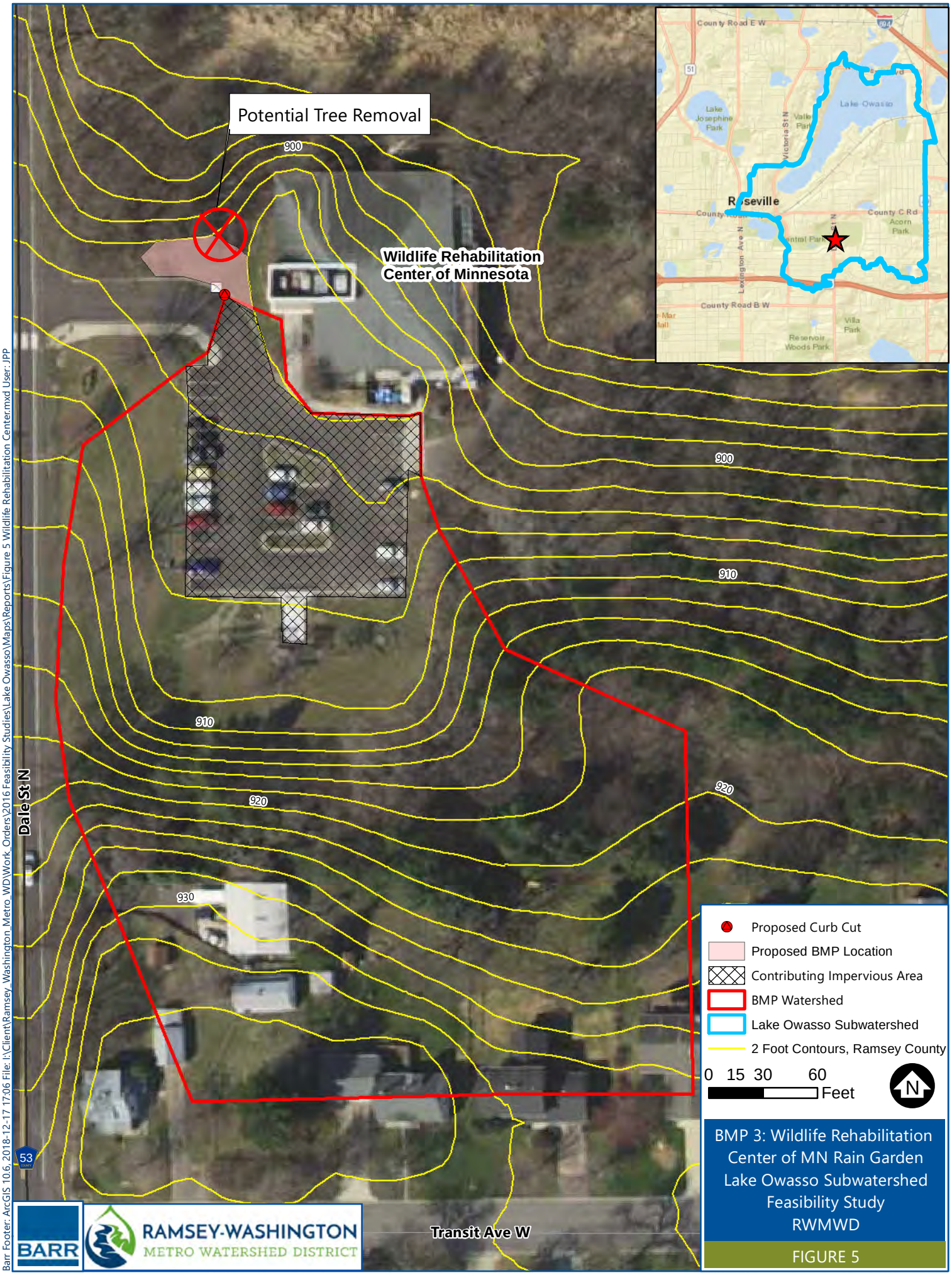
BMP 2: Muriel Sahlin Arboretum Rain Garden
Lake Owasso Subwatershed
Feasibility Study
RWMWD

FIGURE 4

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

Barr Footer: ArcGIS 10.6, 2018-12-17 16:56 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Lake Owasso\Maps\Reports\Figure 4 Muriel Sahlin Arboretum.mxd User: JPP



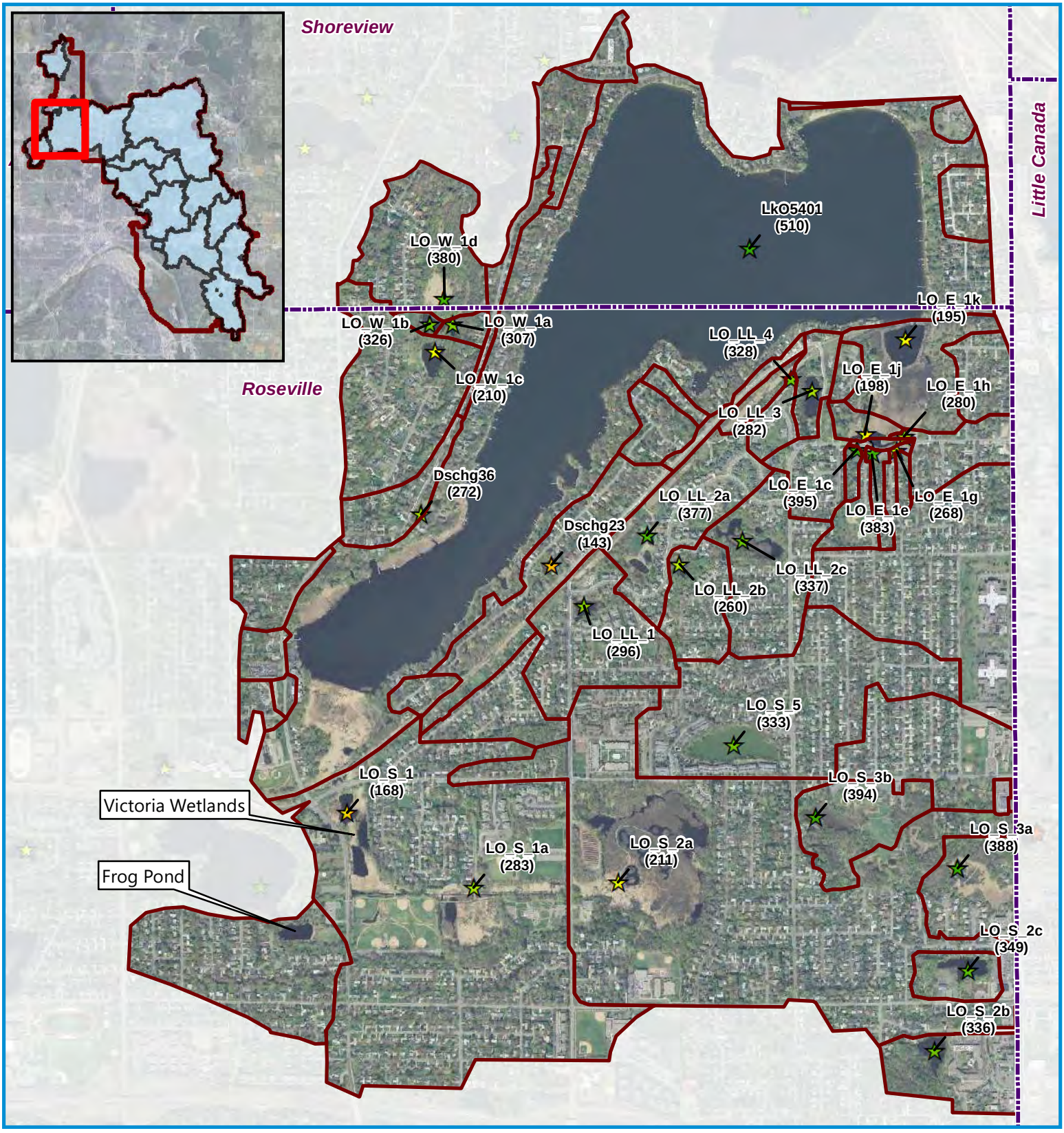
BMP 3: Wildlife Rehabilitation Center of MN Rain Garden
Lake Owasso Subwatershed
Feasibility Study
RWMWD

FIGURE 5

BARR

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

Barr Footer: ArcGIS 10.6, 2018-12-17 17:06 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Lake Owasso\Maps\Reports\Figure 5 Wildlife Rehabilitation Center.mxd User: JPP



Barr Footer: ArcGIS 10.6, 2018-12-21 15:28 File: I:\Client\Ramsey_Washington_Metro_WD\Work_Orders\2016 Feasibility Studies\Lake Owasso\Maps\Reports\Figure 6 Assessment Priority Ranking Ponds (Figure B-11).mxd User: JPP

P8 Modeled Waterbodies

Higher inspection priority

Lower inspection priority

Lake Owasso Drainage Areas

Municipal Boundary

Label Legend

C-67 → Waterbody ID

(205) → (District Priority Ranking, #)

0 780 1,560

Feet

Inspection Priority Ranking: Pond and Wetland Performance Study

Adapted for: Lake Owasso Subwatershed Feasibility Study RWMWD

Figure 6 (Adapted from Figure B-11)

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

resourceful. naturally. engineering and environmental consultants BARR

Memorandum

To:	Board of Managers and Staff
From:	Tina Carstens and Brad Lindaman
Subject:	Project and Program Status Report – January 2019
Date:	December 27, 2018

Groundwater

Manager Skinner has requested that we include a section in the project and program status report that pertains directly to our efforts in groundwater management. While groundwater considerations are sprinkled throughout the following projects in this report and in our education and communications, at this time we aren't actively implementing a specific groundwater project. What we do have is some groundwater level monitoring information in the Grass Lake area, as well as maps and a report that looked specifically at the groundwater and surface water interaction throughout the District. That past study does help to inform us in our future efforts for our projects and in our BMP incentive program. At a future meeting, I will highlight the goals, action and implementation items in our plan that pertain to groundwater and the Board can discuss our 2019 efforts. We can also keep the Board informed on the work other entities are doing in groundwater management around the region.

Project feasibility studies

Owasso County Park stormwater master plan and detailed design: phases I and II (Barr project manager: Matt Metzger; RWMWD project manager: Paige Ahlborg)

The purpose of this study is to assist City of Shoreview Public Works and Ramsey County Parks with creating a holistic "living streets" retrofit design for North Owasso Road and best management practice (BMP) design for new parking lots in Owasso County Park.

The city anticipates submitting the roadway project feasibility study to the city council in January 2019 and beginning 100-percent design in February 2019. Utility construction will likely begin in 2019, with the majority of roadway and stormwater management feature construction occurring in 2020. Barr and RWMWD staff will be engaged in the construction portion of the project to verify that the stormwater design implementation meets RWMMD standards and expectations.

System-wide evaluation of flood control options/Beltline resiliency study (Barr project manager: Erin Anderson Wenz; RWMWD project manager: Tina Carstens)

The purpose of this study is to evaluate system-level flood-damage-reduction options, including real-time mechanical alteration of Lake Phalen and Keller Lake channel outlet structures, as well as other critical system infrastructure, to actively manage stormwater runoff from flood-prone areas tributary to the Beltline storm sewer in an effort to reduce flood levels that would otherwise impact homes. The evaluation will use the RWMWD stormwater model to simulate system-level modifications to evaluate

how adjustments to outlet structures during a flood event may be able to optimize the existing system performance to reduce flooding impacts to homes adjacent to RWMWD-managed water bodies.

This period, Barr continued evaluating modifications to the outlet control structures on Keller Creek and Lake Phalen to identify a feasible operational plan to reduce upstream flood risk without adversely impacting downstream structures. Several structures upstream and downstream of the outlet control structures and the Phalen Chain of Lakes may be prone to flooding, so identifying a feasible operation plan is an iterative process.

In the next few months, Barr will continue evaluating operational plans for the outlet structures on the Phalen Chain of Lakes to identify whether operation of those structures could further mitigate flood risk. The study is phased so that flood-prone areas in the upstream portion of the watershed are addressed first, working downstream. If the study is successful, recommendations for actual field modifications will be offered for future capital improvement programming.

District office permeable asphalt parking lot retrofit (Barr project manager: Matt Kumka; RWMWD project managers: Tina Carstens and Paige Ahlborg)

The purpose of this project is to assess the performance of the permeable asphalt parking lot at the watershed district office and create a range of retrofit options for the board and staff to consider.

As mentioned last month, Barr is working with two paving contractors to finalize recommendations related to various approaches, timing of the work, and likely costs for rehabilitation of the RWMWD's permeable parking lot. We will report our findings and a recommendation in a summary memo after receiving feedback from the contractors, and will likely present those findings at the February 6 board meeting.

Emergency response plan for Lake Owasso (Barr project manager: Erin Anderson Wenz; RWMWD project manager: Tina Carstens)

The purpose of this project is to evaluate the level of flood risk that Lake Owasso's 100-year flood elevation poses to habitable structures along the lake's shoreline and to provide an emergency response plan for protecting at-risk structures to the City of Roseville for implementation during a flood event.

Letters were sent to homeowners on December 21 to notify of upcoming site visits, which are planned for the end of December. After the site visits, sandbag alignment and locations shown in the ERPs may be modified to avoid obstructions and to reflect actual site conditions. The plan will then be turned over to the city for its commissioners and other stakeholders, including affected homeowners, to consider. Plan implementation will be the city's responsibility. However, the RWMWD will provide lake-level, hydrologic, and general technical guidance should flooding appear imminent.

Emergency response plan for Grass Lake and Snail Lake (Barr project manager: Erin Anderson Wenz; RWMWD project manager: Tina Carstens)

The emergency response plan for Snail Lake protects the low home on the lake from the 100-year, 96 hour event flood waters and redirects the overflow from Snail Lake away from the Crestview Addition. The emergency response plan for Grass Lake area keeps Grass Lake overflow water away from North Gramsie Pond, which is thought to contribute to groundwater flooding at homes in the Crestview Addition.

As discussed last month, on November 21st Tina Carstens, Brad Lindaman and Erin Anderson Wenz met with staff from the City of Shoreview (Mark Maloney and Tom Wesolowski), Ramsey County (Molly Churchich) and Ramsey County Parks (Brett "Gus" Blumer and Mike Goodnature). The discussion was productive and resulted in the following proposed conclusions about all aspects of the proposed ERP work in the Grass Lake and Snail Lake areas.

Implementation item	Implementing entity	Implementation funding	Responsible maintainer/operator
Stop-log structure at pedestrian tunnel (sheet C-12, details 1 and 2)	RWMWD	RWMWD, City of Shoreview	City of Shoreview
Changes to low trail areas on south end of wetland A[1] (sheet C-12, details 3 and 4)	City of Shoreview, Ramsey County Parks	City of Shoreview, Ramsey County Parks	City of Shoreview, Ramsey County Parks
Berm on north side of Gramsie Road (sheet C-13, detail 1)	RWMWD	RWMWD	RWMWD
Changes to overflow route from Snail Lake (sheet C-11, details 1 and 2)	RWMWD	RWMWD, City of Shoreview	City of Shoreview, Ramsey County Parks
Suzanne Pond pump station	City of Shoreview	City of Shoreview	City of Shoreview
Protection for Crestview Addition from low point in Gramsie Road	City of Shoreview	City of Shoreview	City of Shoreview
Pipe with gate valve from North Gramsie pond to Suzanne Pond	City of Shoreview	City of Shoreview	City of Shoreview

The items in the table, when implemented, are needed to increase the level of protection and lower flood risk to homes in the Crestview Addition. The ERP for this area includes guidance on when stop logs should be installed (and removed) and conditions in which the gate valve should be closed, as well as sandbagging of one home on Snail Lake. Plan implementation will be the city's responsibility. However, RWMWD will provide lake-level, hydrologic, and general technical guidance should flooding appear imminent. Other than continuing to pursue the lowering of West Vadnais Lake's outlet, the items in the table represent the final construction elements for the area, associated with RWMWD's work in

managing floodwaters in and near Grass Lake and Snail Lake. Construction of RWMWD items will be completed this winter as part of the CIP Maintenance and Repair contract.

Federal Emergency Management Agency (FEMA) flood mapping updates (Barr project manager: Brandon Barnes; RWMWD project manager: Tina Carstens)

The purpose of this project is to apply Minnesota Department of Natural Resources (DNR) grant funding to use the RWMWD's updated stormwater model to develop information required to update the FEMA floodplain maps.

Barr continued to update the RWMWD's stormwater model with the new information provided by the Minnesota Department of Natural Resources (DNR). Model updates will continue through January, and results will be summarized for DNR review in February 2019. The process for updating the FEMA floodplain maps will continue through April 2020.

West Vadnais lakes outlet permitting with the DNR (Barr project manager: Erin Anderson Wenz; RWMWD project manager: Tina Carstens)

The purpose of this project is to coordinate permitting efforts for the proposed Snail, Grass, and West Vadnais lakes outlets with the DNR.

As discussed last month, on November 21 RWMWD staff met with the Vadnais Lake Area Watershed Management Organization (VLAWMO) administrator, Stephanie McNamara, to discuss next steps in evaluating the impacts of lowering West Vadnais Lake's outlet to an elevation of 881.0. Next, we will meet with the VLAWMO's technical advisory committee in early 2019 to discuss the project and obtain feedback about how potential wetland impacts should be evaluated. This effort will continue into 2019.

Modeling of 500-year Atlas 14 district-wide (climate change scenario): flood map generation for future outreach efforts (Barr project manager: Erin Anderson Wenz; RWMWD project manager: Tina Carstens)

The purpose of this project is to use measured water-surface elevations to verify and fine-tune water surface elevations calculated by the RWMWD stormwater model. Following validation, the model will be used to simulate larger rainfall events, including the 500-year rainfall depth. The confidence limit (or uncertainty) associated with the 500-year flood elevation will be used to develop inundation maps that will allow for evaluation of how future climate change may affect flood inundation areas within the RWMWD and will be used for discussion with stakeholders when evaluating future flood-risk reduction projects within the RWMWD.

Contrary to the update for this project last month, Barr is now planning to delay running recurrence interval storms through the updated models until 2019 in order to include any model updates that result from the DNR's survey work for the FEMA flood mapping update project. This effort will help us better understand how lesser storms, other than the 100-year and 500-year events, affect (or do not affect) low-lying structures in order to help prioritize projects in areas that flood during more frequent events.

Water quality and project monitoring

Auto lake monitoring systems (Barr project manager: Chris Bonick; RWMWD project manager: Eric Korte)

The purpose of this project is to install an automated system to monitor lake levels throughout the RWMWD and allow real-time transfer of data to the RWMWD's website for public consumption.

Property-owner approvals are at various stages. The City of Saint Paul has approved the monitoring station to be located on Lake Phalen, and the paperwork is now complete. Peterson Co., the installation contractor for the concrete pad, shelter, and electrical power installation, has provided a bid for the work within the RWMWD's budgetary expectations. This work will be completed in the spring. The equipment for this station has been purchased.

The City of Shoreview and Metropolitan Council Environmental Services have given verbal approval for the stations on Lake Wabasso and Lake Owasso. The equipment for these two stations has been ordered and is due to arrive shortly. Ramsey County Parks is still considering the proposed monitoring stations on Grass and Snail lakes. We anticipate that these stations and their locations will be approved for installation on county property. However, the approvals are not expected until spring 2019. These monitoring stations will be used in conjunction with the ERPs to help guide plan implementation to protect homes.

Maplewood Mall monitoring (Barr project manager: Matt Kumka; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to assess the functionality of the Maplewood Mall stormwater retrofit project as it enters its fifth year of total completion. Features that will be inspected include all stormwater infrastructure, plantings, and tree growth. The findings, including site improvement and maintenance recommendations, will be summarized and presented to the board.

Inspections are now complete, and Barr is reviewing the findings internally and processing the data. A draft memorandum will be discussed with RWMWD staff in early January, and a presentation to the board is scheduled for the February 6 meeting. At that meeting, a summary of findings and recommendations for actions in 2019 will be provided.

Research projects

2018 grant applications (Barr project manager: Erin Anderson Wenz; RWMWD project manager: Tina Carstens)

The purpose of this project is to track grant opportunities and submit grant applications to help fund RWMWD projects.

Barr's grant application submitted to the Minnesota Stormwater Research Council was successful! The study involves an application of spent lime from St. Paul Regional Water Service to a pond immediately south of Wakefield Lake (Wakefield Pond) that is known to have a significant internal load of phosphorus. The project would involve both lab and field testing—perhaps analogous to the approach

being taken at Shoreview Pond with the iron-aggregate application, but without St. Anthony Falls Laboratory involvement. This project would be in partnership with St. Paul Regional Water Services and the VLAWMO, which is also considering a pond application. The project will start in early 2019.

Kohlman Basin weir test system (Barr project manager: Keith Pilgrim; RWMWD project manager: Bill Bartodziej)

The purpose of this project is to test new filtration media on a routine basis.

Kohlman basin weir test in Maplewood

Field activities and monitoring are now complete for 2018. A memo will be drafted to summarize the year's data and conclusions. Testing is planned for 2019 using two existing materials and two new materials. We have tentatively identified a new material that is a byproduct of making aluminum and steel. This byproduct primary consists of calcium oxide, which, when in contact with water, causes the pH to rise. This material may be used in conjunction with another solid media to enhance dissolved phosphorus removal. We will test it with CC17, a crushed limestone product. This may be a suitable treatment media, as it will filter out particulate phosphorus, organically bound dissolved phosphorus, and ortho-phosphorus.

Capital improvement projects

Wakefield Park/Frost Avenue stormwater project (Barr project managers: Erin Anderson Wenz and Michelle Kimble; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to work with the City of Maplewood and its consultants to develop a site plan that involves stormwater management features with associated educational elements for the northern portion of Wakefield Park.

The conceptual design phase of the project is complete. The proposed basins design was presented to the City of Maplewood Parks Commission, which recently voted to move to the next phase of design.

The city council has approved the entire project. This past month, Barr met with the city and its consultant (Kimley Horn) to discuss project scope and schedule. The Wakefield Park project will be bid as part of the Frost Avenue stormwater project. Barr will work with Kimley Horn to coordinate plans and specifications. The project will be submitted on February 13, 2019, to RWMWD for permit approval on March 6. Bid opening is expected on March 21, with contract award on April 8. Construction is anticipated to be completed by November 1, 2019.

Targeted retrofit projects (Barr project manager: Matt Kumka; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to design, provide bid assistance for, and oversee construction of BMP retrofits on previously identified commercial, school, and faith-based properties throughout the RWMWD.

Design continues for the Cornerstone Montessori School and Boys and Girls Club of St. Paul projects. These projects are on track for bidding in spring 2019, with construction throughout the summer.

Roseville High School campus stormwater retrofit feasibility study (Barr project manager: Leslie DellAngelo; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to evaluate the feasibility of a regional stormwater infiltration or filtration project and other local stormwater infiltration projects at Roseville High School. The school is designing an addition to the southeast end of the building, so the project will also include coordination with Roseville High School and its design engineers to place stormwater BMP retrofits.

Barr has evaluated local BMP design options on the west side of the campus. Concept-level design options are complete, and costs estimates and water-quality benefits have been estimated. Results will be summarized in a memorandum in January and discussed with stakeholders later this winter.

BMP incentive fund: general BMP design assistance and review (Barr project manager: Matt Kumka; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to respond to requests for assistance to find cost-share opportunities from RWMWD partners and to seek opportunities for cost-share projects throughout the RWMWD.

Work on the Cottage Place wetland project has begun, with a recent site visit and project scoping meetings. Barr has also met to discuss the Duck Lake shoreline restoration project, which is on track to accept bids in early 2019. We are coordinating with the Ramsey County Conservation District to develop technical specifications and bidding documents for this project.

Aldrich Arena Site Design (Barr Project Manager: Matt Metzger; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to incorporate green infrastructure stormwater management into the renovations to the Aldrich Arena campus. The parking lot will be milled and overlayed by Ramsey County, which would not trigger the need for a RWMWD permit. The partnership between RWMWD and Ramsey County will achieve treatment of the runoff from the parking lots where none currently exists.

At the December board meeting, Tina Carstens described this collaborative effort with Ramsey County Parks. The design effort recently began. Barr, on behalf of the RWMWD, is providing design of the stormwater management features on the site. We are also collaborating with the developer (Loeffler) and its architect (Collaborative Design Group) separately to integrate civil site design features with stormwater elements. The civil design work with the developer and its architect is being performed under a separate scope, schedule, and budget than the RWMWD stormwater management design work.

The team expects concept plans to be developed during the first week of January, with complete design documents ready by April 2019. This schedule will allow construction to begin in August 2019.

CIP project repair and maintenance

Beltline and Battle Creek tunnel repair construction services (Barr project manager: Nathan Campeau; RWMWD project manager: Dave Vlasin)

The purpose of this project is to perform ongoing maintenance and repairs of the Beltline tunnel system to increase the service life of the tunnel.

During December, Barr issued the final construction report and completed project closeout items. This project is now complete and will move into the warranty phase.

CIP maintenance and repairs 2019 project (Barr project manager: Greg Nelson; RWMWD project manager: Dave Vlasin)

The purpose of this project is to maintain the existing systems and infrastructure owned and operated by the RWMWD and to assist and facilitate stormwater pond cleanouts to allow other public entities to meet their MS4 requirements.

At the December 4 meeting, the board awarded the 2019 CIP maintenance and repairs project to contractor Fitzgerald Excavating & Trucking, Inc. of Goodhue, Minnesota. To address manager concerns about the contractor meeting the schedule, Barr, as allowed by the contract, will require the following:

- The anticipated schedule of operations for each site will be provided before notice to proceed is issued.
- The owner requests that Jason Fitzgerald attend a weekly meeting to discuss progress and work-item status against the proposed schedule of operations. The owner may request that subcontractors attend, as the owner and/or engineer deem appropriate. Following each meeting, the engineer will prepare and distribute meeting minutes to the owner and contractor. These minutes will include a brief progress summary as compared to the schedule and status of current work and future work, all to verify that contract deadlines are met. The owner retains the right to cancel a weekly progress meeting as deemed appropriate.

Barr is currently working with the contractor to obtain all required submittal documents. We anticipate that a notice-to-proceed letter will be issued in early January.

Natural Resources Update – Bill Bartodziej and Simba Blood

Vadnais-Snail Lakes Regional Park – Ecological Restoration

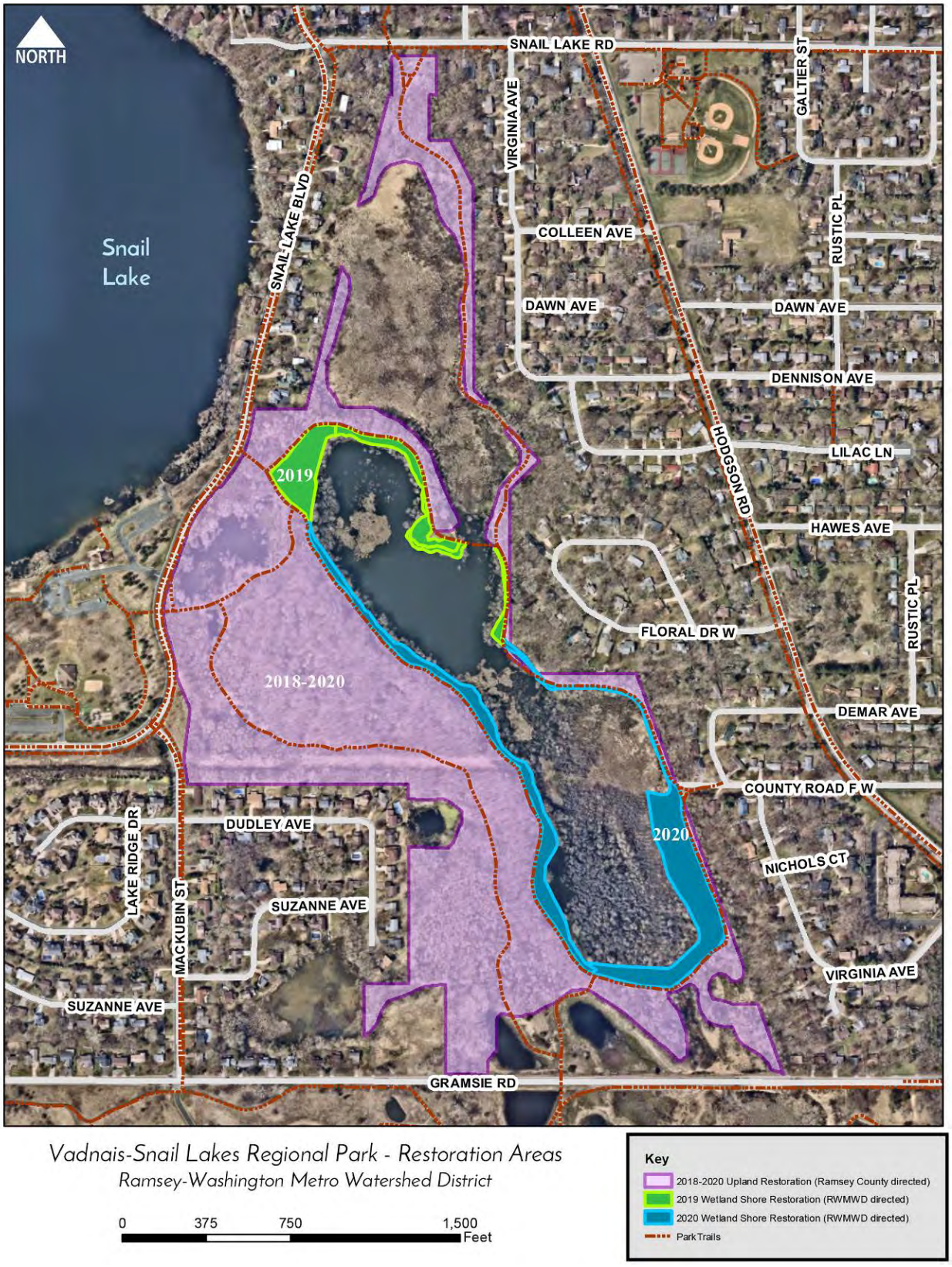
We are happy to report that this project is really moving along nicely. Ramsey County and RWMWD staff are looking forward to making substantial progress in 2019. Chris O'Brien has been making regular updates on a Vadnais-Snail Project page on the District's website. A majority of the information below can be found on that page. Below are several project highlights.

- Last summer, a botanist was commissioned to conduct a survey of the parklands in order to formulate a buckthorn management plan. His data was then used by the county to fine-tune control areas and to author the request-for-proposal for the buckthorn control effort.
- Last fall, Watershed staff began site preparation work, mainly controlling invasive weeds, along a large stretch of northern wetland buffer. Much of this area will be planted with students and volunteers in May and June (green highlighted area on the map on page 12).
- Staff installed signage along the pathways to advertise the restoration and to make aware that detailed project information is available on our website.
- The County just selected a contractor to conduct the buckthorn control work. We should start to see crews on the site in mid to late January, depending on our weather conditions. The wetland buffers and portions of the uplands (purple highlighted area on map) will be targeted this winter.
- Over the last few months, natural resources staff has been busy collecting native seed from established restoration areas, and then spreading this seed in selected areas along the wetland buffer. Although it may seem sort of strange to do this now, dormant or "winter" seeding works quite well. Many native plant species rely on freezing and thawing to prepare their seed for germination in the spring. This seeding will help to establish a diverse and attractive natural buffer along the wetland and the walking pathways.
- Sage is preparing to work with local school classes this coming spring. Master Gardeners and Master Water Stewards will assist the students with the installation of native plant species. The Ramsey County Correctional Facility will grow the native plant material to be used in this restoration and also supply inmate work crews to conduct site preparation.

Site preparation work began last fall on the northern part of the wetland buffer.

Five restoration project signs were installed around the wetland.

The specks on the snow are native prairie and wetland plant seed that was spread by NR staff. Much of this seed will germinate in spring.



Vadnais-Snail Lakes Regional Park - Restoration Areas
Ramsey-Washington Metro Watershed District

0 375 750 1,500 Feet

Key
- 2018-2020 Upland Restoration (Ramsey County directed)
- 2019 Wetland Shore Restoration (RWMWD directed)
- 2020 Wetland Shore Restoration (RWMWD directed)
- Park Trails

Public Involvement and Education Program – Sage Passi

Exploring the Connections between Drinking Water, Stormwater and Ground Water

L'Etoile du Nord fourth grade classes visited the St. Paul Regional Water Services in Roseville to explore where their drinking water comes from and how it is treated prior to public use.

Left: A 3D topo map is used to explain that St. Paul's drinking water originally came from Lake Phalen and now is drawn from the Mississippi River intake station, then carried to Lake Vadnais and moved by conduit to the treatment plant. The guide explained that keeping our lakes clean cuts down on the process/cost of treatment of this water since these lakes ultimately drain to the river. L'Etoile du Nord students will pen pal about their experience with St. Peter fourth graders who will be taking a walking field trip in February to one of North St. Paul's wells that provides the city's drinking water.

Right: Tracy explains the role of algae in phosphorus production in lakes and why oxygen levels drop when algae decompose in water. Both classes were introduced to the concepts of watersheds and run-off and will continue to learn about groundwater issues in the community.

Cultural Healing – Growing A Community Effort in St. Paul

The Freedom Library on the East Side of St. Paul – photos by Kelly Reynolds (left) and MPR News (right)

As our watershed diversity equity initiative unfolds, takes shape and finds direction on multiple levels through RWMWD's education and stewardship programs, we are dialoguing, being witness to multiple perspectives, and beginning to develop some new action steps within our outreach and engagement initiatives. As a watershed district, we have always interfaced with diverse audiences, especially through our school programs. Many of the elements of the Across Generations program, an intergenerational, cultural and environmental program I developed between 1993-1999 when I worked for RSVP, Retired and Senior Volunteer Program, have been carried over into my work within the watershed.

Cultural community leadership on the East Side of St. Paul has been developing, evolving and growing over the years, becoming notably visible to me in the interfaces I have with several organizations including Urban Roots, the Lower Phalen Project, the Eastside Area Business Association and the Freedom Library. This growth is promising, exciting and stimulating. To gain perspective and to build and diversify our relationships, I have participated in several Native American-led events in the past year and a half. I've been witnessing a growing interest in honoring water and its associated cultural ties.

I participated in a three-hour pre-Nibi Walk gathering on October 6 where we learned about the Dakota history of the creek, the ecological impacts of and to the creek and about the Nibi Walk protocols. This was followed by a Nibi walk sponsored by the Indigenous People's Task Force on October 27 from Lake Phalen to the Mississippi River when 50 people, led by Anishinaabe cultural leader and water carrier, Sharon Day and Dakota leader, Ramona Stately from Crow Creek Reservation in South Dakota gathered us at the headwaters of Lake Phalen, led us in the ceremony of gathering water and helped us trace the route on foot of the underground flow of Phalen Creek as it winds through the East Side of St. Paul, as we brought

this water vessel to Lowertown, to the mouth of the creek, and poured the lake water into the Mississippi River within a ceremony of blessings and rememberings.

I also participated in a winter ceremony last winter at Wakan Tipi led by Jim Rock, Dakota Cultural leader, astronomy teacher and director of the University of Minnesota's Planetarium in Duluth, who wove in drumming, fire building, and ancient Dakota teachings about stars, the sky, the land and water and their sacred connections. He grew up in the Mounds Park neighborhood overlooking this park and taught science for many years in this area.

This past summer I joined a summer blessing ceremony led by Dakota elders and other community leaders at Wakan Tipi. For the past three years I have been involved in engaging Native American participants, artists and storytellers in the annual Phalen Freeze Fest. This year, on the urging of David Woods, the Conservation Program Director at Urban Roots who has taken on the Ojibwe pageantry at this event with his youth interns for the past three years, we both acknowledged the need to seek out more active leadership by the Native American community in the preparation for this upcoming event on February 23 at Phalen Park.

On December 13, I attended a Cultural Healing Gathering along with five of our Master Water Stewards and colleagues from Maplewood Nature Center and St. Paul Parks and Recreation at the East Side Freedom Library. At that event there was a showing of a video documentary called "Cultural Healing" produced by John Kaul with support from the Minnesota State Arts Board and the Metropolitan Regional Arts Council. The video explored the need for cultural healing and the forms it takes not only for the indigenous people of this area, but other ostracized communities like Hmong, Cambodian, African American, and Somali. Indigenous community leaders provided input and facilitated a discussion after the film showing.

Voices and Faces from Jim Kaul's video "Cultural Healing" shown December 13 at the East Side Freedom Library.

Planning for the Future – Collaboration with the City of Maplewood

In December, I spent several two half-days with staff from Maplewood Nature Center and the City of Maplewood (Ann Hutchinson, Ginny Gaynor and Oakley Biesantz) by dialoguing, giving input for their long-range Master Plan for the Nature Center and holding our annual "mini-summit" to plan our collaborations for 2019. There were lots of ideas generated for the long-term identity and roles of the Nature Center, as well as short-term ideas for supporting bee lawn education and alternative turf projects, engaging in the Wakefield community with the development of the new "park center" and the new rain gardens, outreach related to the Gladstone street reconstruction project, ways to work together to develop Weaver Elementary School's service learning project for the year and collaboration on wetland education for homeowners … to mention just a few!

Master Water Stewards Take on the Salt Issue at Woodbury's Winter Carnival

Master Water Stewards, Anna Barker, Stephanie Wang and Kristin Seaman (also a city staff) engaged the community of Woodbury in learning Smart Salting techniques and identifying their nearest lake and how to protect it. They shared some lessons learned from this event when they took on this public engagement activity at a Winter Carnival. They estimated that they had interactions with seventy-eight people.

Input for how to overcome the perennial challenge of creating interactions at these kinds of events:

- Lure of fabulous prizes for all ages (e.g. theme appropriate salt water taffy, globe key chains, chip clips)
- Starting the conversation with a simple, interactive question "Would you place a dot on the lake you live closest to?"
- Have everyone try to answer a question before giving out a prize. Repeat visits okay. One prize per one question.
- Eye catching displays
- Invitation to be on the City's Instagram for high schoolers
- Focusing on a few questions (see post-its on display).
- Dividing and conquering…team member interacting with children, another engaging parent
- Good use of space: vertical displays, horizontal "blue tape marking one parking space", table display, team members reaching out into pedestrian traffic

Here are several comments they heard during their interactions with the public:

- I use way too much salt.
- I'm taking this card for my husband. I told him he uses too much salt.
- Mother to son…you like to fish. Listen to how salt is affecting the lakes.

Teaching at the Healthy Soils Open Mic - the Latest Frontier for Blue Thumb

Five of our Master Water Stewards are mesmerized at this latest Blue Thumb gathering. The training was led by Kassie Brown and Russ Henry from Giving Tree and held at the studio space of Spark-Y, a youth organization that teaches about urban agriculture, entrepreneurship, hydroponics and permaculture.

What are they looking at? Microscope images of the microorganisms in the soil samples projected on a screen that participants brought to the event. These images can tell you a lot about the health of the soil and its ability to infiltrate water and support vegetation. Want to learn more? Attend one of our spring Blue Thumb trainings! Watch for an upcoming Ripple Effect article on this subject Stay tuned!

Communications Update – Chris O'Brien

Chloride outreach and legislation

As we head into the winter months, we look for opportunities to educate the public about salt pollution and support policies that reduce salt use in the watershed. Here are a few examples:

- Two of our Master Water Stewards teamed up with the City of Woodbury to host an interactive salt education table at their December 2nd Winter Carnival.
- We updated the Clean Water Tips page on our website with ways to reduce salt use at home and linked to the page on social media.
- With Phalen Freeze Fest coming up February 23, we attended a December 17 planning meeting and will run a salt-related educational display at the event.
- The City of Edina created a model contract for property managers to use when hiring salt applicators. We are considering a strategy for sharing this resource in our district.
- We participated in a conference call on December 18 with the Salt Liability Reform Coalition, a group of non-profit and government agency staff working to introduce a bill in the 2019 state legislative session.
    - This year's bill will be similar in scope to last year's HF3577, which stalled in the Senate Judiciary Committee as the 2018 session expired.
    - The legislation would provide limited liability protection for private salt applicators who get certified by the MPCA's Smart Salt training program.
    - Another goal is to identify a sustainable funding mechanism for the training program. Current federal grant funding will run out in August 2020.
    - Potential authors for the bill in 2019 include Rep. Hansen, Rep. Hornstein, Rep. Persell and Rep. Fischer, (Maplewood) who will head a subcommittee on water.
    - Supporters in the Senate may include Senator Ruud who was a key supporter last session and Senator Hawj from Saint Paul who authored a similar bill in 2016.
    - **The coalition is asking for watershed districts and partner organizations to affirm support for this legislative effort.** Those entities will have their names and logos added to a support letter given to legislators.

Coverage of watershed recognition awards

The East Side Review published a nice article about this year's LEAP award winners. Three of the four recipients are East Side Saint Paul residents.

We also promoted the winners on our website and social media, including a Facebook post that reached more than 700 people.

The City of Maplewood included local recipients of LEAP and Watershed Excellence Awards in their December newsletter, *Maplewood Living*.

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Home

Neighbors awarded for their water and wildlife-friendly gardens

Submitted by admin on Mon, 12/03/2018 - 12:00am

While the return of gardening season is many months away, the Ramsey-Washington Metro Watershed District recently celebrated local homeowners whose landscaping and gardens benefit water quality and local ecology, during the district's annual recognition event Nov. 14 at Keller Golf Course in Maplewood.

On the East Side, three neighbors were awarded the 2018 Landscape Ecology Awards Program honor.

The honorees include Jan Arleth and KatieLynn Hibbard, whose garden is located at 681 Cottage Ave. E., just west of Lake Phalen.

Arleth and Hibbard began replacing their lawn with native plants about seven years ago, and the

Bill Zajicek and Romi Slowiak, seen in the center with presenters Dana Larsen and Mark Gernes, live on the eastern shore of Lake Phalen and have set aside some of their property as restored prairie.

Congratulations Maplewood clean water champions

Ramsey-Washington Metro Watershed recently awarded several individuals who live or work in Maplewood for their outstanding efforts in watershed conservation.

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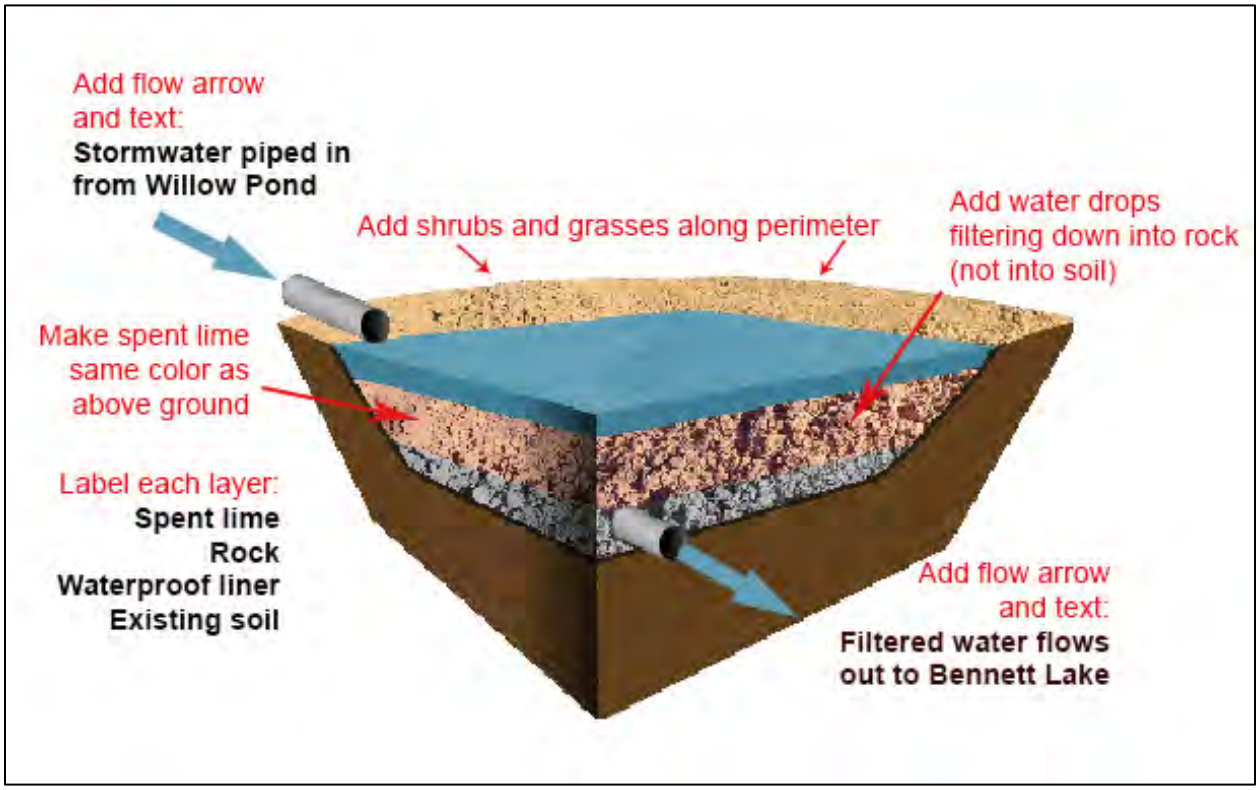
Willow Pond Spent Lime Filter interpretive sign underway

We're working with a designer to produce an interpretive sign for the new Willow Pond Spent Lime Filter. The sign will be installed this spring when construction on the project is finalized.

The sign will be similar to our new rain garden signs with a graphic depiction of water piped into the filtration basin soaking through the spent lime material. We'll also include a location map and information about native vegetation planted around the basin.



This marked up version of the Willow Pond Spent Lime Filter graphic, affectionately dubbed "the dirtbox," is being finalized for an interpretive sign to be installed onsite in the spring.

Thin ice on Lake Gervais caused by leaking cable

A member of the Gervais Lake Association alerted us on December 18 that there was thin ice on the east side of the lake caused by air bubbles from a leaking pressurized cable. We quickly posted on Facebook and Twitter, generating more than 2,600 views in a short period of time.

Ramsey County has since placed thin ice signs in the area, and residents have been in contact with CenturyLink to find out when the issue can be resolved.