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CITY OF BIRCHWOOD VILLAGE
207 Birchwood Avenue
Birchwood Village, MN 55110
651-426-3403 tel
651-426-7747 fax
birchwoodvillage@comcast.net

MEMORANDUM

DATE: February 2, 2011
TO: Mayor & City Council
FROM: Dale Richard Powers, MA, AICP, City Clerk
RE: DOCKET 2011-01-07: Birch Street (NE section) – Changing the name to Owl Street

City staff received a request from residents Randy LaFoy and Bryan & Karin McGinniss for the above-referenced street name change. Randy, Bryan, and Karin cited that the bifurcated Birch Street creates confusion for emergency and delivery vehicles, resulting in delayed response time for emergency vehicles, as well as an unnecessary increase in motor vehicle traffic on this section of Birch Street. This only would affect the part of Birch Street from Wildwood Avenue to the former railroad right-of-way. The "other" Birch Street that intersects with Birchwood Avenue would remain Birch Street. City staff discussed this matter with Randy, Bryan, and Karin. It was determined that the cost of changing the signs is $40.00 per face. Since the petitioners do not have addresses on Birch Street – and there are no other property owners that do have addresses that would be affected by this proposal – it appears that the only costs involved are the signs themselves, as well as costs associated with conducting the required public hearing. Randy indicated that his research revealed no other "Owl Street" in the area. **Randy La Foy will address the Council at this meeting and be available to respond to questions on the matter.**

Some thoughts to consider on this matter:

- Is changing the name of lower Birch Street something the Council wants to consider?
- If so, is "Owl" an acceptable alternative? Street names shouldn't be duplicated elsewhere in any jurisdiction that has a responsibility to respond to emergency requests, as well as in the host county – if at all possible.
- Since the City is required by Federal law to change street signs later this decade, should this matter be delayed until that time? Or should this request be the catalyst to proceed with changing the signs to conform to Federal law?
- Given the Federal mandate, is now a good time to review how the City's street signs are designed (white letters on green background) and consider changing the color scheme and font to make Birchwood more distinctive and less blended with surrounding areas?

ECKBERG LAMMERS MEMORANDUM

TO: City Council
FROM: Kevin S. Sandstrom
DATE: January 30, 2011
RE: Birchwood Village, City of - General 2010-2011
10622-20579

Issue: Resident Randy LaFoy is requesting that Lower Birch Street be renamed to Owl Street. What is the procedure to change the name of a street?

Analysis: Minn. Stat. § 412.221, Subd. 18 provides:

> **Street names, numbers.** The council shall have power by ordinance to name or rename the streets and public places of the city and to number or renumber the lots and blocks of the city, or any part thereof. It may make and record a consolidated plat of the city.

Further, Minn. Stat. § 440.11 states:

> **CHANGE NAME OF STREETS.** The council of each home rule charter city of the second, third, or fourth class may by ordinance change the name of and rename any of the streets, lanes, avenues, public highways, parks, and public grounds of the city. Immediately after publication, the ordinance shall be recorded in the office of the county recorder of the county in which the city is located.

It is clear that the change of a street name or property address must be accomplished by passage of an ordinance. Generally, for the passage of any ordinance relating to zoning, a public hearing must be held. Although not technically a zoning issue, because change of a street or address involves land use, holding a public hearing is advisable.

Notice of the time, place and purpose of the hearing must be given by publication in the city's official newspaper at least 10 days prior to the hearing, and notice must be mailed to property owners within a 350-foot radius of the land in question. Minn. Stat. § 462.357, Subd. 3. Generally, the planning commission should hold the public hearing. Id. If no planning commission exists, then the city council is responsible for holding the public hearing. Id.

Public hearings should include a complete disclosure of what is being proposed, and a fair and open assessment of the issues raised. A public hearing must include an opportunity for the general public and interested parties to hear and see all information and to ask questions, provide additional information, express support or opposition, or suggest modifications to the proposal.

Because this ordinance will relate to a change in land use and addresses, it should be recorded with the county recorder against the affected property(ies). Minn. Stat. § 462.36. A legal description of the affected property should be included within the ordinance as well. Id.

KSS/kss

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BIRCHWOOD VILLAGE CITY CLERK
AMENDED EMPLOYMENT AGREEMENT

This AMENDED AGREEMENT made this _____ day of _____, 2010, by and between the City of Birchwood Village, Minnesota ("Employer"), and Dale Powers ("Employee").

WHERAS, the parties previously agreed upon the terms of employment of Employee and such agreement was approved by the City Council of Employer;

WHEREAS, the parties desire to amend Employee's employment agreement to be consistent with the terms herein, particularly to modify the frequency of Employee's compensation;

WHEREAS, the parties desire that this amended agreement replace the prior Employment Agreement;

NOW THEREFORE, the parties agree as follows:

1. **POSITION.** Employer agrees to employ Employee to perform the functions and duties of the City Clerk and to perform other legally permissible and proper duties and functions as the City shall from time to time assign. A description of the enumerated job duties of the City Clerk is attached hereto as "Exhibit 1."

2. **EMPLOYMENT STATUS.** Employee shall be an employee "at will," with the employment continuing until ended by either Employer or Employee.

3. **COMPENSATION.** Employer shall pay Employee a salary of $34,000.00 per year, paid semimonthly on the first and the fifteenth day of each month in the amount of $1,416.66 gross. Employee's salary shall be based upon an expected work week of 30 hours per week of which a minimum of 24 hours per week shall be "normal" office hours and an additional maximum of 6 hours per week shall be for work outside the "normal" office hours. "Normal" office hours are those hours to be worked according to a regular schedule and to be worked at City Hall or within the city and pursuant to the conditions specified in Section 9 of this Agreement. The additional hours shall include such things as attendance at meetings directed by the City Council to attend, daily email review for locate and other timely requests, responding to emergencies, retrieving voice mails and acting on time sensitive issues, preparing meeting minutes and completing the basic functions of the job. Any hours worked in excess of an average of 30 hours per week within a pay period shall have prior approval by the Mayor or Acting Mayor and shall be compensated by an equal number of hours granted to Employee as compensatory time off. The Employee shall complete timesheets for all hours worked and provide the same to the Mayor or Acting Mayor for review prior to receiving the paycheck for those hours worked. Employee shall be given, at a minimum, annual salary and performance reviews.

Deleted: COMMENCEMENT OF

Deleted: Employee's start date shall be the twelfth day of July 2010.

Deleted: regular and special city council meetings or any other

Deleted: that is held outside "normal" office hours

Deleted: Personnel Director

Deleted: City Council in the Council packets for the first meeting in the month following the performance of the work

4. **PENSION PLAN AND OTHER BENEFITS.** Employer shall contribute to the Public Employees Retirement Association (PERA) for Employee as required by State law, or an alternate pension plan, if selected by Employee, authorized by State law. Employer shall pay for Employee's FICA and Worker's Compensation contributions. Employee shall not be entitled to health insurance, life insurance, or any other benefits not enumerated herein.

5. **PAID TIME OFF.** Employee shall accrue paid time off at a rate of six (6) hours per month, with a maximum accrual of 100 hours at any point in time. Accrual shall commence as of the date of hire. Use of paid time off shall be preapproved by the Mayor or Personnel Director.

Deleted: four (4)

6. **COMPENSATORY TIME OFF.** At any given time, the Employee shall have a maximum accrual of compensatory time off of 45 hours. Upon separation from employment Employee shall not be monetarily compensated for unused compensatory time off. Use of compensatory time off shall be preapproved by the Mayor or Personnel Director.

7. **HOLIDAY PAY.** Employee shall be given holiday paid time off for ten (10) days per year at a rate of six (6) hours per day for each of the following holidays: New Year's, Martin Luther King Jr, Presidents', Memorial, July 4th, Labor, Columbus, Veteran's, Thanksgiving and Christmas. The holiday hours will be credited towards the Employee's 24 hours of "normal" office hours during the week in which the holiday falls. If the holiday falls on a Saturday, the hours shall be credited towards the prior work week. If the holiday falls on a Sunday, the hours shall be credited towards the following work week.

Deleted: four (4)

8. **HOURS OF WORK & OFFICE HOURS.** Open office hours at City Hall shall be 9:00am to 12:00pm on Mondays, Thursdays (subject to change at Council's discretion), and one other weekday at the discretion of the Employee. Employee shall be present at City Hall for those office hours unless such hours fall on a legal holiday or other extenuating circumstances prevent Employee from being present. Time away from the City Hall during open office hours shall be prearranged with the Mayor or Acting Mayor whenever possible, and a notice shall be posted on the office door stating the next date that the office will be open. It is expected that a minimum of 24 hours per week will be worked at City Hall, within the jurisdiction of the City of Birchwood Village in instances where the Employee is expected to make field visits or attend meetings outside of City Hall during "normal" office hours, or at other locations when required to conduct the work of the city. Employee may perform work normally done at City Hall outside of City Hall if pre-approved by the Mayor or Acting Mayor, or during emergency situations. Except for the required open office hours and attendance at required regular and special city council meetings or any other meeting directed by the City Council to attend, the distribution of required work hours throughout the work week is at the discretion of the Employee. Any hours worked in excess of an average of 30 hours per week within a pay period shall have prior approval by the Mayor, Acting Mayor, or the City Council as a whole.

Deleted: Personnel Director

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9. **ATTENDANCE AT COUNCIL MEETINGS.** Employee's attendance at all regular and special city council meetings is required. It is recognized that on occasion due to illness or

family emergencies the employee may not be able to attend these meeting. Any absences from these meetings shall be preapproved by the Mayor or Acting Mayor.

10. **PROFESSIONAL DEVELOPMENT.** Employer shall budget and pay the cost of Employee's attendance at professional development courses or seminars and Employee's dues for membership in professional organizations or associations, relating to Employee's profession and Employee's continued professional participation, growth and advancement. The cost of said courses, seminars and professional organizations shall not exceed the amount budgeted for such expenses for a given year. The City may budget and in its discretion provide for the registration, travel, lodging, and reasonable expenses of the Employee for professional official travel, meetings, and occasions, as deemed appropriate by the Council.

Deleted: The amount budgeted for 2010 is not to exceed $400.00, and such amount shall be reviewed on an annual basis as part of the normal budgeting process, subject to a yearly maximum as provided in the Employer's annual budget.

Employer recognizes that Employee is an officer of the American Planning Association (APA) or a subset thereof. Employer further recognizes that Employee may be required to attend conferences and other meetings as a part of those responsibilities. To that extent, Employer agrees to authorize Employee to attend said conferences and other meetings so long as attendance at the conference and other meetings does not conflict with performing the basic functions of the city clerk job. There is no expectation by Employee that the Employer will budget for registration, travel, lodging, and reasonable expenses associated with Employee's required attendance at APA events. Time spent by Employee attending APA events shall not count toward the required work hours at City Hall. Compensatory time may be used.

11. **GENERAL EXPENSES.** Employer recognizes that certain expenses of a non-personal and generally job-affiliated nature will be incurred by Employee, and hereby agrees to reimburse Employee for such expenses. All such expenses shall be consistent with the annual budget approved by the City Council, and such reimbursement shall be subject to review and approval by the City Council. Employee shall keep receipts or other proof of payment and submit them, along with an itemized ledger, to the City Council for review prior to reimbursement. The Employee shall be compensated for mileage at the rate established by the Internal Revenue Service.

~~12.~~ **GENERAL CONDITIONS OF EMPLOYMENT.** The parties expressly agree that Employee's employment is "at-will." Nothing in this Agreement shall prevent, limit or otherwise interfere with the right of Employer to terminate Employee's employment at any time, and for any reason. Furthermore, nothing in this Agreement shall prevent, limit or otherwise interfere with the right of Employee to resign at any time from his position with Employee; the Employer requests a courtesy notice of a minimum of two weeks.

13. **APPLICABILITY OF PERSONNEL POLICIES AND RESOLUTIONS.** Except where specifically abridged or modified by this Agreement, personnel policies as defined and set forth for employees of Employer, whether previously enacted or to be enacted in the future, shall apply to this Employee.

14. **OTHER TERMS AND CONDITIONS OF EMPLOYMENT.** The City Council and Employee may mutually agree to any other terms and conditions of employment of

Employee as they may mutually deem appropriate from time-to-time, provided such terms and conditions are not inconsistent with the provisions of this Agreement, the laws of the State of Minnesota, the ordinances of Employer, or any other applicable laws. Subject to the provisions of this Agreement, Employee is not prohibited from securing additional employment elsewhere so long as the additional employment does not conflict with performing the basic functions of the city clerk job. Said additional employment shall not be with an employer in which the appearance or fact of a conflict of interest with the Employer is apparent.

15. **DECORUM.** Without the express written consent of the City Council, the Employee, acting within the scope of employment, shall not engage in activities, actions, public displays, or behavior that are directly contrary to the established policies, goals, programs or positions of Employer. The Employee shall not publicly offer opinions representing same to be the official position of Employer on any matter that has not been approved by the City Council for release. The Employee shall not use or disclose any information or data not otherwise already in the public domain for personal or financial gain. The Employee shall disclose to the City Council any direct, indirect or perceived conflicts of interest that the Employee may have relative to matters appearing before the City Council or as may be transacted by Employer in its routine operations.

16. **INDEMNIFICATION.** Employer shall defend and indemnify Employee pursuant to Minnesota Statutes § 466.07. In addition, Employer shall defend, hold harmless, and indemnify Employee from all torts; civil damages and penalties, and fines; and violation of statutes, laws, rules and ordinances, provided the Employee was lawfully acting in the performance of the duties of the position.

17. **ASSIGNMENTS AND SUBCONTRACTS.** None of the sums due, or about to become due, nor any of the work to be performed under this Employment Agreement by Employee shall be assigned to any third party without the prior written consent of Employer.

18. **APPLICABLE LAW.** This Employment Agreement shall be deemed to have been entered into and shall be construed and governed in accordance with the laws of the State of Minnesota.

19. **WAIVERS.** Failure of either party to insist, in any one (1) or more instances, upon the performance of any of the terms, covenants, or conditions of this Employment Agreement, or to exercise any right hereunder, shall not be construed as a waiver or relinquishment of the future exercise of such right, but the obligation of the other party with respect to such future performance shall continue in full force and effect.

20. **SEVERABILITY.** The invalidity or unenforceability of any particular provision of this Employment Agreement shall not affect the other provisions, and this Employment Agreement shall be construed in all respects as if such invalid or unenforceable provision or provisions were omitted.

21. **AMENDMENTS.** The terms of this Employment Agreement may not be amended, modified, released, interpreted or changed in any manner, except by written instrument signed by duly authorized representatives of both parties.

22. **HEADINGS.** The headings utilized herein are provided as aids in referencing provisions of this Employment Agreement, but shall not be utilized in interpretation or construction of the terms and conditions herein.

23. **MERGER.** This Employment Agreement and any attachment (when signed by both parties) contain the entire and only understanding or agreement between the parties in relation to the subject matter hereof. Any representations, provision, undertakings or conditions not contained herein shall be of no effect and nonbinding. This Agreement shall constitute the entire agreement between the parties and shall be binding upon and inure to the benefits of the heirs, executors, administrators and successors in interest of the parties.

24. **FORCE MAJEURE.** Neither party shall be liable or deemed to be in default for any delay or failure to perform under this Employment Agreement resulting, directly or indirectly, from any cause beyond reasonable control, including, but not limited to, war, fire, riot, insurrection and acts of God.

IN WITNESS WHEREOF, Employer has caused this Agreement to be signed and executed on behalf of its Mayor and Council, and Employee has signed this Agreement, in duplicate, the day and year first written above.

EMPLOYER:	**EMPLOYEE:**
By: _____	_____
Date: _____	
Its: _____	**Date:** _____

City Clerk Job Description
March 2010

Purpose of Position
Performs administrative work conducting the daily business activities of the City of Birchwood Village including, but not limited to, performing skilled bookkeeping and record keeping; managing contracts; keeping the official minutes of the city council; conducting city elections, and supervising city employees.

Supervision
Works under the general and administrative supervision of the City Council and its designated Personnel Director.

Typical Duties

General Administration

- Assists the council in the coordination and administration of city policies and procedures including conducting research and assisting in the development of solutions to problems.
- Prepares and types correspondence, reports, memos, letters, ordinances, etc. on behalf of the council.
- Receives requests, complaints and information from the public; conducts the appropriate research and transmits to council.
- Attends regular and special council meetings; prepares agendas and packets; records council actions; and maintains records of minutes, ordinances and resolutions.
- Arranges and publishes notices of meetings and public hearings as required by law.
- Attests the mayor's signature on official documents wherever required and maintains responsibility for the city seal.
- Provides certified copies of proceedings and records of the city upon request.
- Acts as liaison with state and county officials, and city attorney.
- Maintains office equipment.
- Oversees work of contractors consistent with city council direction.
- Prepares draft contracts and requests for proposals.
- Oversees management of city hall including building maintenance and repairs; hall cleaning; and hall rental.

Land Use and Development

- Coordinates zoning permit application and approval process.

Financial

- Acts as the city's bookkeeper, maintaining an account book including all financial transactions of the city.
- Prepares accounts payable and receivable transactions and posts information to journals, verifies account information and generates checks for bill payments.
- Maintains and processes payroll, payroll deductions, payroll records and reports, etc.
- Processes claims and warrants for all funds.

- Assists the council in developing the annual city budget by pulling prior year's budget, recommending adjustments, discussing financial issues with the council and preparing the final budget.
- Bills for special assessments, collects payments and records as appropriate.
- Prepares disbursement list for city council approval.
- Works with treasure to research financial matters.

Elections

- Administers local, state, county and federal elections in accordance with state and county requirements.
- Oversees, schedules, trains, election judges and maintains election records.

Knowledge, Skills and Abilities

- Knowledge of accounting, payroll and billing practices and procedures.
- Knowledge of laws, rules and regulations affecting city government.
- Knowledge of state and county election procedures and laws.
- Knowledge of governmental accounting and budgeting.
- Ability to prepare an annual budget.
- Ability to keep accurate and complete records and files.
- Ability to read and analyze technical information and identify concerns.
- Ability to communicate effectively, both orally and in writing, with city staff, state and county officials, elected officials and the public.
- Ability to prioritize work research files and solve problems.
- Ability to operate typical office equipment including a computer and related software, printer, fax machine, copier, and typewriter.
- Ability to use cable TV and related equipment.
- Ability to type or enter data into a computer with speed and accuracy.

11A

Magic in the Air

Greetings,

*On behalf of the Conference Planning Committee, I sincerely encourage you or a representative from your city to attend the **2011 MCFOA Conference.***

These are tough and challenging times for us in general and for cities in particular. Property valuations and their trend lines are not what they were a few years ago, and we are not out of the woods yet. Our state government is in one of the greatest fiscal crisis' in Minnesota history, and with that, we face great uncertainty with local governmental aid and other funding ties. Yet, this is the absolutely worst time to cut training budgets or other investments in our human resources. The challenges we face won't right themselves — the best and brightest minds (and a lot of hard work) will be needed to pull us to better days.

The training provided at our conference provides the "nuts and bolts" professional training needed in our cities. There are sessions on advanced Excel and Publisher, sales taxes, OSHA inspections, human resources issues, liquor licensing, finance, and even a special session on Minnesota's changing demographics and finances delivered by our State Demographer and a financial expert from the Humphrey School of Public Affairs.

The excellent, well-rounded training opportunities provided at our conference, result in cost savings to our cities. The experience also provides many networking opportunities and exposure to private and public resources that are invaluable to the healthy operations of a city. Knowledge is not only power in this new economy, but as the private sector continually reminds us, it also critical for survival. We train emergency service personnel to do instinctively the right thing at a moment's notice, so too is the importance of training our administrative personnel.

We hope this conference is still in your 2011 budget but if not, we encourage you to find a way to make it happen. It will be among the smartest dollars you spend—you won't find less expensive training for clerks and finance officers anywhere else!

With this year's theme of "There's Magic in the Air," we aim for another magical conference to support those that work their daily magic to make our Minnesota cities sparkle. Thank you and we hope to see you in March!

Paul Hetland, Planning Committee Chair
MCFOA Vice President

Once again MCFOA is offering special discounted **First Time Attendee** rates for this event—$180 for MCFOA members and $235 for non-MCFOA members regardless of the date you register. If you have never attended an MCFOA Conference, 2011 is the year to see what you have been missing! See the registration form contained in this brochure (or the online form) to take advantage of these discounts.

A **Hospitality Room** will be available at the Best Western Kelly Inn during the Conference. This spot provides a great location to connect with your fellow attendees for some informal networking. The MCFOA Entertainment Committee and Region II (hospitality room host this year) are planning some special activities on Tuesday evening. Details regarding activities and hours of operation will be provided in your on-site conference program.

The traditional **Spirit of MCFOA social mixer** will be held on **Wednesday** evening. This change has been made to allow Conference attendees who are not arriving until Wednesday morning to participate in this networking event. This 90-minute social will include a fun "getting to know you" game, hot & cold hors d'oeuvres and cash bars. All attendees are encouraged to wear their city shirt to this event.

As usual, Conference attendees will have an opportunity to put on dancing shoes (or just sit back, relax & enjoy the music). Experienced DJ's from Coopshow Productions will be spinning the platters on Wednesday night.

Always popular—always fun—the MCFOA **Silent Auction** is back on Thursday, March 17th. This event offers a chance to bid on items donated by individual clerks and finance officers from throughout the state; plus items from generous exhibitors and sponsors. Proceeds from this Auction support the Association's training scholarship program. Thursday's **Exhibit Hall** will shine this year, with vendors showcasing the best they have to offer. Remember, they are here for you! Stop, talk, ask questions and receive informative answers on how their products will benefit your city.

On Thursday all Conference attendees are invited to the MCFOA's **traditional evening banquet**. To get into the conference theme *"There is Magic in the Air"*, guests are encouraged to **dress up for the night as a Magical Icon**. In a nod to the wide range of generational diversities so evident in today's society, Association President Mark Karnowski has added a slight *twist* — in planning your attire, consider selecting an icon of a different generation. Boomers could come as Harry Potter, while Gen X'ers could arrive as Merlin or even Harry Houdini!

Entertainment for the Thursday banquet will be provided by Comic Magician Jerry Frasier. This uniquely gifted performer/artist brings nothing but his best to each and every performance — practically embracing audiences with his own brand of *anything can happen* comedy. Jerry's interactive style has captivated audiences all over the country, and is sure to keep attendees on the edge of their seats and provide just the right magical experience to end the evening.

In these times of limited training and travel budgets, the MCFOA Board strongly encourages attendees at this year's Conference to **consider carpooling or even room sharing in St. Cloud.** To help in this process, a link to Conference registrants will be included in the immediate email confirmation you receive from GTS.

Agenda

TUESDAY, MARCH 15, 2011

12:30-1:00 PM On-Site Check-in for Half-Day Workshops (CHOOSE ONE)

1:00-4:30 **Half-day Seminar: Advanced Excel**

1:00-4:30 **Half-day Seminar: Publisher 2007**

5:00-8:00 On-Site Conference Check-In

7:00-9:00 Conference Gathering — activities in Hospitality Suite

WEDNESDAY, MARCH 16, 2011

8:00 AM On-Site Conference Check-In and Continental Breakfast

9:00 Welcome and Presentation of Colors

9:15 **KEYNOTE ADDRESS:**
Thriving in Chaos

10:15 Break

10:45 **CONCURRENT SESSIONS I** (CHOOSE ONE)
1. Collection and Payment of State Sales & Use Taxes
2. Stormwater 101
3. A First Aid Kit of Essential Information
4. Dealing with Difficult People

12:00 NOON Luncheon
MCMC & CMC Recognition Awards

1:15 PM **CONCURRENT SESSIONS II** (CHOOSE ONE)
5. Internal Controls
6. The Bright Side of Leading Others
7. How to Draft an Ordinance
8. Customer Service During Fiscally Challenging Times
9. Cutting HR Costs Without Catastrophe

2:30 Break

2:45 **CONCURRENT SESSIONS III** (CHOOSE ONE)
10. Various Benefit Plans
11. OSHA Inspections
12. Redistricting: What You Need to Know
13. Are HR Policies Anchors or Oars for Our Cities
14. Implementing Technology Accessibility Standards

4:00-6:30 Free Time to visit the City of St. Cloud
(Note: Dinner is NOT included in registration fee)

6:30-8:00 The Spirit of MCFOA (snacks, beverages, etc.)
Formal greetings, introductions & "getting to know you" activities

8:00-12:00 Dance with DJ

THURSDAY, MARCH 17, 2011

8:00 AM Sit Down Breakfast
MCFOA Business Meeting, Oath of Office and Awards

9:20 **GENERAL SESSION:**
Minnesota: Changing (and Challenging) Demographics and Finances

10:30 Refreshment Break in Exhibit Area
Silent Auction Opens
(Exhibits Open until 4:00 PM)

11:00 **CONCURRENT SESSIONS IV** (CHOOSE ONE)
15. Preparing for Your Retirement (90 minutes)
16. Managing a Budget in Tough Economic Times (update from 2010 conference session)
17. Records Retention Applied to Electronic Content
18. Preparing for Disasters
19. Roundtables for Small Cities (Part 1)

12:15 NOON Lunch in the Exhibit Area

1:45 PM **CONCURRENT SESSIONS V** (CHOOSE ONE)
20. Move More, Eat Better, Groove at Work!
21. Federal Health Care Reform: Impact on Cities
22. Liquor Licensing
23. Social Insecurity: To "Friend" or Not to "Friend"
24. Roundtables for Small Cities(Part 2)

3:00 Refreshment Break in Exhibit Area

4:00 Exhibits Close
Silent Auction Closes/Winners Pay and Pick Up Merchandise

4:00 Free Time

6:00 Reception

7:00 Banquet & Entertainment

FRIDAY, MARCH 18, 2011

8:00 AM Light Refreshments

8:30 **FINALE GENERAL SESSION:**
Staying Alive, Mentally -or- They Who Laugh, Last

10:30-11:30 Brunch, and CEU Certificate pick-up

Keynote Presentations

Wednesday Keynote Address

Thriving in Chaos

Tracy Knofla

Today we are expected to do more with less and coordinate a very complicated life, all the while staying sane and happy. Many people report feeling that they've lost control of their lives. Your city needs strong, focused and effective employees in order for you to achieve your goals. Tracy Knofla's keynote address will encourage participants to face this challenge and will provide the tools necessary to identify personal choices in order to bring chaos under contract and develop a plan to be more effective and efficient.

Thursday General Session

Minnesota: Changing (and Challenging) Demographics and Finances

Tom Gillaspy and Jay Kiedrowski

The future success of Minnesota will depend of how it responds to the challenges generated by large demographic and financial forces shaping the future of the state and nation. State and local governments will be on the front line of the changes and much depends on how well they respond to the changing (and challenging) environment. Tom Gillaspy and Jay Kiedrowski will discuss how these forces will impact local government in the near and long term future.

Tom Gillaspy has served as the Minnesota State Demographer since 1979.

Jay Kiedrowski is a Senior Fellow in the Public and Nonprofit Leadership Center and an instructor at the University of MN's Humphrey School of Public Affairs specializing in public finance, organizational development, and leadership.

Friday Finale General Session

Staying Alive, Mentally -or- They Who Laugh, Last

Juli Burney

Often people have said there is no room for HUMOR in the workplace, however, having good humor means having a positive attitude toward situations. Everyone has a sense of humor, they just don't use it to their potential. It shows that you can remain cool under pressure and keep problems in perspective. Stress is a perception of an event. You may not be in control of the events happening around you, but you can control your response to those events. This is when a sense of humor is essential in the workplace.

Tuesday Pre-Conference Workshops

Preconference I: Tuesday, 1:00-4:30 PM

Advanced Excel

Brad Grabham, Technical Training Coordinator, St. Cloud State University

Microsoft Excel is a powerful spreadsheet program that allows you to make quick and accurate numerical calculations and helps you to make your data look sharp and professional. The uses for Excel are limitless: businesses use Excel to create financial reports, scientists use Excel for statistical analysis, and families use Excel to help manage their investment portfolios. In this workshop you will learn how to manipulate spreadsheets, create dynamic charts, and build complex formulas.

Preconference II: Tuesday, 1:00-4:30 PM

Publisher 2007

Gordon Schrubbe, Information Technology Specialist 2 and Administrative Computer Technician (& PC Wizard), St. Cloud State University

Publisher is a desktop publishing program that turns your ideas into professional publications. Publisher lets you create publications that include text and graphics, as well as charts and worksheets created using other applications. Once you have created a publication, you can print it from your own computer, or send it off for commercial printing. In this workshop, you will learn how to navigate the program screen, use the publication wizard, and format your publications.

PLEASE NOTE!!

*Those registering for **either** of these workshops are encouraged to bring their own laptop loaded with the appropriate software. Electrical hook-ups will be available, so make sure to bring a power cord! A limited number of loaner laptops are available — indicate your need on the registration form. You will be notified immediately if your request cannot be accommodated.*

Two weeks prior to the Conference, registrants will receive practice files to download to your laptop for use during the workshop.

Concurrent Sessions

Concurrent Sessions I:
Wednesday, 10:45-12:00 NOON

1 Collection and Payment of State Sales & Use Taxes

Anna Gruber, Pierz City Administrator; Victoria Holthaus, Freeport City Clerk-Treasurer; & Representatives, Minnesota Department of Revenue
Participating Moderator: Renee Eckerly, Paynesville City Administrator

Fearing a Sales Tax Audit from the State of Minnesota? Well this session is just for you! In this session, you will learn what the State is expecting from you, which services cities should be charging sales tax on, learn what you might be charging tax on that you shouldn't be and hear real stories from City Clerks that have been through an audit. This session may help you save your city money in the future by getting it right now.

2 Stormwater 101

MPCA Representative & Todd Hubmer, Associate / WSB & Associates, Inc.

The Federal Clean Water Act (CWA) helped us address many of the states' wastewater facilities. Changes in the CWA now require the MPCA to regulate more stormwater sources, which is challenging since it is also a "people" pollution issues. This session will cover a variety of issues including: why stormwater is an issue; MPCA's Stormwater Permit Program; low impact development; total maximum daily loads (TMDL); financial assistance for wasterwarter and stormwater; local funding options; what's on the horizon and what our local governments and the public can do.

3 Especially for New Clerks: A First Aid Kit of Essential Information

Daniel Buchholtz, Hanover City Administrator, Clerk-Treasurer & Sandy Engdahl, Plymouth City Clerk

Have you recently been hired as a City Clerk but you're unsure at times what that really means as you discover you need to wear many hats in order to effectively run your city? In this session, experienced city clerks will provide insight and resource materials to get you on the right track and hopefully answer many of your questions.

4 Dealing with Difficult People

Tracy Knofla, Speaker, High Impact Training

This follow-up session with the keynote speaker will help participants identify various types of difficult people, understand their different motivations and create strategies to be more effective in working with them or meeting their customer service needs.

Concurrent Sessions II:
Wednesday, 1:15-2:30 PM

5 Internal Controls: What Are The Auditors Talking About?

Christina Wordes, CPA, Manager, Conway, Deuth & Schmiesing, PLLP; Julie Weiers, Annandale Clerk/ Accountant; & Deb Boelter, Winsted Clerk-Treasurer

Lack of Segregation of Duties and Auditor Prepared Financial Statements – sound like common findings from your City's audit? If so, this session is for you! With one or a few staff members, it is a challenge to develop good internal controls to eliminate these findings. Hear about internal controls from a Governmental Auditor and learn helpful tips on how to implement mitigating controls from two City Officials. You'll leave this session with practical advice that you can easily utilize to improve your internal controls.

6 The Bright Side of Leading Others

Wendy Friede, Principal, Friede Coaching and Consulting

We have all heard the horror stories of leading teams who are underperforming, burned out or resistant to change. This session will focus on how to create a culture where leaders are seen as visionaries, coaches and valued resources. Research and practice continues to tell us that employees aren't expecting their leaders to walk on water but simply to provide focus, support, encouragement and the resources to be successful. This session will help you bring your best leadership skills forward to lead employees, committees or volunteers.

7 How to Draft an Ordinance

Duke Addicks, Special Counsel & Alexis Stangl, Staff Attorney, League of Minnesota Cities

This Nuts & Bolts session will cover how to select clear, concise language, why you should define terms and due process issues. The presenters will include ordinance samples that people frequently request from the League of Minnesota Cities.

8 Customer Service During Fiscally Challenging Times

Lisa Lynn, Lynn & Associates & Instructor, Century College

When it comes to customer service, it does not matter what industry one is in, service providers need to be there for internal and external customers, especially during tough economic times. The purpose of this training is to build an awareness of how everyone within an organization can make a difference in providing exceptional service through interactions with customers. Although specific skills such as communication techniques and problem solving strategies are included in the training, the session is primarily devoted to raising awareness levels of how practical, simple daily actions, attitudes, behaviors and communications affect the quality perceived service, work relationships, and interactions with customers. This workshop provides participants an opportunity to review basic skills, learn new ones, and understand what customers really need during these tougher times.

9 Cutting HR Costs Without Catastrophe

Lisa Rund, Human Resources Manager, League of Minnesota Cities

Staff wages and benefits make up a large chunk of most city budgets. As cities continue to struggle with how to make ends meet, many are considering layoffs, wage freezes, furloughs, retirement incentives, and other HR cost-saving measures. Understand what your options are and find out what questions to ask and what issues to consider before taking action.

Concurrent Sessions

Concurrent Sessions III:
Wednesday, 2:45-4:00 PM

10 Various Benefit Plans: What Qualifies & How to Administer

Bill Singer, Senior Sales Representative, AT Group

This session will review: Flex / Cafeteria Plans; Health Savings Accounts; Health Reimbursement Accounts; and Voluntary Employees Beneficiary Association Plan (VEBA's). For each of the above points the presenter will be talking from a non-legal and non-technical practical application point of view. He will review the mechanics of how these plans work, why a group would (or would not) want to implement them and touch on some of the rules and regulations associated with each of them.

11 OSHA INSPECTIONS: The Do's and Don'ts

Kurt Rothwell, Safety Coordinator with the Minnesota Municipal Utilities Association & Safety Assistance Program Coordinator working with the League of Minnesota Cities Regional Safety Programs

Being courteous, polite and professional when MN OSHA drops in for an inspection can be beneficial, but that is just the beginning. This session will explain the process of an OSHA visit and give you a comprehensive plan of what to expect from them. At this training, we will look at past inspections and what violations were found while discussing some pictures of safety violations from Mock OSHA Inspections. Being prepared will cost you pennies to mediate versus thousands of dollars in written citations if you haven't done your homework. Lastly, we will explore the possibilities of whether or not you should contest the inspection report or just pay the fine – the pros and cons of the situation.

12 Redistricting: What You Need to Know

Brad Neuhauser, GIS Specialist, & Gary Poser, Director of Elections, Office of the Minnesota Secretary of State

Participating Moderator: Tom Ferber, Bloomington City Clerk

Attendees will learn about the overall redistricting process, with a focus on statutory requirements and timelines for redistricting city wards and establishing precincts. Other topics will include the history of redistricting in Minnesota, information about the Census data used for redistricting, and a look at redistricting principles.

13 Are H.R. Policies Anchors or Oars for Our Cities?

James Laumeyer, Principal, Laumeyer HR Solutions

This presentation will illustrate the dynamic and significant changes in the workplace and with the workforce. The argument will be supported that current policies and/or "the Manual" are outdated and in many ways barriers to employee retention, productivity and satisfaction. Content will focus on: understanding the changing world of work; the realization that HR policies have generally been carried from the 1950s without significant review or revision and include a discussion of the implications and objectives of the policies to include legal and cultural issues.

14 Implementing Technology Accessibility Standards

Rena Rogers, Project Management Specialist, Minnesota Office of Enterprise Technology

For the past year and a half the Technology Accessibility Standards Implementation project has been underway. Accessibility standards have been adopted into the State architecture and cross-agency workgroups led by OET and Dept of Administration staff have been working on tools and training needed for implementation. This session will provide and update on what has been accomplished and what's to come.

Concurrent Sessions

Concurrent Sessions IV:
Thursday, 11:00-12:15 PM

15 Preparing for Your Retirement-PERA and More

(this session will be 90 minutes)

Carol Mladek, Educational Representative, PERA and Mary Kusske, CFP & President, Kusske Financial

No matter what age you are today, you should learn more about retirement. Attend this session to hear everything you need to know about PERA; including contributions, building service credits, pension calculations and options, applications procedures, disability, survivor benefits and more. Mary brings her 25 years of experience in providing financial advice and addresses issues that everyone needs to understand as they prepare for their retirement.

16 Managing a Budget in Tough Economic Times

Dan Jordet, Brooklyn Center Finance Director

Budgeting for operations can be challenging in the best of times. When the task of allocating dollars meets the realities of limited or shrinking resources in the face of increasing service expectations the task can seem monumental. Bringing that task back down to a manageable size requires a fresh perspective and focus on basic community needs. Stepping back to take what we already know about our communities and incorporating it into the process of budgeting and financial planning can pay huge dividends. *Real world* examples help clarify ideas and point toward workable solutions.

17 Records Retention Applied to Electronic Content

Patrick Welsch, President, Cities Digital, Inc.

As cities implement document management and content management systems many overlook how records retention and email management come into play. This session will cover how implementing document management and records retention can potentially reduce FOIA requests and protect against subpoena liability. See how email can be effectively archived and be made ready for e-discovery requests. Discuss what mediums are next.

18 Preparing for Disasters

Phillip Hansen, Chief Executive Officer, American Red Cross, Twin Cities Area Chapter; John Moore, Disaster Recovery Coordinator, Minnesota Homeland Security and Emergency Management; & Bradley Swenson II, Wadena City Administrator

From the tornado that destroyed much of Wadena, to floods that raised havoc on many communities in the southeastern Minnesota, cities dealt with an many natural disasters in 2010. History shows communities that best cope with and recover from disasters have done advance planning AND know who to call for help! This session will discuss all four stages of disaster management: advance planning (resources available, who must be your community players, developing a game plan); the event (communicating with the public, coordinating with other agencies, working with the media, using volunteers, assisting survivors); recovery (clean-up, re-building, tapping financial resources), and long-term effects on citizens and staff.

19 Roundtables for Small Cities (pop. under 5,000) – Part 1

Roundtable discussions are back! The Conference Planning Committee heard the feedback from previous participants and decided to expand this valuable discussion opportunity to two full sessions (19 & 24) to allow more people to participate. Through facilitated discussion with peers from same-size cities, discover similar issues, possible solutions to problems and trade tools/techniques to use "back home." Attend either session — or both.

Concurrent Sessions V:
Thursday, 1:45-3:00 PM

20 Move More, Eat Better, Groove at Work! www.do-groove.com

Linda M Pellowski, Worksite Wellness Consultant, Center for Prevention BlueCross BlueShield of Minnesota

Let's talk about easy ways to build in more activity and better eating naturally into your day. We will share a few do. stories and highlight ways to help you achieve your personal health goals. Why stop there? We will also touch on the notion of what a healthier workplace culture can mean for you, your fellow employees and your organization's bottom line. No cost ways to improve the culture can positively impact everyone's health and wellness.

21 Federal Health Care Reform: Impact on Cities

Jean Heinrichs, Member Services/Wellness Coordinator, Northwest Service Cooperative; & Daniel Weir, Consultant, Northwest Service Cooperative Insurance

Federal Health Care Reform will be an evolving process. This session will help attendees become informed about some of the new and upcoming health insurance plan changes and review employee communication of plan changes and creditable coverage notification. The changes include: unlimited lifetime limits, preventative care coverage, employers benefit contribution to W-2's, health care exchanges, new wellness initiatives and eligible dependants coverage to age 26.

22 Liquor Licensing

C. Mike Polla & Scott Mueller, Special Investigators, Alcohol & Gambling Enforcement Division, Minnesota Department of Public Safety

This year the ever popular "liquor licensing" session will include the items City Clerks don't handle every day including: What IS a restaurant and why is this important to know; wine licenses—strong beer; special events and festivals; temporary licenses; city owned buildings; caterers; Sunday liquor; 2011 Insurance; and other new items.

23 Social Insecurity: To "Friend" or Not to "Friend"

Corrine Heine & Melissa Manderschied, Attorneys, Kennedy & Graven

Social media is setting the new trend for delivering and receiving news — personal and professional. No city wants to be left behind, and no city wants the equivalent of a Michael Phelps or Miley Cyrus bong-smoking video. This session will address some of the common issues cities face with social media including: policies regarding city social media use, policies on employee social media use, compliance with record retention and data practices laws and the good, the bad and the ugly on social media use

24 Roundtables for Small Cities (pop. under 5,000) – Part 2

Roundtable discussions are back! The Conference Planning Committee heard the feedback from previous participants and decided to expand this valuable discussion opportunity to two full sessions (19 & 24) to allow more people to participate. Through facilitated discussion with peers from same-size cities, discover similar issues, possible solutions to problems and trade tools/techniques to use "back home." Attend either session — or both

The preferred registration method is online at: www.mngts.org/MCFOA
Registering online simplifies the registration process. You will be able to print or email a bill or receipt. It will allow group registrations, and gives you all of the options of the paper form. Payment methods include credit card, purchase order and mailed-in check. The form below is only for those who cannot register online.

MCFOA 2011 Conference Registration Form

Please print your name as you would like it to appear on your name badge!

E-mail:(REQUIRED) _____

First Name: _____

Last Name: _____

Title _____

City Affiliation: _____

Street Address: _____

City: _____

State: _____ Zip: _____

Daytime Phone: (_____) _____

CONFERENCE REGISTRATION (3/16-3/18):

☐ **MCFOA MEMBER**
- ☐ Early Bird Special - $200/person (postmarked by 2/11/11)
- ☐ Regular - $220/person (postmarked after 2/11/11)

☐ **NON-MCFOA MEMBER**
- ☐ Early Bird Special - $250/person (postmarked by 2/11/11)
- ☐ Regular - $270/person (postmarked after 2/11/11)

☐ **FIRST TIME ATTENDEE**
- ☐ $180/person for MCFOA members
- ☐ $235/person for non-MCFOA members

☐ **RETIRED MCFOA MEMBER** - $120/person

OPTIONAL TUESDAY WORKSHOP (CHOOSE ONE):

☐ **Advanced Excel**

☐ **Publisher 2007**
- ☐ $45/person
- ☐ $60/person (if not attending the rest of the conference)
  - ☐ I cannot bring a laptop and request one be provided.
    You will be notified if this request cannot be accommodated.

OTHER:

☐ **Additional Banquet Tickets** (Thurs. evening - $30 each) #_____
(One ticket is included in full conference registration fee.)

AMOUNT DUE:

Conference	$_____
Optional Tuesday Workshop	$_____
Extra Banquet Tickets (#_____)	$_____
TOTAL	$_____

Please indicate the approximate population of your jurisdiction.
- ☐ under 500
- ☐ 500 to 1,000
- ☐ 1,001 to 2,500
- ☐ 2,501 to 5,000
- ☐ over 5,000

SESSION OPTIONS: To assist in assigning breakout sessions to appropriate-sized rooms, please indicate below which sessions you plan to attend on Wednesday and Thursday.

Weds. 10:45 AM	1	2	3	4	
Weds. 1:15 PM	5	6	7	8	9
Weds. 2:45 PM	10	11	12	13	14
Thurs. 11:00 AM	15	16	17	18	19
Thurs. 1:45 PM	20	21	22	23	24

SPECIAL OPTIONS: (check all that apply)

☐ I would like to receive CEU credit.
Social Security #:_____
(Social Security # MUST be included to receive credit.)

☐ I have a dietary or special need. _____
Please contact me at: _____
(circle one: Voice or TTY)
(Must be received by February 21, 2011.)

☐ I will be retiring before the 2012 Conference.

PAYMENT OPTIONS:

☐ Check is enclosed (payable to GTS).
Check #_____
in the amount of $ _____

☐ Bill at this email address: _____
If payment is not received by the start of the Conference you will be billed with a $20 service charge added to amount due.
P.O. # _____ (if applicable)

☐ Credit Card
Circle one: Visa Mastercard Discover AmExpress
Card #: _____
Card Security Code: _____
Exp. Date: _____
Cardholder Name:_____
Email address for receipt: _____

Registration Instructions

Please return completed form by **March 2, 2011**:

MAIL: GTS Educational Events
2233 University Avenue W. Suite 150
St. Paul, MN 55114

or

FAX: GTS at 651-223-5307

For registration questions contact:
Catherine Dubbe (cdubbe@mngts.org)
651-222-7409 extension 200

11B

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RISK MANAGEMENT INFORMATION

ACCIDENT COVERAGE FOR CITY VOLUNTEERS

Cities that elect optional accident coverage for city volunteers will provide a benefit for almost all city volunteers if those volunteers sustain an injury while doing work at the direction of the city. This memo explains volunteer accident coverage, rates, benefits, and options.

Who is Covered?

This coverage automatically covers on a blanket basis almost all city volunteers who work under the city's direction and control. Examples of volunteers covered under the policy include coaches and instructors in recreation programs, volunteers working on a city-sponsored festival or celebration, volunteers working on city construction and demolition projects, "clean-up day" volunteers, etc.

Also included are volunteer members of advisory boards or committees that do not exercise independent decision-making authority.

Who is Not Covered?

Most city volunteers will be automatically covered when the city chooses this coverage option. However, there are certain volunteers that are defined as "employees" by Minnesota's workers' compensation statute and are therefore not covered under this policy. Volunteers covered by workers' compensation include:

- Volunteer firefighters.
- Ambulance attendants.
- First responders.
- Law enforcement assistance volunteers.
- Emergency management volunteers.

Since these volunteers already are protected by workers' compensation, they are not covered through LMCIT's optional accident coverage.

Learn More

More on coverage options for councils and commissions is in:

- *Workers' Compensation Coverage for City Officers*

It's available at www.lmc.org

In addition, the workers' compensation law gives cities the option to extend workers' compensation coverage to city officers such as elected and appointed officials, including members of the city council and members of boards or committees exercising some level of independent decision-making authority. To include council or other city board members under workers'

compensation, the city must pass an ordinance or resolution to that effect. Since these volunteers are eligible for coverage under workers' compensation, they are not covered in the volunteer accident policy.

Benefits for an Injured Volunteer

The plan provides three basic benefits to covered volunteers: disability benefit, death benefit, and impairment benefit.

Disability Benefit

A volunteer who is unable to engage in the activities of his/her normal occupation because of an injury suffered while performing volunteer services for the city will receive a disability benefit of $400/week for up to 26 weeks.

Death Benefit

If a volunteer dies as a result of an injury suffered while performing volunteer services for the city, a death benefit of $100,000 is paid to the volunteer's survivors or estate.

Impairment Benefit

If a volunteer suffers a permanent impairment or disability as a result of an injury suffered while performing volunteer services for the city, the volunteer will receive a lump sum payment as compensation for that impairment. Payments are based on the percentage of disability, ranging from $750 for a 1 percent disability to $100,000 for 100 percent disability. The percentage of disability is determined in the same manner used for impairment compensation in the workers' compensation system.

Optional Benefit

The city can add optional coverage for as much as $1,000 of medical costs. This limited medical coverage is intended to pick up relatively minor first aid costs. On more serious injuries, it could also be applied to the costs that the individual would otherwise have to bear under his/her own health coverage's deductible or co-pay provisions.

Amount of Volunteer Accident Coverage

The cost is based on the city's population, and is broken down as follows:

ANNUAL TOTAL PREMIUM $159.50

- The basic charge is $.075 per capita, subject to a minimum premium of $110 and a maximum premium of $1,100. → 49.50
- The additional cost to add optional medical coverage is 45 percent of the basic premium.

The expiration date of this coverage is coordinated with the city's LMCIT workers' compensation coverage. For cities that add this coverage mid-term, the initial premium will be pro-rated.

Coverage for Volunteer Members of City Boards and Committees Only

If you only want to cover the volunteer members of city boards or committees and not all other city volunteers, you can do so at a charge of $8.50 per person.

Volunteer Accident Coverage--Aren't Volunteers Injuries Already Covered?

Not necessarily. An injury to a volunteer would be covered by the LMCIT liability coverage only if the city was legally liable for that injury – for instance, if an injury was caused by some negligence by the city, a city officer, employee or another city volunteer.

As with any other tort claim, however, the city would not be liable for an injury to a volunteer if the volunteer him/herself were more at fault than the city, or if the injury were simply an accident that really wasn't anyone's fault. For example, a volunteer coach being hit in the head by a batted baseball might be an example of an injury caused simply by accident that isn't anyone's fault.

Highlight

The volunteer accident coverage protects the volunteer on a "no-fault" basis. Benefits automatically are payable if the injury occurs while the volunteer is performing services for the city, regardless of fault.

In addition, no-fault benefits also could help avoid litigation in cases where fault lies with the city for injury to a city officer, employee or volunteer. The injured person can receive these benefits without being in an adversarial position against the city.

Of course, if the volunteer's injuries exceeded the benefits paid under this coverage and the injury was due to city negligence, the volunteer still would be able to make a tort claim against the city for those excess damages.

Voluntary Workers' Compensation Endorsement

The LMCIT Board chose this approach for several reasons, including because it is:

- Substantially less expensive to provide than it is to provide workers' compensation benefits. That's the case because of the more limited scope of benefits provided.
- Easier for a city to administer this coverage because the city doesn't have to keep records of how many hours were worked by how many volunteers, etc.
- Less risky for LMCIT and for LMCIT's other members because it eliminates the problem of determining what the appropriate indemnity rate is for an unpaid volunteer.

Your LMC Resources

If you have questions, contact any of the following:

Barb Meyer, LMCIT Underwriter
(651) 215-4173
bmeyer@lmc.org

Liam Biever, LMCIT Underwriter
(651) 281-1212
lbiever@lmc.org

Obtain a Quote

Please complete the attached application and return to LMCIT.

Pete Tritz 12/10

Thatcher

Thatcher Engineering, Inc.
3055 Old Highway 8, Suite 103
Minneapolis, MN 55418
p 612 781 2188 f 612 781 2241
www.thatcher-eng.com

DRAFT

December 13, 2010

City of Birchwood Village
730 Birchwood Avenue
White Bear Lake, MN 55110

Re: Review of the Proposed Construction of Eight Sump Catch Basins

Dear Mayor and City Council:

In accordance with your request, Thatcher Engineering Inc. ("TEI") prepared this report based on our findings as described below. TEI understands that the City is considering the proposed construction of eight sump catch basins ("Project"). The City's goal is to protect the public health, safety and welfare and to protect and maintain the environment. The City's surface water management goals, policies, standards and planned actions are included in the City's 2010 Comprehensive Plan ("Plan") and the City has developed a Storm Water Pollution Prevention Plan to comply with the United States Environmental Protection Agency ("EPA") National Pollution Discharge Elimination System ("NPDES") Municipal Separate Storm Sewer System ("MS4") permit requirements. The goal of this Project is to protect and maintain White Bear Lake ("WBL") water quality. Preliminary plans, final plans, storm water calculations and designs have not been completed. The City has not adopted design standards. The location of the proposed sump catch basins ("PCB") are as follows:

1. PCB 1 is located at the intersection of Wildwood Avenue and Elm Easement and is PCB 1 in the City's grant application to Rice Creek Watershed District ("RCWD"). The existing catch basin ("CB") at this location is shown as CB 9 on the City's storm sewer map.

2. PCB 2 is located on Wildwood Avenue between Ash Easement and Birch Easement and is shown as PCB 2 in the City's grant application to RCWD. No CB currently exists at this location.

3. PCB 3 is located at the intersection of Birchwood Lane and East County Line Road and is shown as PCB 3 in the City's grant application to RCWD. The existing CB at this location is not shown on the City's storm sewer map.

4. PCB 4 is located on Cedar Street between Hall Avenue and Wildwood Avenue. The existing CB at this location is shown as CB 13 on the City's storm sewer map.

5. PCB 5 is located at the east end of Grotto Street right-of-way directly adjacent to Tighe-Schmitz Park. The existing CB near this location is shown as CB 23 on the storm sewer

map and is part of the Priebe Lake Outfall storm sewer which outlets to Hall's Marsh. TEI understands that PCB 5 is proposed to be in addition to CB 23 and that CB 23 will not be removed or replaced with PCB 5.

6. PCB 6 is located in the cul-de-sac at the south end of Jay Street. The existing CB at this location is shown as CB 30 on the City's storm sewer map.

7. PCB 7 is located in the cul-de-sac at the west end of White Pine Lane directly adjacent to Nording Park. The existing CB at this location is shown as CB 32 on the City's storm sewer map. There is an existing CB in this park that is not shown on the City's storm sewer map that is connected to the Priebe Lake Outfall storm sewer pipe which outlets to Hall's Marsh (only part of this pipe is shown on the City's storm sewer map).

8. PCB 8 is located in the cul-de-sac at the west end of Oakridge Drive. There are two existing CB at this location. They are shown as CB 33 and CB 34 on the City's storm sewer map.

TEI understands that stormwater runoff entering PCB 8 flows downstream to a stormwater pond located in the City of White Bear Lake ("City of WBL"). City of WBL wants the City of Birchwood Village ("City") to pay $1,000.00 every three years to City of WBL for sediment removal. TEI personnel observed that sediment is being removed by a wood baffle on the storm sewer outlet from Oakridge Drive that the City installed in 2002, and very little, if any, City sediment is getting to the WBL pond.

TEI also understands that the City's existing maintenance plan includes inspection of sump CB in the spring and fall of each year and removing sediment when it has reached 60% of the sump capacity. This occurs when the distance from the bottom of the outlet pipe to the top level of any sediment in the CB is 19-inches (40% x 48-inch depth of each sump. [The depth of sediment in the sump at 60% capacity is 29-inches (60% of 48-inches).) The plan (foot print) area of each existing CB is 12.6 square feet based on a 4-feet diameter CB. The volume of sediment in a sump when removal is required is 1.13-cubic yards.]

The person performing the inspection submits a report that includes the following:

1. Condition of the structure and any maintenance needed.
2. Distance from the bottom of the outlet pipe to the top level of any sediment in the CB.
3. Determination whether or not cleaning (sediment removal) is required.
4. If cleaning is required, date of cleaning and volume of sediment removed in cubic yards.

DOCUMENTS

TEI observed the existing catch basins on November 9, 2010 and reviewed and analyzed the following documents ("Documents"):

1. City's 2009 Catch Basin Replacement Project Application ("Application") to Rice Creek Watershed District ("RCWD"). This Application included the following:
    a. Rice Creek Watershed District 2009 Urban Stormwater Remediation Cost-Sharing Program Application Form consisting of two pages not signed or dated.
    b. Exhibit titled "City of Birchwood Village - 2009 Catch Basin Project" consisting of one page not signed or dated.
    c. Report titled "City of Birchwood Village - Rice Creek Watershed District's Urban Stormwater Remediation Cost-Sharing Program Application" consisting of three pages not signed or dated.
2. Memo from Houston Engineering, Inc. ("HEI") to Kyle Axtell, Water Resource Specialist of RCWD, consisting of three pages signed and dated September 16, 2009.
3. Letter from Doug Thomas, Administrator of RCWD, to City of Birchwood Village consisting of one page signed and dated September 18, 2009.
4. City's Sump Inspection Report consisting of one page signed and dated April 24, 2010.
5. City's Sump Inspection Report consisting of one page signed and dated November 6, 2010.
6. Relevant pages of the City's 2010 Comprehensive Plan ("Plan"), which are pages 10, 11, 12, 17, 18, 19, and 20, not signed or dated.
7. City's storm sewer map not signed or dated.
8. Topographic map not signed. The information is from Washington County by way of Howard R. Green in 2004.
9. Birchwood Rain garden Analysis and Recommendations prepared by Emmons & Oliver Resources ("EOR") in accordance with a RCWD request to investigate the Birchwood Village Rain garden located at the intersection of Wildwood Avenue and Birchwood Street not signed or dated.
10. City's Storm Water Pollution Prevention Plan ("SWPPP"), consisting of 49 pages, dated April, 25, 2008 and not signed.

BACKGROUND LITERATURE

TEI reviewed background literature from the Environmental Protection Agency ("EPA"), Minnesota Pollution Control Agency ("MPCA"), and the Rice Creek Watershed District ("RCWD") to assist with the recommendations of this report. The literature provides additional detail and is included in the Appendix to this report.

Important excerpts from the EPA literature include:

1. Catch basins have three major limitations:

    1. Even ideally designed CBs cannot remove pollutants as well as structural stormwater management practices, such as wet ponds, sand filters, and stormwater wetlands.
    2. Unless frequently maintained, can become a source of pollutants through resuspension.
    3. CBs cannot effectively remove soluble pollutants or fine particles.

2. Performance of catch basins is related to the volume in the sump (i.e., the storage in the catch basin below the outlet pipe). Lager *et al.* (1997) described an "optimal" catch basin sizing criterion, which relates all catch basin dimensions to the diameter of the outlet pipe (D) as follows:

    a. The diameter of the catch basin should be equal to 4D.
    b. The sump depth should be at least 4D. This depth should be increased if cleaning is infrequent or if the area draining to the catch basin has high sediment loads.
    c. The top of the outlet pipe should be 1.5 D from the bottom of the inlet to the catch basin.

3. Bioretention areas are among the most effective stormwater management practices at removing stormwater pollutants.

BACKGROUND - CITY STANDARDS

Numerous cities have design and construction standards ("City Standards") regarding catch basins ("CBs") and other infrastructure. Typical City Standards for catch basins are as follows:

1. Minimum depth (distance from top of the CB to the invert of any storm sewer pipe) of 3.5 to 4.0-feet. The purpose is to minimize damage to the CB and pipe due to frost heave.
2. Locate CB in street gutter. The purpose is to minimize flooding caused by snow banks from snow plowing. If the snow bank is between the street gutter and a CB located away from the street, stormwater runoff (especially spring snow melt) can be blocked by the ice and snow in the snow bank.

ANALYSIS OF DOCUMENTS

TEI's analysis of the Documents is as follows:

1. **Document #1 - City's 2009 Catch Basin Replacement Project Application ("Application") to Rice Creek Watershed District ("RCWD")** shows the following:
    a. Project name: "2009 Catch Basin Replacement Project"
    b. Project estimated start date: Summer 2009
    c. Project estimated completion date: September 2009
    d. Purpose: Improve the quality of stormwater runoff discharging into White Bear Lake.
    e. Location of 3 catch basins proposed to be replaced which are as follows:
        i. Catch basin #1 located at the intersection of Wildwood Avenue and Elm easement (PCB 1 in this report).
        ii. Catch basin #2 located on Wildwood Avenue between Ash easement and Birch easement (PCB 2 in this report).
        iii. Catch basin #3 located at the intersection of Birchwood Lane and East County Line Road (PCB 3 in this report).

f. Performance: Each sump CB is estimated to remove 25% of the Total Suspended Solids ("TSS") and 10 % of Total Phosphorus ("TP") based on MassHighway Storm Water Handbook.
g. CB size: Cross section of proposed CB with 4-foot deep sump. The diameter, plan (foot print) area or volume of the catch basin is not provided. The proposed CB is impervious which does not allow stormwater in the sump to leave the CB and infiltrate into the ground between rainfall events. The ability to infiltrate will enhance the CB performance). The proposed CB also does not include a hooded outlet to prevent floatable materials and trash from entering the storm drain system in accordance with EPA recommendations. A hooded outlet can enhance CB performance.
h. Detailed Cost Estimate (including overhead):

i. CB 1 removal and replacement	$6,250.00
ii. CB 2 installation (no existing CB at this location)	$9,375.00
iii. CB 3 removal and replacement	$9,375.00
iv. Estimated Total Cost	$25,000.00

i. City's funding contribution: $12,500.00.
j. RCWD funding request: $12,500.00.

2. **Document #2 - Memo from Houston Engineering, Inc. ("HEI") to Kyle Axtell, Water Resource Specialist of RCWD dated September 16, 2009** shows the following:
   a. White Bear Lake ("WBL") is classified as a Tier 1 lake by RCWD. Tier 1 lakes consistently support swimming use.
   b. Cursory review of the Application including estimated performance of PCB 1, 2 and 3 utilizing the P8 model.
   c. The model shows that the addition of sump CB 1, 2 and 3 will result in a reduction in TSS load. The model shows that estimated TSS removal rates for the proposed CBs are lower than typically reported in literature, probably due to the relatively large drainage area to each CB.
   d. City inspection reports for the Elm CB indicate that the actual sediment volume removed from August 7, 2008 to May 20, 2009 (9-months) was 0.5-cubic yards. Discrepancies between the actual sediment volume removed and the P8 model maybe due to either inaccuracy in field measurements or to inaccuracies of the water quality model.
   e. TP loading to White Bear Lake will not be significantly reduced by the addition of the sump CB, but that is not surprising since sump CB cannot effectively remove soluble pollutants or fine particles.
   f. The expected costs and the computed removal costs per pound fall within the general range of BMP costs in urban landscapes.
   g. Annual maintenance including cleaning cost is not included in the above costs.

3. **Document #3 - Letter from Doug Thomas, Administrator of RCWD, to City of Birchwood Village dated September 18, 2009** shows that RCWD approved up to $12,500.00 in RCWD funding for CB 1, 2 and 3, the Cost-Share Agreement between the City and RCWD was executed on June 19, 2009, RCWD intends to move forward with

the current cost-share agreement unless otherwise directed by the City, and the Cost-Share Agreement is valid through June 19, 2011.

4. **Document #4 - City's Sump Inspection Report dated April 24, 2010** shows the distance from the bottom of the outlet pipe to the top level of sediment in each of the City's 7 existing sump CB on April 24, 2010.

5. **Document #5 - City's Sump Inspection Report dated November 6, 2010** shows the distance from the bottom of the outlet pipe to the top level of sediment in each of the City's 7 existing sump CB on November 6, 2010 and the change from the reading on April 24, 2010 (about 6-months). There are three math errors in the column labeled "change from previous reading." The Report states that the change for CB identification ("ID") numbers are 10, 11 and 13 is +2, +24 and + 12, respectively. The correct change is +20, +23 and + 14, respectively. Actual sump CB performance including the ID, location, corrected change from the April 24, 2010 reading, actual sediment volume removed, estimated time to reach capacity and estimated cleaning frequency are provided in Table 1 below.

Table 1 – Actual Sump CB Performance

CB ID	CB Location	Change (inches)	Volume Retained (cubic-yards)	Estimated Time to Required Sediment Removal* (years)	Estimated Cleaning Frequency (times per years)
4	West of Birch Easement	3	0.12	4.7	once every 4.5 years
5	At Birch Easement	4	0.15	3.7	once every 3.5 years
10	East of Elm Easement	20	0.78	0.7	twice a year
11	At Elm Easement	23	0.89	0.6	twice a year
13	Cedar Street and Hall Avenue	14	0.54	1.0	once a year
15	North end of Tighe Schmitz	0	0.00	not a meaningfull number	never
20	West side of Grotto Street and Wildwood	0	0.00	not a meaningfull number	never
	* Sediment removal (cleaning) is required when sump contains 1.13-cubic yards				

Note: CB 15 contained 22-inches of sediment on April 24, 2010 and no additional sediment on November 6, 2010. No sediment accumulated since its construction 2008 through the fall of 2009. The source of the sediment appears to be an adjacent house construction site with failed erosion control measures. House construction appeared to be largely completed prior to April 24, 2010. The sump removed sediment during construction because either the contractor failed to maintain erosion control measures at the construction site and/or because of lack of enforcement of construction site erosion control requirements, but none after construction was completed.

Two of the seven existing sump CBs (ID #15 and 20) failed to retain any additional sediment in the time period between inspection reports. Based on EPA Standards for sump CB design and information in the Documents, the sumps failure to retain sediment

maybe due to either improper design or the stormwater runoff entering the sump did not contain sediment. The required volume of CB 15 sump according to EPA Standards is 6.3-cubic yards and the actual volume is 1.86-cubic yards (required volume is 3.4 times larger than the actual volume). The required volume of CB 20 sump according to EPA Standards is 34.2-cubic yards and the actual volume is 1.86-cubic yards (required volume is 18.4 times larger than the actual volume). Thus the volume of each of these sump CBs is significantly undersized. There is insufficient information available at this time to determine if these two sumps meet the other EPA Standard for sump CBs which is that "the top of the outlet pipe should be 1.5 D from the bottom of the inlet to the catch basin." There is insufficient information available at this time to determine if the volume of the other five existing sump CBs meet EPA Standards.

6. **Document #6 - City's 2010 Comprehensive Plan ("Plan")** shows the City's surface water management goals, policies, standards, planned actions, and inventory including the following:
    a. Policy: Implement RCWD Watershed Management Plan (The City Local Surface Water Management Plan was approved by RCWD on June 27, 2001), implement EPA National Pollution Discharge Elimination System ("NPDES") Stormwater Pollution Prevention Plans ("SWPPP") Best Management Practices ("BMP") and implement a stormwater monitoring program including monitoring sump CBs, rain gardens, concrete cable swales, and other measures for high levels of sediment and cleaning as needed.
    b. General standards: When possible, existing natural drainage ways, wetlands and vegetated soil surfaces must be used to convey, store, filter, and retain stormwater runoff before discharging to public waters. All new storm sewers will be designed and maintained in accordance with the requirements of RCWD.
    c. Planned actions: "In order to capture rainwater, pollutants and silt, sumps are being added to the City. These sumps will trap some or all of the silt, etc., before the rainwater goes into the lake." There are about 12 CBs that could be reconstructed at an estimated cost of $5,000.00 per CB and the City will complete a minimum of three CBs reconstructions with each project. Where feasible, nutrients in runoff will be leached out using natural methods such as passing it through a wetland or grassy area before runoff enters White Bear Lake. This is similar in manner to the Priebe Lake Outfall, which uses Hall's Marsh for that purpose.
    d. Inventory: In the early 1980's, RCWD installed a storm sewer pipe from Priebe Lake (located in the City of White Bear Lake) through the City of Birchwood, to Hall's Marsh (a.k.a. "Priebe Lake Outfall Project"). In 2002, the City installed a wood baffle on the storm sewer outlet from Oakridge Drive which was designed to reduce stormwater velocity at the outlet. This stormwater flows downstream in a swale along property lines of homes in the City of White Bear Lake ("WBL") to a stormwater pond in WBL. Three years later, a permanent erosion control blanket was installed in the swale. In 2004, the City installed a rain garden in Birchwood Easement. This rain garden needs to be reconstructed due to heavy sediment loading and other reasons at an estimated cost of $7,500.00. In 2006, the City installed a concrete cable swale (a.k.a. semi pervious concrete blanket) in Birch Easement west of Wildwood Avenue that is designed to remove sediment

from stormwater runoff. In 2007, the City replaced three existing CBs with sump CBs in Wildwood Avenue and Elm Easement. In 2007, in Tinghe-Schmitz Park (2.5 acres) a rain garden adjacent to the picnic area was installed.

e. Nordling Park (1.3 Acres) is a wooded area with walking paths and serves as a temporary stormwater ponding area. Based on a site visit, this ponding area appears to function as a Dry Detention Pond and, an existing CB in this park is not shown on the storm sewer map. This CB was installed as part of the Priebe Lake Outfall Project.
f. Lake easements (1.2 acres) are City owned and associations exist for City residents who pay a fee for erection and maintenance of docks.
g. Hall's Marsh (6.6 acres) is a dedicated nature preserve.

7. **Document #7 - City's storm sewer map** shows the City's storm sewers including storm sewer pipe diameter, catch basin structure number, and location of 6 existing sump CBs. This Document does not show the CB at Cedar Street and Hall Avenue as an existing sump CB. However, Documents 4 and 5 show it as an existing sump CB.

8. **Document #8 - Topographic map** shows a topographic map of the City.

9. **Document #9 - Birchwood Rain garden Analysis and Recommendations** shows the following regarding the Birch Easement rain garden:
   a. The rain garden is trapping sediment and filtering pollutant loaded runoff that was previously emptied directly into White Bear Lake. However, because of lack of sediment removal from two upstream sump CBs, it is the only operating treatment facility serving the watershed and is being overwhelmed by its functional responsibilities and its aesthetic appeal is being sacrificed.
   b. An important distinction is that while the facility is titled rain garden, it is functioning more as a vegetated swale or stormwater wetland. Infiltration of stormwater runoff to remove pollutant load is insignificant because of its position in the landscape, the underlying soils, and proximity to groundwater. The rain garden still has a lot of value as a filtration device, but will likely have standing water in the forebay for a much longer period than a true rain garden.
   c. Two major issues identified are excessive sediment loading and annuals and weeds are out competing desired plant species.
   d. Opportunities to reduce the excessive sediment loading were presented including the following:
      i. Identifying and fixing sources of erosion in the watershed is the first step.
      ii. Proper sizing of sump CBs. The recommended volume of the sump should be 4 times the diameter of the outlet pipe for the most efficient removal of sediment (Lager *et al.*, 1977). Further investigation would be required to determine if the sump CBs are properly sized.
      iii. CB sumps can capture sediments up to 60% of the sump volume before they begin to lose effectiveness (Pitt, 1985).

iv. If properly maintained, CB sumps have been shown to remove 60-97% of Total Suspended Solids ("TSS"), 10-56% Chemical Oxygen Demand, and 54-88% Biological Oxygen Demand (Aronson *et al.*, 1983).
v. Modifications to the rain garden to further protect the facility from sediment and allow easier maintenance.

e. Opportunities to reduce excessive annuals and weeds were presented including the following:
i. Increase solar exposure by selectively thinning the overhead canopy.
ii. Decrease the amount of sediment fed to this rain garden.
iii. Change to woody shrub species such as Viburnums, Dogwoods, Winterberry and Black Chokeberry.
iv. Simplify the planting to reduce maintenance costs.

f. The opportunities if implemented can enhance the performance of the already effective rain garden.

10. **Document #10 - Storm Water Pollution Prevention Plan,** is the City's Storm Water Pollution Prevention Plan which was developed to comply with the United States Environmental Protection Agency ("EPA") National Pollution Discharge Elimination System ("NPDES") Municipal Separate Storm Sewer System ("MS4") permit requirements.

ANALYSIS OF THE PROJECT

TEI's analysis of the proposed construction of eight sump catch basins ("Project") is as follows:

1. **The construction of PCB 1 at the intersection of Wildwood Avenue and Elm Easement** to replace existing CB 9 does not adequately meet the City's goal which is protect and maintain WBL water quality, by sediment (TSS) and nutrient (TP) removal, at a reasonable cost for the following reasons:
   a. Total phosphorus (TP) will not be significantly reduced by PCB 1 (see Document 2) because a sump CB cannot effectively remove soluble pollutants or fine particles. Better alternatives to reduce TP are rain gardens or infiltration.
   b. There are already two sump CBs (10 and 11) in the immediate area of existing CB 9 that are removing sediment in this area. PCB 1 might remove some more sediment than existing CB 9, but it is still not removing TP.
   c. Actual performance of sump CBs in the City is unclear. Data indicates that some of the City's existing sump CBs remove no sediment, even though the P8 model predicts that they will do so (Document 2).

   The City has the following alternatives:
   a. Alternative 1 – Install PCB 1 as proposed by Elfering & Associates (Elfering Estimated Total Cost $6,250.00).
   b. Alternative 2 - Do not install PCB 1 now and:
      i. Continue inspections of existing sump CBs to document their performance.

ii. Investigate what type of rain garden and/or infiltration would be appropriate to remove sediment and TP given the specific soil conditions and available space in this area.
iii. Consider installing a rain garden in a small part of Wildwood Park which is adjacent to this PCB.
iv. Ask RCWD if the grant funds already awarded can be used for reconstructing the existing rain garden.
v. Consider installing PCB 1 when the street needs to be replaced.

c. The advantage of Alternative 1 is that some more sediment would likely be removed with the PCB 1, but the disadvantages are (1) it is very expensive considering the minimal improvement in sediment removal and no improvement in nutrient removal and (2) it is premature because it is not yet known what methods to remove mercury will be recommended by the mercury study.
d. The advantages of Alternative 2 are (1) a rain garden and/or infiltration would remove both sediment and nutrients, (2) the City is not spending any money now on PCB 1, and could spend money more effectively on a rain garden, infiltration or mercury removal, and (3) by waiting to install PCB 1 until it replaces the street, the City saves the cost of removing and replacing a street that doesn't need to be replaced (TEI Estimated Cost now is $0 and Estimate Cost of future installation is $3,000.00).

2. **The construction of PCB 2 on Wildwood Avenue between Ash Easement and Birch Easement** where there is no existing CB does not adequately meet the City's goal which is protect and maintain WBL water quality, by sediment (TSS) and nutrient (TP) removal, at a reasonable cost for the following reasons:
   a. Total phosphorus (TP) will not be significantly reduced by PCB 2 (see Document 2) because a sump CB cannot effectively remove soluble pollutants or fine particles. Better alternatives to reduce TP are rain gardens or infiltration.
   b. Based on TEI's observations during a site visit, typical City Standards for CBs cannot be met. Specifically the following:
      i. Minimum depth (distance from top of the CB to the bottom inside of any storm sewer pipe) should be 3.5 to 4.0-feet. The purpose is to minimize damage to the CB and pipe due to frost heave.
      ii. CBs should be located in the street gutter to minimize flooding caused by snow banks from snow plowing. If the snow bank is between the street gutter and a CB located away from the street, stormwater runoff (especially spring snow melt) can be blocked by the snow bank and won't reach the CB and floods the street.
   c. Actual performance of sump CBs in the City is unclear. Data indicates that some of the City's existing sump CBs remove no sediment, even though the P8 model predicts that they will do so (Document 2).

   The City has the following alternatives:
   a. Alternative 1 – Install PCB 2 as proposed by Elfering & Associates (Elfering Estimated Total Cost $9,375.00).
   b. Alternative 2 - Do not install PCB 2 now and:

i. Continue inspections of existing sump CBs to document their performance.
ii. Investigate what type of rain garden and/or infiltration would be appropriate to remove sediment and TP given the specific soil conditions and available space in this area.
iii. Ask RCWD if the grant funds already awarded can be used for reconstructing the existing rain garden.
iv. Consider installing PCB 2 when the street needs to be replaced and at the same time piping the water to the rain garden in Birchwood Easement.

c. The advantage of Alternative 1 is that some more sediment would likely be removed with the PCB 2, but the disadvantages are (1) it is very expensive considering the minimal improvement in sediment removal and no improvement in nutrient removal and (2) it is premature because it is not yet known what methods to remove mercury will be recommended by the mercury study.
d. The advantages of Alternative 2 are (1) a rain garden and/or infiltration would remove both sediment and nutrients, (2) the City is not spending any money now on PCB 2 and could spend money more effectively spent on a rain garden, infiltration or mercury removal, and (3) by waiting to install PCB 2 until it replaces the street, the City saves the cost of removing and replacing a street that doesn't need to be replaced (TEI Estimated Cost now is $0 and Estimated Cost of future installation is $3,000).

3. **The construction of PCB 3 located at the intersection of Birchwood Lane and East County Line Road** to replace existing CB (not on the map or numbered, but near East County Line Road) does not adequately meet the City's goal which is protect and maintain WBL water quality, by sediment (TSS) and nutrient (TP) removal, at a reasonable cost for the following reasons:
   a. There is no demonstrated need for a sump CB at this location, because most of the runoff will bypass the PCB 3 due to the steep slope.
   b. Total phosphorus (TP) will not be significantly reduced by PCB 3 (see Document 2) because a sump CB cannot effectively remove soluble pollutants or fine particles. Better alternatives to reduce TP are rain gardens or infiltration.
   c. Based on TEI's observations during a site visit, stormwater runoff that enters the existing CB flows downstream into existing rip-rap pools and is treated to remove both sediment and nutrients in two pools prior to entering WBL. Ramsey County installed two rip-rap pools for sediment and rate control and turf reinforcement (stabilization) mat in East County Line Road right-of-way north of the intersection with Birchwood Lane in 2009.
   d. Due to steep topographic slope near the existing CB, most of the runoff bypasses it and enters the two pools to be treated before entering WBL. Replacement of the existing CB with PCB 3 will not change this and thus will not reduce the TSS load to WBL. This is contrary to the results predicted by the model (see Document 2) because the actual area being drained to the existing CB is much smaller than the area used in the model. There is no room to change the topography near the existing CB because it is in a driveway to a house.

The City has the following alternatives:

a. Alternative 1 – Install PCB 3 as proposed by Elfering & Associates (Elfering Estimated Total Cost $9,375.00).
b. Alternative 2 - Do not install PCB 3 and:
    i. Continue inspections of existing sump CBs to document their performance.
    ii. Investigate what type of rain garden and/or infiltration would be appropriate to remove sediment and TP given the specific soil conditions and available space in this area.
    iii. Ask RCWD if the grant funds already awarded can be used for reconstructing the existing rain garden.
c. The advantage of Alternative 1 is that some more sediment would likely be removed with the PCB 3, but the disadvantages are (1) it is very expensive considering the minimal improvement in sediment removal and no improvement in nutrient removal and (2) it is premature because it is not yet known what methods to remove mercury will be recommended by the mercury study.
d. The advantages of Alternative 2 are (1) a rain garden and/or infiltration would remove both sediment and nutrients, (2) the City is not spending money on the PCB 3 which might be more effectively spent on a rain garden, infiltration or mercury removal, and (3) by not installing PCB, the City saves the installation cost (TEI Estimated Savings $9,375.00).

4. **The construction of PCB 4 located on Cedar Street between Hall Avenue and Wildwood Avenue** to replace existing CB 13 does not adequately meet the City's goal which is protect and maintain WBL water quality, by sediment (TSS) and nutrient (TP) removal, at a reasonable cost for the following reasons:
    a. Total phosphorus (TP) will not be significantly reduced by PCB 4 (see Document 2) because a sump CB cannot effectively remove soluble pollutants or fine particles. Better alternatives to reduce TP are rain gardens or infiltration.
    b. Based on TEI's observations during a site visit, typical City Standards cannot be met. Specifically the following:
        i. Minimum depth (distance from top of the CB to the bottom inside of any storm sewer pipe) of 3.5 to 4.0-feet. The purpose is to minimize damage to the CB and pipe due to frost heave.
    c. Actual performance of sump CBs in the City is unclear. Data indicates that some of the City's existing sump CBs remove no sediment, even though the P8 model predicts that they will do so (Document 2).

The City has the following alternatives:

a. Alternative 1 – Install PCB 4 as proposed by Elfering & Associates (TEI Estimated Total Cost $9,000.00).
b. Alternative 2 - Do not install PCB 4 now and:
    i. Continue inspections of existing sump CBs to document their performance.
    ii. Investigate what type of rain garden and/or infiltration would be appropriate to remove sediment and TP given the specific soil conditions and available space in this area.
    iii. Consider installing PCB 4 when the street needs to be replaced.
c. The advantage of Alternative 1 is that some more sediment would likely be removed with the PCB 4, but the disadvantages are (1) it is very expensive considering the minimal improvement in sediment removal and no improvement in nutrient removal and (2) it is

premature because it is not yet known what methods to remove mercury will be recommended by the mercury study.

d. The advantages of Alternative 2 are (1) a rain garden and/or infiltration would remove both sediment and nutrients, (2) the City is not spending any money now on PCB 4 and could spend money more effectively spent on a rain garden, infiltration or mercury removal, and (3) by waiting to install PCB 4 until it replaces the street, the City saves the cost of removing and replacing a street that doesn't need to be replaced (TEI Estimated Cost now is $0 and Estimated Cost of future installation is $3,000.00).

5. **The construction of PCB 5 located at the east end of Grotto Street right-of-way directly adjacent to Tighe-Schmitz Park** where there is no existing CB (near CB 23) does not adequately meet the City's goal which is protect and maintain WBL water quality, by sediment (TSS) and nutrient (TP) removal, at a reasonable cost for the following reasons:
   a. There is no demonstrated need for a sump CB at this location, because the runoff is adequately treated in the vegetation buffer and open space.
   b. Total phosphorus (TP) will not be significantly reduced by PCB 2 (see Document 2) because a sump CB cannot effectively remove soluble pollutants or fine particles. Better alternatives to reduce TP are rain gardens or infiltration.
   c. Based on TEI's observations during a site visit, there is existing adequate vegetation buffer, including surface flow (vegetative) filters and open space to reduce sediment.
   d. Actual performance of sump CBs in the City is unclear. Data indicates that some of the City's existing sump CBs remove no sediment, even though the P8 model predicts that they will do so (Document 2).

   The City has the following alternatives:
   a. Alternative 1 – Install PCB 5 as proposed by Elfering & Associates (TEI Estimated Total Cost $9,000.00).
   b. Alternative 2 - Do not install PCB 5 and:
      i. Continue inspections of existing sump CBs to document their performance.
      ii. Investigate what type of rain garden and/or infiltration would be appropriate to remove sediment and TP given the specific soil conditions and available space in this area.
   c. The advantage of Alternative 1 is that some more sediment would likely be removed with the PCB 5, but the disadvantages are (1) it is very expensive considering the minimal improvement in sediment removal and no improvement in nutrient removal and (2) it is premature because it is not yet known what methods to remove mercury will be recommended by the mercury study.
   d. The advantages of Alternative 2 are (1) a rain garden and/or infiltration would remove both sediment and nutrients, (2) the City is not spending money on the PCB 5 which might be more effectively spent on a rain garden, infiltration or mercury removal, and (3) the City saves the installation cost (TEI Estimated Savings $9,000.00).

6. **The construction of PCB 6 located in the cul-de-sac at the south end of Jay Street** to replace existing CB 30 does not adequately meet the City's goal which is protect and maintain WBL water quality, by sediment (TSS) and nutrient (TP) removal, at a reasonable cost for the following reasons:

a. There is no demonstrated need for a sump CB at this location because stormwater runoff that enters existing CB 30 does not flow overland to WBL, but infiltrates into the ground in an existing stormwater pond directly south of CB 30. The pond functions as an infiltration basin which will remove sediment and nutrients.
b. Total phosphorus (TP) will not be significantly reduced by PCB 6 (see Document 2) because a sump CB cannot effectively remove soluble pollutants or fine particles. Better alternatives to reduce TP are rain gardens or infiltration.
c. Actual performance of sump CBs in the City is unclear. Data indicates that some of the City's existing sump CBs remove no sediment, even though the P8 model predicts that they will do so (Document 2).

The City has the following alternatives:

a. Alternative 1 – Install PCB 6 as proposed by Elfering & Associates (TEI Estimated Total Cost $9,000.00).
b. Alternative 2 - Do not install PCB 6 and:
    i. Continue inspections of existing sump CBs to document their performance.
c. The advantage of Alternative 1 is that some more sediment would likely be removed with the PCB 6, but the disadvantages are (1) it is very expensive considering the minimal improvement in sediment removal and no improvement in nutrient removal and (2) it is premature because it is not yet known what methods to remove mercury will be recommended by the mercury study.
d. The advantages of Alternative 2 are (1) sediment and nutrients are already being removed through infiltration and (2) the City saves the installation cost (TEI Estimated Savings $9,000.00).

7. **The construction of PCB 7 located in the cul-de-sac at the west end of White Pine Lane directly adjacent to Nording Park** to replace existing CB 32 does not adequately meet the City's goal which is protect and maintain WBL water quality, by sediment (TSS) and nutrient (TP) removal, at a reasonable cost for the following reasons:
    a. There is no demonstrated need for a sump CB at this location, because the sediment and nutrients in some of the runoff is removed by infiltration and never reaches WBL.
    b. Based on TEI's observations during a site visit, it appears that some stormwater runoff that enters existing CB 32 does not flow overland to White Bear Lake ("WBL"). Some stormwater runoff appears to infiltrate into the ground and is treated in an existing Dry Detention Pond directly west of CB 32 in Nording Park.
    c. Total phosphorus (TP) will not be significantly reduced by PCB 7 (see Document 2) because a sump CB cannot effectively remove soluble pollutants or fine particles. Better alternatives to reduce TP are rain gardens or infiltration.
    d. Actual performance of sump CBs in the City is unclear. Data indicates that some of the City's existing sump CBs remove no sediment, even though the P8 model predicts that they will do so (Document 2).

The City has the following alternatives:

a. Alternative 1 – Install PCB 7 as proposed by Elfering & Associates (TEI Estimated Total Cost $9,000.00).

b. Alternative 2 - Do not install PCB 7 and:
    i. Continue inspections of existing sump CBs to document their performance.
    ii. Investigate what type of additional rain garden and/or infiltration would be appropriate to remove sediment and TP given the specific soil conditions and available space in this area.
c. The advantage of Alternative 1 is that some more sediment would likely be removed with the PCB 7, but the disadvantages are (1) it is very expensive considering the minimal improvement in sediment removal and no improvement in nutrient removal and (2) it is premature because it is not yet known what methods to remove mercury will be recommended by the mercury study.
d. The advantages of Alternative 2 are (1) additional rain garden and/or infiltration would remove both sediment and nutrients, (2) the City is not spending money on the PCB 7 which might be more effectively spent on a rain garden, infiltration or mercury removal, and (3) the City saves the installation cost (TEI Estimated Savings $9,000.00).

8. **The construction of PCB 8 located in the cul-de-sac at the west end of Oakridge Drive** to replace existing CB 33 and 34 does not adequately meet the City's goal which is protect and maintain WBL water quality, by sediment (TSS) and nutrient (TP) removal, at a reasonable cost for the following reasons:
    a. There is no demonstrated need for PCB 8 because the stormwater runoff is already receiving sufficient treatment.
    b. Total phosphorus (TP) will not be significantly reduced by PCB 8 (see Document 2) because a sump CB cannot effectively remove soluble pollutants or fine particles. Better alternatives to reduce TP are rain gardens or infiltration.
    c. Actual performance of sump CBs in the City is unclear. Data indicates that some of the City's existing sump CBs remove no sediment, even though the P8 model predicts that they will do so (Document 2).
    d. Based on TEI's observations during a site visit, stormwater runoff from both existing CBs flows downstream to a wood baffle on the storm sewer outlet from Oakridge Drive that the city installed in 2002 where some sediments is removed.
    e. The runoff continues flowing to a stormwater pond located in the City of White Bear Lake ("City of WBL") where it is treated. It appears to then flow downstream to Priebe Lake, then to Hall's Marsh where it is treated again, and then to WBL.

    The City has the following alternatives:
    a. Alternative 1 – Install PCB 8 as proposed by Elfering & Associates (TEI Estimated Total Cost $12,000.00 – PCB 8 is more expensive because it is either one very large CB or two smaller CBs).
    b. Alternative 2 - Do not install PCB 8 and:
        i. Continue inspections of existing sump CBs to document their performance.

ii. Investigate whether additional rain garden and/or infiltration would be appropriate to remove sediment and TP given the specific soil conditions and available space in this area.

iii. Consider analyzing the method and data used by the City of WBL to prepare its request that the City of Birchwood Village ("City") pay $1,000.00 every three years to City of WBL for sediment removal. Other methods may provide another basis for cost sharing.

c. The advantage of Alternative 1 is that some more sediment would likely be removed with the PCB 8, but the disadvantages are (1) it is very expensive considering the minimal improvement in sediment removal and no improvement in nutrient removal and (2) it is premature because it is not yet known what methods to remove mercury will be recommended by the mercury study.

d. The advantages of Alternative 2 are (1) additional rain garden and/or infiltration would remove both sediment and nutrients, (2) the City is not spending money on the PCB 8 which might be more effectively spent on a rain garden, infiltration or mercury removal, and (3) the City saves the installation cost (TEI Estimated Savings $12,000.00).

9. Rain gardens and infiltration: Most or all areas in the City may have the capability to support rain gardens and infiltrate stormwater runoff (draining into the ground instead of flowing on the ground surface toward the lake). Infiltration is very good for White Bear Lake water quality because the stormwater runoff volume that is infiltrated turns into groundwater. It is treated as it flows through the ground and eventually enters the lake. However, some soils have too much clay and not enough sand in them to allow much infiltration. Thus testing the soil in these locations to determine its ability to infiltrate stormwater runoff is needed at proposed locations. If the soil at any particular location is not capable of infiltration, the filtered runoff can be collected in a perforated underdrain and returned to the storm drain system or discharged to the ground surface (depending on slopes at the site).Infiltration areas should have a separation distance of minimum 3-feet from the bottom of the infiltration area and the seasonally high ground water table, to reduce the risk of contamination. Infiltration practices should also be separated from drinking water wells, which is not a concern in the City because residents obtain drinking water from the City water system and not from private drinking water wells. Groundwater recharge concerns should also be analyzed. However, that analysis is beyond the scope of this report.

10. Hooded outlets for sump CBs: The City should consider hooded outlets for all sump CBs to prevent floatable materials and trash from entering the storm drain system in accordance with EPA recommendations. A hooded outlet can enhance CB performance.

11. The estimated cost to remove sediment from a sump CB is $200.00, and this often needs to be done once or twice a year for each CB. Non-sump CBs do not require sediment removal because they do not catch sediment.

ESTIMATED TOTAL COST (for all 8 projects)

1. Alternative 1 – Elfering's Estimated Total Installation Cost is $73,000.
2. Alternative 2 – TEI's Estimated Installation Cost now is $0.
   TEI's Estimated Future Installation Cost is $9,000.
3. Estimated savings on installation is $64,000.
4. If 8 sump CB's are installed and operated for 30 years, sediment removal cost is estimated to be $1,600 to $3,200 per year or $48,000 to $96,000 total.
5. If only 3 sump CBs are installed and operated for 30 years, the total sediment removal cost is estimated to be $18,000 to $36,000.

SUMMARY AND RECOMMENDATIONS

It is the opinion of TEI that the City would get minimum benefit from the proposed CBs considering their expected construction and ongoing maintenance costs. It may be more effective to spend money on rain gardens and infiltration. Five of the proposed CBs are not needed at all (including PCBs #3,5,6,7&8), and the remaining 3 could possibly be constructed later at the time streets are being replaced in those areas.

TEI's specific recommendations to the City of Birchwood are the following:

1. PCB 1 through 8 – Do not install any CBs now. Five are not needed at all (including PCBs #3,5,6,7&8), and three may be considered for future installation.
2. Request that funding already awarded by RCWD be used for rain garden and/or infiltration construction.
3. Utilize integrated stormwater management approach to consider areas for rain gardens and to infiltrate stormwater runoff (draining into the ground instead of flowing on the ground surface toward the lake).
4. Consider hooded outlets for sump CBs in accordance with EPA recommendations.
5. Consider the adoption of design standards similar to the standards of other Cities.
6. Consider encouraging resident to install rain gardens or infiltration on their private property.

Let me know if you want any further information.

Very truly yours,

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Appendix – Background Information

I. United States Environmental Protection Agency

The United States Environmental Protection Agency ("EPA") has written storm water pollution control Best Management Practices ("BMP") or Standards ("EPA Standards" in this report). The following information is from the EPA, December 2010:

Numerous studies conducted during the late 1970s and early 1980s show that stormwater runoff from urban areas are a significant source of pollution (EPA 1983; Driscoll et al. 1990). Stormwater quality tends to be extremely variable (EPA 1983; Driscoll et al. 1990). The intensity (volume or mass of precipitation per unit time) of rainfall often varies irregularly and dramatically. These variations in rainfall intensity affect runoff rate, pollutant washoff rate, in-channel flow rate, pollutant transport, sediment deposition and re-suspension, channel scour, and numerous other phenomena that collectively determine the pollutant concentrations, pollutant forms, and stormwater flow rate observed at a given monitoring location at any given moment. In addition, the transitory and unpredictable nature of many pollutant sources and release mechanisms (e.g., spills, leaks, dumping, construction activity, landscape irrigation runoff, vehicle washing runoff), and differences in the time interval between storm events also contribute to inter-storm variability. As a result, pollutant concentrations and other stormwater characteristics at a given location should be expected to fluctuate greatly during a single storm runoff event and from event to event.

In addition, the complexity of introducing a structural management practice can greatly affect hydraulics and constituent concentrations in complex ways. For example, flows from detention facilities are often not confined only to the period of wet weather, as drain time can be significant.

The impacts of hydrologic and hydraulic (physical as opposed to chemical) changes in watersheds are increasingly being recognized as significant contributors to receiving waters not meeting beneficial criteria. These impacts include stream channel changes (erosion, sedimentation, temperature changes) as well as wetland water level fluctuations.

The stormwater pollution problem has two main components: (1) the increased volume and rate of runoff from impervious surfaces and (2) the concentration of pollutants in the runoff. Both components are directly related to development in urban and urbanizing areas. Together, these components cause changes in hydrology and water quality that result in a variety of problems, including habitat modification and loss, increased flooding, decreased aquatic biological diversity, and increased sedimentation and erosion. Effective management of stormwater runoff offers a multitude of possible benefits, including protection of wetlands and aquatic ecosystems, improved quality of receiving waterbodies, conservation of water resources, protection of public health, and flood control.

In addition to chemical pollutants in stormwater, the physical aspects related to urban runoff, such as erosion and scour, can significantly affect a receiving water's fish population and

associated habitat. Alterations in hydraulic characteristics of streams receiving runoff include higher peak flow rates, increased frequency and duration of bankfull and subbankfull flows, increased occurrences of downstream flooding, and reduced baseflow levels. Traditional flood control measures that rely on the detention (storage) of the peak flow (referred to as peak shaving) have been characteristic of many stormwater management approaches, have generally not targeted pollutant reduction and in many cases have exacerbated the problems associated with changes in hydrology and hydraulics. The EPA recommends an approach that integrates the control of stormwater peak flows and the protection of natural channels to sustain the physical and chemical properties of aquatic habitat.

Effective stormwater management is often achieved from a management systems approach, as opposed to an approach that focuses on individual practices. That is, the pollutant control achievable from any given management system is viewed as the sum of the parts, taking into account the range of effectiveness associated with each single practice, the costs of each practice, and the resulting overall cost and effectiveness. Some individual practices may not be very effective alone but, in combination with others, may provide a key function in highly effective systems.

Prevention versus Treatment: Once pollutants are present in a waterbody, or after a receiving waterbody's physical structure and habitat have been altered, it is much more difficult and expensive to restore it to an undegraded condition. Therefore, the use of a management system that relies first on preventing degradation of receiving waters is recommended. BMP under the obvious category of pollution prevention, as well as outreach, education, and erosion and sediment control - focus on the prevention of pollutants from ever getting into stormwater. Similarly, some of the practices under the EPA post-construction runoff control minimum measures can be utilized to address site design issues that can result in pollution prevention. EPA has found the practices listed in the menu of BMP to be representative of the types of practices that can successfully achieve effective performance. The list of BMP is not all-inclusive, and it does not preclude the City from using other technically sound practices. Some of the EPA BMP are summarized below along with performance data:

Catch Basins: Catch basins ("CBs"), also known as storm drain inlets and curb inlets, are inlets to the storm drain system. They typically include a grate or curb inlet and sometimes a sump to capture sediment, debris, and pollutants. CBs can be used to capture floatables and settle some solids, and they can act as pretreatment for other treatment practices by capturing large sediments. The effectiveness (performance) of CBs, their ability to remove sediments and other pollutants, depends on its design (e.g., the size of the sump) and on maintenance procedures to regularly remove accumulated sediments from its sump.

CB inserts designed to remove oil and grease, trash, debris, and sediment can improve the efficiency of catch basins. Some inserts are designed to drop directly into existing CB inlets, while others may require retrofit construction. CB inserts for both new development and retrofits at existing sites may be preferred when available land is limited, as in urbanized areas.

Though they are used in drainage systems throughout the United States, many CBs are not ideally designed for sediment and pollutant capture. CBs are ideally used as pretreatment to another stormwater management practice. Retrofitting existing CBs may substantially improve their performance. A simple retrofit alternative is to ensure that all CBs have a hooded outlet to prevent floatable materials, such as trash and debris, from entering the storm drain system.

Catch basins have three major limitations:

1. Even ideally designed CBs cannot remove pollutants as well as structural stormwater management practices, such as wet ponds, sand filters, and stormwater wetlands.
2. Unless frequently maintained, can become a source of pollutants through resuspension.
3. CBs cannot effectively remove soluble pollutants or fine particles.

Performance of catch basins is related to the volume in the sump (i.e., the storage in the catch basin below the outlet pipe). Lager *et al.* (1997) described an "optimal" catch basin sizing criterion, which relates all catch basin dimensions to the diameter of the outlet pipe (D) as follows:

1. The diameter of the catch basin should be equal to 4D.
2. The sump depth should be at least 4D. This depth should be increased if cleaning is infrequent or if the area draining to the catch basin has high sediment loads.
3. The top of the outlet pipe should be 1.5 D from the bottom of the inlet to the catch basin.

Catch basins can also be sized to accommodate the volume of sediment that enters the system. Pitt *et al.* (1997) proposed a sizing criterion based on the concentration of sediment in stormwater runoff. The catch basin is sized, with a factor of safety, to accommodate the annual sediment load in the catch basin sump. This method is preferable where high sediment loads are anticipated, and where the optimal design described above is suspected to provide little treatment.

The basic design should also incorporate a hooded outlet to prevent floatable materials and trash from entering the storm drain system.

Adding a screen (a.k.a. CB insert) to the top of the CB would not likely improve the performance of CB for pollutant removal, but it would help capture trash entering the CB (Pitt *et al.*, 1997). Several varieties of CB inserts exist for filtering runoff. These devices have a very small volume, compared to the volume of a CB sump, and would typically require very frequent sediment removal. Bench test studies found that a variety of options showed little removal of total suspended solids, partially due to scouring from relatively small (6-month) storm events (ICBIC, 1995).

One design adaptation of the CB is to incorporate infiltration through the catch basin bottom. There are two challenges associated with this design. The first is potential ground water impacts, and the second is potential clogging, preventing infiltration. Infiltrating CBs should not be used in commercial or industrial areas, because of possible ground water contamination. While it is

difficult to prevent clogging at the bottom of the CB, it might be possible to incorporate some pretreatment into the design.

Typical maintenance of CBs includes trash removal if a screen or other debris capturing device is used, and removal of sediment using a vactor truck. Operators need to be properly trained in maintenance. Maintenance should include keeping a log of the amount of sediment collected and the date of removal. Some cities have incorporated the use of GIS systems to track sediment collection and to optimize future CB cleaning efforts.

One study (Pitt, 1985) concluded that CBs can capture sediments up to approximately 60 percent of the sump volume. When sediment fills greater than 60 percent of their volume, CBs reach steady state. Storm flows can then resuspend sediments trapped in the CBs, and will bypass treatment. Frequent CB clean-out can retain the volume in the CB sump available for treatment of stormwater flows.

At a minimum, CBs should be cleaned once or twice per year (Aronson et al., 1993). Two studies suggest that increasing the frequency of maintenance can improve the performance of CBs, particularly in industrial or commercial areas. One study of 60 CBs in Alameda County, California, found that increasing the maintenance frequency from once per year to twice per year could increase the total sediment removed by CBs on an annual basis (Mineart and Singh, 1994). Annual sediment removed per inlet was 54 pounds for annual cleaning, 70 pounds for semi-annual and quarterly cleaning, and 160 pounds for monthly cleaning. For CB draining industrial uses, monthly cleaning increased total annual sediment collected to six times the amount collected by annual cleaning (180 pounds versus 30 pounds). These results suggest that, at least for industrial uses, more frequent cleaning of CBs may improve efficiency. However, the cost of increased operation and maintenance costs needs to be weighed against the improved pollutant removal.

In some regions, it may be difficult to find environmentally acceptable disposal methods for collected sediments. The sediments may not always be land-filled, land-applied, or introduced into the sanitary sewer system due to hazardous waste, pretreatment, or ground water regulations.

What the EPA knows about the effectiveness of CBs is limited to a few studies. Table 1 outlines the results of some of these studies.

Table 1. Pollutant removal of catch basins (percent).

Study	Notes	TSS[a]	COD[a]	BOD[a]	TN[a]	TP[a]	Metals
Pitt et al., 1997	-	32	-		-	-	-
Aronson et al., 1983	Only very small storms were monitored in this study.	60-97	10-56	54-88	-	-	-
Mineart and	Annual load	-	-	-	-	-	For

Singh, 1994	reduction estimated based on concentrations and mass of catch basin sediment.						Copper: 3-4% (Annual cleaning) 15% (Monthly cleaning)

[a] TSS=total suspended solids; COD=chemical oxygen demand; BOD=biological oxygen demand; TN=total nitrogen; TP=total phosphorus

A typical pre-cast CB costs between $2,000 and $3,000. The true pollutant removal cost associated with CBs, however, is the long-term maintenance cost. A vactor truck, the most common method of CB cleaning, costs between $125,000 and $150,000. This initial cost may be high for smaller Phase II communities. However, it may be possible to share a vactor truck with another community. Typical vactor trucks can store between 10 and 15 cubic yards of material, which is enough storage for three to five CBs with the "optimal" design and an 18-inch inflow pipe. Assuming semi-annual cleaning, and that the vactor truck could be filled and material disposed of twice in one day, one truck would be sufficient to clean between 750 and 1,000 CBs. Another maintenance cost is the staff time needed to operate the truck. Depending on the regulations within a community, disposal costs of the sediment captured in CBs may be significant.

Retrofit CB inserts range from as little as $400 for a "drop-in" type to as much as $10,000 or more for more elaborate designs.

Infiltration Basin: An infiltration basin is a shallow impoundment which is designed to infiltrate stormwater into the soil. It captures a given stormwater runoff volume and infiltrates it into the ground, transferring this volume from surface flow to groundwater flow. This practice has high pollutant removal efficiency and can also help recharge the ground water, thus increasing baseflow to stream or lake systems. Infiltration basins can be challenging to apply on many sites, however, because of soils requirements. Infiltration basins have select applications. Their use is often sharply restricted by concerns over ground water contamination, soils, and clogging at the site.

Soils and topography are strongly limiting factors when locating infiltration practices. Soils must be significantly permeable to ensure that the practice can infiltrate quickly enough to reduce the potential for clogging, and soils that infiltrate too rapidly may not provide sufficient treatment, creating the potential for ground water contamination. The infiltration rate should range between

0.5 and 3 inches per hour. In addition, the soils should have no greater than 20 percent clay content, and less than 40 percent silt/clay content (MDE, 2000). Finally, infiltration basins may not be used in regions of karst topography, due to the potential for sinkhole formation or ground water contamination.

Designers always need to provide significant separation distance (2 to 5 feet) from the bottom of the infiltration basin and the seasonally high ground water table, to reduce the risk of contamination. Infiltration practices should also be separated from drinking water wells.

Pretreatment refers to design features that provide settling of large particles before runoff reaches a management practice, easing the long-term maintenance burden. Pretreatment is important for all structural management practices, but it is particularly important for infiltration practices. In order to ensure that pretreatment mechanisms are effective, designers should incorporate "multiple pretreatment," using practices such as grassed swales, sediment basins, and vegetated filter strips in series.

In addition to regular maintenance activities, designers also need to incorporate features into the design to ensure that the maintenance burden of a practice is reduced. These features can make regular maintenance activities easier or reduce the need to perform maintenance. In infiltration basins, designers need to provide access to the basin for regular maintenance activities. Where possible, a means to drain the basin, such as an underdrain, should be provided in case the bottom becomes clogged. This feature allows the basin to be drained and accessed for maintenance in the event that the water has ponded in the basin bottom or the soil is saturated.

Infiltration basins recharge the ground water because runoff is treated for water quality by filtering through the soil and discharging to ground water. Infiltration basins typically consume about 2 to 3 percent of the site draining to them.

Estimated pollutant removal for infiltration basins: The average pollutant removal, assuming the infiltration basin is sized to treat the runoff from a 1-inch storm, is:

TSS 75%
Phosphorous 60-70%
Nitrogen 55-60%
Metals 85-90%
Bacteria 90%

Bioretention (Rain garden): Bioretention areas, or rain gardens, are landscaping features adapted to provide on-site treatment of stormwater runoff. They are commonly located in parking lot islands or within small pockets of residential land uses. Surface runoff is directed into shallow, landscaped depressions. These depressions are designed to incorporate many of the pollutant removal mechanisms that operate in forested ecosystems. During storms, runoff ponds above the mulch and soil in the system. Runoff from larger storms is generally diverted past the facility to the storm drain system. The remaining runoff filters through the mulch and prepared soil mix.

The filtered runoff can be collected in a perforated underdrain and returned to the storm drain system or infiltrated into the ground.

Bioretention facilities are ideally suited to many urban areas, such as parking lots. While they consume a fairly large amount of space (approximately 5 percent of the area that drains to them), they can be fit into existing parking lot islands or other landscaped areas.

Bioretention areas should usually be used on small sites (i.e., 5 acres or less). When used to treat larger areas, they tend to clog. In addition, it is difficult to convey flow from a large area to a bioretention area.

Bioretention areas are best applied to relatively shallow slopes (usually about 5 percent). However, sufficient slope is needed at the site to ensure that water that enters the bioretention area can be connected with the storm drain system. These stormwater management practices are most often applied to parking lots or residential landscaped areas, which generally have shallow slopes.

Several basic features should be incorporated into bioretention designs to enhance their pollutant removal. The bioretention system should be sized between 5 and 10 percent of the impervious area draining to it. The practice should be designed with a soil bed that is a sand/soil matrix, with a mulch layer above the soil bed. The bioretention area should be designed to pond a small amount of water (6-9 inches) above the filter bed.

Bioretention areas are among the most effective stormwater management practices at removing stormwater pollutants. Field and laboratory analysis of bioretention facilities conducted by Davis et al. (1997), showed very high removal rates (roughly 95 percent for copper, 98 percent for phosphorus, 20 percent for nitrate, and 50 percent for Total Kjeldhal Nitrogen ("TKN"). Table 2 shows data from two other studies of bioretention areas.

Table 2. Pollutant removal effectiveness of two bioretention areas

Pollutant	Pollutant Removal
Copper	43%-97%
Lead	70%-95%
Zinc	64%-95%
Phosphorus	65%-87%
Total Kjeldahl Nitrogen (TKN)	52-67%
Ammonium (NH_4^+)	92%
Nitrate (NO_3^-)	15%-16%
Total nitrogen (TN)	49%
Calcium	27%

Wet Ponds: Wet ponds (a.k.a. stormwater ponds, wet retention ponds, wet extended detention ponds) are constructed basins that have a permanent pool of water throughout the year (or at least throughout the wet season) unlike dry detention ponds, which dry out between storms. Wet ponds treat incoming stormwater runoff by allowing particles to settle and algae to take up nutrients. The primary removal mechanism is settling as stormwater runoff resides in this pool, and pollutant uptake, particularly of nutrients, also occurs through biological activity in the pond. Traditionally, wet ponds have been widely used as stormwater best management practices.

Pretreatment incorporates design features that help to settle out coarse sediment particles. By removing these particles from runoff before they reach the large permanent pool, the maintenance burden of the pond is reduced. In ponds, pretreatment is achieved with a sediment forebay. A sediment forebay is a small pool (typically about 10 percent of the volume of the permanent pool). Coarse particles remain trapped in the forebay, and maintenance is performed on this smaller pool, eliminating the need to dredge the entire pond.

In addition to the water resource protection benefits of wet ponds, there is some evidence to suggest that they may provide an economic benefit by increasing property values. The results of one study suggest that "pond front" property can increase the selling price of new properties by about 10 percent (EPA, 1995). Another study reported that the perceived value (i.e., the value estimated by residents of a community) of homes was increased by about 15 to 25 percent when located near a wet pond (Emmerling-Dinovo, 1995).

Wet ponds are among the most effective stormwater management practices at removing stormwater pollutants. A wide range of research is available to estimate the effectiveness of wet ponds. Typical removal rates, as reported by Schueler (1997) are:

Total Suspended Solids: 67%
Total Phosphorous: 48%
Total Nitrogen: 31%
Nitrate Nitrogen: 24%
Metals: 24.73%
Bacteria: 65%

Dry Detention Ponds: Dry detention ponds (a.k.a. dry ponds) are basins whose outlets have been designed to detain stormwater runoff for some minimum time (e.g., 12 to 24 hours) to allow particles and associated pollutants to settle. Unlike wet ponds, these facilities do not have a large permanent pool of water. However, they are often designed with small pools at the inlet and outlet of the basin. They can also be used to provide flood control by including additional flood detention storage.

Dry detention ponds have traditionally been one of the most widely used stormwater BMP. In some instances, these ponds may be the most appropriate BMP. However, they should not be used as a one size fits all solution. If pollutant removal efficiency is an important consideration then dry detention ponds may not be the most appropriate choice. Dry detention ponds require a large amount of space to build them. In many instances, smaller-sized BMP are more appropriate alternatives including grassed swales, infiltration basin, infiltration trench, porous pavement, bioretention (rain gardens), alternative pavers, and green roofs.

Dry detention basins provide moderate pollutant removal. Although they can be effective at removing some pollutants through settling, they are less effective at removing soluble pollutants because of the absence of a permanent pool. A few studies are available on the effectiveness of dry detention ponds. Typical removal rates, as reported by Schueler (1997), are as follows:

Total suspended solids: 61%
Total phosphorus: 19%
Total nitrogen: 31%
Nitrate nitrogen: 9%
Metals: 26%-54%

Sand and Organic Filters: Sand filters (a.k.a. media filters) use a granular or membrane filter, with or without a pre-settling basin, to remove pollutants found in stormwater. The most typical filter is sand, but other materials, including peat mixed with sand, compost with sand, geotextiles, and absorption pads and beds are commonly used. Sand filter are usually designed as two-chambered stormwater practices; the first is a settling chamber, and the second is a filter bed filled with sand or another filtering media. As stormwater flows into the first chamber, large particles settle out, and then finer particles and other pollutants are removed as stormwater flows through the filtering medium. There are several modifications of the basic sand filter design, including the surface sand filter, underground sand filter, perimeter sand filter, organic media filter, and multi-chamber treatment train. All of these filtering practices operate on the same basic principle. Modifications to the traditional surface sand filter were made primarily to fit

sand filters into more challenging design sites (e.g., underground and perimeter filters) or to improve pollutant removal (e.g., organic media filter).

Filtering practices are for the most part adapted only to provide pollutant removal, although in some designs, some ground water recharge can be provided. Sand filters are effective for pollutant removal with the exception of nitrates, which appear to be exported from filtering systems. The export of nitrates from filters may be caused by mineralization of organic nitrogen in the filter bed. Typical percent removals rates or ranges are:

TSS	65 - 90+
TP	40 – 85
TN	44 – 47
Metals	25 – 90+
Bacteria	55

Stormwater Wetlands: Stormwater wetlands (a.k.a. constructed wetlands) are similar to wet ponds but incorporate wetland plants into the design. As stormwater runoff flows through the wetland, pollutant removal is achieved through settling and biological uptake. Wetlands are among the most effective stormwater practices in terms of pollutant removal and they also offer aesthetic and habitat value. Although natural wetlands can sometimes be used to treat stormwater runoff that has been properly pretreated, stormwater wetlands are fundamentally different from natural wetland systems. Stormwater wetlands are designed specifically for the purpose of treating stormwater runoff, and typically have less biodiversity than natural wetlands in terms of both plant and animal life. Several design variations of the stormwater wetland exist, each design differing in the relative amounts of shallow and deep water, and dry storage above the wetland.

A distinction should be made between using a constructed wetland for stormwater management and diverting stormwater into a natural wetland. The latter practice is not recommended because altering the hydrology of the existing wetland with additional stormwater can degrade the resource and result in plant die-off and the destruction of wildlife habitat. In all circumstances, natural wetlands should be protected from the adverse effects of development, including impacts from increased stormwater runoff. This is especially important because natural wetlands provide stormwater and flood control benefits on a regional scale.

There are several variations of the wetland design. The designs are characterized by the volume of the wetland in deep pool, high marsh, and low marsh, and whether the design allows for detention of small storms above the wetland surface. For example, in gravel-based wetland design, runoff flows through a rock filter with wetland plants at the surface. Pollutants are removed through biological activity on the surface of the rocks and pollutant uptake by the plants. This practice is fundamentally different from other wetland designs because, while most wetland designs behave like wet ponds with differences in grading and landscaping, gravel-based wetlands are more similar to filtering systems.

Wetlands are among the most effective stormwater management practices at removing stormwater pollutants. A wide range of research is available to estimate the effectiveness of

wetlands. Wetlands have high pollutant removal rates, and are particularly effective at removing nitrate and bacteria. Table 3 provides pollutant removal data derived from the Center for Watershed Protections's National Pollutant Removal Database for Stormwater Treatment Practices (Winer, 2000).

Table 3. Typical Pollutant Removal Rates of Wetlands (%) (Winer, 2000)

Pollutant	Stormwater Treatment Practice Design Variation			
	Shallow Marsh	ED Wetland[1]	Pond/Wetland System	Submerged Gravel Wetland[1]
TSS	83±51	69	71±35	83
TP	43±40	39	56±35	64
TN	26±49	56	19±29	19
NOx	73±49	35	40±68	81
Metals	36-85	(80)-63	0-57	21-83
Bacteria	76[1]	NA	NA	78

[1]Data based on fewer than five data points

Infiltration Trench: An infiltration trench (a.k.a. infiltration galley) is a rock-filled trench with no outlet that receives stormwater runoff. Stormwater runoff passes through some combination of pretreatment measures, such as a swale and detention basin, and into the trench. There, runoff is stored in the void space between the stones and infiltrates through the bottom and into the soil matrix. The primary pollutant removal mechanism of this practice is filtering through the soil.

Schueler (1987) estimated pollutant removal for infiltration trenches. The average pollutant removal, assuming the infiltration trench is sized to treat the runoff from a 1-inch storm, is:

TSS 75%
Phosphorous 60-70%
Nitrogen 55-60%
Metals 85-90%
Bacteria 90%

ANOTHER TREATMENT ALTERNATIVE

Silva Cells®: A Silva Cell® is a stormwater management technique that creates a way to grow large trees and remove pollutants from stormwater runoff in urban environments.

Silva Cells are among the most effective stormwater management practices at removing stormwater pollutants. Silva Cells have high pollutant removal rates, and are particularly effective at removing Phosphorus ("P") and Total Nitrogen ("TN"). Table 4 provides pollutant removal data derived from Prince George's County Bioretention Manual:

Table 4. Typical Pollutant Removal Rates of Silva Cells (%)

Pollutant	Percent Removal by Depth	
	2-foot	3-foot
Cu	93	93
Pb	99	99
Zn	98	99
P	73	81
TKN	60	68
NH4	86	79
TN	0	43

The EPA and other agencies prepared a report titled "Overview of Performance by Best Management Practices ("BMP") Category and Common Pollutant Type" dated June 2008. This report is an analysis of treatment system performance and is intended to provide a consistent and scientifically defensible set of data on BMP design and related performance. This report provides analysis results from available monitoring data drawn from the International Stormwater Best Management Practices Database as of October 2007. The report provides overview-level analysis of BMP performance for BMP methods and apparatus including detention pond, wet pond, wetland basin, biofilter, media filter, hydrodynamic devices and porous pavement. However, the report does not provide performance data for CBs with sump. This information suggests that overview-level data is not currently available to document the performance of CBs with sump or the EPA decided not to analyze CBs with sump. This information also suggests that consistent and scientifically defensible set of data on CBs with sump design and related performance is difficult to locate.

II. Minnesota Pollution Control Agency

The Minnesota Pollution Control Agency's ("MPCA") Minnesota Stormwater Manual Version 2 dated January, 2008 shows the following:

1. Integrated stormwater management is simply thinking about all of the factors that somehow affect precipitation as it moves from the land surface to an eventual receiving water. It is the process of accounting for all of these factors (e.g. rate, volume, quality, ground water impact) in a logical process so that inadvertent mistakes are not made that could eventually harm a resource. The treatment train approach to runoff management mimics the sequence as the stormwater manager looks at the runoff problem and determines how best to address it, starting with the most basic of questions and increasing in complexity only if needed, since simple methods of management are often the most practical. A regulator might view it as a check to see if a simple approach could replace something more complicated and expensive. The first step in integrated stormwater management is determining the scope of the project and the likely solutions that will be

needed. If on-site, simple practices will solve the problem, a non- or minimum-structural approach can be pursued. If problems extend off-site and impact a major regional water body, then a broader scale will need to be pursued and commensurate BMPs chosen.

2. Integrated stormwater management often takes advantage of the interaction that takes place between ground water and surface water. For example, the slow infiltration and movement of surface water into the shallow ground water system results in peak and volume reduction, filtration through cleansing soil and continuation of baseflow to streams. Although stormwater management is often interpreted as a surface water program, many of the BMPs identified in this Manual rely on the ground water system to make them effective. Infiltration BMPs, for example, rely on the soil's capacity to soak in water and transmit it downward to the ground water system. Soil cleansing via filtration, adsorption and microbial uptake can be a very effective removal process for some of the more difficult to treat runoff pollutants. For the above reason, there must be caution used when pollution is "removed" through a system that affects ground water. For example, although soil adsorption is an effective scavenger of some soluble pollutants, one could argue that the introduction of chloride-laden water into any system that discharges to the ground is merely trading pollution in one water for another. The same could be said for ground water pump-outs that discharge contaminated ground water into any surface water or onto any land surface. The Manual will note several instances when the interaction between ground water and surface water could be problematic. Specific cautions are raised in Chapter 13 for active karst areas and other shallow or fractured bedrock, high ground water table, tight soils, source water (wellhead) protection areas, and potential stormwater hotspots (PSHs).
3. A discussion of BMP techniques for runoff management and selection criteria. BMP are tools to assist with choosing structural or non-structural approaches.
4. An introduction into the selection of BMP that provides insight into selection of a BMP or group of BMP. The basic premise for selection of a BMP is to follow the treatment train approach. Under the treatment train strategy, stormwater management begins with simple methods that minimize the amount of runoff that occurs from a site and methods that prevent pollution from accumulating on the land surface and becoming available for wash-off. Even though we know that we will never be able to fully accomplish either of these goals, we can make substantial progress using the better site design techniques and pollution prevention, volume minimization, temporary construction erosion control and supplemental techniques. After all of the efforts possible are made to minimize runoff and surface wash-off, we must recognize that some potential for runoff will occur. The next major BMP then becomes collection and treatment of runoff locally and regionally, either as stand-alone practices or in treatment train combinations. Some of the available BMP are best used to reduce runoff volume, while others focus on water quality improvement. Some BMP will be easy to implement, while others involve serious engineering and sophisticated design. The manual presents detailed design guidance for categories of structural BMPs: bioretention devices, filtration practices, infiltration practices, stormwater ponds and stormwater wetlands.
5. The following BMP design and selection guidance is recommended for lakes designated as most-sensitive. Table 10.6 summarizes the total and soluble phosphorus removal capabilities of common BMP. Soluble phosphorus is of particular interest since it is most

readily available for algal uptake. Therefore, any BMP employed to protect most-sensitive lakes should have a moderate to high capability to remove total and soluble phosphorus. Infiltration practices tend to have the highest phosphorus removal, but are not always be feasible due to soil constraints or lack of the three-foot separation distance between the bottom of the infiltration device and the seasonally saturated water table. Pond systems are generally a reliable removal option for both soluble and total phosphorus. Filters are fairly effective at removing total phosphorus, but exhibit little or no capability to remove soluble phosphorus. This can be explained by the fact that most sand filters have no biological or chemical processes to bind soluble phosphorus. The addition of organic matter or binding agents to sand filters may show promise in boosting removal, but early monitoring of experimental filters have yet to demonstrate this result conclusively (Schueler, 2000). Wetlands have a highly variable capability to remove both soluble and particulate forms of phosphorus. The variability can be explained in part by internal phosphorus cycling within the wetland, sediment release, and vegetative dieback during the non-growing season (Schueler, 1992). Factors such as soil pH, oxygen conditions, nutrient saturation and presence of Ca, Mg or Fe in the soil can also make a big difference in whether phosphorus is removed or released. The best design variation for phosphorus removal in the stormwater wetland group is the pond-wetland system (e.g., wetland with a relatively large portion of its storage devoted to a deep pool).

6. Summarizes the total and soluble phosphorus removal capabilities of common BMP (Table 10.6).
7. Non-Structural BMP - The first level of BMP application occurs at the planning stage and is intended to minimize the impact of development. The process promotes site design and practices that prevent pollution and minimize the increase in stormwater volume. The result will be smaller end-of-the pipe stormwater facilities. The impacts of both stormwater runoff quality and quantity problems are considered prior to initiation of activity. The first two groupings (see below) are intended to address these two aspects of runoff management.

    a. Pollution Prevention Practices
        i. Housekeeping (or other suitable term) including landscaping, street sweeping, pavement maintenance, catch basin maintenance and litter control
        ii. Atmospheric controls including wind erosion and dust, as well as regulatory emission regulations
        iii. Chemical controls including salt management, fertilizer/pesticide management and spill prevention
        iv. Animal waste management
        v. Streambank stabilization

    b. Runoff Volume Minimization
        i. Natural area conservation (reforestation, stream/shoreline/wetland buffers, open space design)
        ii. Soil amendment

iii. Reduction of impervious surfaces including roof leader, parking lots, driveway and sidewalk disconnection, and reduced street width
iv. Grass channels in lieu of curb and gutter
v. Rain barrels/cisterns
vi. Permeable pavement/lattice blocks
vii. Soakaway pits/drywells
viii. Stormwater planters
ix. Green roofs/rooftop gardens

c. Temporary Construction Sediment Control
   i. Pre-construction
   ii. Resource protection (buffers)
   iii. Runoff control (sediment control basins)
   iv. Perimeter controls (access and egress, inlet protection)
   v. Slope stabilization
   vi. Rapid stabilization of exposed soils
   vii. Inspection and maintenance

8. Structural BMP - Structural BMP are as follows:

   a. Bioretention
      i. Rain gardens
      ii. Depressed parking lot islands

   b. Filtration (can be pre-treatment or focus of full treatment)
      i. Media filters (surface, underground, perimeter/Delaware) described by media and function
      ii. Surface flow (vegetative) filters including narrative on limitations for water quality improvement
      iii. Combination media/vegetative filters

   c. Infiltration
      i. Trenches
      ii. Basins

   d. Ponds
      i. Components include forebay/pre-treatment, various storage volumes, physical configuration
      ii. Functions include water quality (including thermal impact) and flow control (rate and volume), which determine whether they are wet/dry or some combination

   e. Wetlands
      i. Components include pre-treatment, various storage volumes (detention needed), biologic character

ii. Functions include primarily water quality and flow control, but could also include ecological factors

9. Supplemental Pre- and Post-Treatment BMP - The final category of BMP presents those that are generally, but not always, included in the stormwater treatment train as a supplement to the primary treatment device. There is the possibility, however, that these devices could be the only BMP used.

    a. Supplemental Treatment
        i. Proprietary sediment removal devices
        ii. Catch basin inserts (Note: inserts are different than a sump in a CB because they collect sediment prior to sediment entering the CB)
        iii. Wet vaults
        iv. Chemical treatment (ferric chloride, alum, polyacrylamides) These chemical treatments could be limited in the State of Minnesota because of the potential toxic effects associated with them.
        v. Skimmers
        vi. Sorbents
        vii. Thermal protection (ex. maintain tree canopy)
        viii. Biological additives (ex. chitosan)

III. Rice Creek Watershed District

The Rice Creek Watershed District ("RCWD") 2010 Watershed Management Plan dated January 4, 2010 show the following:

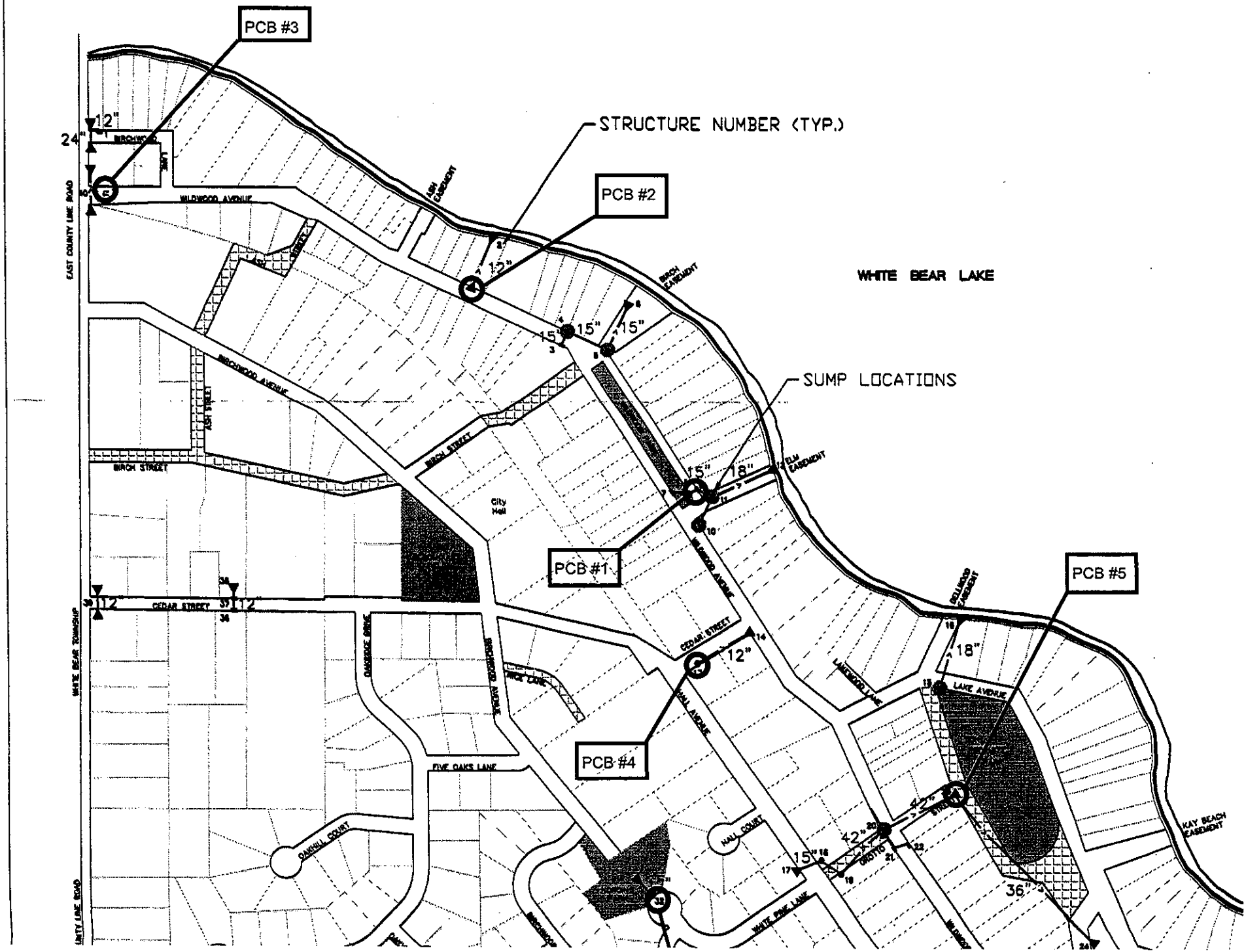
1. White Bear Lake is located in RCWD Clearwater Creek Planning Region.
2. Soils in the City of Birchwood Village are classified as Hydrologic Soils Groups A, A/D, B, C/C. C, and N/A. Multiple entities including the RCWD, cities, counties, and state agencies, and lake associations have roles in managing the lake resources. These entities may have the same or differing management goals, so the roles and responsibilities of the number of entities involved can become unclear. The issue is how to implement a coordinated effort for lake management, with agreeable goals, and to clearly define the responsibilities of the District.
3. Goals and the achievement of the goals for lake management need tailoring to each unique lake situation. For example, Turtle Lake and White Bear Lake have exceptional water quality. The goals and management practices for these lakes are oriented toward protection and prevention of any degradation in quality.
4. Total Maximum Daily Load ("TMDL") studies have been and are currently being completed for lakes located within the RCWD. These studies will establish the load reduction necessary to achieve the beneficial uses and ultimately an implementation plan for achieving the water quality goals. Issues associated with these TMDL studies are the allocation of loads to the various point and nonpoint sources, how the implementation plan resulting from a TMDL study will be integrated with the rules, and the approach

used by the District to allocated financial resources to complete activities included within the implementation plan.

5. Lakes receive water, nutrients, sediments and other substances from the streams, rivers, storm sewers and public drainage systems to which they are connected. The approach used by the District to manage the public drainage systems and by the cities to manage their storm sewer systems, has a direct effect on the lakes.
6. Opportunities for Resolution: Many of the issues associated with managing cultural eutrophication, and lakes in general, can be addressed by continuing to develop lake-specific management plans. These provide an opportunity for broad stakeholder input and agency collaboration. The content of these plans needs to be actively communicated to stakeholders and collaborating agencies.
7. Groundwater Assessment Summary: The Groundwater Management and Planning Program conducted on behalf of the RCWD, provides some insight into the groundwater issues. Some of the issues noted include locations with a high water table that is often less than 5 feet below the surface, potential contamination from infiltration of runoff, mining of materials and its associated potential groundwater contamination, and complications resulting from the lack of understanding about the interaction between surface water and groundwater.
8. Figure 3-2 shows the area around public water-supply wells called Drinking Water Supply Management Areas (DWSMA) that are classified by the MDH as being susceptible to contamination from spills or other land-surface activities that could affect the quality of ground water used for drinking water. Areas marked in red, potentially affecting the water supplies of White Bear Lake, Hugo, and Centerville, among others, are considered highly vulnerable to contamination based on a variety of factors including the absence of confining layers, soil characteristics, and infiltration potential. Infiltration characteristics around other public water-supply wells show in green suggest much less vulnerability; ranging from low to very low. Should contamination be identified, the technology generally is adequate to maintain the quality desired by end-users. Public water supplies are required by law to be routinely tested by the supplier to ensure that they continue to meet drinking-water standards. Some of the City of Birchwood Village is located in areas marked in red.
9. Soils in the City of Birchwood Village have a wide range of infiltration potential.
10. RCWD operates and maintains such projects as Priebe Lake Outlet Project and Hall's Marsh Outlet Structure.
11. Impaired Waters Program: Section 303(d) of the federal Clean Water Act requires states to identify waters that do not meet applicable water quality standards or do not fully support their designated uses. Waters failing to attain their designated use are defined as impaired. Each state determines the cause for impairment. Impaired waters are placed on a list and subject to completion of a TMDL analysis. A TMDL analysis consists of many steps, but the process is intended to identify ways to restore impaired waters to their full beneficial uses. The implementation of load reduction efforts identified in a TMDL analysis may have future bearing on other activities of the RCWD. There are multiple stream/river systems and lakes within the boundaries of the RCWD which are on the 2008 303(d) impaired waters list. The MPCA is required to submit a prioritized list of impaired waters, known as the 303(d) list, to the EPA for review and approval every

other year. The most recent list was approved in 2008, with a new draft version available, which is scheduled for approval in 2010. TMDL plans must be approved by the MPCA before the EPA provides final approval. The MPCA also provides financial assistance through Clean Water Partnership and Clean Water Act Section 319 programs. These programs address nonpoint source pollution issues and are often used for TMDL projects. Funding also may be available through the Clean Water Legacy Act, which also is managed by the MPCA.

12. WBL is not a nutrient impaired lake based on the draft 2010 303(d) list. However, WBL is on the other impaired waters list based on the draft 2010 303(d) list because the affected use is consumption and the pollutant or stressor is Mercury ("Hg") in fish. WBL is included in a statewide Mercury TMDL analysis.
13. Total phosphorus concentration is a strong indicator of eutrophication in most Minnesota lakes. Forty-one of the 49 RCWD lakes considered had recent or historic TP concentration data. These data had been collected recently or from many years ago, and included only a few to hundreds of samples. Average TP concentrations ranged from 18 ug/L in White Bear Lake to 241 ug/L in George Watch Lake. Eleven of the lakes had average TP concentrations of 40 ug/L or less, with 40 ug/L representing the state standard for the North Central Hardwood Forest eco-region. Eighteen lakes had average TP concentrations that were above the 40 ug/L guideline but were less than the 90 ug/L guideline suggesting partial support within guidelines for the nearby Western Corn Belt Plains eco-region. Twelve lakes had average TP concentrations greater than 90 ug/L, and 9 of those were listed as having impairment from high nutrient concentrations.
14. In February 1991, J.M.M prepared a Diagnostic/Feasibility Study of WBL. The Study included 12-month monitoring program and land use assessment. Monitoring program found water quality to be good (TP 50 ug/l) with no observable historical trends. Modeling shows lake to have very long (31 years) residence time. Goal set to maintain TP at 1990 levels. However, the RCWD 2010 Watershed Management Plan dated January 4, 2010 did not report the 1990 level.
15. In 1998, Minnesota Department of Natural Resources prepared a report regarding Lake-Groundwater Interaction at White Bear Lake, Minnesota. Report to the Legislative Committee on Minnesota Resources. 92 p. This report was created after residents, recreational users, and units of governments in the White Bear Lake vicinity were alarmed by low lake level elevations. The report describes the results of a surface water-groundwater exchange study that included the installation and monitoring of wells, lake level monitoring, water balance analysis, and computer modeling. The analysis determined White Bear Lake typically serves a groundwater recharge function and fluctuates widely due to its small watershed area to lake area ratio. It was determined that lake level augmentation from wells typically lasts for periods less than one year. The largest driver for lake level fluctuation was determined to be corresponding fluctuation in nearby aquifers. Groundwater level data and geologic cross sections are products of this investigation.
16. The City of Birchwood Village land area is 222 acres (0.4 square miles) and 0.2% of RCWD.


PCB #3
PCB #2
PCB #1
PCB #4
PCB #5
STRUCTURE NUMBER (TYP.)
SUMP LOCATIONS
WHITE BEAR LAKE
EAST COUNTY LINE ROAD
WHITE BEAR TOWNSHIP
UNITY LINE ROAD
WILDWOOD AVENUE
BIRCHWOOD AVENUE
BIRCH STREET
CEDAR STREET
ASH STREET
ASH EASEMENT
BIRCH EASEMENT
ELM EASEMENT
HOLLWOOD CRESCENT
KAY BEACH EASEMENT
City Hall
LAKE AVENUE
LAKEWOOD LANE
HALL AVENUE
HALL COURT
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FIVE OAKS LANE
CARGILL COURT
WHITE PINE LANE
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12"
15"
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42"
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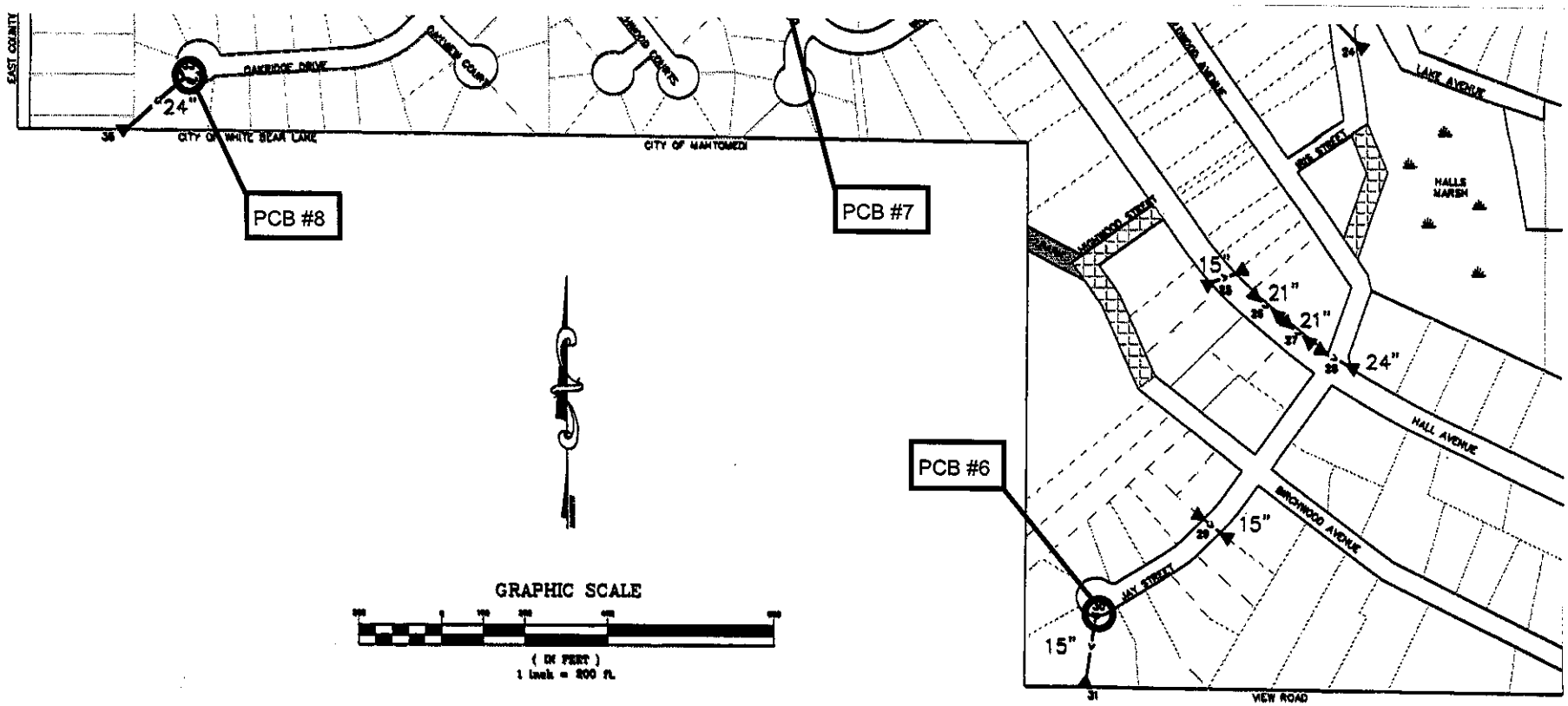
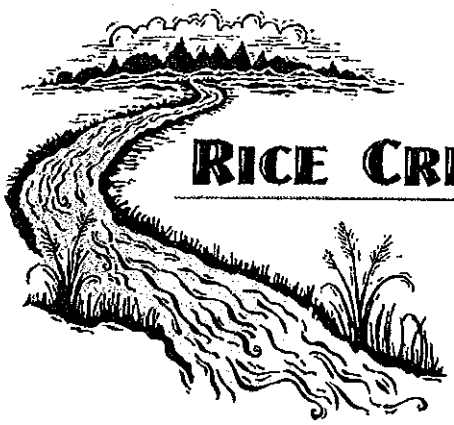


CITY OF BIRCHWOOD VILLAGE

STORM SEWER MAP



RICE CREEK WATERSHED DISTRICT

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September 18, 2009

Mary Wingfield, Mayor
City of Birchwood Village
207 Birchwood Avenue
Birchwood Village, MN 55110

RE: City of Birchwood Village 2009 Catchbasin Replacement Project

Dear Ms. Wingfield,

In response to recent inquiries about the City of Birchwood Village2009 Catchbasin Replacement Project Application the Rice Creek Watershed District (RCWD) ordered its consulting engineer, Houston Engineering, Inc. (HEI), to conduct a review of the project. RCWD staff met onsite with HEI staff on August 14, 2009 to discuss the project in detail. HEI then produced a memorandum summarizing some technical aspects of the project (see enclosure).

This project was approved for up to $12,500 in RCWD cost-share funding by our Board of Managers on May 13, 2009 and the Cost-Share Agreement between the City and the RCWD was executed on June 19, 2009. Based on the conclusions presented in HEI's memo dated September 16, 2009 we intend to move forward with the current cost-share agreement unless otherwise directed by the City.

We look forward to seeing this project successfully implemented. Please contact Kyle Axtell, Water Resource Specialist, at (763) 398-3072 or kaxtell@ricecreek.org to notify him of the City's intentions regarding continuation of this project, including a construction timeline if the project is ultimately undertaken by the City. The Cost-Share Agreement is valid through June 19, 2011.

Sincerely,

Doug Thomas, Administrator

Enc. HEI memorandum dated 09/16/09

CC: Elfering & Associates, Inc.
Houston Engineering, Inc.
RCWD File

MEMO
External Memorandum

HoustonEngineering Inc.

To: Kyle Axtell
Water Resource Specialist, RCWD

From: Greg Bowles, P.E.

Through: Brent Johnson, P.E.

Date: September 16, 2009

Subject: Birchwood Village Urban Stormwater Cost-Share Program

HEI Project No. 5555-060.015

Cc: File 5555-060.015
Doug Thomas, RCWD
Kristie Elfering, City Engineer
Mark Deutschman, P.E.

By email dated March 18, 2009, you requested a cursory review of the Birchwood Village Urban Stormwater Cost-Share Program Application. The review of the Birchwood Village Urban Stormwater Cost-Share Program Application was completed in a memorandum dated March 23, 2009. Since this review, the installation of a limestone rock sediment trap (Rock Trap) was completed by Ramsey County downstream of CB #3. It was also brought to our attention that prior to the Birchwood Village Urban Stormwater Cost-Share Program Application to RCWD the City installed a four foot sump manhole (Elm CB) downstream of CB #1 that was not indicated on the submitted plans. By email dated August 11, 2009, you requested an additional cursory review of the Birchwood Village Urban Stormwater Cost-Share Program Application based upon the changes to the project.

Houston Engineering used the location map, the subcatchment map, proposed drainage areas, and construction cost provided by the City of Birchwood Village to create a P8 model. The models was used to simulate the system and estimate the total suspended solids (TSS) and total phosphorus (TP) loading and removal for each of the proposed BMP's. The inputs to the model include the use of the 1979 rainfall data (a typical rainfall year), an estimated impervious percentage of 30 % (based upon an average 1/3 acre residential lot size) and a curve number of 61 and the BMP sizes. The model simulations assume that the BMP's are clean and free of sediment at the start of each simulation. Maintenance of these BMP's will be required to achieve consistent removal efficiencies.

The existing drainage areas to Elm CB and the Rock Trap were modeled to determine the runoff pollutant (sediment and nutrient) loads of the inflow and the outflow from each of these BMP's. A model was also completed for the proposed drainage areas that included the results of sump manholes CB #1 and Elm CB (in series) and also the sump manhole CB #3 and Rock Trap (in series).

Table 1 and 2 show the results of the P8 model.

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Table 1 TSS Removal

BMP Type	Drainage Area (ac)	Estimated Annual Inflow TSS Load (lbs)[1]	Estimated Annual Outflow TSS Load (lbs)[1]	Estimated TSS Reduction (%)[1]	Annual TSS Removal Cost Per Pound[2]
Elm CB	13.6	1260.7	1185.2	6.0	$3.68
CB #1 and Elm CB	13.6	1260.7	1128.4	10.5	$4.20
CB #2	12.6	1168.0	1093.4	6.4	$3.72
Rock Trap	9.10	843.5	459.4	45.5	$1.04
CB #3 and Rock Trap	9.10	843.5	450.8	46.6	$1.73

Table 2 TP Removal

BMP Type	Drainage Area (ac)	Estimated Annual Inflow TP Load (lbs)[1]	Estimated Annual Outflow TP Load (lbs)[1]	Estimated TP Reduction (%)[1]	Annual TP Removal Cost Per Pound[2]
CB #1/ Elm CB	13.6	3.96	3.89	1.8	$7,936.57
Elm CB	13.6	3.96	3.92	0.8	$6,944.50
CB #2	12.6	3.67	3.63	0.9	$6,944.50
CB #3/ Rock Trap	9.10	2.64	2.16	18.2	$1,412.04
Rock Trap	9.10	2.64	2.17	17.8	$851.06

[1] The input to the P8 model included the 1979 rainfall data (a typical rainfall year), an impervious percentage of 30% and a curve number of 61.

[2] Annual removal cost is based upon the construction cost estimate ($25,000) provide by the City of Birchwood Village divided by the number of CB's over a 30 year life cycle. Cost of Elm CB was estimated to be the same unit cost as provided by the City of Birchwood Village. The cost of the Rock Trap was estimated at $12,000 with a 30 year life cycle. Cost does not include annual maintenance.

The modeling results indicate that when CB #1 and Elm CB are in series the annual outflow TSS and TP loads are reduced by 56.8 lbs. and 0.03 lbs., respectively when compared to the results of Elm CB alone. The results also indicate the when CB #3 and Rock Trap are in series the annual outflow TSS and TP loads are reduced by 8.6 lbs. and 0.01 lbs., respectively when compared to the results of the Rock Trap alone. The drainage area to CB #2 would the same for the existing and proposed conditions. The results indicate that CB #2 will reduce the TSS and TP loads by 74.6 lbs. and 0.04 lbs., respectively.

The annual cost of pollutant removal per pound was estimated based upon the total construction cost estimate ($25,000) provided by the City of Birchwood Village. The total cost was divided by the number of proposed BMP's (3) over an estimated 30 year life span. The cost of Elm CB was estimated at the same unit cost over a 30 year life cycle as proposed sump manholes CB #1, CB #2 and CB #3. The cost of the Rock Trap was estimated at $12,000 with a 30 year life cycle. The capital costs and the computed removal costs per pound fall within the general range of BMP costs in urban landscapes.

In summary, the P8 model shows that the addition of sump manholes CB #1, CB #2, and CB #3 will result in a reduction in TSS load. The simulated TSS removal rates for the catch basins are lower than typically

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reported in the literature, probably due to the relatively large drainage area to each catch basin. The TP loading will not be significantly reduced by the addition of the sump manholes, but that is not surprising since enhanced catch basins (sumps) cannot effectively remove soluble pollutants or fine particles.

The City of Birchwood Village has submitted inspection reports for the Elm CB that indicate from a period of August 7, 2008 to May 20, 2009 a half yard of sediment was removed. The removed sediment volume is greater than our estimates using the P8 model. Discrepancies between the actual removed sediment volume and the P8 model estimated volume maybe due to either inaccuracy in field estimates of sediment volume or to inaccuracy of the water quality model.

In conclusion, the proposed project seems to generally meet the intent of Urban Stormwater Remediation Cost –Share Program. The application: 1) pertains to White Bear Lake, identified as a Tier 1 lake; 2) involves retrofit practices designed to enhance water quality treatment, and 3) shows some ability for reducing sediment and nutrient loads to White Bear Lake. The proposed catch basin sumps will reduce the TSS load to White Bear Lake, but won't significantly reduce the TP load. The expected costs and the computed removal costs per pound fall within the general range of BMP costs in urban landscapes.

Please contact either Greg Bowles or Brent Johnson at 763-493-4522 if you have any questions.

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

Brent K Johnson 9-16-2009

Brent Johnson
MN Reg. No 20378

Greg Bowles 9-16-2009

Greg Bowles
MN Reg. No 41929

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