Elm Creek Watershed Management Commission 2016 Treasurer's Report

		2016 Budget	July 2016	Aug 2016	2016 Budget YTD
EXPENSES					
Administrative		90,000	6,176.54	6,578.23	49,124.67
Watershed-wide TMDL		24,406	113.25		659.18
Grant Writing		5,100			0.00
Website		6,000	1,035.13	280.61	2,180.99
Legal		2,000			580.00
Audit		5,000			4,500.00
Insurance		3,800			3,456.00
Miscellaneous/Contingency		2,000			0.00
Project Reviews	HCEE	105,500		23,752.77	44,763.24
Project Reviews	Consult	6,000	364.50		3,722.00
Project Reviews	Admin	11,000	1,420.98	955.36	6,737.22
WCA-Technical	HCEE	12,500		2,303.87	6,877.74
WCA	Legal	500			0.00
WCA	Admin	2,000	90.96	147.32	723.35
Stream Monitoring		23,500		11.35	914.32
Extensive Stream Monitoring		7,200			0.00
DO Longitudinal Survey		500			0.00
TMDL Monitoring/Comm in-kind					9,100.00
Rain Gauge		195	17.98	21.03	120.90
Rain Gauge Network		100			0.00
Lakes Monitoring - CAMP		1,650			0.00
Lakes Monitoring - TRPD					0.00
Sentinel Lakes		3,100			0.00
Additional Lake		600			0.00
Aquatic Vegetation Surveys		1,000			0.00
Wetland Monitoring (WHEP)		4,000			0.00
Stream Health (SHEP)		6,000			0.00
Education		6,000		10.00	2,174.94
WMWA General Activities		4,000			3,750.00
WMWA Educators/Watershed Prep		4,500			4,500.00
WMWA Special Projects		1,500			1,500.00
Rain Garden Workshops		3,000			2,113.50
Education Grants		3,000			0.00
Macroinvertebrate Monitoring-River Watch		6,000			0.00
Ag Specialist		2,000			0.00
Projects ineligible for ad valorem		50,000			0.00
Studies/Project ID/SWA		35,000	174.66	567.94	3,838.81
S Metro/Upper Miss Bacteria TMDLs		1,000			0.00
Plan Amendments/Local Plans		8,000		70.20	1,698.91
Transfer to (from) Encumbered Funds (see following pages)					*0.00*
Transfer to (from) Capital Projects (see following pages)					*0.00*
Transfer to (from) Cash Sureties (see following pages)					*0.00*
To Fund Balance					0.00
TOTAL - Month			**9,394.00**	**34,698.68**	**153,035.77**
TOTAL Paid in 2016, incl 2015 Expenses		**447,651.00**	**174,582.81**	**209,281.49**	**2016 Paid**

Elm Creek Watershed Management Commission 2016 Treasurer's Report

		2016 Budget	July 2016	Aug 2016	2016 Budget YTD
INCOME					
From Fund Balance					
Project Review Fee		100,000	3,342.50		40,271.35
Return Project Fee					0.00
Water Monitoring - TRPD Co-op Agmt		6,000			0.00
WCA Fees		5,000	150.00		8,100.00
Return WCA Fee					0.00
Reimbursement for WCA Expense		1,500			210.00
Member Dues		215,360	7,255.73		215,360.00
Interest/Dividends Earned		80	70.61		307.70
Transfer to (from) Capital Projects (see page 4)			127,449.66		127,449.66
Watershed-wide TMDL - MPCA - 2015					0.00
Misc Income					0.00
Total - Month			**138,268.50**	**0.00**	**391,698.71**
TOTAL Funds Rec'd in 2016, incl 2015 Incom		**327,940.00**	**403,706.96**	**403,706.96**	**2016 Received**
CASH SUMMARY		**Balance Fwd**			
Checking					
4M Fund		517,804.14	747,928.29	713,229.61	
Cash on Hand			**747,928.29**	**713,229.61**	
CASH SURETIES HELD		**Balance Fwd**			**Activity CY**
WCA Escrows Received		0.00			1,000.00
WCA Escrow Reduced		0.00			0.00
Total Cash Sureties Held		**0.00**	**1,000.00**	**1,000.00**	
CAPITAL PROJECTS					
Revenue - AdValorem Levy Funds		250,000			
Medina Tower Drive		-			0.00
Champlin Mill Pond Dam		-			0.00
Plymouth EC Restoration			127,449.66		127,449.66
Expense - Commission Cost Share		250,000			
Administrative Expense		3,000			
Medina Tower Drive		-			0.00
Champlin Mill Pond Dam		-			0.00
Plymouth EC Restoration					
ENCUMBERED FUNDS					
Encumber Studies/Project Identification/		34,316			
SWA balance from 2015					
Total Expenditures			**0.00**	**0.00**	**0.00**
Total Encumbered Funds		**34,316**	**34,315.54**	**34,315.54**	

Elm Creek Watershed Management Commission 2016 Treasurer's Report

Claims Presented		General Ledger Account No	July	August	TOTAL
Campbell Knutson - Legal		521000			**0.00**
Legal - Project Review (Admin)		578100			
Connexus - Rain Gauge		551100		21.03	**21.03**
Ali Durgunoglu - Postage for Gauge Repair		551000		11.35	**11.35**
Hennepin County Treasurer					**26,056.64**
HCEE - Tech Svcs Project Reviews		578000		23,752.77	
HCEE - Tech Svcs WCA		579500		2,303.87	
JASS					**8,609.66**
Administration		511000		6,434.48	
Annual Report		511000			
Website		581000		280.61	
Project Reviews		578100		955.36	
WCA		579000		147.32	
Plan Amendment		541500		70.20	
Education		590000		10.00	
Elm Creek TMDL		580800			
CIPs General		563001		567.94	
CIPs Medina Tower Drive		563002			
CIPs Champlin Mill Pond Dam		563003			
CIPs Plymouth EC Restoration		563004			
Grant Opportunities		511000		143.75	
TOTAL CLAIMS					**34,698.68**

Elm Creek Watershed Management Commission
2016 Treasurer's Report
Capital Improvement Project Tracking

CIPs	Amount	%age	TOTAL 2014	TOTAL 2015	JAN 2016	'FEB 2016	'MAR 2016	'APR 2016	'MAY 2016	'JUN 2016	'JUL 2016	'AUG 2016	TOTAL 2016	TOTAL ALL YEARS
Ad Valorem 2014 - Medina Tower Drive	68,750	52.380												
Revenue			**-**	**68,916.44**									**-**	**68,916.44**
Expense			**1,989.80**	**-**									**-**	**1,989.80**
Balance			**(1,989.80)**	**68,916.44**									**-**	**66,926.64**
Ad Valorem 2014 - Champlin Mill Pond Dam	62,500	47.620												
Revenue			**-**	**62,653.69**									**-**	**62,653.69**
Expense			**1,631.81**	**-**									**-**	**1,631.81**
Balance			**(1,631.81)**	**62,653.69**									**-**	**61,021.88**
Ad Valorem 2015 - Plymouth Elm Creek Restoratio	250,000.00	100.000												
Revenue				**-**							127,449.66		**127,449.66**	**127,449.66**
Expense				**2,606.17**									**-**	**2,606.17**
Balance				**(2,606.17)**							127,449.66		**127,449.66**	**124,843.49**
TOTAL CIP	**131,250.00**													
Revenue			**-**	**131,570.13**	**-**	**-**	**-**	**-**	**-**	**-**	**127,449.66**	**-**	**127,449.66**	**259,019.79**
Expense			**3,621.61**	**2,606.17**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6,227.78**
Balance			**(3,621.61)**	**128,963.96**	**-**	**-**	**-**	**-**	**-**	**-**	**127,449.66**	**-**	**127,449.66**	**252,792.01**

CONNEXUS® ENERGY
Your Community Energy Partner

Account Number:
481113-238425
ELM CREEK WATERSHED MGMT ORG

Monthly Statement

Service Address
ELM CREEK RD
DAYTON MN

Total Amount Due	Due Date
$21.03	August 13, 2016

Billing Summary

Billing Date: Jul 18, 2016

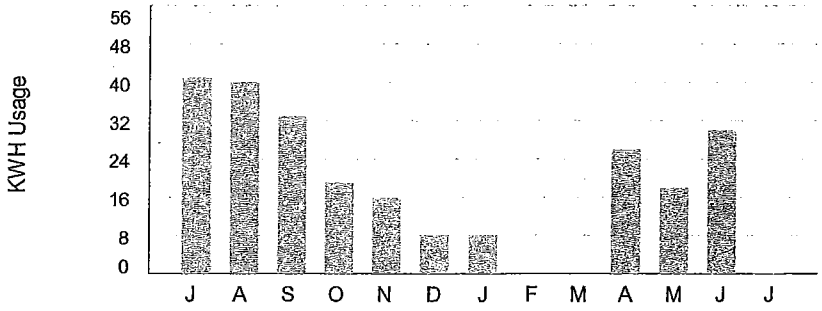
Previous Balance	$17.98
Payments - Thank You!	$17.98
Balance Forward	**$0.00**
New Charges	**$21.03**
Total Amount Due	**$21.03**

Payment must be received on or before August 13, 2016

Message Center

Energy Comparison

Previous Months' Usage Current Month's Usage



How to contact us

Member Services / Moving - 763-323-2650
Outages and Emergencies - 763-323-2660
Hearing/Speech Impaired Call - 711 or 800-627-3529
Email: info@connexusenergy.com
www.connexusenergy.com
Gopher State One Call - 811
14601 Ramsey Boulevard, Ramsey, MN 55303

▼ *Please detach at perforation and return this portion with a check or money order made payable to Connexus Energy* ▼

TRA3-D-009029/001824 AGTYSA S1-ET-M1-C00003 1

CONNEXUS® ENERGY
Your Community Energy Partner

Account Number: **481113-238425**
Total Amount Due **$21.03**
Payment Due By August 13, 2016

009029 1 AB 0.396 000910/009029/001824 033 01 AGTYSA
ELM CREEK WATERSHED MGMT ORG
3235 FERNBROOK LN N
PLYMOUTH MN 55447-5325

Connexus Energy
PO Box 1808
Minneapolis, MN 55480-1808

00002103 00048111302384 25 000000 00000 00000000000 0000009

-----Original Message-----
From: Ali Durgunoglu
Sent: Monday, May 23, 2016 4:15 PM
To: Judie Anderson (judie@jass.biz) <judie@jass.biz>
Subject: Global Waters package shipping receipt

Here's the USPS receipt for the old water level transducer.

Ali Durgunoglu, Ph.D., P.E.
Engineer
Hennepin County Public Works |Environment and Energy Department
701 Fourth Avenue South, Suite 700, Minneapolis, MN 55415
Ali.Durgunoglu@hennepin.us
PHONE: (612) 596-1171 | FAX: (612) 348-8532 www.hennepin.us

==========

COMMERCE
307 4TH AVE S
MINNEAPOLIS
MN
55415-1009
2663070415

05/23/2016 (800)275-8777 12:27 PM

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Product Description	Sale Qty	Final Price
PM 3-Day	1	$11.35
(Domestic)		
(COLLEGE STATION, TX 77845)		
(Weight:2 Lb 3.30 Oz)		
(Expected Delivery Day)		
(Thursday 05/26/2016)		
(USPS Tracking #)		
(9505 5152 0872 6144 0206 68)		
Insurance	1	$0.00
(Up to $50.00 included)		
Total		$11.35
Cash		$11.50
Change		($0.15)

Includes up to $50 insurance

****
BRIGHTEN SOMEONE'S MAILBOX. Greeting cards available for purchase at select Post Offices.
****

Text your tracking number to 28777 (2USPS) to get the latest status. Standard Message and Data rates may apply. You may also visit USPS.com USPS Tracking or call 1-800-222-1811.

Save this receipt as evidence of insurance. For information on filing an insurance claim go to https://www.usps.com/help/claims.htm.

Order stamps at usps.com/shop or call 1-800-Stamp24. Go to usps.com/clicknship to print shipping labels with postage. For other information call 1-800-ASK-USPS.

****
Get your mail when and where you want it with a secure Post Office Box. Sign up for a box online at

Hennepin County
Public Works

Department of Environment and Energy
701 Fourth Avenue South, Suite 700
Minneapolis, Minnesota 55415-1842

612-348-3777, Phone
612-348-8532, Fax
hennepin.us/environment

Bill To:

Elm Creek Watershed Management Commission
c/o: Mr. Doug Baines
3235 Fernbrook Lane
Plymouth, MN 55447

Invoice

Date	Invoice #
7/18/2016	1607001

Contract
Elm Creek WMC

Description	Total Amount
2nd quarter 2016 invoice (April 2, 2016 – July 9th, 2016) for technical services and WCA provided per Agreement A154047	
• **Technical Assistance**	**23,752.77**
• **WCA**	**2,303.87**
(Services provided to date include; engineering and technical review on submitted projects, erosion and sediment control planning and implementation assistance, Wetland Conservation Act administrative and technical assistance, TMDL development and implementation, floodplain assistance and information; and storm water quantity and quality work throughout the watershed).	
• **Accrued 2016 costs to-date** - ***not to exceed a total of $94,500 for technical services and WCA in 2016 unless amended per Agreement A154047.***	**51,640.98**
• **2016 Payments and other credits to-date**	**25,584.34**
Costs associated with the Commission's participation in the Department led volunteer monitoring/education programs (Riverwatch, SHEP, and WHEP), at a not-to-exceed amount of $16,000, will be billed on a lump sum basis with the 4th quarter 2016 invoice.	
AMOUNT DUE	**$26,056.64**

Make check payable to: Hennepin County Treasurer

Remit to: Randy Anhorn
Hennepin County Department of Environment and Energy
701 Fourth Avenue South, Suite 700
Minneapolis, MN 55415-1842.

Direct questions to: Randy Anhorn 612-348-2027

From: Randy J Anhorn [mailto:randy.anhorn@hennepin.us]
Sent: Monday, July 18, 2016 8:31 AM
To: Doug Baines; judie@jass.biz
Cc: James C Kujawa; Ali Durgunoglu
Subject: ECWMC 2nd quarter 2016 invoice

Dear Chairman Baines:

Per agreement (A154047), Hennepin County Department of Environment and Energy (Department) is submitting a quarterly invoice (attached) for accrued costs associated with providing technical assistance to the Elm Creek Watershed Management Commission (Commission) during the period April 2, 2016 - July 9, 2016

Per the terms of the Agreement, the Commission shall reimburse the county on a quarterly basis for actual wages and related personnel costs for Department staff providing technical services for a total not to exceed ninety four thousand five hundred dollars ($95,500) in 2016. Any additional costs for extended work load after the "not-to-exceed" limit has been reached, special studies, or capital projects, must be set forth in a written amendment to the Agreement.

For the Commission's planning purposes, as of July 9, 2016, we have billed $51,640.98 to the Commission's project numbers. This represents 54% of the "not-to exceed" amount.

Services provided to date include:

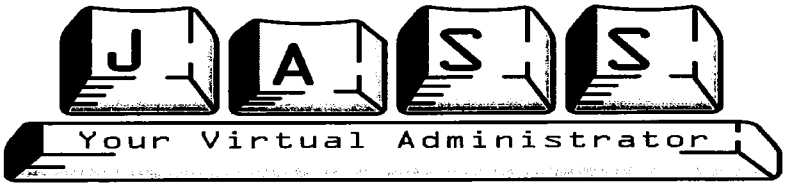
* Engineering and technical review submitted projects plans;
* Erosion and sediment control planning and implementation assistance;
* Wetland Conservation Act administrative and technical assistance;
* TMDL development and implementation
* Floodplain assistance and information; and
* Storm water quantity and quality work throughout the watershed.

In addition, costs associated with the Commission's participation in the Department led volunteer monitoring/education programs (Riverwatch, SHEP, and WHEP), will be billed on a lump sum basis with the 4th quarter 2016 invoice. Please contact me at 612-348-2027 if you have any questions concerning this request.

Sincerely,

Randy Anhorn,
Supervisor, Land and Water Unit

Randy Anhorn | Supervisor, Land & Water Unit | Hennepin County, Environment and Energy Department
701 Fourth Ave S, Suite 700, Mpls MN 55415 |
randy.anhorn@hennepin.us<mailto:randy.anhorn@hennepin.us> | o: 612.348.2027 | c: 651.472.4061 Please consider the environment before printing this e-mail



3235 Fernbrook Lane
Plymouth MN 55447

Elm Creek Watershed Management Commission
3235 Fernbrook Lane
Plymouth, MN 55447

8-Aug-16

				Total by Project Area
Administrative	14.68	55.00	807.40	
Administrative	59.18	60.00	3,550.80	
Admin - Offsite	4.00	65.00	260.00	
Office Support	6.00	200.00	1,200.00	
Storage Unit	1.00	175.78	175.78	
Data Processing/File Mgmt	1.05	55.00	57.75	
Archiving	0.93	60.00	55.80	
Admin - Reimbursable Expense	326.95	1.00	326.95	6,434.480
Website	3.42	55.00	188.10	
Website	0.75	60.00	45.00	
Website - Reimbursable Expense		1.00	0.00	
Web Domain, hosting	47.51	1.00	47.51	280.610
Project Reviews - Secre	0.75	55.00	41.25	
Project Reviews - Admin	11.96	60.00	717.60	
Project Reviews - Admin - File Mgmt	0.17	50.00	8.50	
Project Reviews - Reimbursable Expense	188.01	1.00	188.01	955.360
WCA - Secre	0.50	55.00	27.50	
WCA - Admin	1.50	60.00	90.00	
WCA - Reimbursable Expense	29.82	1.00	29.82	147.320
Education - Secretarial		55.00	0.00	
Education - Admin		60.00	0.00	
Education - Admin Offsite		65.00	0.00	
Education - Reimbursable Expense	10.00	1.00	10.00	10.000
CIPs - General - Secretarial	0.25	55.00	13.75	
CIPs - Administrative	2.68	60.00	160.80	
CIPs- Offsite Admin		65.00	0.00	
CIPs - reimbursables	393.39	1.00	393.39	567.940
Grant opps - Secret		55.00	0.00	
Grant opps -Admin	2.35	60.00	141.00	
Grant opps - reimbursable	2.75	1.00	2.75	143.750
Plan Amendment - Secre		55.00	0.00	
Plan Amendment - Admin	1.17	60.00	70.20	
Plan Amendment - Offiste		65.00	0.00	
Plan amendment - reimbursable		1.00	0.00	70.200
		Invoice Total		8,609.660

elm creek
Watershed Management Commission

ADMINISTRATIVE OFFICE
3235 Fernbrook Lane
Plymouth, MN 55447
PH: 763.553.1144
E-mail: judie@jass.biz

TECHNICAL OFFICE
Hennepin County Public Works
Department of Environment and Energy
701 Fourth Ave. South, Suite 700
Minneapolis, MN 55415
PH: 612.348.7338
E-mail: james.kujawa@co.hennepin.mn.us

Elm Creek Meadows
City of Plymouth, Project #2016-030

Project Overview: The Elm Creek Meadows Development is an approximately 28 acre development within the City of Plymouth. Approximately 17.5 acres will be disturbed and 59 multi-family housing units are to be built. The current land use is low-density residential with some agricultural use. The current impervious area is 1.3 acres (4.6%), and the proposed impervious area is 7.1 acres (25.4%). Elm Creek is located on the west side of the proposed development.

Applicant: The Jarvis Company, Attn: Peter Jarvis, 6117 Blue Circle Drive, Minnetonka, MN 55343. Phone: 612-325-0332. Email:pejarvis@me.com.

Engineer/Agent: Sathre-Bergquest, Inc., Attn. Tom Wlshinger, 150 South Broadway, Wayzata, MN 55391. Phone: 952-476-6000. Email: twlshinger@sathre.com.

Exhibits:

1) ECWMC Request for Plan Review and Approval and fee. Complete application received June 29, 2016.
2) Signed Plan Set, dated June 17, 2016. Total of 23 sheets
    a. Sheet 1, Title Sheet
    b. Sheets 2-4, Final Street Plan
    c. Sheet 5, Turn Lane
    d. Sheets 6-9, Sanitary Sewer and Watermain Plan
    e. Sheet 9a, Helical Pier Design
    f. Sheets 10-14, Final Storm Plan
    g. Sheets 15-17, Final Grading Plan
    h. Sheet 18, Erosion and Sediment Control Plan
    i. Sheets 19-23, City Details
3) Stormwater Management Plan, signed and dated May 17, 2016

Findings

1) A complete application was received on June 29, 2016. The initial 60-day review period per MN Statute 15.99 expires August 29, 2016.
2) The vast majority of the existing site drains overland to Elm Creek. Most of the existing site drains through a wetland that borders Elm Creek; however a small portion

immediately downstream of County Road 47 drains directly to the creek. A small area on the east side of the existing site drains to a wetland to the east. The proposed drainage will route the developed area through three stormwater ponds that will discharge to existing wetlands before eventually discharging to Elm Creek.

3) The project area is a total of 28 acres. The current impervious area is 1.3 acres (4.6%), and the proposed impervious area is 7.1 acres (25.4%).

Stormwater Management - Quantity

4) There are three wetlands on the site and the vast majority of the existing land use drains through one of the wetlands prior to discharging to Elm Creek. The total area draining to wetlands prior to Elm Creek will remain approximately the same

5) The total pre- and post-project flow rates from the entire project area and individual outfalls are as follows:

Total Project Area	2-yr (cfs)	10-yr (cfs)	100-yr (cfs)
Pre-Development Rate	23	52	117
Post-Development Rate	13	28	78

To Elm Creek	2-yr (cfs)	10-yr (cfs)	100-yr (cfs)
Pre-Development Rate	21	48	108
Post-Development Rate	12	27	77

East Wetland	2-yr (cfs)	10-yr (cfs)	100-yr (cfs)
Pre-Development Rate (6.7 ac)	2.2	5.0	11
Post-Development Rate (1.2 ac)	0.5	1.2	2.7

6) Based on 1.1" of water runoff from 5.8 acres of new impervious areas, 23,181 cubic feet of water abstraction is required per the Commission and MPCA requirements.
    a. Based on soil types and water table elevation, infiltration is not feasible within the project area. Dominant soil types are C soils, which cannot be expected to provide good infiltration.
    b. Abstraction credits are achieved through the following credits:
        i. Disconnected Impervious: 2,118 cubic feet
        ii. Filtration: 35,971 cubic feet

Stormwater Management - Quality

7) Stormwater quality is primarily managed through a constructed stormwater pond. Pre and post development analysis are as follows:

Condition	TP Load (lbs./yr) (P8)	TSS Load (lbs./yr) (P8)	Runoff volume (AF/yr.)
Pre-project (baseline)	4.5	1,409	10.7
Post-project without Mitigation	15.3	4,726	21.7
Post-project with Mitigation	3.9	573	21.1
Net Change ("baseline" compared to "post-development with mitigation")	**-0.6**	**-836**	**+10.4**

8) The stormwater treatment components will be included in a drainage easement and maintained by the City of Plymouth.

Grading and Erosion Controls

9) The grading and erosion control plans satisfy the Commission's requirements.

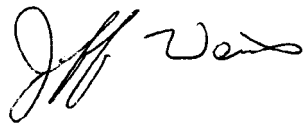
Floodplain Impacts

10) The western boundary of the development lies along the Elm Creek floodplain. This portion of Elm Creek is within the FEMA designated Zone A floodplain. The proposed project will fill 1,774 cubic yards within the floodplain. This fill will be compensated with excavation of 1,999 cubic yards, for a net increase in floodplain storage of 224 cubic yards.

Wetland Impacts and Buffers

11) There are no wetland impacts for this project.

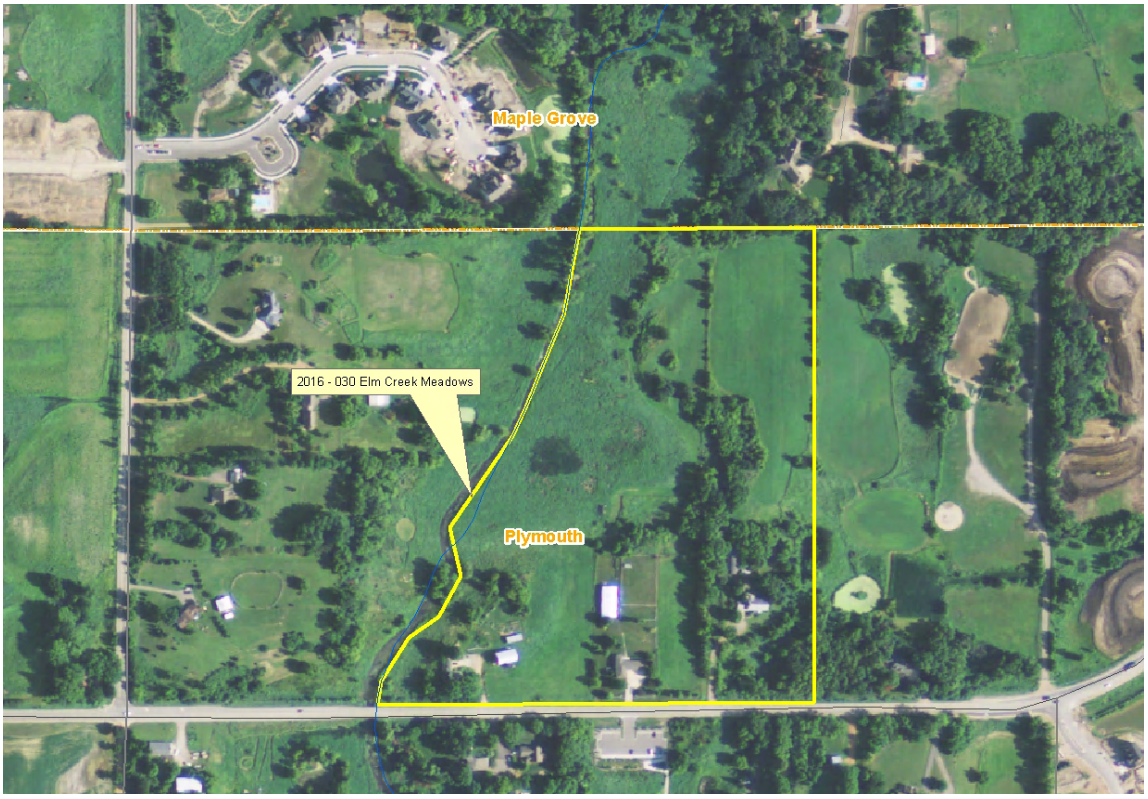
Recommendation: approval



Jeff Weiss, P.E.
Barr Engineering Company
Advisor to the Commission

August 9, 2016
Date

Location Map




N89°26'34"E 1299.00
Medium
WETLAND
FLOODPLAIN 922.77
WETLAND
(338,967 sf)
FLOODPLAIN 922.77
WETLAND
Park Area: +/- 45,380 sf
Flat Area: +/- 12,400 sf
61ST AVE
GARLAND LN
WETLAND
60TH AVE
INLAND LN
WETLAND
Additional ROW +/- 34,333 sf
107.88

From: Steve Woods [mailto:SWoods@freshwater.org]
Sent: Monday, July 18, 2016 2:01 PM
To: Judie Anderson (judie@jass.biz)
Subject: model snow and salt policy

This email is asking if the watershed is willing to join a consortium of other watersheds to provide a state of the art model snow and ice removal policy for municipal use.

As I shared over the phone with you, we are launching a quick cooperative project to develop a model snow and ice policy for road authorities and private commercial snow removal contractors. The project grew out of the February 2016 Road Salt Symposium where Louis presented on liability issues in the world of providing traction. The Symposium has been convened by Freshwater Society and Fortin Consulting for fifteen years. We've seen the big technical hurdles get mostly addressed and excessive road salt use now is driven in part by legal liability concerns—real and imagined.

The post-symposium feedback forms showed us we had a homerun of an issue that was very much on the minds of public works and maintenance supervisors. They WANT the public awareness and elected official support that comes with sound liability management achieved through careful policy adoption. Cities fully get that they have to balance multiple public goals for safety, water quality, operation costs, asset management all while weather conditions fluctuate. A good policy reference these multiple goals is desired by *everyone*.

We developed a scope of work that totals $20,000. The scope includes these steps:

1. Form advisory committee
2. Review legal framework, sample policies; identify key issues and best practices; prepare memo and outline of model policy
3. Advisory Committee Mtg #1; Review and comment on memo and outline
4. Prepare Draft #1 of Model Policy; review with at least 3 city attorneys
5. Advisory Committee Mtg #2; Review and comment on Draft #1
6. Prepare Draft #2 and Statement of Need and Reasonableness (memo explaining research, best practices, reasoning of advisory committee)
7. Advisory Committee Mtg #3; Review, refine final Draft Model Policy & SONAR
8. Present Model Policy to larger forums (e.g. League of Minnesota Cities, Water Resources Conference, CEAM, APWA)
9. Integrate model policy(s) into training materials for Road Salt Applicator (certification) program.

We are hoping your WMO shares in the sense of value for this project and would consider a financial contribution of approximately $1500. (We are estimating that there will be about 6-7 funding partners among watershed districts, WMOs and others.) Freshwater Society has agreed to serve as fiscal lead, Louis Smith is the legal sub-consultant, and Connie Fortin is the chloride sub-consultant in this endeavor.

I would be pleased to answer any questions you may have.

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Model Snow and Ice Policy Advisory Committee

Meeting Minutes

July 20, 2016

Present: Connie Fortin (Fortin Consulting), Becky Christopher (Minnehaha Creek Watershed District), Jeff Davies (City of Grand Rapids), Mark Maloney (City of Shoreview), Brooke Asleson (Minnesota Pollution Control Agency), Steven Lawrence (City of St. Cloud), Leslie Larson (Minnesota Nursery and Landscape Association), John Wickenhauser (Carver County), Craig Eldred (City of Waconia), Katrina Hilton (City of Saint Paul), Steve Woods (Freshwater Society), Louis Smith, Elizabeth Henley.

1. Welcome and Introductions

Ms. Fortin welcomed everyone to the meeting at the offices of the Freshwater Society and invited a round of introductions.

2. Review of June 29, 2016 Meeting Minutes

Ms. Fortin and Mr. Smith introduced the June 29 meeting minutes and invited comments, corrections, and additions. Mr. Smith noted that the intent is to capture the discussion at the Committee meetings to assist in creating the SONAR document that will accompany the model policy. Committee members expressed their appreciation for the detailed minutes. No corrections were requested. Ms. Fortin invited Committee members to email to her any corrections to the June 29, 2016 meeting minutes by July 22 (none were received).

3. Discussion of Draft Model Policy

a. Section A, Introduction

Mr. Smith asked the Committee to offer guidance on the Introduction section of the Model Policy. Mr. Smith asked Mr. Lawrence his opinion on whether the base template for the Model Policy should be the League of Minnesota Cities' model policy. Mr. Lawrence stated that he did not think it necessary to use the League's model policy as a template for the Committee's Model Policy. Mr. Lawrence noted that not many cities adhere to the entirety of the League of Minnesota Cities' model policy, and that some small cities look to the League's model policy for guidance. Mr. Maloney noted that the League's policy is helpful, but that there are opportunities for expansion.

Mr. Smith noted the formatting question – how the document could be formatted to be most usable for cities, counties, and private operators. Mr. Woods suggested that certain terms in the Policy could be highlighted or bolded to indicate different options for counties, cities, and others using the Policy. Mr. Davies noted that while the policy preferences of cities and counties can

vary with changes in city or county administration, it is important that current city councils and counties adopt the Policy. Mr. Smith stated that the introduction to the SONAR document will explain how the Policy is adaptable to different users, and will identify specific places where different users can enter different information.

Mr. Maloney asked whether sentence one discussing city and country streets and public property is too specific. He asked whether the policy should cover parking lots at city parks, sidewalks, and other public spaces, and noted that every city and county is different in what it plows. Mr. Davies suggested describing the property that would be plowed as improved public property. He noted that cities and counties need to show a reasonable effort to reasonably maintain public facilities and entrances. Mr. Davies noted that different policies are in place at the intersection of city and county roadways, and suggested that the policy differentiate between what is maintained by one entity compared to another. Mr. Smith suggested that the language could be changed to city/county streets under the city's/county's jurisdiction. Mr. Davies commented that it is not reasonable or appropriate for a city to plow county or state roads located within that city because the city. Mr. Smith said that he will also bring this issue to the attention of the attorneys who will review the entire draft Policy. Mr. Wickenhauser noted that not every publicly owned property will be plowed.

i. Section A, Paragraphs 1 (Public safety) and 4 (Priority setting to optimize outcomes)

Turning to Section A, paragraph 1, the Committee discussed public safety. Mr. Maloney appreciated that public safety was the first thing mentioned in the list of considerations. Under paragraph 4, Ms. Fortin commented that environment should also be empahsized as a priority, and suggested reversing the order of paragraph 4, priority setting to optimize outcomes, and paragraph 5, environment.

ii. Section A, Paragraph 5 (Environment)

Mr. Smith asked if paragraph 5 was clear and detailed enough about the damage that salt causes to the environment. Mr. Davies suggested adding something more to paragraph 5 about the environment, given the importance of the issue. Mr. Wickenhauser suggested that the language could mention focusing on environmental concerns through extended operator trainings. Ms. Asleson noted that language could be added discussing sand and salt impacts such as toxicity to fish. Mr. Maloney suggested using language about TMDLs and other science-based standards that salt users are affected by in their work. Mr. Maloney mentioned that some people who read about environmental concerns in the Policy will not be aware of chloride effects on the environment. Mr. Woods noted that the MS4 regulatory requirements include some of this environmental language. Ms. Christopher suggested including language that the de-icers are permanent pollutants to the environment. Mr. Maloney suggested using the word impairment in

the paragraph. Ms. Asleson offered to provide the Committee with the MPCA fact sheet that MPCA prepared as part of its chloride management plan.

Ms. Fortin mentioned that the Policy and/or SONAR will offer separate recommendations for private applicators. Mr. Woods noted that paragraph 1 about public safety is only three sentences long, and that there should not be many more sentences than three in the environment paragraph. Mr. Smith said that there would be an effort to preserve an appropriate balance of emphasis in the next draft.

Mr. Maloney commented that once his team better understood BMP maintenance, they stopped using sand because of their MS4 responsibilities. Now communities need to reduce chlorides, and are interested in the impacts of agricultural byproducts on chloride concentrations to determine the extent of road salt responsibility for chloride levels in water. Ms. Fortin mentioned that sand and deicers pose different environmental risks, and have separate impacts. Ms. Asleson commented that alternatives to traditional de-icing materials are being tested in different areas. Mr. Maloney asked what is considered a pollutant, and if sand is considered a pollutant. Ms. Asleson said that a pollutant could even be beet juice from an alternative practice that makes its way into waterways.

iii. Section A, Paragraph 6 (Administrative/technical judgment)

Mr. Woods noted that the need for clearer policy statements about operator discretion based on judgment emerged from the February 2016 road salt conference where presenters noted that weather can be very different over a range of just a few miles. Operators needed to feel protected in using their judgment to flexibly respond to differing weather conditions. Mr. Maloney asked what the term “administrative” means in the Policy. Mr. Smith explained that it means administrative knowledge and general management responsibility for the city or county. Mr. Maloney asked how other cities and counties respond to feedback from the public that operators should have been out on the roads at a time when they were not. Mr. Davies said that his city explains why they pulled equipment and operators off of the road, and that he thinks that is what is described by “administrative” in paragraph 6.

Mr. Smith asked the Committee if they thought it was important to include a more specific statement about professional judgment, such as the priorities and practices—timing of snowfall, starting ice control—paragraphs in the League of Minnesota Cities’ model policy. Mr. Davies commented that his city does not wait for a specific depth of snow to fall, and sometimes begins management activities before any snow, if it is the best decision in the judgment of operators and others managing snow and ice management decisions. Mr. Maloney asked if “administrative” meant decisions made at a higher level than operators. Mr. Eldred asked if “management” would be a better word to use than administrative. Mr. Maloney said that his city purposefully does not use the word “administrative.” Mr. Eldred noted that management may be a better word because those that may often be thought of as occupying an administrative role generally do not

understand the technicalities of snow and ice management, and managers are the individuals using professional judgment to manage snow and ice.

iv. Section A, Paragraph 7 (Need for Adaptability) and Final Paragraph

Mr. Lawrence noted that he liked the sentence that the public has a need to practice due care. Mr. Maloney asked if the statement about public practice should be expanded to include when the public will be ticketed for irresponsible winter activity. Mr. Davies said that his city's equipment has stickers on the back that warn motorists and others to stay back 50-100 feet. Mr. Maloney noted that footage is hard to gauge from a moving vehicle. Mr. Wickenhauser said that on his equipment, it would be difficult to read any warning language because the equipment becomes covered by snow.

b. Section B, Snow and Ice Management Priorities

Mr. Smith noted that in the model policies and city and county policies, there are different options for prioritizing snow and ice management locations. Ms. Fortin provided the MNDOT statement about prioritization. Mr. Smith asked the Committee if it would be useful to include a brief statement detailing how operators will plow streets, and what amount of detail is useful and generally applicable to all types of jurisdictions. Mr. Maloney noted that in cities, downtown areas are the priority. Mr. Davies said that in his city, the central business district gets plowed first, before sidewalks and before streets. Mr. Maloney commented that his city receives more calls and concerns about sidewalks and trails. Mr. Eldred mentioned that his city has two policies, one for sidewalks and trails, and one for roads. Mr. Davies said that sidewalks are also a priority in his city because people want their sidewalks to be open. Ms. Asleson suggested breaking the prioritization table in the draft Policy into more categories. Ms. Fortin suggested including language in Section B stating "insert level of service chart" where cities, counties and private operators may insert their own charts. Mr. Davies and Mr. Eldred commented that each city, county, or private operator will want to modify the priority and level of service information to fit their practices. Mr. Wickenhauser noted that his county's policy states that it does not distinguish between different priority roads and makes safe and open travel conditions on all roads an equal priority. Mr. Davies asked how Carver County defines bare pavement. Mr. Eldred noted that it is challenging to achieve bare pavement with blowing snow. Mr. Wickenhauser suggested that bare pavement is realistically considered about 75% clear roadways.

Mr. Smith asked the Committee if every jurisdiction has their own chart that they want to use in the priorities section of the policy. He asked the Committee if it would be useful to include in the Model Policy a chart listing downtown central business districts and sidewalks as priorities, and high priority route content similar to that in the league of Minnesota Cities' model policy. Mr. Lawrence noted that the League's model policy priorities are not relevant to his city, where bus routes get priority, along with heavily travelled streets and the central business district.

Mr. Lawrence asked about the reference to City/County Engineers under Section B. He suggested changing the sentence to read: “The City/County Administrator or delegated authority directs resources within policies and directives set by the City/County Administrator or delegated authority.” Mr. Lawrence, Mr. Davies, and Mr. Maloney agreed that in their cities, the city engineer does not have a role in snow and ice management decisions. Mr. Maloney commented that it is important that it is clear in the Policy that the point of the Policy is operator discretion. Mr. Smith stated that more variables, including central business districts, will be included in the discussion of priority areas in the first sentences of Section B. Mr. Maloney noted that cities and counties are constrained by equipment, resources, and budget, which is why the policy is needed. Mr. Lawrence noted that it is not possible to simultaneously identify and address all problem areas.

Ms. Fortin noted that operators do not want to be held to the requirements of a table, should priority routes change in any given snow or ice event. Specifically, the Policy should not include regain times or targets, because these can change depending on the snow or ice event. Mr. Smith said that the SONAR document will include examples of what priority information is included in the manuals for reference, but suggested that is seems to be the Committee’s recommendation that priority tables will not be included in the Policy. Mr. Smith stated that the SONAR document will explain the Committee’s thought process and discussion, and go through the Model Policy section by section. The document will also consider the different perspectives in the different snow and ice manuals.

Mr. Maloney asked about other jurisdictions and road authorities operating within city and county limits and how the Model Policy would interact with the policies of those jurisdictions. Mr. Smith responded that the Model Policy will operate alongside those of other jurisdictions. Ms. Asleson suggested that an additional consideration be added as paragraph 8 under Section A stating that business areas and bus routes will be taken into account and affect priorities of city/county snow and ice management. Mr. Smith noted that paragraph 1 under Section A included public safety information that can be referenced elsewhere in the Policy as a significant operational consideration. Mr. Davies said he was reluctant to rely on public demand as part of the Policy for snow and ice management because public requests may be unreasonable, and there is a value in relying on engineers and operators who understand traffic volume and road type.

c. Section C, Training

Mr. Smith introduced Section C, explaining that it discussed the importance of training for more than road maintenance crews. Ms. Fortin suggested that education for the public be added. Mr. Maloney noted that it is the road authority’s responsibility to do education and outreach. Mr. Davies commented that in his experience, the public responds to the city website and its Facebook page information. Ms. Fortin noted that the Policy should be careful not to establish additional responsibilities and duties for cities and counties. Mr. Wickenhauser noted that MNDOT offers education and training on snow and ice management. Ms. Asleson commented

that it is part of cities' MS4 requirement that they provide information to the public. Mr. Smith stated that a legal document is not necessarily the appropriate place to include an education and outreach statement requiring cities and counties to make sure that the road traveling public is aware of city and county Policy to manage snow and ice conditions. The goal of the Policy is not to create a new duty to inform the public of the weather. Ms. Fortin agreed that cities and counties do not want to take on additional risk.

Mr. Maloney commented that he likes the approach of including education and outreach information in the Policy's SONAR background document. Mr. Maloney added that the SONAR document will do a good job of internally informing the city or county organizations about the Policy. Ms. Larson asked that the Policy require that training be documented. Ms. Fortin added that documentation should be done with all aspects of snow and ice management. Mr. Smith suggested that documentation suggestions be included in the SONAR.

d. Section D, Delegation of Authority

Mr. Smith asked if the Policy should include a complaint procedure. Mr. Wickenhauser noted that in his county, the on-call supervisor usually gets the complaint call, and deals with the issue immediately. Mr. Eldred commented that in his city, there is usually a period of time (about 24 hours) before someone responds to a complaint. Mr. Smith asked what the response is when someone reports a hazardous condition. Mr. Eldred said that if the issue is small, someone from the city will take care of the issue. Ms. Asleson noted that it is important to know who is calling, and whether there is actually a hazardous condition.

Mr. Smith stated that the issue of notice is relevant to the liability analysis. Mr. Smith asked the Committee to discuss whether it would make sense to have in the Policy an explanation of the City's or County's response to calls, and how the response is managed in terms of priority of services. Mr. Maloney commented that he would not want such a policy inadvertently to create new duties for cities and counties. His city's approach is to explain to callers that operators are out with equipment, and will get to the issue as soon as possible. A policy that requires operators to log all complaints, and track and process them, creates new expectations for how cities and counties handle complaints. Mr. Davies commented that his city divides the day into the normal working day, when operators consider the complaint situation and determine how to respond, and after hours, when law enforcement decides whether the issue warrants calling out public workers. Mr. Davies said that while the city does follow up on complaints, it may not always document the complaints or follow up. Mr. Smith stated that it is important for the Policy to demonstrate that the operators responsibly considered how best to respond. Mr. Lawrence commented that his city logs all calls and all methods by which it receives information, and documents the city's response.

Ms. Fortin commented that different preferences were being expressed, with cities and counties not wishing to add documentation requirements to the Policy, but wanting the Policy to protect

them for their actions. Mr. Smith noted that in Section D, paragraph 2, the draft Policy states that the administrator will establish procedures for reports. This leaves discretion to the cities, counties, and operators as to how systems will be established. The SONAR document will explain the various considerations.

Mr. Smith asked the Committee if they thought it would be in the interest of the Policy's goals to include language like that in the League of Minnesota Cities' model policy discussing what triggers snow and ice management. Mr. Maloney said that tools are constantly changing and information improving, and cities, counties, and other operators are doing an ever-better job of timing and anticipating their responses to snow and ice conditions. Mr. Maloney suggested that the Policy not be too prescriptive about what triggers commencement of snow and ice management. His city has never had a defined accumulation of snow that triggers start of service because that model has not been helpful in delivering services. Mr. Maloney said that in his community, one of the timing priorities is related to traffic, and it is important that the city plow from 2:00 a.m. to 6:00 a.m. whenever possible to reduce conflicts with traffic. Mr. Maloney noted that it is important that Policy separate technical from operational decision making. Mr. Smith asked the Committee how much of the specific policy information or reference to content in manuals they would like to see in the Model Policy. Mr. Eldred noted that Section D, paragraph 2, part (c), regarding salt storage, is in MS4 requirements for facilities management. Mr. Eldred added that Section D, paragraph 2, parts (b) and (d) are already included in other parts of local policies.

e. Section E, Operational Framework

i. Section E, Paragraph 1 (Training Program)

Mr. Smith asked the Committee if the Policy should include details specific to the training programming. Ms. Fortin suggested that the prescriptive guidance about Smart Salting level 1 training should be included in the supporting SONAR document rather than the policy. Ms. Asleson commented that the supporting document could include Smart Salting level 2 and MS4 permit requirements. Mr. Maloney asked who the target audience for the SONAR document will be. Mr. Smith stated that audiences include city council members so that they understand the thinking behind the Policy, other communities, and perhaps judges so that they are guided and understand the Policy document and its development into a policy by a group of knowledgeable people with diverse expertise.

Mr. Maloney asked if watershed districts offer winter maintenance trainings. Ms. Christopher said that MCWD hosts and provides funding for trainings conducted alongside Ms. Fortin and the MPCA. Ms. Asleson added that the MPCA and others are trying to brand Smart Salting, which is funded through a federal 319 grant. The training is offered through partnerships. Ms. Asleson noted that MNDOT does its own training for MNDOT staff. LTAP is another training program similar to Smart Salting, but does not require those trained to implement BMPs and

does not require trainees to take a test. Ms. Asleson commented that MPCA has a chloride management plan that includes all of its training and educational resources in one document. This document could be referenced in the SONAR and policy. Ms. Larson noted that the snow and ice management association offers training for private operators and works with Smart Salting 1. Mr. Smith commented that Section C of the policy acknowledges that cities and counties determine what training to provide and require.

ii. Section E, Paragraph 4 (Damage to Personal Property)

Mr. Maloney commented that different agencies have different responses to dealing with calls for damage. Every jurisdiction has a different policy for what is replaced or included under the jurisdiction's damage replacement policy. Mr. Smith noted that the city and county attorneys will want to include this provision and will likely already have expected that. The Policy will include a brief version. Mr. Eldred said that the damage to personal property statement needs to be included in the Policy. Mr. Smith suggested that cities and counties cross reference their claims policy, and retain the no landscaping portion of paragraph 4 in the Model Policy.

4. Summary of Next Steps

Mr. Smith will coordinate with other jurisdictions to invite further review and comment. The July 20, 2016 Committee meeting discussion will be incorporated into the second draft of the Policy. Mr. Smith will be in touch with the St. Cloud City Attorney, and several other attorneys, for peer review of the policy. Mr. Smith asked for ideas about who to reach out to at the League of Minnesota Cities, and Mr. Lawrence, Mr. Larson, and Mr. Maloney offered contacts who worked the MPCA's chloride management plan. By August 10, the Committee will make a courtesy call to the League and invite review and comment on the draft Policy. The August 10, 2016 Committee Meeting will include review of the next draft of the Policy, an appendix for private operators, and the draft SONAR document. Mr. Lawrence requested a copy of the Minnesota House and Senate portions of the snow and ice legislation. Ms. Fortin and Ms. Asleson agreed to follow up on this request.

Ms. Fortin thanked everyone for coming and adjourned the meeting at 10:59 a.m. The next Advisory Committee meeting will be held on August 10, 2016.

Respectfully submitted,

Louis Smith
Elizabeth Henley

Snow and Ice Management

Model Policy

A. Introduction

It is among the responsibilities of the **[City/County]** of _____ to manage snow and ice on **[City/County]** streets and public property under the **[City / County]**'s jurisdiction. The purpose of this document is to set policies for how the [City/County] will fulfill this responsibility and to identify those **[City/County]** officials and employees who are authorized to set subordinate policies and make judgments in the course of carrying out snow and ice management activities.

Setting policies for snow and ice management involves evaluating and weighing a number of considerations, including the following:

1. Public safety. The safety of those traveling by motor vehicle, on foot and by other modes of transportation is of high priority. The goal of the **[City/County]** is to provide for surface conditions that are safe for travel in consideration of surrounding conditions and circumstances. Also, vehicles and personnel engaged in snow and ice management activity can increase risk to the public by virtue of their presence on public ways during times when travel conditions and vision are impaired.

2. Personnel safety. **[City/County]** personnel incur risk by their presence on public ways while managing snow and ice. The safety of **[City/County]** personnel as well is of the utmost importance.

3. Cost. **[City/County]** funds are limited and taxpayers require that they be spent cost-effectively. It is not possible to address all snow and ice issues simultaneously and completely. It is not practical to maintain equipment and personnel availability at a level that is sufficient for all circumstances.

4. Environment. Materials to maintain or improve surface traction contribute pollutants such as sand and chlorides to surface waters and to **[City/County]** stormwater basins and other facilities, which in turn can increase the cost of maintaining those facilities. It is important not to use an excess of these materials.

Salt can be harmful to fish and other freshwater aquatic life and can also negatively affect infrastructure, vehicles, plants, soil, pets, wildlife as well as impair groundwater and drinking water supplies. Once in the water, chloride becomes a permanent pollutant and continues to accumulate in the environment over time. The data show that salt concentrations are increasing impairments to both surface waters and groundwater across the state.

5. Priority setting to optimize outcomes. Because consideration must be given to all factors, it is necessary to set priorities for snow and ice management activities. Considerations include, though are not limited to, road classification and vehicle use level, need for emergency vehicle access, areas of known safety risk, reported conditions, costs, and impact on the environment.

6. Management/professional/technical judgment. Policies and practices rest on management, professional, and technical knowledge, on prevailing weather and travel conditions and on other circumstances that operators encounter. As to important policy elements, the **[Council/Board]** cannot state a policy but instead must delegate the authority to establish and adjust the policy to the professional judgment of appropriate **[City/County]** personnel.

7. Need for adaptability. Particularly with respect to effectiveness, cost and environmental consequences, snow and ice management is a realm of innovation. It is important that **[City/County]** policy allow for personnel to maintain awareness of developments and allow for practices to be adjusted as appropriate. The public must practice due care given the continuously changing hazards presented by natural snow and ice concerns

The policies stated in this document, as well as any delegations of authority to set subordinate policies, rest on an assessment and balancing of these considerations. It is not possible or practicable for snow and ice to be fully removed from all surfaces or prevented from accumulating on surfaces. The **[City/County]** encourages and expects that **[City/County]** residents and other members of the traveling public will at all times conduct their activities mindful of conditions, hazards, and what is necessary to remain safe.

B. Snow and Ice Management Priorities

The **[City/County]** differentiates among maintenance areas based on a variety of factors, including traffic volume and location (e.g., business district). The established **[City/County]** priority is as follows:

[Insert City/County "level of service" chart, or use default chart below. modeled on MNDOT's Bare Lane Indicator Guidelines (Table 2-3.02A).]

Classification	Target Regain Time	Lane Description
Super Commuter Arterials Central Business District/ Downtown	0-3 hours	The goal of the jurisdiction is to achieve driving lanes that are as free of snow and ice as reasonably possible in a northern climate. Drivers should take due care when driving on snow and ice surfaces, including reducing their speed. Jurisdictions will log the date and time when a satisfactory road condition is obtained.
Urban Commuter	2-5 hours	
Rural Commuter Remaining streets, including cul-de-sacs	4-9 hours	
Alleys, parking lots, sidewalks, trails, and other surfaces for non-motorized travel	9-36 hours	

However, the **[City/County]** will also consider localized safety concerns, reported hazard conditions and other relevant information in adjusting priorities. The **[City/County]** Administrator, or delegated authority has discretion to direct the resources contained in this Policy, and those directives set by the **[City/County]** Administrator or delegated authority. **[City/County]** Administrator delegated authority directs resources and adjusts priorities during an event with due attention to the considerations listed in Section A, above. Within the policies and directives set by the **[City/County]** Administrator or delegated authority, operations personnel may adjust their activity as well to address safety concerns, improve effectiveness, reduce costs, and limit environmental impacts. Section A, paragraph 1, is a significant operational consideration for **[Cities/Counties]** when making such adjustments.

The **[City/County]** is not responsible for managing snow and ice on streets, sidewalks, or other areas not within **[City/County]** jurisdiction.

C. Training

It is important that personnel involved in snow and ice management receive appropriate training to inform their operational capacities and the judgment that they must exercise in performing their responsibilities. The **[City/County]** Administrator is delegated the authority to determine and provide for appropriate training and tasked to inform the **[Council/Board]** of training funding needs during budgeting. The Administrator will consider training for police, emergency response and other **[City/County]** personnel who may not have specific responsibilities for snow and ice management but whose awareness and coordination is important to the **[City/County]'s** efforts.

The **[City/County]** will document, or require documentation of, all training that it requires or conducts.

D. Delegations of Authority

Authority with respect to snow and ice management decisions is delegated as follows:

1. **[City/County]** Administrator or delegated authority. The **[City/County]** Administrator or delegated authority will exercise general oversight of snow and ice management activities and will make recommendations to the **[Council/Board]** on staffing, purchases and funding as a part of annual budgeting. The Administrator or delegated authority will exercise responsibility with respect to personnel training as indicated in Section C, above.

The Administrator or delegated authority will establish procedures for reports on snow and ice conditions from **[City/County]** personnel or the public to be documented and routed to appropriate **[City/County]** personnel so that such reports inform snow and ice management activities. Operators will consider how best respond to snow and ice management complaints, pursuant to the following **[City/County]** policy:

[Insert individual [City/County] complaint documentation and response policy here. Include how the [City/County] response is management in terms of priority of services.]

The Administrator or delegated authority may enter into contracts for snow and ice management services or may recommend such contracts to the **[Council/Board],** in accordance with **[City/County]** policy. All contracts will provide the following:

a. All personnel performing the contract on behalf of the contracting party are trained to the same extent as would be **[City/County]** personnel performing the same work.

b. The contracting party will perform the work in accordance with all applicable **[City/County]** policies and directives, copies of which will be provided to the contracting party.

c. The contracting party will be insured for general and automotive liability to the same limits and under the same standard conditions as in other **[City/County]** contracts, or to such other limits and under such other conditions as the **[City/County]** Attorney may advise.

d. The contracting party will perform all work with due care, and will indemnify the **[City/County]** and hold it harmless for its negligent and willful acts and omissions.

2. [City/County] Engineer or delegated authority. The [City/County] Engineer or delegated authority is authorized to establish subordinate policies and directives with respect to the following:

a. Adjustments to snow and ice management priorities as indicated in Section B, above.

b. Protocols and directives concerning the initiation and cessation of snow and ice management activities. Cessation protocols and directives will consider conditions that endanger employee or equipment safety, or that cause management activities to be ineffective.

c. Protocols and practices for snow plowing and other operations, including snow storage. In determining snow storage locations and conditions, the Engineer or delegated authority will consider the debris and pollutant load held within stored snow and the potential water pollution impact of snowmelt within surface runoff. **[Insert more specific [City/County] policy here.]**

d. Protocols for application of sand, salt and other means to preserve/reestablish traction. The Engineer or delegated authority will give particular consideration to safety, environmental, and cost concerns, will maintain **[City/County]** awareness of best practices and innovations, and in his or her judgment will adjust protocols in accordance with such practices and innovations.

In making the judgments underlying these actions, the **[City/County]** Engineer or delegated authority will give due attention to the considerations listed in Section A, above. The **[City/County]** Engineer or delegated authority should consider providing for awareness of best practices, including those contained in the Winter Parking Lot and Sidewalk Maintenance Manual (MPCA, 2015) and the Minnesota Snow and Ice Control Field Handbook for Snowplow Operators (Minnesota Local Road Research Board, 2012), as they may be updated, and to provide for incorporation of best practices as appropriate.

Until such time as applicable policies and directives are established, the **[City/County]** Engineer or delegated authority will direct operations in his or her best judgment and with attention to the considerations listed in Section A, above.

3. Operators. **[City/County]** personnel engaged in snow and ice management operations are authorized to adjust activities in accordance with Section B, above. Such personnel, in their judgment, also may adjust plowing and other operational methods and may implement hazard warnings, consistent with the policies and directives set by the **[City/County]** Engineer or delegated authority.

E. Operational Framework

1. Documentation. ***[Insert [City/County] policy for documentation of control practices, decisions, and written or printed records.***

Model statement:

The **[City/County]** and its operators will document control practices and decisions and keep written or printed records of application and other decisions in carrying out this Policy.A storm record will be completed by the **[City/County]** for each storm event and should include operating times, weather conditions, and personnel and equipment resources committed.]

2. Emergency Situations. The **[City/County]** will dispatch operators and equipment as soon as possible to the routes required by emergency vehicles—fire, medical, police—responding to an emergency situation within the jurisdiction of the **[City/County]**, Fire Department, or Police Department.

The **[City/County]** will plow private property only if emergency vehicles require access.

3. Damage to Personal Property. ***[Insert [City/County] policy for responding to damage to personal or private property. This may cross reference the [City/County] policy for damage replacement.***

Model statement:

The [City/County] will consider for repair or replacement at [City/County] expense property that is (1) properly installed, (2) permitted by [City/County] ordinance to be located adjacent to the street, and (3) damaged by contact with city equipment. The [City/County] will not repair or replace damaged trees, shrubs, or landscaping.]

4. Deviation from Policy. If a person with delegated authority determines deviation from this Policy to be in the best interest of the **[City/County]**, or that a change is needed, the deviation will be documented. Documentation includes identifying: the cause, why the response was necessary, and how long the deviation will be in effect.

5. Review and Modification of Policy. **[*Insert jurisdiction's annual review or other review policy.*]**

F. Assuming Responsibility for Private Roadways, Parking Areas, Sidewalks, and Trails

The **[City/County]** is not responsible for snow and ice management on any roadway or parking area not owned by or dedicated to the **[City/County]**, except as may be provided in a legally

binding, written acceptance of that responsibility in the context of a development approval or otherwise. ***[Insert further [City/County] policy statement here.]***

G. Coordination with Other Jurisdictions

The table below lists the jurisdiction responsible for each **[City/County]** boundary street.

Street Segment	Responsibility	Telephone No.
	[City, County, State]	

The following streets owned by the **[City/County]** are maintained and managed for snow and ice by the Minnesota Department of Transportation:

[***List streets in jurisdiction that are maintained by MNDOT***].

The **[City/County]** will coordinate with neighboring or regional jurisdictions as warranted to realize better management outcomes, cost savings or environmental benefits.

No Rights Created

This policy is for internal use only in order to specify the policies and distribution of authority for snow and ice management. The policy is for the benefit of serving the general public and not for the benefit of any individual or specific group of individuals. It is not intended to and does not create any right or expectation in any third party. The **[City Council/Board of Commissioners]** may amend this policy or make exceptions to it as it deems appropriate.

Disclaimer

The **[City/County]** will begin snow and ice management as soon as reasonably possible. Cold, wind, visibility, equipment failure or disability, rapid snow and ice accumulation, and/or other unforeseen conditions or emergencies may prevent safe or effective management and cause delays in management operations.

Distribution

This policy will be distributed to the following:

Snow and Ice Management

Model Policy

A. Introduction

It is among the responsibilities of the **[City / County]** of _____ to manage snow and ice on **[City / County]** streets and public property under the **[City / County]**'s jurisdiction. The purpose of this document is to set policies for how the [City/County] will fulfill this responsibility and to identify those **[City/County]** officials and employees who are authorized to set subordinate policies and make judgments in the course of carrying out snow and ice management activities.

Setting policies for snow and ice management involves evaluating and weighing a number of considerations, including the following:

1. Public safety. The safety of those traveling by motor vehicle, on foot and by other modes of transportation is of the highest priority. The goal of the **[City/County]** is to provide for surface conditions that are safe for travel in consideration of surrounding conditions and circumstances. Also, vehicles and personnel engaged in snow and ice management activity can increase risk to the public by virtue of their presence on public ways during times when travel conditions and vision are impaired.

2. Personnel safety. **[City/County]** personnel incur risk by their presence on public ways while managing snow and ice. The safety of **[City/County]** personnel as well is of the utmost importance.

3. Cost. **[City/County]** funds are limited and taxpayers require that they be spent cost-effectively. It is not possible to address all snow and ice issues simultaneously and completely. It is not practical to maintain equipment and personnel availability at a level that is sufficient for all circumstances.

~~4. Priority setting to optimize outcomes. Because consideration must be given to costs, it is necessary to set priorities for snow and ice management activities. Considerations include, though are not limited to, road classification and vehicle use level, need for emergency vehicle access, areas of known safety risk, and reported conditions.~~

~~4~~5. Environment. Materials to maintain or improve surface traction contribute pollutants such as sand and chlorides to surface waters and to **[City/County]** stormwater basins and other facilities, which in turn can increase the cost of maintaining those facilities. It is important not to use an excess of these materials.

~~High levels of s~~Salt can be harmful to fish and other freshwater aquatic life and can also negatively affect infrastructure, vehicles, plants, soil, pets, wildlife as well as impair

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Comment [EH1]: Connie finds this sentence hard to understand. She asks if what we mean by this sentence is :

"There is a risk to the driving public when winter operations are taking place and if a person chooses to be driving in that situation then they need to understand they are at greater risk than if they stayed at home."

and if we might substitute something similar to her language for that currently in the policy.

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Comment [I2]: Mr. Woods cautioned against including more sentences under the "Environment" section than under "Public safety." We many want to take away some content from within the "Environment" section, or include additional content in the "Public Safety" section.

Comment [I3]:

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groundwater and drinking water supplies. Once in the water, chloride becomes a permanent pollutant and continues to accumulate in the environment over time. The data show that salt concentrations are ~~continuing to~~ increasinge ~~in~~impairments to both surface waters and groundwater across the state.

5. Priority setting to optimize outcomes. Because consideration must be given to all factors ~~costs~~, it is necessary to set priorities for snow and ice management activities. Considerations include, though are not limited to, road classification and vehicle use level, need for emergency vehicle access, areas of known safety risk, reported conditions, costs, and impact on the environment.

6. ~~Administrative~~Management/professional/technical judgment. Policies and practices rest on management, professional, ~~administrative~~ and technical knowledge, on prevailing weather and travel conditions and on other circumstances that operators encounter. As to important policy elements, the **[Council/Board]** cannot state a policy but instead must delegate the authority to establish and adjust the policy to the professional judgment of appropriate **[C~~e~~ity/C~~e~~ounty]** personnel.

7. Need for adaptability. Particularly with respect to effectiveness, cost and environmental consequences, snow and ice management is a realm of innovation. It is important that **[City/County]** policy allow~~provide~~ for personnel to maintain awareness of developments and allow for practices to be adjusted as appropriate. The public must practice due care given the continuously changing hazards presented by natural snow and ice concerns

~~8. Management Priorities. Business areas, bus routes, sidewalks, and **[any others that individual City/County prioritizes]** will be prioritized first, and will affect the priorities of **[City/County]** snow and ice management.~~

The policies stated in this document, as well as any~~the~~ delegations of authority to set subordinate policies, rest on an assessment and balancing of these considerations. It is not possible or practicable for snow and ice to be fully removed from all surfaces or prevented from accumulating on surfaces. The **[City-/-County]** encourages and expects that **[C~~e~~ity/C~~e~~ounty]** residents and other members of the traveling public will at all times conduct their activities mindful of conditions, hazards, and what is necessary to remain safe.

B. Snow and Ice Management Priorities

The **[City-/-County]** differentiates among maintenance areas~~streets~~ based on a variety of factors, including traffic volume~~, and street function,~~ and location (e.g., business district). ~~The [City / County] normally will prioritize attention to more heavily traveled streets, streets with higher posted speed limits, and streets of primary importance for emergency vehicles.~~ The established **[City-/-County]** priority is as follows:

Comment [l4]: Sentence from Brooke Asleson suggested for inclusion in 7-20-16 post-meeting email. Mr. Maloney suggested inclusion of the word "impairment" in the Policy at the 7-20-16 meeting.

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Comment [l5]: Ms. Fortin's edit.

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[Insert City/County "level of service" chart, or use default chart below, modeled on MNDOT's Bare Lane Indicator Guidelines (Table 2-3.02A).]

Classification	Target Regain Time	Lane Description
Super Commuter Arterials Central Business District/ Downtown	0-3 hours	The goal of the jurisdiction is to achieve driving lanes that are as free of snow and ice as reasonably possible in a northern climate. Drivers should take due care when driving on snow and ice surfaces, including reducing their speed. Jurisdictions will log the date and time when a satisfactory road condition is obtained.
Urban Commuter	2-5 hours	
Rural Commuter Remaining streets, including cul-de-sacs	4-9 hours	
Alleys, parking lots, sidewalks, trails, and other surfaces for non-motorized travel	9-36 hours	

~~Arterials~~ ~~Central Business District or Downtown~~	~~First Priority~~
~~Remaining streets, including cul-de-sacs~~	~~Second Priority~~
~~Alleys, parking lots, sidewalks, trails, and other surfaces for non-motorized travel~~	~~Third priority~~

However, the **[City/County]** will also consider localized safety concerns, reported hazard conditions and other relevant information in adjusting priorities. The **[City/County]** Administrator, or delegated authority has discretion to direct the resources contained in this Policy, and those directives set by the **[City/County]** Administrator or delegated authority. **[City/County]** ~~The [City/County] Engineer is~~ Administrator delegated ~~the~~ authority ~~to~~ directs resources and adjusts priorities during an event with due attention to the considerations listed in Section A, above. Within the policies and directives set by the **[City/County]** Administrator~~Engineer~~ or delegated authority, operations personnel may adjust their activity as well to address safety concerns, improve effectiveness, reduce costs, and limit environmental impacts. Section A, paragraph 1, is a significant operational consideration for **[Cities/Counties]** when making such adjustments.

The **[City/County]** is not responsible for managing snow and ice on streets, sidewalks, or other areas not within **[City/County]** jurisdiction. ~~In the event that the **[City/County]** manages snow and ice in an area outside of **[City/County]** jurisdiction, the **[City/County]** is not responsible for the snow and ice condition of that area.~~

C. Training

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Comment [l6]: Based on the 7-20-16 meeting, most cities and counties will likely insert their own priorities table here.
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Comment [l7]: Steve Lawrence insertion suggested at 7-20-16 meeting.
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Comment [l8]: Some discussion during the 7-20-16 meeting suggested concern that C. Training creates new responsibilities for cities and counties. I think that, as drafted, this section may or may not be pursued at the discretion of

It is important that personnel involved in snow and ice management receive appropriate training to inform their operational capacities and the judgment that they must exercise in performing their responsibilities. The **[City/County]** Administrator is delegated the authority to determine and provide for appropriate training and tasked to inform the **[Council/Board]** of training funding needs during budgeting. The Administrator will consider training for police, emergency response and other **[City/County]** personnel who may not have specific responsibilities for snow and ice management but whose awareness and coordination is important to the **[City~~'s~~/County~~'s~~]'s** efforts. ~~The Administrator will also consider education for the public on the **[City/County]**'s snow and ice management policy.~~

The **[City/County]** will document, or require documentation of, all training that it requires or conducts.

D. Delegations of Authority

Authority with respect to snow and ice management decisions is delegated as follows:

1. **[City/County]** Administrator or delegated authority. The **[City/County]** Administrator or delegated authority will exercise general oversight of snow and ice management activities and will make recommendations to the **[Council/Board]** on staffing, purchases and funding as a part of annual budgeting. The Administrator or delegated authority will exercise responsibility with respect to personnel training as indicated in Section C, above.

The Administrator or delegated authority will establish procedures for reports on snow and ice conditions from **[City/County]** personnel or the public to be documented and routed to appropriate **[City/County]** personnel so that such reports inform snow and ice management activities. Operators will consider how best respond to snow and ice management complaints, pursuant to the following **[City/County]** policy:

[Insert individual [City/County] complaint documentation and response policy here. Include how the [City/County] response is management in terms of priority of services.]

The Administrator or delegated authority may enter into contracts for snow and ice management services or may recommend such contracts to the **[Council/Board],** in accordance with **[City/County]** policy. All contracts will provide the following:

a. All personnel performing the contract on behalf of the contracting party are trained to the same extent as would be **[City/County]** personnel performing the same work.

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Comment [l9]: Ms. Fortin requested adding this language at the 7-20-16 meeting. It may be better suited for inclusion in the SONAR document than in the actual policy.
Comment [l10]: Ms. Larson requested at the 7-20-16 meeting that this language be included in the Policy.
Comment [l11]: Ms. Fortin noted that she has never spoken to a city or county ... [1]
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Comment [l12]: The 7-20-16 meeting ... [2]
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Comment [EH13]: Connie says that th ... [3]

b. The contracting party will perform the work in accordance with all applicable **[City/County]** policies and directives, copies of which will be provided to the contracting party.

c. The contracting party will be insured for general and automotive liability to the same limits and under the same standard conditions as in other **[City/County]** contracts, or to such other limits and under such other conditions as the **[City/County]** Attorney may advise.

d. The contracting party will perform all work with due care, and will indemnify the **[City/County]** and hold it harmless for its negligent and willful acts and omissions.

2. [City/County] Engineer or delegated authority. The [City/County] Engineer or delegated authority is authorized to establish subordinate policies and directives with respect to the following:

a. Adjustments to snow and ice management priorities as indicated in Section B, above.

b. Protocols and directives concerning the initiation and cessation of snow and ice management activities. ~~These protocols will consider factors including the expected timing, nature, scale and duration of precipitation; wind conditions; temperature trends; and expected severity of ice conditions.~~ Cessation protocols and directives will consider conditions that endanger employee or equipment safety, or that cause management activities to be ineffective.

c. Protocols and practices for snow plowing and other operations, including snow ~~and salt~~ storage. In determining snow ~~and salt~~ storage locations and conditions, the Engineer or delegated authority will consider the debris and pollutant load held within stored snow and the potential water pollution impact of snowmelt ~~and of salt dissolved~~ within surface runoff. **[Insert more specific [City/County] policy here.]**

d. Protocols for application of sand, salt and other means to preserve/reestablish traction. The Engineer or delegated authority will give particular consideration to safety, environmental, and cost concerns, will maintain **[City/County]** awareness of best practices and innovations, and in his or her judgment will adjust protocols in accordance with such practices and innovations.

In making the judgments underlying these actions, the **[City/County]** Engineer or delegated authority will give due attention to the considerations listed in Section A, above. The **[City/County]** Engineer or delegated authority ~~is tasked to~~ should consider

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Comment [l14]: Cities and Counties at the 7-20-16 meeting stated that they prefer to apply their own criteria to starting or ending snow and ice operations, which is why I removed this language.

Comment [l15]: Delete? Mr. Eldred noted that this information is already included in other sections of city and county policies.

Comment [EH16]: Connie noted that cessation usually happens when snow and ice managers reach the appropriate level of service. She also suggested including conditions that endanger the environment or exceed budget constraints.

Comment [l17]: Mr. Eldred noted at the 7-20-16 meeting that slat storage is covered in the MS4 requirements for facilities management.

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Comment [l18]: Delete? Mr. Eldred noted that this information is included in other parts of local policies.

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providinge for awareness of best practices, including those contained in the Winter Parking Lot and Sidewalk Maintenance ~~m~~Manual (MPCA, 2015) and the Minnesota Snow and Ice Control Field Handbook for Snowplow Operators (Minnesota Local Road Research Board, 2012), as they may be updated, and to provide for incorporation of best practices as appropriate.

Until such time as applicable policies and directives are established, the **[City/County]** Engineer or delegated authority will direct operations in his or her best judgment and with attention to the considerations listed in Section A, above.

3. Operators. **[City/County]** personnel engaged in snow and ice management operations are authorized to adjust activities in accordance with Section B, above. Such personnel, in their judgment, also may adjust plowing and other operational methods and may implement hazard warnings, consistent with the policies and directives set by the **[City/County]** Engineer or delegated authority.

E. Operational Framework

~~NOTE: this Section includes operational issues to be considered; some of these issues may not be appropriate for the Policy document, but would instead be attached as part of the explanation in the Statement of Need and Reasonableness that will accompany the Policy.~~

~~1.Training Program. The **[City/County]** training program will include MPCA's Smart Salting level 1 training.~~

1~~2~~. Documentation. ***[Insert [City/County] policy for documentation of control practices, decisions, and written or printed records.***

Model statement:

The **[City-/-County]** and its operators will document control practices and decisions and keep written or printed records of application and other decisions in carrying out this ~~Snow and Ice Management~~ Policy.

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Comment [l19]: The Committee did not want to include a prescriptive training requirement in the Policy document.

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A storm record will be completed by the **[City-/-County]** for each storm event and should include operating times, weather conditions, and personnel and equipment resources committed.]

23. Emergency Situations. The **[City/County]** will dispatch operators and equipment as soon as possible to the routes required by emergency vehicles—fire, medical, police—responding to an emergency situation within the jurisdiction of the **[City/County]**, Fire Department, or Police Department.

The **[City/County]** will plow private property only if emergency vehicles require access.

34. Damage to Personal Property. ***[Insert [City/County] policy for responding to damage to personal or private property. This may cross reference the [City/County] policy for damage replacement.***

Model statement:

The [City-/-County] will consider for repair or replacement at [City-/-County] expense property that is (1) properly installed, (2) permitted by [City-/-County] ordinance to be located adjacent to the street, and (3) damaged by contact with city equipment. The [City-/-County] will not repair or replace damaged trees, shrubs, or landscaping.]

45. Deviation from Policy. If a ~~supervisor or operator~~ person with delegated authority determines deviation from this Policy to be in the best interest of the **[City/County]** ~~—[city, etc]~~, or that a change is needed, the deviation will be documented. Documentation includes identifying: the cause, why the response was necessary, and how long the deviation will be in effect.

56. Review and Modification of Policy. ***[Insert jurisdiction's annual review or other review policy.]*** ~~[e.g. annual review]~~

F. Assuming Responsibility for Private Roadways, ~~or~~ Parking Areas, Sidewalks, and Trails

The **[City/County]** is not responsible for snow and ice management on any roadway or parking area not owned by or dedicated to the **[City/County]**, except as may be provided in a legally binding, written acceptance of that responsibility in the context of a development approval or otherwise. ***[Insert further [City/County] policy statement here.]***

~~**G. Snow and Ice Management on [City/County] Property**~~

~~The delegations of authority under Section D, above, apply as well to snow and ice management on [City/County] property other than roadways.~~

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Comment [l20]: This section is not necessary because of the change in the introductory paragraph of Part A stating that this Policy applies to property under the City/County's jurisdiction.

~~H~~G. Coordination with Other Jurisdictions

The table below lists the jurisdiction responsible for each **[City/County]** boundary street.

Street Segment	Responsibility	Telephone No.
	[City, County, State]	

The following streets owned by the **[City/County]** are maintained and managed for snow and ice by the Minnesota Department of Transportation:

[List streets in jurisdiction that are maintained by MNDOT].

~~***[List streets].***~~

The **[City/County]** will coordinate with neighboring or regional jurisdictions as warranted to realize better management outcomes, cost savings or environmental benefits.

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Disclaimer

The **[City/County]** will begin snow and ice management as soon as reasonably possible. Cold, wind, visibility, equipment failure or disability, rapid snow and ice accumulation, and/or other unforeseen conditions or emergencies may prevent safe or effective management and cause delays in management operations.

Distribution

This policy will be distributed to the following:

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MODEL SNOW AND ICE POLICY ADVISORY COMMITTEE

GUIDANCE DOCUMENT

accompanying the

Model Snow and Ice Management Policy

August 10, 2016

This Guidance Document presents background on and explains the structure of the Model Policy finalized August 10, 2016 by the Model Snow and Ice Management Policy Advisory Committee. The Model Policy is the product of coordination among diverse snow and ice management professionals from different areas of Minnesota. It is intended to serve as the foundation for city and county snow and ice management policies and follows the following structure:

- Section A: Introduction
- Section B: Snow and Ice Management Priorities
- Section C: Training
- Section D: Delegations of Authority
- Section E: Operational Framework
- Section F: Assuming Responsibility for Private Roadways or Parking Areas
- Section G: Coordination with Other Jurisdictions

The Model Policy is a framework that: (a) identifies the competing public considerations that are weighed in setting specific policy and (b) allocates roles in setting and carrying out these policies as between the policymaking body (city council or county board of commissioners) and the administrative and field employees of the local government unit. The administrative and technical details of snow and ice management as developed by the city or county are intended to integrate into this framework.

The purpose of this framework is both to offer a tool for cities and counties to prepare clear and complete snow and ice management policies and to help them limit the

potential liability risk from these activities. Snow and ice management requires balancing public interests including, as paramount, public safety but also equipment and material cost, environmental impact, and other concerns. Judgments must be made based on weather and ground circumstances as they develop. The law governing public agency operations such as this largely protects cities and counties from liability, in recognition of the fact that in order to perform this important public function, these local units must exercise judgment based on expertise, experience, and the circumstances of the occasion. The law says, however, that to merit this protection, a city or county must be able to show that competing public concerns are in play, that these concerns have been weighed, and that judgment was used in making both policy and operational decisions. The Model Policy is a tool for cities and counties to establish this foundation for their snow and ice management policies and practices.

The Policy was developed specifically to allow for cities and counties to incorporate environmental considerations into their policies and operations and thereby better manage liability risk. Private operators serving private clients do not benefit from the above-referenced legal doctrines that afford liability immunity to local units of government. However, where a private client would like to reduce the environmental impact of ice and snow management on its property, private contract language can reduce the operator's liability risk from instituting more environmentally friendly practices. The accompanying private operator Model Contract Language is offered for this purpose.

The MPCA's Green Leases template includes a sample provision, "Storm water," that the Committee considered as one resource available for private operators.

(*see* https://www.pca.state.mn.us/living-green/green-leases)

> Landlord shall use its best efforts to prevent run-off of snow and ice removal products to the extent possible by having all contractors or workers applying de-icer attend MPCA Smart Salting level 1 training, receive certification, and keep certification current. Landlord, or its building managers and operators must be MPCA Smart Salting level 2 certified and develop and follow a Snow and Ice Policy.

Planning Background

In February 2016, Freshwater Society and Fortin Consulting joined with Smith Partners in a presentation at the 15th Annual Road Salt Symposium titled "Is Salt Your Only Defense?" The presentation responded to requests from cities, counties, and private operators, increasingly interested in reducing application of salt, sand, and other deicers as part of their winter maintenance operations, for legal guidance on how to manage risk and liability for their snow and ice management practices. Fortin Consulting and Freshwater Society pursued the strong interest of symposium attendees to understand and limit legal liability risk for snow and ice management by organizing an Advisory Committee comprising snow and ice management professionals from around Minnesota. This Advisory Committee was to meet and develop a Model Snow and Ice Management Policy. Smith Partners provided legal background, framework, and guidance on snow and ice management risks and liability to the Advisory Committee, and helped to draft the Model Policy.

The Advisory Committee, comprising city, county, and watershed district management professionals, representation from the Minnesota Pollution Control Agency (MPCA), and private operator representatives (Minnesota Nursery and Landscape Association), met three times during Summer 2016 to draft the Model Policy.

Authority

The comments on the drafts of the Model Policy focused on the substantive policies proposed. State law authorizes cities and counties to manage snow and ice within their jurisdictions. Private snow and ice management operators are required under Minnesota law to manage their risks and adhere to a duty of care.

Development of the Model Policy

City, County, and Private Snow and Ice Management Professional Engagement and Draft Policy

The development of the Model Policy relied on Fortin Consulting's strong relationships with snow and ice professionals throughout Minnesota and history of working with state and local agencies to develop snow and ice management handbooks, manuals,

trainings, and other resources. To best ensure that the Model Policy integrates most effectively and productively with existing city, county, and private operator policies, the Model Snow and Ice Management Policy Advisory Committee framed the Model Policy drafting through three key meetings:

The Advisory Committee first met on June 29, 2016 at the Freshwater Society office. The Committee reviewed a summary of legal decisions in snow and ice management cases; sample snow and ice management policies; and examples of different city, county, and private operator snow and ice management policies and contracts. By the end of the June 29 meeting, the Advisory Committee determined the priority content for the Model Policy.

At its second meeting on July 20, 2016, the Advisory Committee reviewed the first draft Snow and Ice Management Model Policy. The first draft Model Policy was developed using the comments, discussion, and feedback from the June 29 Advisory Committee meeting. Based on its review of the first draft, the Committee agreed on a policy framework that would express the discretionary elements of snow and ice management decisionmaking, while also anticipating opportunity for cities and counties to insert actual substantive and technical details.

Smith Partners incorporated the comments, discussion, and feedback from the July 20 Advisory Committee meeting into a second draft Model Snow and Ice Management Policy for Advisory Committee review. In addition, the Advisory Committee incorporated other reviewers in the process to offer feedback. The second draft was circulated among several Minnesota local government attorneys for legal peer review and feedback. The Committee invited review of the second draft Model Policy by the League of Minnesota Cities.

Smith Partners incorporated feedback on the second draft from city and county attorneys, the League of Minnesota Cities, the Advisory Committee, and other reviewers into a third draft Model Policy.

At its final meeting on August 10, the Advisory Committee approved the third draft Model Policy, contingent on the incorporation of changes decided upon at the meeting.

The Model Policy – Guidance and Explanations

The remainder of this Guidance Document summarizes comments and discussion on the Model Policy, and explains how the Advisory Committee structured the Model Policy in response. This Guidance Document then provides background and insights into the operation of each section of the Model Policy.

Overarching Discussion and the Advisory Committee's Responses

MODEL POLICY INCORPORATION OF TECHNICAL GUIDANCE

Members of the Advisory Committee considered numerous times the question of whether, and how much, the Model Policy should include snow and ice management technical practices and guidance. Snow and ice management professionals from cities and counties expressed concern that the Model Policy would duplicate the technical guidance content already contained in other resources, including city and county technical manuals and snow and ice guidance manuals published by the MPCA. Among other discussion, city and county snow and ice management professionals expressed concern about attempting to recreate the level of detail in existing guidance documents developed based on years of snow and ice management experience.

After much discussion about inclusion of detailed operational and technical guidance sections, the Committee elected to eliminate specific technical guidance from the Model Policy. The framework of the Model Policy instead structures the discretion of authorized individuals to make administrative and operational decisions about snow and ice management. The Model Policy includes a reference to the best practices and other technical resources contained in the snow and ice manuals published by the MPCA (*see* section D-2) and assumes that individual cities and counties will develop and insert appropriate substantive and technical policies and practices as appropriate.

DETERMINING SNOW AND ICE MANAGEMENT PRIORITIES

Several Committee members observed that snow and ice management priorities established by the Committee in the Model Policy (see section B) would not be consistent in all particulars with other city and county management priorities. The cities and counties agreed that the Model Policy would provide a structure to help

secure for cities and counties the strongest possible liability protection for judgments made in forming the specifics of their snow and ice policies. Cities and counties should insert their management priorities into this policy structure.

COORDINATION AND REASONABLE EXPECTATIONS

The Committee identified coordination among operators from different jurisdictions, and reasonable expectations about different roads and public responsibility to practice due care, as two main policy needs for the Model Policy to address.

Section-by-Section Review – Substantive Rules

The balance of this Guidance Document explains the rationale supporting the framework of each Model Policy section. While this document attempts to be fully explanatory, it is important for all interested parties to analyze the actual text of the sections to gain a complete understanding of the Model Policy.

The Model Policy has been drafted and refined first and foremost to implement the snow and ice management responsibilities and support the discretion of cities and counties in allocating authority and making snow and ice management decisions.

SECTION A – INTRODUCTION

The Introduction paragraphs (1-7) express the elements to be considered and weighed by cities and counties engaged in snow and ice management.

Importantly, this section provides a framework for judgments made by authorized individuals in making snow and ice management decisions. Some of the information in these paragraphs is articulated in other manuals and policies relied on by snow and ice management professionals in Minnesota. Specifically, the Committee agreed that a foundation for liability protection is of critical importance if cities and counties are to be comfortable in considering the environmental impact of snow and ice management practices, where incorporating such considerations may result, for example, in moderating the use of salt or sand in appropriate instances.

As explained elsewhere in this Guidance Document, individual city councils and county boards will make the decision to use this Model Policy. Sections B, D, E, and F of the Model Policy provide strong backing for the exercise of discretion by such bodies in snow and ice management policy making.

SECTION B – SNOW AND ICE MANAGEMENT PRIORITIES

The purpose of this section is to clearly state that authority is delegated to the decision maker to balance numerous considerations (*see* Section A-1-8).

The Committee discussed how distinct local service priorities are based on local roads, temporary and permanent conditions, and public expectations. Committee members agreed that level of service policies as decided and maintained by individual cities and counties are a better foundation for best management practices than a uniform level of service policy for all cities and counties. The Committee agreed that, like other actual substantive and technical details, level of service details will be inserted into the Policy by cities and counties. The Committee discussed the substantial experience of cities and counties to effectively and efficiently manage snow and ice conditions.

Additional considerations

The Committee considered the additional technical element of re-directing snow and ice management in response to snow and ice conditions. Committee members agreed that cities and counties may at their discretion develop or rely on existing policies for modifying normal level of service.

SECTION C – TRAINING

Section C defers authority to cities and counties to determine training requirements and programs for snow and ice management professionals and other personnel. This training section provides a structure for cities and counties to use and delegate judgment to determine appropriate training.

The Committee references training best practices, included in the MPCA-published manuals and existing policies, in the Model Policy. The Committee did not create new responsibilities for cities and counties in this section. The Committee agreed that more cities and counties would adopt the model policy and consider appropriate training

opportunities for operators, and education for the public, without a requirement in this section that training be conducted. However, liability protection of a city or county will be strengthened when administrative or operational personnel exercising delegated discretion under the policy have received training and the training is documented. The Committee agreed that documentation of training is already practiced among snow and ice management entities, and included this requirement in the policy.

The Committee agreed that requiring specific training in the Model Policy would make it difficult for private operators that would need to navigate different city-by-city training requirements, and opted to instead encourage non-mandatory training. The Committee agreed that training such as Smart Salting level 1 and level 2, should be considered by jurisdictions and private operators for inclusion in a training program.

Other useful snow and ice management tools that the Committee discussed as beneficial resources are the MPCA web-based report card reflecting compliance with snow and ice management best practices, and the MPCA's Twin Cities Metropolitan Area Chloride Management Plan (2016), which includes training and educational resources.

Finally, Committee discussions noted that other city or county departments, in particular those with emergency response authorities, have a role in ice and snow management. This section includes an important reminder that training may be important not only for public works personnel or other city or county personnel within the department specifically responsible for ice and snow management, but also, and in some respects, even more so, for personnel in other departments with a coordinative or supportive role.

SECTION D – DELEGATIONS OF AUTHORITY

It is not practical for the city council or county board of commissioners to craft the details of ice and snow management policies. More so, these details and the judgments necessary to determine them require expertise that these policymaking bodies do not have. Policies must leave room for judgment to be exercised under the immediate circumstances of a weather event.

The law governing liability protection recognizes this and therefore extends protection for discretionary decisionmaking beyond the policymaking body to city and county employees who must exercise judgment in carrying out their responsibilities. It is important, however, for the delegation of such discretionary decisionmaking authority from the city council or county board to be clearly evident. This section creates a framework for the city or county policymaking body to delegate authority to establish and implement local snow and ice management policies.

The section includes space to insert an individualized city or county complaint documentation and response policy to accommodate individual city and county complaint handling practices, which reflect different abilities to manage timing and response to complaints. The Committee discussed how some jurisdictions have the resources to respond to complaints immediately, others have a different policy for complaints received during the day and those received at night, and others have a 24-hour response policy. Committee members agreed that allowing the flexibility for jurisdictions to incorporate these specific policies in the Model Policy is the most workable approach.

Authority to enter into contracts for services

Paragraph 1 of this section concerns contracting for snow and ice management services. It does not state the policy of the city or county personnel as to whether it will enter into such contracts and, if so, whether the city council or county board must approve a particular contract; each city or county should incorporate its policy in this regard. What the section does do, however, is mandate a specific set of terms that any such contract must include to provide a basic framework of contract-based liability protection for the city or county.

Operational and technical policy authority

Paragraph 2 of this section delegates to a specific administrative employee (which may be a city/county engineer, a director of public works, or similar) the authority to establish and modify operational and technical snow and ice management policies. As noted above, this delegation recognizes that while certain judgments such as overall safety risk level and program funding lie at the level of the policymaking body, other

judgments critical to setting management policies rely on expertise and experience held at the administrative level.

The Committee agreed to leave to cities and counties the discretion to determine protocols for snow and ice management, but to require balancing of considerations listed in Section A, as well as specific environmental considerations (*see* Section D-2-c). The criteria in this section reference the two MPCA-published manuals (Parking Lot Sidewalk and Maintenance Manual (MPCA, 2015), and Minnesota Snow and Ice Control Field Handbook for Snowplow Operators (Minnesota Local Road Research Board, 2012)) on which cities, counties, and private operators rely. It is advised that city and county personnel maintain awareness of best practices and conform to them as appropriate. That a particular policy or practice conforms to best practices tends to be evidence that the policy or practice reflects a sound balancing of relevant public concerns and tends to show that personnel are operating with due care.

Exercise of judgment by field personnel

Paragraph 3 of this section authorizes snow and ice management personnel to adjust snow and ice management operations consistent with city or county policy. The Committee agreed that trained and experienced operators are constantly balancing numerous considerations when managing snow and ice operations. A common, agreed upon thread in the Committee's discussion is that each snow and ice event is different, and that operator discretion and professional judgment always is in play in managing snow and ice operations. Because operational activity that does not involve judgment and discretion does not fall within the liability protections afforded by law, it is important to document that during snow and ice operations, even field personnel are engaged in discretionary activity that rests on their experience and training.

SECTION E – OPERATIONAL FRAMEWORK

This section establishes a framework for operational considerations in snow and ice management, and delegates authority to cities and counties to insert the substantive and technical details of these provisions.

Snow and ice management entities have extensive experience in managing operations. The Advisory Committee agreed that, rather than prescribing new policies duplicating existing, locally created and functional operational frameworks, this Model Policy section should have as its purpose to not duplicate what exists and works. This section provides spaces for snow and ice management entities to insert current policies, and also offers model language for jurisdictions without these policies, or that are interested in revising their policies. This section reflects the Committee's agreement that snow and ice managers and operators with extensive discretion under this Model Policy to manage snow and ice must document a deviation from the Model Policy. Some paragraphs, such as E-4, Damage to Personal Property, may be cross-referenced with the existing jurisdictional claims policy for each city and county.

SECTION F – ASSUMING RESPONSIBILITY FOR PRIVATE ROADWAYS OR PARKING AREAS

Section F generally applies to snow and ice management by a city or county with respect to roadways or other surfaces that are not owned by or otherwise under the operational responsibility of that public entity. The Committee noted that different jurisdictions may have policies in place regarding snow and ice management on private property, and agreed that a space should be included for existing city or county policies. The purpose of this statement in the Policy, however, is to establish explicitly that the public body does not have a responsibility unless there is an affirmative, documented agreement to the contrary.

RULE G – COORDINATION WITH OTHER JURISDICTIONS

Section G aims to minimize conflict and ensure mutual understanding with other jurisdictions by clarifying snow and ice management responsibilities on boundary roads, parking lots, sidewalks, and other areas. The section includes a space for cities and counties to list those streets managed by the state. In response to discussion among Committee members, the Advisory Committee agreed that the section should require cities and counties to coordinate with nearby jurisdictions to better be able to balance the considerations in Section A, and facilitate the operation of the Model Policy alongside the policies of other jurisdictions.

Table 1 – Technical Advisory Committee participants

Name	Affiliation
Jeff Davies	City of Grand Rapids
Mark Maloney	City of Shoreview
Dan Plizga	City of Rochester
Steven Lawrence	City of St. Cloud
John Wickenhauser	Carver County
Matt Morreim	City of Saint Paul
Craig Eldred	City of Waconia
Becky Christopher	Minnehaha Creek Watershed District
Erica Sniegowski	Nine Mile Creek Watershed District
Claire Bleser	Riley Purgatory Bluff Creek Watershed District
Leslie Larson	Minnesota Nursery and Landscape Association
Brooke Asleson	Minnesota Pollution Control Agency
Steve Woods	Freshwater Society
Connie Fortin	Fortin Consulting

MODEL LANGUAGE for PRIVATE SNOW & ICE SERVICE CONTRACT

1. The following terms apply to CONTRACTOR's use of anti-icing, de-icing and traction-enhancing materials and methods (together, "ice management materials and methods").

2. Under this Contract, CONTRACTOR exercises judgment as to ice management materials and methods, including when application of material is appropriate, choice of material, method of application and application rates. In making these decisions, CONTRACTOR in its judgment considers, among other things, weather conditions, traction needs, cost and damage from materials to paved surfaces and vegetation. The Contract states OWNER's recognition that snow removal and ice management services will not necessarily result in bare pavement or sidewalks.

3. Further, ice management materials contribute pollutants including sand and chlorides to the environment. Chloride accumulates in the environment, and high chloride levels: (a) are harmful to fish and other freshwater aquatic life; (b) may impair groundwater and drinking water supplies; and (c) may cause injury to infrastructure and vehicles, plants, soil, pets and wildlife. Sand may affect surface water habitat and may increase public cost by accumulating in downstream conveyances and basins.

4. In recognition of these concerns, the approach to ice management and reliance on ice management materials presently is subject to innovation and evolution of best practices. CONTRACTOR provides training to its employees so that they are knowledgeable as to best practices, including those contained in the Winter Parking Lot and Sidewalk Maintenance Manual (Minnesota Pollution Control Agency, 2015) and the Minnesota Snow and Ice Control Field Handbook for Snowplow Operators (Minnesota Local Road Research Board, 2012), as they may be updated.

5. CONTRACTOR and OWNER agree that consideration of these impacts is appropriate and should be taken into account in CONTRACTOR's judgment as to ice management materials and methods along with the other conditions described above.

6. Accordingly, OWNER agrees as follows:

> a. OWNER will not claim that CONTRACTOR has violated or breached this Contract by giving consideration to pollutant impacts in its ice management materials and methods, unless CONTRACTOR has deviated substantially from best practices.

b. In any claim, dispute or proceeding concerning damage or injury to OWNER or any third party, OWNER will not claim that CONTRACTOR has violated a duty of care or any other applicable legal standard by giving consideration to pollutant impacts in its ice management materials and methods, unless CONTRACTOR has deviated substantially from best practices.

Page 11: [1] Comment [l11] **lizabeth** **8/8/2016 9:24:00 AM**

Ms. Fortin noted that she has never spoken to a city or county administrator about winter maintenance.

Page 11: [2] Comment [l12] **lizabeth** **8/8/2016 9:24:00 AM**

The 7-20-16 meeting discussion suggested that cities and counties have different policies and timing abilities for responding to complaints, and prefer to include their own policies rather than modify practices to fit a complaint procedures section in the Policy.

Page 11: [3] Comment [EH13] **Elizabeth Henley** **8/8/2016 9:24:00 AM**

Connie says that this is probably not possible.

Minnesota Water Resources Conference

October 18–19, 2016
Saint Paul RiverCentre

wrc.umn.edu/waterconf

Minnesota Water Resources Conference

October 18–19, 2016

wrc.umn.edu/waterconf

Welcome from the Co-chairs

We are excited to invite you to the 2016 Minnesota Water Resources Conference. Recent events across the nation and world—major droughts and floods, drinking water crises, and legal and political disputes—highlight the need for scientific information and productive dialogue to shape informed decisions about water resource management.

We thank all those who submitted abstracts and the Water Resources Planning committee for their work in developing a timely and engaging program for this year's conference. Reflecting the growing profile of the conference and the importance of the current water issues, the record number of abstract submissions we received displayed an overall quality as high as veteran committee members can remember. The lineup of breakout sessions and posters will provide the latest knowledge on a rich array of water resource topics important to Minnesota and beyond. As always, these sessions will be complemented by a lineup of sought-after plenary speakers in the morning and luncheon sessions.

We also thank the attendees from previous years for feedback on the conference experience. The committee considered these comments carefully and has responded by keeping the features that work well, modifying those that don't, and adding some fresh new ones. Features that began in recent years or have been added this year include:

- Exhibitors on display throughout the conference on Tuesday and Wednesday, now in their own exhibitor hall with posters and refreshments.
- A modified schedule for that allows for four presentations in each breakout session, creating more offerings for attendees and broader dialogue.
- A downloadable mobile app with the full searchable conference program, speaker biographies, maps, exhibitor information, and social media capabilities.
- Special sessions on two timely topics: Social Justice and Water Supply, and the Waters of the United States Rules (see box on page 2).
- Professional development and mentoring opportunities for student attendees.
- Live background music at the Tuesday afternoon poster session and reception, featuring local student artists.

Finally, we'd like to thank our exhibitors for both their financial support and the energy they bring to the networking breaks and Tuesday afternoon reception.

Please join us along with over 600 other policy makers, academics, local implementers, and water resources advocates on October 18 and 19, at the Saint Paul RiverCentre for this annual event.

Jeffrey Peterson, Water Resources Center, University of Minnesota and *Karen Jensen*, Metropolitan Council, Conference Co-Chairs

Sponsored by:

Water Resources Center

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College of Continuing Education

University of Minnesota

Cosponsored by:
Department of Civil Engineering, University of Minnesota
Minnesota Section, American Society of Civil Engineers
Minnesota Sea Grant College Program, University of Minnesota
Natural Resources Research Institute, University of Minnesota

Minnesota Water Resources Conference

October 18–19, 2016

The ***Minnesota Water Resources Conference*** presents **innovative, practical, and applied water resource engineering solutions, management techniques, and current research about Minnesota's water resources.** The conference provides an opportunity to address: 1) lessons learned from the implementation of engineering projects, 2) best practices discovered in the design and application of water resource management techniques, 3) implications of water policy decisions, and 4) research into current and emerging issues. The conference facilitates interaction among engineers, water resources managers, researchers, and local, state and federal agency staff.

Registration and Fees

Early registration

(postmarked on or before September 22)
Two-day - $245
One-day - $170
Student - $65

Late registration

(starting September 23)
Two-day - $265
One-day - $190
Student - $85

The registration fee for the Minnesota Water Resources Conference includes access into all plenary, luncheon, and concurrent sessions, extended sessions, and LID/Stormwater Management Workshop presentations, poster sessions, conference materials, lunch and refreshment breaks each day, and the Tuesday evening reception. Participants may register online, by fax or mail, for either both days or one day only.

Cancellations

Refunds, minus a $30 fee, will be issued to participants who provide a written cancellation notice by October 4. If you cancel after this date, you will not be eligible for a refund. The University reserves the right to cancel the conference, if necessary, in which case a full refund would be made.

Continuing Education Units (CEUs); Professional Development Hours (PDHs)

Conference attendees will receive .675 CEUs/PDHs for each day of the Minnesota Water Resources Conference. Participants who wish to receive full credit must attend all scheduled hours of the event.

Guidebook Mobile App

We encourage you to download the mobile app to enhance your experience at the conference. We will send instructions to registered participants before the conference. Attendees will be able to plan their days with a personalized schedule and browse concurrent session and poster abstracts, presenter biographies, exhibitors, and maps, and participate in the conference backchannel by posting on social media (Twitter and Facebook) before and during the conference.

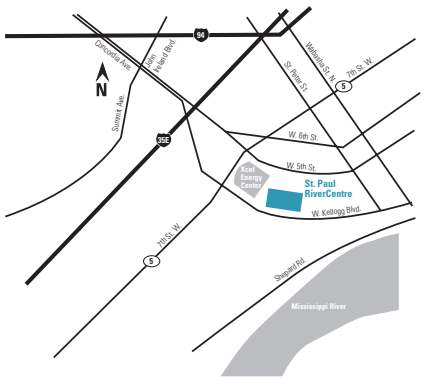
The app is compatible with iOS and Android devices. Windows Phone 7 and Blackberry users can access the same information via the mobile site.

Social Media: Join the Conversation #mnwrc16

We invite you to join the conversation about the Water Resources Conference by posting updates on Twitter and Facebook. The course hashtag is #mnwrc16. Type this hashtag in your tweets/posts to continue the course backchannel, or you may also search Twitter for this hashtag to view the tweets online and keep up with sessions you missed. These social media efforts will help participants network and meet new colleagues prior to and during the course.

Location and Parking

The Water Resources Conference will be held at the Saint Paul RiverCentre, 175 Kellogg Boulevard, Saint Paul, Minnesota. Parking is available in the RiverCentre parking ramp, which is located on Kellogg Boulevard across the street from RiverCentre. Please see the map for the location of RiverCentre. Convenient bus service to the RiverCentre is available. Call Metropolitan Transit, 612-373-3333 for specific route information.



Accommodations

Hotel rooms are available at the Holiday Inn RiverCentre, 175 West 7th Street, Saint Paul, Minnesota. Call the hotel directly at 651-225-1515 or toll free at 888-465-4329 and ask for the University of Minnesota rate. Make your reservation early in order to ensure a room at the hotel.

For Registration Questions

612-625-2900
cceinfo@umn.edu

For Program Questions

Katherine Hagberg
University of Minnesota
612-624-4230
cceconf3@umn.edu

NEW FEATURES THIS YEAR

Special Session: Panel Discussion on Social Justice in Water Supply

Tuesday, October 18, 2016

What is the impact to society of not providing high-quality water from water supply systems? Is Flint a symptom of a bigger problem? What are the issues, the disparities, and what can be done about them? This session will convene a panel of experts to explore issues related to social justice in water supply. Following short presentations by the panelists there will be a moderated panel discussion and an opportunity for audience questions.

Chris Kolb, Flint Water Advisory Task Force; *Ruth Hubbard*, Minnesota Rural Water Association; *Danette McCulley*, Minneapolis Division of Water Treatment and Distribution Services, and others.

Special Session:

Waters of the United States Rules
Wetland Protection vs. Drainage Rights

Wednesday, October 19, 2016

The Waters of the United States (WOTUS) Rules were proposed to be implemented last fall by the US Army Corps of Engineers and the US Environmental Protection Agency, when the Sixth Circuit US Court of Appeals issued a nationwide stay against its enforcement on October 9, 2015, because it was determined to be at odds with the earlier Supreme Court Raponos ruling. These rule changes are contentious, with passionate stakeholders on both sides, pitting environmental issues against landowner rights.

In this session there will be presentations by drainage attorneys familiar with the legal status of the current stay who will explore the potential life of these rules when the stay sunsets. There will also be viewpoint presentations supporting and opposing the proposed new rules.

This session presents a great opportunity to learn about the WOTUS rules and the merits and concerns associated with the proposed rule changes.

Rinke Noonan, Attorneys at Law, St. Cloud, Minnesota; *Don Parrish*, American Farm Bureau Federation, Sr. Director of Regulatory Issues; *Scott Strand*, Minnesota Center for Environmental Advocacy

New exhibitor and poster area

The exhibitor and poster area will be set up in a large ballroom this year, to facilitate networking and discussion with exhibitors and poster authors. Refreshments will be served in this area, along with the Tuesday evening reception.

New Concurrent Session Format

Each concurrent session will feature four 20-minute presentations, with 10 minutes of shared question-and-answer time after the last presentation.

New Student Mentor Program

If you are a student, come attend the mentor program! Connect with professionals to explore career possibilities and expand your professional network. Meet one-on-one with professionals in your field of interest.

RETURNING SESSION THIS YEAR

Stormwater—LID Session at 2016 MN Water Resources Conference

Wednesday, October 19, 2016

This year's session with provide a research quickbyte about a large-scale project being conducted at the University of Minnesota that is investigating the extent and fate of PAHs and phosphorus in stormwater ponds. A second component will highlight a project creating a dynamic and robust framework of stormwater research needs for the next decade. The session will include interactive stakeholder input, one of multiple input workshops and needs assessments being implemented.

2016 Water Resources Planning Committee

John Baker, US Department of Agriculture, and Department of Soil, Water, and Climate, University of Minnesota

Ann Banitt, US Army Corps of Engineers

Jeff Berg, Minnesota Department of Agriculture

John Bilotta, MN Sea Grant, University of Minnesota Extension

Mark Brigham, US Geological Survey

Tina Carstens, Ramsey-Washington Metro Watershed District

Heather Dorr, College of Continuing Education, University of Minnesota

Bill Douglass, Bolton & Menk, Inc.

*Lisa Goddard, S*RF Consulting Group, Inc.

John Gulliver, Department of Civil, Environmental, and Geo- Engineering, College of Science and Engineering, University of Minnesota

Lorin K. Hatch, HDR Engineering, Inc.

Andrea Hendrickson, Minnesota Department of Transportation

**Karen Jensen,* Metropolitan Council

Lucinda Johnson, Natural Resources Research Institute, University of Minnesota

Stephanie Johnson, Mississippi Watershed Management Organization

Ron Leaf, Short Elliott Hendrickson, Inc.

Zack McGough, College of Continuing Education, University of Minnesota

Salam Murtada, Department of Natural Resources, Division of Waters

Randy Neprash, Minnesota Cities Stormwater Coalition & Stantec

**Jeffrey Peterson,* Water Resources Center, University of Minnesota

Amit Pradhananga, Department of Forest Resources, University of Minnesota

Shawn Schottler, St. Croix Watershed Research Station

Wayne Sicora, Natural Resource Group

Faye Sleeper, Water Resources Center, University of Minnesota

Gene Soderbeck, Minnesota Pollution Control Agency

James Stark, U.S. Geological Survey

Katy Thompson, ASCE Representative and WSB & Associates, Inc.

Stew Thornley, Minnesota Department of Health

Rick Voigt, Voigt Consultants, LLC

Greg Wilson, Barr Engineering Company

Brad Wozney, Minnesota Board of Soil and Water Resources

** Committee Co-Chairs*

Program Schedule – Tuesday, October 18, 2016

8:00–8:10 a.m. **Welcome**
Jeff Peterson, Water Resources Center, University of Minnesota

8:10–8:20 a.m. **Dave Ford Water Resources Award**

8:20–9:30 a.m. **Plenary Session**
The Flint Water Crises: Lessons for Improved Governance and Oversight
Chris Kolb, President of the Michigan Environmental Council and Co-Chair of the Flint Water Advisory Task Force

9:30–10:00 a.m. **Break**

10:00–11:30 a.m. Concurrent Sessions I

Track A

Special Session Panel Discussion Social Justice in Water Supply

Moderator: TBD

Co-Moderator: *Andrea Hendrickson*, Minnesota Department of Transportation

What is the impact to society of not providing high-quality water from water supply systems? Is Flint a symptom of a bigger problem? What are the issues, the disparities and what can be done about it? This session will convene a panel of experts to explore issues related to social justice in water supply. Following short presentations by the panelists there will be a moderated panel discussion and an opportunity for audience questions.

Ruth Hubbard, Minnesota Rural Water Association

Chris Kolb, Flint Water Advisory Task Force

Danette McCulley, Minneapolis Division of Water Treatment and Distribution Services

John Linc Stine, Commissioner, Minnesota Pollution Control Agency

and Others

Track B

Managing Biota of Lakes and Streams

Moderator: *Lorin Hatch*, HDR Engineering, Inc

Co-Moderator: *Lucinda Johnson,* Natural Resources Research Institute, University of Minnesota

Assessment of Common Carp at a Watershed Scale and Implications for Management

Justine Dauphinais, Reid Swanson, and Peter Sorensen, University of Minnesota

Role of Invasive Dreissenid Mussels in Restructuring Nutrient Dynamics in in Minnesota Lakes

Felicia Williamson, University of Minnesota Duluth

Restoration of Critical Trout Habitat in Remote Reaches of the Blackhoof River

John Lenczewski, Minnesota Trout Unlimited; *Jason Naber, Kevin Biehn, and Luke Johnson,* Emmons and Olivier Resources

Impact of Rainbow Trout Stocking Moratorium on Zooplankton Community Structure and Water Quality of Square Lake

Leif Hembre, Hamline University; *Meghan Funke*, Emmons and Olivier Resources, Inc; *Jim Shaver*, Carnelian-Marine St. Croix Watershed District

Track C

Planning Sustainable Practices

Moderator: *Bill Douglass*, Bolton & Menk, Inc

Co-Moderator: *Katy Thompson*, WSB & Associates, Inc

Developing a Stormwater Reuse Irrigation Assessment Planning Tool to Reduce Reliance on Groundwater

Phil Belfiori and Catherine Nester, Rice Creek Watershed District; *Mark Deutschman, Rachel Olm, Kate MacDonald, and Drew Kessler,* Houston Engineering, Inc

Cottageville Park: Integration of Land Use Planning and Natural Resources Improvements to Build Sustainable Communities

Renae Clark, Minnehaha Creek Watershed District; *Chris Meehan*, Wenck Associates

SWLRT—Regulatory Complexity

Jim Alexander, Southwest Light Rail Transit Project Office; *Earth Evans*, WSB & Associates, Inc; *Brady Busselman*, Sambatek; *Charlie Howley*, Hansen Thorp Pellinen Olson, Inc

Embracing Sustainable Stormwater Management at the University of Minnesota

Erin Hunker, SRF Consulting Group; *Cathy Abene*, University of Minnesota

Track D

N & P Measuring, Monitoring, Modeling, and Management

Moderator: *Jeff Berg*, Minnesota Department of Agriculture

Co-Moderator: *Greg Wilson*, Barr Engineering Company

Availability of Phosphorus in Sediment from Lake Superior and Its Watershed

Tayler Hebner, Gustavo Merten, Ajan Ajanic, Elizabeth Hill, Sandra Brovold, and Robert W. Sterner, University of Minnesota Duluth

Measuring and Modeling Phosphorus Loss and Transport in the LeSueur River Basin

Brent Dalzell, Department of Soil, Water, and Climate, University of Minnesota; *Jacques Finlay, Amy Hansen, and Christy Dolph*, University of Minnesota

Overview of the Nitrogen Fertilizer Rule

Katie Wolf, Annie Felix-Gerth, and Larry Gunderson, Minnesota Department of Agriculture

Evaluating Nitrogen Management and Crop Yield Through On-Farm Field Trial Demonstrations

Spencer Herbert, Margaret Wagner, Ryan Lemickson, Dawn Bernau, and Aaron Janz, Minnesota Department of Agriculture

11:30 a.m.–12:15 p.m. **Lunch**
Jeffrey Peterson, Water Resources Center, University of Minnesota

12:15–1:00 p.m. **Luncheon Presentation**
Federal/State Partnerships in Atmospheric and Coastal Research
Craig McLean, Assistant Administrator, Oceanic and Atmospheric Research, National Oceanic and Atmospheric Administration, United States Department of Commerce

1:15–2:45 p.m. Concurrent Sessions II

Track A

Building Soil and Water Conservation District Staff Capacity for Groundwater Protection

Amit Pradhananga, Department of Forest Resources, University of Minnesota; *Sharon Pfeifer,* Minnesota Department of Natural Resources; *Mae A. Davenport*, University of Minnesota

Social Science Applications in Conservation and Citizen Education

Moderator: *Amit Pradhananga*, Department of Forest Resources, University of Minnesota

Co-Moderator: *Brad Wozney*, Minnesota Board of Soil and Water Resources

Using Social Science to Accelerate Conservation

Peggy Knapp, Freshwater Society

Inspiring Elected and Appointed Community Leaders to Take Action Accomplished Through Education and Training: How Workshops-On-The-Water Build Knowledge and Result in Action and Behavior Changes

John Bilotta, University of Minnesota Extension and Sea Grant Program

Conservation Leverage Points in Rural Minnesota: Learning from Citizens in the Watonwan River Watershed

Dustin Anderson, Greater Blue Earth River Basin Alliance; *Kimberly Musser*, Water Resources Center Minnesota State University–Mankato; *Paul Davis*, Minnesota Pollution Control Agency

Track B

Climate Change Impacts

Moderator: *Andrea Hendrickson*, Minnesota Department of Transportation

Co-Moderator: *Katy Thompson*, WSB & Associates, Inc

Projected Impacts of Climate and Forest Change on Lake Superior Hydrology and Biology

William (Bill) Herb, St. Anthony Falls Lab, University of Minnesota; *Kristen Blann*, The Nature Conservancy; *Lucinda Johnson*, Natural Resources Research Institute, University of Minnesota; *Will Bartsch*, Environmental Protection Agency, Midcontinent Ecology Division; *Meijun Cai*, Natural Resources Research Institute, University of Minnesota; *John Jereczek*, Minnesota Department of Natural Resources; *Ralph Garono*, Natural Resources Research Group

Examining Community Resilience in Extreme Climatic Conditions

Rebecca Teasley, University of Minnesota Duluth; *Karlyn Eckman*, University of Minnesota; *Courtney Kowalczak*, Environmental Institute Director, Fond du Lac Tribal and Community College; *Dawn Newman*, American Indian and Tribal Partnership Liaison, University of Minnesota Extension; *Tashi Gulrung*, Sea Grant Graduate

The following 3 presentations by the Army Corp of Engineers will fill 40 minutes

Downscaled Climate Change Data Acquisition

Brian Alberto, Pat Foley, and Ann Banitt, United Stated Army Corps of Engineers

Case Study for Climate Change in Fargo, ND, Using Bias Corrected Spatially Disaggregated (BCSD) Data

Brian Alberto, Pat Foley, and Ann Banitt, United States Army Corps of Engineers

Incorporation of Climate Change Impacts into Hydrologic Analysis

Chanel Mueller and Bryan Baker, United States Army Corps of Engineers

Track C

BMPs for Urban Retrofits

Moderator: *Tina Carstens*, Ramsey-Washington Metro Watershed District

Co-Moderator: *Lisa Goddard*, SRS Consulting Group, Inc

Building an Urban Stormwater Treatment Testbed

Marcy Bean, Mississippi Watershed Management Organization; *William Alms*, WSB & Associates, Inc; *Doug Snyder*, Mississippi Watershed Management Organization

Irrigate, Infiltrate, Automate: Stormwater Reuse at Upper Villa Park

Forrest Kelley, Capitol Region Watershed District

Tree Trench and Permeable Pavers in the Edison High School Parking Lot

Dan Edgerton and Mark Statz, Stantec Consulting, Inc

Sustainable Stormwater Analysis for the Ford Site Redevelopment, Saint Paul, MN

Robert Fossum, Capitol Region Watershed District; *Wes Saunders-Pearce*, City of Saint Paul

Track D

Groundwater and Surface Water Interactions

Moderator: *Karen Jensen*, Metropolitan Council

Co-Moderator: *John Baker*, United States Department of Agriculture, and Department of Soil, Water, and Climate, University of Minnesota

Estimating Groundwater Recharge to Buried Aquifers

Alyssa Witt, Jared Trost, and James Stark, United States Geological Survey; William Simpkins, Iowa State University

Characterizing Groundwater and Surface-Water Interactions in Selected Northeastern Twin Cities Lakes, Minnesota—Part 1: Statistical Analysis and Field Data Collection

Perry Jones, Jared Trost, Donald O. Rosenberry, Aliesha Diekoff, and Daniel Morel, United States Geological Survey

Characterizing Groundwater and Surface-Water Interactions in Selected Northeastern Twin Cities Lakes, Minnesota—Part 2: Groundwater Flow Model

Jason Roth, Perry Jones, and Catherine Christenson, United States Geological Survey

Water Budget Changes from Wetland and Prairie Restoration, Glacial Ridge National Wildlife Refuge, Northwestern Minnesota, 2006–13

Tim Cowdery and Catherine Christenson, United States Geological Survey

2:45–3:15 p.m. **Break**

3:15–4:45 p.m. Concurrent Sessions III

Track A

Community Engagement and Perspectives

Moderator: *Faye Sleeper*, Water Resources Center, University of Minnesota

Co-Moderator: *Amit Pradhananga*, Department of Forest Resources, University of Minnesota

The 2016 State of the River Report

Trevor Russell, Friends of the Mississippi River; *Lark Weller*, National Park Service—Mississippi National River and Recreation Area

The Easement Experience

Michael Lynn and Alan Singer, Dakota County

We Think We Can? Collective Efficacy and Community Perspectives on Climate, Extreme Weather, and Water Management in Minnesota's Lake Superior Basin

Vanessa Perry and Mae Davenport, University of Minnesota; *George Host*, University of Minnesota Duluth

Using the Agricultural Conservation Planning Framework to Analyze Minnesota Watersheds

Ann Lewandowski and Les Everett, Water Resources Center, University of Minnesota

Track B

Modeling and Managing Nutrient and Thermal Drivers of Aquatic Habitat

Moderator: *Mark Brigham*, United States Geological Survey

Co-Moderator: *Randy Neprash*, Minnesota Cities Stormwater Coalition, and Stantec

Using Predictive Lake Modeling to Assess the Development of Cyanobacteria Blooms

Richard Kiesling and Erik Smith, United States Geological Survey

Methods for Modeling Stream Temperature Using High Resolution LiDAR, Solar Radiation Analysis and Flow Accumulated Values, to Predict Stream Temperature

Tom Hollenhorst, United States Environmental Protection Agency Mid-Continent Ecology Division; *John Jereczek*, Minnesota Department of Natural Resources, Division of Ecological and Water Resources

Protecting Minnesota's Rivers with New River Eutrophication Standards

Dennis Wasley, Liz Kaufenberg, Matt Lindon, and Steve Weiss; Minnesota Pollution Control Agency

Climate Change Simulations of Cold-Water Fish Habitat in Elk Lake, Minnesota Using a Predictive Mechanistic Lake Model

Erik Smith and Richard Kiesling, United States Geological Survey

Track C

Innovative Urban BMPs

Moderator: *Stephanie Johnson*, Mississippi Watershed Management Organization

Co-Moderator: *Ron Leaf*, Short Elliott Hendrickson, Inc

Iron-Enhanced Ditch Checks for Capturing Phosphorus in Runoff

Poornima Natarajan and John Gulliver, University of Minnesota; *Barbara Loida, Nicholas Olson, David Bauer, James Michael, and Scot Way*, Minnesota Department of Transportation; *Kristine Giga and Ryan Johnson*, City of Roseville

Pump and Treat Iron Enhanced Stormwater Treatment in a Neighborhood Setting

Karen Kill, Brown's Creek Watershed District; *Derek Lash and Ryan Fleming*, Emmons and Olivier Resources, Inc

Multiple Benefits of Privately Shared Stormwater Systems: From Conceptual Design to Construction

Nathan Campeau, Barr Engineering Co.; *Dan Kalmon*, Mississippi Watershed Management Organization

Urban School Retrofits: Sending Stormwater to Detention

Nate Zwonitzer, Capitol Region Watershed District

Track D

Groundwater and Surface Water Supply Management

Moderator: *Karen Jensen*, Metropolitan Council

Co-Moderator: *Jeffrey Peterson*, Water Resources Center, University of Minnesota

Enhancing Groundwater Sources Through Enhanced Aquifer Recharge to Improve Water Supply Reliability

Kathryn Jones and Adam Kessler, HDR Engineering, Inc; *David Brown*, Metropolitan Council; *Kelton Barr*, Braun Intertec

Managing Groundwater at the Local Level

Steve Woods, Freshwater Society

2015 Reconnaissance Study of Pesticide Compounds in Community Public Water Supply Wells

Heather Johnson, Minnesota Department of Agriculture; *David Rindal, Anna Schliep, and Todd Johnson*, Minnesota Department of Health

Historical Trends and Spatial Distribution of Antibiotics in Minnesota Lakes and Rivers

Jill Kerrigan, William Arnold, Kyle Sandberg, and Tim LaPara, University of Minnesota; Daniel Engstrom, St. Croix Watershed Research Station

4:45 – 5:45 **Reception and Poster Session**

Program Schedule – Wednesday, October 19, 2016

8:00–8:10 a.m. **Welcome**
Karen Jensen, Metropolitan Council

8:10–9:30 a.m. **Plenary Session**
Nonpoint Source Water Quality Issues and Solutions
David Mulla, Professor and Larson Endowed Chair in Soil and Water Resources, University of Minnesota

9:30–10:00 a.m. **Break**

10:00–11:30 a.m. Concurrent Sessions IV

Track A

Prioritizing Sediment Reduction Strategies in a Large Watershed: Collaborative for Sediment Source Reduction

Moderator: *Gene Soderbeck*, Minnesota Pollution Control Agency

Co-Moderator: *Shawn Schottler*, St. Croix Watershed Research Station

Karen Gran, University of Minnesota Duluth; *Se Jong Cho and Ben Hobbs*, Johns Hopkins University; *Peter Wilcock and Patrick Belmont*, Utah State University

I. Greater Blue Earth River Basin: Sediment Sources, Sinks, and Delivery

Karen Gran, University of Minnesota Duluth

II. Simulation Model to Link Management Choices and Sediment Delivery

Se Jong Cho, Johns Hopkins University

III. Linking Research and Management Choices at the Watershed Scale

Peter Wilcock, Utah State University

Track B

Creeks, Ponds, Wetlands, and Swales

Moderator: *Tina Carstens*, Ramsey-Washington Metro Watershed District

Co-Moderator: *John Gulliver*, Department of Civil, Environmental, and Geo-Engineering, College of Science and Engineering, University of Minnesota

Application of the Minnesota Dry Swale Calculator

Maria Garcia-Serrana, University of Minnesota–St. Anthony Falls Laboratory; *John Gulliver and John L. Nieber,* University of Minnesota

Diagnosing and Mitigating Urban Wetland Impacts on Downstream Water Resources

Diane Spector, Jeff Strom, Ed Matthiesen, and Joe Bischoff, Wenck Associates, Inc

Stormwater Pond and Wetland Performance Study in Ramsey-Washington Metro Watershed District

Michael McKinney, Erin Anderson Wenz, and Jennifer A., Koehler, Barr Engineering Company

Implementing a Natural Channel Design—Minnehaha Creek

Jonathon Kusa, Inter-Fluve, Inc; *Michael Hayman*, Minnehaha Creek Watershed District

Track C

Water R1

Moderator: *Randy Neprash*, Minnesota Cities Stormwater Coalition, and Stantec

Co-Moderator: *Wayne Sicora*, Natural Resource Group

Applying Multiple Assessment Techniques to Minimize Disturbance and Select Suitable Natural Stream Stabilization Practices

Lisa Odens and Greg Bowles, Houston Engineering; *Matt Moore*, South Washington Watershed District

Developing a Stressor-Response Concept Model for Red River of the North

Tony Miller, Bruce Wilson, Erich Weber, and Julie Blackburn, RESPEC

Elm River Intake Project—Innovative Solutions Transformed the Way Aberdeen Receives Its Water

Kent Torve, Wenck Associates, Inc; *Don Weigel,* Clark Engineering

Phosphorus Removal Evaluation at Mankato Wastewater Treatment Plant Done by Student-Professional Collaboration

Stephen Druschel and Bridget Anderson, Minnesota State University–Mankato

Track D

Targeting Tools for Planning and Implementation

Moderator: *Brad Wozney,* Minnesota Board of Soil and Water Resources

Co-Moderator: *Jeff Peterson,* Water Resources Center, University of Minnesota

Pilot Red Lake River One Watershed, One Plan

Red Lake River Planning Group, Local Governing Units; *Nate Dalager*, HDR, Inc

Optimizing Conservation Using the Scenario Application Manager (SAM)

Julie Blackburn, RESPEC Consulting and Services

Implementing the PTMapp GIS Toolset at Smaller Watershed Scales: Results and Lessons Learned

Jason Ulrich and Joe Pallardy, Emmons and Olivier Resources Inc

Grid-Cell SWAT Modeling Breaks New Ground on Isolating Pollutant Source Areas and Quantifying BMP Benefits

Greg Wilson and Evan Christianson, Barr Engineering Company

Track E

Waters of the United States Rules

Moderator: *William Douglass,* Bolton & Menk, Inc.

Co-Moderator: TBD

Wetland Protection vs. Drainage Rights

Rinke Noonan, Attorneys at Law, St. Cloud, Minnesota; *Don Parrish,* American Farm Bureau Federation, Sr. Director of Regulatory Issues; *Scott Strand,* Minnesota Center for Environmental Advocacy

11:30 a.m.–12:15 p.m. **Lunch**
Karen Jensen, Metropolitan Council Environmental Services

12:15–1:00 p.m. **Luncheon Presentation**
Office of the Governor (invited)

1:15–2:45 p.m. Concurrent Sessions V

Track A

Near Channel Sediment Erosion

Moderator: *Shawn Schottler*, St. Croix Watershed Research Station

Co-Moderator: *Gene Soderbeck*, Minnesota Pollution Control Agency

Influences on Lateral Erosion Rates in Three Agriculture-Dominated Minnesota Watersheds

Jen Oknich, Chris Lenhart, Gary Sands, Mikhail Titov, Ben Underhill, and Laura Triplett, University of Minnesota; Mark Ellefson, Department of Natural Resources

Sediment Load Reduction Treatments in MN River Valley Streams

Martin Melchior, Inter-Fluve*; Ryan Holzer and Paul Nelson,* Scott County

Discharge-TSS Relations Yield Useful Information Regarding Controls on Fine Sediment Production and Transport in Rivers Throughout Minnesota

Angus Vaughan and Patrick Belmont, Utah State University

Historical Landslide Inventory for the Twin Cities Metropolitan Area

Carrie Jennings, Freshwater Society; *Mary Presnail and Suzanne Jiwani,* Department of Natural Resources; *Ethan Kurak, Jessica Palazzolo, and Joshua M. Feinberg*, University of Minnesota; *Rachel Meier*, Gustavus Adolphus College; *Craig Schmidt,* National Weather Service; *Eric Waage,* Hennepin County Emergency Management

Track B

Fine-scale Measurement and Targeting of Agricultural Practices

Moderator: *Jeff Berg*, Minnesota Department of Agriculture

Co-Moderator: *Faye Sleeper*, Water Resources Center, University of Minnesota

Water Quality Models for Establishing Site-Specific Nutrient Goals Based on Water Quality and Biological Response Variables

David Dilks, Hans Holmberg, and Dendy Lofton, LimnoTech

Targeting Conservation Opportunities to Retain Water: Working Towards Altered Hydrology Goals

Jun Yang, Mark Deutschman, Zach Hermann, and Drew Kessler, Houston Engineering, Inc

Clay County Drainage Site: Field Scale Drainage Research in the Minnesota Red River Valley

Stefan Bischof, Minnesota Department of Agriculture

Runoff Risk: A Decision Support Tool for Nutrient Application Timing

Dustin Goering, Steve Buan, and Liz Houle, National Oceanic and Atmospheric Administration, National Weather Service; *Heather Johnson,* Minnesota Department of Agriculture

Track C

Urban Water Quality

Moderator: *Ron Leaf*, Short Elliott Hendrickson, Inc

Co-Moderator: *Andy Erickson*, St. Anthony Falls Laboratory, University of Minnesota

Alum Sulfate (Alum) Treatment Facility: 18 Years of Results

Eric Korte, Ramsey Washington Metro Watershed District

Implementing an Adaptive Management Approach for an Alum Treatment on Bald Eagle Lake, MN

Brian Beck and Joe Bischoff, Wenck Associates; *WIlliam James*, University of Wisconsin; *Matt Kocian,* Rice Creek Watershed District; *John Holz and Tad Barrow,* HAB Aquatic Solutions

Automated Baseflow/ Stormflow Separation and Load Calculation for Continuous Flow Data and Water Quality Samples in Urban Storm Sewers

Britta Suppes, Joe Sellner, and Bob Fossum, Capitol Region Watershed District

Treating Direct Discharges and Reducing Pollutant Loads to the Mississippi River: A Regional Approach to Implementing Green Infrastructure in the NE Industrial Area

Lisa Vollbrecht and Noah Czech, City of Saint Cloud; *April Ryan*, SEH Inc

Track D

Bridge and Infrastructure Issues

Moderator: *Rick Voigt*, Voigt Consultants, LLC

Co-Moderator: *Andrea Hendrickson*, Minnesota Department of Transportation

Two- and Three-Dimensional Simulation of Bridge Pier Scour Development in the Mississippi River

Nicole Bartelt, Petra DeWall, and Solomon Woldeamlak, Minnesota Department of Transportation; Fotis Sotiropoulos, *Ali Khosronejad, and Trung Le*, St. Anthony Falls Laboratory, University of Minnesota

Mitigating Bridge Scour Case Study from the I-90 River Bridge and Interchange Reconstruction

Nicole Bartelt and Petra DeWall, Minnesota Department of Transportation; *Lisa Goddard*, SRF Consulting Group

Drainage Dilemmas in Bluff Country—Case Studies from the I-90 River Bridge and Interchange Reconstruction

Jeremy Nielsen and Lisa Goddard, SRF Consulting Group, Inc

Trunk Highway 53 Location

Jonathan Libby, Kimley-Horn, and Patrick Huston, Minnesota Department of Transportation

LID Workshop

Stormwater Research Priorities and Pond Maintenance Research Project

A Stormwater/LID Extended Session

Moderator: *John Bilotta*

Multiple presenters from the research team cited below.

1:15 p.m.

Project overview and session objectives

This research project is developing information required to improve stormwater pond maintenance and create a ten-year framework of stormwater research needs.

1:20–1:45 p.m.

PAH and Phosphorus Release from Stormwater Ponds—Research Quickbyte

An overview of a current research project (2016–18). What is being studied, how, and why.

1:45–2:45 p.m.

Minnesota Stormwater Research Framework and Priorities

An overview of the project (2016–18) including project design, input from existing research and databases, and summary of an interim needs report.

2:45–3:00 p.m. **Break**

3:00–4:30 p.m. Concurrent Sessions VI

Track A

River Hydrology and Suspended Sediment

Moderator: *Gene Soderbeck*, Minnesota Pollution Control Agency

Co-Moderator: *Shawn Schottler*, St. Croix Watershed Research Station

Modeling the Influences of Riverine Hydrology on Near-Channel Nesting Habitat for State-Listed Turtle Species

Jason Naber, Jason Ulrich, and Mike Talbot, Emmons and Olivier Resources

Application of Dimensionless Sediment Rating Curves to Predict Suspended-Sediment Concentrations, Bedload, and Annual Loads for Rivers in Minnesota

Joel Groten, Christopher Ellison, and David Lorenz, United States Geological Survey; *Karl Koller*, Minnesota Department of Natural Resources

Indicators for Altered Hydrologic Influences on Fluvial Geomorphology and Sediment Loading

Alex Schmidt, Greg Bowles, and Drew Kessler, Houston Engineering

Flow-Related Dynamics in Suspended Algal Biomass andlits Contribution to Suspended Particulate Matter in an Agricultural River Network of the Minnesota River Basin, USA

Christy Dolph, Amy Hansen, and Jacques Finlay, University of Minnesota

Track B

Watershed Monitoring Assessment and Dissemination

Moderator: *Greg Wilson*, Barr Engineering Company

Co-Moderator: *John Baker*, United States Department of Agriculture, and Department of Soil, Water, and Climate, University of Minnesota

Estimating Daily Streamflow for Ungaged Stream Locations in Minnesota

Jeff Ziegeweid, Christopher Sanocki, and David Lorenz, United States Geological Survey Minnesota Water Science Center

An Interactive Application for Graphing and Downloading Daily, Annual, and Average Pollutant Load Data from the MPCA's Watershed Pollutant Load Monitoring Network

Patrick Baskfield and Casey Scott, Minnesota Pollution Control Agency

Long-Term Trends in Concentration and Loads of Stream Pollutants in Minnesota

James MacArthur and James Jahnz, Minnesota Pollution Control Agency

Comparing Minnesota's Nutrient and Sediment Load Monitoring Results with Watershed Characteristics

David Wall and Thomas Pearson, Minnesota Pollution Control Agency; *Ben Gosack*, Minnesota Department of Natural Resources

Track C

New Tools for Salt Management

Moderator: *Lisa Goddard*, SRF Consulting Group, Inc

Co-Moderator: *John Gulliver*, Department of Civil, Environmental, and Geo-Engineering, College of Science and Engineering, University of Minnesota

Smart Salting: Managing Salt Use to Protect the Environment, Save Money and Provide Public Safety

Brooke Asleson and Rachel Olmanson, Minnesota Pollution Control Agency

Winter Maintenance Assessment Tool: An Innovative Planning Tool to Manage Salt Use

Matt Morreim, City of Saint Paul Public Works; *Brooke Asleson*, Minnesota Pollution Control Agency

Using "Big Data" Techniques to Analyze and Visualize Dissolved Salt Concentrations Across the Minnesota Landscape

Scott Kyser and Casey Scott, Minnesota Pollution Control Agency

Revised Sulfate Standard to Protect Wild Rice from Elevated Hydrogen Sulfide

Edward Swain, Phil Monson, and Shannon Lotthammer, Minnesota Pollution Control Agency

Track D

Planning for Floods, Fish Passage, and Flocculation

Moderator: *Ann Banitt*, United States Army Corps of Engineers

Co-Moderator: *Rick Voigt*, Voigt Consultants, LLC

Mitigating Geyser Events in the Minneapolis Stormwater Tunnel Systems

Brandon Barnes, Greg Fransen, Lulu Fang, Christian Frias, and Omid Mohseni, Barr Engineering Company

Development of Planning Toolsets using XP-SWMM and GIS Systems to Address Flood Risk, Climate Change, and Urban and Rural Development

Bryce Cruey and Ed Matthiesen, Wenck Associates, Inc

Culvert Inventory and Ranking Protocol

Amanda Hillman, Minnesota Department of Natural Resources

Flocculation BMPs for Reducing the Sediment in Construction Water Discharges

Stephen Druschel and Nazli Yilmaz, Minnesota State University–Mankato

LID Workshop

3:00–4:30 p.m.

Stakeholder Input for Stormwater Research Priorities for the Next Decade

This will be an interactive input session (not a presentation). Participants will be invited to provide input to help shape future surveys and methods, and contribute to stormwater research needs.

This stormwater/LID extended session will be led by members of the UMN research team carrying out this project including:

Jeff Peterson, Larry Baker, John Bilotta, John Chapman, Jacques Finlay, John Gulliver, Raymond Hozalski, Shahram Missaghi, Matt Simcik, and Bruce Wilson, and may feature multiple post-docs and graduate students.

4:30 **Adjourn**

Poster Display

The following posters will be displayed during the breaks each day. The poster session with poster presenters will be held on Tuesday evening, during the reception.

In-Lake Response to Watershed Restoration: Lake Shaokotan, Lincoln County, MN
Ellen Albright, Macalester College; *Steven Heiskary,* Minnesota Pollution Control Agency

Sampling and Temporal Effects on Arsenic Concentration in New Private Residential Wells in Minnesota
Emily Berquist, Minnesota Department of Health; *Melinda Erickson,* United States Geological Survey

Woodchip Bioreactors: From Planning to Construction, a case study of Faribault County Ditch (CD) 62
Chuck Brandel, ISG

An ArcGIS-Based Tool for Water Table Interpolation
Catherine Christenson and Tim Cowdery, US Geological Survey

Floating Treatment Wetlands in a Northern Climate: Examination of Phosphorus and Nitrogen Removal
Emily Deering, Joseph Magner, Chris Lenhart, and Lawrence Baker, University of Minnesota

Fields to Streams: Managing Water in Rural Landscapes
Les Everett and Ann Lewandowski, University of Minnesota Water Resources Center; *Karen Terry,* University of Minnesota Extension

Identifying Opportunities for Minnesota's One Watershed, One Plan Program
Elizabeth Henley, University of Minnesota

Trend Assessment of Regional River Water Quality in the Twin Cities Metropolitan Area (1976–2014)
Erik Herberg and Hong Wang, Metropolitan Council

Evaluating Nitrogen Management and Crop Yield Through On-Farm Field Trial Demonstrations
Spencer Herbert, Margaret Wagner, Ryan Lemickson, Dawn Bernau, and Aaron Janz, Minnesota Department of Agriculture

Embankment Protection During Road Overtopping Events
Matthew Hernick, Jeff Marr, Sara Mielke, and Robert Gabrielson, University of Minnesota St Anthony Falls Laboratory; *Craig Taylor,* LimnoTech

The Passage Bench: A Review of their Construction as a Standard Bridge Design on River Crossings in Minnesota
Peter Leete, Minnesota Department of Natural Resources, Minnesota Department of Transportation

Seasonal Changes in the Turbidimeter Signal Due to Sediment Color in a Minnesota River Tributary
Gustavo Merten, University of Minnesota, Duluth; *Paul Capel,* University of Minnesota, United States Geological Survey

Idea of a Minnesota Water Resources Modeling Group Revisited
Shahram Missaghi, Minnesota Extension

Alum's Critical Role in Controlling Algae and Phosphorus
Keith Pilgrim and Greg Wilson, Barr Engineering Company

Advancing Groundwater Implementation through GRAPS
Carrie Raber and Mark Wettlaufer, Minnesota Department of Health

The R/V Blue Heron and the Large Lakes Observatory
Richard Ricketts, Large Lakes Observatory, University of Minnesota

Nearshore Lake Superior Periphyton Surveillance
Elaine Ruzycki, Richard Axler, and Jerry Henneck, Natural Resources Research Institute, University of Minnesota, Duluth; *Jeremy Erickson,* Saint Paul Regional Water Services

Phosphorus in the Shell Rock Watershed
Bill Thompson, Minnesota Pollution Control Agency

A Direct-Push Sample-Freezing Drive Shoe for Collecting Sediment Cores with Intact Pore Fluid, Microbial, and Sediment Distributions
Jared Trost and Barbara Bekins, United States Geological Survey; *Tom Christy,* Geoprobe Systems

Iron Oxide Mineral Nanoparticles: Fate and Transport of Nitrobenzene Pesticides
Jeanette Voelz, William Arnold, and R. Lee Penn, University of Minnesota, Twin Cities

Linking Hydrologic Flux and Root Zone Geochemistry at Second Creek, a Sulfate-Enriched Wild Rice Stream in Northeastern Minnesota
Amanda Yourd, Gene-Hua Crystal Ng, Amy Myrbo, and Nathan Johnson, University of Minnesota, Twin Cities, Department of Earth Sciences

Registration Form

Minnesota Water Resources Conference
October 18–19, 2016

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Early registration (postmarked on or before September 22, 2016)
- ☐ Two-day - $245
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Please choose which day (required)
- ☐ Tuesday, October 18
- ☐ Wednesday, October 19

☐ Student - $65

Late registration (postmarked after September 22, 2016, or onsite)
- ☐ Two-day - $265
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