MINNEAPOLIS EMPLOYEES RETIREMENT FUND

ACTUARIAL EXPERIENCE STUDY

AS OF JUNE 30, 2009

Gabriel Roeder Smith & Company

September 30, 2009

Mr. Brian Lokkesmoe
Board President
Minneapolis Employees' Retirement Fund
800 Baker Building
706 2nd Avenue South
Minneapolis, Minnesota 55402-3004

Dear Mr. Lokkesmoe:

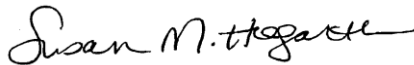**Subject: Results of 2009 Experience Study**

We are pleased to present our report on the results of the 2009 Experience Study for the Minneapolis Employees Retirement Fund (MERF). We have reviewed the actuarial assumptions for healthy pre-retirement, healthy post-retirement and disabled mortality and compared them to actual experience over a five-year period ending June 30, 2009. This report summarizes our findings. It is our recommendation that changes be made in the actuarial assumptions used for the MERF actuarial valuations.

We wish to thank the MERF staff for their assistance in providing data for this study.

Sincerely,

Leslie L. Thompson, FSA, FCA, EA, MAAA
Senior Consultant

Susan M. Hogarth, EA, MAAA
Consultant

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Minneapolis Employees Retirement Fund

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SECTION I

EXECUTIVE SUMMARY

Executive Summary

- *Purpose*
  - To review actuarial assumptions and to compare to actual recent experience
  - Used data from five-year period ending June 30, 2009

- *Healthy Post-retirement mortality rates (non-disabled retirees)*
  - Current tables: Average of male and female rates of 1986 Projected Experience Table with a one-year age setback
  - 435 male deaths and 360 female deaths (excludes beneficiaries and disabled)
  - Expected 401 male deaths and 481 female deaths
  - A/E ratio (actual to expected deaths) for males is 108% and for females is 75%
  - Currently we feel adequate margins do not exists for this assumption
  - We recommend a change to this assumption, thus decreasing the rates for males and females to indicate a longer life expectancy

- *Disabled mortality rates*
  - Current tables: Average of male and female rates of 1986 Projected Experience Table with a one-year age setback
  - 34 male deaths and 11 female deaths; expected 17 male and 8 female deaths
  - 200% A/E ratio for males, 138% for females, overall ratio is 180.0%
  - We recommend a change to this assumption

- *Healthy Pre-retirement mortality rates (non-disabled retirees)*
  - Current tables: Average of male and female rates of 1986 Projected Experience Table with a one-year age setback
  - Closed plan with 3.6% of the total population still active, most at retirement age
  - We recommend a change to this assumption to match the Healthy Post-Retirement mortality rates (non-disabled retirees)

- *Summary of recommendations*
  - For retirees, males are dying <u>faster</u> than expected, while females are dying <u>slower</u> than expected
  - We recommend a change to the healthy post-retirement mortality assumption to decrease the rates for males and females, thus indicating a longer life expectancy
  - We recommend updating the disabled mortality assumption to better fit actual experience
  - We recommend changing the assumption for healthy pre-retirement mortality to match the healthy post-retirement mortality rates (non-disabled retirees)
  - The impact on the total actuarial accrued liability as of July 1, 2009 is approximately $76 million, hence increasing the supplemental contribution by $9.6 million

SECTION II

INTRODUCTION

Introduction

In determining liabilities, contribution rates and funding periods for retirement plans, actuaries must make assumptions about the future. MERF is a closed plan, with nearly all participants in pay status. Thus, the main assumption at work in the valuation is the mortality assumption, and is the only assumption under review in this report.

For assumptions such as mortality rates, past experience provides important evidence about the future. Therefore, actuaries should review their assumptions periodically and determine whether these assumptions are consistent with actual past experience and with anticipated future experience.

In conducting experience studies, actuaries generally use data over a period of several years. This is necessary in order to gather enough data so that the results are statistically significant. In addition, if the study period is too short, the impact of the current economic conditions may lead to misleading results. Using results gathered during a short-term boom or bust will not be representative of the long-term trends in these assumptions. Also, the adoption of legislation, such as plan improvements, will sometimes cause a short-term distortion in the experience. Using a longer period prevents giving too much weight to such short-term effects. On the other hand, using a much longer period would water down real changes that may be occurring, such as mortality improvement or a change in the ages at which members retire. In our view, using a five-year period is reasonable.

In this experience study, we first determine the number of deaths that occurred during the period. Then we determine the number expected to occur, based on the current actuarial assumptions. The number "expected" is determined from using the probability of the occurrence at the given age, times the "exposures" at that same age. For example, let's look at a rate of death at age 55. The number of exposures can only be those members who are age 55 at that time. Thus they are considered "exposed" to that assumption. Finally we calculate the A/E ratio, where "A" is the actual number (of deaths, for example) and "E" is the expected number. If the current assumptions were "perfect", the A/E ratio would be 100%. For mortality assumptions, a reasonable A/E ratio is typically in the range of 105% - 115%, which is conservative (i.e. generates actuarial gains for the Plan) and leaves margin for increases in the future life expectancy. When the A/E ratio for mortality varies much from this range, it is a sign that new assumptions may be needed. Of course we not only look at the assumptions as a whole, but we also review how well they fit the actual results by sex and by age.

Finally, the actuary "graduates" or smoothes the results since the raw results can be quite uneven from age to age.

ORGANIZATION OF REPORT

Section III contains our findings and recommendations for the mortality assumptions. Section IV summarizes the recommended changes. The impact of adopting the recommendations on liabilities

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and contribution rates is shown in Section V. Section VI presents a summary of all the actuarial assumptions, including the recommended changes. Section VII provides the analysis of MERF experience under the recent recommendations provided by Mercer for the Minnesota Public Employees Retirement Association (PERA). The impact of using the recommended rates proposed to PERA for the MERF population is shown in Section VIII.

SECTION III

ANALYSIS OF EXPERIENCE AND RECOMMENDATIONS

Analysis of Experience and Recommendations

This report analyzes three mortality assumptions - healthy pre-retirement, healthy post-retirement and disabled mortality.

HEALTHY PRE-RETIREMENT AND POST-RETIREMENT MORTALITY RATES

The mortality table currently being used for non-disabled retirees and for beneficiaries receiving benefits is the average of male and female rates of 1986 Projected Experience Table with a one-year age setback.

There were 435 deaths among the male retirees and 360 deaths among female retirees during the last five years. (These figures exclude deaths among beneficiaries and disabled retirees.) Based on the current tables, we expected 401 and 481 deaths respectively. This produced A/E ratios of 108% for males and 75% for females. In a closed plan, and particularly a plan that is nearly completely in pay status, we recommend at least a 5% margin on mortality. This margin recommendation translates to an A/E ratio of at least 105%. Also, we frequently look to update mortality tables to more current tables, and adjust them to fit the Fund's experience. We have analyzed the males and females combined at the core ages of 60 to 84, to fit both the male and female tables to a uniform table, which results in an overall A/E ratio of 105%. Therefore, we recommend changing assumptions for healthy post-retirement mortality to the RP-2000 healthy sex distinct tables projected to 2018 with a white collar adjustment. This change decreases the rates for males and females, thus indicating a longer life expectancy.

When we state the "RP-2000 healthy sex distinct tables projected to 2018", this is defined as using a static projection of mortality improvements to calendar year 2018 that were made to a base mortality table. In the case of MERF, the base mortality table was the RP-2000 Combined Healthy with White Collar adjustments and the projection was made from year 2000 (which is the anchor date for the RP-2000 mortality tables) to year 2018 using the recommended projection scale AA. With this static projection, one set of male and female mortality tables is produced such that all mortality improvements from calendar years 2000 to 2018 are recognized immediately.

Regarding the selection of the white collar adjustment, we followed the recommendation that Mercer has provided to PERA for mortality tables. When we asked Mercer to explain how they decided to apply this adjustment for the PERA group (who are noted as public employees), they responded with "We considered no collar, blue collar, and white collar, and found white collar to be the best fit." The definition of this type of adjustment is as follows:

- Under the Society of Actuaries (SOA) the Retirement Plans Experience Committee (RPEC) defined collar type based on information from the data contributors about whether participants were hourly or salaried and union or non-union. If more than 70 percent of the participants were hourly or union then the type was set as blue collar. If more than 70 percent of the

participants were salaried and non-union then the type was set as white collar. If the type could not be determined, either by these rules or by contacting the submitting actuary, it was set as mixed collar."

In addition, we recommend a change to the healthy pre-retirement mortality assumption to equal the same table being proposed for the healthy post-retirement mortality rates (non-disabled retirees).

The results of our analysis for healthy post-retirement mortality are shown below and on the following page:

	Post-Retirement Mortality (non-disabled) – Males			
Age	Actual deaths	Expected deaths	A/E Ratio	Proposed Expected Death
50-54	0	1	0%	1
55-59	10	8	125%	4
60-64	14	17	82%	10
65-69	13	25	52%	16
70-74	28	39	72%	24
75-79	66	72	92%	55
80-84	118	98	120%	94
85-89	110	89	124%	101
90-94	57	39	146%	51
95-99	15	10	150%	14
100-104	3	2	150%	2
105-109	1	1	100%	1
Totals	**435**	**401**		**373**
A/E Ratio		**108%**		**117%**

		Post-Retirement Mortality (non-disabled) – Females		
Age	Actual deaths	Expected deaths	A/E Ratio	Proposed Expected Death
50-54	0	1	0%	0
55-59	1	3	33%	2
60-64	0	6	0%	4
65-69	10	13	77%	8
70-74	17	29	59%	16
75-79	26	62	42%	38
80-84	66	106	62%	75
85-89	108	129	84%	108
90-94	93	95	98%	91
95-99	32	33	97%	33
100-104	7	4	175%	3
Totals	**360**	**481**		**378**
A/E Ratio		**75%**		**95%**

		Post-Retirement Mortality (non-disabled) – Males and Females Combined		
Age	Actual deaths	Expected deaths	A/E Ratio	Proposed Expected Death
50-54	0	2	0%	1
55-59	11	11	100%	6
60-64	14	23	61%	14
65-69	23	38	61%	24
70-74	45	68	66%	40
75-79	92	134	69%	93
80-84	184	204	90%	169
85-89	218	218	100%	209
90-94	150	134	112%	142
95-99	47	43	109%	47
100-104	10	6	167%	5
105-109	1	1	100%	1
Totals	**795**	**882**		**751**
A/E Ratio - Total		**90%**		**106%**
A/E Ratio - Core Ages		**77%**		**105%**

DISABLED MORTALITY RATES

This is a minor assumption, and it has little impact on the liabilities. The current assumption is the Average of male and female rates of 1986 Projected Experience Table with a one-year age setback. There were 34 male deaths and 11 female deaths among the disabled retirees during the five-year study period. This produced A/E ratios of 200% and 138% respectively. For this assumption, we would also like to see A/E ratios within an acceptable range – generally 105% - 115%. In addition, we recommend updating the table to a more current table, and adjusting the rates to fit the MERF experience. Therefore, we recommend increasing the rates for males at all ages, while increasing the rates for females at the core ages and decreasing the rates at older ages. The results of this analysis are shown below and on the following page:

Disabled Mortality – Males				
Age	Actual deaths	Expected deaths	A/E Ratio	Proposed Expected Death
45-49	0	0	0%	1
50-54	2	0	0%	3
55-59	3	1	300%	4
60-64	4	1	400%	4
65-69	2	2	100%	7
70-74	7	3	233%	4
75-79	7	3	233%	5
80-84	2	3	67%	3
85-89	5	3	167%	1
90-94	2	1	200%	0
Totals	**34**	**17**		**32**
A/E Ratio		**200%**		**106%**

Disabled Mortality – Females				
Age	Actual deaths	Expected deaths	A/E Ratio	Proposed Expected Death
45-49	0	0	0%	0
50-54	0	0	0%	1
55-59	0	0	0%	0
60-64	0	0	0%	1
65-69	2	0	0%	1
70-74	2	1	200%	2
75-79	1	2	50%	3
80-84	2	3	67%	2
85-89	4	2	200%	0
Other	0	0	0%	0
Totals	**11**	**8**		**10**
A/E Ratio		**138%**		**110%**

SECTION IV

SUMMARY OF RECOMMENDATIONS FOR MERF

Summary of Recommendations for MERF

We recommend that the Board formally accept this report and adopt the following recommended assumptions effective with the June 30, 2010 actuarial valuation.

– We recommend decreasing the rates for the healthy post-retirement mortality assumption (non-disabled) for both males and females
– We recommend changing the healthy pre-retirement mortality assumption (non-disabled) for both males and females to match the table being proposed for the healthy post-retirement mortality assumption (non-disabled) for males and females
– We recommend updating the disabled mortality assumption for both males and females

SECTION V

ACTUARIAL IMPACT OF RECOMMENDATIONS FOR MERF

Actuarial Impact of Recommendations for MERF as of July 1, 2009 Actuarial Valuation

Summary of Results	*Baseline - New Asset Method* *MERF Assumptions & Methods*	*Impact - New Asset Method* *MERF Recommended Mortality*	Delta from Baseline
Normal cost	$1,152,674	$1,131,208	
Actuarial accrued liability:			
Active members	$91,517,794	$97,614,739	
Inactive members with vested rights	10,193,733	10,908,393	
Annuitants in RBF	1,356,965,523	1,424,938,886	
Annuitants not in RBF - Disability Benefits	57,741,358	55,851,985	
Annuitants not in RBF - Survivor Benefits*	34,680,611	37,907,924	
TOTAL Actuarial Accrued Liability (AAL)	$1,551,099,019	$1,627,221,927	$76,122,908
Present value of $1.00 per year paid monthly through amortization date June 30, 2020 (11 years remaining from July 1, 2009)			7.89
AAL / Amortization Factor			$9,648,024

*   *Increases under 1998 and 1999 legislation are not included in this liability, because the costs are excluded from state - provided funding.*

SECTION VI

SUMMARY OF ASSUMPTIONS AND METHODS INCORPORATING THE RECOMMENDED ASSUMPTIONS

Summary of Assumptions and Methods
Incorporating the Recommended Assumptions

Mortality Rates:

Healthy Retiree:	RP-2000 healthy sex distinct tables projected to 2018 with a white collar adjustment
Disabled:	RP-2000 disabled sex distinct tables with a white collar adjustment, reduced by 20%
Active:	RP-2000 healthy sex distinct tables projected to 2018 with a white collar adjustment

Rates other than Retirement: Shown below for selected ages.

	Rate %							
	Healthy Post-Retirement Mortality		**Disabled Mortality**		**Active Mortality**			
Age	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Withdrawal**	**Disability**
20	0.02	0.02	1.81	0.60	0.02	0.02	21.00	0.21
25	0.02	0.02	1.81	0.60	0.02	0.02	11.00	0.21
30	0.03	0.02	1.81	0.60	0.03	0.02	5.00	0.23
35	0.05	0.04	1.81	0.60	0.05	0.04	1.50	0.30
40	0.08	0.05	1.81	0.60	0.08	0.05	1.00	0.41
45	0.11	0.08	1.81	0.60	0.11	0.08	1.00	0.61
50	0.14	0.12	2.32	0.92	0.14	0.12	1.00	0.93
55	0.23	0.22	2.84	1.32	0.23	0.22	1.00	1.60
60	0.43	0.44	3.36	1.75	0.43	0.44	1.00	0
65	0.86	0.80	4.01	2.24	0.86	0.80	0	0
70	1.47	1.40	5.01	3.01	1.47	1.40	0	0

Retirement Rates:	100% at age 61.
Interest:	Pre-Retirement – 6.00% per annum
	Post-Retirement – 5.00% per annum
Salary Increases:	Total reported pay for prior calendar year increased 1.98% (half year of 4.00%, compounded) to prior fiscal year and 4.00% annually for each future year.
Administrative Expenses:	Prior year administrative expenses (excluding investment expenses) increased by 4.00% expressed as a percentage of projected annual payroll.

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| **Investment Expenses:** | Investment expenses for the fiscal year ending June 30, 1992 are being amortized as follows: |

Beginning Balance	Annual Payment	Years Remaining
$2,849,000	$207,000	11

Allowance for Combined Service Annuity:

Liability for active members are increased by 0.2% and liabilities for former members (not in payment status) are increased by 30.0% to account for the effect of some participants having eligibility for a Combined Service Annuity.

Return of Contributions:

All members withdrawing after becoming eligible for a deferred benefit were assumed to take the larger of their contributions accumulated with interest or the value of their deferred benefit.

Unknown Data For Participants:

Same as those exhibited by participants with similar known characteristics.

Percent Married:

67% of active members are assumed to be married.

Age of Spouse:

Females are assumed to be three years younger than males.

Benefit Increases After Retirement:

Payment of increases based on the excess of Retirement Benefit Fund earnings over 5.00% is accounted for by using a 5.00% post-retirement interest assumption.

Asset Valuation Method:

RBF Reserve: Market Value
Non-RBF Assets: Market Value of Assets on the Valuation Date less i.) 80% of the Excess Return/(Return Shortfall) in the twelve month period ending on the Valuation Date; 60% of the Excess Return/(Return Shortfall) in the twelve month period ending one year before the Valuation Date; 40% of the Excess Return/ (Return Shortfall) in the twelve month period ending two years before the Valuation Date; 20% of the Excess Return/ (Return Shortfall) in the twelve month period ending three years before the Valuation Date. For purposes of this calculation, "Excess Return/ (Return Shortfall)" is the amount by which the actual return on the Market Value of Assets, not held in MERF's Retirement Benefit Fund is less than the expected return on those assets based on the assumed interest rate employed in the July 1 actuarial valuation of the fiscal year.

Actuarial Cost Method:

Entry Age Normal Actuarial Cost Method. Entry Age is the age at the time the participant commenced employment. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are expressed as a level percentage of payroll, with Normal Cost determined as if the current benefit

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accrual rate had always been in effect.

Payment on the Unfunded Actuarial Accrued Liability:	A level dollar amount each year to the statutory amortization date, adjusted for timing of expected receipt. Employers are assumed to contribute 73% of billed contribution amounts on a monthly basis during the plan year. The remaining 27% of contributions are assumed to be deferred to payment in subsequent plan years.

SECTION VII

SUMMARY OF ANALYSIS UNDER RECOMMENDATIONS FOR PERA (MERCER STUDY)

Summary of Analysis under Recommendations for PERA (Mercer Study)

An experience study was recently completed for the Minnesota PERA by Mercer (PERA's actuary) and the following mortality assumptions were provided to PERA as recommendations:

Mortality Rates:

Healthy Post-Retirement:	RP-2000 healthy sex distinct tables projected using generational mortality with a white collar adjustment:
	• Males: No setback
	• Females: Setback two years
Disabled:	RP-2000 disabled sex distinct tables with a white collar adjustment:
	• Males: Setback four years
	• Females: Set forward seven years

The history in the development and selection of the RP-2000 mortality table by actuaries, per the SOA, is provided below:

"The RP-2000 table is the only table [out of the GAM-83, GAM-94, UP-94, and RP-2000] based solely on retirement plan mortality experience. It was developed by the SOA specifically for current liability calculations."

"Similarly, in its issuance of the RP-2000 report, the committee that developed the table said that given the long history of mortality improvement, pension valuations should take mortality improvement trends into account, preferably by using a generational table but, if not, by a comparable static projection."

We have analyzed these assumptions recommended for PERA against the MERF experience over the five-year study period, and summarized our results on the following pages:

Post-Retirement Mortality (non-disabled) – Males				
Age	Actual deaths	Expected deaths	A/E Ratio	Proposed Expected Death
50-54	0	1	0%	1
55-59	10	8	125%	5
60-64	14	17	82%	11
65-69	13	25	52%	18
70-74	28	39	72%	29
75-79	66	72	92%	63
80-84	118	98	120%	103
85-89	110	89	124%	108
90-94	57	39	146%	54
95-99	15	10	150%	14
100-104	3	2	150%	3
105-109	1	1	100%	1
Totals	**435**	**401**		**410**
A/E Ratio		**108%**		**106%**

Post-Retirement Mortality (non-disabled) – Females				
Age	Actual deaths	Expected deaths	A/E Ratio	Proposed Expected Death
50-54	0	1	0%	0
55-59	1	3	33%	1
60-64	0	6	0%	3
65-69	10	13	77%	6
70-74	17	29	59%	14
75-79	26	62	42%	34
80-84	66	106	62%	65
85-89	108	129	84%	90
90-94	93	95	98%	78
95-99	32	33	97%	30
100-104	7	4	175%	3
Totals	**360**	**481**		**324**
A/E Ratio		**75%**		**111%**

Disabled Mortality – Males				
Age	Actual deaths	Expected deaths	A/E Ratio	Proposed Expected Death
45-49	0	0	0%	2
50-54	2	0	0%	4
55-59	3	1	300%	5
60-64	4	1	400%	5
65-69	2	2	100%	7
70-74	7	3	233%	4
75-79	7	3	233%	5
80-84	2	3	67%	3
85-89	5	3	167%	1
90-94	2	1	200%	0
Totals	**34**	**17**		**36**
A/E Ratio		**200%**		**94%**

Disabled Mortality – Females				
Age	Actual deaths	Expected deaths	A/E Ratio	Proposed Expected Death
45-49	0	0	0%	0
50-54	0	0	0%	1
55-59	0	0	0%	1
60-64	0	0	0%	1
65-69	2	0	0%	2
70-74	2	1	200%	4
75-79	1	2	50%	5
80-84	2	3	67%	4
85-89	4	2	200%	0
Other	0	0	0%	0
Totals	**11**	**8**		**18**
A/E Ratio		**138%**		**61%**

SECTION VIII

ACTUARIAL IMPACT OF ANALYSIS UNDER RECOMMENDATIONS FOR PERA (MERCER STUDY)

Actuarial Impact of Analysis under Recommendations for PERA (Mercer Study) as of July 1, 2009 Actuarial Valuation

Summary of Results	Baseline - New Asset Method MERF Assumptions & Methods	Impact - New Asset Method PERA Recommended Mortality	Delta from Baseline
Normal cost	$1,152,674	$1,184,299	
Actuarial accrued liability:			
Active members	$91,517,794	$99,343,859	
Inactive members with vested rights	10,193,733	11,210,575	
Annuitants in RBF	1,356,965,523	1,471,602,335	
Annuitants not in RBF - Disability Benefits	57,741,358	55,847,493	
Annuitants not in RBF - Survivor Benefits*	34,680,611	39,991,945	
TOTAL Actuarial Accrued Liability (AAL)	$1,551,099,019	$1,677,996,207	$126,897,188
Present value of $1.00 per year paid monthly through amortization date June 30, 2020			7.89
(11 years remaining from July 1, 2009)			
AAL / Amortization Factor			$16,083,294

* *Increases under 1998 and 1999 legislation are not included in this liability, because the costs are excluded from state - provided funding.*