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December 16, 2014

Mr. Alan Conroy
Executive Director
Kansas Public Employees Retirement System
611 S. Kansas Ave., Suite 100
Topeka, KS 66603-3803

Re: Cost Study for Impact of Pension Obligation Bonds

Dear Alan:

At your request, we have prepared a cost study to determine the impact on KPERS if there were a pension obligation bond (POB) issued by the state of Kansas with net proceeds of either $1.0 or $1.5 billion deposited into the KPERS trust fund. In our analysis, we assumed, at your direction, that the debt service payments on the POB will come from a funding source other than KPERS contributions. Furthermore, for modeling purposes the POB proceeds are assumed to be deposited into the KPERS trust on December 31, 2015 as you specified. If this concept moves further and more details become available, our cost study may need to be revised to more accurately reflect the actual provisions related to the issuance of the POB.

Cost Impact

We used the projection model prepared in conjunction with the December 31, 2013 actuarial valuation to measure the cost impact of the net proceeds of the proposed POB into the KPERS trust fund on December 31, 2015. These results are compared to the baseline projections without a POB. Exhibits A1 and A2 show the estimated employer contribution rate and the corresponding dollar amounts of employer contributions for the $1.0 billion and $1.5 billion POB respectively. Exhibits B1 and B2 provide a comparison of the key valuation results such as unfunded actuarial liability and funded ratio, with and without the POB proceeds.

POB of $1.0 billion

The total employer contributions under the current plan (no POB) for FY 2015 through FY 2036 are $15,417.41 million (statutory employer contributions plus additional State contributions from ELARF). Under the scenario where a $1.0 billion POB is issued, the total employer contributions over the same period are $13,204.14 million, a difference of $2,213.27 million.

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POB of $1.5 billion

The total employer contributions under the current plan (no POB) for FY 2015 through FY 2036 are $15,417.41 million (statutory employer contributions plus additional State contributions from ELARF). Under the scenario where a $1.5 billion POB is issued, the total employer contributions over the same period are $12,122.71 million, a difference of $3,294.70 million.

The cost analysis provided in this letter reflects only the impact of the POB on KPERS' funding. Under both scenarios, the POB would have to be repaid. As mentioned earlier, we assumed that the debt service payments would be paid from a source other than KPERS contributions. This "cost" has not been taken into account on Exhibits A1 and A2. Only the impact on KPERS is shown.

Please note that the dollar amounts of employer contributions shown in the exhibits are future dollar amounts, calculated using the estimated employer contribution rate and projected payroll in future years. Due to the length of the projection period, the future payroll amounts grow significantly and the resulting contributions in nominal dollars in those years can appear very large. On a present value basis, the contribution difference is approximately the amount of the net proceed deposited into KPERS.

The projections used in this cost study assume that all actuarial assumptions, including the 8% investment return assumption, are met each year in the future. The cost projections are sensitive to the assumptions used, particularly the investment return assumption. To the extent the 8% investment return assumption is not met in the future, the cost projections in these studies are expected to change. Further analysis can be provided upon request if it is deemed to be necessary or helpful.

The provision of this actuarial analysis is made solely for the purpose of comparing results of different financing scenarios based on investment return assumptions supplied by KPERS. The results are not intended to, and should not be interpreted as, making any recommendation or suggestion as to the advisability of any particular financing arrangement. The provision of this analysis is not considered a municipal advisory activity and Cavanaugh Macdonald Consulting, LLC does not hold itself out as a municipal advisor as a result.

Disclaimers, Caveats, and Limitations

The numerical table that comprises this cost study is based primarily upon the December 31, 2013 valuation results, the actuarial assumptions used in that valuation (unless otherwise noted elsewhere in this letter), and the projection model prepared by the System's actuary, Cavanaugh Macdonald Consulting, LLC. Significant items are noted below:

- The investment return in all future years is assumed to be 8% on a market value basis, unless otherwise indicated.
- All demographic assumptions regarding mortality, disability, retirement, salary increases, and termination of employment are assumed to hold true in the future. Please note that the actuarial assumption assumes that mortality will improve in the future (i.e. people will live longer).
- The number of active members covered by KPERS in the future is assumed to remain level (neither growth nor decline in the active membership count). As active members leave covered employment, they are assumed to be replaced by new employees who have a similar demographic profile as recent new hires.
- The funding methods, including the entry age normal cost method, the asset smoothing method, and the amortization method and period, remain unchanged other than as noted elsewhere in this letter.

- All projections reflect the current statutory caps of. 0.9% in FY 2014, 1.0% in FY 2015, 1.1% in FY 2016 and an ultimate cap of 1.2% in FY 2017 and beyond.
- We relied upon the membership data provided by KPERS for the actuarial valuation. The numerical results depend on the integrity of this information. If there are material inaccuracies in the data, the results presented herein may be different and the projections may need to be revised.

Models are designed to identify anticipated trends and to compare various scenarios rather than predicting some future state of events. The projections are based on the System's estimated financial status on December 31, 2013, and project future events using one set of assumptions out of a range of many possibilities. A different set of assumptions would lead to different results. The projections do not predict the System's financial condition or its ability to pay benefits in the future and do not provide any guarantee of future financial soundness of the System. Over time, a defined benefit plan's total cost will depend on a number of factors, including the amount of benefits paid, the number of people paid benefits, the duration of the benefit payments, plan expenses, and the amount of earnings on assets invested to pay benefits. These amounts and other variables are uncertain and unknowable at the time the projections were prepared. Because not all of the assumptions will unfold exactly as expected, actual results will differ from the projections. To the extent that actual experience deviates significantly from the assumptions, results could be significantly better or significantly worse than indicated in this study.

We are available to answer any questions on the material contained in this study or to provide explanations or further details upon request. We, Patrice A. Beckham F.S.A. and Brent A. Banister, F.S.A., are consulting actuaries with Cavanaugh Macdonald Consulting, LLC. We are also members of the American Academy of Actuaries and Fellows of the Society of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

If you have questions or need additional analysis, please let us know.

Sincerely,

Patrice Beckham

Patrice A. Beckham, FSA, FCA, EA, MAAA
Principal and Consulting Actuary

Brent A. Banister, PhD, FSA, FCA, EA, MAAA
Chief Pension Actuary

Exhibit A1

Current Plan vs. $1.0 Billion POB Deposit on 12/31/15

State/School Group

(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Employer Contribution Rate		**Employer Contribution Amount ($M)**		
Fiscal Year	Total Payroll	Current	$1.0 B POB	Current	$1.0 B POB	Difference
2015	$ 4,440.00	11.27%	11.27%	$ 500.39	500.39	$ -
2016	4,554.81	12.37% *	12.37% *	603.09	603.09	-
2017	4,663.16	13.57% *	13.57% *	673.35	673.35	-
2018	4,784.85	14.77% *	14.77% *	748.20	748.20	-
2019	4,918.20	14.83% *	12.99% *	772.01	681.52	(90.49)
2020	5,061.65	14.51% *	12.49% *	777.87	675.62	(102.25)
2021	5,215.15	14.19% *	11.97% *	784.31	668.54	(115.78)
2022	5,378.89	14.09% *	11.71% *	802.99	674.97	(128.02)
2023	5,552.28	13.96% *	11.52%	826.85	639.78	(187.07)
2024	5,734.26	13.85% *	11.35%	846.61	650.62	(195.98)
2025	5,925.05	13.72% *	11.18%	866.70	662.53	(204.17)
2026	6,124.89	13.58%	11.00%	831.84	673.81	(158.02)
2027	6,334.01	13.41%	10.92%	849.37	691.66	(157.72)
2028	6,553.23	13.21%	10.85%	865.54	710.88	(154.66)
2029	6,782.71	12.98%	10.79%	880.10	731.56	(148.54)
2030	7,022.28	12.85%	10.71%	902.70	752.43	(150.28)
2031	7,271.88	12.74%	10.65%	926.12	774.14	(151.98)
2032	7,532.39	12.61%	10.56%	949.67	795.26	(154.41)
2033	7,804.13	4.97%	4.28%	387.51	333.66	(53.85)
2034	8,087.28	3.67%	3.22%	297.12	260.72	(36.39)
2035	8,382.76	2.36%	2.14%	197.81	179.37	(18.44)
2036	8,690.60	1.46%	1.40%	127.24	122.03	(5.21)

* Indicates additional contributions from ELARF are added to this contribution rate to get the total contribution amount shown.

			Total	$ 15,417.41	$ 13,204.14	$ (2,213.27)

This exhibit is an attachment to a letter that contains important information and explanations regarding the numbers shown. Therefore, the exhibit should only be considered with the accompanying letter from Cavanaugh Macdonald dated December 16, 2014.

All assumptions, including the 8% investment return, are assumed to be met each year in the future. 12/16/2014

Exhibit A2

Current Plan vs. $1.5 Billion POB Deposit on 12/31/15

State/School Group

(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Employer Contribution Rate		Employer Contribution Amount ($M)		
Fiscal Year	Total Payroll	Current	$1.5 B POB	Current	$1.5 B POB	Difference
2015	$ 4,440.00	11.27%	11.27%	$ 500.39	500.39	$ -
2016	4,554.81	12.37% *	12.37% *	603.09	603.09	-
2017	4,663.16	13.57% *	13.57% *	673.35	673.35	-
2018	4,784.85	14.77% *	14.77% *	748.20	748.20	-
2019	4,918.20	14.83% *	12.07% *	772.01	636.27	(135.74)
2020	5,061.65	14.51% *	11.48% *	777.87	624.50	(153.37)
2021	5,215.15	14.19% *	10.85%	784.31	565.79	(218.53)
2022	5,378.89	14.09% *	10.53%	802.99	566.17	(236.82)
2023	5,552.28	13.96% *	10.30%	826.85	572.04	(254.81)
2024	5,734.26	13.85% *	10.11%	846.61	579.52	(267.09)
2025	5,925.05	13.72% *	10.01%	866.70	593.21	(273.50)
2026	6,124.89	13.58%	9.92%	831.84	607.67	(224.17)
2027	6,334.01	13.41%	9.86%	849.37	624.52	(224.86)
2028	6,553.23	13.21%	9.80%	865.54	642.08	(223.47)
2029	6,782.71	12.98%	9.74%	880.10	660.34	(219.76)
2030	7,022.28	12.85%	9.67%	902.70	679.40	(223.31)
2031	7,271.88	12.74%	9.60%	926.12	697.79	(228.34)
2032	7,532.39	12.61%	9.51%	949.67	716.17	(233.50)
2033	7,804.13	4.97%	3.92%	387.51	305.57	(81.94)
2034	8,087.28	3.67%	2.97%	297.12	240.50	(56.61)
2035	8,382.76	2.36%	2.01%	197.81	168.47	(29.34)
2036	8,690.60	1.46%	1.35%	127.24	117.68	(9.56)
			Total	$ 15,417.41	$ 12,122.71	$ (3,294.70)

* Indicates additional contributions from ELARF are added to this contribution rate to get the total contribution amount shown.

This exhibit is an attachment to a letter that contains important information and explanations regarding the numbers shown. Therefore, the exhibit should only be considered with the accompanying letter from Cavanaugh Macdonald dated December 16, 2014.
All assumptions, including the 8% investment return, are assumed to be met each year in the future. 12/16/2014

Exhibit B1

Kansas Public Employee Retirement System
Comparison of State/School Group Funded Status Measures
Current Plan vs. $1.0 Billion POB Deposit on 12/31/15

(Dollar amounts in millions)

	Current Plan				$1.0 Billion POB			
Valuation Date	Actuarial Liability	Actuarial Assets	Unfunded Actuarial Liability	Funded Ratio	Actuarial Liability	Actuarial Assets	Unfunded Actuarial Liability	Funded Ratio
12/31/2013	$ 17,078.13	$ 9,726.42	$ 7,351.70	57.0%	$ 17,078.13	$ 9,726.42	$ 7,351.70	57.0%
12/31/2014	17,783.41	10,473.40	7,310.01	58.9%	17,783.41	10,473.40	7,310.01	58.9%
12/31/2015	18,462.18	11,200.48	7,261.70	60.7%	18,462.18	12,239.71	6,222.47	66.3%
12/31/2016	19,111.31	12,105.39	7,005.92	63.3%	19,111.31	13,227.76	5,883.55	69.2%
12/31/2017	19,735.84	12,998.50	6,737.34	65.9%	19,735.84	14,210.66	5,525.19	72.0%
12/31/2018	20,337.87	13,764.98	6,572.90	67.7%	20,337.87	15,027.75	5,310.13	73.9%
12/31/2019	20,937.13	14,561.09	6,376.03	69.5%	20,937.13	15,824.85	5,112.27	75.6%
12/31/2020	21,528.52	15,374.70	6,153.82	71.4%	21,528.52	16,626.40	4,902.11	77.2%
12/31/2021	22,114.60	16,216.53	5,898.07	73.3%	22,114.60	17,441.82	4,672.78	78.9%
12/31/2022	22,701.02	17,100.20	5,600.82	75.3%	22,701.02	18,286.69	4,414.33	80.6%
12/31/2023	23,288.73	18,036.30	5,252.43	77.4%	23,288.73	19,119.29	4,169.45	82.1%
12/31/2024	23,881.04	19,026.87	4,854.17	79.7%	23,881.04	19,989.20	3,891.85	83.7%
12/31/2025	24,478.87	20,076.84	4,402.03	82.0%	24,478.87	20,900.13	3,578.74	85.4%
12/31/2026	25,085.06	21,134.99	3,950.07	84.3%	25,085.06	21,860.10	3,224.96	87.1%
12/31/2027	25,704.59	22,260.27	3,444.32	86.6%	25,704.59	22,881.07	2,823.52	89.0%
12/31/2028	26,339.22	23,456.75	2,882.48	89.1%	26,339.22	23,969.62	2,369.60	91.0%
12/31/2029	26,991.85	24,734.81	2,257.04	91.6%	26,991.85	25,133.47	1,858.38	93.1%
12/31/2030	27,678.56	26,106.63	1,571.93	94.3%	27,678.56	26,380.14	1,298.41	95.3%
12/31/2031	28,393.88	27,582.23	811.65	97.1%	28,393.88	27,718.45	675.43	97.6%
12/31/2032	29,139.65	28,870.28	269.37	99.1%	29,139.65	28,908.27	231.38	99.2%
12/31/2033	29,921.64	29,889.54	32.10	99.9%	29,921.64	29,883.51	38.12	99.9%
12/31/2034	30,744.24	30,864.34	(120.10)	100.4%	30,744.24	30,829.18	(84.94)	100.3%

This exhibit is an attachment to a letter that contains important information and explanations regarding the numbers shown. Therefore, the exhibit exhibit should only be considered with the accompanying letter from Cavanaugh Macdonald dated December 16, 2014.
All assumptions, including the 8% investment return, are assumed to be met each year in the future.

12/16/2014

Exhibit B2

Kansas Public Employee Retirement System
Comparison of State/School Group Funded Status Measures
Current Plan vs. $1.5 Billion POB Deposit on 12/31/15
(Dollar amounts in millions)

	Current Plan				$1.5 Billion POB			
Valuation Date	Actuarial Liability	Actuarial Assets	Unfunded Actuarial Liability	Funded Ratio	Actuarial Liability	Actuarial Assets	Unfunded Actuarial Liability	Funded Ratio
12/31/2013	$ 17,078.13	$ 9,726.42	$ 7,351.70	57.0%	$ 17,078.13	$ 9,726.42	$ 7,351.70	57.0%
12/31/2014	17,783.41	10,473.40	7,310.01	58.9%	17,783.41	10,473.40	7,310.01	58.9%
12/31/2015	18,462.18	11,200.48	7,261.70	60.7%	18,462.18	12,759.32	5,702.85	69.1%
12/31/2016	19,111.31	12,105.39	7,005.92	63.3%	19,111.31	13,788.94	5,322.36	72.2%
12/31/2017	19,735.84	12,998.50	6,737.34	65.9%	19,735.84	14,816.74	4,919.11	75.1%
12/31/2018	20,337.87	13,764.98	6,572.90	67.7%	20,337.87	15,659.13	4,678.74	77.0%
12/31/2019	20,937.13	14,561.09	6,376.03	69.5%	20,937.13	16,456.73	4,480.39	78.6%
12/31/2020	21,528.52	15,374.70	6,153.82	71.4%	21,528.52	17,251.99	4,276.53	80.1%
12/31/2021	22,114.60	16,216.53	5,898.07	73.3%	22,114.60	18,008.10	4,106.50	81.4%
12/31/2022	22,701.02	17,100.20	5,600.82	75.3%	22,701.02	18,783.03	3,917.99	82.7%
12/31/2023	23,288.73	18,036.30	5,252.43	77.4%	23,288.73	19,583.23	3,705.51	84.1%
12/31/2024	23,881.04	19,026.87	4,854.17	79.7%	23,881.04	20,417.28	3,463.77	85.5%
12/31/2025	24,478.87	20,076.84	4,402.03	82.0%	24,478.87	21,292.04	3,186.83	87.0%
12/31/2026	25,085.06	21,134.99	3,950.07	84.3%	25,085.06	22,214.12	2,870.94	88.6%
12/31/2027	25,704.59	22,260.27	3,444.32	86.6%	25,704.59	23,192.79	2,511.80	90.2%
12/31/2028	26,339.22	23,456.75	2,882.48	89.1%	26,339.22	24,233.55	2,105.67	92.0%
12/31/2029	26,991.85	24,734.81	2,257.04	91.6%	26,991.85	25,343.58	1,648.27	93.9%
12/31/2030	27,678.56	26,106.63	1,571.93	94.3%	27,678.56	26,529.48	1,149.08	95.8%
12/31/2031	28,393.88	27,582.23	811.65	97.1%	28,393.88	27,798.99	594.89	97.9%
12/31/2032	29,139.65	28,870.28	269.37	99.1%	29,139.65	28,939.09	200.57	99.3%
12/31/2033	29,921.64	29,889.54	32.10	99.9%	29,921.64	29,891.62	30.01	99.9%
12/31/2034	30,744.24	30,864.34	(120.10)	100.4%	30,744.24	30,821.68	(77.44)	100.3%

This exhibit is an attachment to a letter that contains important information and explanations regarding the numbers shown. Therefore, the exhibit exhibit should only be considered with the accompanying letter from Cavanaugh Macdonald dated December 16, 2014.
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12/16/2014