PENNSYLVANIA COMPENSATION RATING BUREAU

<u>Indicated Change in Loss Costs</u>

Page 1 presents the overall indicated change in loss costs.

For this filing, loss costs resulting from PCRB Filing No. C-373 were used to calculate expected losses on Page 1 and actual loss ratios on Page 2.

Derivation of the indemnity and medical trend factors and trended loss ratios shown on Page 1 is presented on Page 2. Severity ratios, defined as loss ratios adjusted by dividing out the frequency component, for both indemnity and medical, have been fitted using a seven-point exponential curve. Severity trend factors are calculated by fitting severity ratios to curves using a least squares regression analysis and comparing the fitted values at 4/1/20 to the fitted values at the midpoints of the latest three available policy years. Frequency trend factors are derived on Page 3. The resulting severity and frequency trend factors are then applied to the latest three available policy year loss ratios to generate projected ultimate trended loss ratios.

As described in Exhibit 8, staff has selected an annual frequency trend of -6.3%. Page 3 shows the derivation of overall frequency trend factors for each of the latest three available policy years.

In addition, staff is also taking into account the impact of the Pennsylvania Supreme Court ruling in Protz v. WCAB (*Derry Area School District*), as well as the savings impact of House Bill 1840 of 2017.



INDICATED CHANGE IN LOSS COSTS

		<u>Indemnity</u>	<u>Medical</u>	<u>Total</u>
(1)	Policy Year 2014 Ratio of Loss to Expected Loss	0.5317	0.6142	1.1459
(2)	Policy Year 2015 Ratio of Loss to Expected Loss	0.4956	0.5386	1.0342
(3)	Policy Year 2016 Ratio of Loss to Expected Loss	0.4765	0.5215	0.9980
(4)	Average (Midpoint = 1/1/2016)	0.5013	0.5581	1.0594
(5)	Policy Year 2014 Ratio Trended to 4/1/2020 +	0.4245	0.5083	0.9328
(6)	Policy Year 2015 Ratio Trended to 4/1/2020 +	0.4130	0.4621	0.8751
(7)	Policy Year 2016 Ratio Trended to 4/1/2020 +	0.4145	0.4638	0.8783
(8)	Average at 4/1/2020	0.4173	0.4781	0.8954
(9a)	Protz Adjustment	1.1337	1.0000	
(9b)	House Bill 1840 Adjustment	0.8961	1.0000	
(10)	Indicated Change in Loss Costs	0.4239	0.4781	0.9020
				-9.80%

CHANGES IN MANUAL LOSS COST LEVEL BY INDUSTRY GROUP

		<u>iviig.</u>	Cont.	<u>Other</u>	<u>10tai</u>
(11)	Current Collectible Premium Ratio	1.0389	1.1238	0.9931	
(12)	Anticipated Collectible Premium Ratio	1.0411	1.1268	0.9929	
(13)	Final Indicated Change in Manual Loss Cost Level (10T) * (12) / (11)	0.9039	0.9044	0.9018	0.9029

⁺ Refer to pages 1.2 and 1.3

DETERMINATION OF TREND

				INDEMNITY				
Policy Year	_	2010	2011	2012	2013	2014	2015	2016
Actual Loss Ratio		0.6245	0.5897	0.5543	0.5593	0.5317	0.4956	0.4765
Normalized Frequency		0.8008	0.7519	0.7030	0.6868	0.6292	0.5803	0.5373
Severity Loss Ratio		0.7799	0.7843	0.7885	0.8144	0.8451	0.8541	0.8869
	<u>x</u>	1 0.7799	2 0.7843	3 0.7885	4 0.8144	5 0.8451	6 0.8541	7 0.8869
	-	t Exponential R	egression: y :	= 0.750829 * 1.0	22592 ^ x			
		ed Annual Seve					2.26%	
		Annual		Trend Period				
Policy		Severity		# of Years		Severity		Frequency
Year		Trend Factor		to 4/1/20		Trend Factor		Trend Facto
		(1)		(2)		$(3) = (1) \land (2)$		(4) #
2014		1.0226		5.2500		1.1244		0.7101
2015		1.0226		4.2500		1.0996		0.7579
2016		1.0226		3.2500		1.0753		0.8090
Frended Loss Ratio								
Policy		Actual		Combined		Trended		
Year		Loss Ratio		Trend Factor		Loss Ratio		
		(5)		(6) = (3) * (4)		(7) = (5) * (6)		
2014		0.5317		0.7984		0.4245		
2015		0.4956		0.8334		0.4130		
2016		0.4765		0.8699		0.4145		
			4	MEDICAL				
- W W				MEDICAL				
Policy Year	<u>-</u>	2010	2011	2012	2013	2014	2015	2016
Actual Loss Ratio	-	0.6521	0.6396	2012 0.6114	0.6293	0.6142	0.5386	0.5215
Actual Loss Ratio Normalized Frequency	-	0.6521 0.8008	0.6396 0.7519	2012 0.6114 0.7030	0.6293 0.6868	0.6142 0.6292	0.5386 0.5803	0.5215 0.5373
Actual Loss Ratio Normalized Frequency		0.6521	0.6396	2012 0.6114	0.6293	0.6142	0.5386	0.5215
Actual Loss Ratio Normalized Frequency	<u> </u>	0.6521 0.8008 0.8143	0.6396 0.7519 0.8507	2012 0.6114 0.7030 0.8698	0.6293 0.6868 0.9163	0.6142 0.6292 0.9762	0.5386 0.5803 0.9282	0.5215 0.5373 0.9706
Actual Loss Ratio Normalized Frequency	У	0.6521 0.8008 0.8143 1 0.8143	0.6396 0.7519 0.8507 2 0.8507	2012 0.6114 0.7030 0.8698 3 0.8698	0.6293 0.6868 0.9163 4 0.9163	0.6142 0.6292 0.9762	0.5386 0.5803 0.9282	0.5215 0.5373 0.9706
Actual Loss Ratio Normalized Frequency	У	0.6521 0.8008 0.8143 1 0.8143	0.6396 0.7519 0.8507 2 0.8507	2012 0.6114 0.7030 0.8698	0.6293 0.6868 0.9163 4 0.9163	0.6142 0.6292 0.9762	0.5386 0.5803 0.9282	0.5215 0.5373 0.9706
Actual Loss Ratio Normalized Frequency	y 7 Point	0.6521 0.8008 0.8143 1 0.8143	0.6396 0.7519 0.8507 2 0.8507 egression: y :	2012 0.6114 0.7030 0.8698 3 0.8698 = 0.802634 * 1.00	0.6293 0.6868 0.9163 4 0.9163	0.6142 0.6292 0.9762	0.5386 0.5803 0.9282	0.5215 0.5373 0.9706 7 0.9706
Actual Loss Ratio Normalized Frequency Severity Loss Ratio	y 7 Point	0.6521 0.8008 0.8143 1 0.8143 t Exponential Re	0.6396 0.7519 0.8507 2 0.8507 egression: y :	2012 0.6114 0.7030 0.8698 3 0.8698 = 0.802634 * 1.00 ctor =	0.6293 0.6868 0.9163 4 0.9163	0.6142 0.6292 0.9762 5 0.9762	0.5386 0.5803 0.9282 6 0.9282	0.5215 0.5373 0.9706 7 0.9706
Actual Loss Ratio Normalized Frequency Severity Loss Ratio	y 7 Point	0.6521 0.8008 0.8143 1 0.8143 t Exponential Roed Annual Severity	0.6396 0.7519 0.8507 2 0.8507 egression: y :	2012 0.6114 0.7030 0.8698 3 0.8698 = 0.802634 * 1.00000000000000000000000000000000000	0.6293 0.6868 0.9163 4 0.9163	0.6142 0.6292 0.9762 5 0.9762	0.5386 0.5803 0.9282 6 0.9282	0.5215 0.5373 0.9706 7 0.9706
Actual Loss Ratio Normalized Frequency Severity Loss Ratio	y 7 Point	0.6521 0.8008 0.8143 1 0.8143 t Exponential Reed Annual Severity Trend Factor	0.6396 0.7519 0.8507 2 0.8507 egression: y :	2012 0.6114 0.7030 0.8698 3 0.8698 = 0.802634 * 1.00 ctor = Trend Period # of Years to 4/1/20	0.6293 0.6868 0.9163 4 0.9163	0.6142 0.6292 0.9762 5 0.9762 Severity Trend Factor	0.5386 0.5803 0.9282 6 0.9282	0.5215 0.5373 0.9706 7 0.9706
Actual Loss Ratio Normalized Frequency Severity Loss Ratio Policy	y 7 Point	0.6521 0.8008 0.8143 1 0.8143 t Exponential Roed Annual Severity	0.6396 0.7519 0.8507 2 0.8507 egression: y :	2012 0.6114 0.7030 0.8698 3 0.8698 = 0.802634 * 1.00 ctor = Trend Period # of Years	0.6293 0.6868 0.9163 4 0.9163	0.6142 0.6292 0.9762 5 0.9762	0.5386 0.5803 0.9282 6 0.9282	0.5215 0.5373 0.9706 7 0.9706
Actual Loss Ratio Normalized Frequency Severity Loss Ratio Policy Year	y 7 Point	0.6521 0.8008 0.8143 1 0.8143 t Exponential Red Annual Severity Trend Factor (1) 1.0296	0.6396 0.7519 0.8507 2 0.8507 egression: y :	2012 0.6114 0.7030 0.8698 3 0.8698 = 0.802634 * 1.00 ctor = Trend Period # of Years to 4/1/20 (2) 5.2500	0.6293 0.6868 0.9163 4 0.9163	0.6142 0.6292 0.9762 5 0.9762 Severity Trend Factor (3) = (1) ^ (2) 1.1654	0.5386 0.5803 0.9282 6 0.9282	0.5215 0.5373 0.9706 7 0.9706 Frequency Trend Facto (4) # 0.7101
Actual Loss Ratio Normalized Frequency Severity Loss Ratio Policy Year 2014 2015	y 7 Point	0.6521 0.8008 0.8143 1 0.8143 t Exponential Red Annual Severity Trend Factor (1) 1.0296 1.0296	0.6396 0.7519 0.8507 2 0.8507 egression: y :	2012 0.6114 0.7030 0.8698 3 0.8698 = 0.802634 * 1.00 etor = Trend Period # of Years to 4/1/20 (2) 5.2500 4.2500	0.6293 0.6868 0.9163 4 0.9163	0.6142 0.6292 0.9762 5 0.9762 Severity Trend Factor (3) = (1) ^ (2) 1.1654 1.1319	0.5386 0.5803 0.9282 6 0.9282	0.5215 0.5373 0.9706 7 0.9706 Frequency Trend Facto (4) # 0.7101 0.7579
Actual Loss Ratio Normalized Frequency Severity Loss Ratio Policy Year	y 7 Point	0.6521 0.8008 0.8143 1 0.8143 t Exponential Red Annual Severity Trend Factor (1) 1.0296	0.6396 0.7519 0.8507 2 0.8507 egression: y :	2012 0.6114 0.7030 0.8698 3 0.8698 = 0.802634 * 1.00 ctor = Trend Period # of Years to 4/1/20 (2) 5.2500	0.6293 0.6868 0.9163 4 0.9163	0.6142 0.6292 0.9762 5 0.9762 Severity Trend Factor (3) = (1) ^ (2) 1.1654	0.5386 0.5803 0.9282 6 0.9282	0.5215 0.5373 0.9706 7 0.9706 Frequency Trend Facto (4) # 0.7101
Actual Loss Ratio Normalized Frequency Severity Loss Ratio Policy Year 2014 2015 2016	y 7 Point	0.6521 0.8008 0.8143 1 0.8143 t Exponential Red Annual Severity Trend Factor (1) 1.0296 1.0296	0.6396 0.7519 0.8507 2 0.8507 egression: y :	2012 0.6114 0.7030 0.8698 3 0.8698 = 0.802634 * 1.00 etor = Trend Period # of Years to 4/1/20 (2) 5.2500 4.2500	0.6293 0.6868 0.9163 4 0.9163	0.6142 0.6292 0.9762 5 0.9762 Severity Trend Factor (3) = (1) ^ (2) 1.1654 1.1319	0.5386 0.5803 0.9282 6 0.9282	0.5215 0.5373 0.9706 7 0.9706 Frequency Trend Facto (4) # 0.7101 0.7579
Actual Loss Ratio Normalized Frequency Severity Loss Ratio Policy Year 2014 2015 2016 Trended Loss Ratio	y 7 Point	0.6521 0.8008 0.8143 1 0.8143 t Exponential Red Annual Severity Trend Factor (1) 1.0296 1.0296	0.6396 0.7519 0.8507 2 0.8507 egression: y :	2012 0.6114 0.7030 0.8698 3 0.8698 = 0.802634 * 1.00 etor = Trend Period # of Years to 4/1/20 (2) 5.2500 4.2500	0.6293 0.6868 0.9163 4 0.9163 29591 ^ x	0.6142 0.6292 0.9762 5 0.9762 Severity Trend Factor (3) = (1) ^ (2) 1.1654 1.1319	0.5386 0.5803 0.9282 6 0.9282 2.96%	0.5215 0.5373 0.9706 7 0.9706 Frequency Trend Facto (4) # 0.7101 0.7579
Actual Loss Ratio Normalized Frequency Severity Loss Ratio Policy Year 2014 2015 2016 Frended Loss Ratio	y 7 Point	0.6521 0.8008 0.8143 1 0.8143 t Exponential Red Annual Severity Trend Factor (1) 1.0296 1.0296	0.6396 0.7519 0.8507 2 0.8507 egression: y : rity Trend Factorial Actual Loss Ratio	2012 0.6114 0.7030 0.8698 3 0.8698 = 0.802634 * 1.00 etor = Trend Period # of Years to 4/1/20 (2) 5.2500 4.2500	0.6293 0.6868 0.9163 4 0.9163 29591 ^ x	0.6142 0.6292 0.9762 5 0.9762 Severity Trend Factor (3) = (1) ^ (2) 1.1654 1.1319	0.5386 0.5803 0.9282 6 0.9282 2.96% Trended Loss Ratio	0.5215 0.5373 0.9706 7 0.9706 Frequency Trend Facto (4) # 0.7101 0.7579
Actual Loss Ratio Normalized Frequency Severity Loss Ratio Policy Year 2014 2015 2016 Frended Loss Ratio	y 7 Point	0.6521 0.8008 0.8143 1 0.8143 t Exponential Red Annual Severity Trend Factor (1) 1.0296 1.0296	0.6396 0.7519 0.8507 2 0.8507 egression: y :	2012 0.6114 0.7030 0.8698 3 0.8698 = 0.802634 * 1.00 etor = Trend Period # of Years to 4/1/20 (2) 5.2500 4.2500	0.6293 0.6868 0.9163 4 0.9163 29591 ^ x	0.6142 0.6292 0.9762 5 0.9762 Severity Trend Factor (3) = (1) ^ (2) 1.1654 1.1319	0.5386 0.5803 0.9282 6 0.9282 2.96%	0.5215 0.5373 0.9706 7 0.9706 Frequency Trend Facto (4) # 0.7101 0.7579
Actual Loss Ratio Normalized Frequency Severity Loss Ratio Policy Year 2014 2015 2016 Frended Loss Ratio	y 7 Point	0.6521 0.8008 0.8143 1 0.8143 t Exponential Red Annual Severity Trend Factor (1) 1.0296 1.0296	0.6396 0.7519 0.8507 2 0.8507 egression: y : rity Trend Factorial Actual Loss Ratio	2012 0.6114 0.7030 0.8698 3 0.8698 = 0.802634 * 1.00 etor = Trend Period # of Years to 4/1/20 (2) 5.2500 4.2500	0.6293 0.6868 0.9163 4 0.9163 29591 ^ x Combined Trend Factor (6) = (3) * (4)	0.6142 0.6292 0.9762 5 0.9762 Severity Trend Factor (3) = (1) ^ (2) 1.1654 1.1319	0.5386 0.5803 0.9282 6 0.9282 2.96% Trended Loss Ratio (7) = (5) * (6)	0.5215 0.5373 0.9706 7 0.9706 Frequency Trend Facto (4) # 0.7101 0.7579
Policy Year 2014 2015 2016 Frended Loss Ratio	y 7 Point	0.6521 0.8008 0.8143 1 0.8143 t Exponential Red Annual Severity Trend Factor (1) 1.0296 1.0296	0.6396 0.7519 0.8507 2 0.8507 egression: y : rity Trend Factorial Control (5)	2012 0.6114 0.7030 0.8698 3 0.8698 = 0.802634 * 1.00 etor = Trend Period # of Years to 4/1/20 (2) 5.2500 4.2500	0.6293 0.6868 0.9163 4 0.9163 29591 ^ x	0.6142 0.6292 0.9762 5 0.9762 Severity Trend Factor (3) = (1) ^ (2) 1.1654 1.1319	0.5386 0.5803 0.9282 6 0.9282 2.96% Trended Loss Ratio	0.5215 0.5373 0.9706 7 0.9706 Frequency Trend Facto (4) # 0.7101 0.7579

See page 1.3

DETERMINATION OF TREND

CLAIM FREQUENCY

Policy Year Frequency per \$1 million of Expected Losses {1 = PY 2005, 12 = PY 2016}

	Policy		Claim		Normalized		
	Year		Frequency		Frequency		
	2005		25.35		1.0000		
	2006		24.42		0.9633		
	2007		23.02		0.9081		
	2008		21.28		0.8394		
	2009		20.60		0.8126		
	2010		20.30		0.8008		
	2011		19.06		0.7519		
	2012		17.82		0.7030		
	2013		17.41		0.6868		
	2014		15.95		0.6292		
	2015		14.71		0.5803		
	2016		13.62		0.5373		
Policy Year	2010	2011	2012	2013	2014	2015	2016
x	1	2	3	4	5	6	7
у	0.8008	0.7519	0.7030	0.6868	0.6292	0.5803	0.5373

7 Point Exponential Regression: $y = 0.862171 * 0.936859 ^ x$

Selected Annual Frequency Trend Factor =

-6.3%

	Annual	Trend Period	
Policy	Frequency	# of Years	Frequency
Year	Trend Factor	to 4/1/20	Trend Factor
	(1)	(2)	(3) = (1) ^ (2)
2014	0.9369	5.2500	0.7101
2015	0.9369	4.2500	0.7579
2016	0.9369	3.2500	0.8090