

## Interest Rates Used in Appropriations, Including PECO Executive Summary

February 20, 2019

The Revenue Estimating Conference adopted a series of interest rates for use in the state budgeting process, including any bonding related to Public Education Capital Outlay (PECO). The adopted interest rates take into consideration current benchmark rates and market volatility.

The long-term interest rate is used for bond issues with maturity structures of 20 years or more. The Conference affirmed the long-term interest rate of 5.00% adopted in November 2018. This rate matches the Division of Bond Finance’s recommendation. The adopted rate of 5.00% reflects current market conditions, and is based on benchmark rate of 4.09% plus a spread of 91 basis points for volatility.

### Long-Term Interest Rate

Fiscal Year	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Interest Rate	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%

The Conference also agreed with the Division of Bond Finance’s recommendation to retain the short-term (or variable) interest rate of 3.25%. The average short-term interest rate for Everglades bonds over a recent 12-month review period was 1.37%. This rate affects the calculated debt service on an outstanding bond.

Finally, the Conference adopted interest rates for use by the Revenue Estimating Conference in its calculation of the Maximum Appropriations for Public Education Capital Outlay (PECO). The adopted interest rates take into consideration current benchmark rates and the February 2019 National Economic Estimating Conference forecast for the yield on municipal bonds – the Bond Buyer 20-Bond Index.

### PECO Bonds Interest Rate

Fiscal Year	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Interest Rate - November 2018	5.00%	5.00%	5.00%	5.00%	5.00%	NA
Interest Rate - February 2019	4.75%	5.00%	5.00%	5.00%	5.25%	5.25%

**Division of Bond Finance  
Interest Rate Calculations**

**Revenue Estimating Conference**

Interest Rates Used for Appropriations,  
including PECO Bond Rates

November 16, 2018

## Division of Bond Finance

### Calculation of Long-Term Interest Rate

<b><i>Prior Conference Data [July 19, 2018]</i></b>		
<b><i>Long-Term Interest Rate Information*</i></b>		
Current Long-Term Interest Rate <sup>1</sup>	<b>3.85%</b>	<b>3.85%</b>
Plus: Volatility Spread <sup>2</sup>	0.70%	0.75%
<b>Long-Term Interest Rate Range</b>	<b>4.55%</b>	<b>4.60%</b>
<b>Recommended Long-Term Interest Rate for FY 2019-20</b>	<b>5.00%</b>	

<sup>1</sup> Interest rate estimate for a 30-year bond issue based on estimated yields and credit spreads as of July 11, 2018.

<sup>2</sup> Used two measures to calculate interest rate volatility; (1) TM3 Municipal Market Data ("MMD") high-low range over the last 12 months of 70 basis points and (2) Bond Buyer 11 GO Bond Index maximum annual change over the last 20 years of 75 basis points.

<b><i>Updated Data [November 16, 2018]</i></b>		
<b><i>Long-Term Interest Rate Information*</i></b>		
Current Long-Term Interest Rate <sup>1</sup>	<b>4.09%</b>	<b>4.09%</b>
Plus: Volatility Spread <sup>2</sup>	0.75%	1.00%
<b>Long-Term Interest Rate Range</b>	<b>4.84%</b>	<b>5.09%</b>
<b>Recommended Long-Term Interest Rate for FY 2019-20</b>	<b>5.00%</b>	

<sup>1</sup> Interest rate estimate for a 30-year bond issue based on estimated yields and credit spreads as of November 14, 2018.

<sup>2</sup> Used two measures to calculate interest rate volatility; (1) TM3 Municipal Market Data ("MMD") high-low range over the last 12 months of 100 basis points and (2) Bond Buyer 11 GO Bond Index maximum annual change over the last 20 years of 75 basis points.

#### **Long-Term Interest Rate Recommendation:**

Based on the interest rate range noted above, which is based on the Division of Bond Finance's (the "Division") historical methodology that analyzes interest rate trends and volatility over the past 20 years and most recent 12-month period, the Division would recommend maintaining the current long-term interest rate for appropriation purposes at 5.00%.

We are concerned that long-term interest rates may continue to move higher in the next 12-24 months as a result of several market factors. First, the Federal Reserve has continued to move towards a more restrictive monetary policy, including increasing the discount rate (three increases totaling 75 basis points in 2018 to-date, with one additional increase expected in December 2018 and with the market estimating up to three additional rate increases in 2019)

which is placing upward pressure on long-term bond rates. Further, the tapering of quantitative easing (i.e., reducing the size of the Federal Reserve's balance sheet) is also contributing towards higher interest rates. Additionally, the municipal market has recently been facing headwinds created by the combination of persistent net outflows from bond funds (year-to-date outflows through October totaled more than \$6.8 billion, with nearly half of those outflows coming in the last 2 months) and increasing supply as we approach year-end. As a result, many primary market transactions are being forced to increase interest rates in order to attract sufficient investor support and underwriters are being forced to hold significant balances, especially on longer-dated maturities.

*\* The Division of Bond Finance has supplied the above interest rates to assist the REC in adopting official rates that would be used by State agencies for planning and budgetary purposes for Fiscal Year 2019-20. There can be no assurance that actual interest rates for any particular bond issue will not exceed the rates shown above.*

## Division of Bond Finance

### Calculation of Short-Term Interest Rate

<b><i>Prior Conference Data [July 19, 2018]</i></b>		
<b><i>Short-Term Interest Rate Information*</i></b>		
Average Everglades 2007AB Rate in Past Twelve Months	<b>1.15%</b>	<b>1.15%</b>
Plus: Volatility Spread <sup>1</sup>	<u>1.50%</u>	<u>2.00%</u>
<b>Short-Term Interest Rate Range</b>	<b>2.65%</b>	<b>3.15%</b>
<b>Recommended Short-Term Interest Rate for FY 2019-20</b>	<b>3.00%</b>	

<sup>1</sup> Uses the volatility from the two largest year-over-year changes in SIFMA rates over the past 20 years of between 150 basis points and 200 basis points.

<b><i>Updated Data [November 16, 2018]</i></b>		
<b><i>Short-Term Interest Rate Information*</i></b>		
Average Everglades 2007AB Rate in Past Twelve Months	<b>1.37%</b>	<b>1.37%</b>
Plus: Volatility Spread <sup>1</sup>	<u>1.50%</u>	<u>2.00%</u>
<b>Short-Term Interest Rate Range</b>	<b>2.87%</b>	<b>3.37%</b>
<b>Recommended Short-Term Interest Rate for FY 2019-20</b>	<b>3.25%</b>	

<sup>1</sup> Uses the volatility from the two largest year-over-year changes in SIFMA rates over the past 20 years of between 150 basis points and 200 basis points.

#### ***Short-Term Interest Rate Recommendation:***

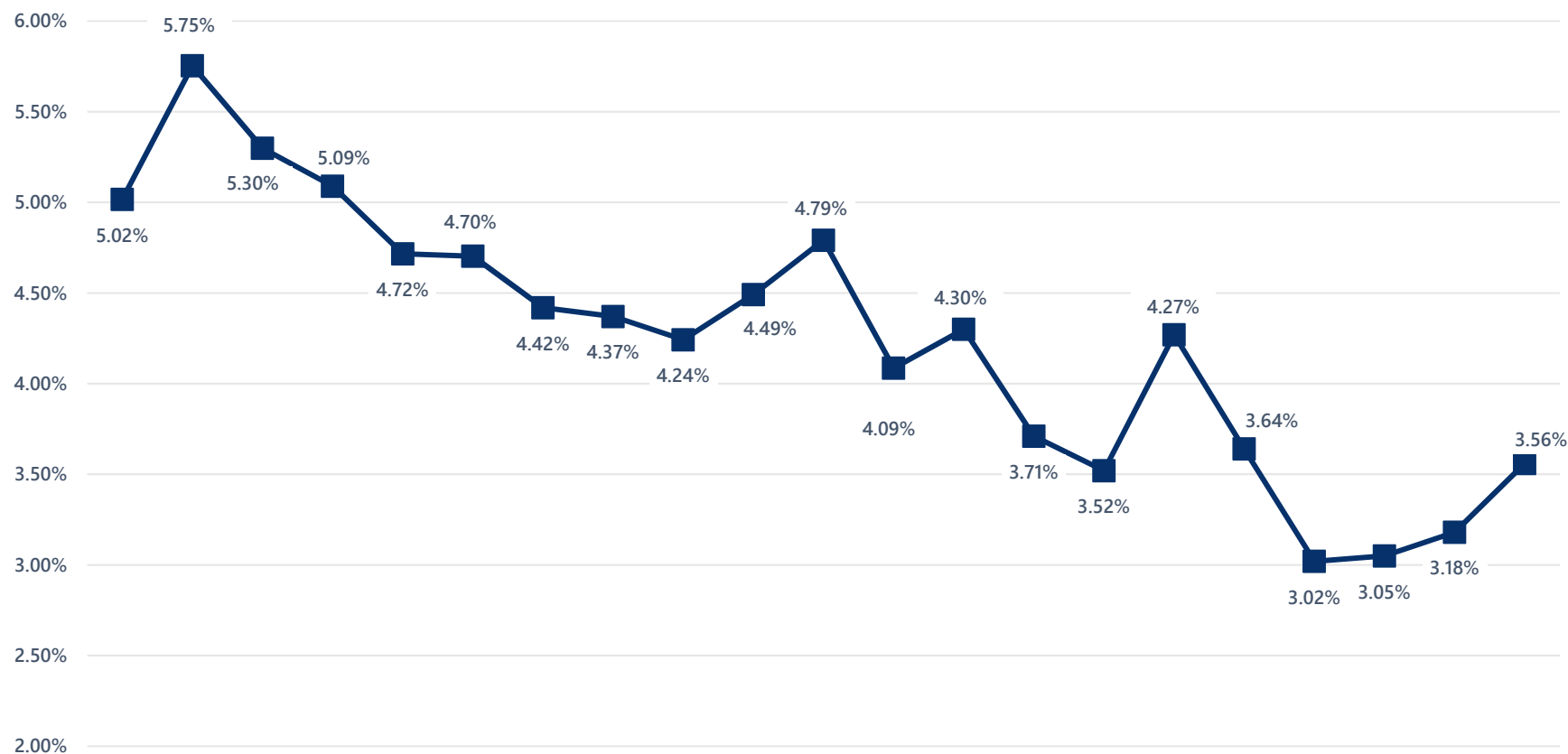
Using the interest rate range noted above, which is based on the Division of Bond Finance's historical methodology that analyzes short-term interest rate volatility over the past 20 years, the Division would recommend increasing the current short-term interest rate for appropriation purposes to 3.25%. This represents a 0.75% increase over the rate used for appropriation purposes in Fiscal Year 2018-19 and a 0.25% increase over the rate recommended at the July 2018 conference.

\* The Division of Bond Finance has supplied the above interest rates to assist the REC in adopting official rates that would be used by State agencies for planning and budgetary purposes for Fiscal Year 2019-20. There can be no assurance that actual interest rates for any particular bond issue will not exceed the rates shown above.

## Long-Term Interest Rate Volatility

### Change in Bond Buyer 11 GO Bond Average Annual Interest Rates Last 20 Years

The maximum change in the annual average Bond Buyer GO Bond Index over the last 20 years is 75 basis points.



Fiscal Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average
BB 11 GO Avg	5.02%	5.75%	5.30%	5.09%	4.72%	4.70%	4.42%	4.37%	4.24%	4.49%	4.79%	4.09%	4.30%	3.71%	3.52%	4.27%	3.64%	3.02%	3.05%	3.18%	3.56%	4.28%
YOY Change	(0.16)%	0.74%	(0.46)%	(0.21)%	(0.37)%	(0.01)%	(0.28)%	(0.05)%	(0.13)%	0.25%	0.30%	(0.71)%	0.21%	(0.59)%	(0.19)%	0.75%	(0.63)%	(0.62)%	0.03%	0.13%	0.38%	0.34% <sup>1</sup>

<sup>1</sup> Average calculated using absolute values of year-over-year changes.

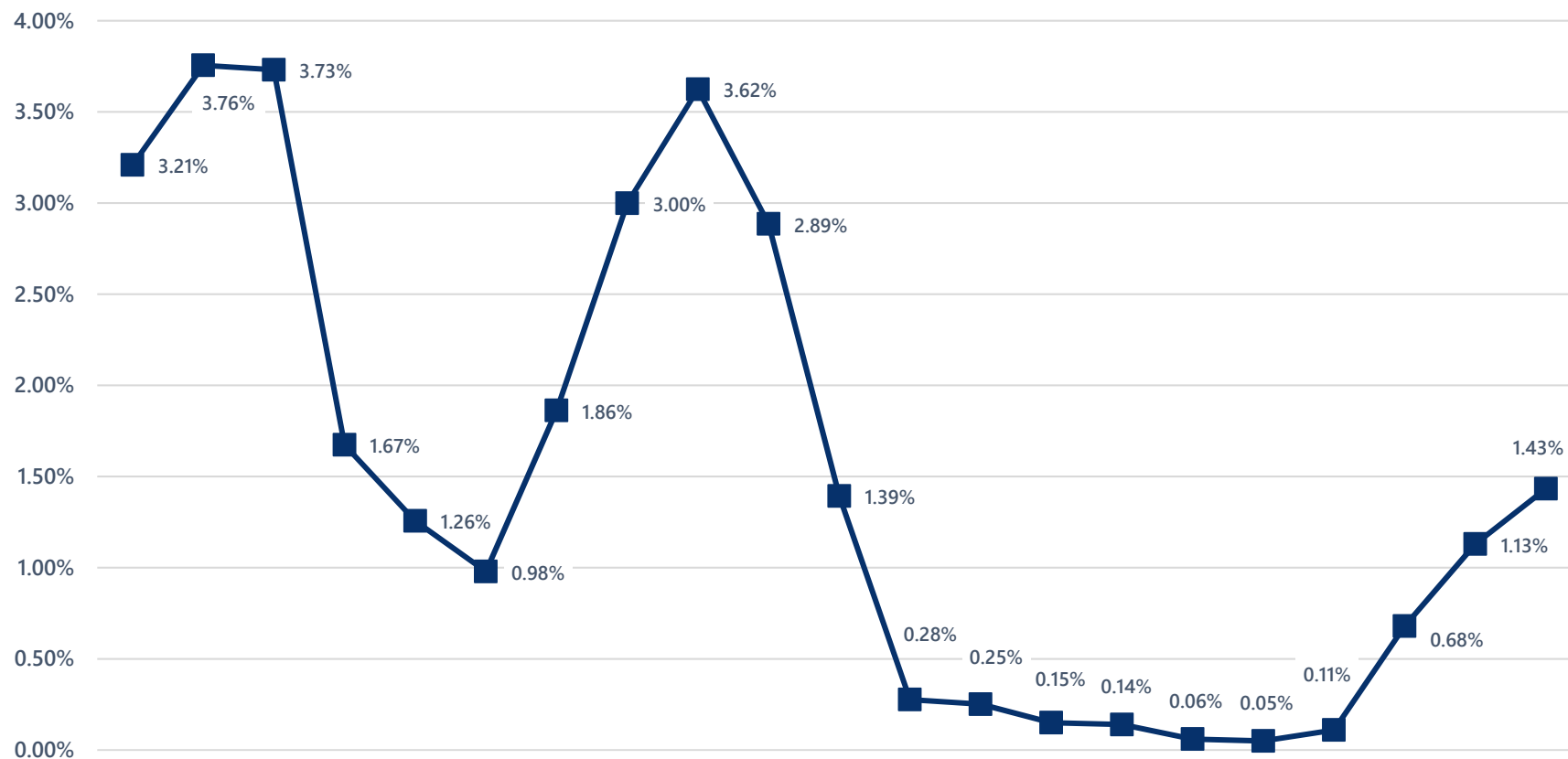
## Long-Term Interest Rate Volatility Change in 30-Year MMD AAA Rates Last 12 Months

The 30-year MMD AAA interest rate ranged from a low of 2.46% to a high of 3.46% over the last 12 months, a difference of 100 basis points.



## Short-Term Interest Rate Volatility Change in SIFMA Annual Average Interest Rates Last 20 Years

The maximum annual change in the SIFMA Index over the last 20 fiscal years is 206 basis points, with 149 basis points representing the next largest annual change.



Fiscal Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average
SIFMA Avg	3.21%	3.76%	3.73%	1.67%	1.26%	0.98%	1.86%	3.00%	3.62%	2.89%	1.39%	0.28%	0.25%	0.15%	0.14%	0.06%	0.05%	0.11%	0.68%	1.13%	1.43%	1.60%
YOY Change	(0.41)%	0.55%	(0.02)%	(2.06)%	(0.42)%	(0.28)%	0.88%	1.14%	0.62%	(0.74)%	(1.49)%	(1.12)%	(0.03)%	(0.10)%	(0.01)%	(0.08)%	(0.01)%	0.06%	0.57%	0.45%	0.30%	0.54% <sup>1</sup>

<sup>1</sup> Average calculated using absolute values of year-over-year changes.



## Short-Term Interest Rate History

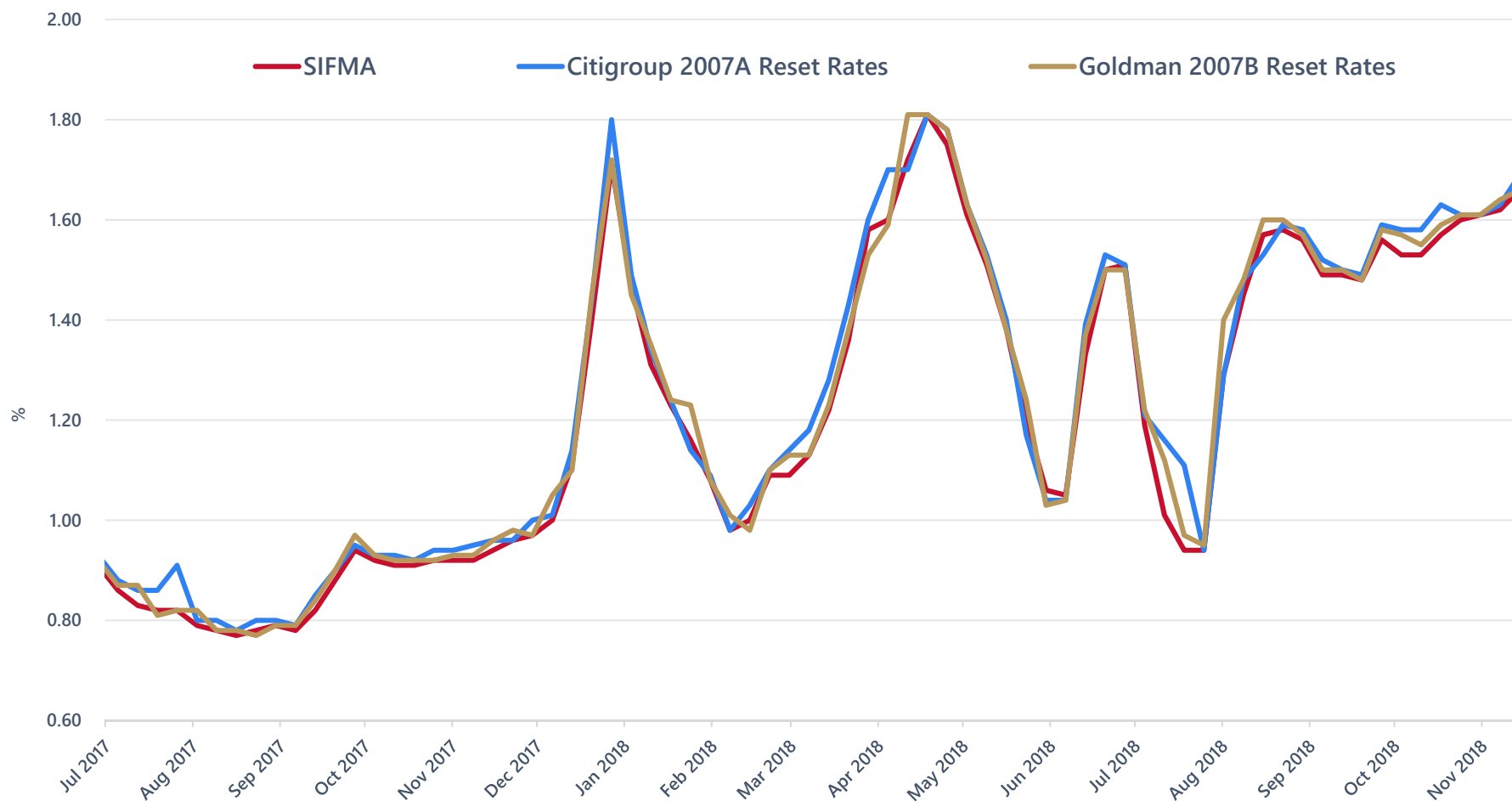
### Average Everglades Bonds Variable Rate Resets

The average variable reset rate over the past 12 months for the State's outstanding Everglades variable rate bonds was 1.37%. The average rate during FY 2017-18 was 1.15% and the average rate in FY 2019 year-to-date is 1.46%.

<u>Date</u>	<u>Interest Rate</u>	<u>Date</u>	<u>Interest Rate</u>
7/5/2017	0.88%	7/4/2018	1.22%
7/12/2017	0.87%	7/11/2018	1.14%
7/19/2017	0.84%	7/18/2018	1.04%
7/26/2017	0.87%	7/25/2018	0.95%
8/2/2017	0.81%	8/1/2018	1.35%
8/9/2017	0.79%	8/8/2018	1.48%
8/16/2017	0.78%	8/15/2018	1.57%
8/23/2017	0.79%	8/22/2018	1.60%
8/30/2017	0.80%	8/29/2018	1.58%
9/6/2017	0.79%	9/5/2018	1.51%
9/13/2017	0.85%	9/12/2018	1.50%
9/20/2017	0.90%	9/19/2018	1.49%
9/27/2017	0.96%	9/26/2018	1.59%
10/4/2017	0.93%	10/3/2018	1.58%
10/11/2017	0.93%	10/10/2018	1.57%
10/18/2017	0.92%	10/17/2018	1.61%
10/25/2017	0.93%	10/24/2018	1.61%
11/1/2017	0.94%	10/31/2018	1.61%
11/8/2017	0.94%	11/7/2018	1.64%
11/15/2017	0.96%	11/14/2018	1.68%
11/22/2017	0.97%	<b>FY 2019 YTD Average</b>	<b>1.46%</b>
11/29/2017	0.99%		
12/6/2017	1.03%		
12/13/2017	1.12%		
12/20/2017	1.45%		
12/27/2017	1.76%		
1/3/2018	1.47%		
1/10/2018	1.35%		
1/17/2018	1.24%		
1/24/2018	1.19%		
1/31/2018	1.09%		
2/7/2018	1.00%		
2/14/2018	1.01%		
2/21/2018	1.10%		
2/28/2018	1.14%		
3/7/2018	1.16%		
3/14/2018	1.26%		
3/21/2018	1.41%		
3/28/2018	1.57%		
4/4/2018	1.65%		
4/11/2018	1.76%		
4/18/2018	1.81%		
4/25/2018	1.78%		
5/2/2018	1.63%		
5/9/2018	1.53%		
5/16/2018	1.39%		
5/23/2018	1.21%		
5/30/2018	1.04%		
6/6/2018	1.04%		
6/13/2018	1.38%		
6/20/2018	1.52%		
6/27/2018	1.51%		
<b>FY 2018 Average</b>	<b>1.15%</b>		

<b>FY 2018 Average:</b>	<b>1.15%</b>
<b>FY 2019 YTD Average:</b>	<b>1.46%</b>
<b>Average Over Last 12 Months:</b>	<b>1.37%</b>

## Short-Term Interest Rate Everglades Series 2007A&B Variable Rate Bonds Interest Rates since July 1, 2017



**PECO BOND SALES AND INTEREST RATES**

(BOLD font indicates forecasted values)

	Bond Buyer 20-Bond Index		Series 2018 FY18-19	Series 2019 FY19-20	Series 2020 FY20-21	Series 2021 FY21-22	Series 2022 FY22-23	Series 2023 FY23-24	Series 2024 FY24-25
	NOV 2018	FEB 2019							
2016 Q1	3.36%	3.36%							
2016 Q2	3.26%	3.26%							
2016 Q3	2.90%	2.90%							
2016 Q4	3.57%	3.57%							
2017 Q1	3.88%	3.88%							
2017 Q2	3.70%	3.70%							
2017 Q3	3.55%	3.55%							
2017 Q4	3.53%	3.53%							
2018 Q1	3.73%	3.73%							
2018 Q2	3.89%	3.89%							
2018 Q3	3.97%	3.97%	<b>4.50% Feb 2019</b>						
2018 Q4	4.35%	<b>4.25%</b>	4.50% Nov 2018						
2019 Q1	4.38%	<b>4.14%</b>							
2019 Q2	4.49%	<b>4.21%</b>							
2019 Q3	4.56%	<b>4.29%</b>		<b>4.75% Feb 2019</b>					
2019 Q4	4.60%	<b>4.36%</b>		5.00% Nov 2018					
2020 Q1	4.63%	<b>4.40%</b>							
2020 Q2	4.65%	<b>4.45%</b>							
2020 Q3	4.66%	<b>4.49%</b>			<b>5.00% Feb 2019</b>				
2020 Q4	4.66%	<b>4.52%</b>			5.00% Nov 2018				
2021 Q1	4.66%	<b>4.54%</b>							
2021 Q2	4.66%	<b>4.56%</b>							
2021 Q3	4.66%	<b>4.59%</b>							
2021 Q4	4.64%	<b>4.61%</b>				<b>5.00% Feb 2019</b>			
2022 Q1	4.64%	<b>4.62%</b>				5.00% Nov 2018			
2022 Q2	4.64%	<b>4.63%</b>							
2022 Q3	4.63%	<b>4.65%</b>					<b>5.00% Feb 2019</b>		
2022 Q4	4.63%	<b>4.67%</b>					5.00% Nov 2018		
2023 Q1	4.62%	<b>4.68%</b>							
2023 Q2	4.62%	<b>4.70%</b>							
2023 Q3	4.61%	<b>4.72%</b>						<b>5.25% Feb 2019</b>	
2023 Q4	4.61%	<b>4.73%</b>						5.00% Nov 2018	
2024 Q1	4.61%	<b>4.74%</b>							
2024 Q2	4.61%	<b>4.75%</b>							
2024 Q3	NA	<b>4.76%</b>							<b>5.25% Feb 2019</b>
2024 Q4	NA	<b>4.76%</b>							NA Nov 2018
2025 Q1	NA	<b>4.77%</b>							
2025 Q2	NA	<b>4.77%</b>							
2/20/2019			<b>4.50%</b>	<b>4.75%</b>	<b>5.00%</b>	<b>5.00%</b>	<b>5.00%</b>	<b>5.25%</b>	<b>5.25%</b>