



Centennial School District

Interest Rate Hedge for Future Refunding of the District's 2010A Bonds

Overview of a Cash Settled Forward Swap

August 22, 2018

Brad Remig, *Managing Director*

Zach Williard, *Director*

John Frey, *Director*

Garrett Moore, *Analyst*

PFM Financial Advisors LLC

213 Market Street
Harrisburg, PA 17101

717.232.2723
pfm.com



Centennial School District's Existing Local Effort Debt Summary

- 2010A Bonds have a call date of 12/15/2020 and 5.00% interest rates.
- The District could consider hedging the interest rates on the future refunding bonds in 2020 using a cash settled forward swap.

LOCAL EFFORT REQUIREMENTS												12
1	2	3	4	5	6	7	8	9	10	11	12	
Fiscal Year Ended	G.O. Bonds Series A of 2009	G.O. Bonds Series B of 2009 [1]	G.O. Bonds Series A of 2010 [1]	G.O. Bonds Series A of 2016	G.O. Bonds Series B of 2016 [1]	G.O. Bonds Series A of 2017	G.O. Bonds Series B of 2017	G.O. Bonds Series C of 2017[1]	G.O. Bonds Series D of 2017[1]	G.O. Bonds Series of 2018	Total Local Effort	
6/30/2018	667,930	1,125,958	2,742,089	545,927	1,189,988	670,351	421,440	351,690	770,307		8,485,680	
6/30/2019	697,653	1,126,662	2,792,363	545,837	1,189,900	1,035,675	395,430	330,645	719,147	751,920	9,585,233	
6/30/2020			2,817,522	545,748	1,189,812	1,032,925	1,026,139	1,378,469	719,012	1,089,025	9,798,652	
6/30/2021			2,835,217	545,659	1,189,724	1,032,575	1,026,496	1,382,958	718,877	1,088,150	9,819,656	
6/30/2022			1,275,735	545,569	1,189,636	1,034,375	1,026,630	1,376,885	2,191,841	1,089,350	9,730,022	
6/30/2023			1,275,735	545,480	1,189,548	1,035,375	1,026,183	1,376,093	2,177,451	1,087,250	9,713,116	
6/30/2024			1,275,735	545,390	1,189,460	1,033,050	1,023,948	1,375,433	2,177,451	1,086,625	9,707,093	
6/30/2025			1,275,735	545,301	1,189,372	1,032,175	1,019,925	1,380,273	2,169,020	1,089,625	9,701,426	
6/30/2026			1,275,735	545,212	2,660,916	1,034,925	1,027,189		2,161,150	1,091,125	9,796,252	
6/30/2027			1,275,735	545,122	2,658,165	1,031,300	1,023,278		2,153,618	1,091,125	9,778,344	
6/30/2028			1,275,735	544,988	2,655,965	1,036,175	1,026,072		2,146,199	1,089,625	9,774,758	
6/30/2029			1,275,735	544,809	2,658,539	1,034,425	1,026,407		2,138,667	1,091,500	9,770,082	
6/30/2030			3,529,294	1,639,882	2,657,659	1,036,050				1,086,750	9,949,635	
6/30/2031			3,523,336	1,634,428	2,658,275	1,032,838				1,085,375	9,934,252	
6/30/2032			3,520,526	1,636,127	2,660,211	1,034,875				1,092,000	9,943,739	
6/30/2033			3,516,029	1,640,239	2,658,979	1,033,375				1,091,500	9,940,123	
6/30/2034			3,518,390	1,642,206	2,658,891	1,033,125				1,089,000	9,941,612	
6/30/2035			3,513,781	1,639,524	2,661,532	1,035,750				1,089,375	9,939,961	
6/30/2036			3,515,354	1,636,060	2,657,021	1,031,250				1,087,500	9,927,185	
6/30/2037			3,518,053	1,637,959	2,655,591	1,034,500				1,088,250	9,934,353	
6/30/2038			3,521,425	1,640,418	2,656,801	1,035,250				1,086,500	9,940,394	
TOTAL	1,365,583	2,252,620	53,069,262	21,291,886	44,075,985	21,350,338	11,069,138	8,952,446	20,242,740	21,441,570	205,111,568	
Principal*	765,000	1,255,000	33,225,000	13,500,000	29,600,000	13,205,000	9,045,000	8,180,000	15,900,000	13,380,000	138,055,000	
PE%:	24.91%	28.19%	23.67%	24.91%	28.19%	0.00%	24.91%	28.19%	23.67%	0.00%		
PE% Status:	Temp.	Temp.	Temp.	Temp.	Temp.	Est.	Temp.	Temp.	Temp.	Estimated		
CARF% (17-18):	42.52%	42.52%	42.52%	42.52%	42.52%	42.52%	42.52%	42.52%	42.52%	42.52%		
Call Date:	12/15/2018	12/15/2018	12/15/2020	12/15/2024	12/15/2024	12/15/2025	12/15/2025	12/15/2025	12/15/2025	12/15/2025	6/15/2026	
Purpose:	New Money	New Money	New Money	Adv Ref portion of 2009A	Adv Ref portion of 2009B	New Money - ESCO	Adv Ref portion of 2009A	Adv Ref portion of 2009B	Adv Ref portion of 2010A	New Money - ESCO		



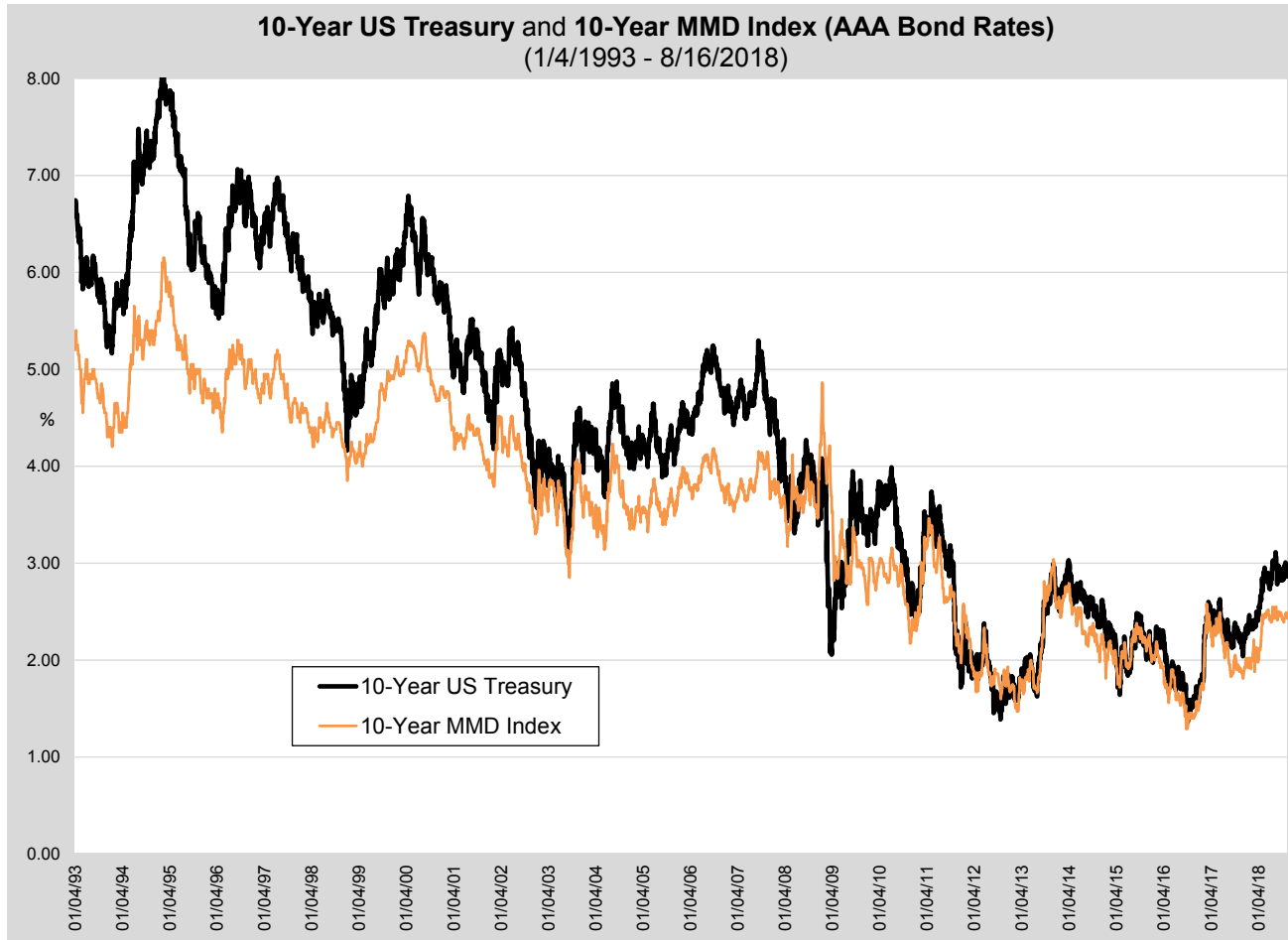
* Outstanding as of June 13, 2018

Does not include vo-tech debt. The District has 14.16% pro-rata share of Middle Bucks Institute of Technology based on 2014 STEB values.

[1] Authorized and incurred prior to June 27, 2006 according to existing Official Statement(s)



Interest Rates & Bloomberg Survey on 10-year US Treasury



Bloomberg Survey Forecast August 2018 Survey* Median Forecasts

		10-yr US Treasury
2018	3rd Qtr	3.04%
	4th Qtr	3.11%
2019	1st Qtr	3.21%
	2nd Qtr	3.30%
	3rd Qtr	3.40%
	4th Qtr	3.49%
2020	1st Qtr	3.53%
	2nd Qtr	3.53%
	3rd Qtr	3.53%
	4th Qtr	3.57%

*Consists of economic forecasts and projections from approximately 30-60 investment banking firms and financial institutions.

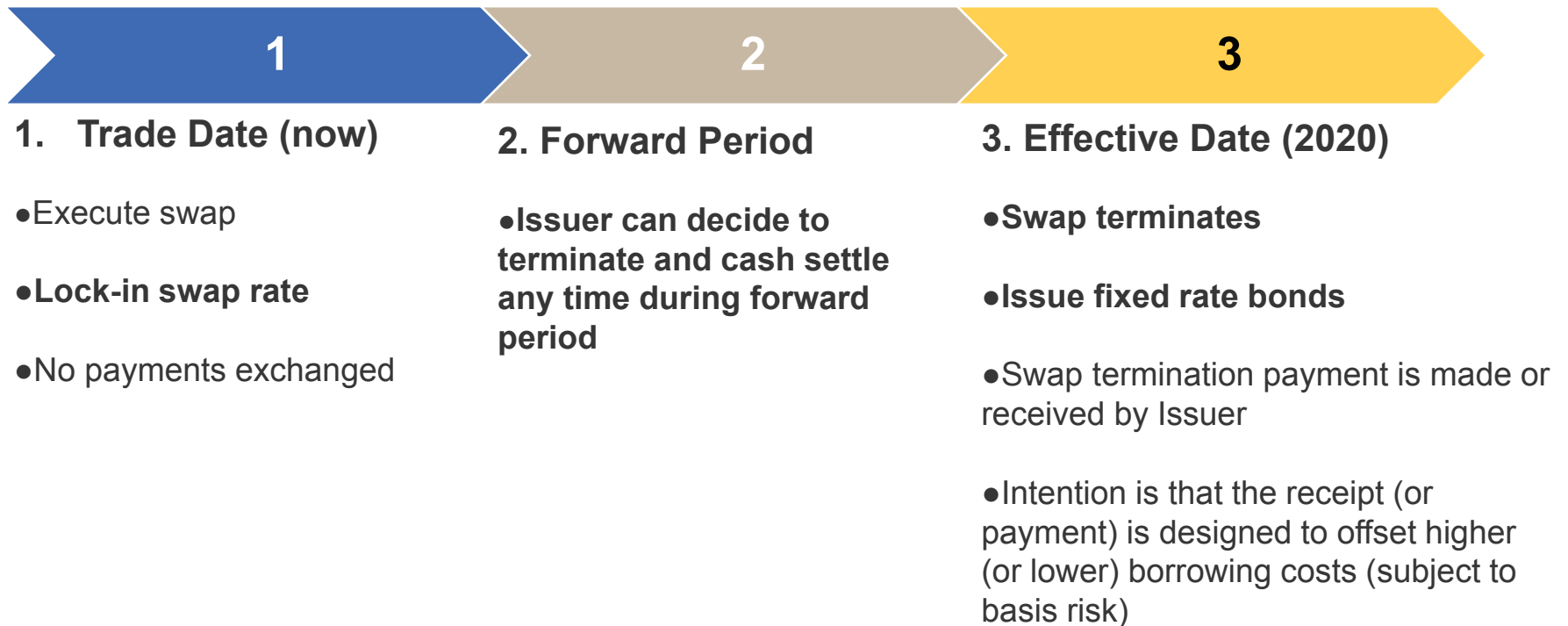


Overview of a Cash Settled Forward Swap

- Allows Issuers to **hedge against rising interest rates on a future issuance of bonds**
 - Issuers need to consider the trade-off between hedging interest rate risk with other risks inherent to the swap transaction
- **Two main differences** in this swap structure compared to swaps completed in mid-2000s in PA:
 - Swap contract is “Cash Settled” prior to cash flows beginning (Early Mandatory Termination), therefore the swap contract is only in place for a 2-3 year period
 - No variable rate bonds are involved - Fixed rate bonds will be issued in the future for the refunding
- **Cash Settled:** The swap contract has an Early Mandatory Termination on a date that is structured to coincide with the expected issuance of the fixed rate refunding bonds
 - Generally match effective date & termination of swap with call date of the existing bonds
 - The swap is terminated and the Issuer either owes a payment or receives a payment depending on the movement of swap rates
 - Therefore the Issuer is only in the swap for a short period of time (2-3 years)



General Timeline of a Cash Settled Forward Swap





Concept of Hedge & Termination Payment at Effective Date (ex. 2020)

◆ If swap rates are higher than the executed swap rate:

- Issuer receives a termination payment from the Counterparty
- That receipt is used by Issuer to reduce the par amount issued to help offset the higher bond rates*

◆ If swap rates are lower than the executed swap rate:

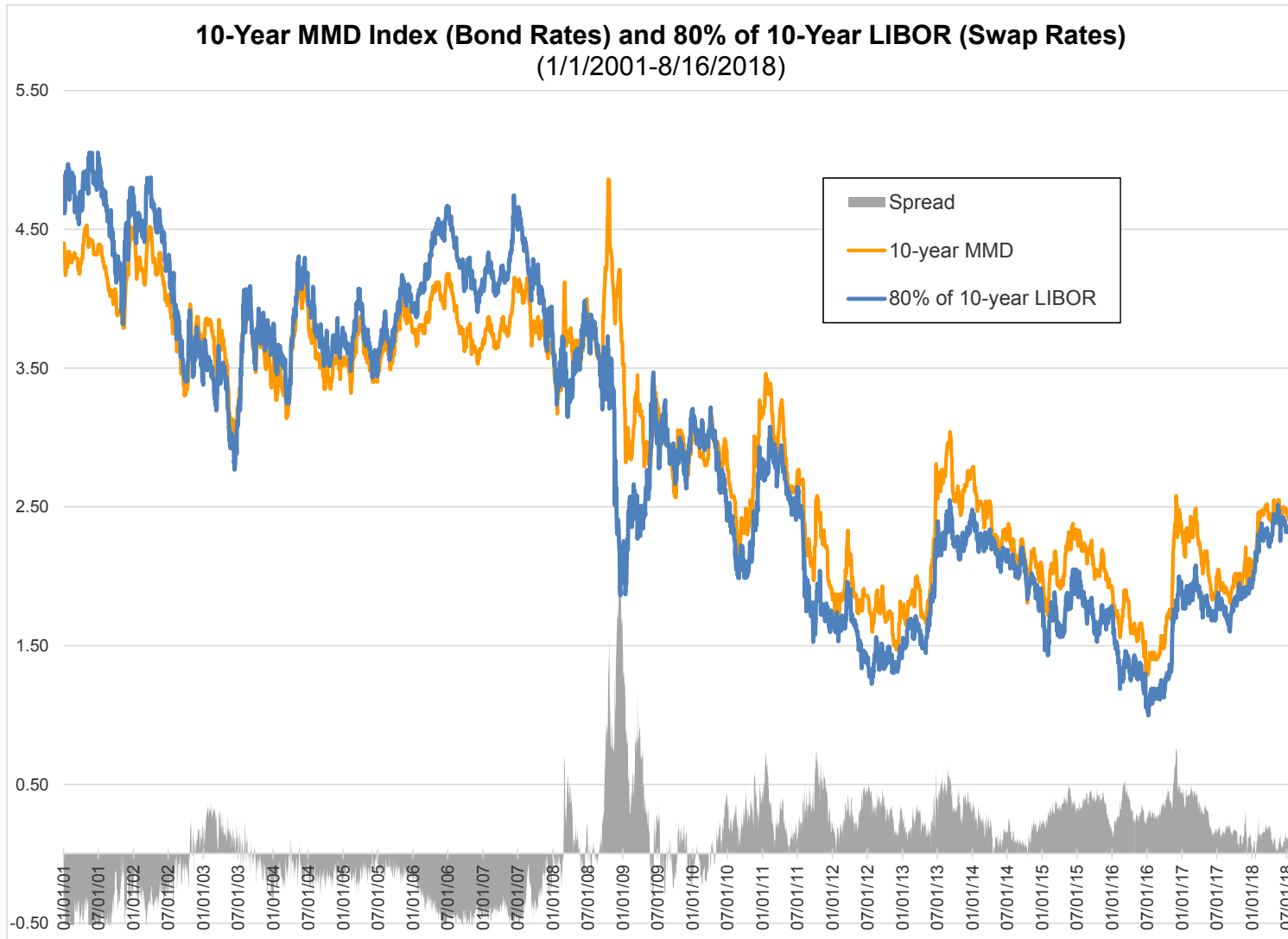
- Issuer owes a termination payment to the Counterparty
- That payment is funded with by the refunding bonds by increasing the par amount
- Issuer would then issue fixed rate bonds at lower bond rates*

◆ In both instances, the Issuer should expect to achieve *similar* all-in borrowing costs and refunding savings that were available at the Trade Date.*

* There is no assurance that swap rates will move in lock-step with the Issuer's actual borrowing costs (Basis Risk). Historically, LIBOR Swap Rates and MMD Index have been correlated but there are times when markets move independently (example Fall 2018).



Basis Risk - Correlation of MMD Index and LIBOR Swap Rates

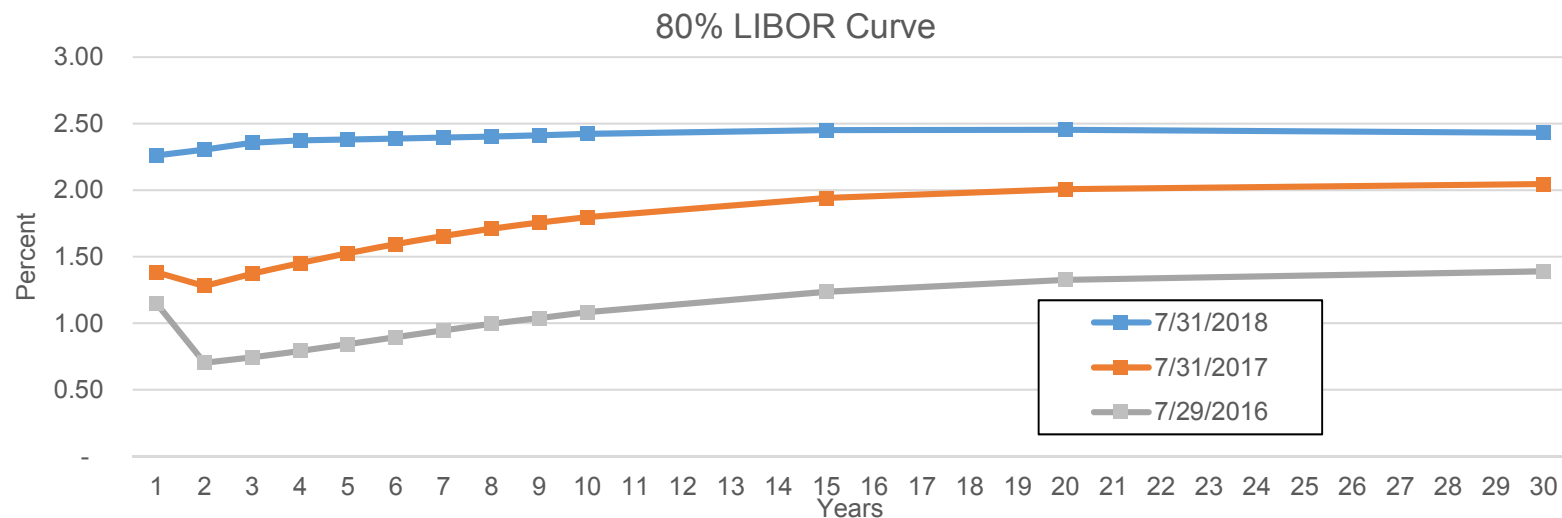


- Swap and bond rates have historically been correlated
- **Basis Risk:** swap and bond rates do not move in lock-step with each other
- Credit Spreads - Changes in Issuer's spreads to MMD Index are not hedged
- **Tax Risk – a form of Basis Risk** - if value of tax-exemption is reduced, then the tax-exempt MMD Index and rates that the Issuer would issue on its bonds may increase relative to taxable LIBOR swap rates



80% LIBOR Swap Curve

- Below is a chart of 80% of LIBOR swap rates for the last day of July each year for the last three years
 - Short term rates have risen more significantly than long term rates since the Fed began tightening in late 2015**
- The spread between 2 and 10 year swap rates has decreased significantly:
 - 7/31/2018 spread: 0.12%
 - 7/31/2017 spread: 0.52%
 - 7/29/2016 spread: 0.38%
- The result has been a **flattening of the yield curve and lower forward premiums** for cash settle swaps





“Cost” of the Hedge

- The executed swap rate would take into account :
 - Current swap rate + forward premium + bank counterparty spread & other professional fees
- **Forward premium** – premium to lock-in a rate that starts in the future: determined by length of forward period, shape of yield curve, structure & term of swap
- **Bank counterparty spread & professional fees**
 - Actual spread & fees would be determined and disclosed prior to execution
- **Therefore, at the effective date, swap rates would have to increase by more than the forward premium, counterparty spread, & professional fees or the Issuer would owe a termination payment.**
 - Note: The Counterparty can make an upfront payment to the Issuer to cover the professional fees (since the fees are built into the executed swap rate).



Preliminary Refunding Analysis for Centennial School District's 2010A Bonds

Indicative Swap Termination & Illustration of Hedge

Columns 4-6: Assumes Lock-Step Movement in Bond and Swap Rates (Swap rates changed by 1.00% and Bond rates changed by 1.00%)

Note: For these purposes, assumes lock-step change in swap and bond rates and PV LE Savings and TIC are inclusive of approximate termination payment or receipt. Results will vary depending on market conditions and actual bond structuring at the time of issuance. Assumes current credit rating and premium coupon structure. A termination payment/receipt will be due regardless of bond closing. **All rates and amounts are for indication purposes only.**

	1	2	3	4	5	6
	Refunding Bonds Only - No Swap			Bonds With Swap		
Change in Rates in December 2020	Change in Bond Rates			Change in Bond & Swap Rates		
	-1.00%	0%	+1.00%	-1.00%	0.00%	+1.00%
Principal	\$25,655,000	\$25,795,000	\$25,925,000	\$28,905,000	\$26,060,000	\$23,665,000
Indicative Swap Termination Amount	Not Applicable: No Swap	Not Applicable: No Swap	Not Applicable: No Swap	District Pays \$3,674,884	District Pays \$298,818	District Receives \$2,542,350
PV Local Effort Savings	\$6,249,676	\$3,261,551	\$621,386	\$2,769,485	\$2,967,754	\$3,201,220
TIC of Issue	2.75%	3.73%	4.71%	3.90%	3.83%	3.75%

Note: Assumes bond settlement and swap termination on 12/15/2020.

Fiscal Year Ending	Estimated Annual Savings	Estimated Annual Savings	Estimated Annual Savings	Estimated Annual Savings	Estimated Annual Savings	Estimated Annual Savings
6/30/2019						
6/30/2020						
6/30/2021	814,276	695,764	576,262	755,818	689,805	637,238
6/30/2022	348,410	111,408	(127,574)	165,391	99,491	(5,621)
6/30/2023	348,590	111,632	(127,304)	168,269	99,716	(5,351)
6/30/2024	348,770	111,857	(127,034)	166,740	99,941	(5,081)
6/30/2025	348,950	112,082	(126,764)	165,391	100,166	(4,812)
6/30/2026	349,130	112,307	(126,494)	168,629	100,391	(4,542)
6/30/2027	349,310	112,532	(126,224)	167,460	100,615	(4,272)
6/30/2028	349,489	112,757	(125,955)	166,471	100,840	(4,002)
6/30/2029	349,669	112,981	(125,685)	165,661	101,065	(3,732)
6/30/2030	470,498	323,655	174,025	166,695	289,817	466,091
6/30/2031	472,454	326,241	171,440	168,472	293,527	466,068
6/30/2032	471,982	323,768	174,925	168,179	292,178	466,945
6/30/2033	473,421	325,229	171,192	165,751	290,379	464,427
6/30/2034	472,094	326,016	173,958	165,504	292,515	467,597
6/30/2035	472,341	321,744	174,295	167,190	293,977	463,168
6/30/2036	473,915	325,791	172,541	166,156	290,379	464,832
6/30/2037	472,116	324,555	173,441	166,695	290,717	463,708
6/30/2038	471,262	322,644	172,721	168,539	290,379	464,517
6/30/2039						
6/30/2040						
TOTAL	7,856,677	4,512,964	1,121,766	3,593,014	4,115,899	4,787,178



Illustration of Hedge assuming 0.20% Mismatch in Movement of Bond and Swap Rates

Change in Swap Rates <i>(at Effective Date 12/15/2020)</i>	-1.00%	0.00%	+1.00%
--	---------------	--------------	---------------

- Mismatch not in favor of the District (Bonds increase 0.20% more than swap rates or decrease 0.20% less)



Change in Bond Rates <i>(at Effective Date 12/15/2020)</i>	-0.80%	+0.20%	+1.20%
Indicative Swap Termination Amount <i>(same as previous page)</i>	District pays \$3,674,844	District pays \$298,818	District receives \$2,542,350
PV Local Effort Savings	\$2,191,559	\$2,419,496	\$2,674,621
TIC of Issue	4.11%	4.03%	3.94%

- Mismatch in favor of the District (Bonds increase 0.20% less than swap rates or decrease 0.20% more)



Change in Bond Rates <i>(at Effective Date 12/15/2020)</i>	-1.20%	-0.20%	+0.80%
Indicative Swap Termination Amount <i>(same as previous page)</i>	District pays \$3,674,844	District pays \$298,818	District receives \$2,542,350
PV Local Effort Savings	\$3,357,674	\$3,534,548	\$3,741,503
TIC of Issue	3.69%	3.63%	3.56%

Note: For these purposes, assumes change in swap and bond rates as noted in chart and PV LE Savings and TIC are inclusive of approximate termination payment or receipt. Results will vary depending on market conditions and actual bond structuring at the time of issuance. Assumes current credit rating and premium coupon structure. A termination payment/receipt will be due regardless of bond closing.

All rates and amounts are for indication purposes only.



Other Considerations prior to Cash Settlement:

- Rating Agency discussion/questions
- Board education for new members that may come during swap term
- Disclosure in Issuer's annual Audit of the swap and its market value (costs?)

Other Risks

• Termination, Basis, and Tax Risks

Previously discussed on prior pages. Additionally, the Counterparty could terminate the swap if the Issuer's credit rating falls below a threshold as established in the swap documents (generally if below A-/A3)

• Market Access Risk

Risk that certain market conditions or disruptions could prevent the Issuer from accessing the bond market and/or securing acceptable financing terms.

• Counterparty Risk

Risk that the Counterparty cannot make the termination payment that may be due to the Issuer.

• Legislative Risk

Risk that future Pennsylvania legislation impacts the Issuer's ability to issue General Obligation Bonds or amends legislation that impacts pre-existing swaps.



Questions?



Disclosures

ABOUT PFM

PFM is the marketing name for a group of affiliated companies providing a range of services. All services are provided through separate agreements with each company. This material is for general information purposes only and is not intended to provide specific advice or a specific recommendation.

Financial advisory services are provided by PFM Financial Advisors LLC and Public Financial Management, Inc. Both are registered municipal advisors with the Securities and Exchange Commission (SEC) and the Municipal Securities Rulemaking Board (MSRB) under the Dodd-Frank Act of 2010. Investment advisory services are provided by PFM Asset Management LLC which is registered with the SEC under the Investment Advisers Act of 1940. Swap advisory services are provided by PFM Swap Advisors LLC which is registered as a municipal advisor with both the MSRB and SEC under the Dodd-Frank Act of 2010, and as a commodity trading advisor with the Commodity Futures Trading Commission. Additional applicable regulatory information is available upon request.

Consulting services are provided through PFM Group Consulting LLC. Institutional purchasing card services are provided through PFM Financial Services LLC. PFM's financial modelling platform for strategic forecasting is provided through PFM Solutions LLC.

For more information regarding PFM's services or entities, please visit www.pfm.com.



Disclosures

Statement on Presentation

The foregoing presentation must be read together with the oral presentation that accompanied it. The presentation is a preliminary discussion of a potential transaction and is subject to the following limitations:

Projections and Estimates – *All statements as to what will or may happen under certain circumstances are based on assumptions, some but not all of which are noted in the presentation. Assumptions may or may not be proven correct as actual events occur, and results will depend upon events outside of your or our control. Changes in assumptions may have a material impact on results. Estimates and projections represent our judgment as of this date and are subject to change without notice. There can be no assurance that estimated returns and results will not be materially different in the context of an actual transaction over time. Past performance does not necessarily reflect and is not a guarantee of future results.*

Terms of Hypothetical Transaction – *The terms, structures and prices shown in this presentation are indicative only and do not represent an offer to engage in a transaction. Should you decide to enter into a transaction of the kind presented here, the final terms would be set forth in legal documentation and the terms, pricing and structure would be determined based on prevailing conditions at the time.*

General Disclaimer – *PFM disclaims all liability relating to the information contained in this presentation. Opinions expressed in the presentation are current opinions only and are subject to change without notice.*

Thank You



pfm