



Financial Services Audit Committee Communication

Agenda Item 6B from Audit
Committee Binder 11.16.18

Date: November 16, 2018

To: Great Lakes Water Authority Audit Committee

From: Deirdre Henry, Treasury Manager

Re: Investment Strategy and Related Proposed Contract Extension with PFM Asset Management LLC (GLWA Contract No. GLWA CS-022)

Background: In November 2015, Great Lakes Water Authority (GLWA) engaged PFM Asset Management LLC (PFM) as a registered investment advisor to assist with 1) identifying portfolio and cash management optimization opportunities, 2) overcome personnel resource constraints during the stand-up of both GLWA and DWSD-Retail, 3) expand the transparency and capacity of investment portfolio reporting, and 4) provide an added level of controls.

PFM has worked with the GLWA treasury staff to 1) negotiate and increase bank earnings credit rates, 2) invest debt service and debt reserve funds, 3) transition balances in bank deposit accounts to higher yielding government money market and local government investment pools, 4) invest funds in construction and trust accounts into longer term investment securities, 5) develop quarterly investment report package and 6) identify a portfolio strategy appropriate for GLWA. With PFM's assistance, GLWA earned \$4.3 million in investment income for fiscal year 2017 and \$13.2 million in fiscal year 2018. The projected investment earnings for fiscal year 2019 is \$19 million.

The original PFM contract amount in 2015, which did not contemplate PFM actively managing the portfolio, was \$250,000. As we have worked through the optimization of the portfolio, identifying cash management opportunities, development of the reporting package, and PFM's management of the portfolio, the contract has been extended and increased two times. The current contract total amount is \$700,000 and is scheduled to expire December 2018.

Analysis: The use of a registered investment advisor has proven to be a cost effective and efficient approach to portfolio management. The investment advisor allows GLWA to have direct access to financial market expertise while allowing the treasury team to focus on the development of cash flows, treasury internal controls, and process improvements.

We have now reached a steady state in identifying GLWA cash flows and fund balances. Based on the analysis and review of our portfolio we have identified an investment strategy for GLWA. This strategy segregates the funds into cash flow portfolios and benchmarked portfolios. The cash flow portfolios will be managed using the Earnings Target Approach which focuses on income stability and specific cash flow predictability. The benchmarked portfolios are proposed to be managed using a Total Return Approach with PFM having approval to actively manage the portfolio to

maximize investment returns while considering financial market conditions and GLWA goals of liquidity and safety. It should be noted that this change in strategy that achieves a desired outcome of increased investment earnings while preserving compliance with GLWA’s investment policy and Michigan Public Act 20, *Investments of Surplus Funds of Political Subdivisions*.

GLWA Treasury recommends an investment strategy which includes active management of some of the funds. Given the timing for implementation of this investment strategy, it is recommended that the PFM contract be extended for a year to allow for stability of this investment approach. The contract extension would be through December 2019 and increase the contract amount by \$370,000. The total life-to-date PFM contract amount after this increase would be \$1,070,000 which requires approval action by the GLWA Board.

The fees charged by PFM are reasonable. As a measure of reasonableness, the total contract amount of \$1,070,000 is 2.9% of the total portfolio income for FY 2017, FY 2018 and FY 2019. In addition, the estimated annual fee of \$415,000 is .04% of the September 2018 investment portfolio balance of \$981,577,211.

Portfolio Income	
FY 2017	\$4,300,000
FY 2018	13,200,000
Projected FY 2019	<u>19,000,000</u>
Total Portfolio Income	<u>\$36,500,000</u>
PFM Contract	
Original Contract Amount - November 2015	\$250,000
Contract Extension & Increase - Approved November	350,000
Contract Extension & Increase - Approved June 2018	<u>100,000</u>
Total PFM Contract - ending December 2018	<u>\$700,000</u>
Proposed Contract Extension & Increase	<u>370,000</u>
New Total PFM Contract - ending December 2018	<u>\$1,070,000</u>
PFM Contract as % of Portfolio Income	<u>2.9%</u>
PFM Annual Fee as % of September 2018 Portfolio	<u>0.04%</u>

Calculation of Contract Increase - Invested Portfolio			
<u>Estimated Invested Portfolio \$</u>	<u>Rate</u>	<u>Fee \$</u>	
1st 100,000,000	0.08%	\$ 80,000	
2nd 100,000,000	0.06%	60,000	
above 2nd 550,000,000	0.05%	275,000	
Portfolio Balance <u>\$ 750,000,000</u>		<u>\$ 415,000</u>	
	Monthly	<u>\$ 34,583</u>	
Total Contract Amount through December 2018	\$	700,000	
Projected billings through December 2018		<u>(647,000)</u>	
Remaining Balance on Current Contract	\$	<u>53,000</u>	
Projected billings through December 2019		<u>(415,000)</u>	
Additional Contract Funds Needed	\$	<u>(362,000)</u>	
Requested Increase		\$370,000	

Proposed Action: The Audit Committee recommends that the Board of Directors for the Great Lakes Water Authority approve a contract extension with PFM Asset Management LLC in the amount of \$370,000 through December 2019 for a total life-to-date contract of \$1,070,000.



Great Lakes Water Authority

Strategy Update Discussion

November 2018

PFM Asset
Management LLC

555 Briarwood Circle
Suite 333
Ann Arbor, MI 48108

734.994.9700
pfm.com



Objective

GAIN SUPPORT FOR FULL DISCRETIONARY/
ACTIVE MANAGEMENT ON SPECIFIC GLWA
PORTFOLIOS AND CONFIRM STRATEGY ON
CASH FLOW BASED PORTFOLIOS

Agenda

ACTIVE MANAGEMENT CONSIDERATIONS

YIELD VS. TOTAL RETURN

IMPACT ON GLWA'S PORTFOLIOS

PFM DELIVERABLES

APPENDIX: RELATIONSHIP TEAM



Active Management Considerations



Active versus Cash Flow (Passive) Management

- ◆ There are basically two ways to manage an investment portfolio: active or passive
- ◆ *Active Management* implies that the portfolio manager may sell some investment securities in order to shift assets to other instruments
 - This may be done simply to rebalance a portfolio that has become over-concentrated in one sector, or it may reflect an effort to enhance total returns by trading or swapping into securities that are expected to outperform the original holding
- ◆ *Passive Management* is an investment strategy in which securities are bought with the intention of holding them to maturity or investing in benchmark products designed to yield a market rate of return
 - Cash flow structured portfolios are considered passive portfolios as securities are purchased with the primary purpose of providing liquidity on a specific future date
- ◆ GLWA is currently following a passive strategy



Active Management vs. Cash Flow Focused Strategies

Active Management

- Ideal for funds with **expansive** permitted investments and / or **uncertain** liquidity needs
- Advisor goal: generate incremental earnings via swapping amongst individual CUSIPs, sectors, and duration buckets to attempt to offset advisory fees
- Enhanced ability to take advantage of benefit from near-constant duration exposure

Cash Flow Strategies

- Ideal for funds with defined cash flow needs and defined permitted investments
- Securities are purchased with intent to hold to maturity and typically used to fund a specific need (i.e., debt service funds)
- May require significant change to market conditions and / or cash flow requirements for restructurings to add value

ACTIVE MANAGEMENT	CASH FLOW STRATEGIES
Real-time monitoring of holdings through time	Monitoring of credit and liquidity needs
More frequent trades to manage duration and / or liquidity	Infrequent trades as typically buy and hold to specific maturity
Greater ability to take advantage of short-term securities mispricings	Limited ability to take advantage of short-term opportunities
Enhanced ability to add incremental net value	May require substantial changes in market conditions to add value
Advisor has fiduciary responsibility	Advisor has fiduciary responsibility primarily focused on credit/liquidity



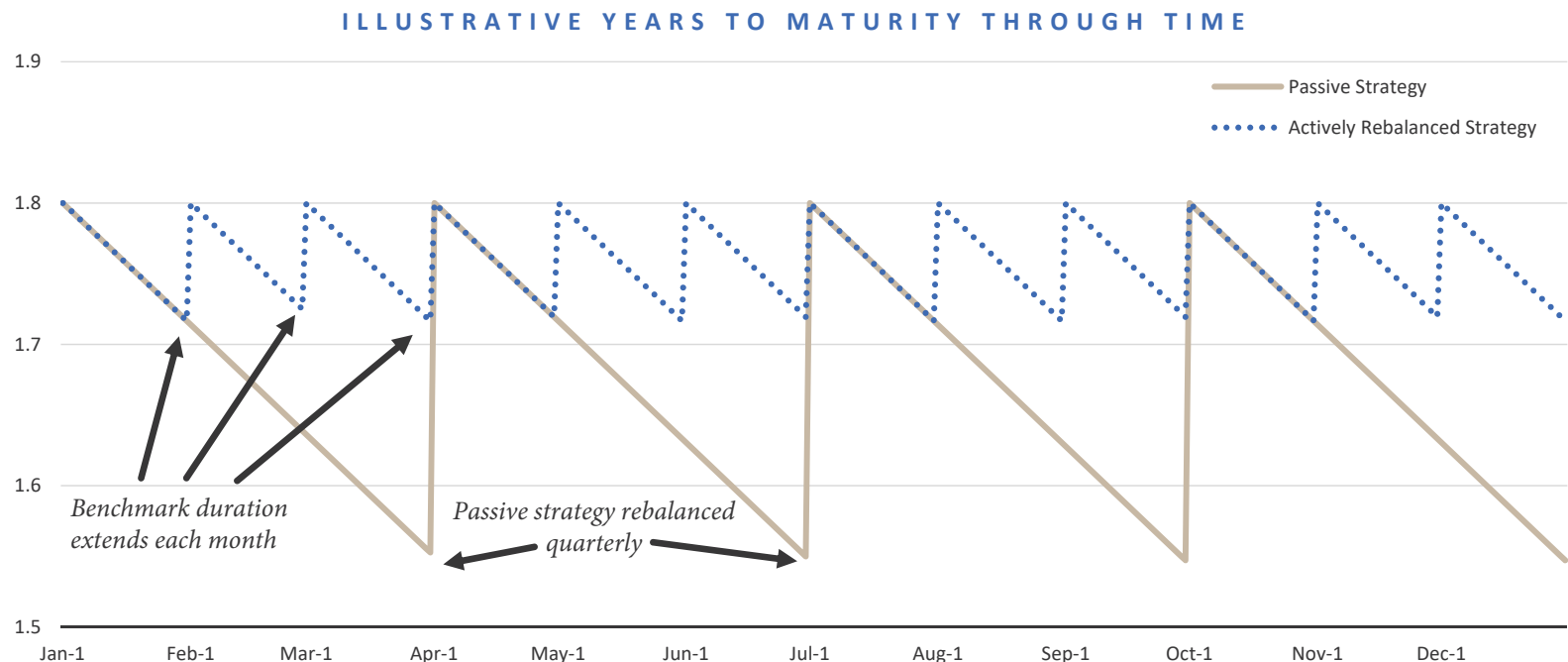
Active Management Tool Box

Source of Return	Factor	Style
Sector	<ul style="list-style-type: none"> Expected to contribute 30% - 40% to the return of the portfolio Treasury sector is baseline Sector spreads respond to macro forces as well as overall supply / demand technical 	<ul style="list-style-type: none"> Seek value in historically wide spreads Macro forces may override value decisions Collective decisions on rich / cheap value Follow credit trends closely – credit first
Duration	<ul style="list-style-type: none"> Expected to contribute no more than 20% to the return of the portfolio Treasury allocation is best way to manage duration dynamically With low rates, income cushion is minimal 	<ul style="list-style-type: none"> Collective portfolio strategy produces targets Manage within a duration band for each product Generally cautious investment approach helps us in down markets
Issuer / Security Selection	<ul style="list-style-type: none"> Expected to contribute 20% - 25% to the return of the portfolio Liquidity differs by issuer and by sector New issue concessions can add value Universe limited to high-grade credits 	<ul style="list-style-type: none"> Investing in liquid issues provides opportunity for active management Will also invest where there is a liquidity premium when appropriate Limit non-government issuer exposure to 2% Changes in relative investment values give insights into credit strength Follow dynamic credit process with maturity limits for each credit -- credit is first
Yield Curve	<ul style="list-style-type: none"> Expected to contribute 15% - 20% to the return of the portfolio Shape of curve may provide roll-down Yield per unit of risk varies over time and by security sector 	<ul style="list-style-type: none"> Macro outlook over 3 – 6 months drives forward rates view Seek greatest income per unit of risk Assess expected investment returns over 3 – 24 month horizon Look to various yield curves for insights into non-macro trends



Proactive Duration Management – Near-Constant Duration Exposure

- Extending with the benchmark on a monthly basis allows for near-constant duration exposure
 - Actively rebalanced strategy matching the benchmark will have a longer average duration than a passive strategy
 - Passive strategy will have a duration that is 2 months shorter by the next purchase date
 - Upward sloping yield curve produces better return due to longer duration of active vs. passive



Assumes both strategies are structured with an initial days to maturity of 1.80 years on January 1. On the first calendar day of each month, the actively rebalanced strategy is assumed to be restructured to the original days to maturity of 1.80 years. The passive strategy is assumed to be restructured quarterly (April 1, July 1, October 1) to have a days to maturity of 1.80.



Proactive Duration Management – Benefit of Roll Down (2-Year Example)

- ◆ Extending duration on a monthly basis may also allow GLWA to take advantage of roll down (price appreciation) as not all securities may be held to maturity

- ◆ Passive strategy will produce the initial yield on the securities purchased assuming each Treasury Note is held to maturity

- ◆ Example: \$100MM invested in 2-year Treasury Note purchased at par and held to maturity vs. BofA/Merrill Lynch 1-3 Year Treasury index
 - Treasury Note purchased at par on 1/2/2007 at a yield of 4.79%
 - The quarterly return was 1.20% (calculated as 4.79% divided by 4 quarters)

QTR ENDED	Return (at par) 2-YR TREASURY	Growth of \$100 MM	BofA Merrill Lynch 1-3 YEAR TSY INDEX	Growth of \$100 MM
Mar-07	1.20%	101,197,750	1.40%	101,400,000
June-07	1.20%	102,409,846	0.70%	102,109,800
Sept-07	1.20%	103,636,460	2.67%	104,836,132
Dec-07	1.20%	104,877,766	2.36%	107,310,264
Mar-08	1.20%	106,133,939	2.98%	110,508,110
June-08	1.20%	107,405,158	-0.86%	109,557,741
Sept-08	1.20%	108,691,604	1.68%	111,398,311
Dec-08	1.20%	109,993,457	2.69%	114,394,925

**Source: Bloomberg. Data retrieved March 2, 2017. 2-Year Treasury Investment assumes investment at yield of 2-year Treasury Note on January 1, 2007 and held to maturity. Quarterly yield is calculated by dividing the 2-year Treasury yield by 4 annual periods. Assumes no interim cash flows or reinvestment of cash flows. Past performance is no guarantee of future results. Actual results will vary.*

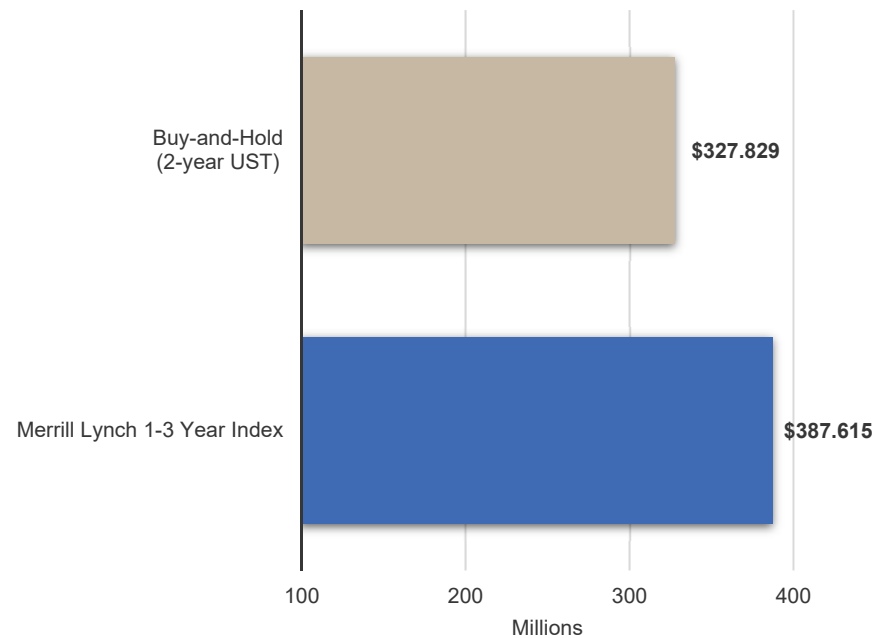
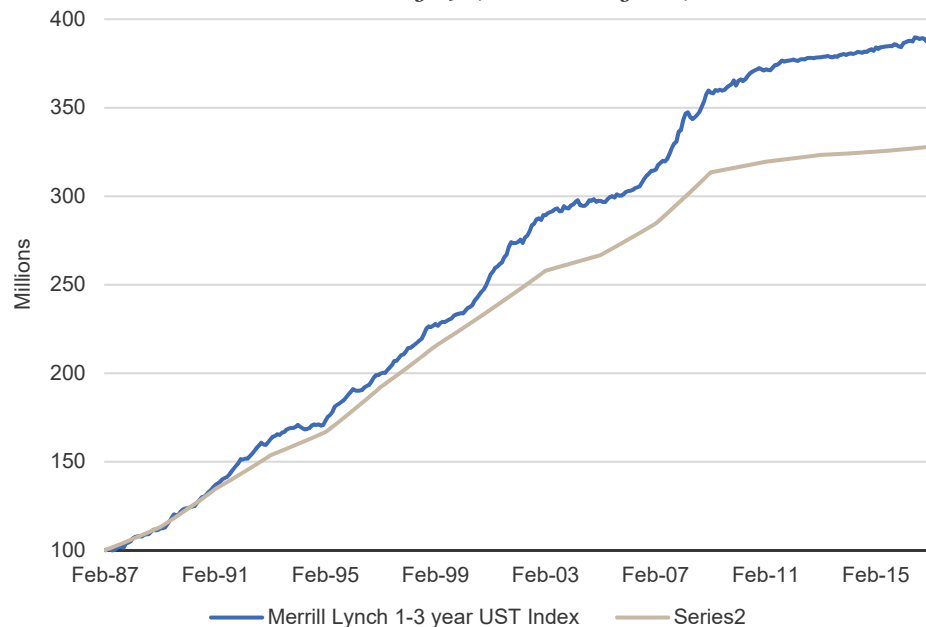


Proactive Duration Management – Benefit of Roll Down (30-Year Example)

- Active management allows portfolios to be continually rebalanced to maintain a constant duration target
- Buy-and-hold eliminates impact of changes in yields between purchase dates (no way to capture price appreciation)

HYPOTHETICAL PERFORMANCE OF ACTIVE VS. PASSIVE STRATEGIES

Growth of \$100,000,000
February 1987 – February 2017



Source: Bloomberg. Data retrieved September 20, 2016. Buy-and-hold strategy assumes all securities are purchased at par and all proceeds reinvested at the yield of the relevant Treasury Note on each applicable purchase date. The 2-year buy-and-hold strategy assumes an initial purchase date of September 1, 1996 and subsequent reinvestment every 2 years. Assumes no interim cash flows.



PFM Fixed Income Separate Account Composite Snapshot (as of June 30, 2018)

- PFM's composites consistently outperform their respective benchmarks
- For example, PFM's 1 – 3 Year Fixed Income Composite has outperformed the Bof/AML 1 – 3 Year Treasury index by 32 basis points (0.32%) over the past 10 years

Strategy/Benchmark	Average Annual Total Returns						Duration	Standard Deviation of Returns (5 years)	No. of Accounts	Assets (in \$ Millions)
	for periods ended June 30, 2018									
	2Q18	1 Year	3 Years	5 Years	7 Years	10 Years				
PFM Enhanced Cash Composite	0.51%	1.16%	0.99%	0.82%	0.72%	1.07%	0.63	0.27%	17	1,646
<i>ICE BofAML 1 Yr Treasury Index</i>	0.40%	0.92%	0.64%	0.49%	0.43%	0.77%	0.90	0.24%		
PFM 1-3 Year Fixed Income Composite	0.36%	0.38%	0.75%	0.81%	0.80%	1.56%	1.68	0.61%	161	11,220
<i>ICE BofAML 1-3 Treasury Index</i>	0.22%	0.08%	0.42%	0.58%	0.58%	1.24%	1.80	0.68%		
PFM 1-5 Year Fixed Income Composite	0.27%	-0.08%	0.82%	1.08%	1.17%	2.16%	2.37	1.14%	125	8,504
<i>ICE BofAML 1-5 Treasury Index</i>	0.13%	-0.35%	0.50%	0.81%	0.89%	1.79%	2.58	1.30%		
<i>ICE BofAML 1-5 Gov't/Corp, AA or better</i>	0.15%	-0.27%	0.58%	0.89%	0.96%	1.89%	2.54	1.26%		
PFM 1-10 Year Fixed Income Composite	0.17%	-0.33%	1.09%	1.46%	1.73%	2.91%	3.48	1.81%	19	810
<i>ICE BofAML 1-10 Treasury Index</i>	0.06%	-0.70%	0.65%	1.09%	1.45%	2.47%	3.64	2.10%		

The performance data shown represent past performance, which is not a guarantee of future results. Investment returns and principal value will fluctuate. Data shown is prior to the deduction of investment advisory fees. GIPS compliant composite presentations are available upon request. For important disclosure information please go to pfm.com/disclosures.

Benchmark source: Bloomberg. All benchmarks represent total returns for the noted periods, with the exception of the ICE BofAML Constant 5-Year Maturity Treasury Index, which represents a book value return by utilizing the rolling 60-month moving average yield. As the stable value benchmark is an equally weighted rolling 60-month moving average of a 5-year Treasury security for each month, the 2.54 year duration noted above represents a weighted average maturity (WAM).



Examples of Active Management

- Active management requires the investment advisor to have full discretion to take losses when necessary to improve long-term performance

Settle Date	Trade Type	Issuer	Par	Maturity	Yield at Cost	Yield at Market	Loss on Sale	Earnings to 6/29/2018	Total Cash Flow
4/19/2018	Sale	Federal Agency	\$1,350,000	6/29/2018	0.85%	1.79%	(\$2,470)	(\$2,184)	(\$4,654)
4/19/2018	Purchase	Supranational	\$1,445,000	4/19/2021	2.70%	2.70%	-	\$7,544	\$7,544
Additional Net Benefit to 6/29/2018									\$2,890

Earnings to 6/29/2018 for the Federal Agency investment that was sold would be the difference between par value and market value at the time of the sale, plus the final coupon payment. For the new Supranational investment that was purchased, earnings to 6/29/2018 and the total cash flow reflects the estimated amortization of the new Supranational purchase from the trade date of 4/19/2018 up to 6/29/2018 plus coupon payments.

Settle Date	Trade Type	Issuer	Par	Maturity	Yield at Cost	Yield at Market	Loss on Sale	Earnings to 10/12/2018	Total Cash Flow
7/3/2018	Sale	Federal Agency	\$3,075,000	10/12/2018	0.90%	2.03%	(\$9,540)	(\$7,587)	(\$17,127)
7/3/2018	Purchase	Commercial Paper	\$3,150,000	10/30/2018	2.38%	2.38%	-	\$20,864	\$20,864
Additional Net Benefit to 10/12/2018									\$3,737

Earnings to 10/12/2018 for the Federal Agency that was sold would be the difference between par value and market value at the time of the sale, plus the final coupon payment. For the new Commercial Paper investment that was purchased, earnings to 10/12/2018 and the total cash flow reflects the estimated amortization of the new Commercial Paper purchase from the trade date of 7/3/2018 up to 10/12/2018.



Yield vs. Total Return



Investment Objectives – Yield vs. Total Return

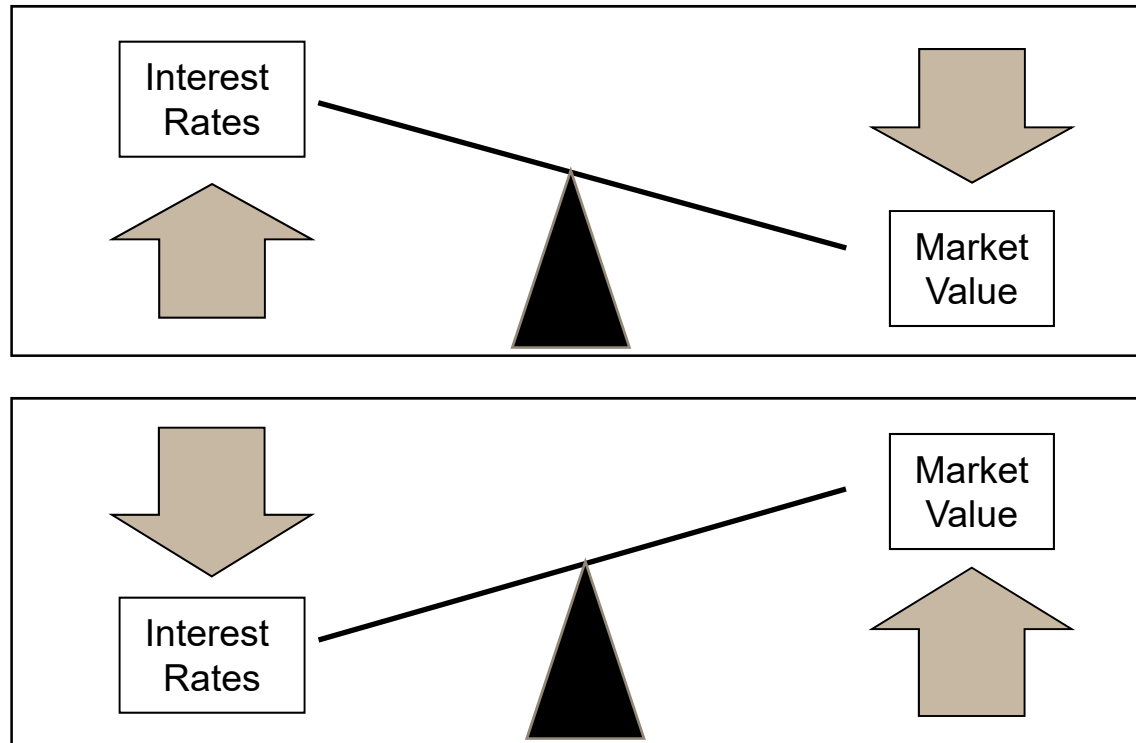
- ◆ **Yield** is the income return at a point in time, expressed as an annualized rate of return based on cost, and is forward-looking; the calculation of yield assumes no changes in cash flow and reinvestment rates (GLWA is currently using an earnings target approach)
- ◆ **Total return** is calculated based on interest and both realized and unrealized changes in market value, expressed as a rate of return over a specified period of time based on cost, and is backward-looking (the use of a total return approach is a GFOA best practice)

Earnings Target Approach	Total Return Approach
<ul style="list-style-type: none"> - Focused on income stability and useful for budgeting purposes - Does not account for changes in market value - Not sufficient for assessing risk and/or investment performance 	<ul style="list-style-type: none"> - Focused on long-term performance and growth - Affected by both yield and also market value fluctuations - Reflects “true value” of the portfolio - Recommended approach by the Government Finance Officers Association
<p>Portfolio Management Style</p> <ul style="list-style-type: none"> - Can limit active management strategies - Focused on meeting earnings target - May sacrifice higher earnings in the future to avoid negatively affecting current year earnings 	<p>Portfolio Management Style</p> <ul style="list-style-type: none"> - Flexible active management - More flexibility to capitalize on new opportunities from changes in interest rates - Can be negative during rising interest rates



Total Return = Yield + Change in Market Value

- Market values move inversely to interest rates





Impact on GLWA's Portfolios



What Would be Different with Active Management

- ◆ Current investment procedures: “Buy and Hold” for cash flow related portfolios
 - Once a security is purchased, it is held to maturity with no active management
- ◆ “Active Management”: PFM would actively manage benchmarked portfolios with full discretion (subject to GLWA’s investment policy)
 - Formal benchmark(s) would be established and portfolios would be managed with similar characteristics
 - Performance and characteristics would be evaluated relative to the benchmark (GFOA best practice)
 - Securities may be sold prior to maturity to improve the overall earning potential of the portfolios
 - GLWA would continue to receive trade tickets for all transactions
 - PFM would not confirm reinvestment or maturity ranges
 - GLWA would inform us of any unexpected cash flows (inflows or outflows) in these accounts
 - To assist in orderly trades, unexpectedly large and significant cash flows should be communicated with as much advanced notice as possible



GLWA Investments by Account Purpose (as of 9/30/2018)

Account Purpose	Balance	Management Type	Strategy Considerations / Comments
Operating & Maintenance	\$105,719,981	Cash-flow Driven	Due to 90 day liquidity goal, decided best to keep in money market
Bond / Construction	\$214,528,410	Cash-flow Driven	Portfolios invested based on initial expected cash flow needs for the construction accounts
Debt Service / Debt Reserve	\$160,400,491	Cash-flow Driven	Duration cannot be extended beyond upcoming principal and interest payment dates
Receiving Funds	\$132,823,776	Cash-flow Driven	Requested liquidity in deposit account at U.S. Bank
Pension Obligation	\$11,072,253	Cash-flow Driven	Known monthly cash flow deposits; securities invested out to mature by June 15th for liquidity to meet pension payments
WRAP Funds	\$8,180,646	Cash-flow Driven	Monthly deposits come in; rolling 3-month investment purchases to meet quarterly cash payouts
Retainage	\$15,308,726	Cash-flow Driven	These funds do not belong to GLWA - they are held on behalf of Flint
All Other	\$3,760,760	Cash-flow Driven	Funds in the Flint Security Deposit account that are held on behalf of the City of Flint and do not belong to GLWA
Budget Stabilization	\$7,509,413	Benchmarked	There will be no deposits into this account during the year; initially laddered investing with maturities from 0 – 5 years
Extraordinary R & R Reserve	\$63,590,192	Benchmarked	Balances will remain relatively stable; laddered investments out to mature from 0 – 5 years
Improvement & Extension	\$258,682,561	Benchmarked	A portion of funds invested short-term to be reviewed for reinvesting with balanced invested out 0 – 5 years
Total	\$981,577,211		



Current Quarterly Report Shows Yields at Cost & Market

	As of September 30, 2018		As of June 30, 2018	
	YTM @ Cost	YTM @ Market	YTM @ Cost	YTM @ Market
Bank Deposits				
Comerica	0.25%	0.25%	0.25%	0.25%
First Independence	0.05%	0.05%	0.05%	0.05%
Flint Deposit Account	0.69%	0.69%	0.57%	0.57%
JP Morgan Chase	0.69%	0.69%	0.57%	0.57%
Sub-Total Bank Deposits	0.43%	0.43%	0.43%	0.43%
Money Market Funds / LGIPs				
GovMIC	2.08%	2.08%	2.02%	2.02%
U.S. Bank - First American MMF	1.95%	1.95%	1.75%	1.75%
JP Morgan Securities - Blackrock MMF	1.88%	1.88%	1.73%	1.73%
Sub-Total MMF / LGIPs	1.84%	1.84%	1.78%	1.78%
Investment Portfolios				
Sewage SR Debt Serv 5403	2.38%	2.43%	0.00%	0.00%
Sewage SR Res 5400	1.51%	2.66%	1.35%	2.33%
Sew 2nd Debt Serv 5403	2.35%	2.40%	0.00%	0.00%
Sewage 2nd Res 5481	1.51%	2.67%	1.30%	2.29%
Sew SRF Debt Serv 5410	2.18%	2.40%	1.98%	2.17%
Sewage ER & R	2.61%	2.72%	1.50%	1.92%
Sewer Improvement & Extension	2.53%	2.65%	0.00%	0.00%
Sewer Pension Obligation	2.36%	2.48%	0.00%	0.00%
Sewer Wrap Fund	2.11%	2.34%	0.00%	0.00%
Sewer Budget Stabilization Fund	2.62%	2.74%	0.00%	0.00%
Sewer Bond Fund	1.53%	2.42%	1.49%	2.25%
Sewer O&M Pension Sub Account	2.41%	2.52%	0.00%	0.00%
Water SR Debt Ser 5503	2.37%	2.42%	0.00%	0.00%
Water SR Reserve 5500	1.44%	2.33%	1.17%	2.11%
Water 2nd Debt Serv 5503	2.37%	2.42%	0.00%	0.00%
Water 2nd Res 5581	2.14%	2.54%	2.15%	2.36%
Water SRF Debt Serv 5575	0.00%	0.00%	1.98%	2.16%
Water ER & R	2.61%	2.72%	1.50%	1.92%
Water Improvement & Extension	2.60%	2.71%	0.00%	0.00%
Water Pension Obligation	2.37%	2.49%	0.00%	0.00%
Water Wrap Fund	2.11%	2.34%	0.00%	0.00%
Water Budget Stabilization Fund	2.62%	2.74%	0.00%	0.00%
Water Bond Fund	1.67%	2.49%	1.63%	2.29%
Water O&M Pension Sub Account	2.41%	2.52%	0.00%	0.00%
Sub-Total Investment Portfolios	2.16%	2.68%	1.61%	1.84%
Grand Total	2.02%	2.30%	1.81%	1.84%

The accounts at Comerica Bank get an earnings credit to offset bank fees. The earnings in the accounts at First Independence Bank is credited to the contractors and not the Authority. The funds in the Flint Security Deposit account are held on behalf of the City of Flint and the earnings do not belong to GLWA. YTM @ Cost is the expected return, based on the original cost, the annual interest receipts, maturity value and the time period from purchase date to maturity, stated as a percentage, on an annualized basis. YTM @ Market is the rate of return, based on the current market value, the annual interest receipts, maturity value and time period remaining until maturity, stated as a percentage, on an annualized basis.



GLWA Sample Investment Report

Cash Flow Portfolios	Balance	Duration	Yield	Market Indicator Yield (3-mo. T-Bill)	Yield Spread
Operating & Maintenance	\$105,719,981	1 Day	1.75%	1.80%	-0.05%
Bond / Construction	\$226,878,891	0.76 Years	2.36%	1.80%	+0.56%
Debt Service / Debt Reserve	\$179,001,860	0.26 Years	1.98%	1.80%	+0.18%
Receiving Funds	\$132,823,776	1 Day	1.75%	1.80%	-0.05%
Pension Obligation	\$11,063,336	0.42 Years	2.11%	1.80%	+0.31%
WRAP Funds	\$8,166,198	0.21 Years	1.92%	1.80%	+0.12%
Retainage	\$15,308,726	1 Day	1.75%	1.80%	-0.05%
All Other	\$3,760,760	1 Day	1.75%	1.80%	-0.05%

Benchmarked Portfolios	Balance	Duration	Quarterly Total Return	Benchmark Return	Performance Difference	Benchmark Type
Budget Stabilization	\$7,516,458	2.10 Years	0.205%	0.151%	+0.54%	0 – 5 Year UST
Extraordinary R & R Reserve	\$71,142,609	2.09 Years	0.203%	0.151%	+0.52%	0 – 5 Year UST
Improvement & Extension	\$258,810,258	2.11 Years	0.206%	0.151%	+0.55%	0 – 5 Year UST

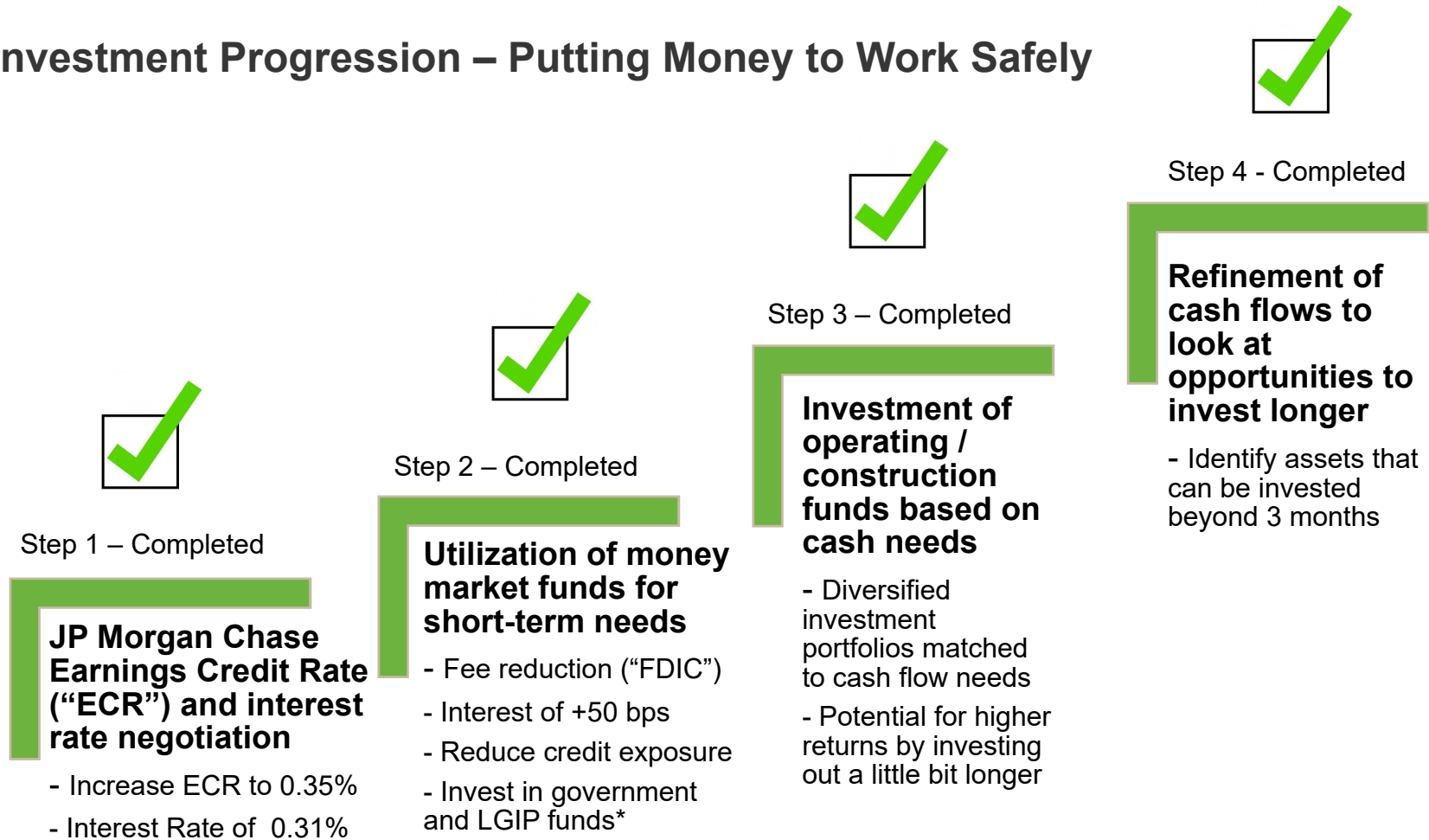
For illustrative purposes only.



PFM Deliverables



Investment Progression – Putting Money to Work Safely



* LGIP – Local Government Investment Pool is currently rated “AAAm” by Standard & Poor’s rating agency.



What Value Does PFM Provide to GLWA

	Hiring PFM
Portfolio Management	<ul style="list-style-type: none"> • Team of over 25 investment professionals • Sector specialists • Supported by 221 professionals, 22 with CFA designations • Functional expertise in portfolio management, trading, accounting, IRS regulations, compliance
Trade Execution & Transparency	<ul style="list-style-type: none"> • Extensive Broker/Dealer relationships including 22 of 23 Primary Dealers & 58 in total • Daily trading volume of \$1 – \$3 billion • Ability to execute reverse inquiry due to PFM market presence and relationships
Portfolio Management Technology & Compliance	<ul style="list-style-type: none"> • Bloomberg, Market Axess, TradeWeb • Bloomberg AIM • CAMRA Accounting System • Easy Online Network (“EON”)
Credit Research & Monitoring	<ul style="list-style-type: none"> • PFM’s Fixed-Income Credit Committee (10 members) • Our access to rating agency research and other independent in-house research • History of never taking a credit loss (past performance is not indicative of future)
Training / Education	<ul style="list-style-type: none"> • Monthly/quarterly market reviews • Strategy calls with the entity • Thought leadership pieces • Training sessions for public finance officials
Portfolio Accounting	<ul style="list-style-type: none"> • Dedicated Accounting team (23 people) • Weekly/monthly reconciliation to custody bank • Industry standard accounting (GASB) • Full service reporting with secure online portal

For illustrative purposes only.



Competitive Trade Execution Process

Value Added Through Superior Market Access

- 22 of 23 primary government securities dealers
- Direct issuers
- Electronic trading / processing platforms provide efficiency and access to real-time prices
- All securities are competitively shopped from a robust list of 58 approved broker/dealers
- Clients benefit from PFMAM's economies of scale: \$2+ billion in average daily trading volume

PFM's Competitive Shopping Can Save Money on Every Trade

Broker	Price (32nds)	Price (decimal)	Yield	Cost (\$)	Difference (\$)
Barclays	116-08 5/8	116.27	1.044%	8,364,294.34	-
Merrill Lynch	116-08 5/8	116.27	1.044%	8,364,294.34	-
BNP Paribas	116-09	116.28	1.042%	8,365,126.37	832.03
JP Morgan	116-09 1/8	116.29	1.041%	8,365,403.71	1,109.37
Deutsche Bank	116-17 7/8	116.56	0.986%	8,384,817.78	20,523.44

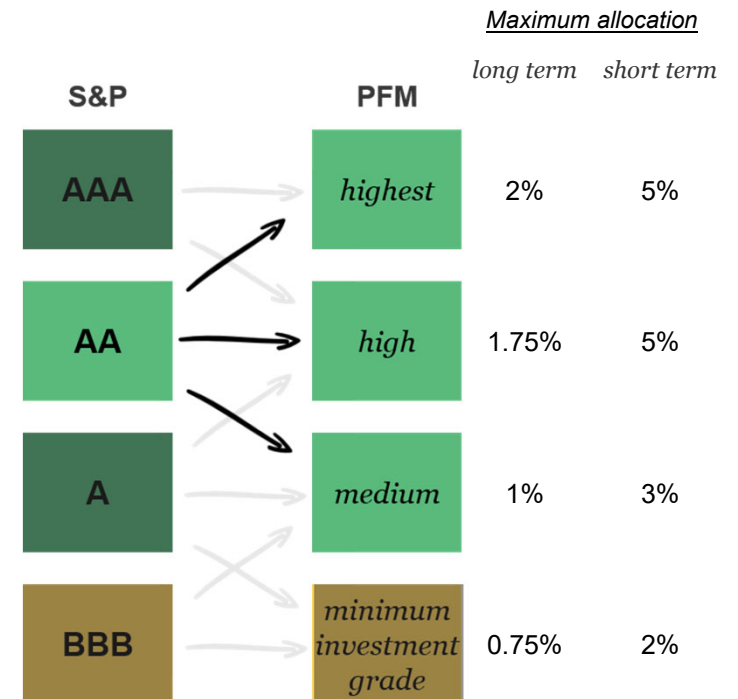
Value Added

For illustrative purposes only.



PFM's Approach to Credit

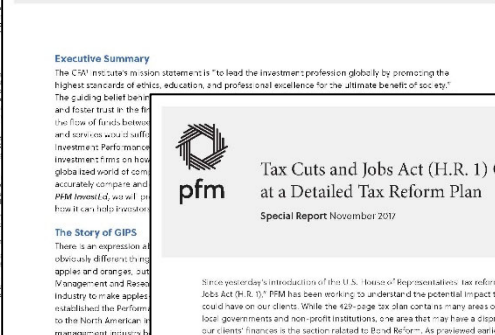
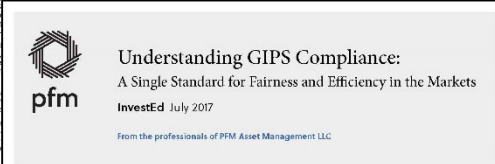
PHILOSOPHY
<ul style="list-style-type: none"> • Use credit to safely seek enhanced returns • Approach credit from the view of a public sector investor • Conduct research “on the desk” by portfolio managers, traders, and analysts • Utilize proprietary models to maintain independence • Build in a margin of safety
CREDIT SCREENING PROCESS
<ul style="list-style-type: none"> • Determine universe of issuers • Narrow list based on ratings criteria, supply, and value • Industry screen – growth outlook and prospects; regulatory environment • Issuer screen – quantitative analysis; in-depth review of financials
IMPLEMENTATION AND MONITORING
<ul style="list-style-type: none"> • Creation of approved list with long- and short-term exposure and horizon limits • Formal credit meetings with Chief Credit Officer, Chief Investment Officer, credit analysts, and traders • Proprietary assessment and mapping to PFM credit tiers • Ongoing evaluation with an emphasis on qualitative assessment





Public Sector Education & Training

- Monthly Market Updates
- PFM “InvestEd” & Thought Leadership Pieces
 - Deconstructing Duration
 - Rolling Down the Yield Curve
 - Money Market Fund Reform
- Investment Seminars (CPE Credit)
 - One-Week Client Training Sessions
 - Customized Training and Education
- Research White Papers
- Annual Economic and Financial Markets Update





What Sets Us Apart

VALUE

- Strong performance track record relative to benchmarks
- Active management that safely enhances investment returns and manages downside risk

EXTENSION OF STAFF

- Independent investment advisor with fiduciary responsibility that provides unbiased advice to the Authority
- Dedicated accounting team and online network that fit seamlessly with existing systems

EXECUTION

- Large staff of fixed-income sector specialists with access to Bloomberg, Market Axess, TradeWeb, and extensive proprietary tools
- Rigorous investment credit review process through PFM's Fixed-Income Credit Committee
- Access to rating agency research and other independent in-house research tools

EXPERTISE




- Public sector specialists who fully understand the unique investment considerations of public agencies
- Consider the implications of investments on both sides of the balance sheet by working closely with the Authority's financial advisor



Appendix: Relationship Team






Brief Resumes: Client Service Team Key Professionals

Team Member	Brief Resume
 <p>Brian Quinn <i>Managing Director</i></p>	<p>32 Years of Experience / 9 Years with PFM Brian is a managing director in PFM's Midwest region for the firm's asset management business. With more than 30 years of investment, accounting and financial management experience, he provides investment advisory and treasury management services in Michigan and Ohio to public-sector clientele, including cities, counties, higher education, insurance pools, public power and intermediate and local school districts. Brian provides banking and investment service needs, including procurement and implementation of treasury management services, design and adoption of investment policies, benchmarking investment performance, development and implementation of investment strategies and discretionary management of public funds. He has extensive experience developing and monitoring the investment of bond proceeds. Brian advises clients through development of cash flows, review of investment policies and banking relationship structuring and evaluation.</p>
 <p>Kyle Jones <i>Director</i></p>	<p>16 Years of Experience / 6 Years with PFM Kyle Joined PFM's asset management business in 2012 and is the director of portfolio strategies and a member of the Portfolio Strategies Group. Kyle works primarily with clients of the separate account business by helping to devise customized portfolio strategies designed to meet their specific investment needs. In addition, he assists in the creation and delivery of our views and strategies to clients, prospects and third-party consultants. Prior to joining PFM, Kyle spent 10 years at JPMorgan Chase in a variety of capacities, most recently as an investment specialist for their Institutional Sales business. Kyle is a board member of the Chicago Booth Black Alumni Association, and an active participant in the Dillard University Alumni Association. He is a frequent speaker at industry conferences and educational seminars.</p>
 <p>Gray Lepley <i>Senior Analyst</i></p>	<p>3 Years of Experience / 3 Years with PFM Gray Lepley joined PFM in 2015 and works in the Harrisburg office. As an analyst in the Structured Products Group, Gray provides quantitative support on a variety of projects including open-market escrow optimization and procurement and the structuring and restructuring of bond proceeds portfolios.</p>



Brief Resumes: Client Service Team Key Professionals

Team Member	Brief Resume
 <p>Danny Nelson <i>Senior Managing Consultant</i></p>	<p>14 Years of Experience / 14 Years with PFM Danny Nelson joined PFM in 2002 and is currently a senior managing consultant in the Midwest region asset management business. He manages relationships for various clients in Illinois, Michigan and Minnesota. He helps municipal governments, school districts and other public authorities with cash flow analysis and overall investment needs. He provides investment advisory and consulting services, develops investment policies and monitors guidelines and strategy implementation. Danny provides clients with training and technical and analytical support with respect to their investment portfolios.</p>
 <p>Amber Cannegieter <i>Key Account Manager</i></p>	<p>13 Years of Experience / 5 Years with PFM Amber joined PFM in 2013 as a key account manager for PFM's Client Service Group. In her role, Amber provides customer service in everyday functions, such as onboarding and new client administration. She also serves as a client advocate by providing a "high touch, high value" experience, to address client needs.</p>
 <p>Brian Raubenstine <i>Portfolio Manager</i></p>	<p>11 Years of Experience / 10 Years with PFM Brian Raubenstine joined PFM's asset management business in 2008 and is a portfolio manager on the long-term fixed-income desk. His primary focus is the daily management of client portfolios, generally from a total return perspective. He specializes in the municipal securities market and credit for the trading desk. He is currently enrolled in the Chartered Financial Analyst (CFA) program.</p>



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Thank You!



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