

MASSACHUSETTS WATER RESOURCES AUTHORITY



Fiscal Year 2017 CURRENT EXPENSE BUDGET

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MASSACHUSETTS WATER RESOURCES AUTHORITY

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September 2016

Louis M. Taverna, Chairman
MWRA Advisory Board
100 First Avenue
Boston, MA 02129

Dear Chairman Taverna:

This letter transmits to the Advisory Board MWRA's Current Expense Budget (CEB) for Fiscal Year 2017. The CEB was approved by the MWRA's Board of Directors on June 29, 2016.

The Final FY2017 budget resulted in a 3.4% combined assessment increase, which is lower than the 3.9% increase projected for FY17 last year. This increase is in line with Board of Directors and Advisory Board's directives.

The FY2017 total expenses are \$719.6 million, of which 63.2% or \$455.1 million is for capital financing costs, \$226.5 million for direct expenses, and \$38.0 million for indirect expenses. The overall expenses increased \$17.1 million or 2.4% from the FY2016 budget.

When establishing expense projections, the main emphasis was on the FY17 budget, but with the goal of continuing to utilize MWRA's multi-year rate management strategy to provide sustainable and predictable assessment increases to our member communities for the long term. To achieve this goal again this year, MWRA has continued to employ conservative budgeting and fiscal discipline which includes controlled spending, capital project prioritization, and use of historical variable rate assumptions. The combination of these measures resulted in assessment increase projections at 3.8% for the next five years. This goal of 3.8% assessment increase is in agreement with the Advisory Board's recommendations.

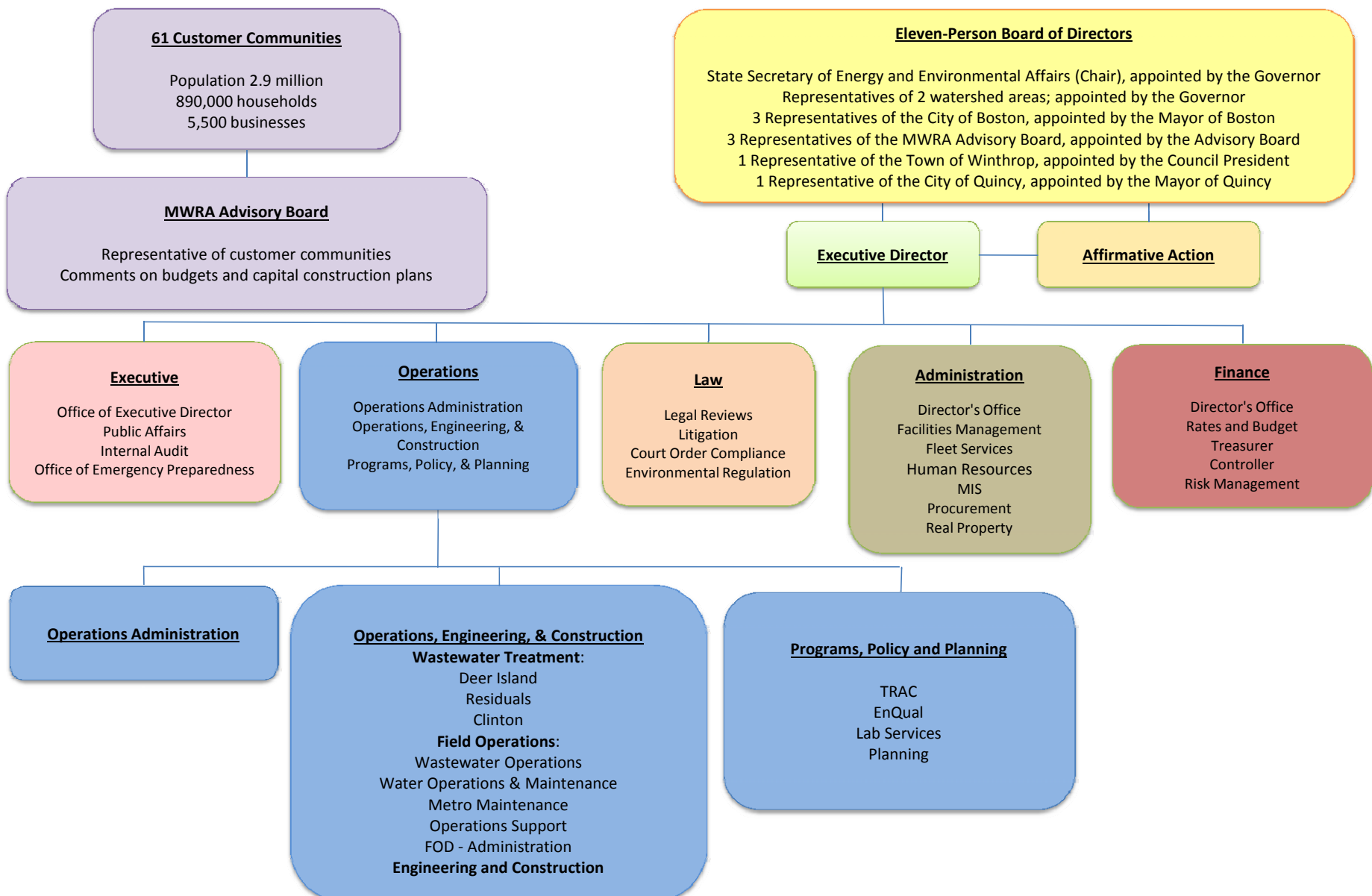
For the first time, the FY17 budget also addresses the smoothing of rate revenue changes at the water and sewer utility level.

Additional budget information and a copy of this document are available online at www.mwra.com. Questions or comments on this document should be directed to the MWRA Budget Department at (617) 788-2268.

Thank you for your continued support.

Sincerely,

Frederick A. Laskey
Executive Director



61 Customer Communities

Population 2.9 million
890,000 households
5,500 businesses

MWRA Advisory Board

Representative of customer communities
Comments on budgets and capital construction plans

Executive

Office of Executive Director
Public Affairs
Internal Audit
Office of Emergency Preparedness

Operations

Operations Administration
Operations, Engineering, & Construction
Programs, Policy, & Planning

Law

Legal Reviews
Litigation
Court Order Compliance
Environmental Regulation

Administration

Director's Office
Facilities Management
Fleet Services
Human Resources
MIS
Procurement
Real Property

Finance

Director's Office
Rates and Budget
Treasurer
Controller
Risk Management

Operations Administration

Operations, Engineering, & Construction

Wastewater Treatment:

Deer Island
Residuals
Clinton

Field Operations:

Wastewater Operations
Water Operations & Maintenance
Metro Maintenance
Operations Support
FOD - Administration

Engineering and Construction

Programs, Policy and Planning

TRAC
EnQual
Lab Services
Planning

Eleven-Person Board of Directors

State Secretary of Energy and Environmental Affairs (Chair), appointed by the Governor
Representatives of 2 watershed areas; appointed by the Governor
3 Representatives of the City of Boston, appointed by the Mayor of Boston
3 Representatives of the MWRA Advisory Board, appointed by the Advisory Board
1 Representative of the Town of Winthrop, appointed by the Council President
1 Representative of the City of Quincy, appointed by the Mayor of Quincy

Executive Director

Affirmative Action

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Executive Summary

Executive Summary

MWRA Organization and History

MWRA Mission

The Massachusetts Water Resources Authority (MWRA) is an independent authority that provides wholesale water and sewer services to its member communities and funds its operations primarily through member community assessments and charges. MWRA's mission is to provide reliable, cost-effective, high-quality water and sewer services that protect public health, promote environmental stewardship, maintain customer confidence, and support a prosperous economy.

Created by the Massachusetts legislature in 1985, MWRA assumed control of the water and sewer systems, including facilities, properties, and the right to utilize water withdrawn from system reservoirs that had formerly been the Sewerage and Waterworks Divisions of the Commonwealth of Massachusetts Metropolitan District Commission (MDC). The Commonwealth, under the management of the MDC Watershed Management Division (now the Department of Conservation and Recreation – Division of Watershed Management), retained ownership of real property, including the reservoirs and watersheds, the maintenance of which are included in MWRA's operating budget. In 1987, the legislature also transferred responsibility to operate and maintain the Clinton Wastewater Treatment Plant from the Commonwealth to the MWRA.

The Enabling Act also established the MWRA Advisory Board to represent the cities and towns in the service area. The Advisory Board appoints three members of the MWRA Board of Directors, approves the extension of water and sewer services to additional communities, and reviews and makes recommendations on MWRA's annual Current Expense Budget and Capital Improvement Program.

Since 1985, the MWRA has invested over \$8.0 billion to modernize and improve the wastewater and waterworks systems serving its 61 member communities. In Fiscal Year 2017, the system serves approximately 2.9 million people and more than 5,500 businesses.

MWRA Goals and Performance Measures

MWRA's five-year Strategic Business Plan emphasizes improvements in service and systems and includes performance targets for operating the water and wastewater systems and maintaining new and existing facilities. MWRA's Water System Master Plan and Wastewater System Master Plan present a long-term vision of the capital development needs of the water and wastewater systems and the actions planned to meet those needs. Parallel to MWRA's goal of carrying out its operating programs and capital projects is its goal of providing sustainable, predictable and reasonable assessments to its customer communities. To that end, the MWRA applies a multi-year rates management strategy to provide sustainable and predictable assessment increases to its member communities. The need to achieve and maintain a balance between these two goals is a critical issue in the development of both MWRA's capital and operating budgets.

During the year, MWRA measures actual performance on a monthly basis using various reporting tools. The monthly Financial Staff Summary reports on actual spending versus the budget and provides

summary explanations of the variances at the line item level. At least twice a year staff prepares projections for the fiscal year-end with a similar level of explanations. The performance indicator reports (published by MWRA as the Orange and Yellow Notebooks) capture a variety of parameters regarding performance of each major functional area, on a monthly and quarterly basis.

Current Expense Budget Process Overview

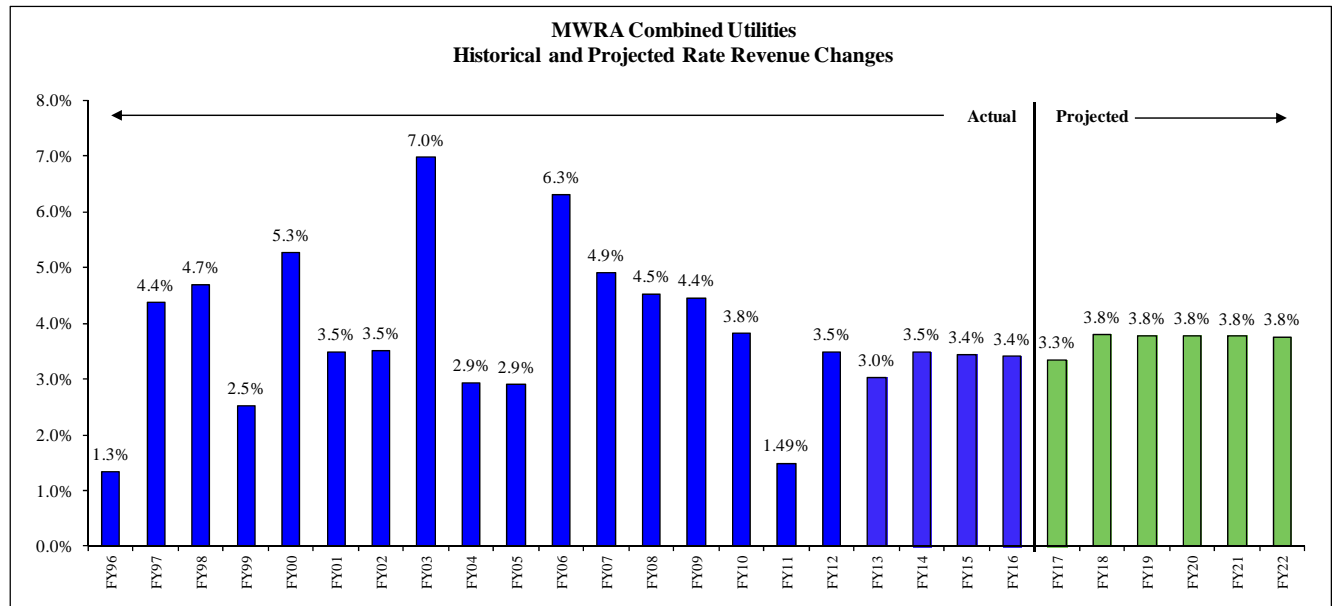
Each year, MWRA prepares a Current Expense Budget that reflects the best available information for anticipated expenditures and revenues. MWRA transmits a proposed budget to the Advisory Board in February, with the anticipated assessment increase. The Advisory Board then has sixty days to review, comment, and provide recommendations. MWRA also hosts a public hearing to solicit comments on the budget and community assessments from citizens in its service area. In June, MWRA's Board of Directors holds hearings on the budget to review recommendations by the Advisory Board and new information available since the budget was developed. Staff incorporates Board decisions from the hearings and presents a final budget and final assessments for approval in late June.

New FY17 Budget Initiative

Water and sewer services are assessed separately based upon the budget allocation for each of the utilities. While the MWRA's strategy for controlling the combined rate increases to customer communities has been successful, the change in rate remained volatile at the utility level. After much review and modeling multi-year rates management strategies, for the first time in the FY17 budget, the MWRA addresses the smoothing of rate revenue changes at the water and sewer utility level.

Final FY17 Budget Summary

The Final FY17 Current Expense Budget (Budget) has a combined utilities assessment increase of 3.34% with Rate Revenues reaching \$694.9 million. Rate Revenues account for nearly 97% of projected FY17 revenues. The graph below represents historical and projected assessment changes based on the Final FY17 Budget.



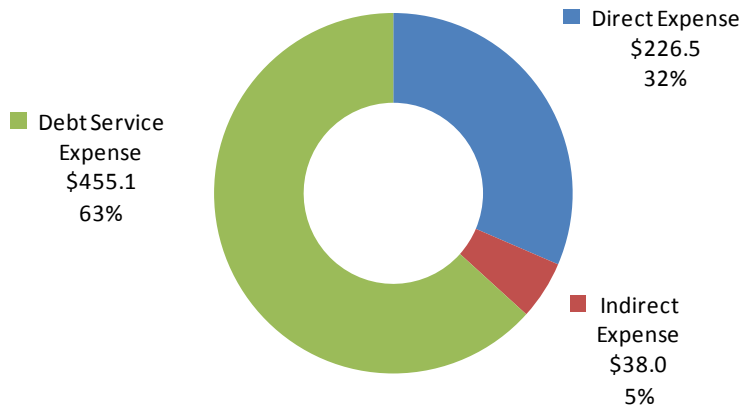
Measures taken by the Authority to achieve the 3.34% rate increase include:

- Continued practice of targeted defeasances;
- Budgeted 1,150 Full-Time Equivalent (FTE's) positions, 10 fewer than in FY16;
- Budgeted an \$11.0 million Debt Prepayment;
- Recognition of \$873,804 in Debt Service Assistance from the Commonwealth;
- Direct Expenses increased 1.7% versus FY16 budget;
- Indirect Expenses decreased 19.1% versus FY16 budget due to a prepayment of outstanding debt for land purchases to the Commonwealth, lower pension obligations and lower required payment for the Deer Island Wastewater Treatment Plant electrical cable lease.

MWRA continues to pursue a rate management strategy which promotes sustainable and predictable assessments and addresses the Authority's Pension and Other Post Employment Benefits (OPEB) related liabilities.

Total expenses are \$719.6 million, an increase of \$22.6 million or 3.2% over the FY16 Actuals. Capital financing costs remain the largest component of the CEB and account for 63.3% of total expenses. The receipt of \$873,804 in April 2016 for Debt Service Assistance is a direct offset to capital financing costs in FY17.

FY17 Current Expense Budget



Total expenses include \$455.1 million for Capital Financing costs and \$264.5 million for operating expenses, of which \$226.5 million is for Direct Expenses and \$38.0 million is for Indirect Expenses. The \$22.6 increase million over FY16 Actuals is mainly due to higher Capital Financing expenses of \$51.8 million, higher Direct Expenses of \$10.5 million due to inclusion of Cost of Living Adjustments (COLA) for staff, higher healthcare costs, and higher projected energy expenses, offset by a \$39.7 million decline in Indirect Expenses mostly for the one-time charge to prepay \$32.0 million of outstanding (FY17-22) debt to the Commonwealth for land purchased by the State for watershed protection. Pension expenses also decline due to a funding level of 98.3% in the latest actuarial evaluation.

The FY17 Rate Revenue Requirement is \$694.9 million, an increase of \$22.4 million or 3.34% over FY16. The Final FY17 Budget revenues, excluding rate revenue, total \$24.7 million, a decrease of \$10.2 million or 29.2% below FY16 Actuals. The Final FY17 Budget non-rate revenue budget includes \$15.3 million in Other User Charges and Other Revenue and \$9.5 million for Investment Income. The majority of the decrease reflects one-time water revenue for water provided to the City of Cambridge during an FY16 Combined Sewer Overflow (CSO) project.

The table on the following page shows MWRA's Final FY17 Budget for revenue and expenses compared with the FY16 and FY15 Actuals. Changes from FY16 to FY17 are described in the Revenue and Expense section of the Executive Summary.

Table I-1

TOTAL MWRA	FY15 Actuals	FY16 Actuals	FY17 Final Budget	Change FY17 Final vs FY16 Final	
				\$	%
EXPENSES					
WAGES AND SALARIES	\$ 94,350,655	\$ 96,118,427	\$ 101,858,897	\$ 5,740,470	6.0%
OVERTIME	4,521,867	4,355,586	\$ 4,192,676	(162,910)	-3.7%
FRINGE BENEFITS	18,325,579	19,131,139	\$ 20,242,324	1,111,185	5.8%
WORKERS' COMPENSATION	2,307,123	2,350,369	\$ 2,344,190	(6,179)	-0.3%
CHEMICALS	9,749,142	9,297,550	\$ 9,110,407	(187,143)	-2.0%
ENERGY AND UTILITIES	21,073,529	18,744,867	\$ 21,541,078	2,796,211	14.9%
MAINTENANCE	28,322,686	30,978,045	\$ 31,080,642	102,597	0.3%
TRAINING AND MEETINGS	369,657	370,752	\$ 435,481	64,729	17.5%
PROFESSIONAL SERVICES	4,950,866	5,886,717	\$ 6,531,939	645,222	11.0%
OTHER MATERIALS	6,060,042	6,186,216	\$ 6,219,630	33,414	0.5%
OTHER SERVICES	22,378,137	22,628,385	\$ 22,974,855	346,470	1.5%
TOTAL DIRECT EXPENSES	\$ 212,409,283	\$ 216,048,053	\$ 226,532,117	\$ 10,484,064	4.9%
INSURANCE	\$ 2,161,628	\$ 1,953,053	\$ 1,997,898	44,845	2.3%
WATERSHED/PILOT	27,167,900	59,469,847	24,291,268	(35,178,579)	-59.2%
HEEC PAYMENT	2,690,026	1,342,141	773,859	(568,282)	-42.3%
MITIGATION	1,459,902	1,520,000	1,558,000	38,000	2.5%
ADDITIONS TO RESERVES	482,953	(34,927)	(167,742)	(132,815)	380.3%
RETIREMENT FUND	7,824,155	8,159,521	3,132,624	(5,026,897)	-61.6%
ADDITIONAL PENSION DEPOSIT	-	-	1,500,000	1,500,000	
POSTEMPLOYMENT BENEFITS	4,821,320	5,224,848	4,876,050	(348,798)	-6.7%
TOTAL INDIRECT EXPENSES	\$ 46,607,884	\$ 77,634,482	\$ 37,961,957	\$ (39,672,526)	-51.1%
STATE REVOLVING FUND	\$ 75,066,883	\$ 78,131,559	\$ 86,971,915	8,840,356	11.3%
SENIOR DEBT	240,678,003	275,085,817	268,472,557	(6,613,260)	-2.4%
SUBORDINATE DEBT	99,686,106	49,222,442	69,997,992	20,775,550	42.2%
LOCAL WATER PIPELINE CP	263,758	262,498	4,149,242	3,886,744	1480.7%
CURRENT REVENUE/CAPITAL	10,200,000	11,200,000	12,200,000	1,000,000	8.9%
CAPITAL LEASE	3,217,060	3,217,060	3,217,060	-	0.0%
DEBT PREPAYMENT	-	-	10,994,960	10,994,960	
CORE FUND DEPOSIT	730,421	-	-	-	
BOND REDEMPTION	(6,745,598)	-	-	-	
VARIABLE RATE SAVINGS	(13,016,491)	(12,873,173)	-	12,873,173	-100.0%
DEFEASANCE ACCOUNT	-	-	-	-	
DEBT SERVICE ASSISTANCE	(853,660)	(873,804)	(873,804)	-	0.0%
TOTAL DEBT SERVICE	\$ 409,226,482	\$ 403,372,399	\$ 455,129,921	\$ 51,757,523	12.8%
TOTAL EXPENSES	\$ 668,243,648	\$ 697,054,934	\$ 719,623,995	\$ 22,569,062	3.2%
REVENUE & INCOME					
RATE REVENUE	\$ 650,315,783	\$ 672,440,000	\$ 694,878,500	22,438,500	3.34%
OTHER USER CHARGES	8,274,428	8,783,469	8,752,834	(30,635)	-0.3%
OTHER REVENUE	10,014,309	15,749,464	6,519,171	(9,230,293)	-58.6%
RATE STABILIZATION	-	-	-	-	
INVESTMENT INCOME	9,688,997	10,303,841	9,473,490	(830,351)	-8.1%
TOTAL REVENUE & INCOME	\$ 678,293,517	\$ 707,276,774	\$ 719,623,995	\$ 12,347,221	1.7%

FY17 Goals:

- Ensure delivery of reliable and cost-effective water and sewer services to customer communities.
- Ensure that water supply and wastewater collection and treatment preserve public health and protect natural resources.
- Continue to plan and develop long-term strategies to ensure sustainable and predictable assessments to our communities.
- Continue to invest in asset protection to ensure adequate availability of equipment and facilities to support core operations.
- Continue to aggressively pursue renewable and sustainable energy resources to reduce the environmental impacts of daily operations, increase energy efficiencies, and reduce overall operating costs.
- Continue to advocate MWRA interests in new and developing regulatory issues.

FY17 Initiatives:

- Recommend options for providing critical water redundancy throughout the Metropolitan system.
- Continue to identify, assess, and implement initiatives to reduce energy demand and increase energy self-generation in MWRA's system, including the projects noted in MWRA's Memorandum of Understanding with Eversource. Pursue grant-funding and cost-sharing arrangements to defray costs of implementing these initiatives.
- Provided lead testing in schools across the State to assist DEP and established, with Advisory Board support, a \$100.0 million lead removal loan program to member communities.
- Continue to meet or surpass environmental compliance standards for DITP as required by the National Pollutant Discharge Elimination System (NPDES) permit and air quality permits.
- Plan for implementation of requirements of the new National Pollutant Discharge Elimination System (NPDES) Permits for DITP (assume new permit is issued after FY17) and Clinton Wastewater Treatment Plant (assume new permit in effect for all of FY17).

FY17 Accomplishments:

- Completed a \$747.6 million refunding and new money bond transaction on May 12, 2016. The new money portion consisted of \$66.0 million in bonds used to permanently finance \$21.0 million of the tax-exempt revolving loan and remainder was deposited in the Construction Fund. The refunding for interest rates savings transaction totaled \$681.6 million. The refunded resulted in \$111.0 million or 14.6% present value savings and \$188.3 million in gross debt service savings over the life of the bonds. The level of savings on this transaction is significant

given that since 1992 MWRA had refunded \$5.3 billion in debt for \$283.3 million in present value savings.

- Executed a \$9.2 million and \$26.4 million defeasance of outstanding senior principal in September 2015 and June 2016 respectively. These defeasances reduced the debt service requirement between FY17 and FY22 by a total of \$42.9 million reducing the rate of increase to the Rate Revenue Requirement in those years.
- Maintained MWRA's strong credit ratings, Aa1, AA+, AA+ from Moody's, Standard & Poor's and Fitch respectively. MWRA's credit ratings from all three major agencies are only one ratings step below the highest rating of AAA. These high credit ratings enable MWRA to borrow at very advantageous interest rates which helps minimize debt service expenses.
- Expanded MWRA's primary security system and participated in the planning and execution of a week-long cyber security drill defending critical infrastructure.
- Received revenue for energy generated at numerous facilities including the following: hydroelectric of \$312,000 from Oakdale Station, \$138,000 from Cosgrove Station, and \$11,000 from the Loring Road Pump Station; wind of \$296,000 from Charlestown Pump Station; and solar of \$105,000 from Carroll Water Treatment Plant.
- Continued to leverage MWRA's self-generation assets and participation in the competitive energy market to offset operating costs. The combined impact of participation in the Independent System Operators of New England (ISO-NE) load response program, non-rate revenue from the sale of Renewable Portfolio Standards Program (RPS) credits, and receipt of utility rebates for CEB-funded efficiency projects resulted in \$2.7 million in revenue for FY16. Deer Island also self-generated ~28.5% of the plant's total required power during that time period.
- Processed 99.1 average tons per day of sludge at the Pelletization Plant and disposed of 5,490 tons of grit and screenings through a contracted vendor.
- In water system, inspected 174.49 miles of water mains and repaired 32 leaks.
- In the wastewater system, inspected 35.48 miles and cleaned 38.94 miles of MWRA pipeline. Also inspected more than 818 structures and rehabilitated 105 manhole frames and covers.
- At DITP, treated on average more than 99% of flows with full secondary treatment, and received the National Association of Clean Water Agencies' "Platinum Peak Performance Award" for 2015, which recognized that the plant had no permit violations in nine years.

SOURCES AND USES OF FUNDS

MWRA funds its operations primarily through member community assessments. Funds supporting the current expense budget are not subject to appropriation with the exception of debt service assistance. The table below shows MWRA's sources and uses of funds for The Final FY17 Budget.

Revenue

MWRA is required by its enabling act to balance its budget each year by establishing user assessments for water and sewer services that provide funds sufficient to recover the cost of operations (excluding depreciation), maintenance and improvements, and debt service, as well as meeting required reserve levels.

SOURCES & USES OF FUNDS*		
\$ in Millions		
<i>Sources of Funds</i>		
Other User Charges	\$8.8	1.2%
Other Revenue	6.5	0.9%
Investment Income	9.5	1.3%
Rate Revenue	694.9	96.6%
Rate Stabilization	0.0	0.0%
TOTAL REVENUE	\$719.6	100.0%
<i>Uses of Funds</i>		
Total Expenses before Debt		
Service Offsets	\$720.5	
Less:		
Debt Service Assistance	(0.9)	
Bond Redemption	-	
Sub-Total Net Expenses	719.6	
Capital Financing	456.0	63.3%
Direct Expenses	226.5	31.4%
Indirect Expenses	38.0	5.3%
TOTAL EXPENSES	\$720.5	100.0%
TOTAL EXPENSES Less Offsets	\$719.6	

*May not add up due to rounding

In the Final FY17 Budget, 96.6% of revenue is derived from rate revenue. The remaining 3.4% of revenue will come from interest on investments, charges to other water and sewer customers (including Chicopee Valley Aqueduct (CVA) communities), non-recurring revenue, annual charges to sewer system users with permits issued by MWRA's Toxic Reduction and Control Department (TRAC), penalties assessed to holders of sewer use permits, and other miscellaneous sources.

Rate Revenue

Under the Final FY17 Budget, the MWRA will raise \$694.9 million of its total revenue requirements from water and sewer assessments to member communities. Of the \$694.9 million, \$460.6 million will fund the sewerage system, an increase of 3.3% as compared to FY16; and \$234.3 million will fund the water system, an increase of 3.5% as compared to FY16.

Non-Rate Revenue

Other User Charges

Other User Charges include revenues derived from the provision of water and sewer services to communities and other entities under special agreements. Other User Charges in the Final FY17 Budget total \$8.8 million, nearly matching FY16 Actuals and includes \$4.9 million for Chicopee Valley Aqueduct (CVA) communities, \$1.6 million for Deer Island water usage, \$753,000 for entrance fees from member communities, and \$500,000 for the Commonwealth's partial reimbursement for Clinton Wastewater Treatment Plant expenses. Other User Charges are \$111,000 or 1.3% more than the FY16 Budget.

Other Revenue

Other Revenue is budgeted at \$6.5 million, a decrease of \$9.3 million or 58.6% from FY16 Actuals mostly due to one-time water revenue in FY16 related to water use by Cambridge during a CSO project. Other Revenue includes \$2.2 million in permit fees and penalties, \$3.2 million for the sale of Renewable Portfolio Credits, sale of generated power, and revenues for demand response programs.

Investment Income

MWRA earns income by investing reserves and fund balances in a variety of interest-yielding securities. The Final FY17 Budget includes \$9.5 million in investment income, a decrease of \$830,000 or 8.1% from FY16 Actuals due to having fewer funds invested long-term due to liquidity needs for the reserve release based on the amendments to the Bond Indenture anticipated for FY16. The FY17 short-term interest rate is 0.60% which is 40 basis points above the FY16 Budget.

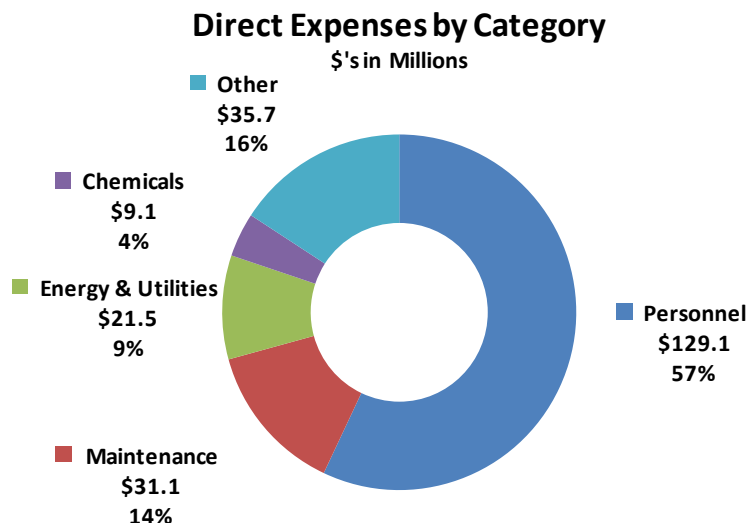
Non-Recurring Revenue

Non-Recurring Revenue is one-time revenue used in a given fiscal year to reduce assessments to member communities. In any fiscal year when annual revenues exceed expenses, MWRA may transfer the unexpended amount to the rate stabilization reserve. Within certain limits, MWRA may use this money to reduce the Rate Revenue Requirement in any subsequent year. Consistent with the requirements of its enabling act and its general bond resolution, MWRA treats transfers from the rate stabilization reserve as revenue in that fiscal year. For the Final FY17 Budget, no Rate Stabilization fund usage is projected.

Direct Program Expenses

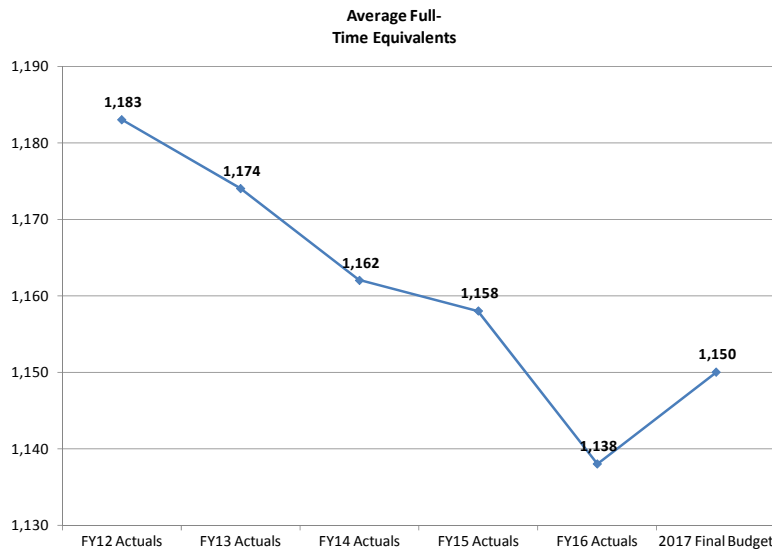
The Final FY17 Direct Expense Budget is \$226.5 million, \$10.5 million or 4.9% above FY16 Actuals. The principal drivers for the increase are wages and salaries due to cost of living adjustments (COLAs). Energy costs are projected to increase from FY16 lows in electricity and diesel, higher sludge expense processing reflecting higher contract indices, fringe benefits for projected healthcare cost increases, and higher maintenance. MWRA continues to manage direct expenses through implementing cost improvement initiatives, such as cross-training staff, competitive purchase of energy and chemicals, lease space reductions, and increased self-generation of electricity.

The chart below combines related direct expense line items into general cost categories and shows that labor costs (wages and salaries, overtime, fringe benefits, workers' compensation, and training) are the largest component of the direct expense budget 57%, other (professional services, other materials, and other services) 16%, maintenance 14%, utilities 9%, and chemicals 4%.



Wages and Salaries – The budget includes \$101.9 million for Wages and Salaries as compared to \$96.1 million expended in FY16, an increase of \$5.7 million or 6.0%. Regular Pay is 98.1% of total Wages and Salaries and increased by \$5.6 million over FT16 Actuals. On a Full-Time-Equivalent (FTE’s) basis the budget is set for 1,150, 12 positions higher than average FY16 actual average FTE of 1,138. The Authority has budgeted 1,150 FTE, the goal recommended to be achieved with a five-year time frame by Amawalk consultants in a 2012 staffing study. New hires and backfills of vacant positions continue to be managed at the agency level and addressed on a case-by-case basis by senior management.

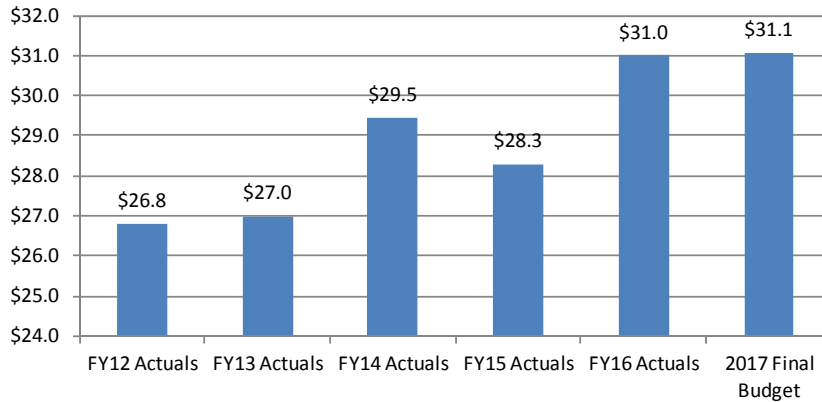
Fringe Benefits – The budget includes \$20.2 million for Fringe Benefits, an increase of \$1.1 million or 5.8% from FY16 Actuals. Health Insurance premiums total \$17.5 million, an increase of \$1.0 million or 6.1% from FY16 Actuals largely due to anticipated cost increases.



Maintenance – The budget includes \$31.1 million for Maintenance projects, an increase of \$103,000 or 0.3% from FY16 Actuals. The FY17 Maintenance request is in line with FY16 actual maintenance spending of \$31.0 million. Over the past 5 years, the general trend in maintenance spending has been increasing, consistent with an organization goal to adequately fund core operations and protect the Authority’s assets. Asset protection is a growing priority on both the current expense and capital improvement budgets.

Maintenance

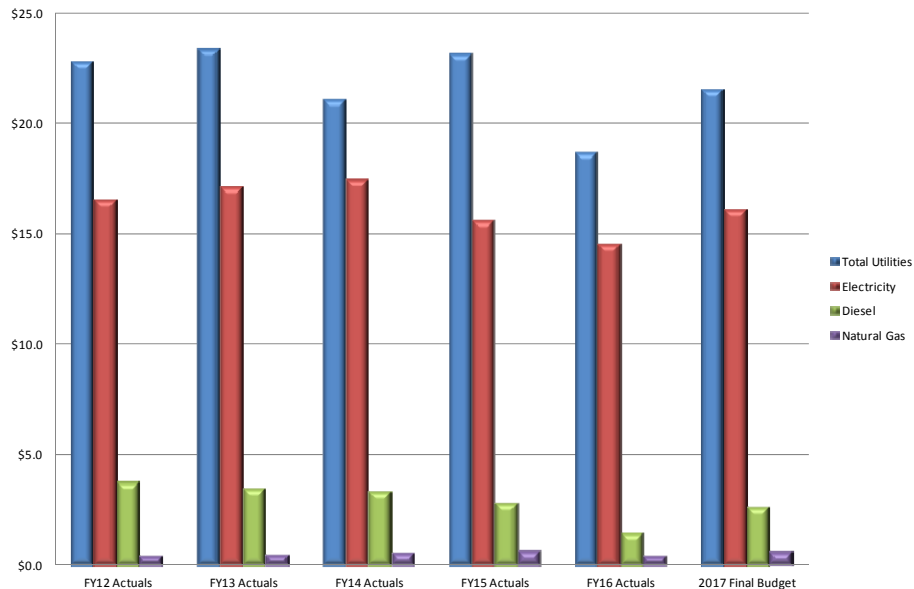
(\$ in millions)



Utilities – The budget includes \$21.5 million for Utilities, which is \$2.8 million or 14.9% higher than FY16 Actuals. The increase reflects underspending on electricity in FY16 due to lower than expected commodity pricing and lower than budgeted transmission and delivery expenses that are not projected to remain at this lower level in FY17. The budget funds \$16.1 million for Electricity, \$2.6 million for Diesel Fuel, \$2.1 million for Water, and \$577,000 for Natural Gas.

Utilities

\$s in millions



Chemicals – The budget includes \$9.1 million for Chemicals, an increase of \$187,000 or 2.0% from FY16 Actuals mainly due to the revised dosing levels for fluoride as well as updated assumptions for usage and pricing based on the most recent information. The FY17 Budget does not include any funding for the new Deer Island National Pollutant Discharge Elimination System (NPDES) permit which is projected to have more stringent requirements for enterococcus treatment compliance.

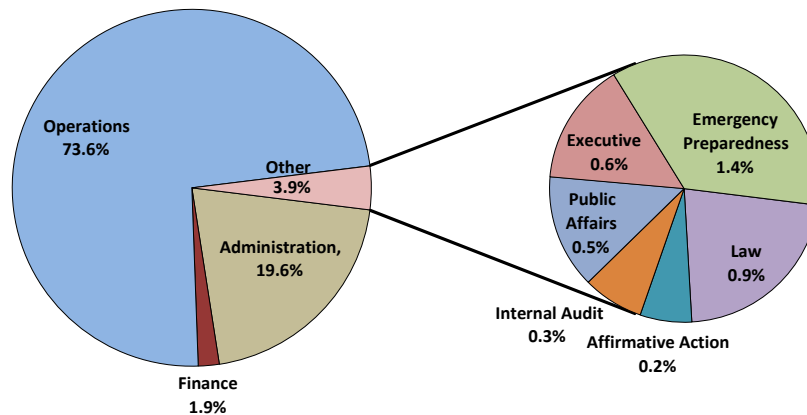
Other Services – The budget includes \$23.0 million for Other Services, an increase of \$347,000 or 1.5% from FY16 Actuals. The budget includes funding of \$13.1 million for Sludge Pelletization, \$3.6

million for Space/Lease Rentals and related expenses for the CNY and Chelsea facilities, \$2.0 million for Voice and Data costs, \$1.2 million for Grit & Screenings, and \$1.3 million for Other Services. The largest decrease is for Sludge Pelletization of \$965,000 due to decreases in inflation indices. This is offset by increases for Telecommunications of \$281,000 for increased lines for security initiatives, and Other Services of \$181,000 for the addition of funds to assist the member communities with lead service analysis.

Functional Area Budget Summary

The chart below shows the breakdown of the MWRA’s direct expense budget by division.

**MWRA Direct Expense Budgets
by Division**



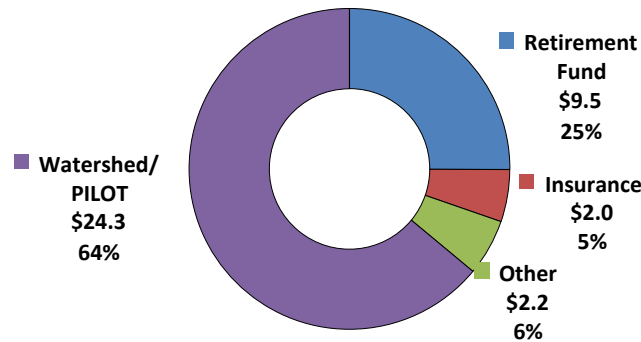
Indirect Program Expenses

The Final FY17 Indirect Expense Budget is \$38.0 million, \$39.7 million or 51.1%, below FY16 Actuals. FY16 Indirects include a one-time prepayment to the Commonwealth of \$32.0 million to retire the remaining \$33.7 million of watershed land purchase debt service for FY17-FY22 period. Going forward, there will be no debt component in the Watershed Management payment saving the Authority approximately \$5.6 million annually.

The following graph combines related indirect expense line items into the general cost categories and shows that Water Supply Protection Program expenses are the largest component of the indirect expense budget at 64% followed by Retirement Fund at 25%, Other (for items such as HEEC, Mitigation, and Addition to Reserves) at 6%, and Insurance at 5%.

Indirect Expenses by Category

\$'s in Millions



Insurance

MWRA purchases property and casualty insurance from external insurance carriers with a self-insured retention of \$2.5 million dollars and Worker’s Compensation Excess insurance with a self-insured retention of \$500,000 per claim. The budget includes \$2 million for Insurance, nearly matching FY16 Actuals. The FY17 Budget for premiums was based on the bids approved at the June 8, 2016 Board meeting and the claims budget was based on projected FY16 Actuals. The budget includes \$1.7 million for premiums and fees and \$440,000 for the projected cost of claims made against the self-insured portion of MWRA coverage. MWRA mitigates the budgetary risk of self-insurance by maintaining an Insurance Reserve. The reserve, which was established as part of the Bond Resolution, requires that an independent insurance consultant review the funding level every three years and provide recommendations as to its adequacy. The Insurance Reserve Fund is currently funded at \$14.0 million which was within the acceptable range as indentified in the insurance consultant review as of February 2014.

Watershed Reimbursement/PILOT

The Enabling Act directs MWRA to pay the Commonwealth of Massachusetts for several statutory obligations: Payment in Lieu of Taxes (PILOT) for Commonwealth-owned land in the watersheds and operating expenses of the Division of Water Supply Protection. The budget includes \$24.3 million for the Division of Water Supply Protection, a decrease of \$35.2 million or 59.2% versus the FY16 Actuals. The decrease is due to the debt prepayment of \$32.0 million in FY16 for the Commonwealth obligation for FY17-22, along with the scheduled FY16 payment of \$5.6 million, offset by higher operating expenses and PILOT payments in FY17.

Watershed Management FY16 Actuals vs. FY17 Budget

	FY16 Actuals	FY17 Budget	Variance
Operating	\$ 13,732,288	\$ 15,919,268	\$ 2,186,980
Pilot	\$ 8,128,726	\$ 8,372,000	\$ 243,274
Debt	<u>\$ 37,608,823</u>	<u>\$ -</u>	<u>\$(37,608,823)</u>
	\$ 59,469,837	\$ 24,291,268	\$(35,178,569)

Harbor Electric Energy Company (HEEC)

The budget includes \$774,000 for the Harbor Energy Electric Company (HEEC), a decrease of \$568,000 or 42.3% from FY16 Actuals. This funding is for the repayment of the capital investment for the Deer Island electric cable and substation which provides electric power to the treatment plant. The decrease is due to the expiration of the contractual obligations in May 2015, ending the amortization of the cable financing component of the capital investment.

Mitigation

MWRA disburses mitigation funds to communities affected by MWRA projects or facilities pursuant to MWRA's Statement of Mitigation Principles and/or specific agreements with communities. MWRA mitigation may include relieving the direct impacts of construction, meeting environmental and regulatory requirements, long-term operating agreements, or community compensation for impacts over and above those addressed by other mitigation. In rare situations, where the extent and duration of the impact of a project or facility on a community is such that restoring the area to its pre-project state is insufficient to relieve the stress of MWRA's presence during the project, MWRA funds or contributes to improvements to affected areas.

Mitigation expenses are funded in the capital budget and in the current expense budget. The Final FY17 Budget includes funding of \$1.6 million in potential community compensation for the City of Quincy and the Town of Winthrop. Both mitigation agreements expire in FY25.

Operating Reserves

The Final FY17 Budget includes a reduction of \$167,742 for the Operating Reserve, a decrease of \$132,815 from the FY16 Budget. The Operating Reserve balance is in compliance with MWRA General Bond Resolution which requires a balance of one-sixth of annual operating expenses. Based on the Final FY17 Budget, the required balance is \$39.2 million versus the \$39.4 million required in FY16.

Retirement System Contribution

The budget includes \$4.6 million for the Retirement Fund, a reduction of \$3.5 million or 56.8% over the FY16 required contribution. The minimum required contribution for FY17 is \$3.1 million based on the January 1, 2015 actuarial report. An additional pension deposit of \$1.5 million was also included in FY17 in recognition of lower than assumed returns on pension investments in Calendar Year 2015. The Pension Fund achieved virtual full funding as of January 1, 2015.

GASB 45 – Accounting and Reporting by Employers for Postemployment Benefits Other than Pensions

In the FY17 Budget the Authority proposes funding its OPEB liability at \$4.9 million, continuing the Authority's long-term commitment to address its liabilities. The Authority has complied with the GASB 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other than Pensions (OPEB)*, by disclosing this liability in the year-end Financial Statements. As part of the multi-year strategy to address its unfunded liabilities for OPEB and pension holistically, the Board approved a plan to pay down the pension liability and upon reaching full funding, move to address the OPEB obligation. This strategy was employed in the FY08-16 budgets (although temporarily halted in

FY11 to achieve a 1.5% rate increase). Based on the latest actuarial evaluation, MWRA's pension fund is at 98.3%. To maximize the benefits in terms of returns and accounting treatment, an irrevocable OPEB Trust was established after Board approval and funding started on April 23rd, 2015 with \$10,800,000 deposit. The source of the deposit was \$10 million cash reserves which became available due to the Amendments to the General Bond Resolution, and \$800,000 from funds appropriated in FY10 for funding OPEB. In FY16, \$5.2 million was deposited into the Trust on June 30th, 2016. The \$4.9 million in FY17 is 50% of the Actuarial Required Contribution (ARC) after the reduction of the pay-as-you-go portion budgeted under the Fringe line item, based on the January 1, 2014 actuarial report.

Capital Financing

Outstanding Debt and Debt Management

The \$8.0 billion spent on MWRA's modernization efforts since the Authority was established in 1986, has relied heavily on debt financing. Total debt as of June 30, 2016 was \$5.4 billion consisting of senior and subordinated debt, as well as Tax-Exempt Commercial Paper. The MWRA enjoys strong unenhanced senior debt ratings of Aa1, AA+, and AA+ from Moody's, Standard & Poor, and Fitch, respectively.

Type	Principal		% of Total
	Outstanding	June 30, 2016	
Senior General Revenue Bonds	\$	3,297,385,000	61.2%
Massachusetts Clean Water Trust	\$	1,035,796,957	19.2%
Subordinate General Revenue Bonds	\$	905,490,000	16.8%
Tax-Exempt Commercial Paper/Revolving Line of Credit	\$	149,000,000	2.8%
Total	\$	5,387,671,957	100.0%

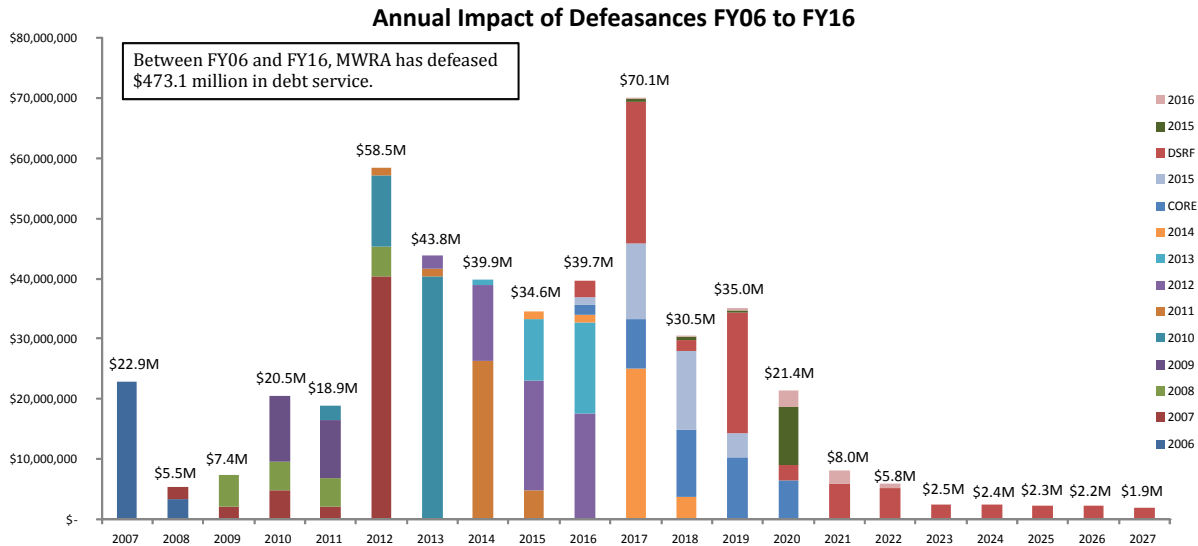
80.4% of MWRA's Debt is Fixed Rate

As a result of the Authority's Capital Improvement Program, Capital Finance as a percent of total expenses (before offsets) has increased steadily from 36% in 1990 to 63.3% in the FY17 Current Expense Budget. Most of this debt service is for completed projects, primarily the Boston Harbor Project and the Integrated Water Supply Improvement Program. The MWRA's capital spending, from its inception, had been dominated by projects mandated by court ordered or regulatory requirements, which in total have accounted for approximately 80% of capital spending to date. Going forward, with the substantial completion of the Combined Sewer Overflow (CSO) program in December 2015, the majority of spending will be focused on asset protection and water redundancy initiatives.

The Authority has actively managed its debt structure to take advantage of favorable interest rates. Tools used by the MWRA to lower borrowing costs and manage rates include current and advanced refunding of outstanding debt, maximizing the use of the subsidized State Revolving Fund (SRF) debt, issuance of variable rate debt, swap agreements, and the use of surplus revenues to defease debt. The MWRA also uses tax exempt commercial paper to minimize the financing cost of construction in process.

The Final FY17 Budget capital financing costs total \$455.13 million, including Debt Service Assistance of \$873,804 which was received in FY16 and used as a direct offset to the FY17 Budget Capital financing costs remain the largest portion of the MWRA's budget, accounting for 63.3% of total expenses.

The Final FY17 Budget includes a planned defeasance of \$5.4 million which will reduce debt service by approximately \$246,800 between FY17 and FY19, by \$2.7 million in FY20, \$2.0 million in FY21, and \$748,800 in FY22. The table below shows the defeasance amounts and annual reduction of debt service as a result of defeasances.



The Final FY17 Budget assumes a 3.25% interest rate for variable rate debt which is the same level as in FY16. The Authority’s variable rate debt assumption is comprised of three separate elements: the interest rate for the daily and weekly series; liquidity fees for the Standby Bond Purchase Agreement, Letter of Credit, and Direct Purchase providers; and remarketing fees. While MWRA continues to experience unusually low interest rates, they are not reflective of historical averages and there is no guarantee that rates will remain at this low level.

The Final FY17 Budget capital financing costs increased by \$51.8 million or 12.8% compared to the FY16 Actuals. This increase in the MWRA’s debt service is the result of including \$11.0 million for debt prepayment, projected FY17 borrowings and the structure of the debt, partially offset by the impact of the projected defeasance. The FY17 capital financing budget includes:

- \$268.5 million in principal and interest payments on MWRA’s senior fixed rate bonds. This amount includes \$5.6 million to support the issuance of \$125.0 million of new money in January 2017, and also includes a reduction of \$246,800 for the effect of the FY16 defeasance;
- \$70.0 million in principal and interest payments on subordinate bonds;
- \$87.0 million in principal and interest payments on SRF loans. This amount includes \$7.5 million to support issuances of \$41.0 of replacement loans and \$50.0 million in regular loans during Fiscal Year 2017;
- \$12.2 million to fund ongoing capital projects with current revenue;

- \$11.0 million debt prepayment to defease future debt payment reducing the Rate Revenue Requirement;
- \$4.1 million to fund the interest expense related to the Local Water Pipeline Assistance Program; and,
- \$3.2 million for the lease of property in Chelsea.

Capital Financing and Grant Revenues

In the past, MWRA has been able to finance approximately 20 percent of its capital spending with grant receipts, totaling approximately \$1.1 billion through FY03. However, since FY03, the MWRA has only received \$4.9 million in capital grants. In addition to participating in federal and state grant programs, the MWRA benefitted from the American Recovery and Reinvestment Act of 2009 which is projected to forgive approximately \$33.0 million in State Revolving Fund loan principal. The Authority continues to pursue grant funding and take advantage of any possible program available to maximize grant funding opportunities.

MWRA expects to borrow the majority of funds necessary for future capital spending. Borrowing will include the issuance of fixed and variable rate revenue bonds; borrowing from the Massachusetts Clean Water Trust (also known as the State Revolving Loan Fund or SRF), and a Tax-Exempt Commercial Paper program. The table below details the FY17 Final budget capital financing line item. It also shows how upgrading the sewerage system has dominated the capital program to date. Current and future borrowings increasingly support improvements to the water system. A complete list of the Authority's indebtedness by series is presented in Appendix F.

	Amount Outstanding	Total FY16 Capital Cost	Sewer	Water
Total SRF ¹	\$1,035.8	\$87.	\$67.2	\$19.7
Total Senior Debt	\$3,297.4	268.	173.7	94.
Total Subordinate Debt	\$905.5	70.	53.	16.
Total SRF and Debt Service²	\$5,238.7	\$425.4	\$294.0	\$131.4
Water Pipeline Commercial Paper	149.0	4.	0.	4.
Current Revenue/Capital ³		12.	9.	3.
Capital Lease		3.	1.	1.
Debt Prepayment ⁴		11.	7.	3.
	149.0	\$30.	\$18.8	\$11.8
Total Capital Financing (before Debt Service Offsets)	5,387.7	\$456.0	\$312.8	\$143.3
Debt Service Offsets:				
Debt Service Assistance		(0.9)	(0.8)	(0.1)
Bond Redemption		0.	0.	0.
Total Capital Financing	5,387.7	\$455.1	\$311.9	\$143.2

¹ SRF debt service payments reflect net MWRA obligations after state and federal subsidies.

² Numbers may not add due to rounding.

³ Current Revenue/Capital is revenue used to fund ongoing capital projects.

⁴ Debt Prepayment will be used for defeasance of bonds at end of fiscal year.

CIP Impact on Current Expense Budget

In addition to the annual financing costs included in the Current Expense Budget, the Capital Improvement Program affects the annual operating budget when capital facilities come on-line and require adjustments to operating budgets. In prior years, completion of the Deer Island Treatment Plant, the Carroll Water Treatment Plant, and the residuals processing facility in Quincy resulted in significant increases in operating expenses. Operating costs will be reduced by approximately \$539,000 through FY27, primarily due to Asset Protection projects at the Deer Island Treatment Plant. These reductions will be offset by IS program related maintenance initiatives that are projected to increase operating costs by \$559,000 by FY27. The following table summarizes the projected CIP impact on the operating budget by project over the next ten years.

Fiscal Year	CEB Impacts (\$ in thousands)										
	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	Total
DI Treatment Plant Asset Protection (not including Co-Digestion or Combined Heat and Power Plant)	(\$966)	\$983	(\$219)	(\$248)	\$0	(\$143)	\$0	\$0	\$0	\$0	(\$592)
DI Treatment Plant Asset Protection - Co-Digestion ONLY	0	0	0	0	0	0	0	0	0	0	0
Clinton Phosphorous Removal Project	29	30	0	0	0	0	0	0	0	0	60
Wastewater Alternative Energy Projects	0	0	0	0	0	0	0	0	0	0	0
North Dorchester Bay	361	(371)	0	0	0	418	(430)	0	0	0	(23)
Total Wastewater (inflated)	(\$576)	\$642	(\$219)	(\$248)	\$0	\$275	(\$430)	\$0	\$0	\$0	(\$556)
Empty	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Empty	0	0	0	0	0	0	0	0	0	0	0
Wachusett Algae Treatment Facility	0	0	0	39	41	0	0	0	0	0	80
Empty	0	0	0	0	0	0	0	0	0	0	0
Water Energy Projects	(31)	(32)	0	0	0	0	0	0	0	0	(63)
Total Water (inflated)	(\$31)	(\$32)	\$0	\$39	\$41	\$0	\$0	\$0	\$0	\$0	\$17
Maximo Upgrades & Lawson Enhancements	\$103	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$103
Storage Upgrades	103	106	0	0	0	0	0	0	0	0	209
Telecommunications	0	27	0	0	0	0	0	0	0	0	27
NET 2020 DITP & Southborough	0	0	0	0	0	0	0	0	0	0	0
Information Security Program	31	0	0	0	0	0	0	0	0	0	31
Information Technology Management Program	0	0	0	0	0	0	0	0	0	0	0
Application Improvement Program	0	0	82	0	0	0	0	0	0	0	82
IT Infrastructure Program	0	107	0	0	0	0	0	0	0	0	107
Total Business and Operations Support (inflated)	\$237	\$240	\$82	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$559
TOTAL MWRA	(\$370)	\$850	(\$137)	(\$208)	\$41	\$275	(\$430)	\$0	\$0	\$0	\$20

Rate Assessment and Methodology

Community Profile and Assessments

MWRA provides wholesale water and sewer services to 61 communities or local bodies. Fifty-one local bodies purchase water supply services, and 45 local bodies purchase wastewater transport and treatment services. Thirty-five local bodies purchase both. Approximately 2.9 million people, or 43% of the population of Massachusetts, live and work in the communities that purchase water and/or wastewater services from MWRA.

MWRA's largest single customer is the Boston Water and Sewer Commission (BWSC), which provides retail services in the City of Boston. In the Final FY17 Budget, rate revenue from BWSC will account for 31% of MWRA's total rate revenue. The table on page I-20, lists MWRA communities, the services received, and the MWRA assessments for FY17.

Each year MWRA determines preliminary wholesale water and sewer assessments in February and final assessments in June before the beginning of the new fiscal year. These assessments must satisfy the statutory requirement that MWRA fully recover its budgeted water and sewer costs by apportioning net costs among its wholesale water and sewer customers.

The table on page I-21 presents the calculation of MWRA's Final FY17 Rate Revenue Requirement. The table shows that most of MWRA's current expenses are directly attributable to either water or sewer service costs, or to investment in the water or sewer systems. Expenses that support both systems are allocated to water or sewer assessments based on generally accepted cost allocation principles. Investment Income and Other Revenues offset water and sewer expenses. The resulting net cost of water and sewer services is the amount MWRA recovers through water and sewer assessments.

Wholesale Assessment Methodology

MWRA calculates separate user assessments for water and sewer services. Budgeted water operating and capital costs are allocated based on each community's share of total water use for the most recent calendar year. The sewer assessment methodology allocates budgeted operating and maintenance costs based on share of wastewater flow and strength parameters, and capital costs based on proportion of maximum flow, strength, and population. MWRA uses three-year averaging of wastewater flows to calculate the flow-related components of wholesale sewer assessments. Flow averaging moderates the short-term impact of year-to-year changes in community flow, but does not eliminate the long-term impact of changes in each community's relative contribution to the total flow.

MWRA Fully Served Water and Sewer Customers	Final FY16 Water Assessment	Final FY17 Water Assessment	Percent Change from FY16	Final FY16 Sewer Assessment	Final FY17 Sewer Assessment	Percent Change from FY16	Final FY16 Combined Assessment	Final FY17 Combined Assessment	Dollar Change from FY16	Percent Change from FY16
ARLINGTON	\$4,724,970	\$4,976,564	5.3%	\$7,699,278	\$7,993,120	3.8%	\$12,424,248	\$12,969,684	\$545,436	4.4%
BELMONT	2,674,576	2,828,456	5.8%	4,624,861	4,825,479	4.3%	7,299,437	7,653,935	354,498	4.9%
BOSTON (BWSC)	80,205,208	82,771,709	3.2%	129,701,392	132,271,845	2.0%	209,906,600	215,043,554	5,136,954	2.4%
BROOKLINE	6,910,863	7,046,691	2.0%	12,639,575	12,894,419	2.0%	19,550,438	19,941,110	390,672	2.0%
CHELSEA	4,155,184	4,215,080	1.4%	7,435,243	7,663,315	3.1%	11,590,427	11,878,395	287,968	2.5%
EVERETT	4,636,654	4,948,191	6.7%	8,056,404	8,124,101	0.8%	12,693,058	13,072,292	379,234	3.0%
FRAMINGHAM	8,243,826	8,159,808	-1.0%	11,893,982	12,824,962	7.8%	20,137,808	20,984,770	846,962	4.2%
LEXINGTON	6,695,144	7,349,661	9.8%	6,970,176	7,265,870	4.2%	13,665,320	14,615,531	950,211	7.0%
MALDEN	6,941,818	6,950,768	0.1%	12,439,049	12,941,073	4.0%	19,380,867	19,891,841	510,974	2.6%
MEDFORD	6,432,009	6,432,219	0.0%	11,355,458	11,878,789	4.6%	17,787,467	18,311,008	523,541	2.9%
MELROSE	2,853,930	2,915,635	2.2%	6,054,875	6,251,952	3.3%	8,908,805	9,167,587	258,782	2.9%
MILTON	3,156,824	3,360,396	6.4%	5,018,915	5,362,055	6.8%	8,175,739	8,722,451	546,712	6.7%
NEWTON	12,205,271	12,950,552	6.1%	19,710,607	20,518,241	4.1%	31,915,878	33,468,793	1,552,915	4.9%
NORWOOD	3,755,101	3,652,867	-2.7%	6,718,885	7,023,166	4.5%	10,473,986	10,676,033	202,047	1.9%
QUINCY	11,918,042	11,776,311	-1.2%	19,481,076	19,971,978	2.5%	31,399,118	31,748,289	349,171	1.1%
READING	2,032,766	2,109,549	3.8%	4,624,378	4,769,928	3.1%	6,657,144	6,879,477	222,333	3.3%
REVERE	5,013,281	4,943,964	-1.4%	10,261,623	10,611,549	3.4%	15,274,904	15,555,513	280,609	1.8%
SOMERVILLE	7,060,400	7,658,290	8.5%	15,585,894	15,918,035	2.1%	22,646,294	23,576,325	930,031	4.1%
STONEHAM	3,381,301	3,174,690	-6.1%	4,429,220	4,542,049	2.5%	7,810,521	7,716,739	(93,782)	-1.2%
WALTHAM	8,631,171	9,384,159	8.7%	12,680,425	13,122,122	3.5%	21,311,596	22,506,281	1,194,685	5.6%
WATERTOWN	3,392,382	3,290,986	-3.0%	5,760,051	5,971,377	3.7%	9,152,433	9,262,363	109,930	1.2%
WINTHROP	1,629,550	1,643,615	0.9%	3,183,339	3,320,069	4.3%	4,812,889	4,963,684	150,795	3.1%
TOTAL	\$196,650,271	\$202,540,161	3.0%	\$326,324,706	\$336,065,494	3.0%	\$522,974,977	\$538,605,655	\$15,630,678	3.0%

MWRA Sewer and Partial Water Customers	Final FY16 Water Assessment	Final FY17 Water Assessment	Percent Change from FY16	Final FY16 Sewer Assessment	Final FY17 Sewer Assessment	Percent Change from FY16	Final FY16 Combined Assessment	Final FY17 Combined Assessment	Dollar Change from FY16	Percent Change from FY16
CANTON	\$1,286,728	\$1,673,754	30.1%	\$3,933,960	\$4,137,162	5.2%	\$5,220,688	\$5,810,916	\$590,228	11.3%
NEEDHAM	1,012,962	1,039,372	2.6%	5,408,445	5,683,915	5.1%	6,421,407	6,723,287	301,880	4.7%
STOUGHTON	1,106,344	1,144,245	3.4%	4,392,863	4,747,341	8.1%	5,499,207	5,891,586	392,379	7.1%
WAKEFIELD	1,855,071	1,852,218	-0.2%	5,563,282	5,813,697	4.5%	7,418,353	7,665,915	247,562	3.3%
WELLESLEY	852,477	1,056,294	23.9%	5,278,300	5,459,750	3.4%	6,130,777	6,516,044	385,267	6.3%
WILMINGTON	353,379	703,075	99.0%	2,476,867	2,595,601	4.8%	2,830,246	3,298,676	468,430	16.6%
WINCHESTER	1,234,222	1,544,349	25.1%	3,868,461	4,033,770	4.3%	5,102,683	5,578,119	475,436	9.3%
WOBURN	3,091,283	3,355,306	8.5%	9,492,994	9,324,662	-1.8%	12,584,277	12,679,968	95,691	0.8%
TOTAL	\$10,792,466	\$12,368,613	14.6%	\$40,415,172	\$41,795,898	3.4%	\$51,207,638	\$54,164,511	\$2,956,873	5.8%

MWRA Sewer-only Customers	Final FY16 Water Assessment	Final FY17 Water Assessment	Percent Change from FY16	Final FY16 Sewer Assessment	Final FY17 Sewer Assessment	Percent Change from FY16	Final FY16 Combined Assessment	Final FY17 Combined Assessment	Dollar Change from FY16	Percent Change from FY16
ASHLAND				\$2,380,635	\$2,485,174	4.4%	\$2,380,635	\$2,485,174	\$104,539	4.4%
BEDFORD				3,199,185	3,368,331	5.3%	3,199,185	3,368,331	169,146	5.3%
BRAINTREE				8,507,387	9,100,270	7.0%	8,507,387	9,100,270	592,883	7.0%
BURLINGTON				4,905,353	5,078,461	3.5%	4,905,353	5,078,461	173,108	3.5%
CAMBRIDGE				23,259,670	23,745,695	2.1%	23,259,670	23,745,695	486,025	2.1%
DEDHAM				5,063,931	5,311,572	4.9%	5,063,931	5,311,572	247,641	4.9%
HINGHAM SEWER DISTRICT				1,695,096	1,798,028	6.1%	1,695,096	1,798,028	102,932	6.1%
HOLBROOK				1,657,660	1,759,996	6.2%	1,657,660	1,759,996	102,336	6.2%
NATICK				5,526,614	5,756,705	4.2%	5,526,614	5,756,705	230,091	4.2%
RANDOLPH				6,011,817	6,272,186	4.3%	6,011,817	6,272,186	260,369	4.3%
WALPOLE				3,559,098	3,713,877	4.3%	3,559,098	3,713,877	154,779	4.3%
WESTWOOD				2,473,296	2,598,265	5.1%	2,473,296	2,598,265	124,969	5.1%
WEYMOUTH				11,087,503	11,765,811	6.1%	11,087,503	11,765,811	678,308	6.1%
TOTAL				\$79,327,245	\$82,754,371	4.3%	\$79,327,245	\$82,754,371	\$3,427,126	4.3%

MWRA Water-only Customers	Final FY16 Water Assessment	Final FY17 Water Assessment	Percent Change from FY16	Final FY16 Sewer Assessment	Final FY17 Sewer Assessment	Percent Change from FY16	Final FY16 Combined Assessment	Final FY17 Combined Assessment	Dollar Change from FY16	Percent Change from FY16
LYNNFIELD WATER DISTRICT	\$614,185	\$643,348	4.7%				\$614,185	\$643,348	\$29,163	4.7%
MARBLEHEAD	2,278,325	2,341,415	2.8%				2,278,325	2,341,415	63,090	2.8%
NAHANT	425,527	476,532	12.0%				425,527	476,532	51,005	12.0%
SAUGUS	3,645,083	3,692,889	1.3%				3,645,083	3,692,889	47,806	1.3%
SOUTHBOROUGH	850,020	948,422	11.6%				850,020	948,422	98,402	11.6%
SWAMPSCOTT	1,827,959	1,834,151	0.3%				1,827,959	1,834,151	6,192	0.3%
WESTON	2,240,675	2,445,970	9.2%				2,240,675	2,445,970	205,295	9.2%
TOTAL	\$11,881,774	\$12,382,727	4.2%				\$11,881,774	\$12,382,727	\$500,953	4.2%

MWRA Partial Water-only Customers	Final FY16 Water Assessment	Final FY17 Water Assessment	Percent Change from FY16	Final FY16 Sewer Assessment	Final FY17 Sewer Assessment	Percent Change from FY16	Final FY16 Combined Assessment	Final FY17 Combined Assessment	Dollar Change from FY16	Percent Change from FY16
DEDHAM-WESTWOOD WATER DISTRICT	\$305,532	\$196,381	-35.7%				\$305,532	\$196,381	(\$109,151)	-35.7%
LYNN (LWSC)	264,873	243,938	-7.9%				264,873	243,938	(20,935)	-7.9%
MARLBOROUGH	3,894,026	3,887,876	-0.2%				3,894,026	3,887,876	(6,150)	-0.2%
NORTHBOROUGH	1,103,542	1,135,772	2.9%				1,103,542	1,135,772	32,230	2.9%
PEABODY	1,480,393	1,507,269	1.8%				1,480,393	1,507,269	26,876	1.8%
TOTAL	\$7,048,366	\$6,971,236	-1.1%				\$7,048,366	\$6,971,236	(\$77,130)	-1.1%
SYSTEMS TOTAL	\$226,372,877	\$234,262,737	3.49%	\$446,067,123	\$460,615,763	3.26%	\$672,440,000	\$694,878,500	\$22,438,500	3.34%

Retail Charges

As noted above, MWRA provides water and sewer services to communities on a wholesale basis. Each community then re-sells services on a retail basis. As a result, household water and sewer charges include each household's share of the community's MWRA water and sewer assessments, plus the community's own charges for the provision of local water and sewer services.

Each community independently establishes retail rates. When establishing local rates, community officials consider issues related to the pricing of services, level of cost recovery, and the local rate structure or methodology. Several factors contribute to a broad range of local rate structures in the MWRA service area:

- Differences in the extent to which water and sewer costs are supported through property taxes and other sources of revenue;
- Differences in the means by which communities finance investments in their own water and sewer systems; and
- Differences in communities' retail rate methodologies.

Some communities have flat unit rates, while others have inclining block rates. Local rates may also provide for differentials among classes of users, such as higher rates for commercial or industrial users, abatements to low-income or elderly residents, and adjusted sewer rates for customers with second meters used for lawn irrigation.

Additional information on rate structure within the member communities is available on the MWRA Advisory Board website as part of its annual retail rate survey.

Calculation of the FY17 Rate Revenue Requirement (000's)

	Sewer	Water	Total
Allocated Direct Expenses	\$150,525	\$76,007	\$226,532
Allocated Indirect Expenses	\$9,142	\$28,820	\$37,962
PLUS			
Capital Expenses:			
Debt Service (less offsets)	\$301,026	\$134,538	\$435,564
Current Revenue for Capital	\$8,975	\$3,225	\$12,200
Other Capital Expenses	\$1,943	\$5,423	\$7,366
PLUS			
Non-Rate Revenue:			
Investment Income	-\$5,318	-\$4,156	-\$9,473
Fees and Other Revenue	-\$5,678	-\$9,594	-\$15,272
Rate Stabilization	\$0	\$0	\$0
EQUALS			
Rate Revenue Requirement	\$460,616	\$234,263	\$694,879

Revenue and Expenditure Trends

Because MWRA is required by its enabling act to balance its budget and to establish annual assessments to cover all expenses, revenue must change as expenses are changing each year. The Rate Revenue Requirement in any year is the difference between MWRA expenses and other revenue sources, most notably non-rate revenue, investment income, and debt service assistance from the Commonwealth (which directly reduces debt service expense). For FY17, community assessments are projected to represent 96.6% of total revenue.

MWRA's planning estimates are projections based on a series of assumptions about future spending (operating and capital), interest rates, inflation, and other factors. MWRA uses the planning estimates to model and project what future rate increases might be based upon these assumptions, as well as to test the impact of changes to assumptions on future rate increases. The planning estimates are not predictions of what rate increases will be but rather they provide the context and framework for guiding MWRA financial policy and management decision making that ultimately determine the level of actual rate increases on an annual basis. Conservative projections of future rate increases benefit the MWRA by providing assurance to the rating agencies that MWRA anticipates to raise revenues sufficient to pay for its operations and outstanding debt obligations now and over the long-term. Additionally, conservative forecasts of rate revenue increases enable member communities to adequately plan and budget for future payments to MWRA.

MWRA also updates its estimates of anticipated revenues and expenses over a multi-year planning horizon. These estimates provide a context for budget discussions and allow MWRA to consider multiple-year rates management implications and strategies as it evaluates alternative capital and operating budget options, the ultimate goal being sustainable and predictable assessment increases.

The table below and Appendix D (in more detail) present the combined estimated future rate revenue requirements for FY17 through FY26. The planning estimates include unbudgeted Debt Service Assistance from the Commonwealth received in April 2016, which is being used to offset the FY17 budget and rate revenue requirement. Otherwise, the planning estimates assume no Debt Service Assistance and use of Rate Stabilization and Bond Redemption reserves through FY2026 to manage the rate increases. These projections also include the release of cash and debt service reserves starting in FY16 as a result of Bond Indenture changes.

Rates & Budget Projections											
Final FY17 CEB	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026
Total Rate Revenue (\$000)	\$ 672,440	\$ 694,879	\$ 721,192	\$ 748,409	\$ 776,656	\$ 805,868	\$ 836,281	\$ 837,450	\$ 832,074	\$ 834,385	\$ 859,611
Rate Revenue Change from Prior Year (\$000)	\$ 22,124	\$ 22,438	\$ 26,313	\$ 27,217	\$ 28,248	\$ 29,211	\$ 30,413	\$ 1,169	\$ (5,375)	\$ 2,311	\$ 25,226
Rate Revenue Increase	3.4%	3.3%	3.8%	3.8%	3.8%	3.8%	3.8%	0.1%	-0.6%	0.3%	3.0%
Use of Reserves (\$000)	\$ -	\$ -	\$ -	\$ -	\$ 6,873	\$ 10,338	\$ 26,540	\$ -	\$ -	\$ -	\$ 18,868

Estimated Household Bill

Based on annual water usage of 61,000 gallons	\$1,051	\$1,096	\$1,145	\$1,196	\$1,250	\$1,307	\$1,365	\$1,410	\$1,453	\$1,502	\$1,567
Based on annual water usage of 90,000 gallons	\$1,551	\$1,617	\$1,689	\$1,765	\$1,845	\$1,928	\$2,014	\$2,080	\$2,143	\$2,216	\$2,312

Increasing debt service to pay down and finance the capital improvement program is the most important factor driving estimates of future budget increases. Over the past several years MWRA's Tax-Exempt Commercial Paper program, debt refinancing, federal grants, SRF loans, and Commonwealth debt service assistance have mitigated the impact on ratepayers of new capital spending. However, new water system improvements, for which there are fewer non-ratepayer sources of funding, and the impact of new financing will increase MWRA capital financing costs over the next several years.

MWRA employs rates management tools where available (e.g. refunding for savings, extended

maturities on future borrowings, variable rate debt, and increased use of Tax-Exempt Commercial Paper) to help cushion and smooth the growth in capital financing expenses. Despite these initiatives, the size of the capital program will unavoidably continue to drive increases in community assessments.

The second largest budget factor is projected growth of base operating costs. The estimated \$64.8 million increase in direct expenses from FY17 to FY26 is primarily the result of an assumed annual inflation rate.

MWRA's planning estimates are projections based on a series of assumptions about future spending (operating and capital), interest rates, inflation, and other factors. The assumptions include:

- Direct expense inflation rate of 2.5% for salaries and 3.0% for other direct expenses starting in FY18;
- CIP inflation rate of 2.5%;
- Capital spending based on the latest CIP expenditure forecast for FY17 to FY19, and FY23 to FY26. Capital spending is capped between FY20 to FY22.
- Long-term fixed rate debt issues with 30-year terms and 5.0% interest rates in FY17, 5.25% rates in FY18, 5.5% rates in FY19, 5.75% rates in FY20 and 6.0% rates from FY21 and beyond;
- Variable rate interest projected at 3.25% in FY17, 3.50% in FY18, 3.75% in FY19, and 4.0% thereafter.

The planning estimates generally use conservative assumptions to help communities plan for future payments to MWRA.

There are several areas where differences from planning estimate assumptions may alter projected increases:

- Changes in anticipated borrowing rates or expected investment income rates;
- The planning estimates do not factor in any positive year-end variances which may be used to defease debt or reserved to offset Rate Revenue Requirements in future years;
- Fewer opportunities for SRF borrowing than expected due to Federal Budget cuts; a dollar borrowed through the SRF at 2% replaces the need to borrow a dollar long-term at an assumed 5% rate;
- Overall inflationary pressures;
- Debt refinancing opportunities;
- Capital spending; and
- Growth in direct expenses, greater than current assumptions.

MWRA Rates Management

Planning estimates for 2017 through 2026 forecast rate revenue requirement increases of 3.34% in FY17, 3.8% annually from FY18 through FY22, 0.1% in FY23, -0.6% in FY24, 0.3% in FY25, and 3.0% in FY26.

The FY17 Budget:

- Continues to refine planning estimates assumptions to provide greater predictability of future assessments;
- Judiciously uses reserves to lower rate increases, but maintain adequate balances;
- Continues the Authority's multi-year rates management strategy of providing sustainable and predictable assessment increases to our member communities; and
- For the first time, implements a smoothing strategy to even out the rate revenue requirement and rate changes caused by fluctuations in debt service at the utility level.

MWRA Organization

MWRA has five separate divisions and the Affirmative Action and Compliance Unit Department (AACU).

Each division provides operations or support services to carry out MWRA's activities under the direction of the Executive Office. MWRA's organizational structure is included in the document before the Table of Contents.

The **Executive Office** provides centralized MWRA management, direction, and policy development. The budget includes funds for the Office of the Executive Director, the Board of Directors, the Advisory Board, and other advisory committees. It includes the following departments: Office of Emergency Preparedness; Public Affairs; and Internal Audit.

The **Operations Division** operates the water and wastewater treatment systems; the water transmission and distribution system; the wastewater collection, transport, and combined sewer overflow (CSO) systems; and the residuals processing facility. It also provides laboratory and engineering and construction services; enforces sewer use regulations and seeks to limit the discharges of toxic materials; manages environmental studies of Boston Harbor and Massachusetts Bay; monitors water quality; and includes the Planning and Coordination Department.

The **Administration Division** is responsible for managing the support services functions of the Authority.

The Administration is comprised of seven departments: Director's Office; Facilities; Fleet Services; Human Resources; Management Information Systems (MIS); Procurement; and Real Property and Environmental Management.

The Administration Division performs a multitude of functions that support the daily operations and ensure the implementation of the Authority's long term goals and strategies.

The **Finance Division** is responsible for managing the finance functions of the Authority.

Finance Division is comprised of five departments: Director's Office; Rates and Budget; Treasury; Controller; and Risk Management.

The Finance Division ensures that a variety of fiscal management systems are in place to monitor and control the Current Expense Budget (CEB) and Capital Improvement Program (CIP).

The **Law Division** provides legal counsel to all divisions on compliance with federal and state law, real estate matters, labor and employment law, litigation, and construction issues. Division attorneys provide or supervise through outside counsel the representation of MWRA in all litigation.

The **Affirmative Action and Compliance Unit (AACU) Department** develops, administers and monitors compliance of Affirmative Action Plan programs and policies by ensuring equal opportunity and non-discrimination in employment and equitable access of Minority/Women Business Enterprises (MBE/WBE) in Authority procurement activities.

Statement of Financial Position

In accordance with its enabling act, each year MWRA submits annual reports to the Governor, the President of the State Senate, the House of Representatives, the Advisory Board, and the Chairs of the State Senate and House Committees on Ways and Means containing financial statements relating to its operations maintained in accordance with Generally Accepted Accounting Principles in the United States of America (GAAP) and, commencing with the annual reports for 1986, audited by independent certified public accountants. MWRA's audited financial statements at June 30, 2016 are available online at www.mwra.com.



Executive Office
Budget

EXECUTIVE DIVISION

Executive

Office of Executive Director
Office of Emergency Preparedness
Internal Audit
Public Affairs

FY17 Final Current Expense Budget EXECUTIVE DIVISION						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 540,943	\$ 578,597	\$ 608,188	\$ 598,347	\$ (9,841)	-1.6%
OVERTIME	-	65	61	-	(61)	-100.0%
TRAINING & MEETINGS	612	43	97	850	753	775.0%
PROFESSIONAL SERVICES	158,222	155,009	164,819	171,380	6,561	4.0%
OTHER MATERIALS	2,037	3,069	2,089	3,485	1,396	66.8%
OTHER SERVICES	470,520	499,041	525,648	541,134	15,486	2.9%
TOTAL	\$ 1,172,334	\$ 1,235,824	\$ 1,300,902	\$ 1,315,196	\$ 14,294	1.1%

FY17 Final Current Expense Budget EXECUTIVE DIVISION						
DEPARTMENT	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
EXECUTIVE OFFICE	\$ 473,229	\$ 506,811	\$ 537,059	\$ 524,168	\$ (12,891)	-2.4%
BOARD OF DIRECTORS	74,124	78,863	77,379	82,662	\$ 5,283	6.8%
ADVISORY BOARD / OTHER COMMITTEES	624,981	650,150	686,464	708,366	21,902	3.2%
TOTAL	\$ 1,172,334	\$ 1,235,824	\$ 1,300,902	\$ 1,315,196	\$ 14,294	1.1%

The **Executive Office** provides executive management and guides the implementation of MWRA policies established by the Board of Directors. It is responsible for developing and implementing specific goals and programs to achieve MWRA's primary mission of providing reliable and efficient water and sewer services, improving water quality, and for creating a framework within which all divisions can operate effectively. The Executive Office oversees a centralized MWRA-wide security program to preserve and protect MWRA facilities, systems and employees.

The Executive Office has direct oversight of the Office of Emergency Preparedness, Internal Audit, Public Affairs, and the Affirmative Action and Compliance Unit (AACU) Departments.

FY17 Goals:

- Ensure delivery of reliable and cost-effective water and sewer services to customer communities.
- Ensure that water supply and wastewater collection and treatment preserve public health and protect natural resources.
- Provide overall management of the agency and ensure adherence to all applicable policies and regulations.

- Continue to aggressively pursue renewable and sustainable energy resources to reduce the environmental impacts of daily operations, increase energy efficiencies, and reduce overall operating costs.
- Manage communication and garner support from key constituents for MWRA programs.

The Executive Office budget supports the Executive Director's Office (which includes the Board of Directors' cost center), the MWRA Advisory Board, and Advisory Committees' cost centers. The Board of Directors formulates policies to guide MWRA actions and is responsible for major policy and fiscal decision-making. The MWRA Advisory Board was established by the Enabling Act to serve as "watchdog" for MWRA's customer communities. The Advisory Board makes recommendations to MWRA on annual expense budgets and capital improvement programs. In addition, the Advisory Board reviews and comments on MWRA reports, hold hearings on related matters, and makes recommendations to the Governor and the Legislature. The other advisory committees supported by this budget are the Water Supply Citizens' Advisory Committee and the Wastewater Advisory Committee. The Executive Office budget accounts for less than 1% of the MWRA FY17 Final Direct Expense Budget.

Budget Highlights:

- The FY17 Final Budget is \$1.3 million, an increase of \$14,000 or 1.1%, as compared to FY16 Actuals.
- \$598,000 for **Wages and Salaries**, a decrease of \$10,000 or 1.6%, as compared to FY16 Actuals. The FY17 Final Budget includes funding for five positions, the same as the FY16 Budget.
- \$171,000 for **Professional Services**, an increase of \$7,000 or 4%, as compared to FY16 Actuals, mainly due to projected increases in the Advisory Committees' operating expenses. This budget funds the Water Supply Citizens' Advisory Committee (WSCAC) and the Wastewater Advisory Committee (WAC) budgets.
- \$541,000 for **Other Services**, an increase of \$15,000 or 3%, as compared to FY16 Actuals, mainly due to projected increases in the MWRA Advisory Board operating expenses which include wages and salaries, space rental, and general administrative office expenses.

OFFICE OF EMERGENCY PREPAREDNESS

FY17 Final Current Expense Budget OFFICE OF EMERGENCY PREPAREDNESS						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 488,502	\$ 554,860	\$ 509,627	\$ 603,837	\$ 94,210	18.5%
OVERTIME	771	797	-	-	-	-
MAINTENANCE	329,657	553,878	598,220	499,651	(98,569)	-16.5%
TRAINING & MEETINGS	1,902	3,915	6,808	17,000	10,192	149.7%
PROFESSIONAL SERVICES	1,727,302	1,804,732	1,845,169	1,920,000	74,831	4.1%
OTHER MATERIALS	21,746	12,849	44,999	18,967	(26,032)	-57.8%
OTHER SERVICES	18,821	110,950	111,395	121,124	9,729	8.7%
TOTAL	\$ 2,588,701	\$ 3,041,980	\$ 3,116,218	\$ 3,180,579	\$ 64,361	2.1%

The **Office of Emergency Preparedness (OEP)** was created in November 2005 to consolidate Authority-wide security and emergency response functions. It is responsible for oversight of the MWRA's security and emergency response plans, policies, and procedures; implementation and training for the Emergency Response Plan; and management, training, and outfitting of the Emergency Service Unit (ESU), which will respond to any intentional or accidental contamination of the water supply. The Director of Emergency Planning and Preparedness reports directly to the Executive Director.

FY17 Goals:

- Develop and implement policies and programs to provide security, critical infrastructure protection, and emergency planning for the MWRA's water and wastewater systems.
- Expand, equip, train, and lead the Emergency Service Unit (ESU).
- Develop and exercise emergency plans and procedures.
- Manage and direct security guard, security monitoring, and security maintenance contracts.

FY17 Initiatives:

- Procure a new Security Equipment Maintenance and Repair Services contract, a new Security Guard Services contract, and a new Monitoring and Maintenance of Intrusion Alarm Systems contract to replace existing contracts.
- Continue to enhance Emergency Response Plans for all water and wastewater facilities. Update Emergency Action Plans (EAPs) as needed, including the Western Section Dam EAPs and spill control EAPs.
- Procure a contract to replace old cameras in the security system.
- Continue the process of ensuring that new construction and rehabilitation of facilities includes an integrated security and surveillance system improvement component. Continue task order security

enhancement designs for selected water and wastewater critical sites, fencing installation, and other facility hardening initiatives.

- Implement notification drills, tabletop exercises, and field training exercises (including at least one major drill). Continue the community emergency response training program and tabletop exercise series for MWRA community water system staff.
- Continue to transition the security monitoring system to the new video software standard.
- Establish a backup security monitoring center and communications head end at Norumbega.
- Establish an unmanned aircraft system (drone) program for emergency response and infrastructure monitoring.
- Audit the physical security of all water and wastewater facilities.
- Engage the Boston Regional Intelligence Center with the MWRA.
- Begin performing vulnerability assessment using Parre software.
- Improve the cyber security of the MWRA's physical Security System.

FY16 Accomplishments:

- Integrated the new Spot Pond Pump Station into the existing access control and monitoring system.
- Participated in the planning and execution of a multi-agency desktop drill for a train derailment at the Wachusett Reservoir.
- Started 24/7 on-call monitoring of the s::can water quality alarms.
- Expanded the primary security system by adding card access for CNY MIS network closets, new cameras at Deer Island and CNY, a new camera and motion detector at the front gate at Chelsea, enhanced security at the ICCF building for the water quality lab, added access control to s::can huts at Arlington Covered Reservoir and Bellevue Tanks, and began converting high energy consuming infrared illumination with energy conserving LEDs.
- Continued to update spill control Emergency Action Plans for water and wastewater facilities subject to spill regulations.
- Completed a total of 112 training events or drills.
- Expanded relationships with Department of Homeland Security threat intelligence, and physical and cyber vulnerability staff.
- Continued to provide an emergency response training program and a tabletop exercise series for MWRA community water system staff.

- Participated in the planning and execution of a week-long cyber security drill defending critical infrastructure that was hosted by the New England units of the National Guard.

Budget Highlights:

- The FY17 Final Budget is \$3.2 million, an increase of \$64,000 or 2.1%, as compared to the FY16 Actuals.
- \$604,000 for **Wages and Salaries**, an increase of \$94,000 or 18.5%, as compared to the FY16 Actuals, mainly due to a vacant position in FY16 which has been filled and for contractual increases. The FY17 Final Budget includes funding for six positions, the same as FY16 Budget.
- \$500,000 for **Ongoing Maintenance**, a decrease of \$99,000 or 16.5%, as compared to the FY16 Actuals, mainly due to the higher than expected spending in the Security maintenance contract. This budget includes funding of \$326,000 to cover the MWRA-wide security systems preventative maintenance and repair service, \$150,000 for MWRA-wide Security systems maintenance materials and equipment, including cameras, intrusion detection, card readers, and \$24,000 for the intrusion alarm annual and semi-annual monitoring services contracts.
- \$1.9 million for **Professional Services**, an increase of \$75,000 or 4.1%, as compared to the FY16 Actuals, primarily to include EAP work on Western Reservoirs, thereby covering over 30 communities. The budget includes \$636,000 for security services at the DITP facility, \$591,000 for the Chelsea facility, \$405,000 for the Carroll Water Treatment Plant, \$84,000 for the Account Manager, \$47,000 for the Training Officer, \$55,000 for vehicle maintenance and emergency allowance, and \$22,000 for Charlestown Navy Yard (CNY) facility. Also included under Professional Services is \$80,000 for updating the Dam EAPs to match the regulatory change to FEMA's PD-64 and annual updates.
- \$19,000 for **Other Materials**, a decrease of \$26,000 or 57.9%, as compared to the FY16 Actuals. FY16 included the purchase of a new set of sophisticated gas monitoring equipment that will not need to be replaced for a number of years. This budget mainly funds purchase of Health and Safety materials for the ESU Team.
- \$121,000 for **Other Services**, an increase of \$10,000 or 8.7%, as compared to the FY16 Actuals. This budget includes funding for licensing cost for two-way radios with Department of Conservation and Recreation (DCR) and for mandatory monthly testing and inspection of the Self-Contained Breathing Apparatus (SCBA).

AFFIRMATIVE ACTION AND COMPLIANCE UNIT

FY17 Final Current Expense Budget AFFIRMATIVE ACTION & COMPLIANCE UNIT							
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17		
WAGES & SALARIES	\$ 557,924	\$ 510,897	\$ 520,186	\$ 547,871	\$ 27,685	5.3%	
OVERTIME	-	137	-	-	-	-	
TRAINING & MEETINGS	0	1,250	4,964	4,800	(164)	-3.3%	
OTHER MATERIALS	2,068	1,703	1,763	1,664	(99)	-5.6%	
OTHER SERVICES	321	312	1,416	924	(492)	-34.8%	
TOTAL	\$ 560,313	\$ 514,298	\$ 528,329	\$ 555,259	\$ 26,930	5.1%	

The **Affirmative Action and Compliance Unit (AACU)** develops, administers, and monitors compliance of Affirmative Action Plan programs and policies by ensuring equal opportunity and non-discrimination in employment and equitable access of Minority Business Enterprises (MBE), Women Business Enterprises (WBE), and Disadvantaged Business Enterprises (DBE) in Authority procurement activities.

FY17 Goals:

- Assist divisions and departments in the implementation of MWRA's affirmative action program and promote MWRA's policy of non-discrimination for all persons in or recruited into its workforce.
- Maintain adequate internal audit and reporting systems to monitor MWRA's accomplishments of goal attainment in identified underutilized job groups for female and minority representation.
- Communicate to managers and supervisors MWRA's commitment to its equal opportunity policies and affirmative action programs.
- Assist the Human Resources department in the coordination and oversight of all external/internal recruitment and selection activities including interviewing, hiring, transfers, and promotions of all candidates, including those who are members of a protected class.
- Provide for the equitable participation of minority/women and disadvantaged-owned businesses in procurement opportunities, ensure that minorities and women are represented in the labor force on construction contracts, and coordinate with other public entities regarding state and federal requirements.
- Assist divisions and departments in the understanding and implementation of MBE/WBE/DBE program policies and practices as well as monitor and report on contractor compliance and expenditures.

FY17 Initiatives:

- Conduct a comprehensive voluntary self-identification survey of employees to identify the race and ethnic designations as used by the Equal Employment Opportunity Commission. Definitions of the race and ethnicity categories are as follows: 1.) Hispanic or Latino, 2.) White (Not Hispanic or Latino), 3.) Black or African American (Not Hispanic or Latino), 4.) Native Hawaiian or Other Pacific Islander (Not Hispanic or Latino), 5.) Asian (Not Hispanic or Latino), 6.) American Indian or Alaska Native (Not Hispanic or Latino), and a **New Category** - Two or more races (Not Hispanic or Latino) - All persons who identify with more than one of the above five races.

FY16 Accomplishments:

- Provided management assistance to the Human Resources Department in the overall recruitment and selection process for qualified candidates for sixty (60) new hires and sixty-five (65) promotions.
- Completed a comprehensive voluntary self-identification survey of employees to identify the race and ethnic designation as used by the Equal Employment Opportunity Commission.
- Conducted oversight of 143 construction and professional projects, including 32 site visits monitoring the minority and women workforce as well as MBE/WBE/DBE compliance. With the exception of WBE Nonprofessional Services, the other procurement targets remain.

Budget Highlights:

- The FY17 Final Budget is \$555,000, an increase of \$27,000 or 5.1%, as compared to the FY16 Actuals.
- \$548,000 for **Wages and Salaries**, an increase of \$28,000 or 5.3%, as compared to the FY16 Actuals, mainly for contractual increases. The FY17 Final Budget includes funding for six positions, the same as FY16 Budget.

INTERNAL AUDIT

FY17 Final Current Expense Budget						
INTERNAL AUDIT						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 686,696	\$ 692,181	\$ 652,455	\$ 644,414	\$ (8,041)	-1.2%
MAINTENANCE	-	5	-	-	-	-
TRAINING & MEETINGS	5,070	6,249	3,069	6,700	3,631	118.3%
PROFESSIONAL SERVICES	-	-	-	-	-	-
OTHER MATERIALS	1,697	1,309	2,258	2,020	(238)	-10.5%
OTHER SERVICES	2,540	2,820	2,109	1,691	(418)	-19.8%
TOTAL	\$ 696,003	\$ 702,564	\$ 659,891	\$ 654,825	\$ (5,066)	-0.8%

The **Internal Audit Department** monitors the efficiency and integrity of MWRA operations by auditing financial and program operations; reviewing compliance with accounting and management control systems, laws and regulations; and coordinates the formulation and revisions to MWRA policies and procedures. Internal Audit also monitors MWRA contracts through its contract audit program, including approval of provisional consultant indirect cost rates and subsequent audit of consultant billings; performs labor burden reviews, construction change orders and claim audits, and vendor and other contract audits.

FY17 Goals:

- Encourage more economical and efficient operations, adhere to sound management procedures, and use controls designed to safeguard MWRA assets.
- Assure that automated and supporting manual management information systems have secure data control environments and to provide accurate and useful management information.
- Assure that contractors and consultants doing business with MWRA have adequate accounting and billing systems to provide current, complete and accurate cost and price information and project invoicing.

FY16 Accomplishments:

- Identified \$2,081,663 in savings related to: internal audits, management advisory services, consultant audits, construction labor burden reviews, facility lease agreements, and on-going savings from the lease of the engine house by the Fore River Railroad Corporation.
- Issued final audit reports on Halon Compliance and Cycle Inventory Counts at various facilities. Issued eight incurred cost audits, four preliminary consultant and 14 preliminary construction reviews.
- Provided management advisory and data analysis services dealing with MWRA overhead rates, change order and amendments, overtime, security alarm review, financial reviews, unemployment compensation and contract negotiations with HEEC, NEFCo and solar energy.

Budget Highlights:

- The FY17 Final Budget is \$655,000, a decrease of \$5,000 or 0.8%, as compared to the FY16 Actuals.
- \$644,000 for **Wages and Salaries**, a decrease of \$8,000 or 1.2%, as compared to the FY16 Actuals. The FY17 Final Budget includes funding for seven positions, one less than FY16 Budget.

PUBLIC AFFAIRS

FY17 Final Current Expense Budget PUBLIC AFFAIRS						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 1,012,009	\$ 1,060,003	\$ 1,089,986	\$ 1,139,183	\$ 49,197	4.5%
OVERTIME	58	852	767	900	133	17.3%
TRAINING & MEETINGS	4,054	(572)	4,044	4,415	371	9.2%
PROFESSIONAL SERVICES	4,925	1,175	0	1,300	1,300	-
OTHER MATERIALS	28,711	25,199	18,195	26,175	7,980	43.9%
OTHER SERVICES	28,945	31,903	30,140	48,816	18,676	62.0%
TOTAL	\$ 1,078,702	\$ 1,118,560	\$ 1,143,133	\$ 1,220,789	\$ 77,656	6.8%

The **Public Affairs Department** is the institutional link to all MWRA constituencies. The department works for passage of legislation necessary to carry out MWRA's mission, monitors legislation, responds to inquiries by elected and appointed officials, and pursues funding from the state legislature for MWRA projects.

The **Community Relations Section** deals directly with cities and towns in the service area, responds to inquiries about MWRA, proactively incorporates community concerns into MWRA project work, coordinates outreach and education initiatives to highlight MWRA programs, and provides technical expertise for specific projects and initiatives. Community Relations staff also work in conjunction with Planning and Coordination Department staff to ensure compliance with state and local regulations and restrictions.

The **Environmental Review and Compliance Section** is responsible for directing Authority-wide MEPA environmental review to ensure that MWRA facilities are protected and private development projects do not negatively impact MWRA facilities. The section is the lead to implement the Public Access Aqueduct Program, a program approved by the Board in April 2012, that authorizes public access along MWRA emergency back-up Aqueducts located in 14 cities and towns in the MetroWest area.

The **Communications Section** manages media relations, issues press releases and responds to information requests, oversees the design and distribution of MWRA publications, manages the web site, and provides design, editorial, and graphics services for other sections of MWRA. In addition, the **Education Section** is responsible for curriculum development, teacher training workshops, as well as providing school education materials on water quality, water conservation, wastewater topics, and environmental issues. Both sections are lead by the Special Assistant to the Executive Director, located in the Executive Office.

FY17 Goals:

- Enhance overall public understanding of MWRA's mission, goals, and benefits to the public through extensive outreach and effective communication.
- Monitor and analyze legislation and regulations that affect the Authority, formulating appropriate responses in concert with the Office of the Executive Director (OED).

- Continue to coordinate the review of projects filed with Massachusetts Environmental Protection Agency (MEPA), and submit timely MEPA responses to ensure that Authority owned infrastructure is protected.
- Provide technical support to 14 cities and towns that host MWRA's emergency back-up aqueducts as part of the Public Access Aqueduct Program.
- Develop and implement proactive strategies for educating and informing key MWRA constituencies and the public at large about MWRA's mission, projects and progress, and promote understanding for associated costs.
- Gain public support for MWRA programs and projects while responding to the needs and concerns of elected and appointed public officials.
- Provide support to MWRA staff to ensure that MWRA projects meet regulatory requirements, and provide input to regulatory agencies in order to ensure MWRA interests are recognized during the development of regulations.
- Maintain and update MWRA's Community Contact Database. This Community Contacts tracking application is used to notify MWRA's communities of any operational issues or emergencies affecting them or surrounding communities.
- Complete and submit the Five-Year Progress Report for 2011-2015.
- Continue to provide accurate and timely information to the public through the MWRA's website and the media, including social media like Twitter and Flickr.
- Continue to circulate Annual Water Quality Report to every household within the MWRA service area.

FY17 Initiatives:

Ongoing Advocacy – Commonwealth Rate Relief

MWRA's highest legislative priority continues to focus on the need for a more robust "Commonwealth Rate Relief Package" to help offset anticipated rate increases over the next several years.

MWRA's Public Affairs staff continues to work with the Legislature to advocate on behalf of member communities for issues that are crucial to the Authority's core mission. The Executive Director and Director of Intergovernmental Affairs routinely meet with House and Senate leaders to advocate on behalf of the Authority and its customers. As the new Legislative session begins in January, staff will continue to monitor all newly filed legislation that could impact the Authority from an operational and administrative perspective.

FY16 Accomplishments:

- Successfully advocated for the funding of the Sewer Rate Relief Fund. The current FY17 General Appropriations Act (GAA) includes \$1.1 million for Sewer Rate Relief.
- Filed comments with the Massachusetts Environmental Policy Act Office related to 21 different development projects in the Commonwealth
- Submitted 8 Project Notification Forms to the Massachusetts Historic Commission and local Historic Commissions.
- Launched the Everbridge communication platform to keep community members informed of construction project updates, service notices, and public meetings.
- Conducted several public meetings to update public officials and constituents of MWRA's upcoming construction projects and their impact on local communities.

Aqueduct Trail Progress -To date, MWRA staff has issued many Section 8 (m) Permits as part of the Public Access Aqueducts Program authorizing approximately 25 miles of Aqueduct Trails, including two new sections in Needham and Wayland. MWRA estimates that approximately 15 miles are currently open to the public.

Wachusett Aqueduct and Open Channel

Northborough: 4.7 miles authorized (2.0 miles opened)
Southborough: 2.1 miles authorized (2.1 miles opened along the Open Channel)

Bay Circuit Trail Connector

Framingham: 0.1 mile authorized
Southborough: 0.4 miles authorized

Weston Aqueduct

Framingham: 4.3 miles authorized (1.45 miles opened)
^[1]Weston: 1.5 miles authorized (1.5 miles opened)
Wayland: 4.2 miles authorized (0 miles opened)

Sudbury Aqueduct

Framingham: 1.5 miles authorized (1.5 miles opened)
Natick: 1.4 miles authorized (1.1 miles opened)
Wellesley: 3.0 miles authorized (3.0 miles opened)
Needham: 1.4 miles authorized (0 miles opened)

Cochituate Aqueduct

Natick: 2.6 miles authorized (0 miles opened)

^[1] Approximately 3.3 miles of additional trails were authorized surrounding the Loring Road Storage Tank and Weston Reservoir as part of previous MWRA commitments included in Memorandum of Agreements with the Town of Weston.

Communications - Three additional construction photo books have been produced, for the John Carroll Treatment Plant, the East Boston CSO project and the South Boston CSO project, with several others underway. The in-house design of the Annual Water Quality Report was completed and delivered in accordance with the EPA mandate. Communications staff have also been updating all MWRA forms on the intranet site.

Through the second half of FY2016, Communications staff focused a lot of time on the issue of lead in drinking water. Efforts include additional information on MWRA's website, design and production of a new lead brochure, response to numerous media inquiries and outreach through social media. This will continue well into FY2017. More recently, the regional drought has emerged as a major communications issue for the agency.

School Education - The School Education staff continues to conduct weekly classroom visits within the MWRA service area to educate elementary school children on the importance of water and sewer infrastructure on their daily lives. The annual poster, essay and video contest raised awareness of this program and provide an important opportunity for the students, teachers and parents to learn together about MWRA's mission.

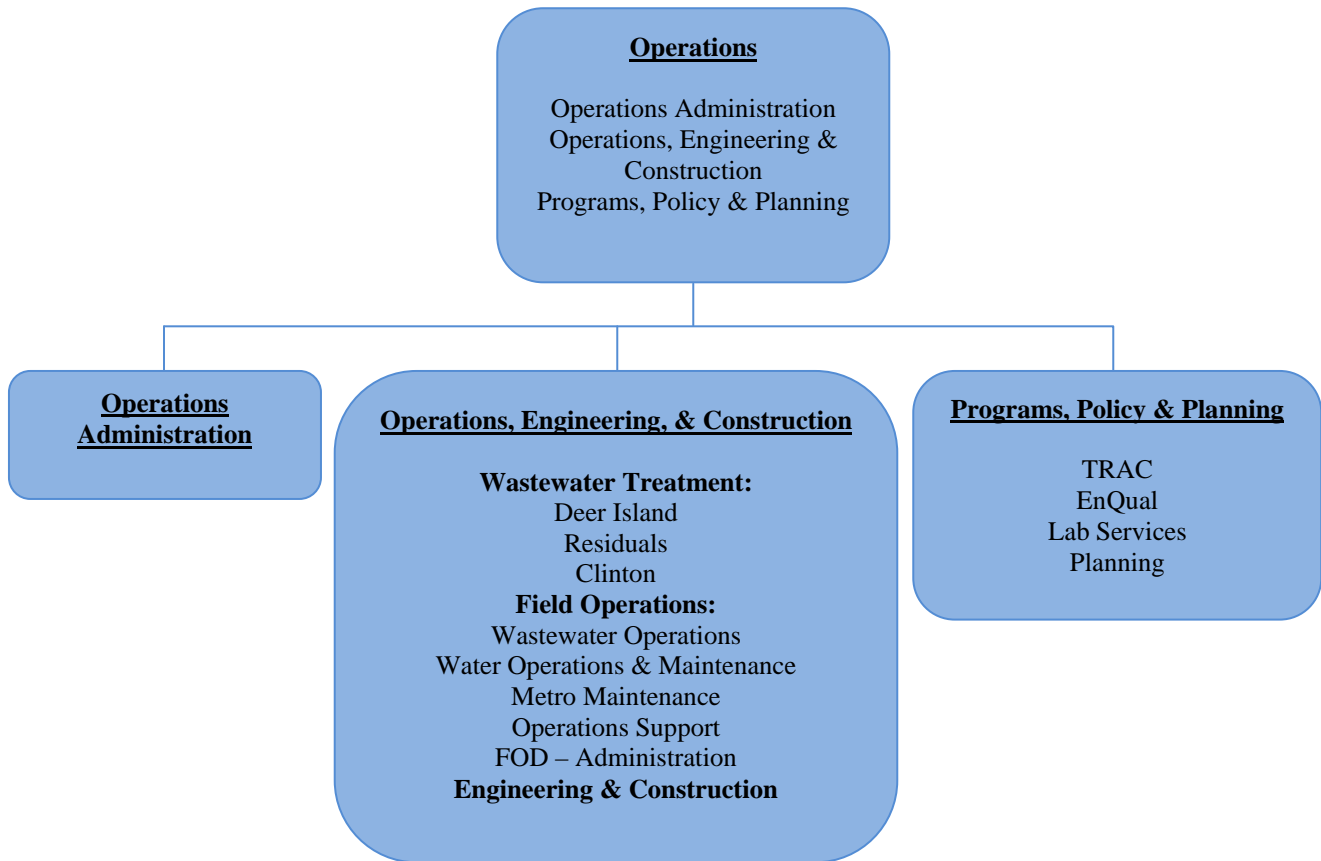
Budget Highlights:

- The FY17 Final Budget is \$1.2 million, an increase of \$78,000 or 6.8%, as compared to the FY16 Actuals.
- \$1.1 million for **Wages and Salaries**, an increase of \$49,000 or 4.5%, as compared to the FY16 Actuals, mainly for contractual increases, offset by lower salary for a new hire. The FY17 Final Budget includes funding for 13 positions, the same as FY16 Budget.
- \$26,000 for **Other Materials**, an increase of \$8,000 or 43.9%, as compared to the FY16 Actuals.
- \$49,000 for **Other Services**, an increase of \$19,000 or 62%, as compared to the FY16 Actuals, mainly for expansion of the MWRA's presence in the community and professional organizations. This budget supports the printing needs of the department, including State of the Harbor Report and the Annual Report.



Operations Division Budget

OPERATIONS DIVISION



FY17 Final Current Expense Budget						
OPERATIONS DIVISION						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 71,409,039	\$ 73,730,111	\$ 75,417,179	\$ 79,571,615	\$ 4,154,435	5.5%
OVERTIME	3,332,244	4,388,800	4,250,176	4,128,812	(121,364)	-2.9%
FRINGE BENEFITS	56,561	80,606	83,741	75,207	(8,534)	-10.2%
CHEMICALS	10,226,458	9,749,142	9,297,550	9,110,407	(187,143)	-2.0%
UTILITIES	23,309,214	20,974,683	18,628,196	21,426,848	2,798,652	15.0%
ONGOING MAINTENANCE	24,216,104	23,826,321	26,256,252	25,712,792	(543,460)	-2.1%
TRAINING & MEETINGS	135,493	130,079	165,127	195,725	30,598	18.5%
PROFESSIONAL SERVICES	1,941,662	1,871,719	2,240,903	2,677,277	436,374	19.5%
OTHER MATERIALS	4,586,539	4,930,576	5,012,352	4,937,519	(74,833)	-1.5%
OTHER SERVICES	18,155,052	18,395,102	18,767,824	18,897,162	129,338	0.7%
TOTAL	\$ 157,368,364	\$ 158,077,138	\$ 160,119,301	\$ 166,733,363	\$ 6,614,062	4.1%

FY17 Final Current Expense Budget						
OPERATIONS DIVISION by Department						
DEPARTMENT	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
OPERATIONS ADMINISTRATION	\$ 4,126,009	\$ 4,455,415	\$ 4,561,932	\$ 4,881,995	\$ 320,062	7.0%
OPERATIONS, ENGINEERING & CONSTRUCTION	136,808,083	136,314,899	137,210,798	142,628,866	5,418,068	3.9%
PROGRAMS, POLICY & PLANNING	16,434,272	17,306,823	18,346,571	19,222,502	875,932	4.8%
TOTAL	\$ 157,368,364	\$ 158,077,138	\$ 160,119,301	\$ 166,733,363	\$ 6,614,062	4.1%

The **Operations Division** provides wastewater and water system services including operations, maintenance, and treatment; environmental monitoring and laboratory testing and analyses; and engineering, construction, planning, and administration. MWRA's Chief Operating Officer (COO) leads this division.

The Operations Division is comprised of the following two key sections, which are lead by Deputy Chief Operating Officers (DCOO): Programs, Policy and Planning (P,P&P) and Operations, Engineering, & Construction (O,E&C). The DCOOs also provide support to the Chief Operating Officer on key MWRA operations, technical, policy, community coordination, permitting and public constituency matters. Additionally, the **Operations Administration Department** serves both sections and provides division-level oversight and general management support in the areas of finance, contract administration, and personnel. The Operations Administration Department budget also includes funds for MWRA vehicle purchases and division-wide memberships.

The **Programs, Policy & Planning Section** is comprised of the Toxic Reduction and Control, Environmental Quality (EnQual), Lab Services, and Planning departments. In total, the budgets for these programs represent 11.5% of the Operations Division's FY17 Final Budget and 8.5% of MWRA's FY17 Final Direct Expense Budget. This section focuses on the following:

- master planning, business planning, and strategic initiatives (such as system expansion);
- environmental programs and regulatory coordination;
- water and wastewater quality testing and reporting;
- divisional budget preparation and monitoring;
- financial planning and analysis;
- accounts payable and contract administration;
- human resources management functions; and
- energy audits, reporting, program evaluation, and analysis.

Brief descriptions of the departments in this section are as follows:

- **The Toxic Reduction and Control (TRAC) Department** operates a multi-faceted program to minimize and control the inflow of hazardous or toxic materials into the MWRA sewer system. TRAC operates MWRA's Environmental Protection Agency (EPA-approved) Industrial Pretreatment Program.
- The **Environmental Quality Department (EnQual)** has two sections: EnQual-Water and EnQual-Wastewater (WW). EnQual-Water manages compliance with the reporting requirements of the MassDEP Drinking Water Regulations, as well as conducts and oversees the drinking water quality monitoring program. EnQual-WW manages compliance with the reporting requirements of MWRA's National Pollutant Discharge Elimination System (NPDES) permit. This unit analyzes environmental data and prepares reports on the quality of sewage influent and effluent and the water quality of Boston Harbor and its tributary rivers and Massachusetts Bay.
- The **Laboratory Services Department** supports various client groups in the Operations Division, the State's Department of Conservation and Recreation (DCR), and the MWRA member communities; providing field sampling, laboratory testing, and reporting services. Most of the

testing is required to meet the strict guidelines of regulatory programs and permits including the Safe Drinking Water Act (SDWA) and MWRA's NPDES permits.

- The **Planning and Coordination Department** provides planning, advocacy, and decision support services on policy, public health, regulatory, and operations matters regarding MWRA's potable and wastewater systems.

The **Operations, Engineering & Construction Section** is comprised of the Wastewater Treatment, Field Operations, and Engineering & Construction departments. In total, the budgets for these programs represent 85.5% of the Operations Division's FY17 Final Budget and 63% of MWRA's FY17 Final Direct Expense Budget. This section focuses on the following:

- operations and maintenance of MWRA's wastewater treatment facilities including Deer Island Treatment Plant, Clinton Wastewater Treatment Plant, Residuals Pelletizing Facility, Combined Sewer Overflow facilities, and screenhouses;
- operations and maintenance of MWRA's wastewater collection system including pipelines, pump stations, and other appurtenances;
- operations and maintenance of MWRA's water treatment facilities including the Carroll Water Treatment Plant serving communities in the Boston metropolitan area and the Brutsch Water Treatment Plant serving communities in the Chicopee Valley Aqueduct (CVA) Water System communities;
- operations and maintenance of the water distribution system including pipelines, pump stations, and valves;
- operations and maintenance of the wastewater and water metering system, Operations Control Centers, and Supervisory Control and Data Acquisition (SCADA) system;
- engineering and construction functions for the Operations Division; and
- energy conservation, capacity, and efficiency maintenance and capital projects.

Brief descriptions of the departments in this section are as follows:

- The **Wastewater Treatment Department** operates and maintains the Deer Island Treatment Plant (DITP), Clinton Wastewater Treatment Plant, and Residuals Processing Facility (pelletization plant) at Fore River Staging Area (FRSA).
- The **Field Operations Department (FOD)** manages the wastewater pretreatment, water treatment, wastewater collection and water distribution functions, including the Carroll Water Treatment Plant (CWTP). This department is responsible for operating, maintaining, and metering both systems.
- The **Engineering and Construction Department** provides the following services to support the

maintenance, repair, and rehabilitation of the wastewater and water systems: in-house engineering, consultant management, drafting, surveying, construction management, and other technical assistance. The department also oversees implementation of the Combined Sewer Overflow (CSO) plan.

FY17 Goals:

- Plan, develop, implement, and operate efficient, reliable, and economical water treatment/delivery and wastewater transport/treatment systems.
- Ensure compliance with state and federal drinking water quality and wastewater discharge regulations including the Safe Drinking Water Act (SDWA), the Clean Water Act, and National Pollutant Discharge Elimination System (NPDES) permits.
- Plan and implement rehabilitation of existing facilities and construction of new facilities including pipelines, pump stations, storage facilities, and treatment facilities on schedules that allow for sufficient system capacity and performance.
- Dispose of wastewater treatment by-products in a cost-effective and environmentally sound manner.

FY17 Initiatives:

Operations, Energy, and New Facilities Start-ups:

- Continue to identify, assess, and implement initiatives to reduce energy demand and increase energy self-generation in MWRA's system, including the projects noted in MWRA's Memorandum of Understanding with Eversource. Pursue grant-funding and cost-sharing arrangements to defray costs of implementing these initiatives.
- Self-generate ~30% of the Deer Island Treatment Plant's (DITP) required power through optimization of power generation assets, including the wind turbines and the Steam Turbine Generation (STG) back pressure system.
- Continue to optimize ultraviolet disinfection treatment process for MWRA's potable water system at the Carroll Water Treatment Plant and Brutsch Disinfection Facility.
- Operate the new Spot Pond covered storage facility in water system for first full year.
- Continue to implement strategies for workforce succession in preparation for expected retirement of many MWRA employees in the upcoming five to ten years.

Engineering & Construction:

- Notice to Proceed for numerous contracts including the following major projects:
 - Water System
 - NIH Redundancy & Storage: Section 89/29 Redundancy – Construction Phase 1C
 - NIH Redundancy & Storage: Section 89/29 Redundancy – Construction Phase 2
 - Central Monitoring System: Waterworks SCADA/PLC Upgrades
 - SEH Redundancy Pipeline Section 111 Phase 2 Construction
 - SEH Redundancy Pipeline Section 111 Phase 3 Construction
 - New Connecting Mains: Shaft 7 to WASM 3 – CP3 Final Design
 - Wastewater System
 - Facility Asset Protection: Chelsea Creek Upgrades - Construction
 - DITP Facility Asset Protection: HVAC Equipment Replacement - Construction
 - DITP Facility Asset Protection: Gravity Thickener Rehabilitation
 - Residuals Asset Protection: Residuals Facility Upgrades – Construction
 - DITP Facility Asset Protection: Switchgear Replacement – Construction
- Substantially complete numerous CIP design and construction phases including the following:
 - Water System
 - Spot Pond Supply Mains Rehab: Section 4 Webster Ave Bridge Pipe Rehab – Design & Construction
 - Long Term Redundancy: Sudbury Aqueduct – MEPA Review
 - Central Monitoring System: Quabbin Power, Communication, & Security - Construction
 - WASM: Section 36 Valve
 - WASM: Section 36/Waltham - Design
 - Wastewater System
 - CSO Program: Cambridge Sewer Separation – Construction
 - CSO Program: Dorchester Bay Sewer Separation – Design & Construction
 - DITP Facility Asset Protection – Scum Skimmer Replacement
 - DITP Facility Asset Protection NMPS & WTF Butterfly Valve Replacements
 - DITP Facility Asset Protection – Power System Improvements - Construction

Maintenance:

- Optimize staff resources, overtime, service contracts, and as-needed design contracts to complete routine and major maintenance projects.
- Continue work on numerous major projects at Deer Island including facility repainting and coating repairs; Zurn boiler maintenance and repairs; electrical system maintenance; motor overhauls; HVAC unit replacement; PLC replacements; and critical equipment maintenance.

- Work on numerous projects in Field Operations including meter inspection and repairs; manhole rehabilitation; pipeline repair and replacement; invasives control in the water reservoirs; dam inspections and tree clearing; and water tank inspections and cleaning.
- Commence and complete periodic facility painting and coating projects at DITP and Clinton.

Environmental:

- Plan for implementation of requirements of the new National Pollutant Discharge Elimination System (NPDES) Permits for DITP (assume new permit is issued after FY2017) and Clinton Wastewater Treatment Plant (assume new permit in effect for all of FY17).
- Continue work on other harbor and outfall monitoring initiatives including: calculating revised thresholds, continuing to work with Department of Conservation and Recreation implementation of appropriate beach management practices in South Boston, and improving instrumentation on National Oceanic and Atmospheric Administration's (NOAA's) weather buoy.
- Plan for the new round of NPDES-required Local Limit testing in TRAC to reassess industrial discharge limits and commence the work after the Environmental Protection Agency (EPA) issues the new NPDES permits.
- Conduct invasive species removal and monitoring at water reservoirs.
- Continue implementation and monitor effects of reduced fluoride dosing in the water system per regulatory changes.
- Continue to develop and implement contaminant monitoring plans in the water system.

FY16 Accomplishments:

Operations, Energy, and New Facilities Start-ups:

- The Long-Term CSO Control Plan was declared to be substantially complete by the Court in December 2015.
- Assisted the Procurement Department with contracts to supply and deliver chemicals for the water and wastewater system facilities. Chemicals procured included aqua ammonia, carbon dioxide, ferric chloride, hydrofluorosilicic acid, hydrogen peroxide, hydrogen sulfide, polymer, soda ash, sodium bisulfate, sodium hydroxide, and sodium hypochlorite.
- Received revenue for energy generated at numerous facilities including the following: hydroelectric of \$312,000 from Oakdale Station, \$138,000 from Cosgrove Station, and \$11,000 from the Loring Road Pump Station; wind of \$296,000 from Charlestown Pump Station; and solar of \$105,000 from Carroll Water Treatment Plant.

- Continue to leverage MWRA's self-generation assets and participation in the competitive energy market to offset operating costs. The combined impact of participation in the Independent System Operators of New England (ISO-NE) load response program, non-rate revenue from the sale of Renewable Portfolio Standards Program (RPS) credits, and receipt of utility rebates for CEB-funded efficiency projects resulted in \$2.7 million in revenue for FY16. Deer Island also self-generated ~28.5% of the plant's total required power during that time period.
- Processed 99.1 average tons per day of sludge at the Pelletization Plant and disposed of 5,490 tons of grit and screenings through a contracted vendor.

Maintenance:

- The Operations Division spent \$26 million on maintenance of which \$13.5 million was for materials and \$12.5 million was for services.
- Procured and implemented numerous contracts for maintenance services, including the following:
 - Temporary flow monitoring and data collection at MWRA wastewater sites
 - Lab equipment maintenance services
 - Fire protection system services
 - Boiler and water heating equipment maintenance services
 - Overhead door maintenance services
- Procured maintenance-related materials including components for DI PICS; DI PLC control panel; DI replacement transformers; electrical hardware and supplies; and meter sensor replacements.
- Procured and implemented numerous contracts for maintenance projects including:
 - Installation of energy efficient lighting at numerous facilities
 - DI Lighting Improvements Phase 4 Exterior Lighting
 - Installation of energy-efficient LED exterior lighting at the CWTP
 - Installation, energy-efficiency LED interior lighting, Loring Rd Vault Chamber
 - Insulation repairs at DITP
- Completed numerous maintenance projects including the following:
 - Completed annual turnaround maintenance on Train #1 at Cryogenic Oxygen Facility at DITP
 - Performed preventive maintenance at East and West Odor Control facilities at DITP
 - Installed two dam seepage-monitoring weirs at Weston Reservoir
 - Completed annual half-plant shut-down for both sides A and B at CWTP
 - Repaired and replaced motor for odor control fan at Nut Island
- Quickly procured and implemented numerous critical services contracts for demolition and clean-up at the Nut Island Headworks in the aftermath of a January 2016 fire in the lower part of the facility.
- In water system, exercised 524 and replaced 11 mainline valves; exercised 318 and replaced 10 blow-off valves.

- In the wastewater system, inspected 35.5 miles and cleaned 39 miles of MWRA pipeline. Inspected more than 818 structures and rehabilitated 105 manholes. Also inspected 48 and cleaned 72 inverted siphon barrels.

Engineering, Construction, and Planning:

- Awarded contract and issued Notice to Proceed for numerous projects including the following:
 - Long Term Redundancy: Wachusett Aqueduct Pump Station – Construction
 - NIH Redundancy and Storage: Sections 89 & 29 Redundancy Construction Phase 1B
 - CWTP Existing Facilities Modifications – CP7
 - Alewife Brook Pump Station Rehab – Construction
 - Clinton Wastewater Treatment Plant: Phosphorous Removal – Construction
 - Facility Asset Protection: Chelsea Screenhouse Upgrades ESDC
 - DITP Asset Protection: DSL Pump Replacement – Phase 2
- Substantially completed numerous projects including the following:
 - Spot Pond Storage Facility: Design/ Build
 - Quabbin Aqueduct & UVWTP – Design/CA/RI
 - Facility Asset Protection: PP/CF Pump and Gearbox Rebuilds
 - DITP Asset Protection: NMPS VFD Replacement – Construction
 - CSO Reserved Channel Sewer Separation: Design and Construction
 - CSO Alewife Brook Sewer Separation: MWR003 Gate & Siphon: Construction 2
- Commenced construction of a nearly mile-long water pipeline and hydropower turbine that will supply six million gallons of water daily to the McLaughlin Fish Hatchery in Belchertown. The project will also produce renewable energy and reduce the hatchery’s electric demand.

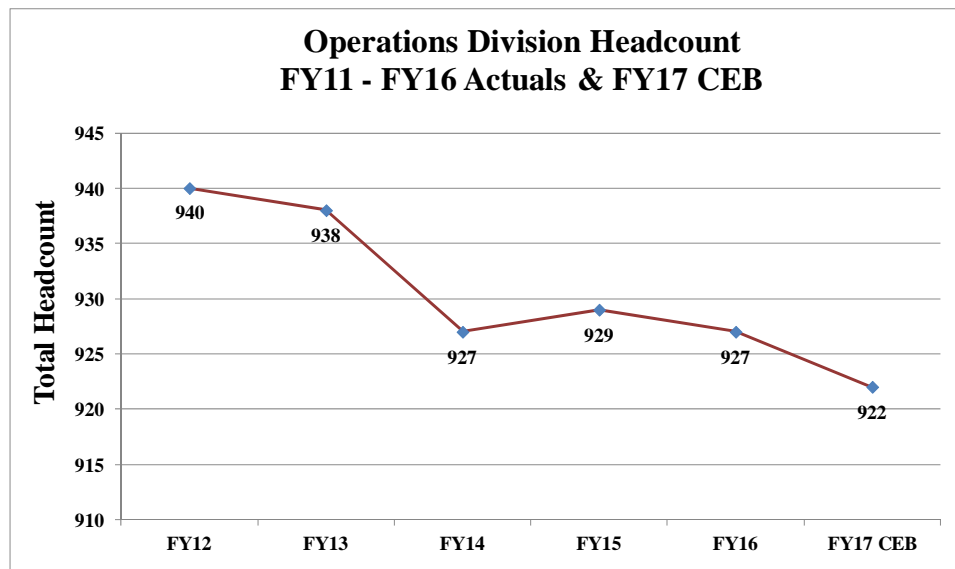
Environmental:

- The TRAC Department completed the following Environmental Protection Agency (EPA)-required work for significant industrial users: 204 inspections, 179 monitoring events, and 381 sampling of connections. This department also issued or renewed 327 permits to Significant Industrial Users (SIUs) and non-SIUs.
- At DITP, treated 99.7% of flow through secondary and met secondary permit limits at all times. Operated DITP without any NPDES Permit violations during FY16.
- EnQual carried out permit-required environmental monitoring of Boston Harbor and Massachusetts Bay water column, sediments, fish and shellfish and CSO receiving water quality. The department finalized 12 technical reports, made monitoring results available on its website, and sent reports to government regulators, the Outfall Monitoring Science Advisory Panel and interested members of the public.

- Met all water quality and treatment standards for giardia in the drinking water system during FY16. Also, maximum turbidity results at Quabbin and Wachusett were within MassDEP standards.
- During FY16, the Department of Laboratory Services performed 265,000 tests including the annual Lead and Copper Rule testing and Massachusetts Bay water column testing for the Harbor and Outfall Monitoring program.
- In conjunction with Advisory Board support, MWRA established a \$100 million CIP-funded interest-free loan program for communities to fully replace lead service lines.

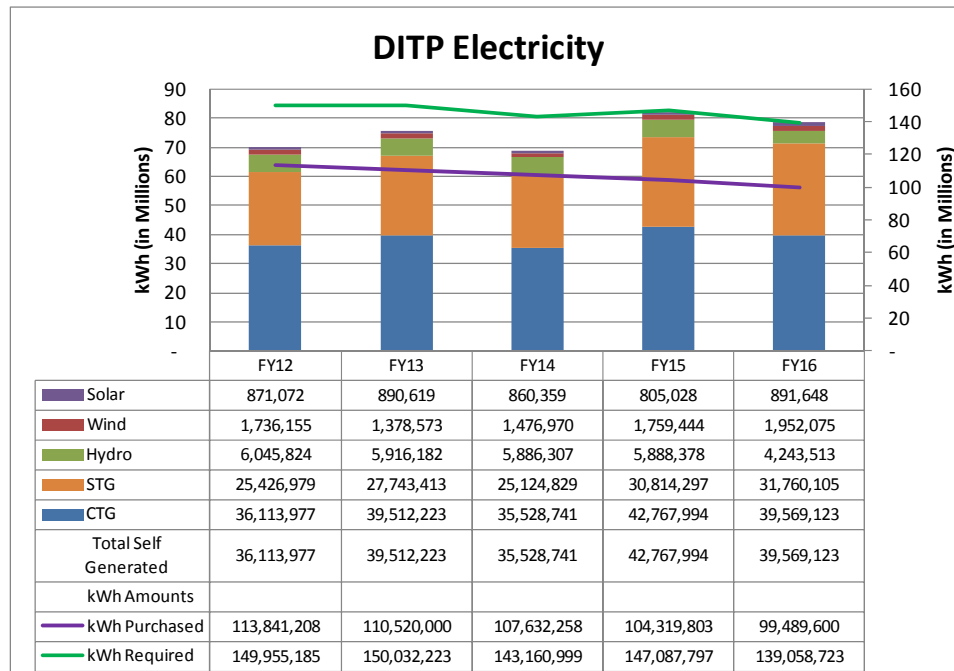
Budget Highlights:

- The FY17 Final Budget is \$166.7 million, which is \$6.6 million or 4%, more than FY16 Actuals.
- Line items that increase from FY16 Actuals include:
 - The FY17 Final Budget of \$79.6 million for **Wages and Salaries** is an increase of \$4.2 million or 5.5% from FY16 Actuals primarily due to wage increases associated with collective bargaining agreements and more filled positions expected in FY17 than in FY16. The FY17 Final Budget funds 919 filled full-time equivalent positions on average during the year versus fewer filled on average in FY16. The budget also includes \$784,000 for Stand-by Pay to ensure staffing availability and response during emergencies, \$217,000 for Interns, and \$162,000 for Temporary Employees to assist with peak workloads and special initiatives such as lead testing in schools.



- The FY17 Final Budget of \$21.4 million for **Utilities** includes \$16 million for electricity, \$2.6 million for diesel fuel, \$2.1 million for water, and \$577,000 for natural gas. The increase of \$2.8 million or 15% from FY16 Actuals is primarily due to conservative budgeting in FY17 for projected price changes for electricity and diesel fuel based on market conditions and

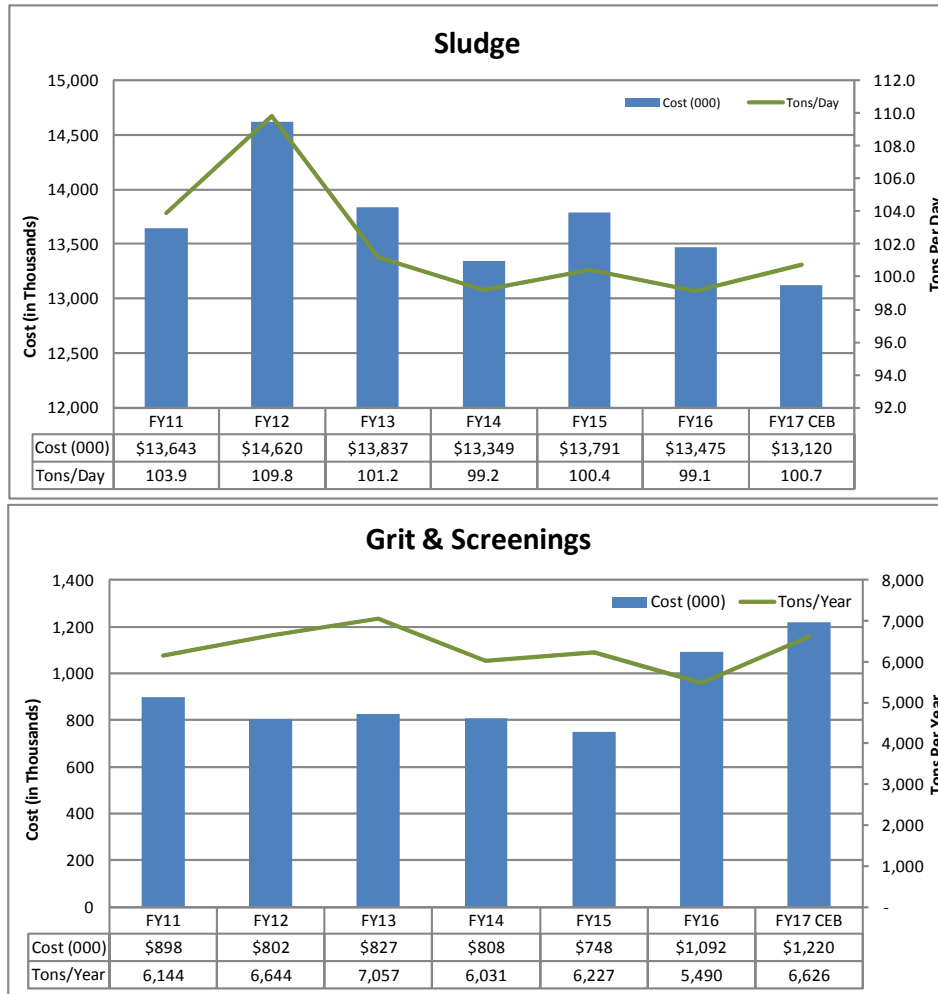
uncertainty. The increases are offset by decreases in the water budget to reflect expected lower usage at DITP and other facilities based on recent trends. The utility budget by department is \$11.7 million for Deer Island Treatment Plant, \$4.7 million for Wastewater Operations, \$4.2 million for Water Operations, \$515,000 for the Chelsea office and maintenance facilities, and \$226,000 for the Clinton Wastewater Treatment Plant.



- The FY17 Final Budget for **Professional Services** is \$2.7 million, including \$1.6 million for lab and testing services; \$722,000 for engineering services and \$304,000 for other services. Major items in the budget include \$1.4 million for Harbor and Outfall Monitoring; \$233,000 for as-needed engineering services to support CEB-funded projects; \$260,000 for assistance in constructing an active directory for SCADA; \$161,000 for Dam Safety Services; \$153,000 for outsourced testing by the Central Laboratory; \$75,000 for MWRA’s FY17 contribution to the Mystic River Modeling project; \$65,000 for comprehensive reservoir-wide plant survey in the water system; \$64,000 for invasive species control services in the reservoirs; and \$50,000 for assessment of MWRA’s cathodic protection program. The FY17 Final Budget is \$436,000 or 19.5% more than FY16 Actuals primarily due to the addition of services for new initiatives such as the assessments of MWRA’s SCADA directory and cathodic protection programs.

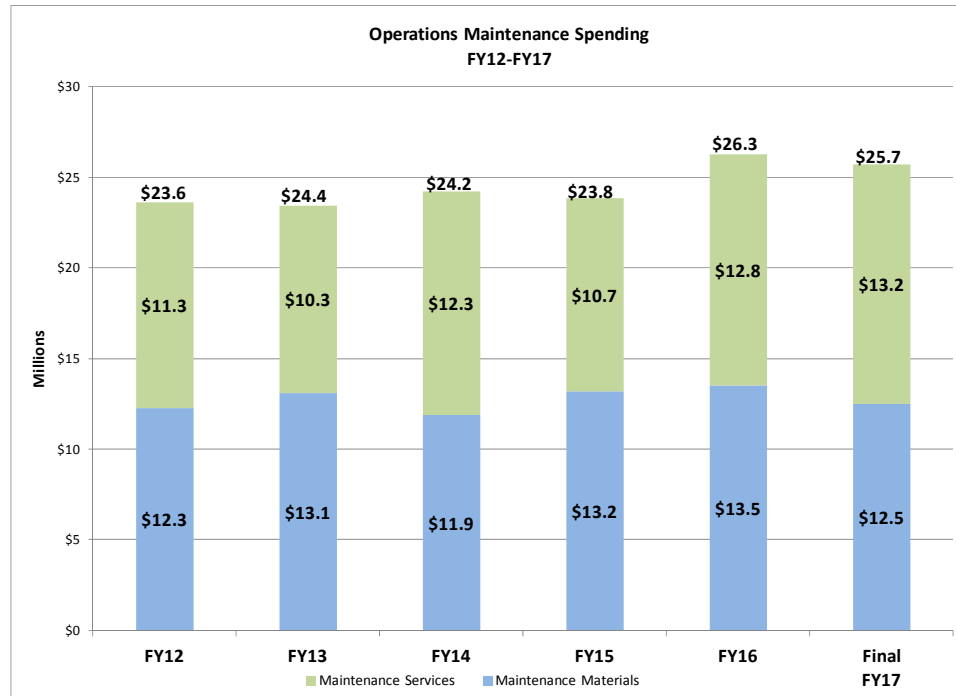
- The FY17 Final Budget for **Other Services** is \$18.9 million, including \$13.1 million for sludge pelletization; \$1.9 million for space leases and rentals, including the Chelsea office facility; \$1.2 million for grit and screenings removal and disposal; \$959,000 for telecommunications services; \$463,000 for police details; \$378,000 for other services; and \$372,000 for memberships, dues, and subscriptions. The FY17 Final Budget is \$129,000 more than FY16 Actuals primarily due to increases for the costs of SCADA data lines and the addition of \$200,000 to the Planning Department’s budget to assist other agencies and

communities in MWRA's service area with programs to reduce lead in water pipes. This increase is partly offset by reductions for contractual inflation for sludge pelletization services.



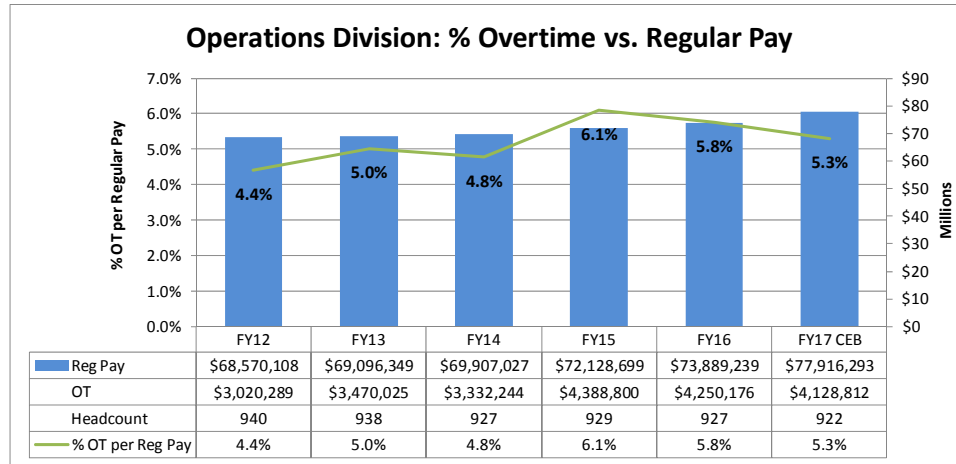
- The FY17 Final Budget of \$196,000 for **Training and Meetings** covers specialized training, attendance at industry conferences, and site visits as required to vendors and other plants. The FY17 Final Budget funds training for topics such as spill response and boom deployment; spill prevention and control; belt laser alignment; cyber security; and electrical voltage. The FY17 Final Budget is \$31,000 or 18.5% more than FY16 Actuals primarily due to increased need for workforce development associated with succession planning and the impacts of expected retirements.
- Line items that decrease from FY16 Actuals include:
 - The FY17 Final Budget for **Maintenance** is \$25.7 million, a net decrease of \$543,000 or 2.1% from FY16 Actuals primarily due to changes in project priorities from year to year. The FY17 Final Budget includes \$13.1 million for services and \$12.6 million for materials. By maintenance area, the largest categories of spending for materials and services include \$12.3 million for plant and machinery; \$4.5 million for building and grounds; 3.2 million for

specialized equipment; \$2.7 million for electrical; \$1.6 million for pipeline; and \$1.1 million for HVAC systems. The budget also funds special initiatives such as energy conservation projects in the Field Operations Department facilities; invasive plant control in the water reservoirs; painting and coating upkeep at the Clinton Wastewater Treatment Plant; and easement clearing on MWRA's aqueducts. As shown below, Maintenance spending has been fairly consistent over the last few fiscal years.



- The FY17 Final Budget of \$9.1 million for **Chemicals** includes \$5.6 million for disinfection and treatment in the water system and \$3.5 million for disinfection, treatment, and odor control in the wastewater system. The budget includes \$3.4 million for soda ash; \$2.1 million for sodium hypochlorite; \$805,000 for ferric chloride; \$443,000 for liquid oxygen; \$380,000 for hydrofluosilicic acid; \$318,000 for activated carbon; \$314,000 for carbon dioxide; \$309,000 for hydrogen peroxide; \$279,000 for polymer; \$229,000 for sodium bisulfite; and \$228,000 for aqua ammonia. The FY17 Final Budget is \$187,000 or 2.0% less than FY16 Actuals due to the net effect of price and usage adjustments based on recent trends, contracts, and market projections. The FY17 Final Budget also reflects the continuation of reductions in fluoride usage in the water system due to regulatory changes.
- The FY17 Final Budget of \$4.1 million for **Overtime** is a net decrease of \$121,000 or 2.9% from FY16 Actuals primarily due to unbudgeted emergency spending in FY16 associated with the NI fire. The budget includes \$1.9 million for emergencies and storms; \$1.2 million for planned work required on off-shifts and during periods of lower flows; \$964,000 for routine coverage of operations per prevailing collective bargaining agreements; and \$19,500 for training. The FY17 Final Budget includes \$333,000 of overtime for valve shutdowns required to complete the DITP North Main Pump Station (NMPS) and Winthrop Terminal Facility Butterfly Valve Replacement CIP project. It also includes contractual wage increases. The net decrease for this item reflects a reduction in overtime associated with the NMPS project due to

fewer planned shutdowns in FY17, offset by increases in the Central Laboratory and the Chelsea Office facility in lieu of hiring temporary workers to handle off-shift work.



- The FY17 Final Budget of \$4.9 million for **Other Materials** includes \$1.9 million for Vehicle Replacements; \$880,000 for Lab and Testing Supplies; \$449,000 for Vehicle Expenses (gas, tolls); \$402,000 for Health and Safety Supplies; \$395,000 for Equipment and Furniture; and \$389,000 for Work Clothes. The decrease of \$75,000 or 1.5% from FY16 Actuals is primarily due to decreases for water quality monitoring equipment associated with contaminant monitoring initiatives. MWRA completed purchase of this equipment in FY16. This is offset by an increase of \$200,000 for vehicle replacements to address the needs of an aging vehicle fleet.

OPERATIONS ADMINISTRATION

FY17 Final Current Expense Budget OPERATIONS ADMINISTRATION						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 2,125,923	\$ 2,307,256	\$ 2,388,095	\$ 2,555,869	\$ 167,773	7.0%
OVERTIME	120	282	508	-	(508)	-100.0%
FRINGE BENEFITS	3	-	-	-	-	-
TRAINING & MEETINGS	15,580	10,288	22,098	23,800	1,702	7.7%
PROFESSIONAL SERVICES	(1,388)	78,738	64,483	105,001	40,519	62.8%
OTHER MATERIALS	1,756,380	1,811,438	1,741,007	1,902,500	161,493	9.3%
OTHER SERVICES	229,391	247,413	345,742	294,825	(50,917)	-14.7%
TOTAL	\$ 4,126,009	\$ 4,455,415	\$ 4,561,932	\$ 4,881,995	\$ 320,062	7.0%

The **Operations Administration Department** is comprised of the Office of the Chief Operating Officer (COO); the Office of the Deputy Chief Operating Officer (DCOO) of Program, Policy and Planning; and division-level support staff. The department's primary goal is to oversee, manage, and implement MWRA policies and procedures pertaining to the following functions: administration, labor relations, finance, contract administration, and general management.

FY17 Goals:

- Ensure delivery of reliable and cost-effective water and sewer services to customer communities.
- Ensure that water supply and wastewater collection and treatment preserve public health and protect natural resources.
- Provide overall management of the Operations Division and ensure adherence to all internal practices and applicable external policies and regulations.
- Continue to aggressively pursue renewable and sustainable energy projects to reduce the environmental impacts of daily operations, increase energy efficiencies, and reduce overall operating costs.

FY17 Major Initiatives:

- Continue to implement projects included in the Eversource Memorandum of Understanding (MOU).
- Continue to evaluate and implement the Co-Digestion Project at the Deer Island Treatment Plant.
- Make substantial progress, complete, and/or implement startup of major capital projects.
- In light of the number of likely retirements in the next five to ten years, prepare and implement strategies for succession planning and workforce development.
- Continue to evaluate and pursue options for the next phase of the Cross Harbor Cable.

FY16 Accomplishments:

- Funded first installment of agreement with United States Geological Survey (USGS) for modeling work coordinated through the Mystic River Watershed Association.
- Initiated and/or completed numerous projects noted in the Eversource MOU and submitted claims for utility rebates.
- The Long-Term CSO Control Plan was declared to be substantially complete by the Court in December 2015.
- Made significant progress on numerous projects including Spot Pond Storage Facility Design/Build.

Budget Highlights:

- The FY17 Final Budget is \$ 4.9 million, an increase of \$320,000 or 7.0%, compared to the FY16 Actuals.
- \$2.6 million for **Wages and Salaries**, an increase of \$168,000 or 7.1%, compared to FY16 Actuals primarily due to wage increases and more occupied positions in FY17 than in FY16 as vacancies are backfilled.
- \$24,000 for **Training & Meetings**, an increase of \$1,700 or 7.7% compared to FY16 Actuals. Funding in this line item is for attendance at conferences for the COO, DCOO, finance staff as well as division-wide attendance to the NEWEA and NEWWA conferences held in January and March.
- \$105,000 for **Professional Services**, which is an increase of \$41,000 or 62.8% compared to FY16 Actuals. The increase is associated with funding for the Mystic River Modeling Project in accordance with the finalized agreement. The budget also includes \$ 30,000 for energy consulting services to support procurements and evaluation of projects.
- \$1.9 million for **Other Materials**, which is an increase of \$161,000 or 9.3% compared to FY16 Actuals primarily to address the needs of an aging fleet. The budget includes \$1.9 million for the replacement of older vehicles in MWRA's fleet. At an average cost of \$30,000 to \$35,000 per vehicle, the budget supports replacement of 54-62 vehicles which is approximately 11%-13% of the active fleet.
- \$295,000 for **Other Services**, a decrease of \$51,000 or 14.7% compared to FY16 Actuals. The budget covers Authority-wide memberships including the Water Research Foundation (WRF; formerly AWWARF), National Association of Clean Water Agencies (NACWA), Association of Metropolitan Water Agencies (AMWA), American Water works Association (AWWA), and the Boston Harbor Association (BHA) marine debris program.

OPERATIONS, ENGINEERING & CONSTRUCTION

Operations, Engineering, & Construction

Wastewater Treatment:

Deer Island
Residuals
Clinton

Field Operations:

Wastewater Operations
Water Operations & Maintenance
Metro Maintenance
Operations Support
FOD – Administration

Engineering & Construction

FY17 Final Current Expense Budget						
OPERATIONS, ENGINEERING & CONSTRUCTION						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 56,468,999	\$ 58,134,027	\$ 59,064,518	\$ 62,296,146	\$ 3,231,628	5.5%
OVERTIME	3,209,439	4,222,642	4,061,318	3,946,827	(114,491)	-2.8%
FRINGE BENEFITS	54,869	78,482	81,089	72,882	(8,207)	-10.1%
CHEMICALS	10,226,458	9,749,142	9,297,550	9,110,407	(187,143)	-2.0%
UTILITIES	23,281,525	20,951,802	18,604,355	21,402,348	2,797,993	15.0%
ONGOING MAINTENANCE	23,752,689	23,269,390	25,825,070	25,100,448	(724,621)	-2.8%
TRAINING & MEETINGS	100,373	100,706	112,363	134,525	22,162	19.7%
PROFESSIONAL SERVICES	490,979	329,896	577,363	906,233	328,870	57.0%
OTHER MATERIALS	1,699,515	1,722,903	1,584,675	1,615,484	30,809	1.9%
OTHER SERVICES	17,523,237	17,755,909	18,002,497	18,043,566	41,069	0.2%
TOTAL	\$ 136,808,083	\$ 136,314,899	\$ 137,210,798	\$ 142,628,866	\$ 5,418,068	3.9%

FY17 Final Current Expense Budget						
OPERATIONS, ENGINEERING & CONSTRUCTION by Programs						
FACILITY	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WASTEWATER TREATMENT	\$ 65,066,656	\$ 63,852,040	\$ 62,673,573	\$ 65,381,119	\$ 2,707,546	4.3%
FIELD OPERATIONS	64,566,350	65,308,951	67,189,014	69,213,696	2,024,681	3.0%
ENGINEERING & CONSTRUCTION	7,175,077	7,153,909	7,348,211	8,034,051	685,841	9.3%
TOTAL	\$ 136,808,083	\$ 136,314,899	\$ 137,210,798	\$ 142,628,866	\$ 5,418,068	3.9%

The Operations, Engineering & Construction Section is comprised of the Wastewater Treatment, Field Operations, and Engineering and Construction departments. In total, the budgets for these programs represent 85.5% of the Operations Division's FY17 Final Budget and 63% of MWRA's FY17 Final Direct Expense Budget.

The Deputy Chief Operating Officer of Operations, Engineering and Construction oversees this section, which focuses on the following:

- Operations and maintenance of MWRA's wastewater treatment facilities including DITP, Clinton Wastewater Treatment Plant, Residuals Pelletizing Facility, CSO facilities, and screenhouses;
- Operations and maintenance of MWRA's wastewater distribution system including pipelines, pump stations, and other appurtenances;
- Operations and maintenance of MWRA's water treatment facilities including the Carroll Water Treatment Plant serving communities in the Boston metropolitan area and the Brutsch Water Treatment Plant serving communities in the Chicopee Valley Aqueduct (CVA) Water System communities;
- Operations and maintenance of the water distribution system including pipelines, pump stations, and valves;
- Operations and maintenance of the wastewater and water metering system, Operations Control Centers, and Supervisory Control and Data Acquisition (SCADA) system;
- Engineering and construction functions for the Operations Division; and
- Energy conservation, capacity, and efficiency maintenance and capital projects.

The Deputy Chief Operating Officer of Operations, Engineering and Construction also provides support to the Chief Operating Officer on key MWRA operations, technical, policy, community coordination, permitting and public constituency matters.

WASTEWATER TREATMENT

FY17 Final Current Expense Budget WASTEWATER TREATMENT						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 18,099,006	\$ 18,914,089	\$ 19,445,011	\$ 19,931,717	\$ 486,707	2.5%
OVERTIME	931,637	1,257,123	1,096,446	1,176,082	79,635	7.3%
FRINGE BENEFITS	17,017	26,236	24,511	18,343	(6,168)	-25.2%
CHEMICALS	3,569,186	3,481,612	3,582,519	3,277,843	(304,676)	-8.5%
UTILITIES	13,457,361	11,697,399	10,227,294	11,886,677	1,659,383	16.2%
ONGOING MAINTENANCE	13,720,757	12,976,875	12,729,618	13,707,179	977,560	7.7%
TRAINING & MEETINGS	12,051	12,213	14,470	26,500	12,030	83.1%
PROFESSIONAL SERVICES	241,797	171,644	105,470	146,401	40,931	38.8%
OTHER MATERIALS	581,671	599,711	666,760	606,925	(59,835)	-9.0%
OTHER SERVICES	14,436,173	14,715,139	14,781,473	14,603,452	(178,021)	-1.2%
TOTAL	\$ 65,066,656	\$ 63,852,040	\$ 62,673,573	\$ 65,381,119	\$ 2,707,546	4.3%

FY17 Final Current Expense Budget WASTEWATER TREATMENT by Program						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
DEER ISLAND	\$ 48,453,665	\$ 46,817,125	\$ 45,563,018	\$ 48,931,257	\$ 3,368,240	7.4%
RESIDUALS	15,014,521	15,375,189	15,158,205	14,529,501	(628,704)	-4.1%
CLINTON	1,598,471	1,659,726	1,952,350	1,920,361	(31,989)	-1.6%
TOTAL	\$ 65,066,656	\$ 63,852,040	\$ 62,673,573	\$ 65,381,119	\$ 2,707,546	4.3%

The **Deer Island Treatment Plant**, the **Residuals Management Program**, and the **Clinton Treatment Plant** comprise the Wastewater Treatment Department. Together, the budgets for these programs represent 39% of the Operations Division's FY17 Final Budget and 29% of MWRA's FY17 Final Direct Expense Budget.

Incoming wastewater from MWRA customer communities is piped to several headworks facilities where large objects are screened out before the influent is transmitted to Deer Island Treatment Plant (Deer Island or DITP) through underground tunnels. At Deer Island, wastewater from the north system is pumped through chambers that remove grit and detritus for disposal in an off-island landfill. South system flows undergo preliminary treatment at the Nut Island headworks and are then pumped directly into the primary treatment facility, bypassing the grit removal chambers. The primary treatment facility consists of stacked clarifiers where scum rises to the top and the sludge settles to the bottom. Secondary reactors and clarifiers remove organic matter through biological and gravity treatment. Primary and secondary sludge and scum are thickened, anaerobically digested, and further thickened to reduce the volume of sludge before it is pumped through the Braintree-Weymouth tunnel to MWRA's Residuals Processing Facility at Fore River Staging Area (FRSA). Methane, a byproduct of anaerobic digestion, is used to fuel the plant's boilers, which produce steam to provide heat and generate electricity.

DEER ISLAND

FY17 Final Current Expense Budget						
DEER ISLAND TREATMENT PLANT						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 17,375,674	\$ 18,188,028	\$ 18,646,944	\$ 19,123,441	\$ 476,497	2.6%
OVERTIME	878,057	1,200,367	1,038,987	1,121,082	82,095	7.9%
FRINGE BENEFITS	16,203	25,501	23,620	17,343	(6,277)	-26.6%
CHEMICALS	3,279,007	3,171,902	3,244,071	2,951,471	(292,600)	-9.0%
UTILITIES	13,208,873	11,463,089	10,043,480	11,660,311	1,616,830	16.1%
ONGOING MAINTENANCE	12,809,096	12,004,627	11,787,238	13,236,665	1,449,427	12.3%
TRAINING & MEETINGS	11,694	12,213	14,470	23,000	8,530	58.9%
PROFESSIONAL SERVICES	228,024	122,390	65,149	130,000	64,851	99.5%
OTHER MATERIALS	428,575	451,412	518,679	444,800	(73,879)	-14.2%
OTHER SERVICES	218,462	177,596	180,380	223,145	42,765	23.7%
TOTAL	\$ 48,453,665	\$ 46,817,125	\$ 45,563,018	\$ 48,931,257	\$ 3,368,240	7.4%

Program Description and Goals:

The **Deer Island Wastewater Treatment Plant** (Deer Island or DITP) budget accounts for 29% of the Operations Division's FY17 Final Budget. DITP has a peak primary treatment capacity of 1.27 billion gallons per day (bgd) and peak secondary treatment capacity of 700 million gallons per day (mgd).

Wastewater influent from MWRA customer communities arrives at the plant through four underground tunnels. Pumps then lift the influent 80 to 150 feet, depending on the tunnel, to the head of the plant.

North system flows pass through grit channels and bar screens at the headworks that remove grit and screenings for disposal in an off-island landfill. South system flows are pre-treated for grit at Nut Island and the Braintree-Weymouth Intermediate Pump Station. Flow is routed to primary treatment clarifiers, which remove about half of the pollutants brought to the plant in typical wastewater (removes 50% of total suspended solids and up to 50% of pathogens and toxic contaminants). In the clarifiers, gravity separates sludge and scum from the wastewater.

In secondary treatment, reactors and clarifiers remove non-settleable solids through biological and gravity treatment. The biological process is a pure oxygen-activated sludge system, using microorganisms to consume organic matter that remain in the wastewater flow. Secondary treatment raises the level of pollution removal to over 85%. More than 100 tons of pure oxygen is manufactured each day at Deer Island's cryogenic facility to support the biological treatment process.

Sludge from primary and scum from both primary and secondary treatment is thickened in gravity thickeners. Sludge from secondary treatment is thickened in centrifuges. Polymer is used in the secondary sludge thickening process to increase its efficiency. Digestion occurs in the egg-shaped anaerobic digesters at the Deer Island Treatment Plant. There are a total of 12 digesters, each 90 feet in diameter and approximately 140 feet tall (128 ft liquid level). Microorganisms naturally present in the sludge work to break sludge and scum down into methane gas, carbon dioxide, solid organic byproducts, and water. Digestion significantly reduces sludge quantity. The methane gas produced in the digesters is used in the plant's on-site power generating facility to save operating costs by reducing consumption of fuel oil for heating and purchased energy. Digested sludge is pumped through the Nut Island inter-island tunnel and Braintree-Weymouth extension tunnel directly to the MWRA's Pelletizing Facility at Fore River, where it is further processed into a fertilizer product.

Organizational Structure:

The Deer Island Treatment Plant (DITP) has six major functional areas: Operations, Thermal Power Plant, Process Control, Maintenance, Capital Engineering, and Operations and Maintenance (O&M) Support.

- Operations staff manages the day-to-day operation of plant processing units, performs minor preventative maintenance activities, and oversees plant functions 24 hours per day, seven days per week.
- Thermal Power Plant staff manages and operates the Deer Island generation and thermal systems. Power Plant personnel provide 24 hour operation of the high-pressure, high temperature steam power plant. This facility is capable of producing up to 70 megawatts of emergency electrical power.
- Process Control manages and maintains the following programs in support of plant operations; real-time process instrumentation and control system (PICS), operational data system (OMS), plant performance monitoring and reporting programs, and regulatory compliance programs including all plant permits, water quality, and air quality. Process Control provides the technical expertise for plant unit operations and routinely performs process optimization studies to help increase performance and reduce operating costs.
- Maintenance performs preventive and predictive maintenance and corrective repairs on all equipment, utilizing a computerized maintenance management system (CMMS) to coordinate scheduling with Operations. Staff have developed the Reliability Centered Maintenance (RCM) program, which has improved plant performance by applying maintenance resources where they are most effective. RCM analyzes the operating systems with the objective of ensuring critical functions perform as required. Implementation of a preventive maintenance program using RCM helps reduce the cost of maintaining the plant and improves the efficiency by anticipating when maintenance will be required. An on-island warehouse, managed by Procurement Department staff, ensures there is adequate stock for maintenance repairs and plant operations.
- Capital Engineering provides technical support services for both Operations and Maintenance. Staff is responsible for all aspects of plant engineering including developing, procuring, and implementing all service contracts, consultant designs, and capital improvement projects at Deer Island. This group also manages the on-island Technical Information Center, which provides services to the DITP community and external constituents, and ensures quick access to plant drawings and technical information for operational and maintenance needs.
- O&M Support is responsible for supporting the business needs of the plant. The Administration and Finance Unit provides financial and administrative support to meet daily operational needs of the plant. The Safety/Security Unit is responsible for ensuring a safe and healthful work environment for employees and minimizing MWRA's exposure to liability and property loss or damage.

The Deer Island Director's Office provides overall management for the plant plus policy direction and support in the areas of public access and community agreements.

Operating Assumptions:

Deer Island's FY17 Final Budget assumes treatment of an average flow of 347 mgd based on ten years of historical data. The projected quantity of digested sludge to be pumped to FRSA (TSS basis) is 100.73 TPD. This is based on tonnage trends from recent years which reflect the increased digestion from the operation of an eighth digester plus additional tonnage associated with the start-up of food waste co-digestion at DITP in April 2017.

Deer Island's FY17 Final Budget accounts for the impact of self-generation of electricity from the steam turbine generators, combustion turbine generators, hydroelectric generators, wind turbine generators, and photovoltaic panels. In total, these assets will provide approximately 30% of the total energy requirements.

Deer Island continues to comply with the conditions of the current National Pollutant Discharge Elimination System (NPDES) Permit which expired in FY06. Given the uncertainty regarding the timing of the permit renewal from the Environmental Protection Agency (EPA), Deer Island's FY17 Final Budget does not assume a new permit will be in effect in FY17. When the new permit is issued, it is anticipated that Deer Island's treatment process will be required to kill enterococcus in addition to fecal coliform to comply with the new regulations.

FY17 Goals:

- Meet or surpass environmental compliance standards for the Deer Island Wastewater Treatment Plant as required by the NPDES permit and air quality permits.
- Maintain DITP assets over the long term at the lowest possible life cycle cost and acceptable risk; consistent with customer, community, and regulatory support service levels.
- Commence and complete DITP's CIP projects on time and within budget.
- Continue to maximize energy efficiency, self-generation, and revenue.

FY17 Major Initiatives:

- Continue to implement the Winthrop Terminal Facility Butterfly Valve Replacement capital project which involves replacement of valves, magnetic flow meters, piping, actuators, and other parts. The FY17 Final Budget assumes an average of two plant shut-downs per month during lower flow periods for a total of 24 during the year to do the work associated with this project.
- Implement projects in CIP according to schedule including issuing Notices to Proceed for key projects and phases such as Expansion Joint Repair Construction 3, Cathodic Protection Design, and North Main Pump Station Motor Control Center Phase 2 Design.
- Upgrade computerized maintenance management software to Maximo 7.6.

- Complete numerous major maintenance projects including replacement of electrical distribution substation equipment; modifications or upgrades to each CTG to increase reliability, and installation of scum mixer gearboxes and motors for primary and secondary scum systems.
- Continue to implement projects and operational changes recommended by Eversource DITP energy audits.

FY16 Accomplishments:

- Met secondary permit limits at all times, treating on average more than 99% of flows with full secondary treatment.
- DITP received the National Association of Clean Water Agencies’ “Platinum Peak Performance Award” for 2015, which recognized that the plant had no permit violations in nine years.
- Provided approximately 29% of required power through self-generation, with 28% from renewable generation.
- Optimized the backpressure turbine and main steam turbine generators vacuum operation increasing electrical energy production by 1.2 MW or 5M kWh.
- Completed the North Main Pump Station capital project involving replacement of all ten motors and VFDs in the NMPS. Close coordination is required with operations to execute the replacement while retaining needed plant capacity.
- Avoided ISO-NE peak hour demand by taking Deer Island off the grid and supplying plant power with the CTGs, therefore avoiding approximately \$500,000 in capacity charges for FY16.
- On average, more than 99.4% of all digester gas generated was utilized at the Thermal/Power Plant in FY16.
- Awarded Notices to Proceed for key capital project phases including DSL Pump Replacement Phase 2 and Fire Alarm System Replacement Design.
- For the sixth straight year, staff met goal of 100% completion of all assigned Preventive Maintenance Work Orders. Also maintained availability of critical equipment at 99.7%, while maintaining a reasonable backlog of work and controlling levels of overtime.
- Completed numerous maintenance projects including replacement of the East and West Odor control HVAC cooling coils and other smaller HVAC coils, heat exchangers, and condensing units throughout the plant; replacement of thickened primary sludge pump plunger style pumps with less maintenance intensive progressive cavity pumps; and replacement of secondary reactor feed control valve actuators.
- Deer Island hosted more than 3,000 guests for tours of the facility.

Budget Highlights:

- The FY17 Final Budget is \$48.9 million, an increase of \$3,368,000 or 7.4%, compared to FY16 Actuals primarily due to wage increases associated with collective bargaining agreements and higher utility prices.
- \$19.1 million for **Wages and Salaries**, an increase of \$476,000 or 2.6%, compared to FY16 Actuals primarily due to wage increases associated with collective bargaining agreements. The FY17 Final Budget also includes \$27,000 for interns and \$196,000 for stand-by pay to support operational and maintenance needs primarily during storms and emergencies.
- \$1.1 million for **Overtime**, an increase of \$82,000 or 7.9%, compared to FY16 Actuals primarily due to collective bargaining increases and adjustments to estimates based on historical averages. The FY17 Final Budget is based on multi-year historical trends and supports overtime required for operational coverage, critical maintenance projects, and regulatory requirements (i.e. inspections).
- \$3.0 million for **Chemicals**, a decrease of \$293,000 or 9.0% compared to FY16 Actuals. The FY17 Final Budget is based on multi-year historical usage trends and projected market prices, which are expected to be favorable in the next year. The FY17 Final Budget also reflects management's expectation that a new NPDES permit will not be in effect. The budget includes \$1.0 million for sodium hypochlorite, \$764,000 for ferrous chloride, \$309,000 for hydrogen peroxide, \$318,000 for activated carbon, \$264,000 for polymer, and \$92,000 for sodium hydroxide.
- \$11.7 million for **Utilities**, an increase of \$1.6 million or 16.1% primarily due to projected increases in diesel fuel and utility pricing based on market assessments. The FY17 Final Budget includes \$8.8 million for electricity, \$1.3 million for diesel fuel, and \$1.6 million for water. The budget also incorporates usage reductions associated with implemented and planned energy efficiency projects such as the optimized steam turbine generators, secondary optimization and lighting retrofits throughout the plant.
- \$13.2 million for **Maintenance**, an increase of \$1.4 million compared to FY16 Actuals. The FY17 Final Budget includes \$5.9 million for materials and \$7.3 million for services. Of the total, \$8.5 million or 64% is for plant and machinery services and materials, \$2.0 million is for electrical system maintenance, and \$1.5 million is for building and grounds work. The budget reflects project priorities with a particular emphasis on maintenance of critical equipment.
- \$130,000 for **Professional Services**, an increase of \$65,000 or 99.5% from FY16 Actuals primarily due to expected use of as-needed engineering services in FY17 based on project priorities. The budget includes \$105,000 for as-needed engineering services to support priority maintenance projects and \$25,000 for environmental testing required as part of MWRA's air quality permit.
- \$445,000 for **Other Materials**, a decrease of \$74,000 or 14.2% from FY16 Actuals primarily due the fit out of the engineering department in FY16. The FY17 Final Budget includes \$160,000 for health and safety materials, \$98,000 for work clothes, \$68,000 for vehicles expenses (tolls, mileage, and gas), and \$44,000 for office supplies.

- \$223,000 for **Other Services**, an increase of \$43,000 or 23.7%, from FY16 Actuals. The FY17 Final Budget includes \$44,000 for permit fees, \$62,000 for health and safety hazardous safety services, \$36,000 for telephones, \$34,000 for membership dues and subscriptions, \$15,000 for freight charges, and \$6,000 for printing services. The budget is based on historical averages for most items in this category.

RESIDUALS

FY17 Final Current Expense Budget RESIDUALS MANAGEMENT PROGRAM						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 115,594	\$ 130,260	\$ 137,835	\$ 141,273	\$ 3,439	2.5%
ONGOING MAINTENANCE	675,045	699,035	444,885	-	(444,885)	-100.0%
TRAINING & MEETINGS	357	-	-	3,200	3,200	-
PROFESSIONAL SERVICES	12,085	19,144	(2,775)	15,001	17,776	-640.6%
OTHER MATERIALS	6,402	15,844	2,390	15,125	12,735	532.8%
OTHER SERVICES	14,205,038	14,510,907	14,575,870	14,354,902	(220,968)	-1.5%
TOTAL	\$ 15,014,521	\$ 15,375,189	\$ 15,158,205	\$ 14,529,501	\$ (628,704)	-4.1%

Program Description and Goals:

The **Residuals Management Program** manages the processing and disposal of approximately 100-105 dry tons per day (on average per year) total suspended solids (TSS) of sludge from the anaerobic digestion process at Deer Island Treatment Plant (DITP), as well as the disposal of grit and screenings from all MWRA facilities. MWRA pumps liquid sludge from Deer Island through the Braintree-Weymouth cross-harbor tunnel to the Fore River processing facility where the sludge is dewatered, dried, and shipped by either rail or truck for use as fertilizer or to other appropriate disposal. MWRA is committed to the beneficial reuse of biosolids to the greatest extent practicable. MWRA seeks to dispose of all sludge and grit and screenings in a reliable, economical, and environmentally sensitive manner.

- MWRA contracts with the New England Fertilizer Company (NEFCo) to operate the sludge processing facility, and to market and distribute sludge products. A 15-year contract with NEFCo became effective March 1, 2001 and continued to December 31, 2015. After negotiations with NEFCo, MWRA approved a revised, five-year contract extension that commenced in January 2016.
- A third-party independent condition assessment of the NEFCo facility noted that the facility was in excellent condition and recommended only minor modifications to several control system devices.
- The FY17 Final Budget is based on the assumption of 100.73 average tons per day (TPD; TSS basis). This includes a baseline of 100.38 average TPD per recent history which reflects improvements in digestion due to the use of an eighth digester. The assumption also includes an average of .35 TPD for the incremental sludge associated with the start-up and phase-in of the commercial food waste co-digestion project at DITP as of April 2017.
- Grit and screenings (minor residuals) from MWRA's headworks and certain pump stations are collected and disposed of in landfills. MWRA contracts with a third party operator for this service. Minor residuals are by-products of wastewater pre-treatment and primary/secondary treatment processes and include grit, screenings, and scum screenings.

FY17 Goals:

- Dispose of all sludge in a reliable and cost-effective manner consistent with all prevailing regulations and to maximize beneficial reuse of the processed pellets.
- Dispose of grit and screenings in a reliable, economical, and environmentally sensitive manner consistent with all prevailing regulations.
- Maintain and expand local (within Massachusetts) beneficial use of MWRA's processed pellets.

FY17 Initiatives:

- Oversee the NEFCo contract to ensure successful pelletization and distribution of an average of 100.73 TPD of sludge.
- In conjunction with NEFCo, continue implementation of the extended contract and initiate all planned capital projects scheduled for 2017.
- Evaluate and expand marketing efforts for Bay State Fertilizer.
- Oversee the contractual disposal of an estimated 6,626 tons of grit and screenings.

FY16 Accomplishments:

- NEFCo successfully processed, pelletized, and distributed an average of 99.1 TPD of sludge.
- MWRA sold Bay State Fertilizer through retail outlets and distributed pellets to public sector clients.
- MWRA's contractor disposed of 5,490 tons of grit and screenings.

Budget Highlights:

- The FY17 Final Budget is \$14.5 million, a decrease of \$629,000 or 4.1%, from FY16 Actuals.
- \$141,000 for **Wages and Salaries**, which funds one permanent position and also stand-by pay to provide coverage for emergencies during off-shifts. This department also receives on-going management oversight and staff support from other departments of the MWRA including Deer Island, Treasury, and Operations Administration.
- No budgeted funds for **Maintenance**, a decrease of \$445,000 from the FY16 Actuals due to a change in MWRA's budgeting and accounting treatment for NEFCo's capital projects in the next phase of the extended contract. The contract includes a list of expected projects by year but as of January 2016, MWRA will fund these projects through the Capital Improvement Program (CIP) budget since the work meets MWRA's capitalization criteria for MWRA assets.

- \$15,000 for **Professional Services** which is an increase from FY16 Actuals due to the inclusion of funding for bi-annual stack testing in FY17 per regulatory requirements.
- \$14.4 million for **Other Services**, a decrease of \$221,000 or 1.5% from FY16 Actuals. The FY17 Final Budget primarily funds the **Sludge Pelletization** services provided through a contract with NEFCo. The FY17 Final Budget includes \$13.1 million for sludge processing, which is a \$355,000 or 2.6% decrease as compared to FY16 Actuals due to lower projected inflation rates for components of the contract. Projected FY17 sludge tonnage of 100.73 average tons per day (TPD) is 1.6 tons per day more than FY16 actual tonnage due to the impacts of the commercial food waste co-digestion project expected to commence in April 2017 and the normal variations in quantities from operation of the plant. In addition, this line item also covers Grit and Screenings disposal of \$1.2 million, which is \$128,000 more than FY16 Actuals due to projected estimates of quantities based on multi-year trends.

CLINTON

FY17 Final Current Expense Budget						
CLINTON WASTEWATER TREATMENT PROGRAM						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 607,738	\$ 595,801	\$ 660,232	\$ 667,003	\$ 6,771	1.0%
OVERTIME	53,581	56,756	57,460	55,000	(2,460)	-4.3%
FRINGE BENEFITS	814	735	891	1,000	109	12.3%
CHEMICALS	290,179	309,710	338,448	326,372	(12,076)	-3.6%
UTILITIES	248,488	234,310	183,814	226,367	42,553	23.2%
ONGOING MAINTENANCE	236,616	273,213	497,495	470,514	(26,982)	-5.4%
TRAINING & MEETINGS	-	-	-	300	300	-
PROFESSIONAL SERVICES	1,688	30,110	43,096	1,400	(41,696)	-96.8%
OTHER MATERIALS	146,694	132,454	145,692	147,000	1,308	0.9%
OTHER SERVICES	12,673	26,637	25,223	25,405	182	0.7%
TOTAL	\$ 1,598,471	\$ 1,659,726	\$ 1,952,350	\$ 1,920,361	\$ (31,989)	-1.6%

Program Description and Goals:

The Clinton Wastewater Treatment Program provides advanced sewage treatment services to the Town of Clinton and the Lancaster Sewer District. MWRA assumed formal operational responsibility for the Clinton plant in 1987. Since then MWRA has designed and constructed new primary, secondary, and advanced treatment facilities which incorporated rehabilitated portions of the existing plant with new construction. The new facilities, designed to meet all current and projected National Pollutant Discharge Elimination System (NPDES) discharge standards, were completed in 1992. A further NPDES permit change (draft in 2013) imposes additional requirements on phosphorus removal. As such, additional facilities are being added, starting in 2016, set to be complete in 2017, to meet more stringent phosphorus removal requirements and lower discharge limits and ready for the new NPDES permit when it is issued.

The plant provides secondary treatment using an activated sludge process in combination with advanced nutrient removal and dechlorination. The major facilities include headworks, primary settling tanks, digesters, sludge processes, trickling filters, aeration tanks, secondary tanks, and a chemical addition building. A phosphorus removal building is being added to meet new permit requirements. The plant discharges its effluent into the South Nashua River in accordance with the discharge limits of the facility's NPDES permit which limits effluent flow to 3.01 mgd. The plant has a potential peak flow rate of 12 mgd and a 6 mgd peak 24-hour flow rate. Residual materials are pressed and transported to an MWRA-owned landfill for disposal. Staff also performs regular monitoring of the landfill site.

The FY17 Final Budget reflects the fourth full fiscal year of operation of the Clinton aeration system efficiency improvements and redundant pumping at the influent and intermediate lift stations. These improvements were completed in 2013. Staff commenced the projects based on a consultant study that recommended installing fine bubble diffusers in three of the six secondary aeration tanks and removing the existing mechanical mixers to obtain a better oxygen transfer rate while reducing electricity consumption. In FY12, the project scope was expanded to include the installation of four permanent submersible auxiliary pumps to increase pumping capacity during high flow conditions in the plant. It also included the installation of SCADA to control the system, collect data for storage, and reporting on select processes. The redundant pumps enable MWRA to avoid the cost of renting additional pumps which were required four times in the past. Further, the new submersible pumps are energy efficient and

significantly reduce the plant's energy consumption. National Grid, in early 2013, allotted a grant for \$177,000 for this work which became available at completion.

The FY17 Final Budget assumes the requirements of the new NPDES permit will be in full effect for the whole year. The new permit requires year around limits for phosphorus discharge, which impacts the use of Ferric Chloride. Ferric chloride and polymer will be utilized along with a disc filter operation as part of the new phosphorus reduction facility currently under construction. The supply of Ferric Chloride for FY17 will cost more than the previous contract because of a factory shutdown in the supply chain. The FY17 Final Budget includes estimates for numerous maintenance projects including \$250,000 for periodic painting and coating of facilities and equipment due to corrosion.

The FY17 Final Budget does not include funds for the operational impact of the Clinton Digester Cleaning and Rehabilitation Capital projects. The project was substantially completed April 2016.

FY17 Goals:

- Meet or surpass environmental compliance standards for Clinton Treatment Plant as required by the NPDES permit.
- Maintain Clinton Treatment Plant assets over the long term at the lowest possible life cycle cost and acceptable risk; consistent with customer, community, and regulatory support service levels.
- Move forward with design and construction of major Clinton Infrastructure Rehabilitation and Renewal Projects.
- Continue to maximize energy efficiency through audits and implementation of recommendations.

FY17 Initiatives:

- Commence and complete the painting and coating of the plant facilities and equipment.
- Substantially complete the Phosphorus Reduction Construction CIP Project by summer of 2017.
- Implement enhanced phosphorus control at the Clinton Wastewater Treatment Plant to comply with the requirements of the new NPDES permit.
- Substantially complete the Clinton Roofing Rehabilitation CIP Project by February 2017.

Budget Highlights:

- \$667,000 for **Wages and Salaries**, an increase of \$7,000 or 1.0%, from FY16 Actuals due to wage increases per collective bargaining agreements plus the expectation that all positions will be filled all year in FY17. Wage & Salaries represent 35% of the budget.
- \$55,000 for **Overtime** - The FY17 Final Budget is based on historical trends. Overtime is used for critical maintenance work and to meet the 24 hour, 7 day per week emergency coverage requirement.

- \$326,000 for **Chemicals**, a decrease of \$12,000 or 3.6% from FY16 Actuals due primarily to usage adjustments based on actual experience and price adjustments based on current or expected contracts. Chemicals are used for sludge processing and disposal and wastewater treatment. The FY17 Final Budget assumes the new NPDES permit will be in effect for the full year. Chemicals represent 17% of the budget.
- \$226,000 for **Utilities**, an increase of \$43,000 or 23.2% from FY16 Actuals. The budget includes \$171,000 for electricity, \$45,000 for fuel oil, and \$10,000 for water. Electricity is based on an average of FY14 and FY15 actual usage because they represent the effect of a fully operational aeration system. Utilities represent 12% of the FY17 Final Budget.
- \$471,000 for **Maintenance**, a decrease of \$27,000 or 5.4% from FY16 Actuals due to project priorities. The FY17 Final Budget includes \$250,000 for painting to address issues with the aerated grit tank as well as \$70,000 for major projects based on the most current rolling priority list. The remainder of the budget is for routine materials and services. Maintenance represents 25% of the FY17 Final Budget.
- \$147,000 for Other **Materials**, level funded with FY16 Actuals. The Other Materials budget includes \$135,000 for clean fill for the landfill operation.
- \$25,400 for **Other Services**, level funded with FY16 Actuals. The FY17 Final Budget includes \$13,000 for permit fees, \$5,000 for telephones, and \$3,000 for railroad easement expenses.

FIELD OPERATIONS

FY17 Final Current Expense Budget FIELD OPERATIONS						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 31,301,802	\$ 32,197,907	\$ 32,407,304	\$ 34,470,507	\$ 2,063,203	6.4%
OVERTIME	2,234,679	2,906,531	2,900,372	2,704,780	(195,592)	-6.7%
FRINGE BENEFITS	37,726	52,103	56,426	54,039	(2,387)	-4.2%
CHEMICALS	6,657,272	6,267,530	5,715,031	5,832,564	117,532	2.1%
UTILITIES	9,824,164	9,254,403	8,377,061	9,515,671	1,138,610	13.6%
ONGOING MAINTENANCE	10,022,329	10,292,373	13,094,776	11,393,270	(1,701,506)	-13.0%
TRAINING & MEETINGS	83,156	73,028	86,282	99,025	12,743	14.8%
PROFESSIONAL SERVICES	249,182	158,251	471,893	759,832	287,939	61.0%
OTHER MATERIALS	1,088,945	1,091,844	892,777	975,509	82,733	9.3%
OTHER SERVICES	3,067,096	3,014,980	3,187,092	3,408,499	221,407	6.9%
TOTAL	\$ 64,566,350	\$ 65,308,951	\$ 67,189,014	\$ 69,213,696	\$ 2,024,681	3.0%

FY17 Final Current Expense Budget FIELD OPERATIONS by Programs						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WASTEWATER OPERATIONS	\$ 11,915,070	\$ 11,752,934	\$ 13,823,886	\$ 12,356,293	\$ (1,467,593)	-10.6%
WATER OPERATIONS & MAINT	27,634,871	27,560,341	26,896,291	29,237,034	2,340,743	8.7%
METRO MAINTENANCE	15,476,388	16,140,065	16,763,160	16,425,078	(338,082)	-2.0%
OPERATIONS SUPPORT	4,680,275	4,793,945	4,924,451	5,802,773	878,322	17.8%
FOD ADMIN	4,859,745	5,061,666	4,781,225	5,392,518	611,292	12.8%
TOTAL	\$ 64,566,350	\$ 65,308,951	\$ 67,189,014	\$ 69,213,696	\$ 2,024,681	3.0%

The primary goal of the **Field Operations Department (FOD)** is to provide high quality, uninterrupted water delivery and wastewater collection services to MWRA communities. The department is responsible for the treatment, transmission, and distribution of water from the Quabbin and Wachusett reservoirs to community water systems. It also manages the collection, transport, and screening of wastewater flow from MWRA communities to the Deer Island Treatment Plant. FOD consists of five operating units: Wastewater Operations, Metropolitan Maintenance, Water Operations and Maintenance, Operations Support, and Administration.

Wastewater Operations operates MWRA's wastewater transport facilities, including four continuously staffed Headworks facilities; 12 fully automated pumping stations; and six Combined Sewer Overflow (CSO) facilities which are similarly unstaffed. The wastewater system is monitored and controlled from the operations control center (OCC) in MWRA's Chelsea facility.

Water Operations and Maintenance is responsible for the treatment and delivery of approximately 198 million gallons per day (three year average mgd) of water from the Quabbin and Wachusett reservoirs to the community water systems. The water system encompasses a service area from Chicopee in the western part of the state to Lynnfield, Wakefield, Marblehead, Norwood and Canton in the metropolitan area. This unit operates and maintains MWRA's western waterworks facilities, including the Carroll Water Treatment Plant, the MetroWest Tunnel, the Brusch Water Treatment Plant, the Cosgrove Intake Facility, the Norumbega Reservoir, and the covered storage facilities. There are two operations centers that provide for monitoring and control of the water system on a 24-hour per day basis. The Metropolitan Operations and Control Center (OCC) is located at MWRA's Chelsea office facility and the Western Operations Center is located at the Carroll Water Treatment Plant.

Metropolitan Maintenance is responsible for the maintenance of MWRA's wastewater and water systems and facilities within the Route 128 area. Staff maintain pipelines, valves, interceptors, pumps, facility equipment, buildings, and grounds. Metropolitan Maintenance staff maintain a waterworks network of approximately 300 miles of water mains, 4,955 valves, 18 miles of deep rock tunnels, twelve pump stations, eight tunnel shafts, twelve distribution storage tanks, and a wastewater network of 240 miles of wastewater interceptors and appurtenances, twelve pump stations, four headworks, and six CSO facilities. This unit also performs TV inspections of the wastewater interceptor system and leak detection. In addition, this unit maintains 179 revenue water meters, 26 master water meters, 187 revenue wastewater meters, and 35 other wastewater monitoring sites.

Operations Support provides technical support to the Field Operations Department (FOD) in two key areas. Engineering staff coordinate all engineering issues related to the operation of the water and wastewater systems. The SCADA unit is responsible for the maintenance of the water and wastewater Supervisory Control and Data Acquisition (SCADA) systems.

FOD Administration provides financial, administrative, planning, and policy oversight functions for the entire Field Operations Department.

FY17 Goals:

Wastewater Operations

- Meet all operational and regulatory performance standards and requirements.
- Promote the use of technology throughout Wastewater Operations to maximize staff productivity and ensure information is readily available to support decision making.
- Provide efficient and cost effective operation of the MWRA's wastewater system.

Water Operations and Maintenance

- Operate and maintain the water supply and treatment facilities to provide an adequate supply of properly treated drinking water to meet all operational and regulatory performance requirements.
- Supply water to customer communities at the expected pressure.
- Continue to maximize staff productivity and efficiency for the maintenance of these facilities.
- Coordinate the operation of these facilities with on-going construction projects such as the Wachusett Aqueduct Pump Station.
- Minimize lag time for leak repair.
- Exercise 1,100 main line valves and 370 blow off valves.

Metropolitan Maintenance

- Ensure that necessary maintenance and support are provided to meet the operational performance standards and regulatory requirements for all of MWRA's facilities in the metropolitan Boston communities.
- Continue to maximize staff productivity and efficiency for the maintenance of these facilities.
- Optimize the use of Maximo, MWRA's computerized maintenance management system, to ensure cost-effective maintenance of facilities and equipment.

Operations Support

- Maximize availability and operations of SCADA system to support operations of MWRA's wastewater and water systems.

FY17 Major Initiatives:

Wastewater Operations

- Expand the use of Maximo where appropriate.
- Constructively apply technology to improve crew efficiency and crew accountability.
- Expand the use of the computerized tracking system to ensure daily and adequate inspection of MWRA's facilities

Water Operations and Maintenance

- Perform system upgrades at the Carroll Water Treatment Plant to replace outdated equipment and to improve efficiency during low demand periods.
- Make modifications and repairs to dams and appurtenances to meet the requirements of the Office of Dam Safety.
- Continue the invasives removal work at Wachusett, Sudbury, and Chestnut Hill reservoirs.
- Survey the MWRA water system for leaks.

Metropolitan Maintenance

- Exercise close supervision of the metro maintenance, equipment maintenance, TV inspection, and process control programs and meet performance goals in all areas tracked by MWRA.
- Continue to review and revise operating procedures.

Operations Support

- Pilot test Verizon Wireless network on SCADA system.
- Roll out Multi Protocol Label Switching network.

FY16 Accomplishments:

Wastewater Operations

- Wastewater Operations staff participated in 11 planned North Main Pump Station Shutdowns and four shutdowns of the Winthrop Terminal.
- Staff attended Chemical Receiving Training, focusing on the proper procedures of receiving chemicals and fuel oil, including ensuring adequate capacity in receiving tanks, testing chemicals and reviewing paperwork.

Water Operations and Maintenance

- Provided temporary water supply to Lynn through November.
- Completed startup of the new Spot Pond Storage Tank in February of 2016.
- Completed the installation of two dam seepage-monitoring weirs at Weston Reservoir.
- Continued invasives removal work in the Stillwater, Sudbury Reservoir, and Chestnut Hill reservoirs.

- Completed the annual half-plant shutdown of the Carroll Water Treatment Plant, cleaned primary contactors and storage tanks, replaced rupture discs on the primary contactors, back pressure valves on chemical feed systems, and UV Lamps that have reached the end of the service life
- Replaced seven main line valves and retrofitted three blow-off valve sites.
- Identified and repaired over 14 leaks, most with the pipelines remaining in service.
- Overall valve operability is 92%-100%, a result of continued valve exercising, repair, and replacement.
- Assisted ten customer communities with valve, leak detection, and water quality issues.

Metropolitan Maintenance

- Staff performed 818 manhole inspections.
- Cleaned and maintained 38.94 miles of the MWRA's sewer system
- Inspected 48 siphon barrels and cleaned 72 siphon barrels.

Operations Support:

- Outfitted the Pressure Reducing Valve (PRV) at Shaft 9A with SCADA Control, providing two sources of automated control to the new Spot Pond Tanks.
- Operations Engineering continued training MWRA Staff on the City Tunnel and City Tunnel Extension Emergency Action Plans. Conducted tours to several shafts to familiarize staff with the locations and the equipment at each site.
- Implemented data diode system on SCADA production network.

Budget Highlights:

- The FY17 Final Budget is \$69.2 million, an increase of \$2 million or 3% from FY16 Actuals.
- \$34.5 million for **Wages and Salaries**, an increase of \$2.1 million or 6.4%, from FY16 Actuals mainly due to wage increases associated with collective bargaining agreements. This line item accounts for 50% of the FY17 Final Budget. The budget also includes \$446,000 for stand-by pay to ensure support for operational and maintenance needs during wet weather and emergencies and \$95,000 for interns to provide support in several areas including Operations Engineering and SCADA.
- \$2.7 million for **Overtime**, a decrease of \$196,000 or 6.7% from FY16 Actuals. The budget, which reflects collective bargaining increases, includes \$1.2 million for emergency related overtime; \$915,000 for planned overtime; and \$551,000 for operational coverage needs. The budget for planned overtime is decreasing significantly due to fewer shut-downs planned in FY17 to complete the North Main Pump Station (NMPS)/ Winthrop Terminal Facility Butterfly Replacement project.
- The FY17 Final Budget includes \$5.8 million for **Chemicals**, which is \$118,000 or 2.1% more than FY16 Actuals. The budget includes \$5.6 million for water treatment and \$236,000 for wastewater treatment. The FY17 Final Budget is based on multi-year historical usage trends and projected market prices, which are expected to be generally favorable in the next year. The Budget includes \$3.2 million for Soda Ash, \$1.0 million for sodium hypochlorite, \$443,000 for liquid oxygen, \$380,000 for hydrofluosilicic acid, \$314,000 for carbon dioxide, and \$228,000 for aqua ammonia.

- \$9.5 million for **Utilities**, an increase of \$1.1 million or 13.6%, from FY16 Actuals, primarily due to estimated prices based on market assessments. The FY17 Final Budget includes \$7.1 million for electricity, \$1.3 million for diesel fuel, \$577,000 for natural gas, \$484,000 for water and \$61,000 for propane. Primarily due to extremely low diesel costs in FY16, the FY17 Final Budget for diesel increases by \$607,000 compared to FY16 Actuals. Additional increases include \$406,000 in electricity due to increased quantities based on 3-year average use; \$163,000 in natural gas primarily due to estimated pricing; and \$23,600 in propane due to estimated increase in both quantity and price. Water decreases by \$61,000 due to lower volume based on 3-year average use.
- \$11.4 million for **Maintenance**, a decrease of \$1.7 million or 13% from FY16 Actuals, which included spending related to the Nut Island Fire. The FY17 Final Budget includes \$4.8 million in day-to-day needs, \$3.5 million for services, \$2.4 million in major projects, and \$608,000 for energy initiatives. Some of the major projects included for the FY17 Final Budget are:

Manhole Rehabilitation Contract	\$360,000
Replace Actuators in Eastern Water facilities	\$241,575
Invasives Control - Stillwater Basin - DASH	\$203,250
New Transformer for Oakdale Substation	\$160,000
Replacement 30" Flow Control Valve at Weston Aqueduct	\$150,000
Reline Hypochlorite Tanks at Carroll	\$125,000

- \$99,000 for **Training and Meetings**, an increase of \$13,000 or 14.8% from FY16 Actuals. The budget covers training required for work duties, health and safety compliance, cyber-security and SCADA technical training, and job-related licensures and certifications.
- \$760,000 for **Professional Services**, an increase of \$288,000 or 61% from FY16 Actuals. The FY17 Final Budget includes \$617,000 for engineering services, which is made up of \$133,000 for as-needed engineering services to support CEB-funded maintenance projects; \$161,000 for a multi-year dam safety contract; \$50,000 to assess and enhance Cathodic Protection infrastructure; \$250,000 for security enhancements for the SCADA system; and \$23,000 for evaluation of spill prevention, control, and countermeasure plans. Additionally, the Professional Services budget also includes \$66,000 for an annual macrophyte survey at the reservoirs; \$64,000 for quality assurance services for macrophyte harvesting; and \$10,000 for energy audits at various facilities.
- \$976,000 for **Other Materials**, an increase of \$83,000 or 9.3% from FY16 Actuals. The FY17 Final Budget includes \$338,000 for vehicle expenses for gas, mileage reimbursements, and tolls; \$268,000 for work clothes; and \$220,000 for health and safety supplies.
- \$3.4 million for **Other Services**, an increase of \$221,000 or 6.9%, from FY16 Actuals primarily due to increases for the costs of SCADA data lines. The FY17 Final Budget includes \$1.9 million for annual lease payments for the Chelsea office building; \$842,000 for telephones, and \$448,000 for police details.

ENGINEERING AND CONSTRUCTION

FY17 Final Current Expense Budget ENGINEERING AND CONSTRUCTION						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 7,068,191	\$ 7,022,031	\$ 7,212,203	\$ 7,893,921	\$ 681,719	9.5%
OVERTIME	43,123	58,989	64,500	65,965	1,465	2.3%
FRINGE BENEFITS	126	143	152	500	348	228.9%
ONGOING MAINTENANCE	9,603	142	676	-	(676)	-100.0%
TRAINING & MEETINGS	5,166	15,466	11,610	9,000	(2,610)	-22.5%
OTHER MATERIALS	28,899	31,349	25,138	33,050	7,912	31.5%
OTHER SERVICES	19,969	25,790	33,932	31,615	(2,317)	-6.8%
TOTAL	\$ 7,175,077	\$ 7,153,909	\$ 7,348,211	\$ 8,034,051	\$ 685,841	9.3%

The **Engineering and Construction Department (ECD)** manages and coordinates the planning, design, and construction of system improvements that ensure a safe and adequate water supply and a reliable wastewater collection and treatment. Staff is organized into three units including Wastewater Engineering, Water Engineering, and Construction.

The department provides in-house engineering, consultant management (during the facilities planning, environmental review, design, and engineering services during construction stages of capital projects), drafting, surveying, construction management, and other technical assistance required for the maintenance, repair, and rehabilitation of wastewater and waterworks systems.

The **Wastewater Engineering Unit** manages all wastewater design and engineering projects including Combined Sewer Overflow (CSO) engineering activities as well as specialized technical services in electrical, structural, mechanical, and civil engineering disciplines.

The **Water Engineering Unit** manages all water design and engineering projects. The unit also maintains the Design Information Services Center (DISC), which provides computer-aided design and drafting (CADD) services.

The **Construction Unit** provides contract management and resident inspection on all MWRA water and wastewater construction and rehabilitation projects, with the exception of Deer Island Treatment Plant.

FY17 Goals:

- In accordance with the prevailing CIP, plan and implement rehabilitation of existing facilities and construction of new facilities including pipelines, pump stations, storage facilities, and treatment facilities on schedules that allow for sufficient system capacity and performance.
- Complete activities necessary to comply with future (Jan 2018 and Dec 2020) Federal Court milestones related to CSO post-construction monitoring and performance assessment.

FY17 Major Initiatives:

- Award contracts and issue Notice to Proceed for numerous contracts including the following major phases (based on the Final FY17 CIP):
 - NIH Redundancy & Storage: Section 89/29 Redundancy – Construction Phase 1C
 - NIH Redundancy & Storage: Section 89/29 Redundancy – Construction Phase 2
 - Central Monitoring System: Waterworks SCADA/PLC Upgrades
 - SEH Redundancy Pipeline Section 111 Phase 2 Construction
 - SEH Redundancy Pipeline Section 111 Phase 3 Construction
 - New Connecting Mains: Shaft 7 to WASM 3 – CP3 Final Design
 - Facility Asset Protection: Chelsea Creek Upgrades – Construction
 - Facility Asset Protection: Inter Ren 1, Reading Extension Sewer – Construction
 - Facility Asset Protection: Prison Point Rehab – Design

- Substantially complete numerous contracts including the following major phases (based on Final FY17 CIP):
 - Spot Pond Supply Mains Rehab: Section 4 Webster Ave Bridge Pipe Rehab – Design & Construction
 - Long Term Redundancy: Sudbury Aqueduct – MEPA Review
 - Central Monitoring System: Quabbin Power, Communication, & Security - Construction
 - WASM: Section 36 Valve
 - WASM: Section 36/Waltham - Design
 - CSO Program: Cambridge Sewer Separation – Construction
 - CSO Program: Dorchester Bay Sewer Separation – Design & Construction
 - Facility Asset Protection – Caruso Pump Station Improvements - Design

- Complete the following regarding the Combined Sewer Overflow plan:
 - Renew Charles River and Alewife Brook/Mystic River CSO variance extensions for the period 2016-19
 - Develop scope of services for court-manadated 3-year CSO performance assessment

FY16 Accomplishments:

- Awarded contracts and/or issued Notice to Proceed for numerous phases including the following major phases:
 - Alewife Brook Pump Station Rehab Construction
 - Facility Asset Protection Chelsea Screenhouse Upgrades ESDC
 - Long Term Redundancy Wachusett Aqueduct Pump Station Construction
 - Cathodic Protection of Distribution Mains Testing Evaluation Program
 - NIH Redundancy & Storage Sections 89 & 29 Redundancy Phase 1B
 - CWTP Existing Facilities Modifications – CP7
 - Fish Hatchery Pipeline

- Caruso Pump Station Improvements
- Substantially completed numerous contracts including the following major phases:
 - Spot Pond Storage Facility Design/Build
 - Facility Asset Protection PP/CF Pump and Gearbox Rebuilds
 - MWR003 CSO Gate, Floatables Control and Rindge Avenue Siphon Relief – Construction
 - CSO Reserved Channel Sewer Separation – BWSC Construction
 - Rehabilitation of Anaerobic Digesters, primary Clarifiers and New Influent Gates at Clinton Wastewater Treatment Plant

Budget Highlights:

- The FY17 Final Budget is \$8.0 million, an increase of \$686,000 or 9.8% compared to FY16 Actuals.
- \$7.9 million for **Wages and Salaries**, an increase of \$682,000 or 9.5% compared to FY16 Actuals, mainly due to the funding of 75 positions compared to an average of 70 filled positions in FY16. In addition there are base salary increases from union raises, internal promotions and new hires. Wages and Salaries represent 98.2% of the FY17 Final Budget.
- \$66,000 for **Overtime**, which is based on planned projects for FY17 and includes increases due to collective bargaining agreements. Overtime covers resident inspection at construction sites after regular work hours to ensure monitoring of construction projects. Overtime is also used for unplanned design or survey needs, attendance at evening public meetings, and meeting deadlines.
- \$9,000 for **Training & Meetings** to cover attendance at conferences and technical seminars.
- \$33,000 for **Other Materials**, an increase of \$8,000 or 31.5%, compared to FY16 Actuals. The FY17 Final Budget is based on historical spending. In FY16 Actuals were lower than the budgeted historical average for several categories of expenses. In FY17, vehicle expenses were reduced to reflect lower historical spending on tolls and gas cards. The budget covers vehicle expenses, office supplies, health and safety supplies, and survey equipment.
- \$32,000 for **Other Services**, a decrease of \$2,300 or -6.8% compared to FY16 Actuals. Funding is based on historical spending and supports printing/duplicating, telephone expenses, specialized copier services, memberships and dues, and police details.

PROGRAMS, POLICY, & PLANNING

Programs, Policy & Planning

TRAC
ENQUAL
Lab Services
Planning

FY17 Final Current Expense Budget PROGRAMS, POLICY & PLANNING						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 12,814,117	\$ 13,288,828	\$ 13,964,566	\$ 14,719,600	\$ 755,034	5.4%
OVERTIME	122,684	165,876	188,350	181,985	(6,365)	-3.4%
FRINGE BENEFITS	1,689	2,124	2,652	2,325	(327)	-12.3%
CHEMICALS	-	-	-	-	-	-
UTILITIES	27,689	22,881	23,842	24,500	658	2.8%
ONGOING MAINTENANCE	463,415	556,931	431,182	612,343	181,161	42.0%
TRAINING & MEETINGS	19,540	19,085	30,666	37,400	6,734	22.0%
PROFESSIONAL SERVICES	1,452,070	1,463,086	1,599,057	1,666,043	66,986	4.2%
OTHER MATERIALS	1,130,644	1,396,234	1,686,670	1,419,535	(267,136)	-15.8%
OTHER SERVICES	402,424	391,779	419,585	558,771	139,186	33.2%
TOTAL	\$ 16,434,272	\$ 17,306,823	\$ 18,346,571	\$ 19,222,502	\$ 875,932	4.8%

FY17 Final Current Expense Budget PROGRAMS, POLICY & PLANNING by Program						
PROGRAM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
TOXIC REDUCTION & CONTROL	\$ 3,588,160	\$ 3,764,566	\$ 3,929,956	\$ 3,975,931	\$ 45,975	1.2%
ENVIRONMENTAL QUALITY	4,143,529	4,275,976	4,837,375	4,915,414	78,039	1.6%
LAB SERVICES	5,621,316	5,932,398	6,264,136	6,584,524	320,388	5.1%
PLANNING	3,081,268	3,333,883	3,315,104	3,746,634	431,529	13.0%
TOTAL	\$ 16,434,272	\$ 17,306,823	\$ 18,346,571	\$ 19,222,502	\$ 875,932	4.8%

The Programs, Policy & Planning Section is comprised of the Toxic Reduction and Control, Environmental Quality (EnQual), Laboratory Services, and Planning departments. The Environmental Quality Department has two units; EnQual-Wastewater and EnQual-Water Quality Assurance (water system). The Planning Department also has two units; Planning and Meter Data. In total, the budgets for these programs represent 11.5% of the Operations Division's FY17 Final Budget and 8.5% of MWRA's FY17 Final Direct Expense Budget.

The Deputy Chief Operating Officer of Programs, Policy, and Planning oversees this section, which focuses on the following:

- Master planning, business planning, and strategic initiatives (such as system expansion);
- Environmental programs and regulatory coordination;
- Water and wastewater quality testing and reporting;

- Divisional budget preparation and monitoring;
- Financial planning and analysis;
- Accounts payable and contract administration;
- Human resources management functions; and
- Energy audits, reporting, program evaluation, and analysis.

The Deputy Chief Operating Officer of Programs, Policy, and Planning also provides support to the Chief Operating Officer on key MWRA operations, technical, policy, community coordination, permitting, and public constituency matters.

TOXIC REDUCTION AND CONTROL

FY17 Final Current Expense Budget TOXIC REDUCTION AND CONTROL						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 3,391,080	\$ 3,582,311	\$ 3,719,990	\$ 3,764,568	\$ 44,578	1.2%
OVERTIME	58,252	62,997	69,228	73,185	3,957	5.7%
FRINGE BENEFITS	1,173	1,221	1,419	1,200	(219)	-15.4%
ONGOING MAINTENANCE	23,213	3,034	16,438	11,500	(4,938)	-30.0%
TRAINING & MEETINGS	-	-	-	1,500	1,500	-
OTHER MATERIALS	105,581	109,971	114,810	115,978	1,168	1.0%
OTHER SERVICES	8,861	5,032	8,070	8,000	(70)	-0.9%
TOTAL	\$ 3,588,160	\$ 3,764,566	\$ 3,929,956	\$ 3,975,931	\$ 45,975	1.2%

The Toxic Reduction and Control (TRAC) Department operates a multi-faceted program to minimize and control the inflow of hazardous or toxic materials into the MWRA sewer system. TRAC operates MWRA’s Environmental Protection Agency (EPA) approved Industrial Pretreatment Program and is responsible for all associated activities which include conducting inspections (approximately 700 annually), issuing permits (300 annually), conducting sampling (more than 2,000 events annually), and carrying out enforcement activities (approximately 400 annually). The program tracks more than 1,400 permitted facilities and 4,000 gas/oil separators. TRAC uses a software application to manage an extensive amount of industrial data on analytical test results, compliance status, and facility sampling and permitting requirements.

FY17 Goals:

- Regulate the level of toxic inflows into the MWRA sewerage system by inspecting, permitting, and monitoring industrial users.
- Ensure compliance with MWRA and Federal regulations by issuing appropriate enforcement actions as outlined in the Enforcement Response Plan.

FY17 Major Initiatives:

- Staff will complete regulatory review of the local limits applicable to the industrial users in the Clinton service area under the requirements of the National Pollution Discharge Elimination System (NPDES) permit renewal process for the Clinton Wastewater Treatment Plant.
- TRAC staff will utilize the Pre-treatment Information Management System (PIMS) software to schedule and track work, as well as to draft permits and track permit requirements. Sampling required by permits is entered into the PIMS system by permittees’ contract laboratories. This electronic reporting system is subject to EPA’s Cross Media Electronic Reporting Rule (CROMERR) and as such, needs to be upgraded to meet the requirements of the rule. TRAC staff are working with MWRA’s MIS staff to ensure that the PIMS system meets these requirements.

FY16 Accomplishments:

- MWRA's Incentive and Other Charges Program recovers a substantial portion of MWRA's costs of inspecting, monitoring, and permitting industrial sewer users. MWRA collected \$2.1 million in fees from discharge permit holders in FY16.
- Through FY16, TRAC conducted 204 annual Significant Industrial User (SIU) inspections required by EPA, 685 oil/water separator inspections, and 228 inspections of septage hauling companies and receiving sites. Staff issued 327 permits to industrial users during the period including 92 permits issued to SIUs.
- Through FY16, the Monitoring group conducted approximately 1,479 SIU and 334 Non SIU sampling events as required by EPA and the monitoring plan. Additionally, 1,762 events were sampled for non-industrial sampling events (e.g. emergencies, Combined Sewer Overflow, Clinton NPDES permit, Carroll Water Treatment Plant NPDES permit, SPSULF, Oakdale and Cosgrove NPDES permit) as well as other events.

Budget Highlights:

- The FY17 Final Budget is \$4.0 million, an increase of \$46,000 or 1.2%, from FY16 Actuals.
- \$3.8 million for **Wages & Salaries**, an increase of \$45,000 or 1.2% from FY16 Actuals primarily due to collective bargaining increases.
- \$12,000 for **Ongoing Maintenance**, a decrease of \$5,000 from FY16 Actuals. This funds sampling equipment, materials, and maintenance of equipment used in sampling industrial discharges at permitted industries. The decrease reflects the transfer of responsibility of a computer maintenance contract to MIS.
- \$116,000 for **Other Materials**, an increase of \$1,000 or 1.0% from FY16 Actuals. This increase primarily reflects the shift of funding for work clothes to the TRAC budget since the department will no longer roll-up into the Field Operations Department budget. Funding in this line item mainly supports lab and testing supplies and health and safety materials.
- \$8,000 for **Other Services**, no change from FY16 Actuals. This funds printing costs for regulations, public advertising of industrial users in Significant Noncompliance, and police details for sampling work done in public streets.

ENVIRONMENTAL QUALITY

FY17 Final Current Expense Budget ENVIRONMENTAL QUALITY						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 2,664,297	\$ 2,734,691	\$ 2,865,105	\$ 3,149,351	\$ 284,246	9.9%
OVERTIME	2,734	3,708	9,780	4,800	(4,980)	-50.9%
FRINGE BENEFITS	11	25	129	200	71	55.0%
CHEMICALS	-	-	-	-	-	-
UTILITIES	-	-	-	-	-	-
ONGOING MAINTENANCE	24,265	97,896	81,982	50,000	(31,982)	-39.0%
TRAINING & MEETINGS	3,406	4,709	16,202	19,400	3,198	19.7%
PROFESSIONAL SERVICES	1,292,785	1,290,537	1,432,258	1,510,863	78,605	5.5%
OTHER MATERIALS	34,430	35,065	311,952	60,330	(251,622)	-80.7%
OTHER SERVICES	121,601	109,346	119,966	120,470	504	0.4%
TOTAL	\$ 4,143,529	\$ 4,275,976	\$ 4,837,375	\$ 4,915,414	\$ 78,039	1.6%

FY17 Final Current Expense Budget ENVIRONMENTAL QUALITY by Program						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
ENQUAL	\$ 2,722,517	\$ 2,715,087	\$ 2,770,877	\$ 2,951,353	\$ 180,476	6.5%
WATER QUALITY ASSURANCE	1,421,012	1,560,889	2,066,498	1,964,061	(102,437)	-5.0%
TOTAL	\$ 4,143,529	\$ 4,275,976	\$ 4,837,375	\$ 4,915,414	\$ 78,039	1.6%

The **Environmental Quality Department** (EnQual) has two sections: EnQual-Water and EnQual-Wastewater (WW). EnQual-Water manages compliance with the reporting requirements of the MA Department of Environmental Protection Drinking Water Regulations, as well as conducts and oversees the drinking water quality monitoring program. Activities include maintaining the Contaminant Monitoring System (CMS) and a mobile S::CAN unit for as-needed sampling in the communities. The group also conducts an algae monitoring program, responds to customer complaints, and reviews system water quality data. EnQual-WW manages compliance with the reporting requirements of MWRA's National Pollutant Discharge Elimination System (NPDES) permits. The group must submit permit reports to state and federal regulators, the science advisory panel and its subcommittees, and designated libraries, and post many of these reports on its Harbor and Bay web pages. EnQual-WW manages environmental data and monitors and reports on the quality of sewage influent and effluent; Boston Harbor and its tributary rivers, and Massachusetts Bay. EnQual-WW also keeps current with upcoming and draft regulations, providing comments and evaluating potential impacts on MWRA operations.

FY17 Goals:

EnQual-Water

- Water quality monitoring:
 - Develop and implement a comprehensive Contaminant Warning System, which includes a network of monitoring stations.
 - Develop and implement a Contaminant Response Program, as part of an Authority Consequence Management Plan.
 - Expand and improve a reservoir monitoring system at Wachusett Reservoir.
 - Provide On-Call staffing for off-hour emergency response to monitoring alarms.

- Design and implement a Mobile Water Quality Trailer to provide field and onsite monitoring and lab capabilities.
- Develop a water quality monitoring program for emergency standby reservoirs, including a plan to ensure readiness of emergency supplies.
- Respond to MassDEP and EPA Regulatory changes regarding drinking water quality monitoring (e.g., new MassDEP regulatory updates, UCMR4, etc)
- Participate in training programs to communities to support response to drinking water quality complaints, improve compliance with regulations, and support overall coordination.
- Continue to work with UMass Amherst, under an Interdepartmental Service Agreement with MWRA, to assess impacts from a potential chemical spill, and how treatment at CWTP can mitigate those effects.

EnQual-Wastewater

- Provide technical and scientific guidance in the development of the EPA-required CSO performance assessment.
- Respond to EPA and MassDEP NPDES regulatory changes and program initiatives, including electronic reporting requirements and any new permits.
- Continue to develop and manage a monitoring program for Boston Harbor and its tributary rivers, and Massachusetts Bay, reflecting relevant current concerns and long-term interests of the area.

FY17 Major Initiatives:

EnQual-Water

- Develop and train staff on emergency response procedures and contaminant response procedures for reservoir or distribution system events. Also train staff in Incident Command System (ICS) protocols, procedures, and practices to aid in integration of service in the case of an emergency event.
- Monitor algal toxins in drinking water and adapt the program to the rapidly changing regulatory landscape of this current issue.
- Collect samples and evaluate data to develop a program for the emergency standby reservoirs, including management goals to ensure these are ready, from a water quality perspective, in the event of an emergency.
- Develop and train staff in preparation for USEPA Unregulated Contaminant Monitoring Rule 4 program which commences in 2018 and continues into 2020.

EnQual-Wastewater

- Explore modification of the Ambient Monitoring Plan to better address issues of emerging concern involving potential impacts of the outfall. This involves working with regulators and their Outfall Monitoring Science Advisory Panel (OMSAP) to review the goals and monitoring questions underlying the Ambient Monitoring Plan, which is required by DITP's NPDES permit.
- Working with staff from Planning, Engineering and Construction, and Operations, plan CSO performance assessment, including ongoing water quality monitoring. This is the next phase of the Long-Term CSO Control Plan, which calls for three years of assessment before 2020 to ensure that the goals of the plan are met.
- To meet the future water quality assessments expected in the CSO Variance areas of the Mystic and Charles Rivers, staff are beginning to scope an intensified level of data analysis bringing together disparate datasets such as localized rainfall data, metered and modeled CSO discharges, and receiving water quality.
- In FY17, EnQual-WW will procure services for the next three years of ambient monitoring. Monitoring carried out by environmental consultants is supported by laboratory analyses of many of the samples by the Department of Laboratory Services. This core monitoring is supplemented with special studies, co-funded by other agencies including the Provincetown Center for Coastal Studies, NOAA Sea Grant, and others. These special studies extend MWRA's core monitoring to Cape Cod Bay, or explore monitoring technology development, or other topics related to MWRA's activities.
- Staff have worked with researchers from the University of Maine and Northeastern Regional Association of Coastal and Ocean Observing Systems (NERACOOS) to secure five-year funding for the NERACOOS program, including an oceanographic buoy in Massachusetts Bay partially funded by MWRA. This funding plan resulted in substantial reductions in MWRA's level of support starting in FY17.
- To respond to public interest and improve timeliness of accurate reporting, EnQual-WW will continue to develop a system to more quickly gather accurate SSO location and volume data.
- If a new final permit is issued for the Clinton Advanced Wastewater Treatment Plant in FY17, EnQual-WW staff will develop procedures to meet any new or changed reporting requirements.

Joint EnQual Water / Wastewater initiatives:

- Develop improved database for monitoring CMS maintenance activities.
- More fully utilize Maximo as appropriate for preventive and corrective job tasks for equipment, as well as scheduling and tracking of inspections and filing requirements.
- Work on a joint proposal, with UMass Boston and other New England utilities to participate in a project with NASA using satellite imagery for WQ /operational decision making.
- For the Wachusett Aqueduct Pump Station, develop monitoring and reporting program which will be required by the NPDES general permit for non-contact cooling water, and apply for coverage under the permit before the facility begins operation.

FY16 Accomplishments:

EnQual-Water

- Replaced and enhanced monitoring capabilities on the Wachusett Reservoir with following equipment: new profiling buoys with water quality and petroleum sensor technology, a towable petroleum sonde, and both water quality and petroleum handheld sondes. Staff have designed and are in the process of installing a year-round, continuous monitoring shed at the Route 12 Bridge, which will provide both routine water quality information and potential contaminant detection.
- Implemented a 24/7 monitoring and response program for CMS alarms.
- Supported major projects including the Lynn transition to MWRA water and activation of the Spot Pond tanks in Stoneham.
- Successfully completed all DEP-required drinking water sampling and reporting in FY16.

EnQual-Wastewater

- Permits – Submitted permit renewals for industrial stormwater at wastewater facilities, and reported required stormwater monitoring data for DITP. Submitted routine monthly, quarterly, and annual reports, and required notifications under Part II of permits, Contingency Plan, DITP blending order, and Clinton copper order. Submitted successful applications for NACWA Peak Performance awards for DITP and Clinton. Submitted annual interpretive report summarizing Ambient Monitoring studies in CY14 as required in the DITP NPDES permit.
- Reviewed and analyzed impact on MWRA of several new draft or final EPA regulations. These included draft permits for municipal stormwater and for application of pesticides, as well as a proposed phosphorus Total Maximum Daily Load for the Mystic River. Analyzed historical wastewater and receiving water bacteria data to identify potential issues in complying with possible future permit limits. Based on data collected with MWRA assistance to DCR's beach monitoring program, Mass. Department of Public Health decided not to change the State marine beach posting limits to more stringent limits recommended by EPA, which would have increased beach postings without any benefit to public health.
- Created and launched new web page with near-real-time reporting of sanitary sewer overflows (SSOs).
- Posted fact sheets for each harbor beach on the web providing context for interpreting water quality data. Initiated project to study microbial source tracking at Tenean Beach. Completed and published a report on CSO receiving water monitoring required by the Charles River and Mystic River water quality standards variances, as well as receiving water quality sections of the annual report to the court on the Long Term CSO Control Program. Working with Laboratory Services Department, planned a modified sampling program for 2016 to support the CSO variances and CSO LTCP Assessment. Introduced improved procedures for reviewing and loading harbor field data.

- Conducted required ambient monitoring including triennial fish/shellfish sampling and tissue analyses.
- Successfully completed all NPDES-required reporting in FY16.

Budget Highlights:

- The FY17 Final Budget is \$4.9 million, an increase of \$78,000 or 1.6%, from FY16 Actuals.
- \$50,000 for **Ongoing Maintenance**, to continue funding parts and maintenance for the drinking water Contaminant Monitoring System and S::CAN drinking water analysis equipment.
- \$1.5 million for **Professional Services**, an increase of \$78,000, or 5.5% over FY16 Actuals, primarily for as-needed task orders budgeted in the Harbor and Outfall monitoring (HOM) contracts. The FY17 Final Budget includes \$1.5 million for laboratory testing and analysis in support of MWRA's HOM Program, including Cape Cod Bay monitoring, and \$300,000 for contracts for the following activities which are co-funded through cost-sharing or cost-reduction agreements:
 - o UMass Amherst special study on railroad contaminants in the Wachusett Reservoir
 - o University of Maine's buoy off Cape Ann; instruments measuring algae and other water-quality indicators
 - o Bays Eutrophication Model maintenance
 - o Study of satellite imaging to measure water quality.

The FY17 Final Budget continues to reflect approximately \$840,000 in annual savings due to the reduction in scope of HOM monitoring that took place in 2011 through 2013 based on favorable findings of many years of monitoring data and regulatory approval.

- \$60,000 for **Other Materials**, a decrease of \$252,000 from FY16 Actuals. This reduction is because the equipment to support security-related initiatives in the water system was purchased with FY16 Budget funds but does not need to be funded again in FY17.
- \$120,000 for **Other Services**, in line with FY16 spending. This funds professional memberships and the Verizon contract related to the Contaminant Monitoring System.

LABORATORY SERVICES

FY17 Final Current Expense Budget						
LABORATORY SERVICES						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 4,200,693	\$ 4,249,159	\$ 4,483,094	\$ 4,827,198	\$ 344,104	7.7%
OVERTIME	61,699	99,170	107,890	104,000	(3,890)	-3.6%
FRINGE BENEFITS	505	873	1,099	875	(224)	-20.4%
CHEMICALS	-	-	-	-	-	-
UTILITIES	27,689	22,881	23,842	24,500	658	2.8%
ONGOING MAINTENANCE	248,489	201,737	291,458	312,350	20,892	7.2%
TRAINING & MEETINGS	5,176	3,679	2,909	7,000	4,091	140.6%
PROFESSIONAL SERVICES	156,185	169,449	162,123	152,080	(10,043)	-6.2%
OTHER MATERIALS	827,126	1,097,396	1,104,836	1,067,452	(37,384)	-3.4%
OTHER SERVICES	93,753	88,054	86,886	89,069	2,183	2.5%
TOTAL	\$ 5,621,316	\$ 5,932,398	\$ 6,264,136	\$ 6,584,524	\$ 320,388	5.1%

The goal of the **Department of Laboratory Services (DLS)** is to provide high quality and responsive laboratory services to MWRA's water and wastewater treatment programs, including the Department of Conservation and Recreation (DCR) and the MWRA member water and wastewater communities. This includes timely and cost-effective laboratory tests to meet the strict testing guidelines required by all regulatory programs and permits, including the Safe Drinking Water Act (SDWA), Clean Water Act, and National Pollutant Discharge Elimination System (NPDES) permits. The Department supports these functions at five locations: Chelsea, Southboro, Quabbin, the Central Laboratory at the Deer Island Treatment Plant (DITP or Deer Island), and the Clinton Wastewater Treatment Plant. Testing supports drinking water transmission and treatment processes, wastewater operations and process control at Deer Island and Clinton, NPDES compliance, Massachusetts Bay outfall monitoring, Toxic Reduction and Control (TRAC), and wastewater residuals. DLS also conducts the Boston Harbor monitoring program that involves regular sampling for nutrients, bacteria, and water quality parameters throughout Boston Harbor. Laboratory staff track and analyze results for submission to the Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP).

Most MWRA laboratory testing is done in-house. Certain highly specialized or low volume tests are outsourced, such as tests for dioxins and radioactivity.

FY17 Goals:

The DLS performance goals are:

- > 95% of lab results completed on-time.
- < 9 days average turnaround time.
- > 98% of quality control tests within specifications.
- Complete targeted laboratory work consistent with staffing level (goal 100%).

FY17 Major Initiatives:

- **Ethics Training** - Expand laboratory ethics and data integrity training to meet upcoming MassDEP laboratory certification requirements.

- **NPDES Permits** - Provide laboratory data and consulting to wastewater operations and EnQual on Clinton or Deer Island draft and final NPDES permits.
- **Electronic Laboratory Notebook (ELN)** - Implement ELN software on wireless tablet computers at three of the water quality laboratory locations.
- **Laboratory Renovation Projects** - Two major projects continue in FY17. The renovation of the roof and the HVAC system at Southboro Lab is nearing completion. Replacement of the HVAC system and fume hoods at the Central Lab is in the design phase with construction expected to commence in late FY17.
- **School Lead Testing Initiative** – This special project began in FY16 and is continuing into FY17. Thousands of samples have been tested.

FY16 Accomplishments:

DLS continued to provide high-quality, responsive, timely, and cost-effective laboratory services to our clients in compliance with strict testing guidelines required by all regulatory programs and permits, including the Safe Drinking Water Act and NPDES permits. DLS's performance versus key goals in the FY16 was as follows:

- 97% of lab results were completed on time versus goal of > 95%
- Turnaround time averaged 5.7 days versus goal of < 9 days
- 98.2% of quality control tests were within specifications versus goal > 98%
- Completed 108% of targeted laboratory work (goal 100% of budget).

Several projects and activities in FY16 are noteworthy including;

- **LIMS Developments** - Implementing the paperless Electronic Laboratory Notebook (ELN) approach, instead of paper logbooks, at the three Water Quality Labs.
- **Unregulated Contaminant Monitoring Rule 3 (UCMR3)** - This project was completed by the contract lab. EPA has recently proposed UCMR4, which is expected to start in 2018.
- **Mobile Laboratory** – Mobile Lab standby coverage was implemented. Completed training for five additional people to operate the Mobile Lab instruments.

Budget Highlights:

- The FY17 Final Budget is \$6.6 million, an increase of \$320,000 or 5.1% compared to FY16 Actuals, primarily due to Wages and Salaries and Maintenance.

- \$4.8 million for **Wages and Salaries**, an increase of \$344,000 or 7.2% compared to FY16 Actuals due to wage increases and the inclusion of more positions in FY17 based on the Lab's projected needs.
- \$104,000 for **Overtime** to cover work associated with peak periods, emergencies, and special initiatives.
- \$25,000 for **Utilities**, which covers the purchase of gases and cryogenic liquids used for various laboratory instruments.
- \$312,000 for **Maintenance**, an increase of \$21,000 or 7.2% compared to FY16 due to projected needs. This includes Lab equipment maintenance, repairs, and calibration for major lab instruments and once a year preventive maintenance for all ovens, water baths, incubators, refrigerators, freezers, chillers, meters, sensors, microscopes, thermometers, and balances.
- \$7,000 for **Training and Meetings**, an increase of \$4,000 or 141% compared to FY16 Actuals. The funding covers EPA Environmental Laboratory Advisory Board (ELAB) Forum on Lab Accreditation/National Environmental Monitoring Conference and the Association of Public Health Laboratories (APHL) annual meeting. Included are several new conferences and seminars to keep staff technically knowledgeable.
- \$152,000 for **Professional Services**, a decrease of \$10,000 or 6.2% compared to FY16 Actuals. The decrease is due to the end of the UCMR3 project. Funding in this line item supports laboratory and testing analysis services the department uses to contract out a variety of complex and/or low volume tests. Outside laboratories are used for emergencies, second opinions, capacity constraints, and unavailability of specialized equipment or economic justification.
- \$1.1 million for **Other Materials**, a decrease of \$37,000 or 3.4% compared to FY16 Actuals primarily due to projected needs. This includes \$719,000 for laboratory supplies and \$300,000 for laboratory instrument replacements.
- \$89,000 for **Other Services**, an increase of \$2,000 or 2.5% compared to FY16 Actuals. This covers boat rental service on an as-needed basis, boat dockage for two boats, removal of hazardous waste, and courier service for shipping samples between laboratories.

PLANNING

FY17 Final Current Expense Budget						
PLANNING						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 2,558,047	\$ 2,722,668	\$ 2,896,378	\$ 2,978,483	\$ 82,106	2.8%
OVERTIME	-	-	1,451	-	(1,451)	-100.0%
FRINGE BENEFITS	-	5	5	50	45	900.0%
CHEMICALS	-	-	-	-	-	-
UTILITIES	-	-	-	-	-	-
ONGOING MAINTENANCE	167,447	254,264	41,304	238,493	197,189	477.4%
TRAINING & MEETINGS	10,958	10,697	11,555	9,500	(2,055)	-17.8%
PROFESSIONAL SERVICES	3,100	3,100	4,677	3,100	(1,577)	-33.7%
OTHER MATERIALS	163,507	153,802	155,073	175,775	20,702	13.3%
OTHER SERVICES	178,209	189,348	204,662	341,232	136,570	66.7%
TOTAL	\$ 3,081,268	\$ 3,333,883	\$ 3,315,104	\$ 3,746,634	\$ 431,529	13.0%

FY17 Final Current Expense Budget						
PLANNING by Program						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
PLANNING	\$ 2,143,315	\$ 2,350,379	\$ 2,404,530	\$ 2,640,890	\$ 236,360	9.8%
METER DATA	937,953	983,504	910,574	1,105,743	195,169	21.4%
TOTAL	\$ 3,081,268	\$ 3,333,883	\$ 3,315,104	\$ 3,746,634	\$ 431,529	13.0%

The **Planning Department** provides regulatory, public policy, and public health advocacy for MWRA's drinking water and wastewater programs. It provides decision support on planning, policy and operations matters, using a range of technical and analytical tools. Staff administers financial assistance programs to improve the infrastructure of member communities and to promote water conservation, and manages the wholesale meter data necessary for water and sewer billing. The Department integrates staff efforts and coordinates MWRA activities related to system and capital planning, infrastructure renewal, and watershed management (in conjunction with the Commonwealth's Department of Conservation and Recreation; DCR); strategic business planning; agency-wide performance measurement; and industry research. The Department's primary responsibilities are as follows:

Mapping, Modeling, and Data Analysis - Technical staff develops and maintains the Geographic Information Systems (GIS) for the water and wastewater systems, including integration of field and engineering records into GIS for access by planning, engineering, and operations staff. Provides demand analysis and forecasting of water and wastewater flows for master planning and system operations; models reservoir operations and performs drought forecasting and planning; evaluates system expansion requests; and develops and maintains water and wastewater system models in support of master planning, system operations, and optimization. Staff assists in developing agency wide summaries of energy and greenhouse gas emission efficiency improvements.

System Planning and Renewal - Staff with expertise in engineering and planning are responsible for water and wastewater system master planning, infrastructure needs assessment, and capital project development. This work is done in coordination with staff across MWRA. Key work includes:

- Reviews water and wastewater system expansion requests, water supply agreements, and emergency water withdrawal requests;

- Assists with project siting decisions, environmental reviews, and permitting, including assessing impacts on MWRA facilities from other agencies' projects;
- Develops strategies for reducing long-term emergency risks; and
- Prepares plans for mitigating the risk of a range of hazards (i.e. climate change and sea level rise) on MWRA facilities and systems.

Regulatory and Policy Matters - Staff work with various regulatory entities to advocate for cost-effective rule setting that protects the environment and promotes public health. Senior staff members also actively work with industry associations and other groups with agendas consistent with MWRA's to advance regulations that make environmental and economic sense. Senior staff conduct strategic policy research on a broad range of topics. Staff also conduct public health research and reports on potable water quality through production of the annual regulatory-required Consumer Confidence Report (CCR). Staff also coordinates with DCR on watershed protection initiatives.

Community Support Program - Staff are responsible for the development, implementation, and reporting on Inflow/Infiltration (I/I) reduction policy; oversight of and reporting on MWRA leak detection and demand management programs; and reporting on the portions of MWRA's NPDES permit related to demand management and flow limitation activities. Staff administers community assistance programs including sewer Inflow/Infiltration financial and technical assistance, water pipeline rehabilitation financial assistance, lead service line replacement funding, water distribution systems technical assistance, water leak detection technical assistance, and water conservation programs.

Meter Data – Staff maintains 179 revenue water meters, 26 master water meters, 187 revenue wastewater meters and 35 other wastewater monitoring sites. This unit collects meter data for operational and revenue generating purposes from the water and wastewater systems.

FY17 Goals:

- Provide cost-effective and timely mapping, modeling, data analysis, and regulatory review services to support decision-making on operational, planning, environmental, regulatory, and infrastructure issues.
- Direct and manage MWRA's planning processes including master planning, business planning, water system expansion planning, and climate change adaptation and mitigation efforts.
- Oversee and manage MWRA's financial assistance and technical community support programs primarily in the areas of sewer I/I control/reduction, water system improvement, lead service line replacement, and water leak detection/demand management.
- In conjunction with the Office of the Executive Director and Public Affairs, serve as the Operations Division's lead on regulatory and policy matters potentially affecting MWRA's water and wastewater systems.
- Effectively manage water and wastewater metering data collection and analysis, to support Rates and Budget Department's allocation of MWRA rate revenue requirements.

FY17 Major Initiatives:

- Complete scope development, coordinate within MWRA and with Advisory Board, and procure consultant services for wastewater meter upgrade project.
- Provide computer modeling support for major capital programs including, North System Pumping Station Valve Replacement, Metropolitan Tunnel Redundancy Project, and CSO evaluation.
- Complete reports on sea level rise adaptation, green house gas tracking and energy efficiency efforts, and develop and maintain a sustainability section on MWRA's web page.
- Update the MWRA wastewater maps, and produce an updated atlas. Participate in efforts to update selected water record plans and real estate records.
- Begin the process of updating the Water and Wastewater Master Plan with extensive coordination across all MWRA Departments.

FY16 Accomplishments:

- Completed updated wastewater metering maps for every community to support meter upgrade project.
- Distributed \$10 million in grants and interest-free loans to member sewer communities.
- Distributed \$12 million in Local Water System Assistance Program interest-free loans to member water communities.
- Developed new lead service line replacement program guidelines and launched program. Also conducted major community briefing on lead issues and coordinated outreach and reporting for new 'lead-in-schools' sampling program.
- Managed the Community Leak Detection Task Order Contract with 16 separate leak detection surveys completed for member communities.

Budget Highlights:

- The FY17 Final Budget is \$3.7 million, an increase of \$432,000 or 13% compared to FY16 Actuals. The Planning Department includes funding for two sub cost centers: the Planning Unit and the Meter Data Unit.
- \$3.0 million for **Wages and Salaries**, an increase of \$82,000 or 28% compared to FY16 Actuals primarily due to wage increases and more filled positions in FY17 than in FY16. The FY17 Final Budget also includes \$10,000 for two summer interns to assist with GIS work and policy research.
- \$238,000 for **Maintenance**, an increase of \$197,000 compared to the FY16 Actuals due to the inclusion of \$200,000 in FY17 to assist other agencies and MWRA's water communities with programs to reduce lead in water pipes. The FY17 Final Budget has \$82,000 in Special Equipment

Services for water meter flow testing, \$148,000 for wastewater meter verification and wastewater community testing temporary metering, and \$8,000 for telog software maintenance.

- \$10,000 for **Training and Meetings**, a decrease of \$2,000 or 17.8% compared to FY16 Actuals. The budget covers participation in training and conferences primarily focused on water quality regulations and geographic information systems.
- \$3,100 for **Professional Services** costs associated with the translation of the Consumer Confidence Report (CCR) and also programming of the GIS user interface.
- \$176,000 for **Other Materials**, an increase of \$21,000 or 13.3% compared to FY16 Actuals. Budget primarily due to anticipated postage increases. This line item includes funding of \$150,000 for postage and mailing of the CCR, \$15,000 for water conservation kits, \$7,000 for mapping supplies, \$2,000 for office supplies, \$1,000 for vehicle expenses, and \$900 for work clothes for the employees in our Meter Data section.
- \$341,000 for **Other Services**, an increase of \$137,000 or 66.7% compared to FY16 Actuals. The increase is primarily due to the inclusion of \$200,000 in FY17 to cover costs associated with implementing emerging initiatives to reduce lead in water pipes in communities and schools. The budget also includes \$60,000 for printing of the CCR, \$10,000 for printing water conservation and other informational brochures, and \$3,300 for Memberships and Dues for department employees.



Law Division
Budget

LAW DIVISION

Law

Legal Reviews
Litigation
Court Order Compliance
Environmental
Regulation

FY17 Final Current Expense Budget						
LAW DIVISION						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 1,553,270	\$ 1,642,863	\$ 1,647,085	\$ 1,734,478	\$ 87,393	5.3%
OVERTIME	-	572	4,945	-	(4,945)	-100.0%
TRAINING & MEETINGS	3,438	787	1,622	1,000	(622)	-38.3%
PROFESSIONAL SERVICES	90,548	88,186	366,643	200,000	(166,643)	-45.5%
OTHER MATERIALS	5,160	4,892	4,160	5,984	1,824	43.9%
OTHER SERVICES	23,625	26,653	20,479	25,947	5,468	26.7%
TOTAL	\$ 1,676,041	\$ 1,763,952	\$ 2,044,933	\$ 1,967,409	\$ (77,525)	-3.8%

The Law Division provides legal counsel to the Board of Directors, the Executive Director, and staff on compliance with federal and state laws, regulations, court cases, and administrative orders. Staff also handle and provide assistance with respect to litigation matters, real estate matters, labor/employment issues, procurement, and construction issues. The General Counsel interprets the MWRA Enabling Act and provides advice on conflict of interest and Code of Conduct issues. Division attorneys monitor the work of outside counsel when it is necessary to retain such services.

Law Division staff, though usually representing MWRA in a defensive posture, also work with Operations Division staff to effectuate cost recovery claims for design errors and omissions. In addition, the Law Division assists in the early resolution of contractor and vendor claims prior to litigation so as to resolve them as favorably and early as possible thereby reducing or eliminating litigation costs and interest payable.

FY17 Goals:

- Timely and cost effective resolution of legal disputes involving MWRA, through litigation or alternative means of dispute resolution.
- High quality legal services to support the business and operational needs of MWRA in the areas of real estate, labor and employment, regulatory compliance, litigation, construction, and business law.
- Advocacy of MWRA interests in new and developing regulatory issues.
- Continue to exhaust all opportunities to shift cost of legal representation to insurers and indemnitors and to litigate insurance coverage disputes as they arise, all in the interest of cost savings.

FY16 Accomplishments:

- Provided Litigation support to Operations (Engineering & Construction) in defending claims for extension of time and extra compensation made by Bay State Regional Contractors for its work at Gillis Pump Station.
- Provided on-going Litigation support to Operations (Deer Island) on claims for additional compensation for Deer Island clarifier tank sludge collection components rehabilitation, including work on fact and expert discovery in preparation to be ready to try the case if not settled.
- Provided Litigation support in defense of wrongful termination claim of former employee first at MCAD and now in Superior Court;
- Provided on-going Litigation support to Operations (Deer Island) re: claims in Superior Court and before the MA Department of Public Utilities against Eversource and its subsidiary Harbor Electric Energy Company re: MWRA's lack of liability for cross-harbor cable protection expenses; obtained agreement with Army Corps of Engineers (ACoE) re: MWRA not to be a co-permittee on next ACoE permit, and not to have responsibility for cable protection work or future maintenance dredging, nor exposure for stipulated penalties.
- Provided review and approval of four DCR watershed parcel acquisitions.
- Provided assistance to Procurement Department re: Fall River Electrical bid dispute.
- Provided assistance to Finance Division re: review of documentation for implementation of investment of MWRA OPEB Trust monies in Commonwealth's SRBT Fund.

Budget Highlights:

- The FY17 Final Budget is \$2.0 million, a decrease of \$78,000 or 3.8%, as compared to FY16 Actuals.
- \$1.7 million for **Wages and Salaries**, an increase of \$87,000 or 5.3%, as compared to FY16 Actuals, mainly due to contractual increases. The FY17 Final Budget includes funding for 16 positions, one less than the FY16 Budget.



Administration Division Budget

ADMINISTRATION DIVISION

Administration

Director's Office
Facilities Management
Fleet Services
Human Resources
MIS
Procurement
Real Property

FY17 Final Current Expense Budget						
ADMINISTRATION						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 11,913,368	\$ 11,939,698	\$ 12,346,277	\$ 13,357,147	\$ 1,010,870	8.2%
OVERTIME	66,975	130,645	99,637	62,964	(36,673)	-36.8%
FRINGE BENEFITS	18,017,803	18,244,973	19,047,398	20,167,117	1,119,718	5.9%
WORKERS' COMPENSATION	2,311,448	2,307,123	2,350,369	2,344,190	(6,179)	-0.3%
CHEMICALS	-	-	-	-	-	-
UTILITIES	87,533	98,846	116,670	114,229	(2,441)	-2.1%
ONGOING MAINTENANCE	4,906,970	3,942,483	4,123,573	4,868,199	744,625	18.1%
TRAINING & MEETINGS	176,073	226,456	183,744	201,991	18,247	9.9%
PROFESSIONAL SERVICES	534,899	491,663	696,524	971,922	275,398	39.5%
OTHER MATERIALS	1,331,179	1,074,880	1,089,384	1,217,717	128,332	11.8%
OTHER SERVICES	3,023,997	3,304,073	3,163,677	3,331,442	167,764	5.3%
TOTAL	\$ 42,370,243	\$ 41,760,840	\$ 43,217,254	\$ 46,636,917	\$ 3,419,663	7.9%

FY17 Final Current Expense Budget						
ADMINISTRATION by Department						
DEPARTMENT	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
ADMIN DIRECTOR'S OFFICE	-	-	153,254	154,402	1,148	0.7%
HUMAN RESOURCES	22,520,179	22,797,542	23,638,247	24,862,437	1,224,191	5.2%
MIS	10,325,125	10,162,225	10,345,574	12,359,507	2,013,934	19.5%
FACILITIES MANAGEMENT	2,376,064	2,312,496	2,321,285	2,488,673	167,389	7.2%
FLEET SERVICES	1,947,022	1,775,292	1,620,246	2,002,630	382,384	23.6%
PROCUREMENT	4,550,834	4,064,066	4,470,678	4,126,009	(344,669)	-7.7%
REAL PROPERTY / ENVIRONMENTAL MGMT	651,020	649,218	667,971	643,258	(24,713)	-3.7%
TOTAL	\$ 42,370,243	\$ 41,760,840	\$ 43,217,254	\$ 46,636,917	\$ 3,419,663	7.9%

The **Administration Division** is responsible for managing the support service functions of the Authority. It is comprised of seven departments: Director's Office; Facilities; Fleet Services; Human Resources; Management Information Systems (MIS); Procurement; and Real Property and Environmental Management.

The Administration Division performs a multitude of functions that support the daily operations and ensure the implementation of the Authority's long term goals and strategies.

FY17 Goals:

- Manage and coordinate the Authority's support service functions.
- Minimize MWRA's exposure to financial loss stemming from contractor and vendor activities by reviewing risk exposure and establishing contract insurance requirements and monitoring contractors for compliance.
- Maintain effective relationships with the unions representing the MWRA workforce while protecting and enhancing management flexibility. Ensure that collective bargaining objectives are met, support MWRA initiatives by designing and implementing appropriate labor relations strategies, create an environment that fosters safety consciousness and productive work, maximize the number of early returns to work by employees who have incurred on-the-job injuries or illnesses, and aggressively manage the Workers' Compensation Program to reduce costs.
- Acquire the real property needed to complete MWRA's major capital projects in a timely and cost-effective manner; manage the disposition of surplus real property in an efficient manner; and provide staff and others with current information regarding MWRA's real property rights.

FY17 Initiatives

- Continue the implementation of the Strategic IT Study.
- Upgrade employment application program to enhance applicant database and expedite critical hiring.

FY16 Accomplishments:

- Continued to work with the landlord to implement facility improvements as provided in our lease agreements for Charlestown Navy Yard headquarters.
- Developed specifications for replacement vehicles and equipment the majority of which will utilize alternative fuel, consistent with the Authority's goal of purchasing environmentally friendly products.
- The Authority continues to fuel diesel powered vehicles/equipment with bio-diesel. The MWRA is rated as one of the largest bio-fuel users by the Massachusetts Alternative Fuel Coalition (MAFC).
- Continued implementation of Automated Vehicle Locator (AVL) Tracking System in MWRA vehicles.
- Completed a variety of professional and technical training to MWRA employees including Confined Space Entry, Hoisting License Mandatory Refresher Training, Wastewater & Water Operator Exam Prep, Wastewater OJT, OSHA 10-Hour Construction Safety, Supervisory Development, Business Writing, Vehicle Maintenance, CDL Drug & Alcohol Awareness, Workzone Safety, Spot Pond Start-up, ASCE Managing the Design Process & ASCE Buried Pipe, Blueprint Reading, Lockout/Tagout, Electrical Safety, CPR First Aid, Underground Storage Tanks, Hands-on Microbiology, Chemistry for

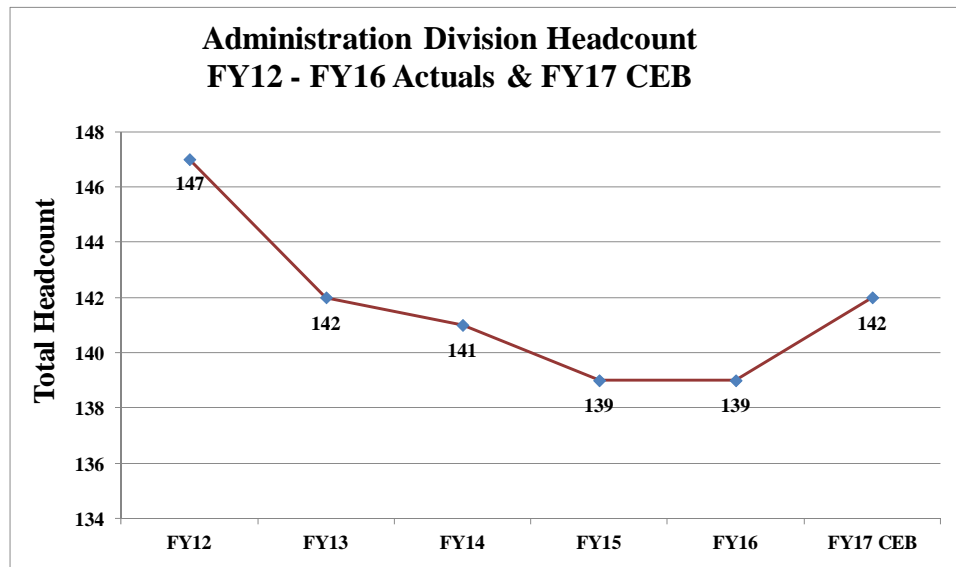
Water & Wastewater, Environmental Compliance Strategies and Sampling for NPDES Permits & Process Control. Recertified 70 employees as Flaggers.

- Competitively bid Class II Renewable Energy Portfolio Standard (RPS) certificates which resulted in FY16 revenues of \$457,845. In addition, received FY16 revenues of \$1,270,786 from forward marketing of CY15 Class I and Solar Carve-Out II RPS certificates.
- Awarded the following major contracts in FY16:
 - Reading Extension Sewer and Metropolitan Sewer Rehabilitation (Sections 73/74/75/46) Design/CA/RE/RI;
 - DITP Sodium Hypochlorite/Sodium Bisulphate Tank Rehabilitation;
 - Supply and Delivery of Soda Ash for John J. Carroll Water Treatment Plant;
 - Investment Banking Services (Underwriters);
 - Supply and Delivery of Sodium Hypochlorite to DITP;
 - Miscellaneous Fencing;
 - Supply and Delivery of Hydrogen Peroxide for DITP;
 - Clinton Wastewater Treatment Plant Phosphorus Reduction Facility;
 - Caruso Pump Station Improvements;
 - Nut Island Emergency Demolition and Duct Cleaning;
 - Rosemary Brook Siphon Buildings Repair and Stabilization;
 - Hatchery Pipeline and Hydroelectric;
 - Managed Security Services;
 - Integrated Financial, Procurement and Human Resources/Payroll Management Systems Maintenance and Support;
 - Thermal and Hydro Power Plant Maintenance;
 - Winthrop Terminal VFD and Synchronous Motor Replacement DITP;
 - Beacon Street Line Water Pipeline Repair;
 - Southern Extra High Pipeline Section 111;
 - Three contracts for Technical Assistance Consulting Services DITP;
 - Chelsea Creek Headworks Upgrade RE/RI;
 - Chelsea Screen House Upgrades ESDC/RI;
 - Nut Island Headworks Odor Control, HVAC and Energy Management Systems Evaluation;
 - Fire Alarm System Services – Metro Boston and Central and Western MA;
 - Boiler and Water Heater Services;
 - Elevator Maintenance and Repair – Various Locations and DITP;
 - DITP Fire Alarm System Replacement Design and ESDC;
 - Section 56 General Edwards Bridge Crossing Feasibility Study;
 - Bond Counsel Services;
 - Letter of Credit and Direct Floating Rate Revolving Loan to Replace Commercial Paper Notes;
 - Electric Power Deer Island Treatment Plant;
 - Electric Power Interval Accounts;
 - Workers' Compensation Third Party Administrator Services;
 - Thermal Power Plant Fuel Oil System Upgrade DITP;
 - Wachusett Aqueduct Pumping Station;
 - Northern Intermediate High Pipeline Project Section 110 Reading and Woburn;

- Technical Assistance Consulting Services for John J. Carroll Water Treatment Plant;
- Alewife Brook Pump Station Rehabilitation;
- Digated Sludge Pump Replacement – DITP, Phase 2;
- Quabbin Power and Security Improvements;
- Metropolitan Operations Paving;
- Insurance Program Renewal for FY17;
- Accounts Payable and Payroll Depository Services;
- Disclosure Counsel Services;
- Groundskeeping Services – Metro Boston;
- Farm Pond Inlet Chamber, Farm Pond Gatehouse and Waban Arches Structural Evaluation;
and
- Two contracts for Agency-Wide Technical Assistance Consulting Services.

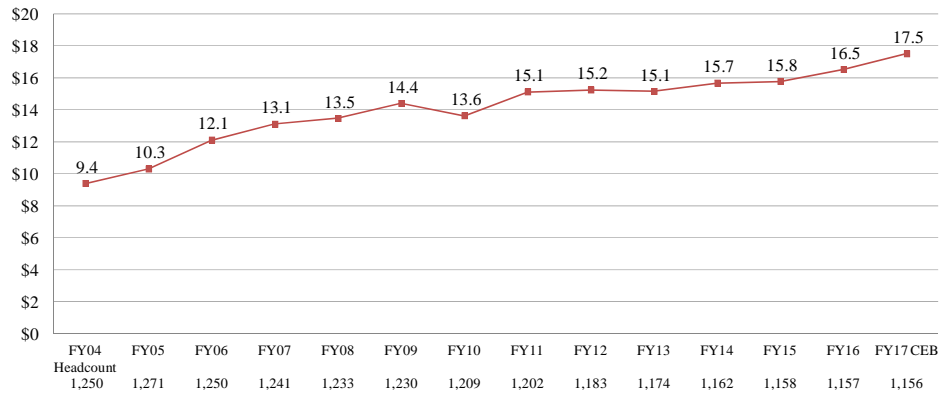
Budget Highlights:

- The FY17 Final Budget is \$46.6 million, an increase of \$3.4 million or 7.9% as compared to the FY16 Actuals.
- \$13.4 million for **Wages and Salaries**, an increase of \$1 million or 8.2% as compared to the FY16 Actuals, mainly due to contractual increases and fewer filled positions during FY16. The FY17 Final Budget funds 142 positions, the same as the FY16 Budget.



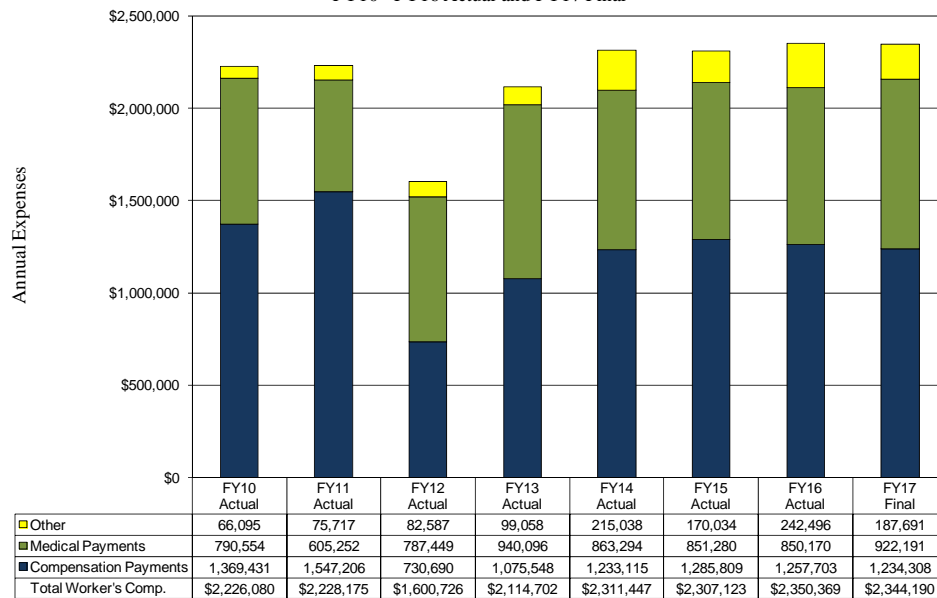
- \$63,000 for **Overtime**, a decrease of \$37,000 or 36.8% as compared to the FY16 Actuals.
- \$20.2 million for **Fringe Benefits**, an increase of \$1.1 million of 5.9% as compared to the FY16 Actuals. The main reason for the increase is the continuing rise in health insurance cost.

Health Insurance Spending (In Millions)



- \$2.3 million for **Workers' Compensation**, a decrease of \$6,000 or 0.3% as compared to the FY16 Actuals. The Workers' Compensation is determined by using a three-year average of actual and projected spending.

Workers' Compensation Expenses FY10 - FY16 Actual and FY17 Final



- \$114,000 for **Utilities**, a decrease of \$2,000 or 2.1%, as compared to the FY16 Actuals.
- \$4.9 million for **Maintenance**, an increase of \$745,000 or 18.1% as compared to the FY16 Actuals, due to increased software upgrade/replacements and higher annual software maintenance costs.
- \$202,000 for **Training**, an increase of \$18,000 or 10% as compared to the FY16 Actuals. The training budget supports the training needs of the division, particularly the MIS department.
- \$972,000 for **Professional Services**, an increase of \$275,000 or 39.5% as compared to the FY16

Actuals. The FY17 Final Budget includes Professional Development and Technical Training, Workers' Compensation Claims Administration and Legal Services, Arbitrators and Arbitration Expenses, Medical Evaluation Services, Employee Assistance Program, and for Specialized Investigation Services.

- \$1.2 million for **Other Materials**, an increase of \$128,000 or 11.8% as compared to the FY16 Actuals. Included in the Other Material funding is \$544,000 for the divisional computer hardware needs, \$424,000 for vehicle expenses mainly fuels, and \$130,000 for office supplies.
- \$3.3 million for **Other Services**, an increase of \$168,000 or 5.3% as compared to the FY16 Actuals. Funding in FY16 Budget mainly covers Space/Lease Rentals for the Charlestown Navy Yard Headquarters of \$1.7 million and Telecommunications expenses for all facilities and security data lines of \$1.0 million.

DIRECTOR'S OFFICE

FY17 Final Current Expense Budget							
ADMINISTRATION DIVISION DIRECTOR'S OFFICE							
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17		
WAGES & SALARIES	\$ -	\$ -	\$ 152,939	\$ 154,078	\$ 1,139	0.7%	
OTHER SERVICES	-	-	315	324	9	2.9%	
TOTAL	\$ -	\$ -	\$ 153,254	\$ 154,402	\$ 1,148	0.7%	

The **Administration Division Director's Office** oversees a multitude of functions that support the daily operations and ensure the implementation of the Authority's long-term goals and strategies.

The Director's Office is responsible for the centralized support functions of procurement, human resources, management information systems, fleet services, facilities management, and real property and environmental management. Additionally, the Director's Office ensures that transactions comply with all rules, regulations, Authority policies and procedures, and contract terms.

FY17 Goals:

- Manage and coordinate the Authority's support service functions.
- Guide and coordinate division activities to support MWRA's goals and objectives.
- Continuously improve processes and performance for greater efficiency.

Budget Highlights:

- The FY17 Final Budget is \$154,000, an increase of \$1,000 or 0.8% as compared to the FY16 Actuals.
- \$154,000 for **Wages and Salaries**, an increase of \$1,000 or 0.8% as compared to the FY16 Actuals. The FY17 Final Budget supports one position, the same as FY16 Budget.

FACILITIES MANAGEMENT

FY17 Final Current Expense Budget						
FACILITIES MANAGEMENT						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 421,954	\$ 426,512	\$ 442,395	\$ 489,639	\$ 47,244	10.7%
OVERTIME	28,724	44,493	37,842	24,154	(13,688)	-36.2%
FRINGE BENEFITS	8	85	-	-	-	-
UTILITIES	85,250	96,780	113,608	111,729	(1,879)	-1.7%
ONGOING MAINTENANCE	148,881	11,618	15,242	30,900	15,658	102.7%
PROFESSIONAL SERVICES	8,700	-	-	7,500	7,500	-
OTHER MATERIALS	56,879	57,118	65,810	55,750	(10,060)	-15.3%
OTHER SERVICES	1,625,668	1,675,890	1,646,387	1,769,001	122,614	7.4%
TOTAL	\$ 2,376,064	\$ 2,312,496	\$ 2,321,285	\$ 2,488,673	\$ 167,389	7.2%

The **Facilities Management Department** provides a range of support services to MWRA staff located at the Charlestown Navy Yard (CNY).

Facilities Management is responsible for coordinating site management activities at CNY. Staff institute maintenance procedures, respond to facilities requests from building occupants, coordinate workspace planning, provide office furnishings, and develop and implement appropriate measures to ensure the safety of MWRA staff and protect and preserve MWRA assets.

In addition, staff provides administrative and office support services that facilitate the efficient use of MWRA resources. These responsibilities include providing and managing the motor pools at Chelsea and CNY, general office equipment repairs, transportation, mail, and courier services. Staff coordinates MWRA parking programs and corporate Massachusetts Bay Transportation Authority (MBTA) pass programs.

FY17 Goals:

- Provide a safe and well-maintained working environment for all MWRA staff at CNY and provide appropriate space for staff by coordinating workspace planning, design, and furniture acquisitions.
- Maintain the CNY facility to prevent loss or deterioration of MWRA assets.
- Implement facility programs in conjunction with MWRA recycling and resource conservation efforts.
- Support efforts to limit the fleet size while meeting operational needs by providing reliable motor pool and transportation services.

FY16 Accomplishments:

- Continued to work with the landlord to implement facility improvements as provided in our lease agreements for CNY headquarters.
- In conjunction with MIS, continued to look at ways to maximize efficiency of day-to-day office equipment such as printers, copiers, and facsimile machines.

Budget Highlights:

- The FY17 Final Budget is \$2.5 million, an increase of \$167,000 or 7.2% as compared to the FY16 Actuals.
- \$490,000 for **Wages and Salaries**, an increase of \$47,000 or 10.7% as compared to the FY16 Actuals, mainly for contractual increases and one additional position. The FY17 Final Budget supports eight positions, one more than FY16 Budget.
- \$31,000 for **Ongoing Maintenance**, an increase of \$16,000 or 102.7% as compared to the FY16 Actuals.
- \$1.8 million for **Other Services**, an increase of \$123,000 or 7.5%, as compared to the FY16 Actuals. This item includes funding for rental and operating costs for CNY headquarters facility and the Marlboro Records Center and Warehouse space.

FLEET SERVICES

FY17 Final Current Expense Budget						
FLEET SERVICES						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 733,745	\$ 735,492	\$ 768,510	\$ 817,956	\$ 49,446	6.4%
OVERTIME	6,711	8,728	3,918	11,000	7,082	180.8%
FRINGE BENEFITS	8	120	28	250	222	792.9%
UTILITIES	2,283	2,066	3,062	2,500	(562)	-18.3%
ONGOING MAINTENANCE	629,236	559,977	552,102	701,500	149,397	27.1%
TRAINING & MEETINGS	42,000	38,850	17,500	42,000	24,500	140.0%
OTHER MATERIALS	532,507	429,160	273,609	425,825	152,215	55.6%
OTHER SERVICES	532	900	1,516	1,600	84	5.5%
TOTAL	\$ 1,947,022	\$ 1,775,292	\$ 1,620,246	\$ 2,002,630	\$ 382,384	23.6%

The **Fleet Services Department** manages and maintains MWRA's motor vehicle and equipment fleet. The goal of the Fleet Services Department is to maintain MWRA's vehicle and equipment fleet to minimize downtime and extend the life of the assets. Fleet Services also manages the Chelsea fuel facility, the gas card program and the development and processing of specifications for new vehicles and equipment.

FY17 Goals:

- Continue to cost effectively maintain the Authority's fleet of vehicles and equipment.
- Integrate more alternative fueled vehicles into the Authority's fleet.
- Continue to install idle reduction devices in all Authority vehicles to comply with state and federal regulations.
- Install rear safety reflective tape (Chevrons) on all Authority vehicles.

FY16 Accomplishments:

- Developed specifications for new replacement vehicles and equipment the majority of which will utilize alternative fuel, consistent with the Authority's goal of purchasing environmentally friendly products.
- The Authority continues to fuel diesel powered vehicles/equipment with bio-diesel. MWRA is being rated as one of the largest bio-fuel users by the Massachusetts Alternative Fuel Coalition (MAFC).
- Prepared documentation for the surplus sale of vehicles and equipment and worked with the Procurement Department for the auction and disposal of the vehicles/equipment.
- Continued to work with MIS & Operations staff on the Maximo system upgrade which includes a transportation module specifically designed for a fleet environment.

Budget Highlights:

- The FY17 Final Budget is \$2.0 million, an increase of \$382,000 or 23.6% as compared to FY16 Actuals.
- \$818,000 for **Wages & Salaries**, an increase of \$49,000 or 6.4% as compared to the FY16 Actuals, mainly for contractual increases and a vacant position during part of FY16. The FY17 Proposed Budget supports 11 positions, the same as FY16 Budget.
- \$702,000 for **Ongoing Maintenance**, an increase of \$149,000 or 27.1%, as compared to the FY16 Actuals. The budget includes funds for automotive materials and services to maintain MWRA's vehicle fleet.
- \$426,000 for **Other Materials**, an increase of \$152,000 or 55.6% as compared to the FY16 Actuals, due to lower vehicle fuel cost in FY16. The FY17 Proposed Budget includes funds for vehicle/equipment fueling which is based on historical fuel usage and current pricing. Fleet Services procures bulk fuels from state contracts while continuing to meet all governmental alternative fuel directives. It should be noted that the volatility of fuel pricing could impact this line item.

HUMAN RESOURCES

FY17 Final Current Expense Budget						
HUMAN RESOURCES						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 1,841,890	\$ 1,784,493	\$ 1,686,914	\$ 1,755,894	\$ 68,980	4.1%
OVERTIME	71	209	17	-	(17)	-100.0%
FRINGE BENEFITS	18,017,283	18,243,431	19,046,856	20,166,567	1,119,710	5.9%
WORKERS' COMPENSATION	2,311,448	2,307,123	2,350,369	2,344,190	(6,179)	-0.3%
TRAINING & MEETINGS	4,703	4,119	9,583	3,263	(6,320)	-66.0%
PROFESSIONAL SERVICES	311,329	435,440	516,642	559,422	42,780	8.3%
OTHER MATERIALS	19,542	11,095	18,264	20,820	2,556	14.0%
OTHER SERVICES	13,913	11,632	9,603	12,282	2,679	27.9%
TOTAL	\$ 22,520,179	\$ 22,797,542	\$ 23,638,247	\$ 24,862,437	\$ 1,224,191	5.2%

The **Human Resources Department** is comprised of 3 units:

The **Employment, Compensation, Benefits and HRIS Unit** coordinates and oversees all external recruitment and selection activities including hiring, lateral transfers, and promotions to meet the business needs of MWRA; develops and coordinates MWRA compensation and benefits strategies and programs; and ensures the proper processing and recording of personnel actions. The compensation unit also ensures that all MWRA employees possess the necessary licenses and certifications required for their positions. The **Labor Relations Unit** is responsible for fulfilling MWRA's collective bargaining and contract administration obligations under Massachusetts' public sector collective bargaining law, its workers' compensation responsibilities, and its responsibilities for employee occupational safety and health. The **Training Unit** develops, coordinates, delivers, and evaluates MWRA technical and professional development training programs and other programs designed to improve employee knowledge, skills, productivity, and the quality of workplace interaction. In addition, the Human Resources Department includes the Centralized Fringe Benefits cost center, which includes the budget for fringe benefits for all MWRA employees as well as for mandatory payments for unemployment expenses and Medicare.

FY17 Goals:

- Attract and retain a qualified high-performance workforce, hire and promote qualified minority, female, and veteran employees, and offer a competitive total compensation package (salary and benefits) to all employees.
- Maintain effective relationships with the unions representing the MWRA workforce while protecting and enhancing management flexibility. Ensure that collective bargaining objectives are met, support MWRA initiatives by designing and implementing appropriate labor relations strategies, create an environment that fosters safety consciousness and productive work, maximize the number of early returns to work by employees who have incurred on-the-job injuries or illnesses, and aggressively manage the Workers' Compensation Program to reduce costs.

FY16 Accomplishments:

- Continued to support the agency's efforts in developing and implementing succession planning activities in anticipation of an increase in retirements over the next several years.
- Selected vendor and designed online employment application program to expedite critical hiring.
- Expanded supervisory, professional, and career development training programs necessary to support succession planning initiatives including developing additional job shadowing training programs (Maintenance and Operations and Medium Voltage Programs).
- Redesigned and implemented updated employee orientation program for newly hired employees.
- Developed additional specialized recruitment sources to attract women, minorities, and veterans for difficult to fill positions including expanding social network recruiting capabilities.
- Completed a variety of professional and technical training to MWRA employees including Confined Space Entry, Hoisting License Mandatory Refresher Training, Wastewater & Water Operator Exam Prep, Wastewater OJT, OSHA 10-Hour Construction Safety, Supervisory Development, Business Writing, Vehicle Maintenance, CDL Drug & Alcohol Awareness, Workzone Safety, Spot Pond Start-up, ASCE Managing the Design Process & ASCE Buried Pipe, Blueprint Reading, Lockout/Tagout, Electrical Safety, CPR First Aid, Underground Storage Tanks, Hands-on Microbiology, Chemistry for Water & Wastewater, Environmental Compliance Strategies and Sampling for NPDES Permits & Process Control. Recertified 70 employees as Flaggers.
- Researched and selected Leadership Development Program.
- Provided training and guidance to MWRA managers in the areas of leave management, sick time use, time and attendance issues, and matters of employee conduct issues.
- Investigated complaints of violations of MWRA policies and Code of Conduct as necessary.
- Negotiated new contracts for dental insurance and the Employee Assistance Program (EAP).

FY17 Initiatives:

- Continue to support the Authority's succession planning activities in anticipation of continued retirements.
- Begin successor collective bargaining negotiations for all 5 bargaining units.
- Design and implement online employment application program.
- Design online employment on-boarding program.
- Develop and implement an expanded orientation program.

- Implement MWRA hoisting license training program.
- Expand career development and job shadow training programs to support succession planning initiatives.
- Procure vendor for Drug & Alcohol testing and flu shots, and renegotiate contract for dental insurance.

Budget Highlights:

- The FY17 Final Budget is \$24.9 million, an increase of \$1.2 million 5.2% as compared to the FY16 Actuals.
- \$1.8 million for **Wages and Salaries**, an increase of \$70,000 or 4.1%, as compared to the FY16 Actuals, due to contractual increases. The FY17 Final Budget includes funding for 18 positions, one less than in FY16 Budget.
- \$20.2 million for **Fringe Benefits**, an increase of \$1.1 million or 5.9%, as compared to the FY16 Actuals. The FY17 Final Budget includes \$17.5 million for health insurance, \$1.3 million for Medicare, \$1.1 million for dental insurance, \$161,000 for unemployment insurance, and \$40,000 for tuition reimbursement.
- \$2.3 million for **Workers' Compensation**, a decrease of \$6,000 or 0.3% as compared to the FY16 Actuals. The Human Resources Department is responsible for the management of this program and the coordination with the third-party administrator and legal counsel.
- \$559,000 for **Professional Services**, an increase of \$43,000 or 8.3% as compared to the FY16 Actuals. The FY17 Final Budget includes \$316,000 for Professional Development and Technical Training, \$122,000 for Workers' Compensation Claims Administration and Legal Services, \$56,000 for Arbitrators and Arbitration Expenses, \$45,000 for Medical Evaluation Services, \$21,000 for the Employee Assistance Program, and \$13,000 for Specialized Investigation Services.

MANAGEMENT INFORMATION SYSTEMS (MIS)

FY17 Final Current Expense Budget						
MANAGEMENT INFORMATION SYSTEM						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 4,943,896	\$ 5,048,011	\$ 5,210,551	\$ 5,781,333	\$ 570,782	11.0%
OVERTIME	20,617	45,758	46,020	2,810	(43,210)	-93.9%
FRINGE BENEFITS	378	893	200	-	(200)	-100.0%
ONGOING MAINTENANCE	3,299,537	3,078,530	2,918,266	4,135,799	1,217,533	41.7%
TRAINING & MEETINGS	121,798	179,569	152,823	146,528	(6,295)	-4.1%
PROFESSIONAL SERVICES	212,705	56,223	164,162	400,000	235,838	143.7%
OTHER MATERIALS	599,185	453,031	594,297	577,972	(16,325)	-2.7%
OTHER SERVICES	1,127,010	1,300,210	1,259,255	1,315,065	55,810	4.4%
TOTAL	\$ 10,325,125	\$ 10,162,225	\$ 10,345,574	\$ 12,359,507	\$ 2,013,934	19.5%

The **MIS Department** provides MWRA with the information processing services necessary to carry out its mission. Applications in use range from financial to operational, and enhance MWRA's ability to access data and improve internal controls, reporting, and management performance. In addition to computing and telephony systems, the department also provides library and records management services.

FY17 Goals:

The goal of the MIS department is to support more than 1,100 MWRA users, including those at the Charlestown Navy Yard (CNY), Chelsea, Deer Island, Southboro, Carroll Water Treatment Plant, and other remote sites, by ensuring that:

- Automated business services delivered increase the efficiency of MWRA's business processes and improve the effectiveness of the staff while maintaining system security and integrity;
- Existing applications, operating systems, hardware, and network resources are cost-effectively maintained, supported, upgraded, and replaced;
- Future changes for Information System reflect management priorities and are consistent with the MWRA Master Plan and the Five-year IT Strategic Plan; and
- Information Technology Service Management is implemented to improve customer satisfaction and improved efficiencies in delivering services.

FY17 Initiatives:

Information Technology Management Program

This program is intended to improve the Information Technology (IT) organization and the oversight processes for selecting, implementing and operating IT solutions throughout the MWRA. The FY17 initiatives are as follows:

- Establishment of a MWRA Software Development Life Cycle (SDLC) with the appropriate policies, procedures, standards, tools, and techniques to efficiently and transparently deliver development efforts on time and within budget.
- Implement a set of policies, procedures, standards, tools, and techniques which employs the best practices for Information Technology Service Management (ITSM).
- In parallel with the ITSM effort, MIS will continue re-organizing to better deliver services. This will include updating job descriptions to reflect the changing technologies and the methods of delivery, re-aligning the organization to match the ITSM and SDLC best practices, and focusing on how technology can be used to increase efficiency of staff and improve the effectiveness of the Authority's business processes.

Application Improvement Program

This program, along with associated projects, continue MWRA's efforts to update and enhance a wide range of applications to improve efficiencies of business processes and effectiveness of the staff while ensuring the availability and integrity of the MWRA's data resources. This program relates to 136 applications with 242 modules that support various business functions across the Authority. Sixty-six percent of these modules are commercially available off the shelf packages.

Administration and Finance Initiatives

- ***e-Discovery:*** A component of Enterprise Content Management (ECM) is underway with the pilot design and implementation of both the Enterprise Vault system archiving application and the Clearwell identification and collection electronic discovery application. These applications will provide the MWRA with rigorous and efficient electronic archiving, disposal processes that will improve the ability to meet the requirements associated with public records requests and litigation document/discovery production, and the accessibility of documents throughout the Authority.
- ***e-Construction:*** A component of ECM, the MWRA will initiate an e-Construction project to improve communication and make construction management practices more efficient. e-Construction is a paperless construction administration delivery process that includes electronic submission of all construction documentation by all stakeholders, electronic document routing/approvals (e-signature), and digital management of all construction documentation in a secure environment allowing distribution to all project stakeholders through mobile devices.
- ***e-Procurement Implementation:*** This project focuses on the implementation of the Contract Management module from Infor Global Solutions. The focus in FY17 will be on Professional Services contracts.
- ***Enterprise Resource Planning (ERP) System Upgrades:*** During FY17, upgrades are scheduled for the e-procurement applications infrastructure, Mobile Supply Chain Management (MSCM), and the Business Software, Inc. Tax Factory application. In addition, a

comprehensive ERP Upgrade plan will be developed.

Compliance Management Initiatives

- ***Electronic Laboratory Notebook (ELN):*** The objective of this project to replace all paper log books with ELN. Drinking water (phase one) paper log books will be replaced with ELN by the end of first quarter FY2017. Wastewater (phase two) paper log books will be replaced with ELN by the end of FY2019.
- ***Pretreatment Information Management System (PIMS) Business Cycle Enhancements:*** The objective of this project is to update the existing application and deliver new functionality in PIMS well in advance of the next TRAC business cycle for the MWRA's Pretreatment Program.
- ***PIMS CROMERR Compliance:*** The current PIMS application is not compliant with EPA's Cross-Media Electronic Reporting Regulation (CROMERR) requirements. CROMERR requirements were reviewed to determine which PIMS modules need to be enhanced. Required modifications can be done partially by the vendor and partially by MIS utilizing EPA's shared services. MIS is working on an agreement with the vendor to obtain the WebSMR source code. Modification to the PIMS application will begin as soon as the source code is received.

System Integration and Data Warehousing Initiatives

- ***Geographic Information System (GIS) Integration:*** The purpose of the GIS Integration projects is to integrate the GIS spatial technology into business and operational applications and to determine an overall strategy for delivering spatial real-time dashboards for managing the MWRA infrastructure. The focus of these projects will be to provide field staff with web-based mapping applications. The data collected by these staff will be instantly available to management staff via the dashboard applications.
- ***Management Dashboards & Reporting:*** These projects consolidate administrative management dashboards and reporting tools to assist in management of the day-to-day operations and to provide data to assist in Authority-wide decision making.

Operations Management Initiative

- ***Computerized Maintenance Management System (CMMS) Enhancements:*** The system is used to manage maintenance activities for Water and Wastewater assets. The MWRA Board of Directors approved the award of the Maximo Upgrade from 5.2 to 7.6 in FY15 Q4; the project is expected to be completed in FY17 Q4. This effort includes:
 - Completing the upgrade
 - Consolidating DI and FOD systems into one
 - Implementing four new modules

- Implementing Control Desk Module as a replacement for Service Desk
- **PI:** The MWRA uses PI to monitor important operating parameters of assets in the field and also facility assets at DITP and CWTP. The current system is running on “end-of-life” hardware and server operating system (OS). The PI upgrade will monitor the same assets as the old system with much improved functionality and performance. The new system is a multi-tier configuration with servers for the database and application, and desktops for the Processbook and datalink client tools. The new system will be upgraded to a 64 bit OS within a virtual environment and provides high availability features.
- **Telog:** An update to the Telog Enterprise system was applied. This update provides real-time access of Telog meters to OCC operators and metering staff. Over 150 PI flow, pressure, and gradient tags have been updated to support the migration of Telog meters to wireless communications. The project was completed FY16 Q2.

Information Security Program

This program focuses on the strength, resiliency, and sustainability of MWRA’s cyber security practices for its data and computing-related assets. The program also monitors for and protects against penetrations, intrusions, and malicious actions from both internal and external threats. The projects associated with this program continue to assess, implement, and improve MWRA’s information security protections, including recommendations to improve each IT system’s security profile. The following are the FY2017 projects under this program:

- ***Phase 2 of the Information Security Program Implementation***
- ***Secure Media Destruction Program Improvements***

Technology Infrastructure Improvement Program

The MWRA currently owns and operates 1,350 desktops, 226 laptops, 203 servers, 20 Wide Area Network Circuits and associated equipment. It also manages in excess of 18 Terabytes (TB) of data of which 7 TBs are stored in 148 database schemes and an additional 11 TB of unstructured data are stored on file shares. This program will assess and implement consolidated and optimized versions of these core IT infrastructure elements as utility-like services and commodities. Furthermore, it will look to improve and optimize data management practices including: storage, backup, and archive and purge processes and technologies. The following projects are currently under way:

- ***Server Consolidation and Virtualization:*** Continuation of “Green Data Center” initiatives, including virtualizing more physical servers and reducing the variety of application infrastructure component versions and manufacturers (like web servers, application servers, and database servers).
- ***Network Convergence:*** Explore new technologies for future implementation considerations including new networking technologies for upcoming network upgrade, web and mobile platforms for business and information services, and Voice-Over-IP (VOIP) for communications.

- **Campus Wide WIFI:** The MWRA has pockets of wireless access points in Vehicle Maintenance, Warehouse, and Laboratory Services. These systems have limited access, are administered independently, and have no redundancy. The design approach for Campus Wide WIFI is to provide a resilient wireless network at all of the MWRA locations where it is cost effective, can be centrally managed, and that provides redundancy.
- **Voice-Over-IP (VOIP):** The existing legacy PBX phone systems are approaching the end of support and product life. VOIP is a mature technology and a core component of Unified Communications. Explore VOIP technologies for solution set that offers existing PBX functionality as a minimum.
- **Network Storage Improvements:** Plan for the migration and implementation for consolidation of new storage requirements for archiving, and implement e-discovery services.
- **Distributed Antenna System (DAS):** The Verizon external cellular coverage at Deer Island is poor. A design was completed to improve the reception. MWRA will implement this design in FY17.
- **Office Automation Refresh Program:** Desktop, mobile, printers, MFD etc.
- **Workforce Mobilization:** Explore new technologies and hardware platforms to improve efficiencies in business process while in the field. Target business units for this initiative are Engineering and Construction, Water and Wastewater Operations, and Maintenance.
- **Central Data Repository:** This effort will include the development of a comprehensive Data Model that can act as a single central data repository for all MWRA applications. This effort will begin in FY2017 and will be an ongoing process going forward.
- **Enterprise Application Integration (EAI):** This effort will establish a dynamically scaling Enterprise Service Bus (ESB) technology product, implemented as Integration Platform for select MWRA applications This will standardize data flow/data exchange format and integrate disparate MWRA applications to the ESB and hence to the Central Data Repository.

FY16 Accomplishments:

Information Technology Management Program

- **Information Technology Steering Committee:** As the first step in establishing IT governance, the Business-IT project prioritization committee was established. It is made up of senior staff representing the Authority's Divisions. The committee meets monthly to assess project progress and set priorities for which applications/business functionality will be worked on next.
- **MIS Reorganization:** With the hiring of a Manager of Application & System Development and other PCR amendments being approved by the Board, MIS has begun the organizational

transformation recommended in the 5 year Strategic Plan. The reorganization is now 48% complete.

Application Improvement Program

- ***Archiving & e-Discovery Project:*** MIS staff participated in a project kickoff conference with VERITAS who requested that MIS run analyzer tools to collect data on the Exchange and File Systems. Workshops were held in December with the consultant and the design pilot groups with the main goal of preparing the draft business policies for archiving Exchange emails and File System folders to a central repository, Enterprise Vault. A Solution Design Workshop was held in January for the infrastructure design and a solution design document draft has been developed by the vendor and is currently being reviewed by MIS.
- ***e-Procurement - Strategic Sourcing and Contracts Management:*** Enabled bid bond functionality with Surety2000 to prepare for the first Chapter 30 (C30) and Chapter 149 (C149) Construction Contract Events. Staff was trained on how to put these events online and the first C30 and C149 (no sub-bidders) sourcing events were posted with successful Contract award and generation. Chapter 149 contracts with Sub-bids are ready for go-live and a mock event will be conducted and is being scheduled. Conducted training for: a) contract invoice entry (non-retainage) for AP staff in anticipation of first live NPS invoice; b) subcontractor payments, supplier diversity, and view-only access to sourcing events for AACU staff.
- ***Miscellaneous Lawson Support:*** Supported first successful payroll of FY16 which incorporated benefit and organizational changes including pay raises and new sick time plan for temporary employees. Began working on a solution for new Federal Affordable Care Act (ACA) that requires IRS 1095c forms for all employees. Worked with the AACU vendor to produce a newly required Veterans' report and updated Lawson to produce the report. The program that produces the Health Insurance Coverage data for the 1095c forms for employees was modified to support the new Federal requirements; created a file for a new form printing vendor (Valli Systems) for final 1095c processing and mailing. Completed development and implementation of new warehouse window issuing and scanning functionality for Mobile Supply Chain Management at the Chelsea and DI Warehouses. To support the change in the bank used for the Purchase Card program, staff conducted numerous tests of passing data between the MWRA and the Bank of America (BOA) and staff manually downloaded live BOA-posted files from the BOA Business-to-Business (B2B) portal successfully and validated data content. Automation of this process is now underway.
- ***Talent Acquisition Application:*** After reviewing Talent Acquisition (Job Application) products offered by 3rd party vendors, selected ApplicantPro for the vendor-hosted job applicant tracking application. MIS and HR held several WebEx sessions with ApplicantPro to begin the design and implementation of the job application and on-boarding hiring processes. Staff are continuing to make template additions and configuration changes based on business decisions. In addition, staff from HR, AACU and MIS have had dedicated meetings that focused on reports including gap analysis and custom reporting needs.

- ***Library Upgrade Project:*** Inmagic Presto replaces several legacy MWRA Library applications with one commercial-off-the-shelf (COTS) application. Inmagic supports integrated management of print and electronic resources and provides a single web interface for searching across multiple internal and third party information assets. Staff has begun mapping and data migration from multiple databases into the new schema. Operations and Maintenance manuals at various site locations will be searchable alongside the Reports that are in the Library collection. Currently converting MWRA's unique/idiosyncratic book cataloging to the Library of Congress standards using free internet tools, and rearranging books under this new classification. Upon our request, the Water Research Foundation (WRF) provided abstracts and links to enhance retrieval of the 700+ of their reports to be included in the MWRA's new catalog. Currently refining Reports and Subscription data and completed the physical move of the MWRA reports and the legal reference materials and will be moving on to repositioning the books consistent with the new cataloging standard.
- ***Everbridge Mass Communication and Notification Subscription System:*** The self registration/subscription services module was implemented Q2 and allows visitors to mwra.com to register for notifications such as construction project updates. The Employee and Community Notifications modules were implemented in Q3 and replace both the current vendor solution, Communicator!NXT, and an internally developed solution, MWRA R911.
- ***Records Management System Replacement Project:*** The MWRA needs to replace the legacy Records Management application, InfoStar, used by the Records Center, DI Technical Information Center (TIC), and E&C to ensure application operability, respond to Internal Audit findings, support legal and regulatory compliance requirements, safeguard vital information, and minimize litigation risks. Staff documented workflows for the Records Center and met with TIC team to review workflows for handling Construction Submittals, shop drawings, and other workflow processes. Also met with E&C to review all the Access databases (12) used to track drawings and other related information. Implement the Infostar replacement may occur in three phases: 1) Marlboro Boxed Records Phase (MWRA, DI, Walnut Hill, and MetroWest); 2) DI TIC Active Physical Records Management Phase; and 3) Physical Drawings phase. Use cases to be developed including two for Phase One (box level, folder level) and one for each part of Phase Two and Three. Because different departments use InfoStar for different purposes, a single solution may not be appropriate to meet all users' requirements.
- ***Tiscor InspectNTrack:*** In addition to the existing inspection routes (groups) for DI, CWTP, Wastewater, Headworks and Metro Ops., staff added a new route, Maintenance Auditing, that allows five managers to audit inspection routes and replaces the paper based Audit forms used by Managers/Supervisors. The new route contains 47 auditing sub routes. Created a report that showed water meter readings collected by operators. The report contains meter reading data at all Wastewater sites from the TISCOR database. Created individual questions for each water meter and set Hi/Low limits for each water meter reading for data validation.
- ***Portia Upgrade:*** Began parallel implementation of the Portia upgrade for Treasury staff users. Users will run the new version and the legacy version for the next several months. Met with

the Portia consultant and key users to review implementation requirements for two new modules, Cash Management and the Automated Import Module (AIM).

- ***Amicus Attorney Upgrade:*** Successfully upgraded the Legal Case Management application Amicus Attorney to the 2015 version. The upgrade included installation of software on a new virtual server and on staff PCs.
- ***Payroll Timesheet Enhancements:*** Based on requests from the Payroll department, completed a design for enhancements to the timesheet adjustment approval process and obtained user signoff; the enhancements allow for additional approvals beyond supervisory approval. The new enhancements were developed and deployed to the development server and are awaiting user acceptance before deploying to the production environment.
- ***GIS:*** Completed the deployment of web-based mapping application for Waterworks, Sewerage, Real Property and EnQual. Web-based mapping dashboards have been developed for SSO events and Wachusett Reservoir contamination events. Web-based application with GPS capabilities have been deployed to assist field staff in location of waterworks and sewerage infrastructure assets. In concert with these are specialized applications and a newly updated general purpose web-based GIS viewer. This viewer is available on all MWRA issued devices. These initiatives were completed in FY16 Q3.
- ***Computerized Maintenance Management System (CMMS) Enhancements:*** The Maximo Upgrade from 5.2 to 7.6 was initiated in Q1 of FY16 the project is expected to be completed in Q4 of FY17. To date the following items have been delivered:
 - Best Practices Report
 - Education Program
 - Requirements Validation and Solution Design – Maximo Asset Management
 - Maximo – Infor/Lawson Interface Design
 - Maximo to PI Interface Design
 - Requirements Validation and Solution Design – Calibration Module
 - Application Environment Assessment
- ***Electronic Laboratory Notebook (ELN):*** In FY16 some 43 log books have been reviewed, designed and either eliminated or coded for the drinking water laboratories. Phase one is 87% complete.

Information Security Program

- ***Phishing Drill:*** An email Phishing drill was conducted in October to establish a baseline for user awareness. The drill results demonstrated fewer than average employees who took the bait when compared to similar DHS findings, but higher than expected, identifying the need for additional user awareness training. As a result, End User Security Awareness Computer Based Training has been purchased. This training incorporates a series of security modules and will be launched in Q3 of FY16 to be completed by the end of the 2016 calendar year.

- **Authority Mobile Application Delivery Implementation:** A Proof of Concept environment has been built in support of the Mobile Application Delivery platform. 58 iPads and 164 iPhones are being managed with the required, associated Mobile Device Management platform. Nine applications have been identified for mobile application delivery, and are being tested by appropriate subgroups of mobile device users.
- **Secure File Delivery Implementation:** A Proof of Concept environment has been built in support of Secure File Delivery. 50 employees have been setup to use and are actively testing the Secure File Delivery software from desktops, laptops, and mobile devices. A job aid and a quick reference guide have been finalized and will be posted to PipeLine.
- **Managed Security Services:** Contract #7499 was awarded to NWN Corporation. This project upgrades and or replaces all “end of life” Information Security (IS) technology types and provides information security monitoring services for all MWRA IS technologies for 3 years.

Technology Infrastructure Improvement Program

- **Print, Fax, Scan and Copy:** Installed new multi-function devices (MFDs) throughout MWRA facilities consolidating services (Print, FAX, Scan, Copier) onto one platform. Purchase 24 MFDs to replace expiring leases.

Budget Highlights:

- The FY17 Final Budget is \$12.4 million, an increase of \$2 million or 19.5% as compared to the FY16 Actuals.
- \$5.8 million for **Wages and Salaries**, an increase of \$571,000 or 11% as compared to the FY16 Actuals, due to three unfilled positions in FY16 and contractual increases. The FY17 Final Budget includes funding for 56 positions, the same as FY16 Budget.
- \$4.1 million for **Ongoing Maintenance**, an increase of \$1.2 million or 41.7%, as compared to the FY16 Actuals, mainly due to a combination of new software (i.e., Microsoft Application Upgrades), Managed Security Service Provider (MSSP) security contract, drop down maintenance costs from CIP projects after warranties expired, and increases for various license and software maintenance agreements. Maintenance spending is for license and maintenance fees to support administrative, operations, and database applications used by MWRA staff.
- \$400,000 for **Professional Services**, an increase of \$269,000 or 143.7%, as compared to the FY16 Actuals. Funding will support the improvement efforts for Water Quality Reporting System upgrade, Lawson Maximo Interface, PI Maximo Interface, CROMERR Implementation, and security system monitoring services.
- \$578,000 for **Other Materials**, a decrease of \$16,000 or 2.8%, as compared to the FY16 Actuals. The FY17 budget included the purchase of mobile devices for the workforce.

- \$1.3 million for **Other Services**, an increase of \$56,000 or 4.4%, as compared to the FY16 Actuals. Funding of \$1.0 million for facility and security data lines, leases for multi-purpose copiers, faxes, and scanners, and Automatic Vehicle Locator (AVL) services.

PROCUREMENT

FY17 Final Current Expense Budget						
PROCUREMENT						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 3,538,806	\$ 3,566,438	\$ 3,624,579	\$ 3,890,659	\$ 266,080	7.3%
OVERTIME	10,852	31,457	11,841	25,000	13,159	111.1%
FRINGE BENEFITS	126	444	314	300	(14)	-4.5%
ONGOING MAINTENANCE	829,315	292,358	637,962	-	(637,962)	-100.0%
TRAINING & MEETINGS	7,147	2,379	2,830	6,200	3,370	119.1%
OTHER MATERIALS	122,819	124,420	137,126	136,700	(426)	-0.3%
OTHER SERVICES	41,769	46,570	56,026	67,150	11,124	19.9%
TOTAL	\$ 4,550,834	\$ 4,064,066	\$ 4,470,678	\$ 4,126,009	\$ (344,669)	-7.7%

The **Procurement Department** includes three units. The **Purchasing Unit** operates a competitive purchasing system for the procurement of materials, goods, and non-professional services in accordance with MWRA policies and procedures. The **Contract Management Unit** reviews, drafts, and negotiates contracts, amendments, and change orders for all professional, non-professional, and construction services contracts. Staff directs the bid, review, and selection process, and maintains a contracts database. The **Materials Management Unit** manages an Authority-wide inventory control and management system for better control, storage, distribution, and accounting of MWRA's inventory. The unit manages three regional warehouses/distribution centers that support all MWRA activities.

FY17 Goals:

- Procure materials, equipment, supplies, construction, professional, and non-professional services in a timely, efficient, and openly competitive process in accordance with MWRA policies and procedures, including those related to meeting affirmative action goals.
- Maintain centralized, efficient, and cost-effective management of spare parts and operating supplies inventory.
- Provide timely and high quality services to initiating Divisions to enable MWRA programs to meet their public, production and schedule responsibilities.
- Maintain a recycling program in order to contain MWRA operating costs by removing recyclable materials from the waste stream.
- Continue implementing electronic procurement for contract bids, which will significantly reduce the amount of paper processing, with a focus on electronic bidding for Chapter 149 construction projects with filed sub-bids and professional services contracts.
- Review policies and procedures for procurement of professional services.
- Provide training to MWRA staff on various procurement policies and procedures including purchasing of goods and materials and selection committee service.

- Continue staff procurement training.
- Continue staff participation in Maximo upgrade efforts and Lawson-Maximo Interface redesign, including data conversation and data migration.

FY16 Accomplishments:

- Competitively bid Class II Renewable Energy Portfolio Standard (RPS) certificates which resulted in FY16 revenues of \$457,845. In addition, received FY16 revenues of \$1,270,786 from forward marketing of CY15 Class I and Solar Carve-Out II RPS certificates.
- Awarded the following major contracts in FY16:
 - Reading Extension Sewer and Metropolitan Sewer Rehabilitation (Sections 73/74/75/46) Design/CA/RE/RI;
 - DITP Sodium Hypochlorite/Sodium Bisulphate Tank Rehabilitation;
 - Supply and Delivery of Soda Ash for John J. Carroll Water Treatment Plant;
 - Investment Banking Services (Underwriters);
 - Supply and Delivery of Sodium Hypochlorite to DITP;
 - Miscellaneous Fencing;
 - Supply and Delivery of Hydrogen Peroxide for DITP;
 - Clinton Wastewater Treatment Plant Phosphorus Reduction Facility;
 - Caruso Pump Station Improvements;
 - Nut Island Emergency Demolition and Duct Cleaning;
 - Rosemary Brook Siphon Buildings Repair and Stabilization;
 - Hatchery Pipeline and Hydroelectric;
 - Managed Security Services;
 - Integrated Financial, Procurement and Human Resources/Payroll Management Systems Maintenance and Support;
 - Thermal and Hydro Power Plant Maintenance;
 - Winthrop Terminal VFD and Synchronous Motor Replacement DITP;
 - Beacon Street Line Water Pipeline Repair;
 - Southern Extra High Pipeline Section 111;
 - Three contracts for Technical Assistance Consulting Services DITP;
 - Chelsea Creek Headworks Upgrade RE/RI;
 - Chelsea Screen House Upgrades ESDC/RI;
 - Nut Island Headworks Odor Control, HVAC and Energy Management Systems Evaluation;
 - Fire Alarm System Services – Metro Boston and Central and Western MA;
 - Boiler and Water Heater Services;
 - Elevator Maintenance and Repair – Various Locations and DITP;
 - DITP Fire Alarm System Replacement Design and ESDC;
 - Section 56 General Edwards Bridge Crossing Feasibility Study;
 - Bond Counsel Services;
 - Letter of Credit and Direct Floating Rate Revolving Loan to Replace Commercial Paper Notes;

- Electric Power DITP;
 - Electric Power Interval Accounts;
 - Workers' Compensation Third Party Administrator Services;
 - Thermal Power Plant Fuel Oil System Upgrade DITP;
 - Wachusett Aqueduct Pumping Station;
 - Northern Intermediate High Pipeline Project Section 110 Reading and Woburn;
 - Technical Assistance Consulting Services for John J. Carroll Water Treatment Plant;
 - Alewife Brook Pump Station Rehabilitation;
 - Digested Sludge Pump Replacement – DITP, Phase 2;
 - Quabbin Power and Security Improvements;
 - Metropolitan Operations Paving;
 - Insurance Program Renewal for FY17;
 - Accounts Payable and Payroll Depository Services;
 - Disclosure Counsel Services;
 - Groundskeeping Services – Metro Boston;
 - Farm Pond Inlet Chamber, Farm Pond Gatehouse and Waban Arches Structural Evaluation;
 - Two contracts for Agency-Wide Technical Assistance Consulting Services.
- Continued to work with Deer Island Treatment Plant (DITP), Field Operations (FOD), and utility companies to establish energy conservation programs at DITP and FOD facilities utilizing various programs including the Green Communities Act and the utilities' municipal programs. Continued to seek environmentally friendly products including recycled toners, batteries, copy paper, hybrid vehicles, and bio-fuels. Continued to dispose of surplus scrap metal materials in an environmentally responsible manner.
 - Continued development of an electronic procurement bidding process, including bidding of Chapter 30 construction contracts and Chapter 149 construction contracts with no filed sub-bids.
 - Processed 9,275 purchase orders in FY16 for a total of \$54,465,764.
 - Completed the transition of the MWRA's Purchasing Card Program to Bank of America NA, through the Commonwealth of Massachusetts State Blanket Agreement PRF44designatedOSC. The MWRA will now receive an annual rebate based on the total Commonwealth P-Card purchasing spends. This rebate will be calculated based upon spending from October 1st through September 30th of each year. The current State rebate is set at 1.43 percent. Based upon its annual spending of approximately \$500,000, an annual rebate to the MWRA is estimated at \$7,150. In addition, all per card fees that were charged by the previous bank have been eliminated.
 - Procured the MWRA's vehicle purchases at the beginning of FY16, including 30 vehicles procured through the use of a "Reverse Auction" format.
 - Purchased 294,000 gallons of ultra-low-sulfur, #2 diesel fuel for the DITP Power Plant in September, 2015 at a cost of \$1.6483/gallon, and 210,000 gallons in April 2016 at a cost of \$1.40/gallon, both lower than the FY16 budgeted price of \$2.7500/gallon.

- Continued regular meetings with DITP, Chelsea, and MIS staff to foster better communication between MWRA departments and the Purchasing Unit.
- Continued an online vehicle and equipment auction process that resulted in revenue of \$287,691 during FY16.
- Recycled 1558 batteries, 19.31 tons of paper, 268.30 tons of scrap metal, and 7,083 pounds of stainless steel, brass, and copper, generating \$32,456 in revenue.

Budget Highlights:

- The FY17 Final Budget is \$4.1 million, a decrease of \$345,000 or 7.7% as compared to the FY16 Actuals.
- \$3.9 million for **Wages and Salaries**, an increase of \$266,000 or 7.3% as compared to the FY16 Actuals, mainly for contractual increases. The FY17 Final Budget supports 44 positions, the same as FY16 Budget.
- \$67,000 for **Other Services**, an increase of \$11,000 or 19.9% as compared to the FY16 Actuals, mainly due to historical spending trends. This funding supports advertising and printing/duplicating for contract documents and specifications.

REAL PROPERTY AND ENVIRONMENTAL MANAGEMENT

FY17 Final Current Expense Budget						
REAL PROPERTY / ENVIRONMENTAL MANAGEMENT						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 433,078	\$ 378,752	\$ 460,389	\$ 467,588	\$ 7,199	1.6%
TRAINING & MEETINGS	425	1,540	1,008	4,000	2,992	296.9%
PROFESSIONAL SERVICES	2,165	-	15,720	5,000	(10,720)	-68.2%
OTHER MATERIALS	247	56	279	650	371	133.2%
OTHER SERVICES	215,105	268,871	190,575	166,020	(24,555)	-12.9%
TOTAL	\$ 651,020	\$ 649,218	\$ 667,971	\$ 643,258	\$ (24,713)	-3.7%

The **Real Property and Environmental Management Department** negotiates the purchase or lease of real estate and land necessary to support MWRA's capital projects and operations and manages the disposition of surplus real property. Staff participates in site selection and negotiates acquisitions or easements. In addition, staff has developed and is maintaining the Real Property database, the compilation of more than 100 years of easements and land rights for the water and sewer systems. Department staff manages environmental regulatory compliance at MWRA facilities and also provide special expertise and assistance to MWRA staff regarding air quality and hazardous material issues. Assistance includes management of oil and hazardous materials site assessment and remediation, air emission permit negotiations, and preparation and submittal of quarterly/annual monitoring reports.

FY17 Goals:

- Acquire the real property needed to complete MWRA's major capital projects in a timely and cost-effective manner; manage the disposition of surplus real property in an efficient manner; and provide staff and others with current information regarding MWRA's real property rights.
- Manage the centralized environmental management program, providing technical assistance regarding hazardous waste management, air quality compliance, and related issues during all phases of MWRA projects as well as monitor and provide assistance in maintaining environmental regulatory compliance at MWRA facilities.

FY17 Initiatives:

- Reevaluate actual hazardous waste generation rates at all applicable MWRA facilities in order to confirm appropriate MassDEP generator status with the goal of reducing compliance fees and any unnecessary reporting requirements.
- Coordinate implementation of the anticipated air quality operating permit renewal for the Deer Island Treatment Plant.

FY16 Accomplishments:

- Provided ongoing real estate planning and services to acquire additional space to support the Chelsea facility including site search (RFP development, issuance, and review of proposals), appraisals, market research and outreach. Reviewed impacts to MWRA lease due to Silver Line expansion.

- Provided real estate services for FRSA (licenses and easements) and for Deer Island (appraisal of abutting land).
- Managed seven (7) permit agreements (five at Turkey Hill and two at Walnut Hill). Coordinated with Operations for approval of the equipment changes and improving the invoicing system for maintenance reimbursements. Total revenue for the seven agreements is \$436,000 of which MWRA and the host community each receive half.
- Provided real estate support to Operations and Public Affairs for issuance of 8M permits to 1) private entities requesting use of MWRA controlled land and 2) cities and towns applying to the Aqueduct Trails Program. Updated fees and negotiated new agreements for long-term 8M permits on MWRA fee controlled land increasing annual revenue to \$69,000.
- Provided real estate services (appraisal, negotiation, plan review and planning) for: Carroll Water Treatment Plant (CWTP) security entrance renovations (easement acquisitions and grant of license to City of Marlborough and temporary easement acquisition from private owner); Chelsea Headworks Renovation (acquisition of fee interest from City of Chelsea); and Shaft 9A, Medford, (acquisition of easements from 2 private property owners); Reading Extension Sewer (easement needs assessment) and Northern Intermediate High Service (temporary laydown planning).
- Provided deed and title research, legislative review, document review with Law Division. Responded to in-house and public regarding ongoing inquiries regarding MWRA real estate rights.
- Provided strategic and technical support in concert with MIS and Planning's GIS group to prepare scope for consultant to upgrade and streamline Real Property data base to a state-of-the-art GIS map based interface. Updated over 75 records and added 120 new records to database for a total of 800 plus records.
- Continued with remediation and assessment of oil contamination at the Fore River Staging Area (FRSA) facility.
- Continued with the remediation assessment of the oil contamination resulting from the February 2010 spill at the Cottage Farm Combined Sewer Overflow (CSO) facility.
- Submitted the Phase II – Comprehensive Site Assessment report for the Chelsea Creek Headworks to the MassDEP ahead of schedule in support of completing facility rehabilitation contract documents. In addition, continued to provide technical support for the planned PCB abatement at the Chelsea Creek Headworks and provided support related to PCB encapsulation pilot testing.
- Provided technical support for ongoing evaluation of project scope and schedule for remediation of PCBs at the Cottage Farm CSO Facility.
- Provided support during construction startup for PCBs, lead paint, mercury, and asbestos abatement at the abandoned Westborough State Hospital Pump Station located on the grounds of the Carroll Water Treatment Plant.

- Continued to provide technical and regulatory coordination of the fuel tank maintenance contract. Completed fuel tank pumping system replacement at the Chelsea Facility, replaced tank monitoring system at two facilities, replaced piping at Framingham Pump Station, installed a new piping sump at the Prison Point CSO Facility, removed the underground storage tank at the Hingham Pump Station after it failed a tightness test (it was subsequently determined that the tank had not leaked fuel to the environment), and general monitoring system repair and upgrades at other facilities. Continued with the MassDEP-required monthly inspection requirement for all underground fuel storage tank systems.
- Completed the MassDEP-required triennial Third-Party Inspections at all MWRA underground fuel storage tank facilities with passing results at all facilities.
- Completed MassDEP-required triennial cathodic protection tests at two MWRA underground fuel storage tank facilities.
- Completed updates to the Spill Prevention, Control, and Countermeasure (SPCC) Plan for the MWRA Biosolids Processing Facility and Lonergan Intake. Incorporated these new and revised plans into the MWRA-wide SPCC annual training program. Completed annual inspections at eleven (11) MWRA facilities where oil is used and stored in accordance with the SPCC regulations.
- Continued to prepare, coordinate and oversee the completion of annual SPCC Plan training of over 200 MWRA oil handling staff and managers.
- Continued with MassDEP-required periodic groundwater monitoring around the former wastewater holding tank at Clinton.
- Provided technical and environmental regulatory support regarding environmental regulatory compliance, contaminated soil and groundwater management, as well as geotechnical issues on various design and construction projects, including:
 - Stoneham Low Service Covered Storage and Pump Station,
 - Remote Headworks Rehabilitation,
 - Northern Intermediate High project,
 - Section 36 Watertown-Waltham Connection,
 - Alewife Brook Pump Station facility upgrades,
 - MWR003 Gate, Siphon and Floatables Control project
 - Southern Extra High Pipeline
 - Sudbury Aqueduct Rosemary Brook Siphon and Farm Pond facility rehabilitations
 - Section 49 Water Line Leak Repair
 - Section 56 Water Line Replacement
 - Section 57 Water Line Rehabilitation
 - Section 23, 24, and 47 Water Line Rehabilitation
 - Fells Covered Storage microwave antenna tower project
 - Webster Avenue, Somerville pipe bridge
 - Ward Street Headworks antenna demolition
 - Fuel storage tank installation design at the Quincy and Hingham Pump Stations

- Continued to provide ongoing regulatory technical support to Operations staff for the diesel oxidation catalyst-equipped engines at Cottage Farm, Prison Point, and CWTP including annual accuracy audits for each engine's monitoring systems, quarterly review of data to identify any non-compliant periods of operation, timely submission of semi-annual compliance reports to EPA and ensure scheduling of the periodic performance retesting for the 4 engines at CWTP in accordance with EPA guidelines.
- Submit Compliance Certification to DEP for the new emergency generator at Spot Pond Covered Storage facility and continue to work with Engineering & Construction on completing the compliance certification process for Fells Covered Storage facility in compliance with DEP's Environmental Results Program.
- Continued to work with Operations staff to implement maintenance and recordkeeping requirements for all emergency generators including quarterly records review of each engine to ensure compliance with maximum allowed operating hours.
- Completed annual opacity testing for the DITP CTGs, including submission of an official test report to DEP in accordance with the monitoring and testing requirements of the DITP's operating permit.
- Completed air emissions compliance testing at the DITP's North Main Pump Station Odor Control facility including submission of an official test report to DEP in accordance with the monitoring and testing requirements of the DITP's operating permit.
- Completed a relative accuracy test audit of the Combustion Turbine Generator continuous emission monitoring system in accordance with the monitoring and testing requirements of the DITP's operating permit.
- Completion and timely submission to DEP of an air emissions compliance testing protocol for DITP's Secondary Odor Control Facility.
- Completion and timely submission of on-line greenhouse gas emissions reporting for DITP and the Biosolids Processing Facility via the Climate Registry Information System for compliance with the DEP and the Electronic Greenhouse Gas Reporting Tool for compliance with EPA.
- Notify MWRA management that reporting of DITP's greenhouse gas emissions to EPA will no longer be required starting in 2016 based on five consecutive years of data showing emissions below the reporting threshold.
- Completion and timely filing of annual Source Registration and Emissions Statements for DITP and the Biosolids Processing Facility via the eDEP's on-line electronic filing system.
- Complete and submit a small source applicability worksheet to DEP for Spot Pond Covered Storage Facility to determine emissions reporting requirements.
- Completion and timely filing of triennial Source Registration and Emissions Statements for the following facilities via the eDEP's on-line electronic filing system.
 - Chelsea Creek Headworks

- Columbus Park Headworks
 - Ward Street Headworks
 - Nut Island Headworks
 - Braintree-Weymouth Intermediate Pump Station
 - DeLauri Pump Station
 - Carroll Water Treatment Plant
 - Gillis Pump Station
- Continue to provide technical support for the Limited Air Plan Approval Application for the substantial reconstruction of the odor control facility at the Chelsea Creek Headworks including review and input to multiple drafts.
 - Complete biennial boiler tune up certifications for nine facilities in compliance with EPA's Subpart JJJJJ, Boiler MACT.
 - Continue to prepare and submit quarterly, semi-annual and annual air monitoring and emissions compliance reports to EPA and DEP for DITP, Biosolids Processing Facility, Nut Island Treatment Plant, CWTP, Prison Point CSO and Cottage Farm CSO.
 - Provided technical and regulatory support in the assessment, reporting, and closeout of the Framingham Pump Station odor control chemical spill.
 - Continue to provide technical and regulatory support in response to the Nut Island Headworks odor control system fire including continuous review of emissions data while the facility operates on carbon alone as the sole pollution control device.
 - Represented MWRA in the Massachusetts Geological Survey annual meeting of the State Map Advisory Committee to assist the State Geologist with prioritize geological mapping activities in the next calendar year.

Budget Highlights:

- The FY17 Final Budget is \$643,000 a decrease of \$25,000 or 3.7% as compared to the FY16 Actuals.
- \$468,000 for **Wages and Salaries**, an increase of \$7,000 or 1.6% as compared to the FY16 Actuals, for contractual increases. The FY17 Final Budget includes funding for four positions, the same as FY16 Budget.
- \$4,000 for **Training and Meetings**, an increase of \$3,000 or 296.9% as compared to the FY16 Actuals.
- \$166,000 for **Other Services**, a decrease of \$25,000 or 12.9% as compared to the FY16 Actuals. The decrease is due to the decreased costs for the underground storage tank project based on remaining funds in the current contract.



Finance Division Budget

FINANCE DIVISION

Finance

Director's Office
Rates and Budget
Treasury
Controller
Risk Management

FY17 Final Current Expense Budget						
FINANCE DIVISION						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 3,589,481	\$ 3,641,446	\$ 3,327,444	\$ 3,662,005	\$ 334,560	10.1%
OVERTIME	200	-	-	-	-	-
FRINGE BENEFITS	-	-	-	-	-	-
WORKERS' COMPENSATION	-	-	-	-	-	-
UTILITIES	-	-	-	-	-	-
ONGOING MAINTENANCE	-	-	-	-	-	-
TRAINING & MEETINGS	2,139	1,451	1,276	3,000	1,724	135.1%
PROFESSIONAL SERVICES	442,678	538,383	572,658	590,060	17,402	3.0%
OTHER MATERIALS	6,885	5,566	11,016	6,100	(4,916)	-44.6%
OTHER SERVICES	12,332	7,283	5,696	6,615	919	16.1%
TOTAL	\$ 4,053,715	\$ 4,194,129	\$ 3,918,090	\$ 4,267,780	\$ 349,689	8.9%

FY17 Final Current Expense Budget						
FINANCE by Department						
DEPARTMENT	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
DIR OFFICE (FINANCE)	\$ 345,912	\$ 378,113	\$ 250,203	\$ 244,575	\$ (5,628)	-2.2%
CONTROLLER	1,487,662	1,496,244	1,366,086	1,599,366	233,280	17.1%
RATES AND BUDGET	797,962	830,770	820,478	880,037	59,560	7.3%
TREASURY	966,582	1,056,582	1,034,017	1,070,055	36,038	3.5%
RISK MANAGEMENT	455,597	432,420	447,307	473,746	26,440	5.9%
TOTAL	\$ 4,053,715	\$ 4,194,129	\$ 3,918,090	\$ 4,267,780	\$ 349,689	8.9%

The **Finance Division** is responsible for managing the finance functions of the Authority.

The Finance Division is comprised of five departments: Director's Office; Rates and Budget; Treasury; Controller; and Risk Management.

The Finance Division performs a multitude of functions that support the daily operations and ensure the implementation of the Authority's long term goals and strategies.

The Finance Division ensures that a variety of fiscal management systems are in place to monitor and control the Current Expense Budget (CEB) and Capital Improvement Program (CIP).

FY17 Goals:

- Manage and coordinate the Authority's finance functions.
- Develop and implement long-term strategies to ensure assessment increases to MWRA's communities are sustainable and predictable.
- Manage MWRA's debt portfolio to contribute to the achievement of sustainable and predictable rate increases.
- Improve the quality and presentation of budget documents and regularly required reports while working to develop new reports that will aid the Authority's Board of Directors, Management, and the MWRA Advisory Board.

FY17 Initiatives

- Continue assessment and evaluation of sustainable cost savings opportunities throughout the organization.
- Develop options and recommendations to ensure sustainable and predictable assessments and charges to our communities at both the water and wastewater utility level.

FY16 Accomplishments:

- Developed the FY17 Budget consistent with the FY16 planning estimates, for both the Current Expense Budget and the Capital Improvement Program.
- Maintained MWRA's strong credit ratings, Aa1, AA+, AA+ from Moody's, Standard & Poor's and Fitch respectively. MWRA's credit ratings from all three major agencies are only one ratings step below the highest rating of AAA. These high credit ratings enable MWRA to borrow at very advantageous interest rates helping to minimize debt service expenses.

Budget Highlights:

- The FY17 Final Budget is \$4.3 million, an increase of \$350,000 or 8.9% as compared to the FY16 Actuals.
- \$3.7 million for **Wages and Salaries**, an increase of \$335,000 or 10.1% as compared to the FY16 Actuals, mainly due to three fewer filled position in FY16, contractual increases, and longevity pay offset by reduction in the funding for an intern position during the summer. The FY17 Final Budget funds 39 positions, the same as in FY16 Budget.
- \$590,000 for **Professional Services**, an increase of \$17,000 or 3% as compared to the FY16 Actuals, for bond counsel services and audit services.

DIRECTOR'S OFFICE

FY17 Final Current Expense Budget						
FINANCE DIVISION DIRECTOR'S OFFICE						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 336,559	\$ 369,655	\$ 241,578	\$ 235,135	\$ (6,443)	-2.7%
TRAINING & MEETINGS	2,049	1,361	635	3,000	2,365	372.1%
OTHER MATERIALS	5,323	4,616	7,442	5,100	(2,342)	-31.5%
OTHER SERVICES	1,981	2,481	547	1,340	793	144.8%
TOTAL	\$ 345,912	\$ 378,113	\$ 250,203	\$ 244,575	\$ (5,628)	-2.2%

The **Finance Division Director's Office** oversees a multitude of functions that support the daily operations and ensure the implementation of the Authority's long-term goals and strategies.

The Director's Office is responsible for the centralized financial functions of rates development, revenue collection, budgeting, capital financing, debt and investment management, accounting, payroll processing, and risk management. Additionally, the Director's Office ensures that transactions comply with all rules, regulations, Authority policies and procedures, and contract terms. The Director's Office manages the development and implementation of policies to uphold the efficient utilization of resources and control of all monies. The Director's Office provides advice and analysis to the Executive Director and the Board of Directors on all financial issues.

The division's continuing challenge in FY17 will be maintaining an agency-wide focus on balancing competing needs to minimize assessment increases while ensuring the provision of critical MWRA services.

FY17 Goals:

- Manage and coordinate the Authority's finance and support service functions.
- Guide and coordinate division activities to support MWRA's goals and objectives.
- Continuously improve processes and performance for greater efficiency.
- Develop and implement long-term strategies to ensure reasonable rate increases to MWRA's communities.

Budget Highlights:

- The FY17 Final Budget is \$246,000, a decrease of \$6,000 or 2.6% as compared to the FY16 Actuals.
- \$235,000 for **Wages and Salaries**, a decrease of \$6,000 or 2.7% as compared to the FY16 Actuals, mainly for the elimination of funding for interns/co-op. The FY17 Final Budget funds two positions, the same as in FY16 Budget.

RATES AND BUDGET

FY17 Final Current Expense Budget						
RATES AND BUDGET						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 796,450	\$ 829,846	\$ 818,871	\$ 878,912	\$ 60,041	7.3%
TRAINING & MEETINGS	-	-	588	-	(588)	-100.0%
OTHER MATERIALS	982	615	305	500	195	64.0%
OTHER SERVICES	531	310	713	625	(88)	-12.3%
TOTAL	\$ 797,962	\$ 830,770	\$ 820,478	\$ 880,037	\$ 59,560	7.3%

The **Rates & Budget Department** provides the financial analysis that allows MWRA to translate its goals, and legal and financial commitments into cost-effective annual and multi-year programs and budgets. Department staff works closely with divisional staff to coordinate development of the long-term Capital Improvement Program (CIP) and monitor the progress of capital projects compared to projected schedules and budgeted spending. Staff also coordinates the development of MWRA's annual Current Expense Budget (CEB) and monitors spending compared to the budget throughout the year. The Budget Department also manages the annual process of establishing water and sewer assessments to be paid by MWRA's member communities and develops planning estimates of rate projections.

FY17 Goals:

- Continually enhance processes and the management of resources to deliver the final CIP and CEB timely and accurately.
- Adhere to all MWRA policies, procedures, and administrative practices as well as all relevant statutory and regulatory authority, accounting, and budgeting principles.
- Improve the quality and presentation of budget documents and regularly required reports while working to develop new reports that will aid the Authority's Board of Directors, Management, and the MWRA Advisory Board.
- Provide financial analysis as required.

FY17 Initiatives:

- Continue assessment and evaluation of sustainable cost savings opportunities throughout the organization.
- Develop options and recommendations to ensure sustainable, predictable, and reasonable assessments and charges to our communities at both the water and wastewater utility level.

FY16 Accomplishments:

- Developed the FY17 Budget consistent with the FY16 planning estimates, for both the Current Expense Budget and the Capital Improvement Program.
- Provided financial analysis for system expansion initiatives and preliminary long-term water redundancy options.

Budget Highlights:

- The FY17 Final Budget is \$880,000, an increase of \$60,000 or 7.3% as compared to the FY16 Actuals.
- \$879,000 for **Wages and Salaries**, an increase of \$60,000 or 7.3% as compared to the FY16 Actuals, mainly due to a partial vacancy during FY16, for contractual increases, longevity pay and one intern position during the summer. The FY17 Final Budget funds eight positions, the same as in FY16 Budget.

TREASURY

FY17 Final Current Expense Budget						
TREASURY						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 733,489	\$ 705,338	\$ 609,604	\$ 674,195	\$ 64,591	10.6%
OVERTIME	17	-		-	-	-
TRAINING & MEETINGS	90	90	52	-	(52)	-100.0%
PROFESSIONAL SERVICES	224,302	348,072	418,966	394,060	(24,906)	-5.9%
OTHER MATERIALS	549	183	2,050	300	(1,750)	-85.4%
OTHER SERVICES	8,135	2,899	3,345	1,500	(1,845)	-55.2%
TOTAL	\$ 966,582	\$ 1,056,582	\$ 1,034,017	\$ 1,070,055	\$ 36,038	3.5%

The **Treasury Department** secures funds for ongoing operations and capital programs in addition to processing cash disbursements. Department staff collects revenue, disburse funds, and manage grant and loan programs in addition to debt issuance and investments.

FY17 Goals:

- Manage MWRA’s debt portfolio to contribute to the achievement of sustainable and predictable assessment increases.
- Maximize investment return while maintaining compliance with the General Revenue Bond Resolution requirements regarding security and liquidity.

FY16 Accomplishments:

- Completed a \$747.6 million refunding and new money bond transaction on May 12, 2016. The new money portion consisted of \$66 million in bonds used to permanently finance \$21.0 million of the tax-exempt revolving loan and remainder was deposited in the Construction Fund. The refunding for interest rates savings transaction totaled \$681.6 million. The refunded resulted in \$111 million or 14.6% present value savings and \$188.3 million in gross debt service savings over the life of the bonds. The level of savings on this transaction is significant given that since 1992 MWRA had refunded \$5.3 billion in debt for \$283.3 million in present value savings.
- Executed a \$9.2 million and \$26.4 million defeasance of outstanding senior principal in September 2015 and June 2016 respectively. These defeasances reduced the debt service requirement between FY17 and FY22 by a total of \$42.9 million reducing the rate of increase to the Rate Revenue Requirement in those years.
- Maintained MWRA’s strong credit ratings, Aa1, AA+, AA+ from Moody’s, Standard & Poor’s and Fitch respectively. MWRA’s credit ratings from all three major agencies are only one ratings step below the highest rating of AAA. These high credit ratings enable MWRA to borrow at very advantageous interest rates which helps minimize debt service expenses.

- Replaced the \$250 million 1994 Notes Tax-exempt Commercial Paper Program with a \$100 million Tax-exempt Revolving Loan with Bank of America and new \$150 million Tax-exempt Commercial Paper Notes with a letter of credit from TD Bank.
- Completed the Massachusetts Clean Water Trust (MCWT) Pool 19 borrowing. This \$53.0 million transaction was made at subsidized interest rates contributing to a lower overall cost of debt for the Authority.

Budget Highlights:

- The FY17 Final Budget is \$1.1 million, an increase of \$36,000 or 3.5% as compared to the FY16 Actuals.
- \$674,000 for **Wages and Salaries**, an increase of \$65,000 or 10.6% as compared to the FY16 Actuals, mainly due to a partial vacancy during FY16. The FY17 Final Budget funds eight positions, the same as FY16 Budget.
- \$394,000 for **Professional Services**, a decrease of \$25,000 or 5.9%, as compared to the FY16 Actuals for bond counsel related services.

CONTROLLER

FY17 Final Current Expense Budget						
CONTROLLER						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 1,325,902	\$ 1,334,187	\$ 1,246,698	\$ 1,440,816	\$ 194,118	15.6%
OVERTIME	183	-	-	-	-	-
PROFESSIONAL SERVICES	160,625	160,975	117,615	156,000	38,385	32.6%
OTHER MATERIALS	27	152	982	200	(782)	-79.6%
OTHER SERVICES	925	930	791	2,350	1,559	197.1%
TOTAL	\$ 1,487,662	\$ 1,496,244	\$ 1,366,086	\$ 1,599,366	\$ 233,280	17.1%

The **Controller Department** consists of the Accounting, Accounts Payable, Accounts Receivable, and Payroll units. The department has the responsibility for ensuring integrity within the financial accounting system and integration among the four functions. The department is also responsible for the appropriate treatment, classification, and reporting of the MWRA's assets, liabilities, revenues and expenditures in accordance with accounting principles generally accepted in the United States of America.

FY17 Goals:

- Implement process efficiencies in all department units.
- Enhance controls to safeguard Authority assets and ensure accurate and timely reporting.

FY17 Initiatives:

- Finalize new contract accounting software module with existing accounting software.
- Continue to support management initiatives with underlying documentation and detail.

FY16 Accomplishments:

- Successfully completed certified financial statement audit with no audit findings.
- Completed automation of multiple Payroll Department documents.

Budget Highlights:

- The FY17 Final Budget is \$1.6 million, an increase \$233,000 or 17.1% as compared to the FY16 Actuals.
- \$1.4 million for **Wages and Salaries**, an increase of \$194,000 or 15.6%, as compared to the FY16 Actuals, mainly due to a number of vacancies during FY16 and contractual increases. The FY17 Final Budget funds 17 positions, the same as in the FY16 Budget.
- \$156,000 for **Professional Services**, an increase of \$38,000 or 32.6%, as compared to the FY16 Actuals, mainly for increased audit costs. The FY17 Final Budget reflects anticipated costs associated with the annual financial statement audit, the A-133 Single Audit related to the receipt of federal funds, and the actuarial services related to GASB 45 Other Post Employment Benefits.

RISK MANAGEMENT

FY17 Final Current Expense Budget						
RISK MANAGEMENT						
LINE ITEM	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Final	Change FY16 to FY17	
WAGES & SALARIES	\$ 397,081	\$ 402,420	\$ 410,693	\$ 432,946	\$ 22,253	5.4%
PROFESSIONAL SERVICES	57,751	29,336	36,077	40,000	3,924	10.9%
OTHER MATERIALS	4	-	237	-	(237)	-100.0%
OTHER SERVICES	760	664	300	800	500	166.7%
TOTAL	\$ 455,597	\$ 432,420	\$ 447,307	\$ 473,746	\$ 26,440	5.9%

The **Risk Management Department** is responsible for all MWRA insurance programs and risk management functions. Department staff manage all administrative functions relating to the initial reporting, processing, and resolution of construction contract claims and self-insured auto, general liability, and property damage claims. Department staff members are responsible for the annual procurement, renewals, and maintenance of all Authority-wide insurance policies and programs and for managing all aspects of MWRA's contractor/vendor insurance certificate program. Department staff serve as liaisons to insurance industry participants including brokers, insurers, insurance consultants, and attorneys as well as providing support to all MWRA departments.

FY17 Goals:

- Process self-insured automobile, general liability, property damage, and construction contract claims in an efficient and timely manner.
- Secure the timely, cost effective renewal of Authority-wide insurance policies and contracts.
- Minimize MWRA's exposure to financial loss stemming from contractor and vendor activities by reviewing risk exposures and establishing contract insurance requirements and monitoring contractors/vendors for compliance.
- Provide support to all MWRA Departments on all insurance, claims, litigation and risk management issues.

FY16 Accomplishments:

- Successfully procured MWRA's Insurance Program through a competitive bid process for all lines of coverage at a 1.4% reduction in program cost compared to the FY16 program.
- Staff renewed MWRA's license to operate as a self-insured entity for workers compensation claims by completing the annual application process with the Division of Insurance.
- Received, investigated and processed more than 100 self-insured Automobile, General Liability and Property damage claims.

- Provided timely support to MWRA managers on all insurance, claims, litigation and risk management issues.

Budget Highlights:

- The FY17 Final Budget is \$474,000, an increase \$26,000 or 5.9% as compared to the FY16 Actuals.
- \$433,000 for **Wages & Salaries**, an increase of \$22,000 or 5.4% as compared to the FY16 Actuals, mainly due to a partial vacancy during FY16 and for contractual increases. The FY17 Final Budget funds four positions, the same as in the FY16 Budget.
- \$40,000 for **Professional Services**, an increase of 10% or \$4,000 as compared to FY16 Actuals. The Professional Services budget is calculated as an average of actual spending for the past three fiscal years as well as anticipated effort to complete Insurance Reserve Report preparation in FY17.



Appendices

APPENDIX A

DIRECT EXPENSE BUDGET LINE ITEM DESCRIPTIONS

Introduction

MWRA's direct expense budget funds the annual expenses of its operating and support divisions. Though the direct expense budget constitutes less than half of MWRA's total budget, it is these expenses which directly support the provision of water and sewer services to MWRA's customers. The direct expense budget includes the annual costs of operating the water and sewer systems, and funds the policy direction, administrative, financial, and legal support services for MWRA's ongoing operations. The direct expense budget also includes the personnel costs for management and oversight of MWRA's extensive capital programs.

There are 11 line items in the division budgets. The line items are:

Wages and Salaries - This line item includes funds for regular pay, shift differential, holiday pay, and standby pay for MWRA staff, as well as funds for interns and temporary staff.

Overtime - This line item includes funds for overtime related to operations, maintenance, emergencies, and training.

Fringe Benefits - This line item includes funds for health and dental insurance, unemployment compensation, Medicare, and overtime meals.

Workers' Compensation - This line item includes funds for compensation payments, medical payments, and settlements of compensation claims.

Chemicals - This line item includes funds for the chemicals used in water and wastewater treatment, such as chlorine, sodium hypochlorite, soda ash, sodium bisulfite, and hydrofluosilicic acid.

Utilities - This line item includes funds for electricity, diesel fuel, and other utilities such as water and sewer services paid by MWRA to the towns in which it operates facilities.

Maintenance - This line item includes funds to purchase materials and services for the maintenance of MWRA's plants and machinery, water and sewer pipelines, grounds, and buildings.

Training and Meetings - This line item covers the costs of staff training, meetings, and professional seminars.

Professional Services - This line item funds outside consultants supporting MWRA activities, including engineering and construction services, laboratory and testing contracts, computer system consultants, and legal and audit services.

Other Materials - This line item includes funds for office materials, equipment, postage, laboratory supplies, MWRA vehicles, work clothes, and computer hardware and software.

Other Services - This line item includes funds for space leasing, health and safety initiatives, removal of grit and screenings from the sewerage system, and the contracted operation of MWRA's residuals processing plant.

Sections II – V present summaries of the MWRA's budgets with a detailed description of program budgets and highlights within each divisional section.

APPENDIX B

BUDGET PROCESS AND TIMETABLE

MWRA operates on a fiscal year that starts July 1. The Current Expense Budget development process begins in September and, as described below, continues through a series of interactive reviews and revisions until June, when the Board of Directors approves the final budget. Throughout the formal budget process, MWRA staff maintains an ongoing dialogue with the Board of Directors and Advisory Board to discuss issues, the status of budget development, and other concerns.

MONTH	ACTIVITY
September	Divisions receive budget targets, guidelines, and manuals for the development of budget requests, and can begin to access MWRA's interactive budgeting system.
December	After the divisions return their budget requests, the Rates and Budget Department consolidates the authority-wide budgets, develops briefing materials for senior management, and identifies major budget issues.
January	The Executive Director determines proposed funding levels required to meet operational and financial objectives. Staff may seek appropriate policy direction from the Board.
February	MWRA transmits the Proposed Current Expense Budget to the Advisory Board for a 60-day review, during which time MWRA staff meet with Advisory Board staff, respond to questions, and provide updated information on plans and prices.
March – May	MWRA hosts public hearings to solicit comments on the proposed budget and community assessments from citizens in its service area. The Advisory Board reviews the proposed budget and transmits comments and recommendations to the MWRA.
June	The Board of Directors holds a hearing on the proposed budget and the Advisory Board's comments and recommendations. The Board of Directors adopts a final Current Expense Budget and a schedule of final wholesale water and sewer assessments.

APPENDIX C

MASSACHUSETTS WATER RESOURCES AUTHORITY BUDGET AND ASSESSMENT POLICIES AND PROCEDURES

**(Revised August 2003 to incorporate changes to capital budget section of Management
Policies adopted by the Board of Directors June 11, 2003)**

These policies and procedures govern certain budget, assessment, and rates management practices at the Massachusetts Water Resources Authority (MWRA). Policies and procedures may be amended from time to time, provided that changes in provisions governing reporting to or approvals by the Board of Directors or the Advisory Board must be approved by the Board of Directors. If any sections of these policies and procedures are at variance with requirements of MWRA's financing agreements, the latter shall govern.

ASSESSMENT POLICIES AND PROCEDURES

Basis of MWRA Assessments

MWRA is required by its Enabling Act to establish assessments which, with other revenues, provide sufficient funds each year to pay all current expenses, debt service, and obligations to the Commonwealth; to pay all costs of maintenance, replacement, improvements, extension, and enlargement of the sewer and waterworks systems; to create and maintain reserve funds; and to provide amounts required by financing agreements. These assessments are adopted by MWRA based on the rate revenue requirements set forth in the Current Expense Budget.

Costs Recovered

MWRA capitalizes certain of its asset costs in accordance with its capitalization policy. Capital expenditures are planned as set forth in the Capital Improvement Program and are recovered through assessments in accordance with MWRA financing agreements. The Current Expense Budget provides detailed information on capital and debt costs, additions to reserves, and all operations and maintenance costs to be recovered with current revenue.

Sources of Current Revenue

MWRA recovers most of its current expenses from users of the services it provides. In addition to rate revenue requirements, budgeted current revenue includes anticipated fines, fees, investment income on certain fund balances, and payments for contracted services. MWRA is committed to seeking additional sources of current revenue.

Coverage Requirements

MWRA's financing agreements include coverage requirements which provide that each year revenue less operating expenses (net revenue) must be more than the amount required for debt service payments on outstanding bonds. The primary bond coverage requirement is that net

revenue must be 120 percent of required debt service fund deposits for bonds outstanding excluding subordinated bonds. The secondary coverage requirement is that net revenue must be 110 percent of required debt service fund deposits for all bonds outstanding, including subordinated bonds. Revenue must be raised annually to meet the primary and secondary bond coverage requirements and may be used for additions to reserves or for payment of obligations to the Commonwealth. Amounts remaining after these uses are used to pay capital costs in order to reduce the need for future borrowing or to reduce current debt service costs. In addition, MWRA has a supplemental bond coverage requirement that amounts contained in its Community Obligation and Revenue Enhancement (CORE) Fund shall equal 10 percent of required debt service fund deposits for bonds outstanding, excluding subordinated bonds. Amounts required to be on deposit in the CORE Fund are recovered through assessments as necessary.

Budget Surpluses

In any year in which current revenue exceeds both current expenses on a budget basis and amounts required to meet bond coverage tests, the amount of over-recovery is deposited first to reserve funds, if any, which are below the level specified in any financing agreements, and second into MWRA's rate stabilization fund or bond redemption fund. Amounts deposited in these funds are used to offset rate requirements in subsequent years and such, to provide rate relief for our communities. With Board approval, surplus funds can also be used for targeted defeasance in future years and/or to reduce future liabilities, as part of a multi-year rate strategy. MWRA consults with the Advisory Board regarding the yearly use of these funds.

Budgeting and Assessment Objectives

MWRA follows conservative budgeting practices, and has the following objectives in developing budgets and community assessments:

1. To minimize total costs, consistent with MWRA's statutory responsibilities to provide effective, environmentally sound wholesale water delivery and wastewater collection and treatment services;
2. To minimize the cost of debt;
3. To avoid single year assessment spikes by prudent management of cost and assessment increases, and
4. To support inter-generational equity by avoiding unfair assessment burdens on either current or future ratepayers.

Allocation of Costs and Revenue to Systems

Most of MWRA's current expenses are directly attributable to either water or sewerage service costs or to investment in either the water or sewerage systems. Expenses which support both systems (indirect system costs) are allocated to the water or sewer system based on generally accepted cost allocation principles. Investment, contract, and other income offsets water and

sewerage expenses on either a direct or allocated, indirect basis. The resulting net cost of water and sewerage services is the amount to be recovered through water and sewer assessments.

Allocation of Rate Revenue Requirements to User Assessments

Users of MWRA wholesale water and sewerage services are assessed for those services according to MWRA's water and sewer assessment methodologies. Assessments for water services are computed by MWRA based on metered water use for the preceding calendar year. The total assessment is allocated based on each community's share of water delivered in the immediately preceding calendar year.

Assessments for sewer services are computed on the basis of a combination of metered wastewater flow and loads, and population.

- Operations and Maintenance (O&M) costs are allocated based on total annual metered wastewater flow, and total annual average strength, septage, and high strength flow loads.
- Capital (or debt service) costs are allocated based on a combination of metered wastewater flow and loads, and population. One-quarter of capital costs are allocated based on maximum month flow, and total annual average strength, septage, and high strength flow loads. The remaining three-quarters of capital costs are allocated based on population. Half of the population allocation is based on census population and half is based on contributing population.

Schedule and Procedure for Adoption of Assessments

During the preparation of the proposed Current Expense Budget, required water and sewer rate revenue is determined, and a preliminary calculation of the allocation of costs to user-specific assessments is made. This information is provided to MWRA customers to assist them in their own fiscal planning. As provided in the Enabling Act, the proposed Current Expense Budget and preliminary assessments undergo statutory review, including public hearings and review by MWRA's Advisory Board. Further refinements of projected expenses and revenues also occur during this period. If review and analysis of the proposed Current Expense Budget results in lower projected expenses or higher projected revenue, some or all of such savings from preliminary estimates of assessments can be included in the adopted budget as additions to the rate stabilization fund and used to reduce rate revenue requirements in subsequent years. Alternatively, some or all of such savings can be used to reduce final assessments to customers below preliminary estimates.

The Current Expense Budget and final water and sewer assessments are adopted in June for the fiscal year beginning in July. The budget adopted in June may differ from the proposed budget as a result of review and further refinement of the proposed budget, although final assessments adopted by MWRA must be sufficient to recover water and sewer rate revenue requirements specified in the adopted budget. Final water and sewer rate requirements and their allocation to users may thus change from preliminary estimates. In addition, any individual community's final assessment may be higher or lower than the preliminary estimate, both because of changes

in the factors which affect the allocation of assessments among wholesale customers, and because of differences between MWRA's proposed and final budgets as approved by the Board of Directors.

Review and Dispute Resolution Process

MWRA annually determines preliminary and final assessments for water and sewer services in February and June prior to the beginning of the new fiscal year. These assessments must satisfy the requirement that MWRA fully recover its water and sewer costs by apportioning total costs as assessments among its wholesale water and sewer customers pursuant to its water and sewer rate methodologies and to certain specified data including:

- Calendar year metered water volume and metered wastewater flow obtained from MWRA's water and wastewater metering systems;
- Federal and state community census statistics, and sewer population estimates and other information supplied on Customer Service Update forms and Municipal Discharge Permits; and
- High strength user monitoring data and estimates of community septage volumes as obtained by MWRA's Toxic Reduction and Control Department.

The review and dispute resolution process provides MWRA's wholesale customers with the opportunity to review and comment on the reasonableness of the data used to calculate preliminary water and sewer assessments. During the year, MWRA provides its customers with monthly summaries of water and wastewater flow data distributed, at a minimum, on a bimonthly basis. Because annual metered water and wastewater flows are major components for establishing water and sewer charges for each community, customers are strongly encouraged to review this data closely upon receipt and raise questions with MWRA staff concerning the data. MWRA expects that prompt customer review and comment on meter data will result in the resolution of most water and wastewater metering questions and assure the most consistency between preliminary assessments in February and final assessments announced in June. Community contributions of high strength flow and septage, and population data are made available with the release of preliminary assessments in February.

If after an initial review a community believes that specific data used to calculate assessments should be reevaluated, a community may submit a written objection to the Executive Director with a copy to the Rates Manager or their designee. The objection must be signed by the local official on record with MWRA as responsible for water or sewer services in the city, town, or district. The objection should state the community's concern with the data used to calculate community assessments, and should also include information and technical data to support the community's objection.

In order for any data adjustments to be incorporated into the allocation of final fiscal year assessments, all objections to data used to calculate preliminary assessments must be received no later than the date of the final public hearing on the proposed budget and preliminary

assessments, held pursuant to Section 10 of the MWRA Enabling Act. MWRA staff will review and evaluate the merits of all written objections. Customers are notified in writing of the results of this review prior to the release of final assessments.

Adjustments to preliminary data, if any, are not retroactive beyond the applicable calendar year for proposed assessments. Final fiscal year assessments are calculated incorporating adjustments, if any, resulting from the review and objection process, and final rate revenue requirements as adopted by the Board of Directors.

Written objection(s) may also be submitted following the adoption of final fiscal year assessments, but no later than the end of the fiscal year for which the assessments are applicable. Objections submitted in this manner must also be directed to the Executive Director with a copy to the Rates Manager or their designee.

Following MWRA staff review, adjustments to assessments resulting from the challenge of rate basis data that are submitted following the adoption of final fiscal year assessments will be applied to the subsequent year's assessments. Customers are notified in writing of the results of this review and any assessment adjustments prior to the release of the subsequent year's assessments.

Water and Sewer Assessment Payment Schedule

MWRA adopts a schedule of assessments and a schedule of payments annually. Any adjustments for prior years resulting from the review and objection process are apportioned to each of the scheduled payment amounts. No interest is paid or billed by MWRA for previous year's adjustments.

Assessments are payable to MWRA in ten equal installments due on the first day of August, September, October, November, December, February, March, April, May, and June.

Interest Charge on Delinquent Payments

For payments received after a payment due date MWRA levies an interest charge of one percent per month or 0.033 percent per day. Interest charges do not accrue until 30 days after the bills are mailed to MWRA's customer communities. Interest charges are added to subsequent regular billings.

Retail Rates

MWRA assessments are for MWRA's provision of wholesale services. Local bodies which receive wholesale services in turn provide retail services to their users at the local level.

MWRA encourages its customers to establish retail rates which:

1. Recover the full cost of providing local water and/or sewerage services, including both direct costs and an allocation or estimate of indirect costs,

2. Charge users of local water and/or sewerage services in a manner which demonstrates to customers that increased use of services results in increased user costs,
3. Comply with MWRA policies directed to conservation of water; elimination of infiltration and inflow of surface water and ground water into the sewage collection, treatment, and disposal system; and removal or pretreatment of industrial wastes, and
4. To the extent consistent with #1 and #2, provide assistance to low income users through lifeline rates.

CAPITALIZATION POLICY

It is the policy of the MWRA that capitalization of expenditures conforms to generally accepted accounting principles. Under such guidelines, MWRA has adopted the provisions of the Financial Accounting Standards Board's Statement No. 71, "Accounting for the Effects of Certain Types of Regulation," which is intended to assure that utility revenues are appropriately matched with incurred costs. Capital expenditures create assets or extend their useful lives. Assets are valued at their cost and provide benefits over an extended period of time. Sources of funds for capital expenditures include grants, proceeds of MWRA borrowing, loans, and current revenue.

Asset value created by MWRA is of two kinds. One is the value of tangible assets either created or increased through MWRA capital investments. Such assets include land, buildings, plant, equipment, and the system infrastructure for water and wastewater. The cost of such fixed asset investment includes not only purchase, rehabilitation, and construction cost, but also ancillary expenses necessary to make productive use of the asset. Ancillary costs can include, but are not limited to, costs for planning studies, professional fees, transportation charges, site preparation expenditures, and legal fees and claims directly attributable to the asset.

The second kind of asset value created by MWRA investment is the value of intangible assets. While such investment does not result in tangible MWRA assets, it does create a benefit to MWRA and its users over several years. Such assets include the cost of MWRA efforts to establish base-line leak detection information for the water systems of MWRA customers. The cost of providing water consumption-limiting devices to households is another example.

Expenditures for tangible assets are included in the Capital Improvement Program and Budget if the expected cost of the individual asset or capital project is \$100,000 or more and if the expected useful life is more than one year. Expenditures for intangible assets are capitalized if the expected cost is \$100,000 or more and if the expected benefit period is three years or more. Annually recurring costs and expenditures for maintenance of assets are not capitalized, even though their cost may exceed \$100,000. Examples of such maintenance expenditures include replacement of vehicles or computers, replacement of inoperable valves or other equipment before the anticipated useful life has been reached, and pipeline or interceptor repairs that do not add significant life to the underlying asset.

RESERVES FUNDED FROM CURRENT REVENUE

Operating Reserve

The Operating Reserve has been established to provide a source of funds to be used to pay operating expenses of the sewer or water systems should there not be sufficient funds otherwise available for that purpose. Bond agreements specify that the fund level shall not be less than one-sixth of MWRA's annual operating expenses.

Insurance Reserve

The Insurance Reserve has been established to provide funds to restore, replace, or reconstruct lost or damaged property or facilities of the water or sewer system. It provides funds reserved against risks for which MWRA does not currently maintain insurance. This self-insurance reduces the cost MWRA might otherwise incur for purchased insurance policies. MWRA periodically evaluates the level of its insurance reserve and every three years a consulting engineer or an insurance consultant recommends an appropriate insurance reserve fund requirement. The current funding level of \$14.0 million has been determined to be adequate based on a FY14 Insurance Reserve Fund review performed by an outside insurance consultant who estimated an acceptable fund level in the range of \$12 to \$16 million. The next Insurance Reserve Fund review is expected to be finalized in February 2017.

Renewal and Replacement Reserve

The Renewal and Replacement Reserve has been established to pay the costs of emergency repairs or capital improvements to the system when funds are not available in either the Construction Fund or the Operating Fund. Amounts may not be withdrawn until MWRA has specified the project to which the amount will be applied, its estimated cost, and estimated completion date. It must also certify that such expenditures are reasonably required for the continued operation of the systems, or for maintenance of revenues, or that other provisions have not been made for funding such expenditures. Every three years, MWRA receives recommendations from a consulting engineer as to the adequacy of the renewal and replacement reserve fund requirement. The Renewal and Replacement Reserve Fund requirement is presently established at \$35 million. The adequacy of the funding requirements for the Operating Reserve Fund and the Replacement Reserve Fund have been confirmed by the Consulting Engineer in its most recent triennial report dated October 2011, prepared and delivered in accordance with the General Resolution. The next Triennial Report is scheduled for October 2014.

CURRENT EXPENSE BUDGET MANAGEMENT POLICIES AND PROCEDURES

A. Budget Allocations

Budget Contingency Holdbacks

After the Board of Directors adopts the Current Expense Budget each year, the Executive Director, the Chief Operating Officer, or a division director may reserve between two percent and four percent of a division's approved budget as a budget contingency to be expended only upon approval of the Executive Director. The contingency holdback may be from any line item or cost center or combinations thereof, and any amount reserved as a budget contingency is not to be included in the monthly budget allocation process described below. The Administration, Finance, and Audit Committee will be notified of all budget contingency holdback amounts.

Monthly Allocation of the Annual Current Expense Budget

Initial monthly allocations are made for purposes of adopting and filing an operating budget in accordance with MWRA's financing agreements. Before the end of the first reporting period of the fiscal year, divisions, with the assistance of the Rates and Budget Department, allocate the approved budget, less any holdbacks, by month. The allocations set forth planned expenditures and accruals for each of the 12 months of the year to be compared to actual expenditures and accruals as reported in MWRA's monthly variance reports.

B. Budget Variance Monitoring and Analysis

At the close of each monthly accounting period, the Treasury Department prepares MWRA financial statements. The Rates and Budget Department then prepares monthly variance reports that compare planned to actual revenues and expenses.

Variance Analysis

Division directors and staff review variance reports and explain variances between planned and actual expenditures as requested by the Rates and Budget Department. Variance explanations are prepared as needed, usually at the end of each quarter of the fiscal year. At least twice each year MWRA staff prepares forecasts of year-end expenditures and revenue. Barring extraordinary circumstances, division directors are responsible for controlling spending within the overall division budget. The Rates and Budget Department reviews all variances and projections so that appropriate measures may be taken to ensure that overall spending is within the MWRA's budget.

Variance explanations are submitted to the Rates and Budget Department in accordance with the schedule developed by the Rates and Budget Department. Each month the Rates and Budget Department prepares a summary of budget variances for inclusion in the Management Indicators Report (Yellow Notebook). The Rates and Budget Department also prepares a monthly staff summary (except for July and August) to the Board of Directors describing major budget

variances and a quarterly budget variance report for inclusion in the Board of Directors Report on Key Indicators of MWRA Performance (Orange Notebook). At least twice a year, the Rates and Budget Department prepares a staff summary to the Board of Directors on year-end projections of revenue and expenses.

C. Budget Amendments

An amendment to an MWRA Current Expense Budget is defined as follows:

A proposed change in an adopted budget or a proposed budget transmitted to the MWRA Advisory Board in accordance with Section 8(b) of Chapter 372 of the Acts of 1984 which meets any of the following criteria:

1. Any increase in total current expenses.
2. An increase of five percent or more in total division expenses.
3. An increase in any expense line item (subsidiary account) of 15 percent or more if that line item is at least 2.5 percent of total current expenses.
4. An addition or deletion of a specific new program or initiative, the cost of which is greater than one percent of total current expenses, unless the addition or deletion has been specifically recommended by the Advisory Board.

The Executive Director, with the concurrence of the Chairman of the Board of Directors and the Chairman of the Administration, Finance, & Audit Committee of the Board of Directors, submits proposed amendments to the Advisory Board for comment and recommendation. At the end of the Advisory Board 30-day review period, the Board of Directors may take action on the amendment.

CAPITAL BUDGET MANAGEMENT POLICIES AND PROCEDURES

General Guidelines

The Authority shall periodically adopt and revise capital facility programs for the Waterworks and Sewer Systems and capital budgets based on these programs. The Authority shall consult in the preparation of its capital facility programs for the Sewer and Waterworks Systems with the Authority's Advisory Board and the Executive Office of Environmental Affairs, and may consult with other agencies of federal, state and local government concerned with the programs of the Authority. Proposed capital facility programs and capital expenditure budgets for said systems shall be submitted to the Advisory Board for such consultation no less than sixty days prior to adoption or revision by the Authority. The Authority shall prepare a written response to reports submitted to it by the Advisory Board, which response shall state the basis for any substantial divergence between the actions of the Authority and the recommendations contained in such reports of the Advisory Board. The Authority shall capitalize expenditures in accordance with generally accepted accounting principles. Capital expenditures will be planned in accordance with Authority financing agreements and policies for amortization of capital costs.

Capital Budget Contingency

A contingency for each fiscal year is incorporated into the Capital Improvement Program for the purpose of providing for unanticipated or unpredictable expenditures under the CIP spending cap.

Capital Budget Monitoring and Reporting

The Authority shall continually monitor the progress of capital projects for purposes of managerial control and decision-making and for financial planning and management. Two capital budget variance analysis reports will be provided to the Board of Directors, one for the first six months of a year and one at year-end. The reports will include planned project schedules and budgets compared to actual performance. The reports will highlight any major changes, either in scope or budget, of any project. Based on these reports, staff may recommend to the Board of Directors revisions, if appropriate, to the annual and five-year caps based upon said changes. In addition, capital budget progress reports shall be provided to the Board of Directors on a regular basis, both as project specific updates and in Quarterly Orange Notebook reports that shall include discussions of project progress compared to schedules. Monthly Financial Summary reports shall include discussions of capital expenditures compared to budget.

Capital Budget Spending Cap

Beginning in June 2003, the Board of Directors established a five-year Capital Budget Spending cap and annual caps for each year within the cap period. Spending for any year in the cap period may vary within plus or minus 20% of the annual cap, as long as total spending for the five-year period does not exceed the five-year cap. Before the end of each five-year cap period, the Board will adopt a cap for the next five-year period and annual caps for each year in the period. The Board established the third five-year cap for the FY14-18 period at its June 2013 meeting.

Expenditures in Excess of the Spending Cap

In the event of unanticipated spending requirements, the Executive Director may recommend to the Board of Directors that annual expenditures exceed an annual cap by more than 20% or that five-year expenditures exceed the current five-year CIP spending cap. In such an event, a proposed plan to adjust the five-year cap or any of the annual caps will be presented to the Board. Any such proposed plan will be submitted to the MWRA Advisory Board for review and comment for a period of thirty days. At the end of the thirty-day period, the Board of Directors may take action on the proposed plan.

APPENDIX D

MWRA Planning Estimates FY2017 to FY2026

COMBINED UTILITIES	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026
EXPENSES										
Direct Expenses	\$226,532	\$232,572	\$240,003	\$246,660	\$253,433	\$260,648	\$268,301	\$275,466	\$283,265	\$291,286
Indirect Expenses	37,962	40,773	42,204	43,272	43,667	46,051	47,362	47,703	50,544	46,418
Capital Financing (before offsets)	456,004	474,932	494,654	524,046	550,964	588,519	554,509	542,513	535,169	576,137
Sub-Total Expenses	\$720,498	\$748,277	\$776,861	\$813,978	\$848,065	\$895,218	\$870,171	\$865,682	\$868,978	\$913,841
Debt Service Assistance	(874)	0	0	0	0	0	0	0	0	0
Bond Redemption Savings	0	0	0	0	0	(15,783)	0	0	0	(10,325)
Variable Rate Savings	0	0	0	0	0	0	0	0	0	0
Total Expenses	\$719,624	\$748,277	\$776,861	\$813,978	\$848,065	\$879,435	\$870,171	\$865,682	\$868,978	\$903,516
REVENUE & INCOME										
Non-Member and Other Revenue	\$15,272	\$15,539	\$15,820	\$16,000	\$16,295	\$16,611	\$16,474	\$16,734	\$17,019	\$17,357
Interest Income	9,473	11,546	12,632	14,448	15,564	15,792	16,254	16,881	17,581	18,013
Rate Stabilization	0	0	0	6,873	10,338	10,915	0	0	0	8,386
Total Other Revenue	\$24,745	\$27,085	\$28,452	\$37,322	\$42,197	\$43,317	\$32,728	\$33,615	\$34,599	\$43,756
Total Rate Revenue	\$694,879	\$721,192	\$748,409	\$776,656	\$805,868	\$836,118	\$837,443	\$832,068	\$834,379	\$859,760
Rate Revenue Increase	3.3%	3.8%	3.8%	3.8%	3.8%	3.8%	0.2%	-0.6%	0.3%	3.0%
Estimated Annual Household Charge **										
Based on water use of 61k gpy (weighted)	\$1,096	\$1,145	\$1,196	\$1,250	\$1,307	\$1,366	\$1,410	\$1,453	\$1,503	\$1,568
Based on water use of 90k gpy (weighted)	\$1,617	\$1,689	\$1,765	\$1,845	\$1,928	\$2,015	\$2,081	\$2,144	\$2,217	\$2,314
WASTEWATER UTILITY										
EXPENSES										
Direct Expenses	\$150,525	\$154,376	\$159,535	\$163,900	\$168,309	\$173,086	\$178,268	\$182,907	\$188,099	\$193,439
Indirect Expenses	9,142	10,393	10,867	11,052	10,527	11,961	12,298	11,631	13,427	10,187
Capital Financing (before offsets)	312,752	325,041	337,135	354,842	366,360	384,025	362,059	340,215	322,297	331,225
Sub-Total Wastewater Expenses	\$472,419	\$489,810	\$507,537	\$529,794	\$545,195	\$569,072	\$552,625	\$534,753	\$523,824	\$534,852
Debt Service Assistance	(807)	0	0	0	0	0	0	0	0	0
Bond Redemption Savings	0	0	0	0	0	(5,783)	0	0	0	0
Variable Rate Savings	0	0	0	0	0	0	0	0	0	0
Total Wastewater Expenses	\$471,611	\$489,810	\$507,537	\$529,794	\$545,195	\$563,289	\$552,625	\$534,753	\$523,824	\$534,852
REVENUE & INCOME										
Non-Member and Other Revenue	\$5,678	\$5,786	\$5,899	\$6,016	\$6,139	\$6,266	\$6,371	\$6,475	\$6,591	\$6,733
Interest Income	5,318	6,293	6,935	7,939	8,590	8,791	9,020	9,184	9,340	9,552
Rate Stabilization	0	0	0	3,923	0	0	0	0	0	0
Prior Year Utility Surplus/Deficit Transfer	0	0	0	0	0	0	0	0	0	0
Total Other Revenue	\$10,996	\$12,080	\$12,834	\$17,879	\$14,729	\$15,057	\$15,392	\$15,659	\$15,931	\$16,285
Wastewater Rate Revenue	\$460,616	\$477,731	\$494,703	\$511,916	\$530,466	\$548,232	\$537,233	\$519,094	\$507,892	\$518,567
Rate Revenue Increase	3.3%	3.7%	3.6%	3.5%	3.6%	3.3%	-2.0%	-3.4%	-2.2%	2.1%
Estimated Annual Household Charge **										
Based on water use of 61k gpy (weighted)	\$648	\$677	\$707	\$738	\$771	\$804	\$823	\$838	\$859	\$894
Based on water use of 90k gpy (weighted)	\$956	\$999	\$1,043	\$1,089	\$1,137	\$1,187	\$1,214	\$1,237	\$1,268	\$1,319
WATER UTILITY										
EXPENSES										
Direct Expenses	\$76,007	\$78,196	\$80,468	\$82,760	\$85,124	\$87,561	\$90,033	\$92,559	\$95,166	\$97,846
Indirect Expenses	28,820	30,380	31,337	32,220	33,141	34,090	35,064	36,072	37,116	36,231
Capital Financing (before offsets)	143,252	149,891	157,519	169,204	184,605	204,494	192,450	202,298	212,872	244,912
Sub-Total Water Expenses	\$248,079	\$258,467	\$269,324	\$284,184	\$302,870	\$326,146	\$317,546	\$330,929	\$345,155	\$378,989
Debt Service Assistance	(67)	0	0	0	0	0	0	0	0	0
Bond Redemption Savings	0	0	0	0	0	(10,000)	0	0	0	(10,325)
Variable Rate Savings	0	0	0	0	0	0	0	0	0	0
Total Water Expenses	\$248,013	\$258,467	\$269,324	\$284,184	\$302,870	\$316,146	\$317,546	\$330,929	\$345,155	\$368,664
REVENUE & INCOME										
Non-Member and Other Revenue	\$9,594	\$9,753	\$9,921	\$9,984	\$10,156	\$10,345	\$10,103	\$10,258	\$10,428	\$10,624
Interest Income	4,156	5,253	5,697	6,509	6,974	7,001	7,233	7,697	8,240	8,461
Rate Stabilization	0	0	0	2,950	10,338	10,915	0	0	0	8,386
Prior Year Utility Surplus/Deficit Transfer	0	0	0	0	0	0	0	0	0	0
Total Other Revenue	\$13,750	\$15,006	\$15,619	\$19,443	\$27,468	\$28,260	\$17,336	\$17,955	\$18,668	\$27,471
Water Rate Revenue	\$234,263	\$243,461	\$253,705	\$264,741	\$275,401	\$287,886	\$300,210	\$312,974	\$326,487	\$341,193
Rate Revenue Increase	3.5%	3.9%	4.2%	4.3%	4.0%	4.5%	4.3%	4.3%	4.3%	4.5%
Estimated Annual Household Charge **										
Based on water use of 61k gpy (weighted)	\$448	\$468	\$490	\$513	\$536	\$561	\$588	\$615	\$644	\$674
Based on water use of 90k gpy (weighted)	\$661	\$691	\$722	\$756	\$791	\$828	\$867	\$907	\$949	\$995

** Annual household charges are estimated for communities that receive full water and wastewater services from MWRA weighted by the number of households in each of these core communities. Based on community responses to the 2015 MWRA Advisory Board's Annual Water and Sewer Retail Rate Survey.

APPENDIX E

GLOSSARY OF FINANCIAL AND OPERATING TERMS

8M permit: Permission granted by MWRA to persons who wish to construct property improvements on land either adjoining or overlapping MWRA property interests. Permission may be conditioned on various operational and/or engineering concerns.

Accrued Costs: Adjustments to paid expenditures to account for materials or services received but for which payment has not been made.

Activated Sludge: The sludge that results when primary effluent is mixed with bacteria-laden sludge and then agitated and aerated to promote biological treatment.

Advanced Waste Treatment: Wastewater treatment beyond the secondary or biological stage that includes the removal of nutrients such as phosphorus and nitrogen and the removal of a higher percentage of suspended solids and organic matter than primary treatment.

Advisory Board: The agency that represents the interests of MWRA's 61 user communities to the Board of Directors in an advisory capacity in accordance with the provisions of MWRA's Enabling Act. The Advisory Board elects three members of the Board of Directors, reviews and comments on MWRA's CIP and CEB, and approves the addition of new communities to the wastewater and water systems.

Aerobic: In the presence of free oxygen.

Anaerobic: Life or processes such as bacteria that digest sludge that require, or are not destroyed by, the absence of free oxygen.

AOOC: Assimilable Organic Carbon - One measure of the "food" available to bacteria within a water system. More complex carbon compounds can become assimilable when oxidized by strong disinfectants.

ARRA: American Recovery and Reinvestment Act of 2009 – principal forgiveness loans distributed based on the Department of Environmental Protection's Intended Use Plan.

Ash: The inert material remaining after the combustion of wastewater sludge. Ash is either wet or dry depending on combustion system design.

Bacteria: One-celled microscopic organisms commonly found in the environment. Bacteria can be harmful, such as pathogens, or helpful and perform a variety of biological treatment processes.

BDOC: Biologically Degradable Organic Carbon - Another, more precise, measure of the "food" available to bacteria within a water system.

BGD: Billion gallons per day.

Biofilm: Growth of various bacteria within a water distribution system on the pipe walls. Biofilm growth can contribute to iron corrosion, colored water, poor taste, excessive chlorine demand, and complications with coliform testing.

Blow-off valves: Valves operated during pipeline repair to de-water (drain) a portion of a pipeline.

BOD: Biochemical Oxygen Demand - An indicator of the amount of biodegradable contaminants in wastewater.

Board of Directors: The 11-member governing board of MWRA.

Bond Resolution: A document adopted by the Board of Directors that governs MWRA's issuance of revenue bonds and sets forth its obligations to bondholders.

Boston Harbor Project: An extensive plan of activities which MWRA developed and implemented to construct new wastewater treatment facilities in response to a federal court order to comply with the provisions of the U.S. Clean Water Act.

Business Systems Plan (BSP): The strategic planning framework for MWRA's management information systems. The BSP is updated annually to reflect ongoing business requirements, new opportunities identified by ongoing MWRA strategic planning efforts, technology changes, and user requests.

BWSC: Boston Water and Sewer Commission - The agency responsible for providing water and sewer services to the City of Boston, MWRA's largest customer.

BWTF: William A. Brutsch Water Treatment Facility – Water treatment plant for the Chicopee Valley Aqueduct communities of Chicopee, South Hadley Fire District #1, and Wilbraham. The facility has a capacity of 24 mgd, and disinfects the water using a combination of UV light and chlorine.

CADD: Computer aided drafting and design.

Capital Improvement Program (CIP): A plan which identifies and estimates the nature, schedule, cost, and financing of long-term assets that MWRA intends to build or acquire during a specific period.

Capital Investment: Development of a facility or other asset that adds to the long-term value of an organization.

Carroll Water Treatment Plant (CWTP): Water treatment facility for waters from Quabbin and Wachusett Reservoirs with capacity of 405 mgd using ozonation as a primary disinfectant and UV as a secondary disinfectant beginning in February 2014.

CDF: Cosgrove Disinfection Facility

Cathodic Protection: A form of corrosion protection that is particularly effective against galvanic corrosion. Galvanic corrosion occurs when pipe metal is in the presence of other metals while immersed in water. The interaction of these elements causes an electric current to flow away from the pipe, taking electrons with it and pitting the pipe as a result. Cathodic protection reverses the current, thereby stopping the corrosion.

Centrifuge: A machine that uses centrifugal force to separate substances of different densities and remove moisture. MWRA uses centrifuges at the Deer Island Wastewater Treatment Plant to de-water sludge.

CFM: Cubic Feet per Minute - A measure of the quantity of a material flowing through a pipe.

Chloramination: The process of adding chloramine to drinking water. Chloramine, a form of chlorine and ammonia, is used as a residual disinfectant because it lasts longer in the water distribution system than primary disinfectants.

Chloramine: A long lasting residual disinfectant created by combining measured amounts of chlorine and ammonia. Chloramine forms fewer disinfection by-products than chlorine.

Chlorination: The process of adding chlorine to drinking water to inactivate pathogens.

Chlorine: A relatively strong primary disinfectant, effective against bacteria, *giardia*, and viruses, but not *cryptosporidium*. Concerns exist about the health effects of its by-products, some of which are or will be regulated.

Clarifiers: Settling tanks or basins in which wastewater is held for a period of time, during which heavier solids settle to the bottom and lighter materials float to the surface.

Clean Water Act: A law passed by Congress in 1972, and subsequently amended, which sets national standards for pollution reduction, permits discharges from wastewater treatment plants, and promotes achievement of the national goal that all surface waters be "fishable and swimmable."

Cleaning and Lining: Cleaning and cement lining of unlined cast iron water mains to improve hydraulic capacity and extend useful life.

CMMS (Computerized Maintenance Management System): *Maximo* is the computerized maintenance management system which is an essential component of successful asset management. This system is an important tool used in refining the long-term maintenance strategy to ensure proper maintenance and replacement of plant assets.

Co-Digestion Process: Introduction of non-wastewater derived organic waste material into the wastewater anaerobic digestion process. Co-digestion could potentially increase digester gas production which would be utilized for heating and electricity generation at Deer Island.

Coliform bacteria: A group of lactose fermenting bacteria, which while not of direct health concern, are used as a first line indicator of potential problems. See fecal coliform and *E.coli*.

Combined Sewer and Combined Sewer Overflow: While modern systems transport rainwater and sewage from homes and businesses through separate pipes, some older systems like Boston's have "combined" sewers that carry both flows together. During normal conditions flows are delivered to treatment plants. During very heavy rains, these systems become overloaded. Built-in overflows (called combined sewer overflows or "CSOs") must then act as relief points by releasing excess flows into the nearest body of water. This prevents sewage backups into homes and onto area streets, but the discharges can impact water quality.

Comminutor - A machine or process that pulverizes and reduces solids to minute particles.

Commonwealth Debt Service Assistance (DSA): Funds appropriated by the Commonwealth to offset MWRA capital financing expenses.

Community Obligation and Revenue Enhancement (CORE) Fund: A fund established by MWRA's bond resolution that is used to provide insurance against delays by communities in paying charges due to MWRA.

Composting: The process of converting wastewater treatment residuals to a soil-like humus material often used in the horticultural industry. The process involves the aerobic breakdown of the residuals and the addition of sawdust or wood chips.

Corrosion Control: Adjustments to the chemistry of treated water to reduce its ability to dissolve lead, copper, other metals, or form hydrogen sulfide. Corrosion control can include adjustments to pH and alkalinity, as well as the addition of corrosion inhibitors such as phosphates or oxidizers.

Coverage Requirement: Requirement of MWRA's bond resolution which provides that each year, revenue less operating expenses (net revenue) must be more than the amount required for debt service payments on outstanding bonds.

CP (Construction Package): Major construction projects such as the Carroll Water Treatment Plant or the North Dorchester Bay CSO project will group areas of work into individual construction contracts.

Cross-Connection: A point at which potable water piping is connected to a non-potable water source creating an opportunity for the introduction of pollutants into the potable water.

Cryogenic oxygen plant: MWRA operates a cryogenic oxygen-based facility as part of its secondary wastewater treatment program at Deer Island.

Cryptosporidium: A protozoan parasite that can cause severe gastrointestinal disease in healthy individuals, and may be fatal to people with compromised immune systems. Cryptosporidia exist in the environment as hard walled oocysts that are very resistant to chlorination, but can be inactivated by disinfection with ozone or ultraviolet light.

CSO: Combined Sewer Overflow – An overflow point and the discharged flow from a combined sewer system intended to provide hydraulic relief to avoid system flooding and backups during large wet weather events. During large rainstorms, systems can become overloaded, with the excess discharged directly into surface waters. The discharged flow and the discharge location are called CSOs. In the metropolitan Boston area there are approximately 46 active, permitted CSOs that currently discharge into rivers or Boston Harbor.

CSO Facilities: MWRA has six facilities that intercept the flow from CSO pipes. Four of these facilities provide treatment and two provide storage prior to discharge. The CSO facilities have some capacity to store flow and pump it to the Deer Island plant after rainstorms end.

CT: Concentration x Contact Time - A measure of disinfection effectiveness established under the Surface Water Treatment Rule. CT is the product of the concentration of disinfectant [C] and the time it has been in contact with the water [T]. Required CT varies by type of disinfectant, organism, temperature, and pH.

CTG (Combustion Turbine Generator): CTGs are used to generate electricity during planned cable outages, wet weather operations and for participation in price response events.

Current Expense Budget: A financial plan that estimates the revenues and expenses associated with MWRA's operations for a fiscal year.

C-Value: The carrying capacity of a water main for a specified length and pressure drop that is determined by its diameter and resistance to flow. The friction coefficient "C" of the main is often used as a measure of flow resistance. C-values for new pipe are about 120 for water mains that are 6 to 16-inches in diameter, and 130 and 140 for larger diameter mains.

DAF: Dissolved Air Flotation - A process of adding super saturated air into water to cause coagulated solids to rise to the top to be skimmed off. DAF replaces conventional gravity sedimentation (clarification) and is particularly cost-effective for low turbidity waters subject to periodic algae blooms.

DBP: Disinfection By-products - Complex compounds formed by the use of oxidizing agents such as chlorine or ozone in waters containing organic matter.

D/DBP Stage 1: Disinfectants/Disinfection By-products, Stage 1 Rule - Promulgated 11/1998, and effective 1/2002, this rule set DBP limits at 80 parts per billion for Trihalomethanes and 60 parts per billion for Haloacetic Acids, averaging all samples over four quarters.

D/DBP Stage 2: Disinfectants/Disinfection By-products Stage 2 Rule - The rule further regulates the amount of DBPs allowed in water. The 80/60 values set in Stage 1 will now apply to each individual sample location in a "Locational Running Annual Average".

Debt Service: In a given fiscal year, the amount of money necessary to pay interest and principal on outstanding notes and revenue bonds.

DEP: Department of Environmental Protection - The Massachusetts agency that regulates water pollution control, water supplies, and waterways and dispenses federal and state grant funds to support these activities.

Department: A sub-unit of an MWRA division.

Department of Conservation and Recreation (DCR): Created in 2003 through the merger of the Metropolitan District Commission and the Department of Environmental Management, DCR manages the Commonwealth's diverse parks system and protects and enhances natural resources and outdoor recreational opportunities throughout Massachusetts.

De-watering: The process of removing water from wastewater treatment residuals. De-watered sludge has the appearance of mud or wet soil material.

Diffusers: A system of shafts, rising from the end of MWRA's effluent outfall tunnel to the seabed, which disperses treated wastewater over a large area. Technically, the diffusers are the "sprinkler heads" mounted on top of the riser shafts that lead from the outfall tunnel and disperse wastewater into Massachusetts Bay.

Digesters: Tanks for the storage and anaerobic or aerobic decomposition of organic matter present in sludge.

Direct Program Expenses: Costs directly associated with providing services or performing activities.

Disinfection, Primary: The inactivation (killing) of pathogenic organisms in a water system by the use of chemical or other disinfection agents.

Disinfection, Residual: The presence of a measurable residual of disinfectant within a water distribution system to help control bacterial re-growth and guard against contamination.

Dissolved Oxygen (DO): A measure of the amount of oxygen in a given amount of water. Adequate levels of DO are needed to support aquatic life. Low dissolved oxygen concentrations can result from inadequate wastewater treatment.

Division: A major organizational unit within MWRA, encompassing the activities and resources for providing a major service or function.

DLS (Department of Laboratory Services): Laboratory Services is a full service analytical testing and consulting group within the MWRA that primarily serves client groups primarily within the Operations Division. The analytical services that Laboratory Services provides include wet chemistry, metals, organics, and microbiology testing. Related services include field sampling, technical consultation, and contract laboratory management.

DMR (Discharge Monitoring Report): Monthly reports that are submitted to federal and state regulators. MWRA monitors the effluent (treated sewage) that is discharged into Massachusetts Bay, to ensure that it meets the standards set out in the NPDES permit. Analytical support to the effluent monitoring program is provided by the Department of Laboratory Services.

E.coli: A normal inhabitant of the digestive tract of mammals. The presence of *E.coli* indicates probable contamination by fecal matter.

Effluent: Treated wastewater discharged from a treatment plant.

EIR: Environmental Impact Report – A document prepared in adherence with the Massachusetts Environmental Policy Act (MEPA) to review the environmental impact of projects and ensure opportunities for public review and comment.

EIS: Environmental Impact Statement – A document prepared in adherence with the National Environmental Policy Act to review the environmental impact of projects and ensure opportunities for public review and comment.

Enabling Act: Legislation (Chapter 372 of the Acts of 1984) that established MWRA and define its purpose and authority as of January 1, 1985.

ENF: Environmental Notification Form - The first step in the MEPA process.

EOEEA: Executive Office of Energy and Environmental Affairs - The Massachusetts cabinet office that oversees state environmental agencies.

EOC: Emergency Operations Center

EOEA: Executive Office of Environmental Affairs - The Massachusetts cabinet office that oversees state environmental agencies.

EPA: Environmental Protection Agency - The federal government agency responsible for environmental enforcement and investigation.

ESWTR: Enhanced Surface Water Treatment Rule - A federal rule that is promulgated in three stages:

1) Interim Enhanced Surface Water Treatment Rule (IESWTR): The IESWTR was promulgated in 1998 and tightened the requirements for the operation of water filtration plants in large systems to take a first step toward controlling *cryptosporidium* in source waters. IESWTR also added *cryptosporidium* to the list of issues considered within watershed protection plans for unfiltered systems.

2) LT1ESWTR primarily extends the IESWTR to smaller systems

3) LT2ESWTR: further tightens the standards for the operation of filtration plants and adds requirements for 99% inactivation of *cryptosporidium* and the use of two primary disinfectants for unfiltered systems. The concept of proportional treatment, with less treatment required for cleaner sources, was implemented as part of the rule.

Enterococcus: A pathogen indicator, similar to fecal coliform, that is used in the Massachusetts Water Quality Standards for marine waters, consistent with the Federal Clean Water Act requirements, which indicates potential contamination from human or animal waste.

Eutrophication: Nutrient enrichment of a lake or other water body typically characterized by increased growth of planktonic algae and rooted plants. Eutrophication can be accelerated by wastewater discharges and polluted runoff.

Expenditures: Payments for goods and services received.

Expenses: Costs associated with the operating activities of a period, including expenditures and accrued costs.

Facility Information System (FIS): The management information system at the Deer Island Treatment Plant.

Fecal coliform bacteria: A group of bacteria used as a primary indicator organism for potential contamination from human or animal waste. Also called thermo-tolerant bacteria. Specific organisms in the group may or may not be of health concern (see *E.coli*).

Filtration: A water treatment process involving the removal of suspended particulate matter by passing the water through a porous medium such as sand or carbon.

Fiscal Year: The 12-month financial period used by MWRA that begins July 1 and ends June 30 of the following calendar year. MWRA's fiscal year is numbered according to the calendar year in which it ends.

Flash coat: A light coat of shotcrete used to cover minor blemishes on a concrete surface.

FOD (Field Operations Department): Department within the Operations Division created to provide high quality, uninterrupted water delivery and wastewater collection services to MWRA communities. The department is responsible for the treatment, transmission, and distribution of water from the Quabbin and Wachusett reservoirs to community water systems. It also manages the collection, transport, and screening of wastewater flow from MWRA communities to the Deer Island Treatment Plant.

Force Main: A pressure pipe joining the pump discharge at a water or wastewater pumping station with a point of gravity flow.

FRSA (Fore River Staging Area): The site of the Sludge Pelletization Plant.

Giardia: A protozoan parasite that can cause severe gastrointestinal disease, although there is medical treatment available. *Giardia* exist in the environment as hard-walled cysts, and are moderately resistant to chlorine disinfection.

Geographic Information System (GIS) -- A geographic information system is a system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data.

Green Energy: Energy that comes from natural sources such as sunlight, wind, rain, tides, plants, algae and geothermal heat. These energy resources are renewable, meaning they're naturally replenished.

Goal: A statement in general terms of a desired condition, state of affairs, or situation. Goals, which are long-term in nature and not usually directly measurable, provide general direction for the activities of operating units.

Global Positioning System (GPS): Also known as an Automatic Vehicle Location system (GPS/AVL), this tool provides real-time transmission alerts utilizing a cell phone/satellite communication system and a web-based mapping system to track vehicles and operator-driven mobile equipment in MWRA's service area. The system allows MWRA to respond more quickly to emergencies, enhance driver and vehicle safety, reduce fuel costs, track mileage electronically, monitor unauthorized vehicle usage, and improve efficiency.

Graphitization: A corrosion mechanism that alters the molecular structure of the carbon/iron matrix of cast iron pipe. During the process, iron atoms are forced away from the metal leaving behind an unstable carbon matrix. The result is a weakened pipe, easily susceptible to ruptures. High frequency in the number of breaks causes leakage to be a major problem of graphitized pipe.

Grit: Sand-like materials that quickly settle out of wastewater.

Groundwater: A body of water beneath the surface of the ground. Groundwater is made up primarily of water that has seeped down from the surface.

HAA: Haloacetic Acids - A class of disinfection by-products related to chlorine disinfection. HAAs are regulated under D/DBP Stage 1 and 2 Rules at 60 ppb.

Harbor Electric Energy Company (HEEC): A subsidiary of NStar which installed a cross harbor power cable and built a sub-station to provide power for construction and operation of the new Deer Island Treatment Plant.

Head House: A structure containing the control gates to a conduit such as a sewer pipeline.

Headworks: A preliminary treatment structure or device, usually including a screening and de-gritting operation, that removes large or heavy materials such as logs and sand from wastewater prior to primary treatment.

Heavy Metals: Metals such as lead, silver, gold, mercury, bismuth, and copper that can be precipitated by hydrogen sulfide in an acid solution.

HOM (Harbor and Outfall Monitoring): A comprehensive program to provide environmental data that helps to predict and measure the effect of Deer Island outfall discharge on the marine ecosystem.

Incentives and Other Charges: A fee system designed to help recover permitting, inspecting, and monitoring costs incurred by MWRA's TRAC Program and provide incentives to permitted users to reduce discharges.

Indirect Expenses: Costs not directly associated with providing services or performing activities.

Infiltration/Inflow (I/I): The problem of clean water flows entering sewers resulting in diminished pipe capacity for sanitary flows and in costly pumping and treatment of unnecessarily large wastewater volumes. Infiltration is groundwater that leaks into the sewerage system through pipe joints and defects. Inflow, primarily a wet-weather phenomenon, refers to water that enters sewers from improperly connected catch basins, sump pumps, land and basement drains, and defective manholes. Inflow also enters through improperly closed or defective tidegates during high tides.

Influent: The flow of water that enters the wastewater treatment process.

Insurance Reserve: A fund established to adequately reserve against risks for which MWRA does not currently maintain insurance.

Interceptors: The large pipes that convey wastewater from collection systems to treatment plants.

Investment Income: Income derived by investing certain operating and reserve fund balances in interest-yielding securities in accordance with the provisions of MWRA's bond resolution.

ISO - NE (Independent System Operator of New England): Non-profit wholesale operator of the regional grid system. The MWRA receives payment from ISO-NE when Deer Island, Carroll Water Treatment Plant, and the four Remote Headworks remove themselves from the grid. All six facilities participate in load response programs offered by ISO-NE which pays larger commercial and industrial electricity consumers to "shed load" during grid peaks. There are several programs available such as price, demand response and load response. MWRA constantly evaluates the options and participates in the most advantageous program.

Labor Costs: Direct costs of employing permanent and temporary personnel, including wages, salaries, overtime pay, fringe benefits, and workers' compensation.

Land Application: The use of wastewater treatment residuals on land for agricultural benefits.

Landfilling: The disposal of residuals by burial. Modern landfills have double liners, leachate collection systems, and other design features to protect against groundwater contamination.

LCR: Lead and Copper Rule – A federal rule that set an action level for lead and copper at “worst case” consumer taps. Optimized corrosion control, notification, education, and lead service replacements are all components of compliance plans.

Leachate: Water that drains from a landfill after having been in contact with, and potentially contaminated by, buried residuals. Modern landfills are designed to collect leachate for subsequent treatment.

Limnology: The scientific study of physical, chemical, meteorological, and biological conditions in fresh waters.

LIMS: Laboratory Information and Management System – An automated database system used to transfer information between MWRA’s Central Laboratory to its client groups and to process information obtained by the Central Laboratory to monitor substances that enter and leave the MWRA wastewater system. Use of LIMS removes the potential for human error in the sampling process by bar coding samples, eliminating the need to transcribe sample data, producing pre-printed project-specific sample check-off forms for field crews, and automating testing through pre-set test codes and project-specific parameters.

LOX (Liquid Oxygen): Liquid oxygen is used together with electrical energy to generate ozone at the Carroll Water Treatment Plant.

Mapping Protocols: Sets of specifications defining the content and format of data to be collected.

MCL: Maximum Contaminant Level - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available control technology.

MCLG: Maximum Contaminant Level Goal - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Massachusetts Environmental Policy Act (MEPA) Unit: A unit of the Commonwealth’s Executive Office of Environmental Affairs responsible for implementation of the state environmental review process.

Methane: A colorless, nonpoisonous, flammable gas produced as a by-product of anaerobic sludge processing. At Deer Island, MWRA uses methane as fuel to provide heat and hot water and to generate electricity.

MGD: Million gallons per day.

MIS: Management Information Systems

Mission: A description of the fundamental purposes and major activities of an operating unit or program.

Mitigation: Financial remuneration or non-financial considerations that MWRA provides to communities to alleviate the negative effects of major construction projects.

Molybdenum (Mo): A metallic element that resembles chromium and tungsten in many properties, and is used in strengthening and hardening steel. Mo is a trace element in plant and animal metabolism. The concentration of molybdenum in sludge products is strictly regulated.

NACWA (Nation Association of Clean Water Agencies): NACWA represents the interests of publicly owned wastewater treatment plants. NACWA is involved in all areas of water quality protection including the development of environmental legislation and assisting federal regulatory agencies in the implementation of environmental programs.

NEFCo: New England Fertilizer Company - The contractor responsible for the operation of processing sludge into fertilizer pellets at MWRA's residuals processing plant located in Quincy. NEFCo is also responsible for marketing and distributing the pellets and disposing of any product that is not marketable.

National Pollutant Discharge Elimination System (NPDES) Permit: A permit issued by EPA in conjunction with DEP that governs wastewater discharges into surface waters.

NHS (Northern High Service): Project that involves a series of water system pipeline improvements in the MWRA's Northern High Service Area.

Nitrification: An aerobic process in which bacteria changes the ammonia and organic nitrogen in wastewater into oxidized nitrogen (usually nitrate). Second-stage BOD is sometimes referred to as the nitrification stage (first-stage BOD is called the carbonaceous stage). Also, a similar process in the water distribution system, where ammonia from chloramine can be used by nitrifying bacteria, resulting in a reduced chlorine residual, and the potential for additional bacteria growth.

OCC: Metropolitan Operations Control Center, located at MWRA's Chelsea Facility.

OEP (Office of Emergency Preparedness): The Office of Emergency Preparedness has oversight over security, exercises, emergency operations, planning, the Emergency Services Unit and critical infrastructure protection.

OMS (Operations Management Systems): OMS correlates PICS data with laboratory analysis to track and analyze DITP's process performance with regard to the plant's discharge permit from EPA and DEP and with respect to cost effective operation.

Operating Reserve: A fund established to adequately reserve for operating contingencies, required by MWRA's bond resolution to be not less than one-sixth of its annual operating expenses.

Organic Matter: Material containing carbon, the cornerstone of plant and animal life. It originates from domestic and industrial sources.

Other User Charges: Revenue received per agreements MWRA has for provision of water, sewer, and other services to entities other than communities which are charged assessments.

Outfall: The pipe or structure where effluent is discharged into receiving waters.

Ozonation: The application of ozone to water, wastewater, or air, generally for the purposes of disinfection or odor control. The Carroll Water Treatment Plant (CWTP) employs the ozonation process to inactivate pathogens, including *cryptosporidium*, with lower levels of DBPs.

Ozone: A strong disinfectant made from oxygen and electrical energy. Ozone is effective against *cryptosporidium*.

Pathogens: Harmful organisms, often called germs that can cause disease. Waterborne pathogens (or the diseases they cause) include *giardia*, *cryptosporidium*, cholera, typhoid, *E.coli*, Hepatitis A, *legionella*, and MAC.

Payments in Lieu of Taxes (PILOT): Amounts which MWRA pays each fiscal year to cities and towns for land owned by the Commonwealth in the Quabbin, Ware River, Wachusett, and Sudbury watersheds. Consistent with the provisions of MWRA's Enabling Act, these payments are based on the past commitments of the Commonwealth of Massachusetts.

Penalty Revenue: Revenue derived from penalties assessed by MWRA to violators of its sewer use regulations.

Performance Measure: An indicator of the work and/or service provided, defined by output, work or service quality, efficiency, effectiveness, or productivity.

Performance Objective: A statement of proposed accomplishments or attainments that is short-term in nature and measurable.

PICS (Process Instrumentation and Control System): PICS provides real-time operations data from systems throughout Deer Island (including system status, flow, etc.).

Plume: The rising discharge of treated wastewater effluent from a treatment plant outfall pipe.

Preliminary Treatment: The process of removing large solid objects, sticks, gravel, and grit from wastewater.

Pretreatment: The reduction or elimination of pollutant properties in wastewater prior to discharge into a sewer system.

Primacy: Primary enforcement authority for Federal Safe Drinking Water Act regulations delegated to a state by the Environmental Protection Agency (EPA).

Primary Treatment: A wastewater treatment process that takes place in a rectangular or circular tank and allows substances in wastewater that readily settle or float to be separated from the water being treated. Primary treatment results in 50-60% removal of suspended solids and 30-34% removal of BOD.

Program: An organized group of activities and the resources to carry them out aimed at achieving one or more related objectives.

Rate Revenue: Revenue received from annual assessments of communities within MWRA's service area for water and sewer services.

Rate Stabilization Reserve: A fund established by the Board of Directors that is used to reduce rate revenue requirements. MWRA finances this reserve with unexpended or surplus funds available from the Current Expense Budget at the end of each fiscal year.

RCM (Reliability Centered Maintenance): A maintenance strategy adopted at Deer Island in FY00 for critical systems. RCM is a failure modes and effects process that involves maintenance, operations and engineering staff in the development of preventative maintenance and operation plans for plant systems.

Relief Sewer: A sewer built to carry flows in excess of the capacity of an existing sewer.

Renewable Energy: Energy from a source that is not depleted when used, such as wind or solar power

RGGI: The Regional Greenhouse Gas Initiative is a mandatory, market-based program in the United States to reduce greenhouse gas emissions. The program involves selling emission allowances through auctions and investing the proceeds in demand-side management and clean energy technology projects.

Remote Headworks: The initial structures and devices of a treatment plant set apart by some distance from the plant site.

Renewal and Replacement Reserve: A fund established to adequately reserve for the cost of capital improvements not provided for by funds available through the Capital Improvement Program or the Current Expense Budget.

Residuals: The by-products of the wastewater treatment process, including scum (floatables), grit and screenings, primary sludge, and secondary sludge.

Revenue Bonds: Bonds payable from a specific source of revenue and which do not pledge the full faith and credit of the issuer.

RPS (Renewable Portfolio Standards): State policies which mandate a state to generate a percent of its electricity from renewable resources. Qualified renewable generation facilities for the MWRA include: the Steam Turbine Generator (STG) and a variety of Hydroelectric, Wind

and Solar units. The MWRA is issued electronic certificates for each megawatt hour of electricity produced from the digester gas, which is considered renewable energy. RPS credits are a source of revenue for the MWRA.

Safe Yield Model: The equation used to determine the maximum dependable draft that can be made continuously on a water supply source during a period of years during which the probable driest period or period of greatest deficiency in water supply is likely to occur.

SAMS: Sewerage Analysis and Management System – A database which contains specifications of the location, size, and condition of MWRA wastewater interceptors and appurtenances and which produces maps for use by MWRA and outside parties. Now referred to as Wastewater GIS.

Sanitary Sewers: In a separate system, pipes that carry only domestic wastewater.

SCADA: Supervisory Control and Data Acquisition - Equipment for monitoring and controlling water or wastewater facilities remotely.

SCBA: Self-contained breathing apparatus.

Screenings: Large items such as wood and rags that are collected from wastewater in coarse screens prior to primary treatment.

Scum: Floatable materials such as grease, oil, and plastics that are skimmed from the surface of wastewater as it flows through large settling tanks.

SDWA: Safe Drinking Water Act - A Federal law enacted in 1986 and amended in 1996 that requires EPA to establish national primary drinking water regulations for water suppliers which consist of MCLs or treatment techniques.

Secondary Treatment: Usually following primary treatment, secondary treatment employs microorganisms to reduce the level of BOD and suspended solids in wastewater.

Sedimentation Tanks: Settling tanks where solids are removed from sewage. Wastewater is pumped to the tanks where the solids settle to the bottom or float on the top as scum. The scum is skimmed off the top, and solids on the bottom are pumped out for further treatment and/or final disposal.

Seeding: The initial filling of sludge into digesters.

Sensitive user: A member of a group within the general population likely to be at greater risk than the general population of adverse health effects due to exposure to contaminants in drinking water. Sensitive users include infants, children, pregnant women, the elderly, and individuals with histories of serious illness.

Septic Tanks: Tanks used for domestic wastes when a sewer line is not available to carry them to a treatment plant. Periodically, the septage is pumped out of the tanks, usually by commercial firms, and released into a wastewater treatment system.

Shotcrete: Mortar or concrete conveyed through a hose and projected at high velocity onto a surface; also known as air-blown mortar, pneumatically applied sprayed mortar, or gunned concrete.

Siphon: A closed conduit, a portion of which lies above the hydraulic grade line, resulting in a pressure less than atmospheric and requiring a vacuum within the conduit to start flow. A siphon utilizes atmospheric pressure to effect or increase the flow of water through the conduit.

Slip Lining: Insertion by pushing or pulling of lines fabricated of plastic, concrete cylinder pipe, reinforced concrete, or steel through existing conduits from access pits.

Sludge: Material removed by sedimentation during primary and secondary treatment. Sludge includes both settled particulate matter and microorganisms and is the single largest component of wastewater residuals. At the time sludge is removed during the treatment process, it contains only 0.5% to 5% solid content by weight. It has the appearance of muddy water.

Sodium Hypochlorite (NaOCl): A liquid form of chlorine that MWRA uses in the disinfection and/or odor processes at the Deer Island Treatment Plant, various other Wastewater facilities, and the Carroll Water Treatment Plant (CWTP).

Storm Sewers: Separate systems of pipes that carry only water runoffs from roofs, streets, and parking lots during storms.

Surcharging: Loads on a system beyond those normally anticipated; also, the height of wastewater in a sewer manhole above the crown of the sewer when the sewer is flowing completely full.

Suspended Solids: The particulate matter contained in wastewater.

SWTR: Surface Water Treatment Rule – A Federal rule promulgated in 1989 that affects all utilities using surface waters or waters under the influence of surface waters. SWTR requires filtration unless certain criteria on source water quality, watershed control, and disinfection effectiveness can be met (see also ESWTR).

Telemetry: Remote measuring or monitoring devices connected to a central monitoring station via telephone lines.

TCR: Total Coliform Rule – A federal rule that requires monitoring of water distribution systems for coliform bacteria and chlorine residual. No more than 5% of the coliform samples in a month can be positive.

TOC: Total Organic Carbon - A measure of the amount of organic material in water. Often used as a surrogate for disinfectant demand or DBP precursors.

Transition: A short section of conduit used as a conversion section to unite two conduits having different hydraulic elements.

TTHM: Total Trihalomethanes - A class of disinfection by-products, related to primarily chlorine disinfection (see D/DBP Rule).

TRAC: Toxic Reduction and Control – The department responsible for MWRA’s industrial pretreatment program.

TSS (Total Suspended Solids): A measure of the settleable solids and non-settleable solids in wastewater. During the primary treatment process, flows are routed to primary treatment clarifiers that remove about half of the pollutants brought to the plant in typical wastewater (50-60% of total suspended solids and up to 50% of pathogens and toxic contaminants are removed).

Ultraviolet (UV) Treatment: Ultraviolet light is an effective method of disinfection in drinking and wastewater applications. UV light damages the DNA of microbes, and is particularly effective against cryptosporidium. Federal regulations require two primary disinfectants for unfiltered water systems. The Carroll Water Treatment Plant added UV as a second disinfectant (in addition to ozonation) in February 2014 and the Quabbin Disinfection Facility (now named the William A. Brutsch Water Treatment Facility) in Ware added UV (as a second disinfection in addition to chlorine) in October 2014.

United States Geological Survey (USGS): The federal agency that collects Geographic Information System (GIS) data for developing mapping protocols.

Vector Jet Truck: A vehicle used to clean and/or remove blockages from sewer lines by pushing and/or pulling fluids in the sewer.

VMM: Vehicle Management and Maintenance – The program responsible for management and maintenance of MWRA’s vehicles and heavy equipment.

WASM (Weston Aqueduct Supply Mains): Project involving the rehabilitation of the four Weston Aqueduct Supply Mains that carry potable water to MWRA’s service area. When complete, they will transmit about one-third of the water to MWRA’s service area and the City tunnel will carry the remaining two-thirds.

Wastewater: The water carried by sewers serving residences and businesses that enters wastewater facilities for treatment. Wastewater is any water that has been adversely affected in quality by anthropogenic influence. It comprises liquid waste discharged by domestic residences, commercial properties, and/or agricultural and can encompass a wide range of potential contaminants and concentrations.

Wastewater Treatment Plant (WTP): A facility containing a series of tanks, screens, filters, and other equipment and processes for removing pollutants from wastewater.

Water Supply Trust: The legislature further enhanced the ability of the Department of Conservation and Recreation (DCR) Office of Watershed Management to protect the source waters of the MWRA drinking water supply by establishing a Water Supply Protection Trust in 2004. The trust provides a more efficient mechanism for MWRA's direct funding of the Office of Watershed Management. The Water Supply Protection Trust has a five person board of trustees responsible for approving the Annual Work Plan and Budget each spring for the following fiscal year.

Watershed Reimbursement: An amount that MWRA pays to the Department of Conservation and Recreation (DCR) each fiscal year for maintaining and managing the primary sources of MWRA's water supply (watersheds) in accordance with the laws of the Commonwealth of Massachusetts. The amount of the reimbursement is determined by prevailing legislation.

Wholesale Water and Sewer Services: Potable water and wastewater collection, transport, delivery, and treatment services that MWRA provides to communities. Communities provide the same services directly to retail customers or end users.

WOCC: Western Operations Control Center, located at the Carroll Water Treatment Plant.

APPENDIX F
FY17 Final Current Expense Budget - Capital Financing Detail (as of 6/30/16)

	Outstanding as of 6/30/16	Total	Sewer	Water
SRF ¹				
Unrefunded (93A, 93D, 95A,98C)	\$ 1,375,000	\$ 3,532	\$ 3,532	\$ -
1999E Sewer		392,808	392,808	-
1999E Water	9,368,956	579,892	-	579,892
1999F	215,625,000	20,294,527	20,294,527	-
2000E Sewer		2,843,928	2,843,928	-
2000E Water	52,225,067	572,208	-	572,208
2001C Water	1,720,000	248,060	-	248,060
2001D Sewer		384,595	384,595	-
2001D Water	2,944,867	81,482	-	81,482
2002H Sewer		3,153,402	3,153,402	-
2002H Water	76,815,000	1,550,234	-	1,550,234
2002I Sewer		100,707	100,707	-
2002I Water	1,730,198	1,465	-	1,465
2003A	645,755	68,484	-	68,484
2003B	1,554,654	222,128	-	222,128
2003C Sewer		1,361,152	1,361,152	-
2003C Water	33,061,399	964,765	-	964,765
2004C Sewer		544,693	544,693	-
2004C Water	8,416,542	91,298	-	91,298
2004D Sewer		2,689,064	2,689,064	-
2004D Water	48,960,000	642,619	-	642,619
2005C Sewer		419,088	419,088	-
2005C Water	5,510,356	68,557	-	68,557
2005D Sewer		3,045,132	3,045,132	-
2005D Water	55,006,594	801,616	-	801,616
2005E Sewer		24,961	24,961	-
2005E Water	273,433	5,479	-	5,479
2006C Sewer		484,121	484,121	-
2006D Sewer		2,807,930	2,807,930	-
2006D Water	62,905,137	1,607,466	-	1,607,466
2006E Sewer		22,883	22,883	-
2006E Water	324,572	10,281	-	10,281
2007C Sewer		307,061	307,061	-
2007C Water	4,335,508	181,033	-	181,033
2007D Sewer		1,148,187	1,148,187	-
2007E Sewer		3,242,827	3,242,827	-
2007E Water	58,726,123	1,259,793	-	1,259,793
2008G Sewer		402,460	402,460	-
2008G Water	4,531,876	82,117	-	82,117
2009C Sewer		5,742,088	5,742,088	-
2009C Water	85,912,800	1,885,220	-	1,885,220
2009D Sewer		647,609	647,609	-
2009D Water	9,417,934	85,620	-	85,620
2010 D Sewer		1,423,132	1,423,132	-
2010 D Water	40,427,414	1,436,853	-	1,436,853
2011A Sewer		383,189	383,189	-
2011A Water	8,751,731	367,968	-	367,968
2012C Sewer		524,324	524,324	-
2012C Water	9,841,229	254,745	-	254,745
2012D Sewer		2,857,384	2,857,384	-
2012D Water	45,985,970	532,418	-	532,418
2013B Sewer		2,214,434	2,214,434	-
2013B Water	34,977,514	533,721	-	533,721
2014C Sewer		283,380	283,380	-
2014C Water	9,803,204	385,121	-	385,121
2015A Sewer		2,646,508	2,646,508	-
2015A Water	61,626,073	979,497	-	979,497
2015B Sewer		260,517	260,517	-
2015B Water	5,254,926	152,224	-	152,224
2016A Sewer		2,289,047	2,289,047	-
2016A Water	52,965,112	924,671	-	924,671
Replacement Loan Sewer (spring 2016)		18,543	18,543	-
Replacemtn Loan Water (Spring 2016)		37,040	-	37,040
Replacement Loan Sewer (Fall2016)		839,288	839,288	-
Replacement Loan Water (Fall2016)		745,648	-	745,648

APPENDIX F
FY17 Final Current Expense Budget - Capital Financing Detail (as of 6/30/16)

	Outstanding as of 6/30/16	Total	Sewer	Water
Pool 20 Sewer		2,580,745	2,580,745	
Pool 20 Water		1,644,015	-	1,644,015
Replacement Loan Sewer (Spring 2017)		839,288	839,288	
Replacement Loan Water (Spring 2017)		745,648	-	745,648
Total SRF Debt	\$ 1,035,796,957	\$ 86,971,915	\$ 67,222,531	\$ 19,749,384
MWRA Senior Debt				
2002J New	273,180,000	63,203,625	56,883,263	6,320,363
2002J Refunding	1,000,000	50,000	25,000	25,000
2005A Refunding	263,845,000	18,607,688	8,373,459	10,234,228
2005B Refunding	75,245,000	3,762,250	1,253,958	2,508,292
2006B Refunding	31,485,000	1,521,500	1,141,125	380,375
2007B Refunding	647,950,000	34,017,375	28,574,595	5,442,780
2009B Refunding	157,480,000	7,685,000	5,533,200	2,151,800
2010A New	5,185,000	207,400	145,180	62,220
2010B Refunding	107,945,000	4,932,250	2,860,705	2,071,545
2011B New	79,845,000	3,831,700	2,682,190	1,149,510
2011C Refunding	321,160,000	15,824,275	6,171,467	9,652,808
2012A New	98,085,000	4,847,225	2,423,613	2,423,613
2012B Refunding	86,775,000	4,240,325	890,468	3,349,857
2013A Refunding	165,640,000	46,030,450	25,777,052	20,253,398
2014D New	68,275,000	3,357,250	2,282,930	1,074,320
2014E Refunding	25,295,000	4,171,750	3,650,281	521,469
2014F Refunding	141,410,000	6,396,700	1,982,977	4,413,723
2016B New	65,970,000	4,404,050	2,202,025	2,202,025
2016C Refunding	681,615,000	35,757,300	18,236,223	17,521,077
FY17 New Money (2017)		5,624,444	2,597,222	3,027,222
Total Senior	\$ 3,297,385,000	268,472,557	\$ 173,686,933	\$ 94,785,623
Subordinate Debt				
1999B	\$ 58,600,000	\$ 5,804,500	\$ 3,482,700	\$ 2,321,800
2002C Refunding	35,120,000	1,141,400	380,429	760,971
2008A Refunding	234,845,000	14,744,498	12,975,158	1,769,340
2008C Refunding	105,620,000	17,296,112	16,604,268	691,844
2008E Refunding	133,640,000	8,324,436	7,658,481	665,955
2008F Refunding	50,000,000	1,625,000	146,250	1,478,750
2012E Refunding	62,830,000	3,464,820	727,612	2,737,208
2012F Refunding	60,300,000	3,382,595	710,345	2,672,250
2012G Refunding	49,780,000	10,485,094	10,065,690	419,404
2014A Refunding	50,000,000	1,625,000	146,250	1,478,750
2014B Refunding	64,755,000	2,104,538	189,408	1,915,129
Total Subordinate Debt	\$ 905,490,000	69,997,992	\$ 53,086,591	\$ 16,911,401
Total SRF & MWRA Debt Service²	\$ 5,238,671,957	425,442,463	\$ 293,996,055	\$ 131,446,408
Other Capital				
Water Pipeline Commercial Paper	\$ 149,000,000	4,149,242	-	4,149,242
Current Revenue/Capital ³		12,200,000	8,975,056	3,224,944
Capital Lease		3,217,060	1,943,377	1,273,683
Debt Prepayment ⁴		10,994,960	7,837,052	3,157,908
Total Other Capital	\$ 149,000,000	\$ 30,561,262	\$ 18,755,485	\$ 11,805,777
Total Capital Financing (before Debt Service Offsets)	\$ 5,387,671,957	456,003,726	\$ 312,751,541	\$ 143,252,185
Debt Service Offsets				
Debt Service Assistance		(873,804)	\$(807,257)	\$(66,547)
Bond Redemption			-	-
Total Debt Service Offsets		(873,804)	\$(807,257)	\$(66,547)
Total Capital Financing	\$ 5,387,671,957	455,129,921	\$ 311,944,283	\$ 143,185,638

¹ SRF debt service payments reflect net MWRA obligations after state and federal subsidies.

² Numbers may not add due to rounding.

³ Current Revenue/Capital is revenue used to fund ongoing capital projects.

⁴ Debt Prepayment will be used defeasance of bonds at end of fiscal year.