

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**BASIS AND BACKGROUND STATEMENT**

**PROPOSED AMENDMENTS TO N.J.A.C. 7:11-2.1 et seq. IN THE SCHEDULE OF  
RATES, CHARGES AND DEBT SERVICE ASSESSMENTS  
FOR THE SALE OF WATER FROM THE RARITAN BASIN SYSTEM**

**ADJUSTMENT OF GENERAL RATE SCHEDULE FOR  
OPERATIONS AND MAINTENANCE FOR  
SALES BASE AND OPERATING EXPENSES FOR FISCAL YEAR 2018**

**ADJUSTMENT OF DEBT SERVICE ASSESSMENT AND SALES BASE FOR  
DEBT SERVICE PAYMENTS DUE AND REQUIRED FOR FISCAL YEAR 2018**

**ADJUSTMENT OF GENERAL RATE SCHEDULE FOR  
CAPITAL FUND COMPONENT FOR FISCAL YEAR 2018**

**ADJUSTMENT OF SOURCE WATER PROTECTION FUND  
COMPONENT FOR FISCAL YEAR 2018.**

**Effective Date: July 1, 2017**

**Approved by the Board: 12/5/2016**

**NEW JERSEY WATER SUPPLY AUTHORITY  
PROPOSED RATE ADJUSTMENTS FOR FISCAL YEAR 2018  
RARITAN BASIN SYSTEM**

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## **PART I - EXPLANATION OF PROPOSED REVISED RATE STRUCTURE**

### **Overview of Rate Proposal for Fiscal Year 2018** **(July 1, 2017 - June 30, 2018)**

The New Jersey Water Supply Authority (Authority) is proposing to adjust its Schedule of Rates, Charges and Debt Service Assessments for the Sale of Water from the Raritan Basin System, to cover expenses for the Fiscal Year (FY) starting on July 1, 2017.

#### **Summary of Proposed Adjustments**

<b>Component</b>	<b>Current (FY2017) Rates Per MG 7/1/2016 - 6/30/2017</b>	<b>Proposed (FY2018) Rates Per MG 7/1/2017 - 6/30/2018</b>
Operations & Maintenance Assessment	\$171.00	\$194.00
Debt Service Assessment Dredging	\$25.00	\$25.00
Debt Service Assessment RV Dam Improvements	\$0.00	\$60.00
Capital Fund Component	\$33.00	\$33.00
Source Water Protection Fund Component	\$24.00	\$24.00
Total Rate	\$253.00 /mg	\$336.00 /mg

The General Rate Schedule for Operations and Maintenance (O&M) was last adjusted effective July 1, 2016 to cover the operating expenses of the System for FY2017. The FY2017 O&M sales base was 182.339 million gallons per day (mgd). The Authority anticipates the FY2018 O&M sales base to increase slightly to 182.353 mgd. The O&M Component is projected to increase for FY2018 from \$171.00 per million gallons to \$194.00 per million gallons.

With the allocation of appropriate Headquarters expenses and insurance costs to the Manasquan Reservoir Water Supply System, the projected operating costs for FY2018 require that an O&M Component of \$194.00 per million gallons be charged starting on July 1, 2017.

In recent fiscal years, the actual O&M Component adjustments have been minimized because of credits for receipts of unanticipated revenues from the sale of water in excess of contractual amounts, positive budget variances during the preceding fiscal years or from uses of other one-time sources of revenue, specifically, those funds raised to pay debt service on the deferred dredging program. These credits have the effect of obscuring the full O&M Component adjustment needed and as a result Raritan Basin System rates do not represent full cost pricing. The rate has been subsidized by an average of \$1.6 million in non-recurring (overdraft sales and depletion of reserves) revenue over the past five years. The amount available for the Rate

Stabilization Fund was 2,124,146 in FY2017, most of which is derived from the Debt Service Assessment for the NJEIFP Dredging Loan. The amount available in FY2018 will decrease to \$781,992 because the bonds for the dredging program will be issued and the rate component is now needed to repay debt service in FY2018. This decrease in revenue causes a \$23 per million gallon increase in the O&M component of the rate. Overdraft sales rose from \$213,151 in FY2017 to \$267,337 in FY2018. An additional \$175,655 in prior year positive budget variance is used in FY2018 to offset the O&M component. Without the use of any rate stabilization funds in FY2018, the required O&M Component of the rate would be an additional \$14.00 per million gallons, or \$208 per million gallons.

The Authority established the Source Water Protection Fund Component in FY2003 to protect the quality and quantity of waters in the Raritan Basin System. The Authority is proposing no increase in this component of the Rate of \$24.00 per million gallons in FY2018. The rate component supports debt service on acquired critical watershed parcels and matching dollars for watershed protection projects.

The Authority has submitted an application to the New Jersey Environmental Infrastructure Financing Program (NJEIFP) to finance the dredging of a 10.5 mile segment of the Delaware and Raritan Canal (D&R Canal) between Kingston at Lincoln Highway to Amwell Road in Franklin Township, Somerset County, New Jersey. The Authority has also submitted an application to the New Jersey Environmental Infrastructure Financing Program (NJEIFP) to finance the rehabilitation of three embankments within the Round Valley Reservoir complex. The Authority proposes increasing the rate component from \$25.00 per million gallons (the dredging loan) to \$85.00 per million gallons (\$60.00 per million gallons for the embankment project) to fund the debt service in FY2018 for both projects. This rate component, before the increase in FY2018, had been subsidizing the Operations and Maintenance component of the rate. Because the rate component will now pay debt service, the Operations and Maintenance component of the rate will increase by \$25.00 per million gallons.

Finally, the Authority established a "Capital Fund Component" of the rate commencing July 1, 1994. This Component is used to fund the Authority's current Capital Improvement Program without incurring long-term debt. The Capital Fund Component was increased in FY2008 from \$21.00 to \$33.00 per million gallons, funded from the 1981 Bond Act debt service savings. The rate component was reduced to \$30.00 per million gallons in FY2012 to accommodate pressure on the O&M Component in order to keep the overall rate at \$231.00 per million gallons. The Authority increased this component of the rate from \$30.00 to \$33.00 per million gallons in FY2016 and proposes to keep it at the same rate of \$33.00 per million gallons in FY2018.

Table 1 on page 13 shows the increase in the O&M component, the maintenance of a stable rate for each of the other rate components and reflects a total rate of \$336.00 per million gallons for FY2018.

The balance of this document contains a further discussion of the individual rate components, a Schedule of Events and Detailed Supporting Information for the proposed rate adjustments.

A pre-public hearing on the proposed rate adjustments is scheduled at 10:00 a.m. on Friday, January 6, 2017, at the Authority's Administration Building, 1851 Highway 31, Clinton, New Jersey.

A public hearing on the proposed rate adjustments is scheduled at 10:00 a.m. on Friday, February 3, 2017 at the Authority's Administration Building, 1851 Highway 31, Clinton, New Jersey.

The New Jersey Register Comment Period is scheduled to close on March 4, 2017 and the public hearing record on the proposed rate adjustments is scheduled to close on March 10, 2017.

Final action on the rate adjustment is scheduled for the Authority's June 5, 2017 meeting. The FY2018 rate will take effect on July 1, 2017.

### **Distribution of Headquarters General and Administrative Costs and Insurance Costs to all Operating Systems**

On July 1, 1990 the Authority placed the Manasquan Reservoir Water Supply System in operation to provide an untreated water supply for use throughout Monmouth County. In addition to this major System, the Authority also began operation of the Water Treatment Plant and Transmission System for the Monmouth County Improvement Authority (MCIA) on July 1, 1990. The Boroughs of Brielle, Spring Lake, Spring Lake Heights, Sea Girt and Wall Township entered into agreements with the MCIA for this treatment/transmission system, which treats and conveys their portion of the supply from the Manasquan Reservoir System. In December 2008, the five member communities created the Southeast Monmouth Municipal Utilities Authority and in September 2009 purchased the Water Treatment Plant from the MCIA and the Authority continues to operate the Water Treatment Plant. The Authority is operating, maintaining and managing three distinct Systems each with its own budget, cost accountability and revenue stream.

The Authority's Headquarters' staff located in Clinton provides general and administrative support services for all three Systems. These services include, but are not limited to, Financial Management, Payroll, Human Resources, Purchasing, Contract Administration, Risk Management and overall management. In order to equitably assess each of the three Systems, the Authority previously retained the services of an auditing firm to develop a methodology for the allocation of the Headquarters General and Administrative costs to all three operating Systems. After the close of each fiscal year, the Authority's auditors provide the Authority with their findings as to the adjustment, if any, to the allocation factors and the actual audited expenditures for the fiscal year.

The audit report for the immediately preceding fiscal year ending June 30 is available during November. Each September the Authority formulates the proposed budgets for the upcoming fiscal year starting on the following July 1. The adjusted allocation factors, if any and

the audited expenditures for the previous fiscal year are used to establish a debit or credit for each of the three operating Systems. This debit or credit is applied to the budgets being prepared each September for the upcoming fiscal year starting on July 1.

An independent accounting firm performed the Authority's FY2016 audit. The audit included a review of the allocation factors as well as the actual audited expenditures. The appropriate adjustments have been made to the FY2018 budget based on the FY2016 audit. A copy of the Auditor's report on the allocation of the Headquarters General and Administrative costs is included in the Appendices to the rate proposal package for each System.

Insurance costs are also allocated to each System based upon the recommendations of the Authority's Risk Management Consultant. See the rate proposal package for more information on insurance charges.

### **Analysis of Significant Changes in Operations and Maintenance Expenses** **Raritan Basin System**

#### Overview of Projected Operational Expenses

The Authority's proposed FY2018 Raritan Basin System Total Budget requirement, which is net of the allocation of appropriate Headquarters General and Administrative expenses to the Manasquan Water Supply System, and includes capital equipment and contribution to reserves is \$13,542,487. This is \$121,248 more than the FY2017 budget of \$13,421,239. The Capital Equipment budget of \$104,600 is \$78,300 less than the FY2017 budget of \$182,900. The proposed contributions to the Reserve for Formal Dam Inspections (\$10,000), Capital Equipment Reserve (\$150,000) and the Pumping Reserve (\$150,000) remain at FY2017 levels. There are no contributions scheduled for the Depreciation Reserve and the Self-Insurance Reserve in FY2018. These Reserves last received a \$100,000 and \$150,000 contribution in FY2011 respectively but are sufficiently funded at the present time. There are no proposed contributions to the Operations and Maintenance Reserve, Major Rehabilitation Reserve or the Pension Reserve. The reserve for capital equipment purchases established in FY2015 requires an additional year of funding with a simultaneous direct expenditure for capital equipment because six years of stable rates from FY2009 through FY2014 caused deferral of equipment purchases from which the Authority is still recovering. It is still the Authority's intention to fund the reserve at an annual level of \$150,000 to eliminate rate fluctuations associated with the annual change in level of capital equipment purchases once the reserve is adequately funded. In FY2017 for the first time, the Authority funded a reserve for other post-employment benefits (accumulated sick leave payout for retirees) of \$181,000. No additional funds are required in FY2018. This represents the maximum statutory benefit for all employees eligible to retire as of June 30, 2016. All of these modifications result in a total FY2018 budget requirement of \$13,653,387 which is an increase of 1.73 percent relative to FY2017. (Page 16)

Sixteen of the thirty-one FY2018 direct operating expense accounts are projected to increase, but only six accounts by \$5,000 or more relative to FY2017. Eleven of the operating expense accounts are projected to decrease relative to FY2017. The most significant projected

increases in the budget occur in protective services and service and maintenance contracts. In Salary and Fringe, regular salary is increasing by \$103,400; the pension payment is increasing by \$95,700. Retiree health benefits are increasing by \$46,600 and assume 4 additional retirees between FY2017 and FY2018. Salaries and benefits constitute approximately 75.4 percent of the FY2018 operating budget, and are increasing approximately .03 percent relative to FY2017.

### Salaries and Benefits

Authority employees within Communications Workers of America (CWA) and the International Brotherhood of Electrical Workers (IBEW) are operating currently without a contract. The International Federation of Professional and Technical Engineers (IFPTE) contract has been negotiated. The previous contract expired June 30, 2015. The FY2018 budget assumes a 1.75% cost of living adjustment payable July 1, 2017 (the C.O.L.A. awarded to IFPTE). The IFPTE/AFL-CIO, represents the Authority's Maintenance, Craft and Security Units and the CWA represents the Authority's Administrative and Clerical, Primary Level and Higher Level Supervisors Units.

Due to a law change requiring certain managers to be unionized, two managers from the Raritan system and one from the Manasquan system joined the IBEW as of March 21, 2015.

The Authority did not include any cost of living adjustments in the FY2018 budget for management. The Authority is budgeting 55 percent of the Salary budget for fringe benefits in FY2018, exclusive of retiree medical.

The initial estimate from the State of New Jersey for pension expense payable on April 1, 2017 is not yet available. The Authority has built in 20 percent per year growth in that expense item over actual FY2016. Although increases have stabilized in the last three years, there is still a level of uncertainty in this expense item because the pension system remains significantly underfunded.

### Overtime Salaries and Wages

The Authority's overtime expenses are projected to increase by \$24,500 from \$190,000 to \$214,500 in FY2018. Overtime expenses are incurred within Security and O&M Facilities and Canal Operations principally (those areas operating within a crew or shift structure).

### Retiree Health Benefits

Employees who retired with a minimum of 25 years of service prior to July 1, 1997 are entitled to paid health benefits. For those who retire after July 1, 1997, co-pay is required. The Authority is increasing the retiree health benefits expense item in FY2018 by \$46,600. The Authority is budgeting four additional retirees in FY2018. The increase projected by State Health Benefits for 2017 for retiree medical is 8.6%. The Authority budgeted 12.5% each year for FY2017 and FY2018. The budget contains sufficient funds for 57 retired employees.

## Other Expense

### Electrical Service

The Authority's Hamden Pumping Station is utilized to pump water to the Round Valley Reservoir. The proposed budget remains the same for electricity costs for the normal operation of the pumping station of \$92,000 in FY2018. The Authority entered into a three-year contract for power effective January 1, 2016. The rate reductions were only slight. The State of New Jersey prefers budget certainty and opts for longer term contracts over lower rates. The pumps are in a scheduled rehabilitation cycle and will be exercised as rehabilitated pumps are put back on line. The next pumping is expected in spring 2017. Pumping is funded from the Pumping Reserve (\$150,000 annual deposit).

### Special and Professional Services

The Authority is proposing to decrease this line item from \$498,140 in FY2017 to \$491,839 in FY2018 representing budgeting more in line with FY2016 actual within the United States Geological Survey gaging station costs. In other areas, pricing is stable. The line item also includes payments to the Governor's Authorities Unit, costs charged to the Authority by the Attorney General's Office for legal services provided, and the cost of the Authority's independent auditor.

### Heating Fuel and Vehicular Fuel

The cost of heating fuel is expected to decrease from \$107,100 to \$91,800 and vehicular fuel is projected to remain the same at \$159,000 in FY2018. The prices of fuel in FY2018 are budgeted at \$2.25 per gallon for unleaded and \$2.35 per gallon for diesel.

## **Insurance Program**

The Authority is recommending an increase in insurance expense for FY2018 reflecting general market conditions based on the advice of the Authority's insurance broker and consultant. The Authority formally re-marketed the program effective March 1, 2016. March 1, 2017 will be a straight renewal. The Authority has included a \$194,785 increase in the insurance line item for FY2018 which is a 17.62 percent increase over budgeted FY2018.

Allocation of the Primary, Umbrella and Public Officials Liability insurance costs between the three Systems is based upon proportionate water sales. The Automobile Liability cost is allocated based upon the assignment of vehicular equipment to each System. The cost of the Business Property coverage is allocated on the basis of insured values for each System and the Workers Compensation premiums are allocated on the basis of salaries for each System.

### **Interest Income**

The projected interest earnings for FY2018 are \$40,700 based upon current rates of .25 percent for Short-term investments and 1.30 percent on the Authority's long-term investments. This represents an increase of \$5,300 from \$35,400 in FY2017. (Schedule 7, page 26) At the urging of the contractual water customers, in past years the Authority executed sweep contracts for its non-interest bearing accounts. After analysis, the Authority reversed the contracts because of increased costs assessed against the accounts. Due to the naturally low balances in these accounts and the large number of transactions, the transaction costs outstripped the sweep interest earnings. Most of the Authority's short and long-term investments are either direct Treasury note investments or pegged to the Treasury bill.

### **Reserve Contributions**

During FY2018 the Authority will make no contribution to the Depreciation Reserve. The Depreciation Reserve is fully funded in FY2018 (Page 16).

The Authority will contribute \$150,000 to the pumping reserve, and will do so every year, as this will be the primary funding mechanism for pump exercises and reservoir refilling requirements. The Self Insurance Reserve fund will receive no funding in FY2018. The Authority will continue funding for the Reserve for Formal Dam Inspections at \$10,000 in order to avoid future swings in the professional services accounts for expenses associated with this three-year cycle. The Authority will contribute \$150,000 to the Capital Equipment Reserve, and will do so every year, as this will be the primary funding mechanism for capital equipment purchases. When the reserve reaches the appropriate level, while equipment purchases will continue to be identified in the Basis and Background Document and approved by the Board, the direct line item will be removed from the rate and replaced by the annual appropriation.

### **Debt Service Assessments**

#### **New Jersey Environmental Infrastructure Financing Program Debt Service Assessment – D&R Canal Dredging and Round Valley Reservoir Dams – Rehabilitation and Preservation Project**

The Authority has submitted an application to the New Jersey Environmental Infrastructure Financing Program (NJEIFP) to finance the dredging of 300,000 cubic yards from a 10.5 mile segment of the Delaware and Raritan Canal (D&R Canal) between Kingston at Lincoln Highway to Amwell Road in Franklin Township, Somerset County, New Jersey. This project is expected to cost approximately \$42,000,000 and last in duration up to three years. Funding through the NJEIFP would allow a portion of the loan to be at zero interest and a portion of the loan to be at market rate with the blended rate at favorable terms. The expected closing on the bonds will be May of 2018 with the first debt service payment in August 2018. The Authority proposes to continue the rate component of \$25.00 per million gallons in FY2018 to assure that sufficient funds are available to make debt service payments as they come due in

August 2018 and every six months thereafter. The project was originally scheduled to close in May of 2014 but was deferred four years. The sum of approximately \$1.5 million that was collected during FY2017 will be the last year deposited into the Rate Stabilization Fund to offset the O&M rate requirement.

The Authority has submitted an application to the New Jersey Environmental Infrastructure Financing Program (NJEIFP) to finance the rehabilitation of the embankments in the Round Valley Reservoir complex in Clinton Township, Hunterdon County, New Jersey. This project is expected to cost approximately \$65,000,000 and last in duration for one year. Funding through the NJEIFP would allow a portion of the loan to be at zero interest and a portion of the loan to be at market rate with the blended rate at favorable terms. The expected closing on the bonds will be May of 2018 with the first debt service payment in August 2018. The Authority proposes increasing the rate component by \$60.00 per million gallons in FY2018 to assure that sufficient funds are available to make debt service payments as they come due in August 2018 and every six months thereafter.

The total rate component will be adjusted after the bonds are issued in accordance with a final debt service schedule.

### **Capital Fund Component For Current Financing of Capital Improvement Program**

During the period from 1982-1993 the Authority had invested \$62,000,000 in the Capital Improvement Program for the Raritan Basin System. Much of this effort was the direct result of inadequate investments in the facilities during the years preceding the creation of the Authority. These Capital Improvement Programs were financed through the issuance of two long-term debt obligations, the 1981 Water Supply Bond Funds and 1988 Water System Revenue Bonds.

In 1995, the Authority began preparing a rolling five-year Capital Improvement Program, which required the investment of approximately \$1,500,000 per year. Current estimates place the annual necessary investment between \$2,500,000 and \$5,500,000. In evaluating options for financing this program (and subsequent five year CIP's) the Authority looked at (1) the continuation of the practice of incurring long-term debt through the issuance of Revenue Bonds and (2) the possibility of current financing through the assessment of annual charges as part of our rate structures. The Authority concluded at the time that financing of such a small annual Capital Improvement Program based upon the issuance of long-term debt was fiscally imprudent. The Authority reevaluates this financing methodology on an annual basis.

The Authority's financial plan was predicated upon the establishment of a Capital Fund Component of \$10 per mg starting on July 1, 1994 with subsequent increases in this component of the total rate structure to \$15 per mg effective July 1, 1995 and to \$20 per mg effective July 1, 1996 and to \$25 per mg effective on July 1, 1998. Since then, the annual rate component has fluctuated between \$20 and \$35.

This level of current financing for reinvestments in plant and equipment somewhat

exceeds the booked depreciation of the plant and equipment for the Raritan Basin System facilities (without the depreciation of the dams), which amounts to about \$1,900,000 per year. Any future unplanned or unanticipated major capital investment may, however, require the issuance of long-term debt. Any future planned activity that increases the System capacity will be financed using long-term debt.

For FY2018, the Authority continues to believe the use of internally generated funds for such capital improvements is the least cost method of financing.

The Authority has determined that a Capital Fund Component of \$33.00 per million gallons, level funding over FY2017, should be assessed for FY2018 to generate approximately \$2,196,442. The Authority deems these revenues sufficient to meet its capital needs for FY2018 in light of existing capital reserves and excellent contract pricing, and to ensure that sufficient funds are committed to the continuing rehabilitation of Authority assets. The Authority is expecting to raise the Capital Fund Component of the Rate to \$45.00 per million gallons in FY2019 to assure that the projected capital needs, especially for repairs to the D&R Canal, are met within the five year program.

#### **Source Water Protection Fund Component for the Protection of Water Quality**

The Authority established its Watershed Protection Unit in 1999 to implement a watershed management program for the Raritan River Basin pursuant to a Memorandum of Agreement with the New Jersey Department of Environmental Protection. Primary functions of the Unit are planning for watershed protection, development and implementation of projects that improve protection of water supply.

As a component of the Authority's watershed protection initiative, the Authority established the Source Water Protection Fund in August of 2001 for the purpose of protecting the quality and quantity of waters in the Raritan Basin System. The first \$5.00 per million gallons of the component is used for three purposes in cooperation with federal, State, local and nonprofit partners: (1) administrative actions associated with the acquisition of critical watershed parcels in the Raritan Highlands; (2) planning assistance to improve management of land development by municipal, county and State government to protect both water quality and flows to and within Authority facilities; and (3) water quality characterization and associated remedial projects to preserve and enhance water quality.

In light of the rapid decline in available watershed parcels, and the critical value of these parcels to the sustained supply of water in the Raritan Basin System, the Authority increased the Source Water Protection Fund by \$5.00 per million gallons in FY2004 and again by \$3.00 per million gallons in FY2006, to acquire fee and other interests in critical watershed parcels in the System and rehabilitate properties to maximize benefit to water quality and quantity. To date, more than 3,954 acres of property have been preserved by the Authority and its partners. Some of the watershed and water quality projects include a tributary and storm water assessment of the D&R Canal to determine sediment loading, followed by an implementation project; the

development of storm water management plans for a variety of tributaries in the Basin; and a stream restoration project of a reach of the Mulhockaway which feeds into Spruce Run. The Authority increased the Source Water Protection Rate from \$13.00 per million gallons to \$15.00 per million gallons in FY2008 to further support direct watershed protection and restoration projects. The Authority increased the Source Water Protection Rate from \$15.00 per million gallons to \$24.00 per million gallons in FY2014 to support debt service on previously acquired critical watershed parcels. The Authority is proposing no change to this component of the Rate in FY2018.

### **Other Rule Amendments**

There are no other rule amendments. The language supporting the overall proposal is contained beginning on page 56 of this document.

**PART II – DETAILED SUPPORTING INFORMATION**

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Table 1 - Summary Of Proposed Fiscal Year 2018 Adjustments  
Based On Present Usage**

The rates, charges and debt service assessments listed below shall be paid for raw water diverted, withdrawn or allocated from the Raritan Basin System:

RATE COMPONENT	CURRENT	ORIGINAL PROPOSAL 12/05/16	DIFFERENCE	PERCENTAGE INCREASE (DECREASE)
O & M Assessment	\$171.00	\$194.00	↑ 23.00	13.45%
Debt Service Assessment Dredging	25.00	25.00	→ 0.00	0.00%
Debt Service Assessment RV Dam Improvements	0.00	60.00	↑ 60.00	NA
Capital Fund Component	33.00	33.00	→ 0.00	0.00%
Source Water Protection Component	24.00	24.00	→ 0.00	0.00%
Total Rate	\$253.00/mg	\$336.00/mg	↑ 83.00	32.81%

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Table 2 - Rate History of Water Charges per Million Gallons of Raw Water Daily**  
Fiscal Year 2003 – Fiscal Year 2018

<u>Effective Date</u>	<u>O&amp;M Charge</u>	<u>1981 Bond Charge</u> <u>7/1/86-10/30/06</u>	<u>1998 Bond Charge</u> <u>8/1/98-11/1/13</u>	<u>2018 Bond Component</u> <u>8/1/13-8/1/23</u>	<u>Capital Fund Component</u>	<u>Source Water Protection Component</u>	<u>Total Charge per MG</u>	<u>Percent Increase -Decrease</u>
July 1, 2002	105.46	31.73	49.28		13.53	5.00	\$205.00	0.00%
July 1, 2003	111.68	31.62	49.15		7.55	10.00	\$210.00	2.44%
July 1, 2004	122.75	28.31	41.71		12.23	10.00	\$215.00	2.38%
July 1, 2005	111.80	28.24	41.51		20.45	13.00	\$215.00	0.00%
July 1, 2006	133.13	19.55	41.32		21.00	13.00	\$228.00	6.05%
July 1, 2007	138.71		\$41.29		\$33.00	15.00	\$228.00	0.00%
July 1, 2008	142.34		\$40.66		\$33.00	15.00	\$231.00	1.32%
July 1, 2009	142.39		\$40.61		\$33.00	15.00	\$231.00	0.00%
July 1, 2010	142.55		\$40.45		\$33.00	15.00	\$231.00	0.00%
July 1, 2011	145.66		\$40.34		\$30.00	15.00	\$231.00	0.00%
July 1, 2012	145.84		\$40.16		\$30.00	15.00	\$231.00	0.00%
July 1, 2013	152.00			\$25.00	\$30.00	24.00	\$231.00	0.00%
July 1, 2014	167.00			25.00	30.00	24.00	\$246.00	6.49%
July 1, 2015	171.00			25.00	33.00	24.00	\$253.00	2.85%
July 1, 2016	171.00			25.00	33.00	24.00	\$253.00	0.00%
July 1, 2017	194.00			85.00	33.00	24.00	\$336.00	32.81%

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYTEM

**Schedule Of Events**

(NJAC 7:11-2.1 et. seq.)

To become effective July 1, 2017

**2016**

- SEPTEMBER 30 Advise Water Users of informal meeting.
- NOVEMBER 9 Informal meeting with Water Users – 10:00 AM.
- DECEMBER 5 Board reviews and approves proposed Rates.
- 23 Mail Official Notice to water customers, Rate Payer Advocate, interested parties and advertise in newspapers.

**2017**

- JANUARY 3 Publication in the New Jersey Register.
- 6 Pre-Pubic Hearing – 10:00 AM (within 45 days of Official Notice). Deadline for responses to inquires received prior to pre-public hearing.
- 27 Deadline for receipt of comments to be addressed at Public Hearing (15 days after pre-public hearing).
- FEBRUARY 3 Public Hearing Meeting. (SR Administration Building) – 10:00 AM Deadline for responses to inquires received between pre-public and public hearing.
- 17 Written responses to questions raised at Hearing (within 10 business days of the public hearing).
- MARCH 4 NJ Register Comment Period Ends.
- 10 Public Hearing record closes (25 business days after Public Hearing).
- JUNE 5 Board approval of FY 2018 Rates and Budgets.
- JULY 1 Effective date.

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Proposed**

**Fiscal Year 2018 Budget Summary**

(7/1/17 - 6/30/18)

	ADOPTED F/Y17	PROPOSED F/Y18
Proposed Operating Expense Budget (Schedule 1)	\$ 13,491,339	\$ 13,890,887
Net Allocation of Headquarters General and Administrative Expenses to the Manasquan Water Supply System - (Schedule 5)	\$ (744,000)	\$ (763,000)
Proposed Total Expense Budget	\$ 12,747,339	\$ 13,127,887
Proposed Capital Equipment Budget (Schedule 6)	\$ 182,900	\$ 104,600
Total Operating Expense & Capital Equipment Budgets	\$ 12,930,239	\$ 13,232,487
Contribution to Reserve Funds		
- Other Post Employment Benefits Reserve	\$ 181,000	\$ -
- Reserve for Formal Dam Inspection	\$ 10,000	\$ 10,000
- Pumping Reserve	\$ 150,000	\$ 150,000
- Capital Equipment Reserve	\$ 150,000	\$ 150,000
Total Budget Requirements	\$ 13,421,239	\$ 13,542,487
 <u>MISCELLANEOUS REVENUES:</u>		
Employee Housing/Land Rental	\$ (47,200)	\$ (47,200)
Receivable from the State of NJ and Other Reservoir Sites	\$ (5,000)	\$ (5,000)
Interest Earnings on Funds (Except Major Rehabilitation and Depreciation Reserve Fund) (Schedule 7)	\$ (35,400)	\$ (40,700)
	\$ (87,600)	\$ (92,900)
 <u>OTHER AVAILABLE FUNDS:</u>		
Funds Appropriated to Rate Stabilization Fund for use in F/Y2017 (Resolution #2242, dated 06/06/16)	\$ (1,929,360)	\$ -
Unanticipated Revenue (Schedule 8)		\$ (781,990)
Total Other Available Funds	\$ (1,929,360)	\$ (781,990)
Net Amount to be paid for O & M Component	\$ 11,404,279	\$ 12,667,597

Note 1. This amount is net of withdrawal from Depreciation Reserve.

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 1 - Proposed Operating Expenses Budget – Fiscal Year 2018 Distributed by Cost Center**  
Fiscal Year 2018

CODE	ACCOUNT	OFFICE EXECUTIVE DIRECTOR	FINANCIAL MANAGEMENT & ACCOUNTING	WATERSHED PROTECTION PROGRAMS	OPERATIONS MAINTENANCE & ENGINEERING	PROPOSED BUDGET FOR FY18
5110	Regular Salaries & Wages	\$121,900	\$1,734,350	\$573,400	\$3,560,400	\$5,990,050
5120	Overtime-Salaries & Wages	0	\$117,600	\$0	\$96,900	\$214,500
5130	New Positions-Salaries & Wages	0	\$0	\$0	\$0	\$0
5140	Seasonal Help-Salaries & Wages	0	\$0	\$0	\$0	\$0
5150	Fringe Benefits	33,700	\$807,400	\$199,400	\$2,132,400	\$3,172,900
5167	Retiree Health Benefits	54,600	\$263,200	\$36,700	\$737,600	\$1,092,100
5168	Workers Compensation (Self-Insured)	0	\$10,000	\$0	\$0	\$10,000
	Total Salary & Fringe Benefits	\$210,200	\$2,932,550	\$809,500	\$6,527,300	\$10,479,550
5200	On-Site Residences	0	\$0	0	\$26,600	\$26,600
5211	Heating Fuel	0	\$0	0	\$91,800	\$91,800
5220	Utilities -Electrical Service	0	\$0	0	\$110,500	\$110,500
5230	" -Gas Service & Water	0	\$0	0	\$4,800	\$4,800
5240	" -Propane	0	\$0	0	\$500	\$500
5250	Electricity for Pumping	0	\$0	0	\$92,000	\$92,000
5260	Vehicular Fuel	0	\$159,000	0	\$0	\$159,000
5270	Oil & Grease	0	\$0	0	\$9,200	\$9,200
5280	Tires	0	\$0	0	\$28,000	\$28,000
5290	Maintenance Supplies	0	\$8,100	0	\$175,700	\$183,800
5300	Maint. Supplies - Vehicular Equipment	0	\$0	0	\$56,000	\$56,000
5310	Major Special Vehicle Service & Repair	0	\$0	0	\$90,000	\$90,000
5320	Agricultural Supplies	0	\$1,000	0	\$4,500	\$5,500
5330	Maintenance of Equipment	0	\$7,700	3500	\$25,200	\$36,400
5340	Service & Maintenance Contracts	0	\$67,200	100	\$167,200	\$234,500
5350	Equipment Rental	0	\$24,850	0	\$26,700	\$51,550
5360	Household-Safety & Protective Supplies	100	\$27,400	0	\$6,300	\$33,800
5370	Uniforms	0	\$5,400	0	\$3,220	\$8,620
5380	Special & Professional Services	25,000	\$219,639	\$118,100	\$129,100	\$491,839
5390	Protective Services	0	\$1,300,000	0	\$0	\$1,300,000
5400	Telephone	0	\$83,000	0	\$0	\$83,000
5410	Postage & Freight	0	\$7,500	0	\$180	\$7,680
5420	Data Processing	0	\$38,788	0	\$0	\$38,788
5430	Printing & Office Supplies	500	\$34,750	9000	\$7,550	\$51,800
5440	Scientific & Photographic	0	\$0	0	\$500	\$500
5450	Dues & Subscriptions	14,400	\$11,730	1000	\$13,400	\$40,530
5460	Advertising	0	\$4,500	0	\$0	\$4,500
5470	Travel & Subsistence	1,500	\$1,980	1500	\$1,600	\$6,580
5480	Staff Training & Tuition Aid	500	\$9,750	3500	\$6,300	\$20,050
5490	Fees & Permits	0	\$113,100	0	\$11,700	\$124,800
5500	In-Lieu Taxes	0	\$18,700	0	\$0	\$18,700
	Total Operating Expenses	\$42,000	\$2,144,087	\$136,700	\$1,088,550	\$3,411,337
	GRAND TOTAL	\$252,200	\$5,076,637	\$946,200	\$7,615,850	<b>\$13,890,887</b>

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 1A - Comparative Statement**  
Fiscal Year 2018

CODE	ACCOUNT	FY'14 ACTUAL	FY'15 ACTUAL	FY'16 ACTUAL	FY'17 ADOPTED	FY'18 PROPOSED
5110	Regular Salaries & Wages	\$5,227,901	\$5,232,036	\$5,327,730	\$5,886,650	\$5,990,050
5120	Overtime-Salaries & Wages	186,907	176,438	193,406	190,000	\$214,500
5130	New positions-Salaries & Wages	0	0	0	0	\$0
5162	Retiree Unused Sick & Vacation	41,044	38,788	0	0	\$0
5150	Fringe Benefits	2,549,057	2,478,311	2,754,466	3,171,500	\$3,172,900
5167	Retiree Health Benefits	711,226	769,820	812,707	1,045,500	\$1,092,100
5168	Workers Comp. (Self Insured)	4,384	5,707	850	10,000	\$10,000
	Total Salary & Fringe	8,720,519	8,701,100	9,089,159	10,303,650	10,479,550
	Budget Salary & Fringe	\$9,700,250				
5200	Residences	\$85,031	\$77,320	\$25,013	\$35,600	\$26,600
5211	Heating Fuel	99,709	71,915	31,683	107,100	\$91,800
5220	Utilities -Electrical Service	106,609	105,818	80,151	112,500	\$110,500
5230	-Gas Service	4,980	4,234	4,093	5,000	\$4,800
5240	-Propane	520	271	834	200	\$500
5250	Electricity for Pumping Station	77,401	79,790	134,865	92,000	\$92,000
5260	Fuel - Vehicular	144,641	143,557	78,973	159,000	\$159,000
5270	Oil & Grease	5,222	6,041	5,606	8,700	\$9,200
5280	Tires	31,557	23,157	16,712	29,000	\$28,000
5290	Maintenance Supplies	161,555	147,168	152,302	194,300	\$183,800
5300	Maint. Supplies - Vehicular	51,614	47,617	69,029	48,000	\$56,000
5310	Major Vehicle Service & Repair	102,034	72,802	70,229	80,000	\$90,000
5320	Agricultural Supplies	653	3,008	2,550	5,000	\$5,500
5330	Maintenance Equipment	35,808	26,502	34,487	44,200	\$36,400
5340	Serv. & Maintenance Contracts	167,202	184,660	217,681	197,600	\$234,500
5350	Equipment Rental	60,514	42,988	38,002	38,050	\$51,550
5360	Household - Safety Supplies	26,771	26,899	31,543	31,600	\$33,800
5370	Uniforms	3,266	4,828	6,362	6,800	\$8,620
5380	Special & Professional Services	411,176	436,850	493,339	498,140	\$491,839
5390	Protective Services	1,133,656	1,188,766	1,142,799	1,105,215	\$1,300,000
5400	Telephone	73,113	83,797	81,248	75,000	\$83,000
5410	Postage & Freight Out	3,464	6,157	6,893	7,600	\$7,680
5420	Data Processing	36,203	40,023	36,336	42,284	\$38,788
5430	Printing & Office Supplies	56,904	46,225	42,595	52,150	\$51,800
5440	Scientific & Photographic	0	995	478	500	\$500
5450	Dues & Subscriptions	33,520	34,206	35,063	40,600	\$40,530
5460	Advertising & Promotional	5,925	3,898	5,746	3,500	\$4,500
5470	Travel & Subsistence	2,939	2,274	4,695	6,500	\$6,580
5480	Staff Training & Tuition Aid	11,220	8,352	9,507	19,050	\$20,050
5490	Fees & Permits	114,616	113,970	123,539	123,800	\$124,800
5500	In - Lieu Taxes	18,689	18,689	18,689	18,700	\$18,700
	Total Other Expenses	\$3,066,512	\$3,052,777	\$3,001,045	\$3,187,689	\$3,411,337
	Total Operating Expenses	\$11,787,031	\$11,753,877	\$12,090,204	\$13,491,339	\$13,890,887
	Annual Increase (Decrease)	-0.14%	-0.28%	2.86%	11.59%	2.96%
	Budget -other expenses	3,077,600	3,290,600	3,365,700	3,187,689	
	ANNUAL BUDGET	\$12,777,850	\$12,823,900	\$13,157,000	\$13,491,339	

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 2 - List of Category 5340 Items Recommended Service & Maintenance Contracts**

Fiscal Year 2018

		ADOPTED F/Y17	PROPOSED F/Y18
1.	Postage/Fax/ Misc. Machines (Dept. 16)	\$1,500	\$1,500
2.	HIS-Safety Software (Dept. 17)	\$1,700	\$1,700
3.	GO DADDY.COM - Remote Access Certificates (Dept. 17)	\$300	\$300
4.	WMWARE (Dept. 17)	\$500	\$500
5.	Sage MAS 200 (Dept. 17)	\$4,500	\$0
6.	Clients First MAS 100 (Dept. 17)	\$0	\$4,750
7.	Western Technologies NJ Parcel Maps (Dept. 17)	\$1,300	\$1,400
8.	Sage Fixed Asset (Dept. 17)	\$2,500	\$2,250
9.	PV & Associates- Winslamm (Dept. 17)	\$500	\$500
10.	People Trak Support Technical Difference (Dept. 17)	\$1,000	\$1,000
11.	COMCAST - Cable Internet (Dept. 17)	\$4,280	\$4,280
12.	Essention - Conservation Trak	\$2,500	\$5,000
13.	Pure Host Web Hosting Administration (Dept. 17)	\$200	\$200
14.	Pure Host Web Hosting Watershed (Dept. 17)	\$250	\$250
15.	Symantec Anti-Virus Maintenance-Clinton (Dept. 17)	\$2,200	\$2,500
16.	Sonic Wall Software (Dept. 17)	\$1,200	\$1,200
17.	ESRI ArcView Maintenance- Watershed (Dept. 17)	\$5,400	\$5,400
18.	CU Riverware Maintenance Agreement (Dept. 17)	\$3,400	\$3,400
19.	McAfee Antispam (Dept. 17)	\$1,500	\$1,500
20.	River Morph (Dept. 17)	\$500	\$500
21.	DLT Solutions Autocad (Dept. 17)	\$1,500	\$1,500
22.	Fastrax SBPS Monitoring Software (Dept. 17)	\$900	\$900
23.	ESRI ArcView Maintenance-Clinton (Dept. 17)	\$800	\$800
24.	Keystone Precision-GPS Software Maint. (Dept. 17)	\$800	\$800
25.	HAAS Systems-Security Alarm Software Maint. (Dept. 17)	\$400	\$400
26.	Clients First-Vipre Antivirus/Antispam (Dept. 17)	\$250	\$250
27.	EZ Watch Security Video (Dept. 17)	\$900	\$900
28.	Clients First - Server Software (Dept. 17)	\$1,000	\$1,000
29.	Delmar Enterprises - Key Systems (Dept. 17)	\$520	\$520
30.	DocuSign (Dept. 17)	\$0	\$400
31.	Yahoo for River Friendly (Dept. 20)	\$100	\$100
32.	Refuse Collection (Dept. 31)	\$11,900	\$11,900
33.	Janitorial Service (Dept. 31)	\$15,500	\$15,500
34.	HVAC Service (Dept. 31)	\$5,500	\$5,500
35.	Electrician & Plumber Services (Dept. 31)	\$5,000	\$5,000

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NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 2 (Cont.) - List of Category 5340 Items Recommended Service & Maintenance Contracts**  
Fiscal Year 2018

	ADOPTED <u>F/Y17</u>	PROPOSED <u>F/Y18</u>
36. Instrumentation Services (Dept. 31)	\$4,500	\$4,500
37. Entry Rugs (Dept. 31)	\$2,700	\$5,000
38. Carpet Cleaning (Dept. 31)	\$2,300	\$8,000
39. Generator Service-Administration Building (Dept. 31)	\$1,200	\$1,200
40. Underground Plant Location Service Notifications (Dept. 31)	\$1,000	\$1,500
41. Crane Service and Inspection (Dept. 31)	\$1,200	\$1,200
42. Elevator Service-SBPS (Dept. 31)	\$2,800	\$2,800
43. Electrical Service-SBPS (Dept. 31)	\$6,400	\$20,000
44. Miscellaneous (Dept. 31)	\$0	\$6,900
45. Floor Cleaning Maintenance-Office (Dept. 32)	\$2,400	\$2,600
46. Janitorial Service (Dept. 32)	\$7,300	\$8,000
47. Dumpster Service Canal Office (Dept. 32)	\$3,000	\$12,000
48. Dumpster Service Route 1 (Dept. 32)	\$31,000	\$30,000
49. Dumpster Service-Extra (Dept. 32)	\$2,000	\$2,000
50. Instrumentation Testing (Dept. 32)	\$1,000	\$1,000
51. Floor Mats (Dept. 32)	\$1,000	\$2,400
52. Grass Mowing Service (Dept. 32)	\$5,800	\$6,000
53. Boiler Service (Dept. 32)	\$300	\$500
54. Wood Disposal Fees (Dept. 32)	\$3,100	\$3,100
55. Generator Service-Scudders & Perdicaris (Dept. 32)	\$3,000	\$3,000
56. Vac Truck Service-IFW, 10 Mile PS (Dept. 32)	\$3,900	\$4,200
57. Tire Recycling (Dept. 32)	\$1,000	\$0
58. Floor Mats (Dept. 33)	\$2,800	\$0
59. Carpet Cleaning (Dept. 33)	\$8,000	\$0
60. Welco Gas (Dept. 33)	\$600	\$1,000
61. Parts Washer & Hazardous Removal (Dept. 34)	\$1,000	\$1,000
62. Boom Lift Annual Inspection (Dept. 34)	\$0	\$900
63. Recycle Used Vehicle Fluids (Dept. 35)	\$0	\$500
64. Fire Extinguisher Maintenance (Dept. 36)	\$7,000	\$7,000
65. Hazardous Waste Control (Dept. 36)	\$1,500	\$1,500
66. Fire Alarm Testing (Dept. 36)	\$8,000	\$8,000
67. Vehicle Lifts Annual Testing (Dept. 36)	\$1,500	\$1,500
68. Delaware Electric Cellular Service (Dept. 37)	\$0	\$600
69. Dial My Calls (Dept. 37)	\$0	\$1,000
70. Miscellaneous (Dept. 37)	\$0	\$2,000
<b>TOTAL</b>	<u>\$197,600</u>	<u>\$234,500</u>

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 3 - List of Category 5380 Items Recommended Professional Services**  
Fiscal Year 2018

	ADOPTED F/Y17	PROPOSED F/Y18
1. Services-Governor's Authorities Unit (Dept. 10)	\$25,000	\$25,000
2. Consultant-C.P.A. to Conduct Annual Audit (Dept. 13)	\$60,610	\$62,495
3. Services-GFOA Certificate Fee (Dept. 13)	\$500	\$500
4. 125 Plan-Family security Insurance Agency (Dept. 13)	\$2,730	\$2,496
5. Archiving (Dept. 13)	\$5,000	\$0
6. Services-Pre-Employment Exams & Tests (Dept. 14)	\$2,400	\$3,300
7. Fidelifax-Background Checks (Dept. 14)	\$1,600	\$2,248
8. Medical CDL Drug Testing (Dept. 14)	\$1,600	\$1,600
9. Employee Advisory Service (Dept. 14)	\$2,500	\$2,500
10. Consultant-Risk Management - to provide assistance to the Authority in the review of insurance coverage and continuation of a Comprehensive Coordinated Risk Management Program (Dept. 15)	\$29,000	\$36,500
11. Insurance Broker-HRH (Dept. 15)	\$42,000	\$40,000
12. GL Administrator (ESIS) (Dept. 15)	\$800	\$800
13. Services-Attorney General's Office - Assistance of Deputy Attorney General concerning a wide range of legal matters (Dept. 15)	\$40,000	\$40,000
14. Miscellaneous (Dept. 15)	\$10,000	\$10,300
15. Water Monitoring Costs - USGS SR @ Glen Gardner (Dept. 20)	\$15,100	\$17,600
16. Water Monitoring Costs - USGS Mulhockaway @ Van Syckel (Dept. 20)	\$5,400	\$5,500
17. Water Monitoring Costs - USGS Lockatong Creek @ Raven Rock (Dept. 20)	\$11,900	\$0
18. Water Monitoring Costs - USGS Raritan River @ Manville (Dept. 20)	\$44,300	\$45,100
19. USGS Continuous Water Quality for D&R Canal, Landing Lane (Dept. 20)	\$33,600	\$34,100
20. Water Monitoring-SBWA/URWA now RHA (Dept. 20)	\$2,000	\$2,000
21. Water Monitoring-SBMWA (Dept. 20)	\$1,500	\$1,500

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NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 3 (Cont.) - List of Category 5380 Items Recommended Professional Services**

Fiscal Year 2018

	ADOPTED F/Y17	PROPOSED F/Y18
22. Dash for the Trash (Dept. 20)	\$1,000	\$1,000
23. Lab Certification WPU/Water Sample Analysis (Dept. 20)	\$1,500	\$1,500
24. NJ Invasive Species Strike Team (Dept. 20)	\$300	\$300
25. Lockatong ISCO Monitoring (Dept. 20)	\$4,000	\$5,600
26. D&R Canal ISCO Monitoring (Dept. 20)	\$4,000	\$1,300
27. Cedar Grove Brook ISCO Monitoring (Dept. 20)	\$0	\$2,600
28. Services-Emergency Engineering Services (Dept 30)	\$2,500	\$2,500
29. Underground Storage Tank-CEA Report (Dept. 30)	\$11,000	\$11,000
30. Underground Storage Tank Groundwater Test (Dept. 30)	\$2,500	\$2,500
31. Services - USGS Cooperative Agreement River Gauging - Maintenance of Raritan Basin Stream Gauging Stations and the Delaware & Raritan Canal Gauging at Kingston per USGS/DWR/NJWSA Agreement (Dept. 31)	\$72,000	\$68,000
32. Services-USGS Spruce Run Gauging	\$17,000	\$17,000
33. Maintenance of two stations on Streams feeding Spruce Run not covered under State Cooperative Agreement (Dept. 31)		
34. Water Testing and Sampling to comply with the Safe Water Drinking Act (Dept. 31)	\$2,400	\$2,400
35. Services-Water Sampling and Testing as per NJDWR Requirements - A) RT 202 Stockpile Site (Dept 32)	\$5,500	\$5,700
36. Maintenance of USGS Gauges at Washington Crossing and Pricaris Waste Gate (Dept. 32)	\$20,000	\$20,000
37. Safety Suggestion Program, Poster and Promotional Materials, Safety Incentive Program (Dept. 36)	\$9,700	\$9,700
38. Pulmonary Testing and Physicals (Dept. 36)	\$5,000	\$5,000
39. Annual Contributions to Fire Companies and Rescue Squads (Dept. 36)	\$500	\$500
40. Hepatitis Vaccinations (Dept. 36)	\$800	\$800
41. Calibration for the Pota-Count Respirator (Dept. 36)	\$900	\$900
<b>TOTAL</b>	<b>\$498,140</b>	<b>\$491,839</b>

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 4 - Projected FY 2018 New Jersey Water Supply Authority Insurance Program**

<b>Policy</b>	<b>Raritan Basin System</b>	<b>Manasquan Reservoir System</b>	<b>Manasquan Water Treatment Plant and Transmission System</b>	<b>Total Premium</b>
<b>Property</b> Limit \$150 million, Limit \$25m BI Deduct: \$100k all perils \$250k Deduct dams, dikes / \$1m Deduct Canal flood	\$618,526	\$207,930	\$50,886	\$877,342
<b>General/Products Liability</b> Limit \$1 million Deduct: \$150k	\$114,067	\$10,665	\$2,214	\$126,946
<b>Environmental Impairment Liability</b> Limit \$10 million Deduct: \$100k	\$21,456	\$2,006	\$417	\$23,879
<b>Workers' Compensation</b> Limit \$1 million	\$205,001	\$26,354	\$27,613	\$258,968
<b>Employer Liability</b> Limit \$1 million	Included in Workers' Comp	Included in Workers' Comp	Included in Workers' Comp	Included in Workers' Comp
<b>Umbrella Liability</b> Limit \$23 million	\$283,672	\$26,521	\$5,507	\$315,700
<b>Business Automobile</b> Limit: \$1 million G/L, \$0 pd Deduct: \$50k, G/L	\$6,813	\$1,210	\$277	\$8,300
<b>Management Liability</b> Public Officials Liability Cyber Risk Fidelity & Crime Limit \$5 million/\$1million/\$1 million Deduct: \$100k/\$10k/\$50k	\$44,961 \$5,092 <hr/> \$50,053	\$4,204 \$476 <hr/> \$4,680	\$873 \$99 <hr/> \$3,531 <hr/> \$4,503	\$50,038 \$5,667 <hr/> \$3,531 <hr/> \$59,236
<b>Travel Accident</b> Limit \$2 million	\$876	\$82	\$17	\$975
<b>TOTAL:</b>	\$1,300,464	\$279,448	\$91,434	\$1,671,346

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 5 - Recap Of Allocation Of Headquarters General And Administrative Expenses Charged  
To The Manasquan Water Supply System**  
Fiscal Year 2018 (7/1/17-6/30/18)

	<b>Total Headquarters Charge</b>	<b>Manasquan Reservoir System</b>	<b>Manasquan WTP/TS</b>
Budgeted-Appendix I, amount to be charged to Manasquan System for F/Y18 (7/1/17-6/30/18)	\$792,622	\$682,867	\$109,755
F/Y16 Adjustment as per audited Expenditures:			
Budgeted as per rate schedule for F/Y16 (7/1/15-6/30/16). Amounts paid during F/Y16 to Raritan Basin System.	\$737,000	\$640,000	\$97,000
Actual allocation based upon audited expenditures F/Y16 (7/1/15-6/30/16) - Appendix II	\$707,416	\$609,460	\$97,956
Adjustments F/Y16	(\$29,584)	(\$30,540)	\$956
Net Allocation for F/Y2018 Budget	\$763,038	\$652,327	\$110,711
Estimate	\$763,000	\$652,000	\$111,000

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 6 - Proposed Capital Equipment Budget**  
Fiscal Year 2018

	Description	(R) Replacement (A) Addition	Year of Purchase	Dollar Value	Depreciation Reserve
<b>INFORMATION SYSTEMS</b>	(1) LAPTOP ADMIN	(R) FF2095	2008	1,500	1,159
	(1) LAPTOP WATERSHED	(R) FF2128	2009	1,500	1,565
	(1) LAPTOP ADMIN	(R) FF2184	2011	1,500	1,240
	(1) LAPTOP WATERSHED	(R) FF1943	2004	1,500	1,723
<b>FACILITIES</b>	(1) A/C UNIT FOR ENGINEER'S OFFICE SBPS	(A)		3,000	
	(1) ELECTRIC CHAIN HOIST SBPS	(R) EQ1854	2002	3,000	2,681
	(1) SINGLE DOOR - BAY 19	(R) ORIGINAL		3,500	
	(1) NJWA-04 REPLACEMENT	(R) TR2000	2006	35,000	24,617
<b>GROUNDS</b>	(2) BRUSH HOG MOWER DECKS	(R) EQ2064/EQ2065	2007	14,000	5,636
	(1) 6-7 TON DECK OVER TRAILER	(R) TR1631	1998	7,000	4,925
	(1) 22" STUMP CUTTER ATTACHMENT FOR POWER TRAC	(A)		2,200	
	(1) 18 CU. FT. BUCKET ATTACHMENT FOR POWER TRAC	(A)		1,000	
<b>CANAL</b>	(1) NJWA-09 PICKUP W/CAP	(R) TR2198	2011	35,000	22,528
	(1) NJWA-39 CLASS II PICKUP 4WD	(R) TR2001	2006	40,000	20,377
	(1) FLAIL MOWER (90") W/SPARE BLADES	(R) PE1778	2000	9,000	2,629
	(1) NJWA-52 MACK ROLLOFF	(R) TR0811	1988	225,000	71,877
<b>AUTO SHOP</b>	(1) PASSENGER/LIGHT TRUCK TIRE BALANCER -CANAL	(R) EQ1953	2005	7,000	2,996
	(1) VEHICLE FLEET MANAGEMENT SOFTWARE -CANAL	(R) FF1109	1990	3,500	2,000
<b>SAFETY</b>	(2) REPLACE TWO AED UNITS	(R) EQ2203/EQ2204	2012	4,000	2,642
<b>SECURITY</b>	(1) SECURITY VEHICLE - NJWA-03 FORD EXPLORER	(R) TR2235	2014	32,000	6,964

	TOTAL COST	\$430,200	\$175,559
LESS AMOUNT CHARGED TO DEPRECIATION RESERVE		(175,559)	
	NET TOTAL	\$254,641	
mc:a:capeqp.xlw	LESS AMOUNT CHARGED TO CAPITAL EQUIPMENT RESERVE		(\$150,000)
	TOTAL	\$104,641	
	AMOUNT FUNDED FOR FY2018	<b>\$104,600</b>	

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 7 - Estimate Of Interest Income For Fiscal Year 2018 Budget**

Fund/Reserve	TD Bank Funds	Long-Term Investments
Operating	\$800,000	\$0
Reserve for O & M	\$2,000,000	\$1,600,000
Pumping Reserve	\$600,000	\$0
Self-Insurance Reserve	\$300,000	\$800,000
Rate Stabilization Fund	\$80,000	\$0
Estimated Total	\$3,780,000	\$2,400,000
	\$3,780,000 x .25% =	\$9,450
	\$2,400,000 x 1.30% =	\$31,200
	Total	\$40,650
	Estimate	\$40,700

Short-Investments

TD Bank  
Managed Rate of .25%  
95% of the 30 Day Libor After the  
Compensating Balance Has Been Satisfied

Long-Term Investments

JP Morgan  
New Jersey State G/O Bonds  
Various Due Dates and Yields to Maturity

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 8 - Unanticipated Revenue**

Funds to be appropriated Into the Rate Stabilization Fund for Fiscal Year 2018

	Amount
F/Y2016 Net Year-End Balance	\$514,655.00

<u>Overdrafts</u>	<u>Invoice No.</u>	<u>Billed</u>	<u>Amount</u>
City of New Brunswick	1084	12/02/15	\$41,066.15
Hamilton Farms	1082	12/02/15	\$78.68
Heron Glen	1083	12/02/15	\$290.33
NJ American	1080	12/02/15	\$269,423.75
	1150	03/07/16	\$78,012.04
Raritan Valley Country Club	1122	1/15/16	\$3,275.39
	1085	12/02/15	\$4,210.33
Roxiticus	1086	12/02/15	\$667.79
	1149	03/02/16	\$331.17
Royce Brook Golf Club	1087	12/02/15	\$159.43
Somerset County Park Commission	1088	12/02/15	\$87.88
Stonebridge Community Associates	1135	02/03/16	\$502.04
	1081	12/02/15	\$179.90
Township of East Brunswick	1079	12/02/15	\$10,448.39
Trump National Golf Course	1089	12/02/15	\$1,951.43
Washington Twp. MUA	1090	12/02/15	\$115.19
		Total	\$410,799.89
		Amount used in FY2017	-\$206,052.00
		NET	\$204,747.89

Overdrafts Not Billed, Accrued through July, 2016

NJ American, Raritan Valley Country Club, Royce Brook Golf Club, Roxiticus, Somerset County Parks, Trump National Golf Course	\$62,589
<u>Other Sources of Funds</u>	

	Grand Total	\$781,991.90
	FY18 Budget	\$781,990.00

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 9 - Fund Balances as of 6/30/16**

\*\*Final\*\*

	REVENUE FUND	OPERATING ACCOUNT	OPERATING FUND	O & M RESERVE	LONG-TERM INVESTMENTS O & M RESERVE	TOTAL
BALANCE 6/30/16	\$784,554	\$2,191,956	\$816,063	\$2,176,178	\$1,618,190	\$7,586,941
Deduct: Accrued expenses to be paid as of 6/30/16			(249,277)			(249,277)
Deduct: June 1st billing, received			(764,579)			(764,579)
Adjusted Balances 6/30/16	\$784,554	\$2,191,956	(\$197,793)	\$2,176,178	\$1,618,190	\$6,573,085
 INCOME						
Reimbursement Manasquan						
Receipt of Headquarters Overhead Expenses for 7/10/16			160,000			160,000
Operating transfer	(750,000)	(2,100,000)	2,850,000			0
 EXPENSES						
O & M Expenses - (A/P 6/30/16)						
Includes accrued Payroll and Insurance thru 6/30/16			(405,858)			(405,858)
Capital items to be purchased by 6/30/16			(123,511)			(123,511)
Various Reserve contributions (one month)			0			0
PROJECTED BALANCE AT 6/30/16	\$34,554	\$91,956	\$2,282,839	\$2,176,178	\$1,618,190	\$6,203,717

Note 1. Unanticipated Revenues for F/Y 18

(overdrafts in F/Y 16 to be available for appropriation to Rate Stabilization for FY17/FY18)

		Less: FY2017 O & M reserve balance (3 mos required by resolution)	(3,467,256)
Hamilton Farms	\$78.68	Adjusted balance of funds available 6/30/16	2,736,461
Heron Glen	\$290.33		
NJ American	\$269,423.75		
Raritan Valley Country Club	\$3,275.39	Use of Available Funds	
	\$4,210.33		
Roxiticus	\$667.79		
	\$331.17	Unanticipated revenues (overdrafts in F/Y 16 to be available for appropriation to Rate Stabilization Fund for FY17/FY18 (Note 1)	(291,722)
Royce Brook Golf Club	\$159.43		
Somerset County Park Commission	\$87.88		
Stonebridge Community Associates	\$502.04	Rate Stabilization Fund Transfer for FY17	(554,151)
	\$179.90		
Township of East Brunswick 1079	\$10,448.39		
Trump National Golf Course 1089	\$1,951.43		
Washington Twp. MUA 1090	\$115.19		
	\$291,721.70	Projected Net Balance	<b>\$1,890,588</b>

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 10 - Projected Fiscal Year 2018 Operations & Maintenance Component**  
**Sales Base**

New Jersey Environmental Infrastructure Financing Program  
Debt Service Assessment

USER	DAILY ALLOCATION (MGD)	DAYS PER YEAR	TOTAL MG/YR	ANNUALIZED SALES BASE (MGD)
Duke Farms	0.075	N/A		0.000
East Brunswick Twp	8.000	365	2,920.000	8.000
NJ American Water Company	126.600	365	46,209.000	126.600
Mercer County Park Commission – Golf	0.132	184	24.300	0.067
Middlesex Water Co.	27.000	365	9,855.000	27.000
New Brunswick, City of	10.500	365	3,832.500	10.500
North Brunswick Twp.	8.000	365	2,920.000	8.000
Princeton University	0.150	365	54.750	0.150
Trenton Country Club	0.126	365	46.000	0.126
United Water Lambertville	0.490	365	178.850	0.490
Ridge at Back Brook	0.111	365	40.510	0.111
Roxbury Water Company	0.041	365	15.000	0.041
Royce Brook Golf Club	0.165	365	60.230	0.165
Hunterdon County Golf (Heron Glen)	0.079	365	28.800	0.079
Raritan Valley Country Club	0.012	365	4.380	0.012
East Windsor Municipal Utilities Authority	0.011	365	4.000	0.011
Somerset County Park Commission (Neshanic Valley Golf Club)	0.142	365	51.750	0.142

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 10 (Cont.) - Projected Fiscal Year 2018 Operations & Maintenance Component**  
**Sales Base**

New Jersey Environmental Infrastructure Financing Program  
Debt Service Assessment

USER	DAILY ALLOCATION (MGD)	DAYS PER YEAR	TOTAL MG/YR	ANNUALIZED SALES BASE (MGD)
Lamington Farms LLC (Trump National Golf Club)	0.170	365	62.100	0.170
Morris County Municipal Utilities Authority	0.079	365	28.830	0.079
Mt. Olive Township	0.010	365	3.554	0.010
Washington Township Municipal Utilities Authority	0.035	365	12.775	0.035
Borough of Glen Gardner	0.008	365	2.775	0.008
Roxiticus Golf Club	0.046	365	16.790	0.046
Hamilton Farm Golf Club	0.138	365	50.400	0.138
Springdale Golf Club	0.098	365	35.640	0.098
NJ Department of Corrections	0.025	365	9.250	0.025
Stonebridge Community Assoc.	0.081	365	29.565	0.081
Village Grande @ Bear Creek	0.074	365	27.010	0.074
Eastern Concrete Materials	0.023	365	8.500	0.023
Hunterdon Medical Center	0.031	365	11.000	0.031
Princeton University Operations	0.027	365	9.855	0.027
Renaissance at Monroe Condominium Association	0.014	365	5.110	0.014
<b>TOTAL SALES BASE</b>				<b>182.353</b>

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 11 - Operations And Maintenance Rate Component**  
Fiscal Year 2018

Funds Required for F/Y2018 Budget

Proposed Operating Expense and Capital Budget	\$13,542,487
Less Miscellaneous Revenues & Interest Income	(\$92,900)
Other Available Funds	(\$781,990)
Net Budget Requirement	\$12,667,597
Less: 182.339 x 171.00 x 61Days (Cash received in July and August for water used in May and June based on \$171.00/mg)	(\$1,901,978)
 Additional Revenue required to cover Operations and Maintenance Expense through 6/30/18	 \$10,765,619

Computation of Operations & Maintenance Rate for Fiscal Year 2018

Sales Base	
Period 7/1/17 to 4/30/18 304 days x 182.353 mgd	= 55,435.31 mg
 Required Operations & Maintenance Rate F/Y2018	
$\frac{\$10,765,619 \text{ mg}}{55,435.31 \text{ mg}}$	= \$194.00 mg

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 12 - Debt Service Rate Component For NJEIT Loan Repayment**

Effective July 1, 2017, (F/Y2018, July 1, 2017-June 30, 2018)

Total due on Principal and Interest \$1,664,100/ year

$$\text{Debt Service Rate for NJEIT Loan} = \frac{\$1,664,100/\text{ year}}{182.353 \text{ mgd} \times 365 \text{ days}} = \$25.00 / \text{mg}$$

\*This rate may be subject to future adjustments based on actual loan terms.

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 13 - Debt Service Rate Component For Round Valley Dam Improvements**

Effective July 1, 2017, (F/Y2018, July 1, 2017-June 30, 2018)

Debt Service Raised in Fiscal Year 2018	\$4,028,072/ year
Debt Service Fund Interest Income and Other Available Resources	(\$20,140)
Net Debt Service Obligation	\$4,007,932
20% Debt Service Coverage	\$0
Total to be Recovered by Rates	\$4,007,932
Debt Service Rate Effective 7/01/17 = $\frac{\$4,007,932}{182.353 \text{ mgd} \times 365 \text{ days}}$ = \$60.00 /mg	

\*This rate may be subject to future adjustments based on actual loan terms.

\*\* Assumes traditional financing

**NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM**

**Schedule 14 - Capital Improvement Program**  
Fiscal Years 2017-2021

PROJECT	ESTIMATED PROJECT COST	Period First Identified	Priority	Prior Years	Rate Assumption Per Million Gallons:				
					\$33	\$33	\$45	\$45	\$45
					FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
Refurbishment of the Main Pumps & Motors 1 & 6	\$ 1,300,000	2008	High	1,044,276	255,724				
Asset Management Plan for SBPS	\$ 260,000	2009	High	217,639	42,361				
Dredging Kingston & Amwell Road - Design engineering only	\$ 1,800,000	2006	High	1,484,376	150,000	165,624			
Dredging Kingston & Amwell Road - Construction Rt 202 Stockpile site only	\$ 1,500,000	2006	High	-		1,500,000			
Dredging Kingston & Amwell Road - Construction engineering only (bond)	\$ -	2006	High	-					
Dredging Kingston & Amwell Road - Construction \$35M (bond)	\$ -	2006	High	-					
Rehab Western Embankment Stockton Borough	\$ 3,750,000	2006	High	170,428	50,000	800,000	2,729,572		
Rehab Swan Creek Culvert & Aqueduct new project incl culvert liner work	\$ 2,500,000	2015	High	957,561	75,000	500,000	967,439.19		
Rehabilitation of the Cherry Tree Lane Spillway	\$ 1,200,000	2010	High	211,698	988,302				
Dam Impmnts as recommended by TRB (preliminary eng and Owners eng)	\$ 2,275,000	2013	High	1,834,609	150,000	290,391.18			
RV Res Dams-Rehab & Resource Preservation Project (eng only)	\$ 5,000,000	2015	High	-	3,000,000	2,000,000			
Round Valley Dam Improvements - Construction (bond) Est. \$60M	\$ -	2015	High	-					
Construction eng management for RV dam improvements (bond) Est. \$5M	\$ -	2015	High	-					
Owner's Engineer - constr of RV dam impvrmts (bond) Estimate \$325K	\$ -	2015	High	-					
Rehabilitate hydraulic valve on RV South Dam low level release (bond)	\$ -	2015	High	-					
Rehab 10-inch cast iron pipe connect RV-S dam vault to Foremain (bond)	\$ -	2015	High	-					
New 2D Inundation mapping for Round Valley and Spruce Run Reservoir	\$ 500,000	2015	High		100,000	400,000			
Rehab of Ten Mile Waste Gate	\$ 150,000	2010	High	10,730	139,270				
Dredging of Intake Pond and replace ice deflectors at SBPS	\$ 1,000,000	2005	High	-	150,000	850,000			
	\$ 21,235,000								
Rehab of Upper Canal Embankment - Raven Rock to Pralville	\$ 4,250,000	2006	Med High	100,114	50,000	1,000,000	1,000,000	1,000,000	1,099,886
Rehabilitation of Carnegie Lake Creek Aqueduct	\$ 150,000	2015	Med High	14,400	25,000	25,000	85,600		
Rehab of Canal Flow Control Structures Griggstown and 10-Mile Locks	\$ 1,500,000	2000	Med High					50,000	1,450,000
Refurbishment of the Main Pumps & Motors 4, 5, 7, & 8	\$ 2,800,000	2008	Med High		600,000	2,200,000			
Removal of Sediment from Rt. 1 Conduit	\$ 25,000	2013	Med High		25,000				
Rehab of the Landing Lane Spillway	\$ 800,000	2013	Med High		200,000	600,000			
Rehab of Spruce Run Weir	\$ 800,000	2016	Med High		60,000	740,000			
Repair of Pipe at Whitehead Road	\$ 500,000	2012	Med High					500,000	
Rehabilitation Work at Washington Crossing Spillway	\$ 300,000	2012	Med High					300,000	
Washington Crossing Waste Gate Repair / Replacement	\$ 50,000	2015	Med High		50,000				
Security System and Upgrades	\$ 225,000	2003	Med High	99,317	25,000	25,000	25,000	25,000	25,683.38
	\$ 11,400,000								
Alexauken Creek Aqueduct	\$ 750,000	2015	Medium					500,000	250,000
Roof Replacement North & South Towers	\$ 100,000	2011	Medium				100,000		
Replacement of Through the Wall HVAC Units in SRA	\$ 150,000	2011	Medium			150,000			
Rehab of Culvert at Station 2550+90 (1 mile upstream of 10-mile)	\$ 700,000	2008	Medium						700,000
Rehab of Traprock Spillway	\$ 1,200,000	2010	Medium						1,200,000
	\$ 2,900,000								
Dredging between Landng Lane and Route 18 - engineering	\$ -	2007	Low						
Dredging of Canal Between Lambertville and Route 1	\$ -	2015	Low						
Dredging of Canal Between Amwell Road and 10 Mile	\$ -	2015	Low						
Construction Bedload Stone Trap @ Wickecheoke Creek	\$ -	1995	Low						
Cutoff Wall in Shipetaukin Creek Guard Bank	\$ -	2005	Low						
Wickecheoke Creek Gates Abandonment	\$ -	2015	Low						
Rehab of Waste Gate d/s of 10 Mile - woodwork on facade	\$ -	1990	Low						
Rebuild Stone Embankment at the 10 Mile Waste Gate	\$ -	1990	Low						
Rehab of Gold Run Spillway	\$ -	2008	Low						
Rehab of 6-Mile Run Culvert Headwall	\$ -	2008	Low						
Carnegie Lake Culverts Investigation / Isolation	\$ -	2015	Low						
Raven Rock retaining wall downcanal of Lock	\$ -	2015	Low						
Refurbishment of the Main Pumps & Motors 3 & 9	\$ -	2015	Low						
Refurbishment of the Main Pumps & Motors 2 & 10	\$ -	2015	Low						
Canal Culvert Rehabilitation 2249+79 (Snydam)	\$ -	2015	Low						
Canal Culvert Rehabilitation 2661+86 (Randolph Brook)	\$ -	2015	Low						
Canal Culvert Rehabilitation 2992+34 (Mile Run Culvert)	\$ -	2015	Low						
Concrete Repairs at the Sullivan Way Aqueduct	\$ -	2007	Low						
Rehab of Spillway u/s of Griggstown Lock	\$ -	2010	Low						
Rehab of the Four Mile Spillway	\$ -	2010	Low						
Pipeline Evaluation - Whitehouse Release Pipeline	\$ -	1990's	Low						
Pipeline Evaluation - RV Force Main	\$ -	1990's	Low						
	\$ -								
<b>TOTAL</b>	<b>\$ 35,535,000</b>			<b>6,145,148</b>	<b>6,135,656</b>	<b>11,246,015</b>	<b>4,907,611</b>	<b>2,375,000</b>	<b>4,725,569</b>
<b>Balance CIP</b>				<b>14,593,432</b>	<b>10,654,218</b>	<b>1,604,644</b>	<b>(307,818.92)</b>	<b>312,329</b>	<b>(1,418,092)</b>

The estimated project costs listed includes engineering, cultural, construction and miscellaneous expenses.

Funds in CIP as of June 30, 2016 is \$13,343,432 plus \$1,250,000 from Capital Improvements Investments

Estimated cost for dredging of the Canal between Kingston & Amwell Road is \$35,000,000 plus engineering & Cultural Resource inspections during construction.

The cost of removal of sediment from the 202 stockpile site is included in the CIP since it will not be part of the NJEIT bonding. Engineering and cultural costs during construction will be included in loan for project.

Round Valley Dam Improvements: Costs of remedial work will need to be bonded. Preliminary estimate \$60 million plus engineering construction management and inspection.

This does not include expenditure of \$13,967.21 for Sinkholde Emergency Repair D&R 1265-00

**RARITAN BASIN SYSTEM  
CAPITAL IMPROVEMENT PROGRAM  
Fiscal Years 2017 – 2021  
Updated – September 2016**

The following is a description of projects that the Authority anticipates being funded from the Capital Improvement Program (CIP) in Fiscal Years 2017 – 2021. Discussion also includes projects that may be delayed beyond FY 2021 due to funding.

#	<b>HIGH PRIORITY</b>
1	Refurbishment of the Main Pumps & Motors 1 & 6 at SBPS
2	Asset Management Plan for SBPS
3	Dredging Kingston & Amwell Road - Design engineering only
4	Dredging Kingston & Amwell Road - Rt 202 Stockpile site only
5	Dredging Kingston & Amwell Road - Construction engineering only (bond)
6	Dredging Kingston & Amwell Road - Construction \$35M (bond)
7	Rehab Western Embankment Stockton Borough
8	Rehab Swan Creek Culvert & Aqueduct new project includes culvert liner work
9	Rehabilitation of the Cherry Tree Lane Spillway
10	Dam Improvements as recommended by TRB (preliminary engineering and Owner's Engineer)
11	Design improvements to RV dams – Engineer of Record design engineering only
12	Round Valley Dam Improvements - Construction \$60M (bond)
13	Construction Eng. management for RV dam improvements (bond Est. \$5M)
14	Owner's Engineer – construction of RV dam improvements (bond) Est. \$325K
15	Rehabilitate hydraulic valve on RV South Dam low level release (bond)
16	Rehab 10-inch cast iron pipe connect RV-S dam vault to Forcemain (bond)
17	New 2D Inundation mapping for Round Valley and Spruce Run Reservoir
18	Rehab of Ten Mile Waste Gate
19	Dredging of Intake Pond and replace ice deflectors at SBPS
	<b>MEDIUM / HIGH PRIORITY</b>
20	Rehab of Upper Canal Embankment - Raven Rock to Prallsville
21	Rehabilitation of Carnegie Lake Aqueduct
22	Rehab of Canal Flow Control Structures Griggstown and 10-Mile Locks
23	Refurbishment of the Main Pumps & Motors 4, 5, 7 & 8
24	Removal of Sediment from Rt. 1 Conduit
25	Rehab of the Landing Lane Spillway
26	Rehab of Spruce Run Weir
27	Repair of Pipe at Whitehead Road
28	Rehabilitation Work at Washington Crossing Spillway
29	Washington Crossing Waste Gate Repair / Replacement

30	Security System Upgrade
	<b>MEDIUM PRIORITY</b>
31	Alexauken Creek Aqueduct
32	Roof Replacement North & South Towers
33	Replacement of Through the Wall HVAC Units in SRA
34	Rehab of Culvert at Station 2550+90 (1 mile upstream of 10-mile)
35	Rehab of Trap Rock Spillway
	<b>LOW PRIORITY</b>
36	Dredging between Landing Lane and Route 18 - engineering
37	Dredging of Canal Between Lambertville and Route 1
38	Dredging of Canal Between Amwell Road and 10 Mile
39	Construction Bedload Stone Trap @ Wickecheoke Creek
40	Cutoff Wall in Shipetaukin Creek Guard Bank
41	Wickecheoke Creek Gates Abandonment
42	Rehab of Waste Gate d/s of 10 Mile - woodwork on façade
43	Rebuild Stone Embankment at the 10 Mile Waste Gate
44	Rehab of Gold Run Spillway
45	Rehab of 6-Mile Run Culvert Headwall
46	Carnegie Lake Culverts Investigation / Isolation
47	Raven Rock retaining wall downcanal of Lock
48	Refurbishment of the Main Pumps & Motors 3 & 9
49	Refurbishment of the Main Pumps & Motors 2 & 10
50	Canal Culvert Rehabilitation 2249+79 (Suydam)
51	Canal Culvert Rehabilitation 2661+86 (Randolph Brook)
52	Canal Culvert Rehabilitation 2992+34 (Mile Run Culvert)
53	Concrete Repairs at the Sullivan Way Aqueduct
54	Rehab of Spillway u/s of Griggstown Lock
55	Rehab of the Four Mile Spillway
56	Pipeline Evaluation - Whitehouse Release Pipeline
57	Pipeline Evaluation - RV Force Main

### **Item #1 Refurbishment of Main Pumps and Motors at SBPS**

#### **Item #2 Asset Management Plan for SBPS**

The South Branch Pumping Station (SBPS) was constructed in the 1960's to pump water into Round Valley Reservoir. The main pumps, motors and associated equipment at the station are infrequently operated (usually one month a year to maintain the pool elevation, as required). Maintenance pumping is done periodically to maintain the equipment. As the demand on Round Valley Reservoir increases, so will the need to pump water through the station. There may also be the need in the future to be able to reliably refill the reservoir following a period of sustained drawdown.

Approximately 1.9 billion gallons of water were pumped into Round Valley Reservoir during the April – May 2009 pumping program. Lessons learned from the program demonstrated the need to repair the baseplates under the pumps and motors to prevent movement and maintain alignment between the pumps and motors.

The Authority retained Hatch Mott MacDonald (HMM) to prepare an asset management plan for the SBPS and prepare specifications for the refurbishment of the pump units. All ten pumps have similar baseplate and alignment problems, but only two (pump assemblies 1 & 6) are being refurbished at the present time under the current contract.

Inspections of the motors also showed the deterioration of the stator winding insulation. Deterioration of the insulation of the stator windings is attributed to the age of the units and the humidity in the building. The extent of the deterioration in each unit is unknown because the entire stator cannot be inspected without full disassembly of the motors at an authorized shop. Other service requirements to the units can only be ascertained when the units are removed and disassembled.

Refurbishment of the first two pump and motor assemblies was awarded to Longo Electrical-Mechanical, Inc. of Wharton, New Jersey in 2013 for an amount not to exceed \$1,239,700.00. Approval was also authorized for allowance items specified in the bid documents for an amount not to exceed \$445,200.00. These allowance items are for parts needed for the pump refurbishment that could not be determined until the units were undergoing refurbishment. To date only \$33,381.60 for the purchase of two casing rings has been authorized from the allowance items.

Units 1 and 6 were reinstalled and reconnected in the spring 2016. The pumps and motors were tested during a pump period that extended from early May until the second week of June, which also served as acceptance testing of the rehabilitated pump and motor units 1 and 6. Over 700 million gallons were pumped to Round Valley Reservoir during the entire 2016 pumping program. Total water volume was limited due to lack of rainfall and low flows in the Raritan System's rivers. The contractor only has punch list items remaining to complete their contract.

Refurbishment of the next four pump and motor sets, units 4, 5, 7, and 8, is planned for FY 2017 and 2018. An analysis of the refurbishment work undertaken on pumps 1 and 6 will be conducted to formulate a "lessons learned" report and modify the scope and technical

specifications as necessary to try to address some of the delays experienced by the Contractor. With the foreseen sustained pumping periods in the future (due to reservoir drawdown and refilling in the near future), the demands on these pumps will increase, necessitating the continued refurbishment of the remaining pumps and motors.

**Item #3 Dredging between Kingston and Amwell Road – Design Engineering**

**Item #4 Dredging between Kingston and Amwell Road – Rt 202 Stockpile Site**

**Item #5 Dredging between Kingston and Amwell Road – Construction Engineering (bond)**

**Item #6 Dredging between Kingston and Amwell Road – Construction \$35M (bond)**

Flow in the 10.5-mile reach of the Canal between Lincoln Highway (Route 27 just east of Kingston) and Amwell Road in Franklin Township, Somerset County is being hindered by accumulated sediment. The flow restriction is aggravated by weed growth during the summer months. To compensate for these flow restrictions, the Canal is operated at a level that is higher than desirable and causes water to overtop normally dry spillways. Five major water purveyors divert water from the Canal, downstream of this area, including North Brunswick Township, New Jersey American Water, Middlesex Water Company, East Brunswick Township and the City of New Brunswick.

Staff took cross-sections in this reach during 2007 and 2008 to estimate the quantity of accumulated sediment. Analysis of the cross-sections indicated that an estimated 250,000 cubic yards of sediment have accumulated in the Canal and must be removed and properly disposed.

Additionally, the US Route 202 sediment stockpile site in Delaware Township, Hunterdon County (just north of Lambertville) is reaching capacity. Removal and disposal of up to 53,000 cubic yards of sediment from this site is included as part of the dredging project.

Professional engineering consultant Urban Dredging Consultants Joint Venture (Urban Dredging) was selected to plan the dredging program including development and execution of a proactive public participation program. A bathymetric survey was conducted to confirm the quantity of sediment to be removed. The bathymetric survey confirmed the estimated quantity to be removed. Sediment cores were taken to determine the characterization of the material to be removed.

Urban Dredging considered the following four methodologies for the proposed dredging project: mechanical excavation (in dry), mechanical dredging (in wet), hydraulic dredging with Geobags, and hydraulic dredging with mechanical dewatering. All four considered methodologies have environmental concerns but hydraulic dredging methodologies reduce many of these concerns since the slurry would be conveyed in a pipe floating in the Canal to a temporary staging area for dewatering.

An Environmental Impact Assessment and the necessary public information meetings were held between 2010 and 2013. While not finalized, five access points and the staging area are being targeted and the completion of the design documents is proceeding. The one major remaining factor to be decided on is the disposal (final destination) of the dredged material.

Removal of sediment from this reach is planned for FY 2018 - 2020. The application for funding through the New Jersey Environmental Infrastructure Trust (NJEIT) will be resubmitted and formulated to cover the full estimated construction cost of the dredging and other allowable expenses, currently estimated at \$45,000,000.00. The costs shown in the CIP include design costs and cultural resource services incurred before the loan is authorized. The Authority also solicited a preliminary cost proposal from Urban Dredging for full-time inspection and construction management (for the expected 3 years of dredging), which can also be bonded with the Construction cost.

Removal and disposal of up to 53,000 cubic yards of sediment from the US Route 202 stockpile site cannot be funded through the NJEIT and is also included in this CIP. The estimated cost for removal and disposal of this sediment is \$1,500,000.00.

#### **Item #7 Rehabilitation of the Western Embankment, Stockton Borough**

The one mile long reach of the western embankment between the Prallsville Lock at Station 155+00 and the railroad bridge crossing over the Canal at Station 205+00 is a narrow embankment that separates the Canal from the Delaware River. During extreme flooding events of the Delaware River, the embankment is threatened by the extreme floodwaters from the river. It was overtopped during major storm events in 2005 and again in 2006, when the embankment breached. In 2011, Tropical Storms Irene and Lee caused severe flooding of the Delaware River. While the embankment did not breach, over 1,000 linear feet of the embankment experienced slope failure on the Canal side due to the saturation of the embankment from the river, and significant amounts of material slid into the Canal compromising the cross-sectional area of the embankment.

Emergency actions were taken to prevent a breach of the embankment following the storms in 2011. These emergency actions included placement of quarry processed blend via conveyor belt from the opposite side of the Canal due to the unsafe nature of the embankment. The quarry processed blend was put in with varying levels of compaction. While a breach was prevented, additional long-term repair / reinforcement work on the embankment is required to reinforce the repairs. The embankment is compromised by extreme flooding events in the Delaware River resulting in the continued potential of further breaches. The embankment may need improvements to increase the factor of safety for resisting slope failure due to the saturation when the river is approaching the top of the embankment, or the threat of overtopping the entire embankment causing erosion. The possibility of installation of a positive seepage barrier in the embankment in the form of pressure grouting or steel sheeting is being considered.

A professional engineering services contract was awarded in March 2014 to a team led by TranSystems. Hunter Research was selected as the Cultural Resource consultant for the project. To date, borings were taken through the embankment and preliminary meetings were held with the permitting agencies. The Authority is reviewing a Schematic Design Report from the consultant. At this time, an estimated construction cost of \$3.75M is included in the CIP, and is projected in FY 2018 & FY 2019.

### **Item #8 Rehabilitation of the Swan Creek Culvert & Aqueduct**

The Swan Creek Aqueduct and culvert is located at approximate Station 363+00 on the Canal in the City of Lambertville, Hunterdon County. The aqueduct structure was erected to carry the Canal over Swan Creek with the secondary function to act as a spillway for the Canal. An adjacent culvert also contributes to the conveyance of Swan Creek under the Canal, the towpath, and the former Belvedere-Delaware Railroad. The aqueduct is a concrete and masonry structure that was partially rehabilitated in 1989. The waste gates were replaced, some of the masonry was reconstructed, and some of the existing concrete was repaired with shotcrete.

Repairs were made to the structure in 2006 following major flooding events on the Delaware River. Significant leakage occurred through the masonry wall on the southeast part of the structure where Swan Creek enters the opening under the aqueduct. A contractor was hired on an emergency basis to pump pressure grout behind the wall where a sinkhole had formed resulting from the seepage. The grout significantly slowed the leakage, but did not stop it completely.

A jet grout seepage cutoff wall was constructed in April 2009 to eliminate seepage through the wingwall. Most of the seepage was stopped with the jet grout seepage cutoff wall. An additional phase of repairs was conducted in 2014, which included rehabilitation of masonry and concrete and replacement of the bent stem for one of the two waste gates.

The scope of work for the 2014 repair project was reduced significantly during construction due to dewatering concerns, as well as safety concerns related to the corrugated metal liner in the north culvert, which shows signs of being corroded and limits the amount of work which could be conducted safely in the culvert.

A Scope of Services is being developed to retain a new consulting engineer to design a new structural liner to guard against further deterioration and concrete spalling. The new design engineer will have to address all of the concerns developed during the 2014 construction, as well as consider design options for the culvert rehabilitation and reinforcing which will not significantly reduce the volumetric flow rate capacities of the culverts.

### **Item #9 Rehabilitation of the Cherry Tree Lane Spillway**

The Cherry Tree Lane Spillway is located at Station 1269+65 of the Canal approximately 650 feet upstream of the intersection of Whitehead Road and the Canal in Lawrence Township, Mercer County. The spillway structure is located along the Canal right bank with a longitudinal centerline oriented in a northeast direction. The spillway consists of a 201 feet long concrete control overflow weir at elevation 55.5 with a central spillway crest, approximately 82 feet long, at elevation 55. The spillway discharges to a concrete apron that conveys the flow to an arched culvert under the Route 1 Highway (Trenton Freeway Section).

In 2010, the spillway was found to be in poor condition. The concrete was spalled and cracked, rebar was exposed, and there were significant sections that exhibited mortar loss and exposed concrete aggregate. The crest was eroded, spalling and crumbling. The downstream concrete outlet apron had large voids, was cracked and showed exposed rebar and concrete aggregate. In 2013, a large sinkhole downstream of the spillway was backfilled by Canal maintenance crews.

The Authority proposed rehabilitation of the spillway and the outlet discharge apron to eliminate the current unwanted water spillage and the unsafe structural conditions. The spillway is still functional, but the progressive deterioration threatens its structural integrity. Failure of the spillway would adversely affect the water supply function of the Canal.

In 2014, a professional services contract was executed with Johnson, Mirmiran & Thompson (JMT), who developed a schematic design report for full repair of the structure and presented the report to the D&R Canal Commission (DRCC). Following their initial inspections which revealed that the foundation material under the spillway structure was eroded and undermined, an emergency repair was conducted on the spillway in December 2014. A construction contract in the amount of \$906,625.00 was awarded to South State, Inc. of Bridgeton, New Jersey in 2016. Construction started in August 2016 and was moving on a fast schedule as of the writing of this document in September 2016.

**Item #10 Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project  
(preliminary engineering and Owner's Engineer preconstruction)**

**Item #11 Design improvements to RV dams – Engineer of Record – design engineering only**

**Item #12 Round Valley Dam Improvements - Construction \$60M (bond)**

**Item #13 Construction engineering mgmt for RV dam improvements (bond Est \$5M)**

**Item #14 Owner's Engineer – Construction of RV dam improvements during construction  
(bond Est \$325K)**

In connection with the 2013 Formal Dam Inspection, the Authority convened a Technical Review Board (TRB) in April-May 2014 comprised of experts in the fields of dam construction on limestone formations, evaluation of critical dam construction features, and geology related to dam construction. This was the first TRB that was assembled to review information about the construction and operation of the Round Valley (RV) Reservoir and the first one in 20 years to look at operations data at Spruce Run (SR) Reservoir. The SR and RV Dams were constructed in the 1960's. The TRB recommended additional information gathering of the construction plans and records for the RV dams, and the installation of piezometers at the three embankments at RV Reservoir. The TRB also recommended installation of additional piezometers at SR Dam. The TRB recommended that the Side Scan Sonar conducted in the mid-1980s at the SR Reservoir be repeated and that the drainage pipes at the toe of the SR Dam be visually inspected by remotely operated cameras. The TRB also recommended that a follow-up to the first TRB be performed for RV and SR.

The existing contract with Gannett Fleming, the engineering consultant, was amended to oversee the performance of the above noted work including but not limited to subcontracting the specialty drillers for the installation of the piezometers at all four dams, subcontracting for the performance of the Side Scan Sonar, and overseeing the follow-up TRB meetings for RV and SR.

In preparation for the follow-up RV TRB, Authority staff was tasked with compiling and digitizing all available records of the RV embankments. A searchable database was constructed

to assist the TRB in their analysis of all of the available data pertaining to the construction and maintenance of the embankments. The RV TRB was conducted in July 2015 and was specifically slated to conduct a Potential Failure Mode Analysis (PFMA) on the three RV Embankments (RV South, RV North, and RV Dike). In their report on the PFMA, the TRB recommended that the Authority “begin budgeting, engineering, and planning for the required modifications.”

At a minimum, it is anticipated that construction will be large in scale and include the following:

- Installation of a new blanket drain system on the downstream slopes of all three embankments at Round Valley. The new blanket drains will act to filter the existing seepage.
- Installation of new toe drains to filter, collect, and convey embankment and foundation seepage safely away from the structures.
- Installation of additional fill to flatten the downstream slopes to increase the stability factor of safety.
- Foundation rock grouting, particularly at the embankments’ abutments to eliminate potential sources of seepage.

These improvements would be made to all three of the RV embankments, with an aggressive construction schedule aiming for construction during the 2018 calendar year. The cost of these improvements will have to be bonded by the Authority, with preliminary cost estimations (with contingencies) in excess of \$60M.

The construction and planning of this project is beyond the scope of this CIP document, and is well documented in the existing draft reports.

Gannett Fleming (GF) has been procured to provide further engineering and consulting services during design and construction of the Round Valley Dam rehabilitation. As has been discussed in the Preliminary Tentative Design and Construction Schedule for Round Valley Rehabilitation Project (dated February 22, 2016), the Request for Proposals (RFP) soliciting the engineer of record issued in March 2016, and the addendum to the RFP issued on April 26, 2016, the Authority will utilize GF in the role of Owner’s Engineer during the design and construction of the project. While there will be a separate engineer of record, GF will continue to provide advice and consultation to Authority staff during this very important project.

It is noted that the tasks have been listed separately in the CIP chart since part of the work would take place during design (Item #11 and is not eligible for bonding. The work to take place during construction shall be bonded and is not part of the CIP (Item #14).

The TRB also recommended that a follow-up TRB and PFMA take place for Spruce Run Dam. The SR follow-up TRB was scheduled for mid-October 2016, but had to be rescheduled for early 2017.

**Item #15 Rehabilitate hydraulic valve on RV South Dam low level release**

The existing Round Valley (RV) low level release valve was last serviced in 1992 when a hydraulic valve actuator and hydraulic control system were installed at the Round Valley South Tower. This hydraulic system, with hoses reaching down to 180 feet below the water surface to the low level release valve, replaced the out-of-service original control system. The existing hydraulic lines are showing signs of leakage while under operating pressures, and must be replaced if the leak cannot be pinpointed.

The replacement of this hydraulic line to the underwater actuator must be done with commercial divers due to the extreme depths. The entire system will be analyzed to determine if any additional repairs are required. The engineer selected through the RFP process will also make recommendations regarding the selection of more modern synthetic oil to replace the existing mineral oil, which is not ideal for this application and may have exceeded its useful service life. It is noted that the rehabilitation of the hydraulic valve is now expected to be repaired as part of the large scale rehabilitation at RV, and therefore will be bonded.

**Item #16 Rehabilitation of 10-inch cast iron pipe connect RV-S dam vault to Forcemain**

The existing 10-inch cast iron pipe connecting the 108-inch RV Force Main to the RV South Dam Vault was installed as part of the original construction of the Force Main. Through the use of dye testing, Authority staff confirmed that an underground leak exists somewhere in this 10-inch cast iron pipe. This pipe is installed underground with flange connections which are prone to leak in buried applications. The pipe is also subject to internal corrosion. It must be determined if the best course of action will be to line the pipe with a cast iron pipe lining material or to replace it by direct burial. It is noted that the rehabilitation of the 10-inch cast iron pipe that connects the RV South Dam vault to the RV Force Main is now expected to be repaired as part of the large scale rehabilitation at RV and therefore will be bonded.

**Item #17 New 2-dimensional (2-D) Inundation mapping for Round Valley and Spruce Run Reservoir**

In 2014 and 2015 the Authority upgraded all of the inundation mapping (attachments to the Emergency Action Plan) for all four of the high hazard dams at the Spruce Run and Round Valley Reservoir Complex in Clinton. This mapping upgrade constituted taking the old inundation model one dimensional (1-D) data that was originally drawn onto high scale USGS mapping and transferring it into a GIS overlay of modern aerial images. This work produced maps that were significantly more detailed than the previous mapping, and show the location of residential and commercial structures that may be affected by flooding during a dam emergency.

The drawback regarding these upgraded maps is that the inundation areas are still dependent upon the 1-D computational data from 1980. The 1-D mapping is based on empirical calculations based on cross-sections taken at large intervals along the rivers. It is uncertain how accurate this modeling would be in the event of an actual emergency.

Authority staff feels that it is prudent to invest in a new study where computers model the flows based on 2-D topographic squares in the flood zones. The degree of accuracy of this method far surpasses the existing 1980 1-D studies. Modern deliverables will also include animations as well as color coded mapping layers depicting depth of water in any particular area in a time

sequenced video. It is also possible to better simulate the effect of tidal fluctuations on the inundation area, which was not possible to analyze at the time of the initial models.

Authority staff has been researching computer program options and deliverables, and planning the anticipated scope of work to procure a consultant engineering firm to construct this inundation mapping model. The procurement for the modeling effort is being delayed at least until the Round Valley improvements schematic designs are complete since the final shape of the embankments will affect the study.

#### **Item #18 Rehabilitation of the TenMile Waste Gate**

The TenMile Waste Gate is located just upcanal of the Ten Mile Lock. It is a concrete structure with two sluice gates that are routinely opened and closed to adjust discharge flow from the Canal to the Millstone River near its confluence with the Raritan River. Canal flow in excess of that required by downcanal water purveyors is used to augment flow in the Raritan River and to control levels in the Canal. The existing waste gates were installed in 1958 and are in need of replacement. One of the two gates is inoperable and the second gate is difficult to operate. Construction plans and specifications to replace the existing gates have been prepared by Authority staff. It is anticipated that the gates will be replaced in FY2017.

#### **Item #19 Dredging of Intake Pond and replacement of ice deflectors at the South Branch Pumping Station**

The intake pond at the South Branch Pumping Station (SBPS) was designed with a capacity of 21,000,000 gallons during low flow pumping periods. Sediment has accumulated in the pond reducing its capacity, thereby reducing the efficiency of the pumping operation. Sediment was last removed from the pond in 1986 when it was removed in the dry and stockpiled in a temporary site at the station where it is used as needed.

Also at the SBPS, there are twelve steel wide flange beams set in a concrete bed that function as an ice deflector at the release works of the channel of the South Branch Raritan River adjacent to the pond. The ice deflectors protect the structure from damage from ice and trees floating down the river. They are deteriorating and need to be replaced. The ice deflectors are intended to be repaired as part of the pond dredging project.

Authority staff is currently procuring the services of a consultant to provide professional engineering services for this project.

#### **Item #20 Rehabilitation of the Upper Canal Embankment - Raven Rock to Prallsville**

Since September 2004, four major flood events in the Delaware River have overtopped the Canal embankment between the Raven Rock intake and Prallsville. The embankment that separates the Canal from the River in that stretch is very narrow and is inaccessible by vehicle, necessitating maintenance by boat, which is challenging. During the large flood events several areas in this stretch experienced deterioration, typically initiated by fallen trees.

Following the major river flooding resulting from Tropical Storms Irene and Lee in 2011, these areas were attended to by Authority forces utilizing emergency measures to prevent furtherance of the ongoing erosion. Since all of the work had to be done by hand using barges to supply

materials, riprap and cement bags were used to close openings in the embankment. These temporary repairs require replacement with more substantial and historically appropriate materials.

The Authority identified eight primary locations in this reach that required investigation, design and repair. The consultant procured for the design of the repairs was charged with inspecting the entire embankment from Raven Rock to Prallsville and identifying any other additional locations that should be considered for repair.

A professional services contract was awarded to a team led by GZA GeoEnvironmental as the engineers for the repairs of the embankment. PS&S was selected as the Cultural Resource consultant for the project.

A schematic design report identified and prioritized seventeen additional areas that warrant attention. Conceptual approval has been received from the State Historic Preservation Office and the Delaware and Raritan Canal Commission.

GZA's preliminary conceptual construction cost estimate for the eight primary damaged embankment repairs is approximately \$2.52 million, however, the budget has been increased due to the expectation that new repair areas will need to be addressed based on recent inspections. Staff will need to prioritize repairs of the eight originally noted sites and the seventeen additional areas. Construction of this project is anticipated to take place over several years due to access, environmental, and wildlife constraints.

#### **Item #21 Rehabilitation of Carnegie Lake Aqueduct**

The Carnegie Lake Aqueduct comprises a concrete structure that crosses over the Millstone River at Station 1739+00 of the D & R Canal. Previous inspections indicated that the aqueduct structure was not structurally deficient, although minor cracking and concrete spalling at isolated locations was observed. It was not thought that these conditions would compromise the structure's integrity. A small leak was observed at the northerly wing-wall of the aqueduct near the lake's staff gauge.

In 2016 the Authority retained the services of a diving services contractor to analyze the condition of the structure. The result of the inspection did not reveal any items in urgent need of repair. It is anticipated that some relatively minor repairs will have to be made during the next three years.

#### **Item #22 Rehabilitation of Canal Flow Structures at the Griggstown and Ten Mile Locks**

The Canal was converted into a water supply source in the 1940s and 1950s. This included conversion of the original locks into flow control structures with sluice gates to regulate the flow. There are nine flow control structures located along the length of the Canal that were inspected and evaluated by Schnabel Associates in 2001 to determine the required rehabilitation. The structures include Raven Rock Lock, Prallsville Lock, Lambertville Lock, Kingston Lock, Griggstown Lock, Ten Mile Lock, South Bound Brook Lock, Five Mile Lock and the Ten Mile Waste Gate.

In addition to the replacement many of the flow control gates, there are a variety of repairs needed at each of the sites. The deficiencies range from minor cracking and spalling of the concrete to repair of undermining of the locks.

The Authority plans to phase in gate replacement and structural rehabilitation based on operational priorities.

### **Item #23 Refurbishment of Main Pumps and Motors No. 4, 5, 7, & 8**

The South Branch Pumping Station (SBPS) was constructed in the 1960s to pump water into Round Valley Reservoir. The main pumps, motors, and associated equipment at the station are infrequently operated. Maintenance pumping is done periodically to maintain the equipment. As the demand on Round Valley Reservoir increases, so will the need to pump water through the station. There may also be the need in the future to be able to reliably refill the reservoir following a period of sustained drawdown.

The Authority retained Hatch Mott MacDonald (HMM) to prepare an asset management plan for the SBPS and prepare specifications for the refurbishment of the pump units. All ten pumps have similar baseplate and alignment problems, but only two (pump assemblies 1 & 6) of the ten were refurbished under the current contract.

There clearly will be a need for a significant pumping program within the next few years. The Authority has targeted the need to rehabilitate four more pumps, specifically pump assemblies 4, 5, 7, and 8. Lessons learned from the rehabilitation of pumps 1 & 6 will be used to fine tune the efforts in rehabilitating the next four pumps.

### **Item #24 Removal of Sediment from Route 1 Conduit**

The U.S. Route 1 Conduit is a twin-barrel, 13' x 8' concrete box culvert constructed in the 1950s. It is approximately 6,050 feet long and carries the Canal water under U.S. Route 1 from Southard Street to the north of Mulberry Street, in the City of Trenton, Mercer County. This section of roadway is locally named the "Trenton Freeway."

In addition to carrying the Canal water, this conduit serves as the storm drainage outlet for the highway directly above the 300 +/- acre area immediately west of the conduit in the City of Trenton. As a result of highway storm drains and local storm drainage pipes discharging into the westerly barrel of this enclosed section of the Canal, sediment accumulates in the conduit and interferes with its flow carrying capacity. This is a recurring problem necessitating removal of the sediment. Approximately 6,000 cubic yards of sediment was last removed from the west barrel in the 1980s.

Currently, the flow carrying capacity of the conduit is again being impacted by accumulated sediment. In a meeting in early 2016, NJDOT accepted responsibility for this project and is preparing plans and specifications to have the sediment removed. A small amount has been left in the Capital Improvement Plan in case the NJDOT requires assistance from the Authority.

### **Item #25 Rehabilitation of the Landing Lane Spillway**

The Landing Lane Spillway is located immediately upcanal of the Landing Lane Bridge in the City Of New Brunswick, Middlesex County. This spillway was rehabilitated in 1991 with the construction of a concrete cutoff wall in the Canal to control leakage from the Canal. Timber planks were installed on the concrete wall for historical appearance. The spillway was finished with hand-placed stones across the crest and the river side slope. The stones were laid in a sand bed without the benefit of mortar. The stones are being dislodged and the spillway crest needs to be stabilized. The planned rehabilitation is to remove all stone from the crest, pour a concrete slab and reset the stones with ties to the concrete slab in a similar fashion as recently completed Canal spillways.

### **Item #26 Rehabilitation of the Spruce Run Weir**

The Spruce Run Weir is a reinforced concrete structure that crosses the Spruce Run downstream of the Spruce Run Reservoir just upstream from its confluence with the South Branch of the Raritan River. The USGS gaging station on the west bank of Spruce Run measures the total flow of water that is discharging from Spruce Run, including release through the pipelines or overflow at the spillway. Authority staff has been making “patchwork” repairs to the spillway over the past decade. The concrete structure is severely degraded; however, with large amounts of exposed reinforcing steel and visible through seepage suggesting that the structure has met the end of its useful life.

### **Item #27 Repair of Pipe at Whitehead Road**

A sinkhole developed in the towpath 1,600 feet upcanal from Whitehead Road in Lawrence Township, Mercer County. This location is 3,600 feet downcanal of the outlet of the Trenton Conduit. The sinkhole developed as a result of a failed storm drainage pipe that goes under the Canal and U.S. Route 1 and discharges into the Assunpink Creek. The sinkhole caused erosion in the Canal slope and the Canal path. Staff filled the sinkhole with 6-inch riprap and regraded the area.

The pipe was not repaired and will necessitate additional planning and action. The initial step in repairing the pipe is the need to determine who is responsible for the pipe and assess the condition of the entire pipe length.

### **Item #28 Rehabilitation Work at the Washington Crossing Spillway**

The Delaware River Joint Toll Bridge Commission advised the Authority on June 6, 2013 of a small amount of clear seepage coming from their historic stone bridge abutment at the Washington Crossing Bridge. At the time of notification, the Authority had been operating the Canal at raised levels in that vicinity to address a flow problem in the Trenton area. The higher than normal levels of the Canal caused the Washington Crossing spillway, which is directly adjacent to the abutment, to operate (overflow).

The concrete spillway structure has two motor-operated waste gates that can be operated on site or remotely from the Canal Office. The spillway and associated waste gates were designed to help regulate the amount of water in the Canal and to provide a controlled discharge in periods of high water. The concrete spillway is approximately 152± feet long and 37± feet wide, consisting of two concrete spillway boxes with twenty 36”x40” vertical elliptical reinforced concrete pipes,

and one 68"x75" reinforced concrete pipe. A concrete apron in front of the 68"x 75" concrete pipe handles the flow of water coming through the pipe and the stone apron in front of the rest of the pipes protect the embankment from erosion. Hand placed stonewalls border the aprons.

As a temporary measure, staff opened the waste gate associated with the spillway and was able to draw the Canal level down sufficiently to stop discharge over the spillway. The abutment seepage stopped. At that time, it was unknown if the seepage was a result of the elevated Canal levels causing increased pressure or simply the presence of the water discharging over the spillway, through the pipes below and hitting the abutment.

Authority staff placed sandbags on the spillway crest. This temporary stopgap measure is working to eliminate the seepage. Experience from the earlier trials has shown that the seepage returns if the sandbags are removed or washed off and flow discharges from the northern most pipes. Seepage may cause damage to the spillway structure, the bridge tender's house or the bridge abutment as a result of removal of fines by piping or undermining.

Staff is continuing to monitor the situation and to investigate alternatives for controlling the flowing water.

#### **Item #29 Washington Crossing Waste Gate Repair / Replacement**

One of the waste gates at the Washington Crossing spillway, which was replaced in 2000, will not seal properly after being opened. The Authority procured the services of a diving contractor to perform an underwater investigation to determine if the problem was mechanical, with the seal, or if the gate was obstructed by sediment buildup around the gates. Based on the initial investigation, a second contractor was procured to make small repairs to the gate seal. After the repair, when trying to test the gate, the automatic operator was found to be deficient. Repairs to the operator are pending. Some estimated costs remain in the budget in case the gate needs further repairs.

#### **Item #30 Security System Upgrade**

A vulnerability assessment of the Authority's facilities was completed in 2003. Buoys were installed around the tower at the Spruce Run Reservoir in 2015. Several security improvements have been included as part of the Round Valley Dam rehabilitation project identified above. Other protective measures are continuing to be considered as recommended in the vulnerability assessment.

#### **Item #31 Alexauken Creek Aqueduct**

Paralleling the western side of the Alexauken Creek Aqueduct is the former Belvidere-Delaware Railroad concrete bridge, which passes over the creek immediately adjacent to the 1940s-era concrete aqueduct trunk.

The Aqueduct's northeast, center and southeast circa-1834 historic stone abutments were rehabilitated in 1989-1990. Recent inspections revealed that all the abutments have missing mortar on the lower areas, which are continuously exposed to the water line action. In addition, the northeast abutment shows vegetation covering the structure on the creek's face.

It is noted that a new Canal leak was detected in 2015 below the northeast abutment's masonry. Further investigation into the leak revealed that water is percolating between the joint of the concrete aqueduct northeast flap wall and the stone masonry abutment. This erosive process could lead to a progressive failure of the stone masonry structure, as it has been observed for the southwest Canal embankment. The aqueduct's embankments are in fair condition with the exception of the southwest Canal embankment, which is leaking water from the Canal into the creek.

It is recommended to set up a corrective action on the new detected leak at the northeast end of the aqueduct.

### **Item #32 Roofing Replacement at the North & South Towers**

The built-up roofing at the North and South Towers at Round Valley Reservoir are more than 30 years old, being last replaced in 1984. There are also some masonry crack repairs required in the brick work around the sides of the towers, which should be added to the scope of work for this project, as there is no safe way for Authority personnel to conduct these repairs. This item remains in the CIP budget, but there is a chance that this work will be included in the Round Valley rehabilitation project noted above.

### **Item #33 Replacement of the through the wall HVAC units at the Administration Building**

The 26 through-the-wall HVAC units at the Administration Building are reaching the end of their useful life. They were installed in 1994. Replacement parts are becoming difficult to get and the units are constantly in need of service. Replacement of the units is currently being investigated by Authority staff.

### **Item #34 Rehabilitation of Culvert at Station 2550+90 (1 mile upstream of 10-mile)**

The unnamed culvert at Station 2550+90 is located in Franklin Township, Somerset County approximately one mile east of the Weston Causeway and ¼ mile east of School House Road. Boswell Underwater Engineering inspected the culvert in September 2007. The inspection identified numerous areas exhibiting missing mortar pointing and stone along both the walls and crown of the structure. Missing stones were also identified on both the upstream and downstream headwalls. The contractor classified the culvert as being in fair condition and recommended repairs be made to the culvert barrel as well as both headwalls.

### **Item #35 Rehabilitation of the Trap Rock Quarry Spillway**

The Trap Rock Quarry Spillway between Station 1925+90 and Station 1929+20 of the Canal in Franklin Township, Somerset County approximately ¾ mile upcanal from Route 518 is in poor condition and warrants rehabilitation. The 330-foot long spillway was built as part of the original Canal construction in the 1830s and is part of the Canal's flood control system into the Millstone River. Engineering services are required in order to inspect the structure, prepare a schematic design, prepare a design of the approved rehabilitation alternative and provide construction management services during the rehabilitation of the structure. A cultural resource consultant is also required to perform a cultural resource investigation for the rehabilitation of the spillway and to provide observation during rehabilitation. Rehabilitation of the Trap Rock Spillway will be scheduled after the dredging program between the Kingston and Amwell Road.

### **Item #36 Dredging of the Canal between Landing Lane and Route 18**

Approximately 70 percent of water diverted from the Canal is taken by purveyors at the Canal terminus near Route 18 in the City of New Brunswick, Middlesex County. Sediment bars have formed just upstream of the two primary intakes from the Canal wherein the normal Canal operating level is only 18 inches above the sediment level. A decrease in the Canal operating level by more than 12 inches makes it difficult for the water purveyors to divert water. Removal of this accumulation is essential to ensure delivery to these water purveyors.

Removal of the accumulation must be carefully coordinated with the water purveyors in this reach. Development of a program will be modeled after the dredging program that is being developed for the Canal reach between Kingston and Amwell Road.

### **Item #37 Dredging between Lambertville Lock and Trenton**

Sediment was removed from this reach in the mid-1980s. Breach of the embankment at the Workhouse Spillway in 2011 drained the Canal between the Lambertville Lock and the Kingston Lock exposing sediment that has accumulated since the 1980s. While the Canal was drained, Authority staff removed the most pronounced sediment mounds but was unable to remove all of the mounds. Long-term planning needs to focus on the removal of sediment from this reach.

### **Item #38 Dredging between Amwell Road and Ten Mile Lock**

Currently plans are being developed to dredge a 10.5 mile stretch of the Canal between Kingston and Amwell Road. Flow in the stretch of the Canal between Amwell Road and Ten Mile Lock is also being impeded by the accumulation of sediment. Long term planning needs to focus on the removal of sediment from this reach.

### **Item #39 Construction of a Bedload Stone Trap at the Wickecheoke Creek**

Wickecheoke Creek enters the Canal just upstream of the Prallsville Lock Control Structure on the border of Delaware Township and Stockton Borough, Hunterdon County. Excess flow from the Canal and the Creek are discharged over the Wickecheoke Creek spillway into the Delaware River. Investigations in the early 1990s recommended the construction of a bedload stone trap in the creek upstream of its confluence with the Canal to improve the ability to remove the bedload without disrupting the flow in the Canal.

The Authority desires to pursue construction of the structure because of the escalating need to remove bedload from the Canal at this location and the difficulty of removing the material from the Canal at this location. However, this project is currently on hold and has been moved to low priority.

### **Item #40 Cutoff Wall in the Shipetaukin Creek Guard Bank**

The Shipetaukin Creek guard bank located in Lawrence Township, Mercer County, was constructed along the western side of the Canal to separate the Canal from the Lawrence Meadows and Shipetaukin Creek. The guard bank breached during Hurricane Floyd in September 1999 because of high water levels in the Lawrence Meadows. Typically the water level in the Lawrence Meadows between Province Line Road and the Route 295 Interchange is higher than the water levels in the Delaware and Raritan Canal so the breach did not cause a loss of Canal water supply.

Leakage is visible through the guard bank from the Lawrence Meadows towards the Canal. Currently the seepage is clear; however, the volume of seepage is getting progressively worse and a program is necessary to control the leakage and prevent piping and a potential failure of the embankment. This section of towpath is approximately 7,000 feet long but most of the leakage occurs in a 3,200-foot long section between Station 1477+00 and Station 1509+00.

A cutoff wall is planned for construction in this reach of the embankment. The depth of the cutoff wall is expected to range between 8 and 18.5 feet and it will be constructed of either slurry concrete mix or a clay mix. The slurry concrete mix has the advantage for ease of installation but may cause permit problems.

It will be necessary to retain a consultant to obtain boring information through the guard bank to determine the precise recommended depth of the cutoff wall. Funding for this project is not included in this five year program.

#### **Item #41 Wickecheoke Creek Gates Abandonment**

Authority staff has been instructed to not operate these waste gates because they have been extensively damaged by wood debris that accumulates in this area during flooding. The gates will need to be abandoned in the future. Funding for this project is not included in this five year program.

#### **Item #42 Rehabilitation of the Waste Gate downstream of Ten Mile Lock**

The waste gate is located at Canal Station 2599+50, approximately 600 feet downstream of the Ten Mile Lock in Franklin Township, Somerset County. The existing non-operational waste gate consists of a wooden gate structure set between guides attached to the recessed portion of a concrete inlet headwall. A 60-inch diameter concrete pipe links the gate and inlet headwall to the outlet headwall. The outlet headwall and wingwalls are constructed of stone masonry.

The outlet pipe was permanently sealed with concrete in 2014. Woodwork is planned for the waste gate façade. Funding for this project is not included in this five year program.

#### **Item #43 Rebuild Stone Embankment at the 10-Mile Waste Gate**

This project encompasses reconstruction of the deteriorated stonework on the downstream side of the structure. Funding for this project is not included in this five year program.

#### **Item #44 Rehabilitation of the Gold Run Spillway**

The Gold Run spillway is located at Station 955+00 approximately 500 feet upstream of Lower Ferry Road in Ewing Township, Mercer County. The Gold Run spillway is a concrete structure built in 1913. The concrete spillway box is approximately 98± feet long and 4± feet wide. The elevation of the spillway crest is 56.70 feet.

Fourteen 36-inch diameter concrete pipes handle the flow of water coming through the spillway. The pipes discharge onto a downstream concrete apron that protects the embankment from erosion. The spillway box is leaking and needs to be replaced. Funding for this project is not included in this five year program.

**Item #45 Rehabilitation of the Six-Mile Run Culvert Headwall**

The Six-Mile Run culvert was rehabilitated in the mid-1980s. Stone-faced concrete headwalls were constructed at the inlet and outlet ends of the culverts and minor stone repair was performed in the culvert barrels. A portion of the stone facing of the downstream headwall has dislodged from the concrete headwall during the winter of 2005-2006. The stone armoring above the downstream headwall needs to be restored.

Funding for this project is not included in this five year program.

**Item #46 Carnegie Lake Culverts Investigation / Isolation**

There are two submerged culverts located adjacent to Carnegie Lake which the Authority must locate and investigate. Funding for this project is not included in this five year program.

**Item #47 Raven Rock Retaining Wall Downcanal of Lock**

The control structure at Raven Rock lock is located at Canal station 0+00 at Bulls Island State Park in Delaware Township, Hunterdon County. The concrete lock structure consists of four metal sluice gates and operators. Adjacent and downcanal from the locks there is a stone wall. Several stones are missing from the wall. Funding for this project is not included in this five year program.

**Item #48 Refurbishment of Main Pumps and Motors No. 3 & 9**

**Item #49 Refurbishment of Main Pumps and Motors No. 2 & 10**

See description above for Refurbishment of Main Pumps and Motors No. 4, 5, 7 & 8. The remaining four pumps would be refurbished in the order stated above. Funding for these projects is not included in this five year program.

**Item #50 Canal Culvert Rehabilitation 2249+79 (Suydam)**

The culvert near Suydam Road is a single barrel drop style culvert located at Station 2249+79 of the Canal. During the April 2006 inspection the condition appeared very much the same as its condition in October 2003 when it was dewatered and surveyed. On the inlet side, there are a few stones missing at the base of the inlet structure and there is some shifting of some of the capstones.

On the outlet side, the entire dry-laid headwall has the appearance that it is bowed inward. Additional inspection is required to determine the priority of repairs. Funding for this project is not included in this five year program.

**Item #51 Canal Culvert Rehabilitation 2661+86 (Randolph Brook)**

The Randolph Brook culvert structure consists of three distinct sections. Looking downstream from the inlet, the culvert has a semicircular corrugated steel section, 63 feet long, 13 feet wide and 8 feet high, which runs beneath Weston Canal Road. The pipe abuts a 6-foot long transition box or access chamber where the alignment of the structure shifts slightly to the left. A double barrel stone arched structure carries the Brook under the Canal into the Raritan River. The barrels measure approximately 139.5 feet long, 5 feet wide and 4.5 feet high.

The culvert was rehabilitated in 1990. The rehabilitation entailed the installation of a sleeve of steel liner plates within the arches of the main culvert barrels. Support for the liner plates was provided by newly poured concrete walls. The outlet headwall and timber apron were restored preserving their historic appearance. Additional inspection is required to determine the priority of repairs. Funding for this project is not included in this five year program.

**Item #52 Canal Culvert Rehabilitation 2992+34 (Mile Run Culvert)**

The Mile Run culvert consists of two semi-circular barrels approximately 129 feet long, which appear to be founded on natural rock. The culverts convey Mile Run Creek under the Canal and discharge into the Raritan River in the City of New Brunswick. The barrels are approximately 12 feet wide and 6 feet high. The culvert barrels were constructed of stone masonry and at some time, a brick liner was installed in the east barrel and a shotcrete coating was installed in the west barrel.

The culvert was rehabilitated in 1994. The rehabilitation comprised the restoration of headwalls and deteriorated barrels. A structural steel liner was installed in the east barrel, set back 15 feet from the upstream end and 25 feet from the downstream end. The shotcrete liner in the west barrel was patched as needed.

A previous inspection in 2015 revealed that the east barrel's first 25-foot brick liner section has minor spalls and the remaining metal liner section looks to be in good condition. On the west barrel it was observed that the gunite layer has spalled away at several locations at the mid-length of the barrel, above the footing.

Additional inspection is required to determine the priority of repairs. Funding for this project is not included in this five year program.

**Item #53 Concrete Repairs at the Sullivan Way Aqueduct**

The Sullivan Way aqueduct is located in the City of Trenton, Mercer County. The structure was constructed in the early 1900s and has been waterproofed and patched several times. The superstructure is a concrete encased steel structure constructed to carry the Canal over Sullivan Way. The concrete on the abutments is spalling and needs attention. Funding for this project is not included in this five year program.

**Item #54 Rehabilitation of the Spillway upstream of the Griggstown Lock**

The spillway upstream of the Griggstown Lock between Station 2060+40 and Station 2064+20 of the Canal in Franklin Township, Somerset County is in poor condition and warrants rehabilitation. The 380-foot long spillway was built as part of the original Canal construction in the 1830s and is part of the Canal's flood control system into the Millstone River. Engineering services are required in order to inspect the structure, prepare a schematic design, prepare a design of the approved rehabilitation alternative and provide construction management services during the rehabilitation of the structure. A cultural resource consultant is also required to perform a cultural resource investigation for the rehabilitation of the spillway and to provide observation during rehabilitation.

Rehabilitation of the spillway will be scheduled after the dredging program between Kingston and Amwell Road is complete so the reconstructed spillway does not get damaged by the heavy equipment used to haul the sediment from the site. Funding for this project is not included in this five year program.

**Item #55 Rehabilitation of the Four-Mile Spillway**

The Four-Mile spillway is located in the section of the Canal between Five-Mile Lock and Route 18 in Franklin Township, Somerset County, opposite the Rutgers Preparatory School on Easton Avenue. This 600-foot spillway was rehabilitated in 1999 with the installation of a tremie concrete cutoff wall to eliminate leakage from the Canal. The spillway was finished with hand placed stones across the crest, the river side slope and the Canal side slope of the rehabilitated structure. The stones were laid in a mortar bed with a recess in the pointing finish.

Recent flooding events washed the cement from the mortar leaving the stones sitting in a loose sand bed. The stones have the potential to become dislodged and the spillway crest needs to be stabilized. The planned rehabilitation will be to remove all stone from the crest, pour a concrete slab and rest the stones with ties to the concrete slab similar to the recently completed rehabilitation of the Colonial Park spillway. Recent inspections, however, show that the spillway appears stable, with grass growing between the stones. Funding for this project is not included in this five year program.

**Item #56 Pipeline Evaluation – Whitehouse Release Pipeline**

The Round Valley Release Pipeline (RVRP) conveys water from the Round Valley North Vault to the Whitehouse Release. The pipeline was also intended to convey water pumped from the planned Confluence Pumping Station back to the Reservoir. One pipe section of the 108-inch diameter prestressed concrete cylinder pipe ruptured in 1988 and numerous other sections were found to have broken prestressing wire that may lead to additional ruptures of the pipe sections. The RVRP was converted into a gravity release pipeline in 1996 with the installation of pressure reducing valves in the North Vault. The reduced pressure design assumes that all the prestressing wire has failed and relies on the strength of the embedded steel cylinder. It was recommended that the pipeline continue to be monitored on a regular basis. The manufacturing and installation dates of the specific pipe sections used in this release line fall within the range of dates where there were faulty materials being manufactured in the industry, which have resulted in failures of similarly dated pipelines.

Funding for this project is not included in this five year program; however, the Authority continues to execute scheduled internal inspection of the release piping. Staff will continue its periodic inspection of the pipeline and take action accordingly.

**Item #57 Pipeline Evaluation - RV Force Main**

The Round Valley Force Main is a 3.5-mile long 108-inch diameter prestressed concrete cylinder pipe that conveys water from the South Branch Pumping Station (SBPS) to the South Dam Tower at Round Valley Reservoir. The Force Main may also be used for releases from the reservoir to the South Branch Raritan River.

Non-destructive testing of the Force Main was conducted in 1999. The non-destructive testing identified that the majority of the pipe sections were in very good condition. Approximately 5% of the 1,062 pipe sections exhibited anomalous readings that give rise to varying degrees of concern. One section of pipe, pipe section 42, located within the SBPS property, was excavated and further examined externally and internally. The examinations confirmed the results of the non-destructive testing. Instead of instituting a program to immediately replace pipe section 42 and other sections of pipe that were of concern, the Authority embarked on a program to develop a management plan to estimate the anticipated longevity of various pipe sections and prioritize pipe replacement.

Pipe section 42 was replaced in 2005 and was dismantled and tested in January 2006. Pipe section 42 was designed to have a double wrap of pre-stressing wire. The outer level of pre-stressing was missing and the pipe section was considered to be severely structurally compromised. A large portion of the pre-stressing wire had significantly lower than the specified stress as determined by the strain gauge testing.

Additionally, the management plan developed in 2003 identified four other sections that warrant increased monitoring: pipe sections 33, 43, 48 and 617. The consultants recommended additional non-destructive testing of the entire length of the Force Main with particular emphasis on the noted sections. Continued monitoring of the Force Main is warranted before any additional pipe sections are excavated or replaced.

Funding for this project is not included in this five year program; however, the Authority continues to execute scheduled internal inspection of the force main piping. Staff will continue its periodic inspection of the pipeline and take action accordingly.

**PART III – PROPOSED RULE AMENDMENT**

NEW JERSEY WATER SUPPLY AUTHORITY

**Amendments To The Schedule Of Rates, Charges And  
Debt Service Assessments For The Sale Of Water From  
The Raritan Basin System**

**To Become Effective July 1, 2017**

The following rules and regulations can be found in the New Jersey Administrative Code under N.J.A.C. 7:11-2.1, et. seq.

7:11-2.3      General Rate Schedule for Operations and Maintenance

(a)      The General Rate Schedule for Operations and Maintenance per million gallons listed at (b) below is based on estimated annual operations and maintenance expense consisting of all current costs, obligations and expenses of, or arising in connection with, the operation, maintenance and administration of the System, and minor additions or improvements thereof or thereto, or the performance of any water purchase contract, including, but not limited to, all of the following:

1 –7      (No change.)

8.      Any other current costs, expenses or obligations required to be paid by the Authority under the provision of any agreement or instrument relating to bonds, other indebtedness of the Authority or by law. The current sales base of [182.339] **182.353** million gallons per day has been used in setting the rate listed in (b) below.

(b) General rate schedule for operations and maintenance:

<u>Period</u> (State Fiscal year or otherwise indicated)	<u>Allocation</u>	<u>Rate/Million Gallons</u>
State fiscal year [2017] <b>2018</b>	Million Gallons per Day (MGD)	[\$171.00] <b>194.00</b>

7:11-2.4 Debt Service Assessments

- (a) The Debt Service Assessment Rate per million gallons shall be based on the amounts and schedules of payments required to repay the New Jersey Environmental Infrastructure Financing Program for loans issued to the Authority for the Delaware and Raritan Canal Capital Program **and the Round Valley Reservoir Rehabilitation Program.**
- (b) The following Debt Service Assessment rate for the New Jersey Environmental Infrastructure Financing Program loans, based on a sales base of [182.339] **182.353** million gallons per day will be applied to all customers.

<u>Period</u> (State Fiscal year or otherwise indicated)	<u>Allocation</u>	<u>Rate/Million Gallons</u>
State fiscal year [2017] <b>2018</b>	Million Gallons per Day (MGD)	[\$25.00] <b>\$85.00</b>

7:11-2.5 Capital Fund Component

- (a)-(b) (No change.)
- (c) Capital Fund Assessment

<u>Period</u> (State Fiscal Year or otherwise indicated)	<u>Allocation</u>	<u>Rate/Million Gallons</u>
State Fiscal Year [2017] <b>2018</b>	Million Gallons per Day (MGD)	\$33.00

7:11-2.6 Source Water Protection Fund Component

(a) (No change.)

(b) Source Water Protection Fund Assessment

<u>Period</u>	<u>Allocation</u>	<u>Rate/Million Gallons</u>
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(State Fiscal Year or  
otherwise indicated)

State Fiscal

Year [2017] **2018**

Million Gallons per Day (MGD)

\$24.00

## **APPENDICES**

### **I. Report of CLA PC – Allocation of Headquarters General and Administrative Expenses – FY2018**

**NEW JERSEY WATER SUPPLY AUTHORITY  
(A Component Unit of the State of New Jersey)**

**FORECASTED COST ALLOCATION SCHEDULES**

**YEAR ENDED JUNE 30, 2018**

**NEW JERSEY WATER SUPPLY AUTHORITY  
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YEAR ENDED JUNE 30, 2018**

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## INDEPENDENT ACCOUNTANTS' REPORT

Commissioners  
New Jersey Water Supply Authority

At your request, we have performed certain agreed-upon procedures, as enumerated below, with respect to the accompanying forecasted cost allocation schedules of the New Jersey Water Supply Authority (the "Authority"), a component unit of the State of New Jersey for the fiscal year ending June 30, 2018. These procedures, which were agreed to by the Commissioners and Authority management, were performed solely to assist you in evaluating the forecasted cost allocation schedules in connection with the setting of water rates for each of the three operating systems (Raritan, Manasquan Reservoir and Manasquan Treatment Plant/Transmission). The Authority's management is responsible for the schedules. This agreed-upon procedures engagement was performed in accordance with attestation standards established by the American Institute of Certified Public Accountants. The sufficiency of these procedures is solely the responsibility of the Authority's management. Consequently, we make no representation regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose. The procedures that we performed are as follows:

1. We were provided with the fiscal year 2018 budgeted expenses for each of the three operating systems by the Authority's director of finance and administration, who advised us that the fiscal year 2018 budgeted expenses are based upon preliminary budgets that are subject to approval by the Authority's Commissioners. We performed no procedures in regard to these fiscal year 2018 budgeted expenses.
2. We recalculated the allocated costs on the schedules. We found no exceptions as a result of these procedures.
3. We compared the methodologies used for cost allocation on the forecasted schedules to the methodologies used in the Authority's cost allocation schedules for the year ended June 30, 2016 and found them to be consistent.

We were not engaged to and did not conduct an examination, the objective of which would be the expression of an opinion on the accompanying forecasted cost allocation schedules. Accordingly, we do not express such an opinion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you. Furthermore, there will usually be differences between the forecasted and actual results, because events and circumstances frequently do not occur as expected, and those differences may be material. We have no responsibility to update this report for events and circumstances occurring after the date of this report.

Commissioners  
New Jersey Water Supply Authority

This report is intended solely for the information and use of the Commissioners and management of the Authority and should not be used by those who have not agreed to the procedures and taken responsibility for the sufficiency of the procedures for their purposes.

*CliftonLarsonAllen LLP*

**CliftonLarsonAllen LLP**

Plymouth Meeting, Pennsylvania  
October 3, 2016

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**SCHEDULE OF FORECASTED COST CENTER EXPENSE RECLASSIFICATION**  
**YEAR ENDED JUNE 30, 2018**  
*(See Independent Accountants' Report)*

DEPT. #	DEPT./COST CENTER	COST CENTER COSTS	RECLASSIFICATIONS									REVISED COST CENTER COSTS
			1 HEATING/ ELECTRIC	2 VEHICULAR FUEL	3 PROFESSIONAL FEES	4 INSURANCE	5 TELEPHONE	6 PERMITS	7 WORKERS' COMP.	8 IN LIEU TAXES	9 CHIEF ENGINEER SALARY & FRINGE	
	BUILDING HQ	\$ -	\$117,800	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$117,800
	TELEPHONE HQ					83,000						83,000
36	SAFETY	218,100			(5,000)							213,100
37	SECURITY	956,150										956,150
14	HUMAN RESOURCES	336,648			(4,100)				(10,000)			322,548
16	PURCHASING	593,250		(121,875)			(83,000)	(16,000)				372,375
17	INFORMATION SYSTEMS	164,900										164,900
15	CONTRACTS & RISK MGMT.	1,799,230			(36,500)	(1,300,000)		(96,100)		(18,700)		347,930
13	FINANCIAL MGMT.	1,040,559			(2,496)							1,038,063
34	AUTO SHOP	287,300		121,875					16,000			425,175
35	AUTO SHOP-CANAL	232,520										232,520
10	EXEC OFFICE	254,500	4,757									259,257
20 30 31 32 33	WATERSHED, ENGINEERING & O&M (RARITAN SYSTEM)	8,118,630	(122,557)		48,096	1,300,000		96,100	10,000	18,700	(11,247)	9,457,722
		14,001,787	0	0	0	0	0	0	0	0	(11,247)	13,990,540
40-60	MANASQUAN SYSTEM	5,305,899									11,247	5,317,146
		<u>\$19,307,686</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$19,307,686</u>

See accompanying Notes to Financial Schedules.

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**SCHEDULE OF FORECASTED SYSTEM-WIDE ALLOCATION COSTS**  
**YEAR ENDED JUNE 30, 2018**  
*(See Independent Accountants' Report)*

DEPT. #	DEPT./COST CENTER	REVISED COST CENTER COSTS	ALLOCATION BASIS											ALLOCATED COST CENTER COSTS	
			SQ. FT. #	# OF TELEPHONES	# OF EMPLOYEES	100 % RARITAN O&M	# OF EMPLOYEES	# OF P.O.s	# OF COMPUTERS	MGD CONTRACTS	O&M BUDGET	# OF VEHICLES	# OF VEHICLES		TIME ESTIMATE
	BUILDING HQ	\$117,800	<u>(\$117,800)</u>												
	TELEPHONE HQ	\$83,000	0	<u>(\$83,000)</u>											
36	SAFETY	\$213,100	884	922	<u>(\$214,906)</u>										
37	SECURITY	\$956,150	4,525	3,689	17,583	<u>(\$981,947)</u>									
14	HUMAN RESOURCES	\$322,548	5,449	2,767	3,907	0	<u>(\$334,671)</u>								
16	PURCHASING	\$372,375	6,012	2,767	3,907	0	6,761	<u>(\$391,822)</u>							
17	INFORMATION SYSTEMS	\$164,900	1,254	922	1,954	0	3,381	12,954	<u>(\$185,365)</u>						
15	CONTRACTS & RISK MGMT.	\$347,930	3,914	1,844	3,907	0	6,761	6,878	6,620	<u>(\$377,854)</u>					
13	FINANCIAL MGMT.	\$1,038,063	11,405	6,456	13,676	0	23,664	10,088	26,481	0	<u>(\$1,129,833)</u>				
34	AUTO SHOP	\$425,175	18,574	1,844	1,954	0	3,381	18,915	6,620	0	30,613	<u>(\$507,076)</u>			
35	AUTO SHOP-CANAL	\$232,520	0	1,844	1,954	0	3,381	14,100	6,620	0	16,742	0	<u>(\$277,161)</u>		
10	EXEC OFFICE	\$259,257	15,806	6,456	1,954	0	3,381	2,981	3,310	0	18,667	0	0	<u>(\$311,812)</u>	
20 30 31 32 33	WATERSHED, ENGINEERING & O&M (RARITAN SYSTEM)	\$9,457,722	49,977	53,489	115,268	981,947	199,448	168,627	99,303	341,445	680,969	507,076	277,161	276,733	\$13,209,165
40-60	MANASQUAN SYSTEM	\$5,317,146	0	0	48,842	0	84,513	157,279	36,411	36,409	382,842	0	0	35,079	6,098,521
		<u>\$19,307,686</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$19,307,686</u>

See accompanying Notes to Financial Schedules.

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**SCHEDULE OF FORECASTED COST ALLOCATION FACTORS**  
**YEAR ENDED JUNE 30, 2018**  
*(See Independent Accountants' Report)*

REQUIRED STATISTICS												
ALLOCATION OF:	BUILDING HQ	TELEPHONES	SAFETY	HUMAN RESOURCES	PURCHASING	INFORMATION SYSTEMS	CONTRACTS & RISK MGMT	FINANCE O&M	AUTO SHOP	AUTO SHOP CANAL	EXEC. OFF	
ALLOCATION BASIS:	SQ. FT.	# OF	# OF	# OF	# OF	# OF	# OF	FUNCTIONAL	# OF	# OF	TIME	
DEPT. #	DEPT./COST CENTER	#	TELEPHONES	EMPLOYEES	EMPLOYEES	P.O.'S	COMPUTERS	MGD CONTRACTS	COST	VEHICLES	VEHICLES	ESTIMATE
	BUILDING HQ											
	TELEPHONE HQ											
36	SAFETY	110	1									
37	SECURITY	563	4	9								
14	HUMAN RESOURCES	678	3	2								
16	PURCHASING	748	3	2	2							
17	INFORMATION SYSTEMS	156	1	1	1	113						
15	CONTRACTS & RISK MGMT.	487	2	2	2	60	2					
13	FINANCIAL MGMT.	1,419	7	7	7	88	8	0				
34	AUTO SHOP	2,311	2	1	1	165	2	0	\$425,175			
35	AUTO SHOP-CANAL	0	2	1	1	123	2	0	232,520			
10	EXEC OFFICE	1,967	7	1	1	26	1	0	259,257	0		
20 30 31 32 33	WATERSHED, ENGINEERING & O&M (RARITAN SYSTEM)	6,218	58	59	59	1,471	30	182	9,457,722	40	40	88.75
40-60	MANASQUAN SYSTEM			25	25	1,372	11	19	5,317,146			11.25
		14,657	90	110	99	3,418	56	202	\$15,691,820	40	40	100 %

See accompanying Notes to Financial Schedules.

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**SCHEDULE OF FORECASTED MANASQUAN SYSTEM ALLOCATED COSTS**  
**YEAR ENDED JUNE 30, 2018**  
*(See Independent Accountants' Report)*

COSTS	ALLOCATION BASIS					ALLOCATED COSTS	
	1 TIME STUDY	2 \$ VALUE OF VEHICLES	3 \$ VALUE OF EQUIPMENT	4 TIME STUDY	5 VALUE OF WATER CONTRACTS		
<u>GENERAL &amp; ADMINISTRATIVE</u>							
SALARIES & FRINGES	\$3,090,050	<u>(\$3,090,050)</u>					
VEHICLE RELATED	99,825	<u>(\$99,825)</u>					
MAINT. SUPPLIES & RELATED	76,100		<u>(\$76,100)</u>				
OFFICE & MISC.	48,500			<u>(\$48,500)</u>			
H.Q. OVERHEAD	792,622				<u>(\$792,622)</u>		
RESERVOIR (40)	1,049,600	1,512,000	72,553	30,394	23,732	682,867	\$3,371,146
TREAT./TRANS. (50)	941,860	1,578,050	27,272	45,706	24,768	109,755	2,727,411
	<u>\$6,098,557</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$6,098,557</u>

See accompanying Notes to Financial Schedules.

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**NOTES TO FINANCIAL SCHEDULES**  
**JUNE 30, 2018**  
*(See Independent Accountants' Report)*

**NOTE 1 GENERAL**

The New Jersey Water Supply Authority as part of its annual budget and rate making process performs a two step cost allocation calculation. During the first step, the Authority forecasts its actual expenses by Cost Center. For purposes of this calculation, the Authority uses the following Cost Centers:

Raritan System

- Building Headquarters
- Telephone Headquarters
- Safety
- Security
- Human Resources
- Purchasing
- Information Systems
- Contracts & Risk Management
- Financial Management
- Auto Shop
- Auto Shop – Canal
- Executive Office
- Engineering, Watershed Management, Operations and Maintenance (Raritan System)
- Manasquan System

In deriving expenses by Cost Center, several expense reclassifications are made on the Schedule of Forecasted Cost Center Expense Reclassification as follows:

1. Heating and electricity expenses related to Building Headquarters (“HQ”) and Executive Office are reclassified from Engineering and Operations & Maintenance (“O & M”).
2. Vehicular fuel expense related to Auto Shop is reclassified from Purchasing.
3. Professional fees related to O & M are reclassified from the various departments to which they have been charged.
4. Insurance premium expense related to the Raritan System is reclassified from Contracts and Risk Management.
5. Telephone expense is reclassified from Purchasing to a separate Telephone HQ Cost Center.
6. Permit expense related to the Raritan System is reclassified from Contracts and Risk Management and Purchasing.

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**NOTES TO FINANCIAL SCHEDULES**  
**JUNE 30, 2018**  
*(See Independent Accountants' Report)*

**NOTE 1 GENERAL (CONTINUED)**

7. Workers' compensation expense related to the Raritan System is reclassified from Contracts and Risk Management.
8. In-lieu taxes related to the Raritan System are reclassified from Contracts and Risk Management.
9. Chief Engineer Salary & Fringe Expenses related to the Manasquan System are reclassified from the Engineering Department.

The second step entails a step-down allocation of eleven of the Authority's Cost Centers to the Raritan and Manasquan System Cost Centers. In making this step-down allocation the Authority allocates costs as follows:

1. Building HQ is allocated to each of the Cost Centers based on the amount of space utilized.
2. Telephone HQ is allocated to each of the Cost Centers based on the number of telephones utilized.
3. Safety is allocated to each of the Cost Centers based on the number of employees.
4. Security is allocated entirely to the Raritan System.
5. Human Resources is allocated to each of the Cost Centers based on the number of employees.
6. Purchasing is allocated to each of the respective Cost Centers based on the number of purchase orders issued.
7. Information Systems is allocated to each of the Cost Centers based on the number of computers.
8. Contracts and Risk Management is allocated to each of the Cost Centers based on the value of water contracts for each system.
9. Financial Management is allocated based on a percentage of the four remaining Cost Centers' budgets.
10. Auto Shop and Auto Shop-Canal are allocated based on the number of vehicles used.
11. Executive Office is allocated based on the amount of executive time utilized in managing each of the systems.

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**NOTES TO FINANCIAL SCHEDULES**  
**JUNE 30, 2018**  
*(See Independent Accountants' Report)*

**NOTE 2 MANASQUAN SYSTEM ALLOCATED COST**

The Manasquan Water Supply System's direct and allocated costs are then allocated between the Reservoir System and the Water Treatment Plan/Transmission System. In making this allocation, the Authority adds to each System's direct expenses, the indirect costs allocated as follows:

1. Salaries and Fringe Benefits are allocated based on actual time studies performed by each employee throughout Fiscal Year 2016.
2. Vehicle related expenses are allocated based on the dollar value of vehicles held by each System.
3. Maintenance Supplies and related expenses are allocated based on the dollar value of capital equipment held by each System.
4. Office and miscellaneous expenses are allocated based on the time studies performed by each employee throughout Fiscal Year 2016.
5. Headquarters Overhead expenses are allocated based on the value of water contracts for each System.

**II. Report of CLA PC – Allocation of Headquarters General and Administrative Expenses – Audited FY2016 Expenditures**

**NEW JERSEY WATER SUPPLY AUTHORITY  
(A Component Unit of the State of New Jersey)**

**COST ALLOCATION SCHEDULES**

**YEAR ENDED JUNE 30, 2016**

**NEW JERSEY WATER SUPPLY AUTHORITY  
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YEAR ENDED JUNE 30, 2016**

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**CliftonLarsonAllen**

CliftonLarsonAllen LLP  
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## **INDEPENDENT ACCOUNTANTS' REPORT**

Commissioners  
New Jersey Water Supply Authority

We have examined management's assertion that the accompanying financial schedules of New Jersey Water Supply Authority (the "Authority"), a component unit of the State of New Jersey, for the year ended June 30, 2016, listed in the foregoing table of contents are presented in accordance with the cost allocation criteria set forth in Notes 1 and 2. The Authority's management is responsible for the assertion. Our responsibility is to express an opinion based on our examination.

Our examination was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants and, accordingly, included examining, on a test basis, evidence supporting the financial schedules and performing such procedures as we considered necessary under the circumstances. We believe that our examination provides a reasonable basis for our opinion.

In our opinion, the financial schedules referred to above present, in all material respects, the Authority's allocation of costs to the Raritan and Manasquan Systems based on the cost allocation criteria set forth in Notes 1 and 2.

This report is intended for the information and use of the Commissioners and management of the Authority and is not intended to be and should not be used by anyone other than these specified parties.

*CliftonLarsonAllen LLP*

**CliftonLarsonAllen LLP**

Plymouth Meeting, Pennsylvania  
October 3, 2016

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**SCHEDULE OF COST CENTER EXPENSE RECLASSIFICATION**  
**YEAR ENDED JUNE 30, 2016**  
*(See Independent Accountants' Report)*

DEPT. #	DEPT./COST CENTER	COST CENTER COSTS	RECLASSIFICATIONS									REVISED COST CENTER COSTS	
			1 HEATING/ ELECTRIC	2 VEHICULAR FUEL	3 PROFESSIONAL FEES	4 INSURANCE	5 TELEPHONE	6 PERMITS	7 WORKERS' COMP.	8 IN LIEU TAXES	9 CHIEF ENGINEER SALARY & FRINGE		
	BUILDING HQ		\$50,672										50,672
	TELEPHONE HQ							\$81,248					81,248
36	SAFETY	190,952											190,952
37	SECURITY	878,951											878,951
14	HUMAN RESOURCES	317,144			(\$2,773)					(\$850)			313,521
16	PURCHASING	480,925		(\$78,973)				(81,248)		(\$15,388)			305,316
17	INFORMATION SYSTEMS	149,113											149,113
15	CONTRACTS & RISK MGMT.	1,604,589			(35,546)		(\$1,176,991)			(92,808)		(\$18,689)	280,555
13	FINANCIAL MGMT	918,449			(2,358)								916,091
34	AUTO SHOP	214,392		78,973						15,388			308,753
35	AUTO SHOP-CANAL	187,542											187,542
10	EXEC OFFICE	239,026	4,180										243,206
20 30 31 32 33	WATERSHED, ENGINEERING & O&M (RARITAN SYSTEM)	6,889,166	(54,852)		40,677		1,176,991		92,808	850		18,689	8,152,985
		12,070,249	0	0	0	0	0	0	0	0		(11,344)	12,058,905
40-60	MANASQUAN SYSTEM	4,782,588										11,344	4,793,932
		<u>\$16,852,837</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$16,852,837</u>

See accompanying Notes to Financial Schedules.

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**SCHEDULE OF SYSTEM-WIDE ALLOCATED COSTS**  
**YEAR ENDED JUNE 30, 2016**  
*(See Independent Accountants' Report)*

ALLOCATION BASIS															
DEPT. #	DEPT./COST CENTER	REVISED COST CENTER COSTS	SQ. FT. #	# OF TELEPHONES	# OF EMPLOYEES	100 % RARITAN O&M	# OF EMPLOYEES	# OF P.O.s	# OF COMPUTERS	MGD CONTRACTS	O&M BUDGET	# OF VEHICLES	# OF VEHICLES	TIME ESTIMATE	ALLOCATED COST CENTER COSTS
	BUILDING HQ	\$50,672	<u>(\$50,672)</u>												
	TELEPHONE HQ	\$81,248	0	<u>(\$81,248)</u>											
36	SAFETY	\$190,952	380	903	<u>(\$192,235)</u>										
37	SECURITY	\$878,951	1,946	3,611	15,728	<u>(\$900,236)</u>									
14	HUMAN RESOURCES	\$313,521	2,344	2,708	3,495	0	<u>(\$322,068)</u>								
16	PURCHASING	\$305,316	2,586	2,708	3,495	0	6,506	<u>(\$320,611)</u>							
17	INFORMATION SYSTEMS	\$149,113	539	903	1,748	0	3,253	10,599	<u>(\$166,155)</u>						
15	CONTRACTS & RISK MGMT.	\$280,555	1,684	1,806	3,495	0	6,506	5,628	5,934	<u>(\$305,608)</u>					
13	FINANCIAL MGMT	\$916,091	4,906	6,319	12,233	0	22,772	8,254	23,736	0	<u>(\$994,311)</u>				
34	AUTO SHOP	\$308,753	7,990	1,806	1,748	0	3,253	15,477	5,934	0	22,431	<u>(\$367,392)</u>			
35	AUTO SHOP-CANAL	\$187,542	0	1,806	1,748	0	3,253	11,537	5,934	0	13,625	0	<u>(\$225,445)</u>		
10	EXEC OFFICE	\$243,206	6,799	6,319	1,748	0	3,253	2,439	2,967	0	17,669	0	0	<u>(\$284,400)</u>	
20 30 31 32 33	WATERSHED, ENGINEERING & O&M (RARITAN SYSTEM)	\$8,152,985	21,498	52,359	103,107	900,236	191,942	137,982	89,012	276,161	592,309	367,392	225,445	252,405	\$11,362,833
40-60	MANASQUAN SYSTEM	\$4,793,932	0	0	43,690	0	81,330	128,695	32,638	29,447	348,277	0	0	31,995	5,490,004
		<u>\$16,852,837</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$16,852,837</u>

See accompanying Notes to Financial Schedules.

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**SCHEDULE OF COST ALLOCATION FACTORS**  
**YEAR ENDED JUNE 30, 2016**  
*(See Independent Accountants' Report)*

		REQUIRED STATISTICS										
ALLOCATION OF:	BUILDING HQ	TELEPHONES	SAFETY	HUMAN RESOURCES	PURCHASING	INFORMATION SYSTEMS	RISK MGMT	FINANCE O&M	AUTO SHOP	AUTO SHOP CANAL	EXEC. OFF	
ALLOCATION BASIS:	SQ. FT. #	# OF TELEPHONES	# OF EMPLOYEES	# OF EMPLOYEES	# OF P.O.'S	# OF COMPUTERS	MGD CONTRACTS	FUNCTIONAL COST	# OF VEHICLES	# OF VEHICLES	TIME ESTIMATE	
DEPT. #	DEPT./COST CENTER											
	BUILDING HQ											
	TELEPHONE HQ											
36	SAFETY	110	1									
37	SECURITY	563	4	9								
14	HUMAN RESOURCES	678	3	2								
16	PURCHASING	748	3	2	2							
17	INFORMATION SYSTEMS	156	1	1	1	113						
15	CONTRACTS & RISK MGMT.	487	2	2	2	60	2					
13	FINANCIAL MGMT	1,419	7	7	7	88	8	0				
34	AUTO SHOP	2,311	2	1	1	165	2	0	\$308,753			
35	AUTO SHOP-CANAL	0	2	1	1	123	2	0	\$187,542			
10	EXEC OFFICE	1,967	7	1	1	26	1	0	243,206			
20 30 31 32 33	WATERSHED, ENGINEERING & O&M (RARITAN SYSTEM)	6,218	58	59	59	1,471	30	182	8,152,985	42	42	88.75
40-60	MANASQUAN SYSTEM			25	25	1,372	11	19	4,793,932			11.25
		14,657	90	110	99	3,418	56	202	\$13,686,418	42	42	100 %

See accompanying Notes to Financial Schedules.

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**SCHEDULE OF MANASQUAN SYSTEM ALLOCATED COSTS**  
**YEAR ENDED JUNE 30, 2016**  
*(See Independent Accountants' Report)*

COSTS	ALLOCATION BASIS					ALLOCATED COSTS
	1 TIME STUDY	2 \$ VALUE OF VEHICLES	3 \$ VALUE OF EQUIPMENT	4 TIME STUDY	5 VALUE OF WATER CONTRACTS	
<u>GENERAL &amp; ADMINISTRATIVE</u>						
SALARIES & FRINGES	\$2,911,342	<u>(\$2,911,342)</u>				
VEHICLE RELATED	56,943	<u>(\$56,943)</u>				
MAINT. SUPPLIES & RELATED	54,738		<u>(\$54,738)</u>			
OFFICE & MISC.	27,700			<u>(\$27,700)</u>		
H.Q. OVERHEAD	707,416				<u>(\$707,416)</u>	
RESERVOIR	954,521	1,349,167	41,386	21,862	12,687	609,460
TREAT./TRANS.	777,344	1,562,175	15,557	32,876	15,013	97,956
	<u>\$5,490,004</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>(\$0)</u>
						<u>\$5,490,004</u>

See accompanying Notes to Financial Schedules.

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**NOTES TO FINANCIAL SCHEDULES**  
**JUNE 30, 2016**  
*(See Independent Accountants' Report)*

**NOTE 1 GENERAL**

The New Jersey Water Supply Authority as part of its annual budget and rate making process performs a two step cost allocation calculation. During the first step, the Authority calculates its actual expenses by Cost Center. For purposes of this calculation, the Authority uses the following Cost Centers:

Raritan System

- Building Headquarters
- Telephone Headquarters
- Safety
- Security
- Human Resources
- Purchasing
- Information Systems
- Contracts & Risk Management
- Financial Management
- Auto Shop
- Auto Shop – Canal
- Executive Office
- Engineering, Watershed Management, Operations and Maintenance (Raritan System)

Manasquan System

In deriving expenses by Cost Center, several expense reclassifications are made on the Schedule of Cost Center Expense Reclassification as follows:

1. Heating and electricity expenses related to Building Headquarters (“HQ”) and Executive Office are reclassified from Engineering & Operations and Maintenance (“O&M”).
2. Vehicular fuel expense related to Auto Shop is reclassified from Purchasing.
3. Professional fees related to O & M are reclassified from the various departments to which they have been charged.
4. Insurance premium expense related to the Raritan System is reclassified from Risk Management.
5. Telephone expense is reclassified from Purchasing to a separate Telephone HQ Cost Center.
6. Permit expense related to the Raritan System is reclassified from Risk Management and Purchasing.

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**NOTES TO FINANCIAL SCHEDULES**  
**JUNE 30, 2016**  
*(See Independent Accountants' Report)*

**NOTE 1 GENERAL (CONTINUED)**

7. Workers' compensation expense related to the Raritan System is reclassified from Risk Management.
8. In-lieu taxes related to the Raritan System are reclassified from Risk Management.
9. Chief Engineer Salary & Fringe Expenses related to the Manasquan System are reclassified from the Engineering Department.

The second step entails a step-down allocation of eleven of the Authority's Cost Centers to the Raritan and Manasquan System Cost Centers. In making this step-down allocation the Authority allocates cost as follows:

1. Building HQ is allocated to each of the cost centers based on the amount of space utilized.
2. Telephone HQ is allocated to each of the cost centers based on the number of telephones utilized.
3. Safety is allocated to each of the Cost Centers based on the number of employees.
4. Security is allocated entirely to the Raritan System.
5. Human Resources is allocated to each of the Cost Centers based on the number of employees.
6. Purchasing is allocated to each of the respective Cost Centers based on the number of purchase orders issued.
7. Information Systems is allocated to each of the Cost Centers based on the number of computers.
8. Risk Management is allocated to each of the Cost Centers based on the value of water contracts for each system.
9. Financial Management is allocated based on a percentage of the four remaining Cost Centers' budgets.
10. Auto Shop and Auto Shop-Canal is allocated based on the number of vehicles used.
11. Executive Office is allocated based on the amount of executive time utilized in managing each of the systems.

**NEW JERSEY WATER SUPPLY AUTHORITY**  
**NOTES TO FINANCIAL SCHEDULES**  
**JUNE 30, 2016**  
*(See Independent Accountants' Report)*

**NOTE 2 MANASQUAN SYSTEM ALLOCATED COST**

The Manasquan Water Supply System's direct and allocated costs are then allocated between the Reservoir System and the Water Treatment Plant/Transmission System. In making this allocation the Authority adds to each System's direct expenses, the indirect costs allocated as follows:

1. Salaries and Fringe Benefits are allocated based on actual time studies performed by each employee throughout Fiscal Year 2016.
2. Vehicle related expenses are allocated based on the dollar value of vehicles held by each System.
3. Maintenance Supplies and related expenses are allocated based on the dollar value of capital equipment held by each System.
4. Office and miscellaneous expenses are allocated based on the time studies performed by each employee throughout Fiscal Year 2016.
5. Headquarters Overhead expenses are allocated based on the value of water contracts for each System.