

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 2021**

**ADJUSTMENT OF DEBT SERVICE ASSESSMENT AND SALES BASE FOR
DEBT SERVICE PAYMENTS DUE AND REQUIRED FOR FISCAL YEAR 2021**

**ADJUSTMENT OF GENERAL RATE SCHEDULE FOR
CAPITAL FUND COMPONENT FOR FISCAL YEAR 2021**

**ADJUSTMENT OF SOURCE WATER PROTECTION FUND
COMPONENT FOR FISCAL YEAR 2021.**

Proposed effective Date: July 1, 2020

Approved: 11/4/2019

**NEW JERSEY WATER SUPPLY AUTHORITY
PROPOSED RATE ADJUSTMENTS FOR FISCAL YEAR 2021
RARITAN BASIN SYSTEM**

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PART I - EXPLANATION OF PROPOSED REVISED RATE STRUCTURE

Overview of Rate Proposal for Fiscal Year 2021 **(July 1, 2020 - June 30, 2021)**

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, 2020.

Summary of Proposed Adjustments

Component	Current (FY2020) Rates Per MG 7/1/2019 - 6/30/2020	Proposed (FY2021) Rates Per MG 7/1/2020 - 6/30/2021
Operations & Maintenance Assessment	\$194.00	\$194.00
Debt Service Assessment Dredging & RV Structure Refurbishment	\$85.00	\$85.00
Capital Fund Component	\$33.00	\$33.00
Source Water Protection Fund Component	\$24.00	\$24.00
Total Rate	\$336.00 /mg	\$336.00 /mg

The General Rate Schedule for Operations and Maintenance (O&M) was last adjusted effective July 1, 2019 to cover the operating expenses of the System for FY2020. The FY2020 O&M sales base was 182.353 million gallons per day (mgd). The Authority anticipates the FY2021 O&M sales base to decrease slightly to 182.339. The O&M Component is projected to remain the same for FY2021 at \$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 FY2021 require that an O&M Component of \$194.00 per million gallons be charged starting on July 1, 2020.

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 amount available for the Rate Stabilization Fund was \$968,180 in FY2020, and the amount available in FY2021 will be \$851,650. Overdraft sales increased from \$171,179 in FY2020 to \$201,653 in FY2021. An additional \$650,000 in prior year positive budget variance is used in FY2021 to offset the O&M component. Without the use of any rate stabilization funds in

FY2021, the required O&M Component of the rate would be an additional \$12.80 per million gallons, for a total of \$206.80 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 FY2021. 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 Infrastructure Bank (NJIB) to finance the dredging of a 10.5 mile segment of the Delaware and Raritan Canal (D&R Canal) between Kingston at Lincoln Highway and Amwell Road in Franklin Township, Somerset County, New Jersey. The Authority has also submitted an application to the NJIB to finance the refurbishment of structures within the Round Valley Reservoir complex. The Authority proposes maintaining the NJIB rate component at \$85.00 per million gallons (\$60.00 per million gallons for the Round Valley refurbishment project and \$25.00 per million gallons for the dredging project) to fund the debt service in FY2021 for both projects.

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 FY2021.

Table 1 on page 12 shows the maintenance of a stable rate for each of the rate components and reflects a total rate of \$336.00 per million gallons for FY2021.

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 10, 2020, 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 7, 2020 at the Authority's Administration Building, 1851 Highway 31, Clinton, New Jersey.

The New Jersey Register Comment Period is scheduled to close on March 6, 2020 and the public hearing record on the proposed rate adjustments is scheduled to close on March 16, 2020.

Final action on the rate adjustment is scheduled for the Authority's May 4, 2020 meeting. The FY2021 rate will take effect on July 1, 2020.

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 FY2019 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 FY2021 budget based on the FY2019 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 FY2021 Raritan Basin System Operating Expense Budget is decreasing by \$274,280 from FY2020. The 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 \$13,912,557. This is \$116,480 less than the FY2020 budget of \$14,029,038 and results from a decrease in operations and maintenance expenses partially offset by an increase in expected capital equipment purchases. The Capital Equipment budget of \$294,700 is \$126,800 more than the FY2020 budget of \$167,900. 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 FY2020 levels. There are no contributions scheduled for the Depreciation Reserve and the Self-Insurance Reserve in FY2021. 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. The reserve balance is currently approximately \$245,000. All of these modifications result in a total FY2021 budget requirement of \$13,912,557 which is a decrease of .8 percent relative to FY2020 (Page 15).

Fourteen of the thirty-one FY2021 direct operating expense accounts are projected to increase, but only six accounts by \$5,000 or more relative to FY2020. Ten of the operating expense accounts are projected to decrease relative to FY2020. The most significant projected increases in the budget occur in the Protective Services (insurance) and Special and Professional Services categories, while the most significant projected decreases in the budget occur in Vehicular Fuel and Maintenance of Equipment. In Salary and Fringe, regular salary is increasing by \$207,800. Fringe benefits for active employees are decreasing by 7.8 percent due largely to reductions in premiums in medical and prescription costs resulting from recent union contract negotiations. Retiree health benefits are decreasing by \$336,400 and assume 6 additional retirees between FY2020 and FY2021. Salaries and benefits constitute approximately 75 percent of the

FY2021 operating budget, and are decreasing approximately 3.4 percent relative to FY2020.

Salaries and Benefits

Authority employees within the Communications Workers of America (CWA) and the International Federation of Professional Technical Engineers (IFPTE) are currently operating under a contract that expires on June 30, 2023. Authority employees represented by the third union, the International Brotherhood of Electrical Workers (IBEW), are operating under an expired contract. The FY2021 budget assumes a 2.0 percent cost of living adjustment payable July 1, 2020. 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. The IBEW represents several management employees.

The Authority did not include any cost of living adjustments in the FY2021 budget for management. The Authority is budgeting 49 percent of the Salary budget for fringe benefits in FY2021, exclusive of retiree medical.

Pension expense payable to the state of New Jersey on April 1, 2020 will be approximately \$775,000 for the Raritan System. The Authority has budgeted \$966,400 for this line item in FY2021. The average increase in actual payments to Treasury for pension contributions since FY2016 is 5.9 percent. 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 \$25,800 from \$243,470 to \$269,270 in FY2021. 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. Those who attain 25 years on or after July 1, 1997 share some portion of post-retirement health benefit costs with the employer as determined by union contract or bargaining unit agreement. The Authority is decreasing the retiree health benefits expense item in FY2021 by \$336,100. The Authority is budgeting six additional retirees in FY2021. The Centers for Medicare and Medicaid Services (CMS) estimates that national health care spending will increase at an annual rate of 5.5% from 2018-2027. The Authority used actual 2019 rates and budgeted 6.0 percent and 6.0 percent increases for calendar years 2020 and 2021, respectively. The budget contains sufficient funds for 58 retired employees.

Electrical Service

The Authority's Hamden Pumping Station is utilized to pump water to the Round Valley Reservoir. The proposed budget for FY2021 will be maintained at \$87,000 for electricity costs for the normal operation of the pumping station. The Authority entered into a contract for power through the New Jersey Consolidated Energy Saving Program 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 most recent pumping occurred in the spring of 2019. Pumping is funded from the Pumping Reserve (\$150,000 annual deposit).

Special and Professional Services

The Authority proposes to increase this line item from \$543,818 in FY2020 to \$591,136 in FY2021. The increase is primarily due to forecasted increases in gauging station expenses for the United States Geological Survey.

Heating Fuel and Vehicular Fuel

The cost of heating fuel in FY2021 remains level at \$93,500 and vehicular fuel expense is projected to decrease from \$159,000 in FY2020 to \$121,875 in FY2021. The prices of fuel in FY2021 are budgeted at \$2.25 per gallon for unleaded and \$2.25 per gallon for diesel.

Insurance Program

The Authority is recommending an increase in insurance expense for FY2021 reflecting general market conditions and based on the advice of the Authority's insurance broker and consultant. Broker services are remarketed every three years and the insurance program is renewed on March 1. The Authority has included a \$78,100 increase in the insurance line item for FY2021 which is a 6.6% increase versus budgeted FY2020.

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 FY2021 are \$81,400 based upon a rate of 1.25 percent for short-term investments. This represents an increase of \$7,400 from \$74,000 in FY2020. (Schedule 7, page 25). In recent years, the Authority has been able to substantially increase earnings on funds held in bank accounts by consolidating banking relationships.

Reserve Contributions

During FY2021, the Authority will make no contribution to the Depreciation Reserve. The Depreciation Reserve is fully funded in FY2021 (Page 15) Interest earnings from long-term investment accounts are swept into Depreciation Reserve.

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 FY2021. 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 Structure Refurbishment – Rehabilitation and Preservation Project

The Authority has submitted an application to the New Jersey Infrastructure Bank (NJIB) 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 \$45,000,000 and last in duration up to three years. Funding through the NJIB 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. An interim loan for the project closed in February 2018, and the permanent financing is expected upon substantial project completion. The project was originally scheduled to close in May of 2014 but was deferred several years. The Authority has also submitted an application to the NJIB to finance the refurbishment of structures at the Round Valley Reservoir complex in Clinton Township, Hunterdon County, New Jersey. This project is expected to cost approximately \$75,000,000 and last in duration for several years. Funding through the NJIB 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. An interim loan for the project closed in June 2019. The Authority proposes maintaining the rate component of \$85.00 per million gallons in FY2021 to assure that sufficient funds are available to make debt service payments for both projects. 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 FY2021, 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 FY2020, should be assessed for FY2021 to generate approximately \$2,196,442. The Authority deems these revenues sufficient to meet its capital needs for FY2021 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 FY2022 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 FY2021.

Other Rule Amendments

There are no other rule amendments. The language supporting the overall proposal is contained beginning on page 67 of this document.

PART II – DETAILED SUPPORTING INFORMATION

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

**Table 1 - Summary Of Proposed Fiscal Year 2021 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 11/04/19	DIFFERENCE	PERCENTAGE INCREASE (DECREASE)
O & M Assessment	\$194.00	\$194.00	0.00	0.00%
Debt Service Assessment Dredging & RV Structure Refurbishment	85.00	85.00	0.00	0.00%
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	\$336.00/mg	\$336.00/mg	0.00	0.00%

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Table 2 - Rate History of Water Charges per Million Gallons of Raw Water Daily
Fiscal Year 2005 – Fiscal Year 2021

<u>Effective Date</u>	<u>O&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>NJEIFP/NJIB Debt Component</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, 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%
July 1, 2018	194.00			85.00	33.00	24.00	336.00	0.00%
July 1, 2019	194.00			85.00	33.00	24.00	336.00	0.00%
July 1, 2020	194.00			85.00	33.00	24.00	336.00	0.00%

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYTEM

Schedule Of Events

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

To become effective July 1, 2020

2019

- SEPTEMBER 27 Advise Water Users of informal meeting.
- NOVEMBER 1 Informal meeting with Water Users – 10:00 AM.
- 4 Board reviews and approves proposed Rates.
- DECEMBER 20 Mail Official Notice to water customers, Rate Payer Advocate, interested parties and advertise in newspapers.

2020

- JANUARY 6 Publication in the New Jersey Register.
- 10 Pre-Pubic Hearing – 10:00 AM (within 45 days of Official Notice). Deadline for responses to inquires received prior to pre-public hearing.
- FEBRUARY 3 Deadline for receipt of comments to be addressed at Public Hearing (15 days after pre-public hearing).
- 7 Public Hearing Meeting. (SR Administration Building) – 10:00 AM Deadline for responses to inquires received between pre-public and public hearing.
- 24 Written responses to questions raised at Hearing (within 10 business days of the public hearing).
- MARCH 6 NJ Register Comment Period Ends.
- 16 Public Hearing record closes (25 business days after Public Hearing).
- MAY 4 Board approval of FY2021 Rates (Budget approval option)
- JUNE 1 Board approval of FY2021 Budgets.
- JULY 1 Effective date.

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Proposed

Fiscal Year 2021 Budget Summary

(7/1/20 - 6/30/21)

	<u>ADOPTED</u> F/Y20	<u>PROPOSED</u> F/Y21
Proposed Operating Expense Budget (Schedule 1)	\$ 14,211,138	\$ 13,936,857
Net Allocation of Headquarters General and Administrative Expenses to the Manasquan Water Supply System - (Schedule 5)	<u>\$ (660,000)</u>	<u>\$ (629,000)</u>
Proposed Total Expense Budget	\$ 13,551,138	\$ 13,307,857
Proposed Capital Equipment Budget (Schedule 6)	<u>\$ 167,900</u>	<u>\$ 294,700</u>
Total Operating Expense & Capital Equipment Budgets	\$ 13,719,038	\$ 13,602,557
Contribution to Reserve Funds		
- Other Post Employment Benefits Reserve	\$ -	\$ -
- Reserve for Formal Dam Inspection	\$ 10,000	\$ 10,000
- Pumping Reserve	\$ 150,000	\$ 150,000
- Capital Equipment Reserve	<u>\$ 150,000</u>	<u>\$ 150,000</u>
Total Budget Requirements	<u>\$ 14,029,038</u>	<u>\$ 13,912,557</u>
<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)	<u>\$ (74,000)</u>	<u>\$ (81,400)</u>
	<u>\$ (126,200)</u>	<u>\$ (133,600)</u>
<u>OTHER AVAILABLE FUNDS:</u>		
Unanticipated Revenue (Schedule 8)	<u>\$ (968,180)</u>	<u>\$ (851,650)</u>
Total Other Available Funds	<u>\$ (968,180)</u>	<u>\$ (851,650)</u>
Net Amount to be paid for O & M Component	<u>\$ 12,934,658</u>	<u>\$ 12,927,307</u>

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 2021 Distributed by Cost Center
Fiscal Year 2021

CODE	ACCOUNT	OFFICE EXECUTIVE DIRECTOR	FINANCIAL MANAGEMENT & ACCOUNTING	WATERSHED PROTECTION PROGRAMS	OPERATIONS MAINTENANCE & ENGINEERING	PROPOSED BUDGET FOR FY21
5110	Regular Salaries & Wages	\$130,000	\$1,773,850	\$649,500	\$3,922,300	\$6,475,650
5120	Overtime-Salaries & Wages	0	129,290	0	139,980	269,270
5130	New Positions-Salaries & Wages	0	0	0	0	0
5140	Seasonal Help-Salaries & Wages	0	0	0	0	0
5150	Fringe Benefits	43,700	778,300	220,200	2,077,800	3,120,000
5167	Retiree Health Benefits	41,700	137,500	21,200	339,100	539,500
5168	Workers Compensation (Self-Insured)	0	10,000	0	0	10,000
	Total Salary & Fringe Benefits	\$215,400	\$2,828,940	\$890,900	\$6,479,180	\$10,414,420
5200	On-Site Residences	\$0	\$0	\$0	\$19,600	\$19,600
5210	Heating Fuel	0	0	0	93,500	93,500
5220	Utilities -Electrical Service	0	0	0	102,900	102,900
5230	" -Gas Service & Water	0	0	0	5,200	5,200
5240	" -Propane	0	0	0	500	500
5250	Electricity for Pumping	0	0	0	87,000	87,000
5260	Vehicular Fuel	0	121,875	0	0	121,875
5270	Oil & Grease	0	0	0	12,100	12,100
5280	Tires	0	0	0	23,000	23,000
5290	Maintenance Supplies	0	8,100	0	186,500	194,600
5300	Maint. Supplies - Vehicular Equipment	0	0	0	57,500	57,500
5310	Major Special Vehicle Service & Repair	0	0	0	85,000	85,000
5320	Agricultural Supplies	0	500	0	6,500	7,000
5330	Maintenance of Equipment	0	5,700	5,500	39,700	50,900
5340	Service & Maintenance Contracts	0	76,300	3,456	207,600	287,356
5350	Equipment Rental	0	23,350	0	32,500	55,850
5360	Household-Safety & Protective Supplies	100	25,400	0	14,000	39,500
5370	Uniforms	0	5,400	0	3,260	8,660
5380	Special & Professional Services	25,000	204,278	177,358	184,500	591,136
5390	Protective Services	0	1,251,100	0	0	1,251,100
5400	Telephone	0	81,000	0	4,200	85,200
5410	Postage & Freight	0	5,500	0	120	5,620
5420	Data Processing	0	27,420	0	0	27,420
5430	Printing & Office Supplies	1,500	72,350	3,000	8,200	85,050
5440	Scientific & Photographic	0	0	6,000	500	6,500
5450	Dues & Subscriptions	14,400	12,720	400	14,700	42,220
5460	Advertising	0	5,500	5,500	500	11,500
5470	Travel & Subsistence	1,500	1,980	1,500	1,600	6,580
5480	Staff Training & Tuition Aid	500	9,150	5,000	10,800	25,450
5490	Fees & Permits	0	112,100	0	11,820	123,920
5500	In-Lieu Taxes	0	8,700	0	0	8,700
	Total Operating Expenses	\$43,000	\$2,058,423	\$207,714	\$1,213,300	\$3,522,437
	GRAND TOTAL	\$258,400	\$4,887,363	\$1,098,614	\$7,692,480	\$13,936,857

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 1A - Comparative Statement
Fiscal Year 2021

ACCOUNT	FY'17 ACTUAL	FY'18 ACTUAL	FY'19 ACTUAL	FY'20 ADOPTED	FY'21 PROPOSED
Regular Salaries & Wages	\$5,413,220	\$5,799,411	\$5,959,265	\$6,267,850	\$6,475,650
Overtime-Salaries & Wages	265,792	244,222	239,713	243,470	269,270
New positions-Salaries & Wages	150	0	0	0	0
Retiree Unused Sick & Vacation	23,815	0	0	0	0
Fringe Benefits	4,657,807	3,633,755	3,047,059	3,383,900	3,120,000
Retiree Health Benefits	867,991	821,473	1,498,763	875,600	539,500
Workers Comp. (Self Insured)	1,766	493	4,590	10,000	10,000
Total Salary & Fringe	11,230,542	10,499,354	10,749,390	10,780,820	10,414,420
Budget Salary & Fringe					
Residences	\$24,679	\$17,161	\$27,122	\$21,600	\$19,600
Heating Fuel	57,211	67,502	61,012	93,500	93,500
Utilities -Electrical Service	92,554	98,336	93,556	102,900	102,900
-Gas Service	4,171	4,531	4,571	4,800	5,200
-Propane	219	403	457	500	500
Electricity for Pumping Station	492,775	328,769	59,993	87,000	87,000
Fuel - Vehicular	95,995	116,756	106,304	159,000	121,875
Oil & Grease	7,650	4,033	9,317	9,600	12,100
Tires	10,908	16,056	15,540	23,000	23,000
Maintenance Supplies	151,949	163,391	184,818	193,300	194,600
Maint. Supplies - Vehicular	58,231	61,576	50,108	60,000	57,500
Major Vehicle Service & Repair	57,628	47,127	103,843	80,000	85,000
Agricultural Supplies	4,472	2,317	5,758	7,000	7,000
Maintenance Equipment	31,169	37,388	28,372	76,400	50,900
Serv. & Maintenance Contracts	205,526	228,974	241,120	256,000	287,356
Equipment Rental	32,345	54,332	35,066	57,550	55,850
Household - Safety Supplies	39,518	34,163	39,576	37,700	39,500
Uniforms	3,667	3,213	9,581	8,560	8,660
Special & Professional Services	453,825	506,542	455,218	543,818	591,136
Protective Services	1,126,790	1,138,434	1,154,913	1,173,000	1,251,100
Telephone	82,167	78,449	75,123	85,400	85,200
Postage & Freight Out	5,794	5,718	6,285	7,620	5,620
Data Processing	34,933	35,453	25,995	27,420	27,420
Printing & Office Supplies	31,846	41,272	47,991	93,050	85,050
Scientific & Photographic	236	1,174	784	500	6,500
Dues & Subscriptions	30,964	35,117	36,715	42,420	42,220
Advertising & Promotional	23,078	5,219	1,966	6,000	11,500
Travel & Subsistence	5,353	3,841	5,433	6,580	6,580
Staff Training & Tuition Aid	19,111	12,460	14,222	23,550	25,450
Fees & Permits	114,584	111,609	118,400	123,850	123,920
In - Lieu Taxes	18,689	18,689	8,703	18,700	8,700
Total Other Expenses	\$3,318,038	\$3,280,008	\$3,027,860	\$3,430,318	\$3,522,437
Total Operating Expenses	\$14,548,580	\$13,779,362	\$13,777,251	\$14,211,138	\$13,936,857
Annual Increase (Decrease)	20.33%	-5.29%	-0.02%	3.15%	-1.93%
Budget -other expenses	3,187,689	3,411,337	3,540,285	3,540,285	3,522,437
ANNUAL BUDGET	\$13,491,339	\$13,890,887	\$14,238,081	\$14,211,138	\$13,936,857

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

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

Fiscal Year 2021

		ADOPTED F/Y20	PROPOSED F/Y21
1.	Postage/Fax/ Misc. Machines (Dept. 16)	\$ 1,500	\$ 500
2.	IHS-Safety Software (Dept. 17)	1,700	2,000
3.	Comodo- Remote Access Certificates (Dept. 17)	300	300
4.	WMWARE (Dept. 17)	500	500
5.	Sage Clients First MAS 100 (Dept. 17)	4,750	5,000
6.	Property Fax - Parcel Maps (Dept. 17)	1,400	1,400
7.	Sage Fixed Asset (Dept. 17)	2,250	2,600
8.	PV & Associates- Winslamm (Dept. 17)	500	500
9.	People Trak Support Technical Difference (Dept. 17)	1,000	1,000
10.	COMCAST - Cable Internet (Dept. 17)	8,000	12,000
11.	Essention - Conservation Trak	5,000	5,000
12.	Weebly (Web Hosting at Clinton) (Dept. 17)	200	200
13.	Square Space (Web Hosting Watershed) (Dept. 17)	250	250
14.	Symantec Anti-Virus Maintenance-Clinton (Dept. 17)	2,500	2,500
15.	Sonic Wall Software (Dept. 17)	1,200	1,200
16.	ESRI ArcView Maintenance-Watershed (Dept. 17)	5,400	5,400
17.	CU Riverware Maintenance Agreement (Dept. 17)	3,500	3,500
18.	Proofpoint Antispam (Dept. 17)	1,500	1,500
19.	River Morph (Dept. 17)	500	500
20.	DLT Solutions Autocad (Dept. 17)	1,500	1,600
21.	Fastrax SBPS Monitoring Software (Dept. 17)	900	900
22.	ESRI ArcView Maintenance-Clinton (Dept. 17)	500	500
23.	Keystone Precision-GPS Software Maint. (Dept. 17)	800	800
24.	HAAS Systems-Security Alarm Software Maint. (Dept. 17)	400	400
25.	Clients First-Vipre Antivirus/Antispam (Dept. 17)	250	250
26.	EZ Watch Security Video (Dept. 17)	900	900
27.	Clients First - Server Software (Dept. 17)	1,000	1,000
28.	Delmar Enterprises - Key Systems (Dept. 17)	520	520
29.	DocuSign (Dept. 17)	400	400
30.	Wix for Web (Dept. 20)	100	156
31.	Janitorial Service (Dept. 20)	3,300	3,300
32.	Trimble Catalyst for GPS (Dept. 30)	500	500
33.	Refuse Collection (Dept. 31)	11,900	7,500
34.	Janitorial Service (Dept. 31)	15,500	15,500
35.	HVAC Service (Dept. 31)	5,500	5,500
36.	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 2021

	ADOPTED F/Y20	PROPOSED F/Y21
37. Instrumentation Services (Dept. 31)	\$ 4,500	\$ 4,500
38. Entry Rugs (Dept. 31)	5,000	5,000
39. Carpet Cleaning (Dept. 31)	8,000	8,000
40. Generator Service-Administration Building (Dept. 31)	1,200	1,200
41. Underground Plant Location Service Notifications (Dept. 31)	1,500	1,500
42. Crane Service and Inspection (Dept. 31)	2,200	2,200
43. Elevator Service-SBPS (Dept. 31)	2,800	2,800
44. Electrical Service-SBPS (Dept. 31)	20,000	20,000
45. UST Testing and Inspections	-	15,000
46. Miscellaneous (Dept. 31)	6,900	6,900
47. Janitorial Service (Dept. 32)	8,000	8,400
48. Dumpster Service Canal Office (Dept. 32)	12,000	18,000
49. Dumpster Service Route 1 (Dept. 32)	42,000	48,000
50. UST Service (Dept. 32)	2,500	2,500
51. Instrumentation Service (Dept. 32)	1,000	1,000
52. Floor Mats (Dept. 32)	2,400	2,400
53. Grass Mowing Service (Dept. 32)	8,000	8,000
54. Boiler Service (Dept. 32)	500	500
55. Wood Disposal Fees (Dept. 32)	3,600	4,800
56. Generator Service-Scudders & Perdicaris (Dept. 32)	3,000	3,000
57. Viking Pest	-	600
58. Johnny on the Spot - Rt. 202 (Dept. 32)	2,400	2,400
59. Welco Gas (Dept. 33)	1,000	1,000
60. Tree Stump Recycling	-	2,500
61. Parts Washer & Hazardous Removal (Dept. 34)	1,000	1,000
62. Boom Lift Annual Inspection (Dept. 34)	900	900
63. Recycle Used Vehicle Fluids (Dept. 35)	1,500	1,500
64. Fire Extinguisher Maintenance (Dept. 36)	9,000	9,000
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)	600	600
69. Dial My Calls (Dept. 37)	1,200	1,200
70. Geomoto GPS Tracking (Dept. 37)	1,200	1,200
71. Covert Wireless (Dept. 37)	180	180
TOTAL	<u>\$ 256,000</u>	<u>\$ 287,356</u>

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 3 - List of Category 5380 Items Recommended Professional Services

Fiscal Year 2021

	ADOPTED F/Y20	PROPOSED F/Y21
1. Services-Governor's Authorities Unit (Dept. 10)	\$ 25,000	\$ 25,000
2. Consultant-C.P.A. to Conduct Annual Audit (Dept. 13)	55,000	55,000
3. 125 Plan-Family security Insurance Agency (Dept. 13)	2,730	2,730
4. Archiving (Dept. 13)	6,000	6,000
5. Services-Pre-Employment Exams & Tests (Dept. 14)	3,300	3,300
6. Fidelifax-Background Checks (Dept. 14)	2,248	2,248
7. Medical CDL Drug Testing (Dept. 14)	1,600	1,600
8. Employee Advisory Service (Dept. 14)	2,500	2,500
Consultant-Risk Management - to provide assistance to the Authority in the review of insurance coverage and continuation of a Comprehensive		
9. Coordinated Risk Management Program (Dept. 15)	40,000	45,000
10. Insurance Broker-HRH (Dept. 15)	42,000	42,000
11. GL Administrator (ESIS) (Dept. 15)	2,000	2,000
12. Services-Attorney General's Office - Assistance of Deputy Attorney General concerning a wide range of legal matters (Dept. 15)	20,000	20,000
13. Appraisals - Canal Leases	-	5,000
14. MP Water Monitoring Costs - USGS SR @ Glen Gardner (Dept. 20)	9,860	10,057
15. MP Water Monitoring Costs - USGS SB Raritan @ Stanton (Dept. 20)	8,400	8,568
16. MP Water Monitoring Costs - USGS Landing Lane (Dept. 20)	35,700	36,414
17. MP Water Monitoring Costs - USGS Raritan River @ Manville (Dept. 20)	47,000	47,940
18. Continuous Record Gaging - USGS @ Washington Crossing (Dept. 20)	21,650	22,083
19. Water Quality Monitoring - USGS @ Washington Crossing (Dept. 20)	4,960	5,059
20. Water Monitoring Costs ASWQMN- USGS D&R Canal @ Landing Lane (Dept. 20)	13,350	13,617
Water Monitoring Costs ASWQMN - NJDEP Mulhockaway @ Van Syckel		
21. (Dept. 20)	7,320	7,320
22. Additional Flow Measure at SR, Stanton, Manville & Calco Dam (Dept. 20)	8,500	8,500
23. Water Monitoring-SBWA/URWA now RHA (Dept. 20)	2,000	2,000
24. Water Monitoring-SBMWA (Dept. 20)	1,500	1,500

(continued on next page)

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

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

Fiscal Year 2021

	ADOPTED F/Y20	PROPOSED F/Y21
25. Dash for the Trash (Dept. 20)	\$ -	\$ -
26. Lab Certification WPU/Water Sample Analysis (Dept. 20)	1,500	2,000
27. NJ Invasive Species Strike Team (Dept. 20)	300	300
28. ISCO Monitoring (Dept. 20)	9,600	8,000
29. General Lab Analysis	-	4,000
30. Services-Emergency Engineering Services (Dept 30)	2,500	2,500
31. Underground Storage Tank-CEA Report (Dept. 30)	11,000	16,000
32. Underground Storage Tank Groundwater Test (Dept. 30)	2,500	6,000
33. USGS Cooperative Agreement River Gaging - Maintenance of Raritan Basin Stream Gaging Stations and the Delaware & Raritan Canal Gauging at Kingston per USGS/DWR/NJWSA Agreement (Dept. 31)	68,000	68,000
34. USGS Spruce Run Gage at Glen Gardner (Dept. 31)	10,200	10,200
35. USGS Clinton Rain Gage (Dept. 31)	3,200	3,200
36. USGS Washington Crossing Rain Gage (Dept. 31)	3,200	3,200
37. Water Testing and Sampling to comply with the Safe Water Drinking Act (Dept. 31)	2,400	2,400
38. Water Sampling and Testing as per NJDWR Requirements - RT 202 Stockpile Site (Dept 32)	20,000	20,000
39. Maintenance of USGS Gauges at Washington Crossing and 10-mile and others (Dept. 32)	24,900	48,000
40. Vac Truck Service - IFW, 10 Mile PS (Dept. 32)	5,000	5,000
41. Safety Suggestion Program, Poster and Promotional Materials, Safety Incentive Program (Dept. 36)	9,700	9,700
42. Pulmonary Testing and Physicals (Dept. 36)	5,000	5,000
43. Annual Contributions to Fire Companies and Rescue Squads (Dept. 36)	500	500
44. Hepatitis Vaccinations (Dept. 36)	800	800
45. Calibration for the Pota-Count Respirator (Dept. 36)	900	900
TOTAL	<u>\$ 543,818</u>	<u>\$ 591,136</u>

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 4 - Projected FY 2021 New Jersey Water Supply Authority Insurance Program

<u>Policy</u>	<u>Raritan Basin System</u>	<u>Manasquan Reservoir System</u>	<u>Manasquan Water Treatment Plant and Transmission System</u>	<u>Total Premium</u>
Property Limit \$150 million, Limit \$25m BI	\$585,160	\$196,749	\$48,091	\$830,000
Deduct: \$100k all perils \$250k Deduct dams, dikes / \$1m Deduct Canal flood Earthen Dam:Builders Risk	\$15,000			\$15,000
General/Products Liability Limit \$1 million Deduct: \$150k	\$103,332	\$9,661	\$2,007	\$115,000
Environmental Impairment Liability Limit \$10 million Deduct: \$100k	\$24,261	\$2,268	\$471	\$27,000
Workers' Compensation Limit \$1 million	\$186,027	\$23,915	\$25,058	\$235,000
Employer Liability Limit \$1 million	Included in Workers' Comp	Included in Workers' Comp	Included in Workers' Comp	Included in Workers' Comp
Umbrella Liability Limit \$23 million	\$269,563	\$25,203	\$5,234	\$300,000
Business Automobile Limit: \$1 million G/L, \$0 pd Deduct: \$50k, G/L	\$24,627	\$4,372	\$1,001	\$30,000
Management Liability Public Officials Liability Cyber Risk Fidelity & Crime Limit \$5 million/\$1 million/\$1 million Deduct: \$100k/\$10k/\$50k	\$35,942 \$5,391 <hr/> \$41,333	\$3,360 \$504 <hr/> \$3,864	\$698 \$105 <hr/> \$3,000 <hr/> \$3,803	\$40,000 \$6,000 <hr/> \$3,000 <hr/> \$49,000
Travel Accident Limit \$2 million	\$1,797	\$168	\$35	\$2,000
TOTAL:	\$1,251,100	\$266,200	\$85,700	\$1,603,000

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 2021 (7/1/20-6/30/21)

	Total Headquarters Charge	Manasquan Reservoir System	Manasquan WTP/TS
Budgeted-Appendix I, amount to be charged to Manasquan System for FY21 (7/1/20-6/30/21)	\$703,604	\$606,999	\$96,605
F/Y19 Adjustment as per audited Expenditures:			
Budgeted as per rate schedule for F/Y19 (7/1/18-6/30/19). Amounts paid during F/Y19 to Raritan Basin System.	\$772,000	\$666,000	\$106,000
Actual allocation based upon audited expenditures F/Y19 (7/1/18-6/30/19) - Appendix II	<u>\$697,111</u>	<u>\$601,381</u>	<u>\$95,730</u>
Adjustments F/Y19	<u>(\$74,889)</u>	<u>(\$64,619)</u>	<u>(\$10,270)</u>
Net Allocation for F/Y2021 Budget	<u><u>\$628,715</u></u>	<u><u>\$542,380</u></u>	<u><u>\$86,335</u></u>
 Estimate	 <u>\$629,000</u>	 <u>\$542,000</u>	 <u>\$87,000</u>

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 6 - Proposed Capital Equipment Budget
Fiscal Year 2021

	Description	(R) Replacement (A) Addition	Year of Purchase	Dollar Value	Depreciation Reserve
ENG/FACILITIES	DRONE AND CAMERA FOR MONITORING - ENG.	A		12,000	
	DEWALT CHOP SAW FOR METAL	A		1,200	
	JET MODEL IIDP-22 DRILL PRESS	R <1000		3,000	
	(3) REPLACEMENT DOORS ANNEX	R		12,000	
	SEAMLESS GUTTERS AT BUSHER RESIDENCE	R		3,500	
	HONDA 2200 WATT GENERATOR	R		1,250	
	GENIE ELECTRIC SCISSOR LIFT GS-1930	A		15,000	
	TRAILER FOR SCISSOR LIFT	A		9,500	
	NJWA-12 2006 HYBRID ESCAPE	R (1995)	2006	40,000	25,953
	NJWA-18 2006 F250 W/BUMPER CRANE	R (1991)	2006	40,000	20,328
GROUNDS	14' JON BOAT	A		1,500	
	DUAL AXLE DUMP TRUCK	R (1964)	2005	175,000	104,988
CANAL	J.D. 450K BULL DOZER W/WINCH	R	1996	150,000	64,860
	SKID STEER / FORK LIFT/ SNOW PLOW / AUGER	R/A (1739 reconditioned)	2000	80,000	4,500
	ROLL-OFF DEMOLITION CONTAINER 22' x 8'	R (849)	1988	6,000	6,040
	TRACTOR	R (1540)	1996	75,000	21,562
	8-TON TRAILER	A		11,000	
	(2) 2" TRASH PUMPS	R (2104 & 2105)	2008	4,000	4,800
	NEW SNOW PLOW DR41	R (1237)	1991	6,000	1,475
	F150 P/U w/ CAP (WSO)	R (2242)	2014	40,000	30,195
AUTO SHOP - CANAL	SCUDDERS FALLS X-FER SWITCH	R		5,000	
	SNAP-ON - DIAGNOSTIC SMOKE MACHINE	A		1,600	
	NJWA 50 - F250 UTE BODY W/LIFT GATE (MECHANIC)	R (2227)	2013	58,000	33,045
SAFETY	HOT WATER PRESSURE WASHER	R (892)	1989	6,000	3,445
	(2) AED UNITS	(R)2205/2206	2012	4,000	3,235
SECURITY	NJWA 03 - 4WD PICK-UP	(R) 2235	2014	32,000	23,400

	TOTAL COST	\$792,550	\$347,826
LESS AMOUNT CHARGED TO DEPRECIATION RESERVE		(347,826)	
	NET TOTAL	<u>\$444,724</u>	
LESS AMOUNT CHARGED TO CAPITAL EQUIPMENT RESERVE		(\$150,000)	
	TOTAL	\$294,724	
	AMOUNT FUNDED FOR FY2021	\$294,700	

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 7 - Estimate Of Interest Income For Fiscal Year 2021 Budget

Fund/Reserve	TD Bank Funds	
Operating	\$ 2,295,000	
Reserve for O & M	2,265,000	
Pumping Reserve	1,565,000	
Self-Insurance Reserve	300,000	
Rate Stabilization Fund	87,000	
Estimated Total	\$ 6,512,000	
	\$6,512,000 x 1.25% =	\$ 81,400
	Total	\$ 81,400
	Estimate	\$ 81,400

Note: Long-term investment earnings are being used to fund depreciation reserve

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 8 - Unanticipated Revenue

Funds to be appropriated Into the Rate Stabilization Fund for Fiscal Year 2021

			<u>Amount</u>
F/Y2019 Net Year-End Balance			\$650,000
<u>Overdrafts</u>	<u>Invoice No.</u>	<u>Billed</u>	<u>Amount</u>
Renaissance at Monroe	R259	Dec 18	\$346
Stonebridge Community Assoc.	R258	Dec 18	\$1,153
NJ American	R257	Dec 18	\$119,452
Mount Olive Township	R256	Dec 18	\$3
	Total		\$120,954
	Amount used in FY2020		<u>-</u>
	NET		\$120,954
 <u>Overdrafts Not Billed, Accrued through July, 2019</u>			
Renaissance at Monroe			\$498
NJ American			\$80,201
 <u>Other Sources of Funds</u>			
	Grand Total		<u>\$851,653</u>
	FY21 Budget		<u>\$851,650</u>

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 9 - Fund Balances as of 6/30/19

Final

	REVENUE FUND	OPERATING ACCOUNT	OPERATING FUND	O & M RESERVE	LONG-TERM INVESTMENTS O & M RESERVE	TOTAL
BALANCE 6/30/19	\$501,639	\$1,232,179	\$2,295,191	\$2,264,545	\$1,420,444	\$7,713,998
Deduct: Accrued expenses to be paid as of 6/30/19			(274,879)			(274,879)
Deduct: June 1st billing, received			(474,229)			(474,229)
Adjusted Balances 6/30/19	\$501,639	\$1,232,179	\$1,546,083	\$2,264,545	\$1,420,444	\$6,964,890
 INCOME						
Reimbursement Manasquan						
Receipt of Headquarters Overhead Expenses for 7/10/19			166,500			166,500
Operating transfer	(501,639)	(1,232,179)	1,733,818			-
 EXPENSES						
O & M Expenses - (A/P 6/30/19)						
Includes accrued Payroll thru 6/30/19			(763,927)			(763,927)
Capital items to be purchased by 6/30/19			(75,699)			(75,699)
Various Reserve contributions (one month)			-			-
PROJECTED BALANCE AT 6/30/19	\$0	\$0	\$2,606,775	\$2,264,545	\$1,420,444	\$6,291,764
						Less: O & M reserve balance (3 mos required by resolution)
						(3,594,760)
						Adjusted balance of funds available 6/30/19
						2,697,005
						Use of Available Funds
						Unanticipated revenues (overdrafts in F/Y 19 to be available for appropriation to Rate Stabilization Fund for FY21)
						(120,954)
						Rate Stabilization Fund Transfer for FY20
						(968,180)
						Projected Net Balance
						\$1,607,870

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

**Schedule 10 - Projected Fiscal Year 2021 Operations & Maintenance Component
and Debt Service Assessment Sales Base**

USER	DAILY ALLOCATION (MGD)	DAYS PER YEAR	TOTAL MG/YR	ANNUALIZED SALES BASE (MGD)
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 PPL	0.150	365	54.750	0.150
Trenton Country Club	0.126	365	46.000	0.126
Suez 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 2021 Operations & Maintenance Component
and Debt Service Assessment Sales Base**

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
TOTAL SALES BASE				182.339

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 11 - Operations And Maintenance Rate Component
Fiscal Year 2021

Funds Required for FY2021 Budget

Proposed Operating Expense and Capital Budget	\$13,912,557
Less Miscellaneous Revenues & Interest Income	(\$133,600)
Other Available Funds	(\$851,650)
Net Budget Requirement	\$12,927,307
Less: 182.339 x 194.00 x 61Days (Cash received in July and August for water used in May and June based on \$194.00/mg)	(\$2,157,800)
Additional Revenue required to cover Operations and Maintenance Expense through 6/30/21	\$10,769,508

Computation of Operations & Maintenance Rate for Fiscal Year 2021

Sales Base	
Period 7/1/20 to 4/30/21 305 days x 182.339 mgd	= 55,613.40 mg
Required Operations & Maintenance Rate FY2021	
	$\frac{\$10,769,508 \text{ mg}}{55,613.40 \text{ mg}} = \194.00 mg

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 12 - Debt Service Rate Component For NJEIFP Loan Repayment

Debt Service Rate Component for NJIB Loan Repayment

Effective July 1, 2020, (F/Y2021, July 1, 2020-June 30, 2021)

Total due on Principal and Interest \$ 5,692,172 /year

$$\text{Debt Service Rate for NJIB Loan} = \frac{\$5,692,172}{182.339\text{mgd} \times 365 \text{ days}} = \$85.00 /\text{mg}$$

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

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 13 – Source Water Protection

Dedicated Land	\$19.50	\$19.50	\$19.50	\$19.50
Dedicated WSP	\$4.50	\$4.50	\$4.50	\$4.50
Sales Base	182.339	182.339	182.339	182.339

Source Water Protection Fund	Actual FY'19	Adopted FY'20	Proposed FY'21	Projected FY'22
Fund Component Rate	\$24.00	\$24.00	\$24.00	\$24.00
Annual Household Impact		\$0.00	\$0.00	\$0.00
Opening Balance July 1	\$4,989,889	\$5,204,240	\$5,322,262	\$5,390,740
Total Rate Component	1,597,404	1,597,412	1,597,412	1,597,412
Rate Component Watershed	299,515	299,515	299,515	299,515
Rate Component Land	1,297,897	1,297,897	1,297,897	1,297,897
Interest and Other Additions	<u>71,477</u>	<u>30,657</u>	<u>30,000</u>	<u>30,000</u>
Total Available	6,658,778	6,832,309	6,927,703	6,996,297
Available Watershed	2,616,768	2,505,249	2,405,249	2,305,249
Expenditure Watershed	<u>411,034</u>	<u>399,515</u>	<u>399,515</u>	<u>399,515</u>
Balance Watershed	2,205,734	2,105,734	2,005,734	1,905,734
Available Land	4,042,010	4,327,060	4,522,454	4,691,048
P/D & Adm/ & Cash for Easements	0	0	0	0
Property Administrators	0	0	0	0
Debt Service & Trust Fees Land	1,043,504	1,110,532	1,137,449	1,120,047
Other Land Expenditure				
Total Expenditure Land	<u>1,043,504</u>	<u>1,110,532</u>	<u>1,137,449</u>	<u>1,120,047</u>
Balance Land	2,998,506	3,216,528	3,385,006	3,571,000
Total Project Expenditures	<u>1,454,538</u>	<u>1,510,047</u>	<u>1,536,964</u>	<u>1,519,562</u>
Ending Balance June 30	<u>\$5,204,240</u>	<u>\$5,322,262</u>	<u>\$5,390,740</u>	<u>\$5,476,734</u>

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 14 - Capital Improvement Program
Fiscal Years 2020-2024

PROJECT	ESTIMATED	Period	Priority	Prior	\$33	\$33	\$45	\$55	\$55
	PROJECT	First			Years	FY	FY	FY	FY
PROJECT	COST	Identified			2020	2021	2022	2023	2024
Dredging Kingston & Amwell Road - Design eng only (some is bonded)	\$ 2,261,712	2006	High	2,134,133	127,579				
Dredging Kingston & Amwell Road - Construction engineering only (bond)	\$ -	2006	High	-					
Dredging Kingston & Amwell Road - Construction \$41M (bond)	\$ -	2006	High	-					
Rehabilitate Western Embankment Stockton Borough	\$ 5,100,000	2006	High	221,782	1,000,000	3,878,218			
Rehab Swan Creek Aqueduct new project includes culvert work	\$ 1,200,000	2015	High	-			100,000	1,100,000	
Dam Impmnts as recommended by TRB (preliminary eng and owner's eng)	\$ 2,600,000	2013	High	2,295,400	175,000	120,000	9,600		
RV Res Dams-Rehab & Resource Preservation Project (eng only)	\$ 5,000,000	2015	High	4,211,515	350,000	350,000	88,485		
Round Valley Dam Improvements - Construction (bond)	\$ -	2015	High	-					
Construction eng mgmt for RV dam improvements (bond)	\$ -	2015	High	-					
Grouting abutments of RV embankments (bond)	\$ -	2016	High	-					
Dredging intake channel to RV South Dam Tower (bond)	\$ -	2016	High	-					
Electrical Improvements at Round Valley Reservoir (Not bonded)	\$ 450,000	2016	High	-	450,000				
Security Improvements at RV reservoir (cameras) (Not bonded)	\$ 1,200,000	2016	High	-		300,000	900,000		
Security Improvements at RV and SR (Perimeter hardening) (Not bonded)	\$ 800,000	2017	High	-		150,000	150,000	150,000	350,000
Background Screening of contractors and consultants (Not bonded)	\$ 202,252	2016	High	-	67,417	67,417	67,417		
New 2D Inundation mapping for Round Valley and Spruce Run Reservoir	\$ 500,000	2015	High	-	250,000	250,000			
Dredging of Intake Pond and replace ice deflectors at SBPS	\$ 2,800,000	2005	High	133,842	900,000	1,766,158			
Rehab of 6-Mile Run Culvert	\$ 1,500,000	2008	High	77,754	550,000	872,246			
Replace Fuel dispenser and software/inventory system at Spruce Run Adm.	\$ 250,000	2017	High	40,961	209,039				
Replace Office phone system - Authority Wide	\$ 75,000	2017	High	-	75,000				
Refurbishment of the Main Pumps & Motors 4, 5, 7, & 8 with additional upgrades (bond)	\$ -	2008	High	-					
Replace Boilers at Spruce Run Administration Building	\$ 175,000	2018	High	-	100,000	75,000			
Replace Water storage tanks in Spruce Run Administration Building Basement	\$ 100,000	2018	High	-	75,000	25,000			
Emergency Generator at Spruce Run Administration Building	\$ 400,000	2019	High	-	200,000	200,000			
SR Reservoir Multidisciplinary Release works improvements & studies	\$ 4,000,000	2016	High	374	300,000	1,500,000	2,199,626		
Scudders Falls Wastegate Controls Improvements	\$ 75,000	2019	High	-	75,000				
	\$ 24,613,954								
Rehab of Upper Canal Embankment - Raven Rock to Prallsville	\$ 4,800,000	2006	Med High	105,419	400,000	1,500,000	1,000,000	1,794,581	
Rehabilitate Flow Control Gate on back Race at Lambertville	\$ 150,000	2019	Med High	-	25,000	125,000			
Rehab of Canal Flow Control Structures Griggstown and 10-Mile Locks	\$ 1,500,000	2000	Med High	-				100,000	1,400,000
Rehab of Landing Lane Spillway and rehab slope d/s of Island Farm Weir	\$ 1,850,000	2013	Med High	122,820	700,000	1,027,180			
Repair of Pipe at Whitehead Road	\$ 500,000	2012	Med High	-				250,000	250,000
Rehabilitation Work at Washington Crossing Spillway	\$ 300,000	2012	Med High	-				150,000	150,000
Security System and Upgrades (Clinton and Canal)	\$ 450,000	2003	Med High	100,992	100,000	100,000	50,000	50,000	49,008.38
	\$ 9,550,000								
Alexauken Creek Aqueduct	\$ 1,000,000	2015	Medium	-				500,000	500,000
Rehabilitation of Carnegie Lake Creek Aqueduct	\$ 100,000	2015	Medium	14,400	85,600				
Replacement of Through the Wall HVAC Units in SRA	\$ 175,000	2011	Medium	-	175,000				
Rebuild Stone Embankment at the 10 Mile Waste Gate and rebuild façade	\$ 200,000	1990	Medium	-	100,000	100,000			
Rehab of Spillway u/s of Griggstown Lock	\$ -	2010	Medium	-					
Rehab of Culvert at Station 2550+90 (1 mile upstream of 10-mile)	\$ 700,000	2008	Medium	-					700,000
Replace boiler at Canal Field Office	\$ 150,000	2019	Medium	-		150,000			
Replace underground heating oil tank at South Branch Pumping Station	\$ 300,000	2018	Medium	-				300,000	
Replace underground heating oil tank at SR Ad Building	\$ 300,000	2019	Medium	-				300,000	
Replace underground diesel and gasoline tanks at Spruce Run Ad Building	\$ 600,000	2019	Medium	-				600,000	
Spruce Run Administration Building Network Data Closet Construction	\$ 100,000	2019	Medium	-		100,000			
	\$ 3,625,000								
Rehab of Traprock Spillway	\$ -	2010	Low	-					
Dredging between Landing 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	-					
Storage Building at Canal Field Office	\$ -	2019	Low	-					
Spruce Run Administration Building Tie-in to Public Water Supply	\$ -	2018	Low	-					
Storage Building near Spruce Run Annex	\$ -	2018	Low	-					
Construction Bedload Stone Trap @ Wickechoke Creek	\$ -	1995	Low	-					
Cutoff Wall in Shipetaukin Creek Guard Bank	\$ -	2005	Low	-					
Wickechoke Creek Gates Abandonment	\$ -	2015	Low	-					
Rehab of Gold Run Spillway	\$ -	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 (Suydam)	\$ -	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 the Four Mile Spillway	\$ -	2010	Low	-					
Third Hand Shop Culvert under D&R Canal Cleaning (partially Clogged)	\$ -	2019	Low	-					
No-Name Culvert Under Canal Sta. 936+50 Outlet Cleaning (Part Clogged)	\$ -	2019	Low	-					
Pipeline Evaluation - Whitehouse Release Pipeline	\$ -	1990's	Low	-					
Pipeline Evaluation - RV Force Main	\$ -	1990's	Low	-					
	\$ -								
TOTAL	\$ 38,464,956			9,459,392	6,289,635	12,656,219	4,765,128	5,294,581	3,399,008
Balance CIP				18,520,178	14,426,816	3,972,887	2,202,677	568,552	829,999

The estimated project costs listed includes engineering, cultural, construction and miscellaneous expenses.
Funds in CIP as of June 30, 2019 is \$11,566,428 plus \$7,116,000 from Capital Improvements Investments
Cost for the Dredging of the Canal between Kingston & Amwell Road of \$41,000,000 represents construction costs.
Spruce Run Improvements - An extensive ranging grouting program is anticipated on an approximate 4-year timeline.

**RARITAN BASIN SYSTEM
CAPITAL IMPROVEMENT PROGRAM
Fiscal Years 2020 – 2024
Updated – August 2019**

The following is a description of projects that the Authority anticipates being funded from the Capital Improvement Program (CIP) in Fiscal Years 2020 – 2024. Discussion also includes projects that may be delayed beyond FY 2024 due to funding.

HIGH PRIORITY
Dredging Kingston & Amwell Road - Design engineering only (some is bonded)
Dredging Kingston & Amwell Road - Construction engineering only (bond)
Dredging Kingston & Amwell Road - Construction \$41M (bond)
Rehabilitate Canal Western Embankment Stockton Borough
Rehab Swan Creek Aqueduct new project includes culvert work
Dam Improvements as recommended by TRB (preliminary engineer and owner's engineer)
RV Reservoir Dams-Rehab & Resource Preservation Project (eng only)
Earthen Dam Rehabilitation and Ancillary Work (Improvements to RV Dams) - Construction (Bond Est \$58M)
Construction engineering management for RV dam improvements (bond) Est. \$5M
Grouting abutments of RV embankments (bond) Est \$4.2M
Dredging intake channel to RV South Dam Tower (bond) Est \$1M
Electrical Improvements at RV Reservoir
Security Improvements at RV reservoir (cameras)
Security Improvements at RV and SR (Perimeter hardening)
Background Screening of Contractors and Consultants
New 2D Inundation mapping for RV, SR Reservoirs and No-Name Dam
Dredging of Intake Pond and replace ice deflectors at SBPS
Rehab of 6-Mile Run Culvert in the D&R Canal @ Sta. 2298+17
Replace Fuel Dispenser System at Spruce Run at Spruce Run Admin
Replace office phone system - Authority Wide
Refurbishment of the Main Pumps & Motors 4, 5, 7, & 8 with additional upgrades
Replace Boilers at Spruce Run Administration Building
Replace Water storage tanks in Spruce Run Administration Building Basement
Emergency Generator at Spruce Run Administration Building
Multidisciplinary engineering project for structures rehabilitation in connection with the Spruce Run reservoir outlet works
Improvements to Scudders Falls Wastegate Controls

MEDIUM / HIGH PRIORITY
Rehab of Upper Canal Embankment - Raven Rock to Prallsville
Rehabilitate Flow Control Gate at Back Race at Lambertville
Rehab of Canal Flow Control Structures Griggstown and 10-Mile Locks
Rehab of the Landing Lane Spillway and rehab slope d/s of Island Farm Weir
Repair of Pipe at Whitehead Road
Rehabilitation Work at Washington Crossing Spillway
Security System and Upgrades (Clinton and Canal)
MEDIUM PRIORITY
Alexauken Creek Aqueduct
Rehabilitation of Carnegie Lake Aqueduct
Replacement of Through the Wall HVAC Units in SRA
Rehab of Waste Gate Outlet Wingwalls downstream of 10 and repair of upstream façade
Rehab of Spillway upcanal of Griggstown Lock
Stone Repair of Culvert at Station 2550+90 (1 mile upstream of 10-mile)
Replace Boiler at Canal Field Office
Replace underground heating oil tank at South Branch Pumping Station
Replace underground heating oil tank at SR Admin Building
Replace underground diesel and gasoline tanks at SR Admin Building
Spruce Run Administration Building Network Data Closet Construction
LOW PRIORITY
Rehabilitation of Traprock Spillway Sta. 1927+61
Dredging between Landing Lane and Route 18 - engineering
Dredging of Canal Between Lambertville Lock and Route 1 in Trenton
Dredging of Canal Between Amwell Road and 10 Mile Lock
Storage Building at Canal Field Office
Spruce Run Administration Building Tie-in to Public Water Supply
Storage Building near Spruce Run Annex
Construction Bedload Stone Trap @ Wickecheoke Creek
Cutoff Wall in Shipetaukin Creek Guard Bank
Wickecheoke Creek Gates Abandonment
Rehab of Gold Run Spillway
Carnegie Lake Culverts Investigation / Isolation
Raven Rock left retaining wall downcanal of Lock
Refurbishment of the Main Pumps & Motors 3 & 9
Refurbishment of the Main Pumps & Motors 2 & 10
Canal Culvert Stones Resetting 2249+79 (Suydam)
Canal Culvert Stones Resetting 2661+86 (Randolph Brook)
Canal Culvert Repairs 2992+34 (Mile Run Culvert)
Concrete Repairs at the Sullivan Way Aqueduct

Rehab of the Four Mile Spillway Canal Sta. 2886+75
Third Hand Shop Culvert under D&R Canal Cleaning
No-Name Culvert Under Canal Sta. 936+50 Outlet Cleaning
Pipeline Evaluation - Whitehouse Release Pipeline
Pipeline Evaluation - RV Force Main

Dredging between Kingston and Amwell Road – Design Engineering

Dredging between Kingston and Amwell Road – Construction Engineering (bond)

Dredging between Kingston and Amwell Road – Construction \$41M (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 was 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: North Brunswick Township, New Jersey American Water, Middlesex Water Company, East Brunswick Township and the City of New Brunswick.

Staff took cross-sectional measurements in this reach during 2007 and 2008 to estimate the quantity of accumulated sediment. Analysis of the cross-sections indicated that an estimated 248,000 cubic yards of sediment had accumulated in the Canal and needed to 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 47,000 cubic yards of sediment from this site that was previously dredged as part of the Authority’s maintenance dredging program is included as part of the proposed 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 and confirmed the quantity of sediment 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. Five access points and the staging area were targeted and the design documents were completed. The determination of the disposal site (final destination) of the dredged material was the final critical element in the design.

The project is ongoing and expected to be completed by FY21. The application for funding through the New Jersey Infrastructure Bank (NJIB), formerly the New Jersey Environmental Infrastructure Trust, was resubmitted and formulated to cover the full estimated construction cost of the dredging, full-time inspection and construction management for the first dredging year by Urban Dredging, and other allowable expenses.

All permits for the project were obtained. A contract was executed with the lowest responsive bidder, J.F. Brennan Company, Inc., La Crosse, Wisconsin, and they mobilized on March 14, 2018.

Three seasons of dredging are anticipated to complete this very important project. Guidelines for material acceptance at a beneficial reuse site and appropriate testing protocols were agreed upon by all parties including NJDEP and the Environmental Protection Agency.

Dredging in the first season started in the second week of July 2018. Dredging was completed in Reaches 1, 2 and 4 in the first season of dredging. After drying and amending and mixing cement with the soil, approximately 50,000 cubic yards of dewatered sediment was transported to the beneficial reuse site. Season 2 for dredging started in May 2019 and will extend until the end of October 2019. Dredging in Reach 3 was completed at the end of June, 2019 and the majority of Reach 5, extending from Griggstown Causeway to Blackwells Mills Causeway, is expected to be completed by the two dredges that are in operation. Approximately 45,000 yards of sediment from the Stockpile site near Route 202 in Delaware Township are expected to be taken to the beneficial reuse site in late summer to early fall 2019.

Rehabilitation of the Canal 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 elevated floodwaters from the river. It was overtopped during separate major storm events in 2005 and 2006 when the embankment breached into the Canal. In 2011, Tropical Storms Irene and Lee caused severe flooding of the Delaware River. While the embankment did not breach, more than 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 soils slid into the Canal. These slides compromised the cross-sectional area of the embankment, drastically reducing the ability for the embankment to resist breaches.

Emergency actions were taken to prevent a breach of the embankment following the storms in 2011. These emergency actions included placement of fill material onto the embankment with varying levels of compaction. The fill material had to be installed via conveyor belt from the

opposite side of the Canal due to the unsafe nature of the embankment. While a breach was prevented, additional long-term repairs on the embankment are required to reinforce the repaired areas. This earthen embankment is generally comprised of medium dense to very loose, brown silty or clayed sand with varying amounts of gravel, which can be susceptible to slope failure from saturation and/or erosion during major flooding events, leading finally to Canal breaching. Stability improvements are being considered to increase the factor of safety against slope failure; failure by piping through seepage, when the river approaches the top of the embankment; or the threat of failure by erosion caused by overtopping of the entire embankment.

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. The Schematic Design report considered strengthening and improving the stability of the embankment and providing partial seepage cutoff by performing compaction grouting along the full length of the embankment. The proposed project will now target approximately 740 linear feet of the embankment with compaction grouting focused on the most vulnerable areas down-canal from Bridge Street in Stockton. Repair of the Delaware River side dry-laid stone in those areas is also expected. In addition, the Canal side embankment restoration will be performed only in areas of previous temporary repairs or disturbances.

The chosen design will include restoration of all Canal-side slopes that were damaged during Tropical Storms Irene and Lee. The tarps that were placed over those areas will be removed, the soil repaired and grass growth will be reestablished. The Delaware River dry-laid stone armoring will be replaced within segments of the embankment damaged by the storms. A pilot compaction grouting program is also planned for approximately 100 linear feet. The pilot program will be based on a performance specification and will serve as a guide for the effectiveness of the subsequent longer production grouting (approximately 740 linear feet) of the selected station limits. The work is currently projected to conclude in FY21.

Rehabilitation of the Swan Creek Aqueduct & Culvert

The Swan Creek Aqueduct and Culvert are 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 of a spillway for the Canal. An adjacent culvert also contributes to the conveyance of Swan Creek under the Canal, the multi-use trail, and the former Belvidere-Delaware Railroad. The Swan Creek Aqueduct is a concrete and masonry structure that was partially rehabilitated in 1989 when 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 as a result of the seepage. The seepage was slowed significantly by the injection of the grout, although it did not stop 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 issues and safety concerns. The corrugated metal liner in the north culvert showed signs of being corroded, limiting the amount of work which could be conducted in the culvert.

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

Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project – Earthen Dam Rehabilitation and Ancillary Work

Preliminary Engineering and Owner’s Engineer

Design Improvements to Round Valley Dams - Engineer of Record – Design Engineering Only

Earthen Dam Rehabilitation and Ancillary Work (Improvements to Round Valley Dams) - Construction (Bond Est \$58M)

Construction Engineering Management for Design Improvements to Round Valley Dams (Bond Est \$5M)

Dam Abutment Grouting (Round Valley North and South Dams) (Bond Est \$4.2M)

Sediment Relocation (Dredging) for Maintenance of the South Tower Intake Channel (Dredging) (Bond Est \$1M)

Round Valley Reservoir Electrical Services Upgrades

Round Valley Security Improvements (Cameras)

Background Screening of Contractors and Consultants

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 1960s. 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, previously 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 2013 contract with Gannett Fleming, the engineering consultant for the Formal Dam Inspection, 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 Authority staff, the TRB, the Owner's Engineer, and the Engineer of Record eventually chosen for the rehabilitation work at RV in their analysis of all available data pertaining to the construction and maintenance of the embankments. The first RV TRB took place 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 its report on the PFMA, the TRB recommended that the Authority "begin budgeting, engineering, and planning for the required modifications" to RV.

At that time, it was anticipated that construction would be large in scale and include the following, at a minimum:

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

Schnabel Engineering was procured to act as the Engineer of Record to investigate, plan, design, and provide full time construction management services for the above noted efforts. Schnabel Engineering is also responsible for development and execution of a proactive public participation program Gannett Fleming (GF) was procured to provide further engineering and consulting services during design and construction of the Round Valley Dam rehabilitation. The Authority will utilize GF in the role of Owner's Engineer during the design and construction of the project. While Schnabel Engineering will act as the Engineer of Record, GF will continue to provide advice and consultation to Authority staff during this very important project.

Schnabel Engineering is completing the design plans, specifications, and permitting for the project. The following represents a summary of the current tasks that are part of the design:

- Dredging of the Round Valley South Tower Intake Channel (detailed below);

- Security improvements at RV Reservoir (detailed below);
- Consider alternatives to rehabilitate the hydraulic valve on the Round Valley South Dam (detailed below);
- Remove and replace 10-inch cast iron pipe that connects the RV Force Main to the RV South Vault (detailed below);
- Repairs to the Round Valley building structures (towers and vaults, detailed below);
- Installation of a new blanket drain system on the downstream slopes of all three embankments at Round Valley to filter the existing seepage;
- Installation of new toe drains to filter, collect, and convey embankment and foundation seepage safely away from the structures;
- Electrical service improvements to the three embankments at RV Reservoir (detailed below);
- Grouting of the abutments at the North and South Dams.

It is noted that, with the exception of the security improvements and the electrical service improvements, which will be financed from the CIP, long-term bond funding is being sought from the New Jersey Infrastructure Bank (NJIB). The project is intended to be phased with the abutment grouting, intake channel dredging, and electrical improvements to be implemented prior to the large scale work on the embankments, which will incorporate all of the remaining noted scope items. The security improvements are scheduled to be constructed after the large scale embankment work.

Dam Abutment Grouting (Grouting of Abutments at North and South Dams)

Following an initial recommendation from the TRB, the Engineer of Record reviewed all of the grouting records associated with the original construction. The Engineer of Record has recommended grouting of the abutments at the North and South Dam. The abutments are the edges of the dam where the constructed embankment meets the existing valley slope. Review of the original grouting records suggests that the grouting was terminated before it reached the end of the abutments. The proposed grouting will be accomplished by drilling through the overburden soils and into the bedrock below. Cementitious grout will then be pumped under pressure into the bedrock to fill existing cracks or voids that may be present. This project is currently under construction and expected to be completed in FY20.

This project was bid out separately from the other RV projects so that it can be completed ahead of the large scale embankment modifications. Since this project will be financed through NJIB bonding, funding is not included in the CIP budget.

Sediment Relocation (Dredging) for Maintenance of the South Tower Intake Channel (Dredging of the Round Valley South Dam Intake Channel)

When the Round Valley Reservoir was originally constructed, a channel was blasted and excavated from the rock leading into the reservoir side of the Round Valley South Dam Tower. Over more than 50 years of pumping from the river, the constructed channel has filled with sediment. As part of the large-scale Round Valley Rehabilitation & Resource Preservation Project, the consultants were asked to design plans to remove the significant volume of sediment from the channel.

The investigation and design for this project is included in the scope for the Engineer of Record on the Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project. It is anticipated that the sediment will be collected using a dredge. The chosen design calls for relocation of the sediment to the deepest parts of the reservoir. The project was bid and awarded, and is expected to be completed by the end of fall 2019 (FY 2020).

This project was bid out separately from the other RV projects so that it can be completed ahead of the large scale embankment modifications. Since it will be bonded, funding is not included in the CIP budget.

Round Valley Reservoir Electrical Service Upgrades

The Earthen Dam Rehabilitation and Ancillary Work (detailed below) project requires the installation of a dewatering pumping system at the toe of each embankment. This system will require the use of significant electricity. In advance of the large scale project, the Authority will be making upgrades to the existing electrical service at the North Dam and South Dam, and will be installing electrical service at the Dike. These services are sized appropriately for the dewatering system at each embankment and future improvements to the structures, including security upgrades and electric actuators. This project also includes upgraded electric panels at each vault, generator transfer switches at each vault, and internet service installation at the Dike (for security improvements). It is anticipated that this work will be paid for from the CIP budget and be completed in FY20.

Earthen Dam Rehabilitation and Ancillary Work (One Construction Contract):

Embankment Modifications

The goal of the embankment modifications, as stated above, is to install a new blanket drain system on the downstream slopes of all three embankments at Round Valley to filter the existing seepage. Further, the existing seepage will be collected in new toe drains, monitored, and conveyed safely away from the structures.

Final design plans and technical specifications and permitting are near completion. The scope of the design was discussed and vetted at a meeting that included the Engineer of Record, members of Authority staff, representatives of the NJDEP Dam Safety Section, the Authority's Technical Review Board (TRB), and the Owner's Engineer. For the North and South Dams, the design

includes excavation into each dam while maintaining a specific slope acceptable to the Engineer of Record and the TRB. The soils removed from the embankments will be stockpiled at or near each dam site. Once the excavation has reached a certain depth, a sand and gravel filtering drain will be installed across the entire exposed downstream slope. In order to maintain a crest width sufficient for construction operations, the crests of each dam will be temporarily lowered. It is anticipated that the maximum allowable reservoir pool elevation during the project will be EL 360 feet, or 25 feet below full pool.

The major excavation work must be preceded by the installation of dewatering wells and piezometers. The dewatering or well points will act to lower the phreatic line (groundwater levels) in the embankments. The new piezometers will determine the effectiveness of the well points, which must be proved prior to excavation into the embankments.

Construction is expected to initiate in early 2020 with the installation of the well points. Large scale excavation of the embankments is currently scheduled to begin in spring 2020. This work will be paid for through a separate application for bonding. Since it will be bonded, funding is not included in the CIP budget

Ancillary Work

Rehabilitate Hydraulic Valve on RV South Dam Low-Level Release

The existing RV low-level release valve was last rehabilitated 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 hydraulic valve installed in 1992 is no longer functional and requires rehabilitation.

The investigation and design for this project is included in the scope for the Engineer of Record on the Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project. After inspection of the system and a report of proposed alternatives, the alternative selected is the complete abandonment of the low-level release pipeline. Abandonment will be accomplished by filling of the pipeline with grout. The hydraulic lines to the underwater actuator will be removed. This work will be included in the contract for the Earthen Dam Rehabilitation and Ancillary Work contract and paid for through the above noted bonding. Since it is being bonded, funding is not included in the CIP budget.

Rehabilitation of 10-inch Cast Iron Pipe Connecting RV-S Dam Vault to Force Main

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, likely adjacent to the vault. This pipe is installed underground with flanged connections which are prone to leak in buried applications. The alternative selected for the repair is to replace the pipe by direct burial.

The investigation and design for this project is included in the scope for the Engineer of Record on the Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project. This work will be included in the contract for the Earthen Dam Rehabilitation and Ancillary Work contract and paid for through the above noted bonding. Since it is being bonded, funding is not included in the CIP budget.

Repairs to Round Valley Reservoir Building Structures (Towers and Vaults)

The building structures (towers and vaults) at the Round Valley Reservoir are in need of maintenance. Authority staff believes it is prudent to take advantage of the potential lowered reservoir condition to make repairs to the reservoir building structures, including the underwater portions of the towers.

The Engineer of Record has already made inspections, including underwater portions, of the two towers in the Round Valley Reservoir. The work on the towers will include, but not necessarily be limited to, repairs to the sluice gates, roof replacements, access ladder replacements, and replacement of the existing cranes. This project will also include the purchase of an emergency portable generator to be used with the transfer switches being installed at each vault as part of the Round Valley Reservoir Electrical Upgrades project.

This work will be included in the contract for the Earthen Dam Rehabilitation and Ancillary Work contract and paid for through the above noted bonding. Since it is being bonded, funding is not included in the CIP budget.

Security Improvements at RV Reservoir

Staff has identified potential improvements to existing cameras and has recommended the addition of new cameras as the most prudent means of enhancement. The investigation and design for this project is included in the scope for the Engineer of Record on the Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project. It is anticipated that this work will be paid for from the CIP budget.

Security Improvements RV and SR Perimeter Hardening

Additional security improvements are considered for the RV and SR embankments on a continual basis. Furtherance of the existing perimeter hardening is being considered as part of the next improvements to the existing security. It is anticipated that this work will be completed as part of multiple projects over the next several years.

Background Screening of Contractors and Consultants

The Authority solicited proposals to retain a consultant to process personal identity verification and criminal background history checks of individuals who will be accessing restricted areas of Authority property during the upcoming rehabilitation projects at the Round Valley Reservoir in Clinton Township, Hunterdon County. The Authority developed a scope of services for

verifying personal identities and processing background checks for contract workers, as well as maintenance of a secure database of screened applicants.

The chosen security consultant will also provide the necessary equipment, such as hand held scanners and other associated communications hardware. The selected contractor for the large scale embankment work will be required to construct gates at access points where these scanners will be used to check the security consultant-issued credentials. This contract is expected to start in FY20.

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 was done by taking the old inundation model's 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 using 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 believes 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 may 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.

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, thereby reducing its capacity and 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 adjacent to the pond. The material has been dispersed through the years by maintenance crews as needed throughout Authority properties.

Also at the SBPS, there are twelve steel wide flange beams set in a concrete bed that function as ice deflectors 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 replaced as part of the pond dredging project.

Authority staff procured a consultant to provide professional engineering services to prepare designs for dredging of the pond and replacement of the ice deflectors. The design is complete and permits were obtained. It is now anticipated that the dredging will take place in FY20 – FY21.

Rehabilitation of the Six-Mile Run Culvert

The Six-Mile Run Culvert is a historic 3-barrel stone arched culvert that carries the Six-Mile Run under Canal Road, the Canal, and the multi-use trail. The culvert was rehabilitated in the mid-1980s. Stone-faced concrete headwalls were constructed at the inlet and outlet ends of the barrels and minor stone repair was performed inside the culvert barrels. A portion of the stone facing on the downstream headwall dislodged from the concrete substructure during the winter of 2005-2006.

It is noted that the Township of Franklin maintains the road above the culvert. The culvert is considered a bridge by the NJDOT, and thus, biannual inspections are performed by an engineering consultant. Inspection reports are forwarded to the County of Somerset, Township of Franklin, and the Authority.

A sinkhole formed in the roadway above the structure, requiring emergency repairs. The emergency repairs were performed by a consultant and contractor procured by the Authority. This sinkhole suggested that the movement of soils above the stone arches that form the culvert is occurring. The emergency repairs were considered to be temporary. Inspections of the upstream interior of the culvert, located directly beneath Canal Road, have confirmed missing stones and movement of soil.

Additional temporary repairs have been performed within the barrels to limit the loss of stonework in the interior of the culvert by filling with a lightweight concrete. Engineering services have been procured and are in the design phase to clean and inspect the culvert and to design repairs to the stonework inside the culverts. The engineering services will address any structural deficiencies found in the structure to provide for a long term rehabilitation. The temporary repair will be removed and replaced with appropriate historical aesthetics of the stonework. Further, the collapsed stone façade on the downstream headwall will be replaced. A contract to clean and inspect the culvert is scheduled be procured in FY 20. Engineering design is expected to take place in FY20, and rehabilitation construction is expected to take place in FY21.

Replacement of Fuel Dispenser and software/inventory system at Spruce Run Administration Building

The Spruce Run facilities house the Administration Building, the mechanical shops and a fleet of maintenance and commuting vehicles. The Administration Building was constructed in the early 1960s and includes a gasoline facility that was found leaking, prompting its relocation and reconstruction in 1991. The 1991 project included two double-wall, fiberglass-coated, steel underground storage tanks with a 5,000 gallon capacity for gasoline and a 2,000 gallon capacity for diesel fuel; a fuel dispensing island with computerized pumps; a canopy for weather protection; associated piping and electrical wiring; leak detection; overfill protection; spill prevention; and corrosion protection for both tanks and piping.

The system has generally performed to the Authority's needs, but inspections revealed that the dispenser frames, supplementary connection piping, containment chambers, junction boxes and the fuel island steel curb forms are rusted and have lost most of their structural integrity. The dispensing units are also in poor condition and are discontinued from the current market. The fuel storage and management system requires an upgrade to match newly installed fuel dispensing systems at the Canal Field Office in West Trenton and the Manasquan Water Supply System in Wall Township. It is noted that the most recent tank tightness test results demonstrated that the tanks are providing adequate containment for the stored product.

The Authority retained the professional engineering services of a consultant who investigated and design developed a rehabilitation project. A contractor has been retained to make the designed repairs that are expected to be completed in FY20.

Replace Office Telephone System Authority Wide

The Authority telephone system was purchased in 2007 with a serviceable life expectancy of ten years, based on history and the manufacturer's and installer's recommendations. In 2013, the Clinton Administration Building system was replaced due to a lightning strike. At that time, the service company stated that if the Authority replaced in-kind, it would be installing old technology and repair and replacement parts would be limited. All of the Authority systems are currently operating in analog mode and current technology is digital. By proactively upgrading the technology, the Authority will gain additional capabilities including voicemail to email; extension dialing between Authority locations; teleconferencing and videoconferencing within the system and dedicated teleconference and videoconference units for each location that will be standardized; and digital recording capability on phones and conference phones.

Facilities personnel will also be able to access and service all systems from one location. Upgrading the systems would necessitate the replacement of all components, including handsets, door phones, and conference phones. Additional and replacement wiring and switching will also be required. Phone system replacement is anticipated for FY20. Investigation is ongoing to ensure there is a redundant communications system in the event of an emergency.

Refurbishment of Main Pumps and Motors No. 4, 5, 7, & 8 with Additional Upgrades at the South Branch Pumping Station

The Authority's South Branch Pumping Station (SBPS) is located in Clinton Township. The primary purpose of the SBPS is to pump up to 350 million gallons per day (MGD) of raw water from the South Branch of the Raritan River to the Round Valley Reservoir as needed to replace depleted storage. The water transfer is accomplished using ten horizontal, centrifugal pumps with 2,000 horsepower motors. Maintenance of the pumps is essential to operations at the SBPS.

The SBPS was built in 1965 and the need for renewal and replacement of mechanical and electrical components was identified. In 2009 the Authority procured and retained an engineering consultant to provide professional engineering services to prepare an Asset Management Plan (AMP) for the SBPS, which was completed in 2011. The AMP included inspection, testing, and conditions assessment for major mechanical and electrical systems. Following recommendations of the AMP, the Authority proceeded to retrofit several of the major mechanical and electrical equipment systems. The Authority recently refurbished two of the ten pumps, numbers 1 and 6, as part of a trial and a phased approach to rehabilitate all of the ten pumps, motors, suction piping, and baseplate assemblies. The two refurbished pumps were placed back into service in 2016.

This project represents the second phase of the rehabilitation. The engineering consultant will investigate and design the rehabilitation of four additional pumps, motors, and mountings in the north and south bays of the SBPS, listed as pumps Numbers 4, 5, 7, and 8. The project will include fabrication and installation of new baseplates to address alignment issues. It is expected that the consultant will perform an investigation to identify appropriate rehabilitation items, secure needed permits and approvals, and prepare the construction plans and specifications that are necessary to bid the project.

Other miscellaneous pump station system upgrades, including electrical and control upgrades, are anticipated to be addressed in this project as well. These include alarm sensors and systems replacement, computerized monitoring of pump performance, control room improvements, safety upgrades, HVAC upgrades, pump cooling systems, traveling water screen replacements, asset management plan update, force main hydraulic model study, and VFD drive unit study. The replacement of the Force Main surge tank roof and Whitehouse Release structure roof are being incorporated into this project as well.

Replace Boilers at Spruce Run Administration Building

The four heating oil-fired boilers in the basement of the Spruce Run Administration Building are at the end of their service life and require replacement. These boilers provide the main source of heat for the majority of the original portion of the Administration Building, although there are currently multiple independent systems elsewhere in the building that provide additional heating. This project requires HVAC engineering analysis, design, and construction code permitting work. The engineer would be tasked with determining the best HVAC solution to replace the four boilers. Possibilities include modern high efficiency boilers, oil fired boilers, natural gas

boilers (requiring external gas line extensions), or installation of a system of boilers which could utilize both options. The project would also require the replacement of the hot water heater.

Replace Water Storage Tanks in Spruce Run Administration Building Basement

The two water storage tanks in the Spruce Run Administration Building basement have reached the end of their service life and are in need of replacement. The tanks act as a buffer/storage for the well water that is pumped up out of the Administration building's well. The replacement of these water tanks should be planned for in the near future. Replacement of several doors to the basement is pending and is being added into to this contract, since the tanks are very large and require the removal of the doors.

Emergency Generator at Spruce Run Administration Building

The Clinton Administration building's emergency power service is dependent on the operation of a generator that has reached the end of its operating life. The existing generator is in the basement and runs off of fuel supplied by the building's heating oil underground storage tank. This generator should be removed and replaced with an outdoor diesel generator with a dedicated external above ground diesel fuel tank. The location of this generator should be on a newly constructed concrete pad on the outer perimeter of the building. This would require trenching and installation of new service wiring and conduits. The project may also involve testing/upgrades or replacement of existing electrical panels and transfer switches. An engineer will be procured who will investigate alternative fuel options such as natural gas or propane, as well as acquire all permits required such as a new air permit.

Multidisciplinary engineering project for structures rehabilitation in connection with the Spruce Run reservoir outlet works

Authority staff is procuring a consultant to provide professional engineering services for all of the tasks described below as A through J. The tasks may manifest as more than one construction project.

A. Rehabilitation of the Spruce Run Flow Measuring Weir

The Spruce Run Weir is a reinforced concrete structure that crosses the Spruce Run downstream of the Spruce Run Reservoir and overflow spillway and upstream from Spruce Run's confluence with the South Branch of the Raritan River. The spillway was constructed in the early 1960s with the rest of Spruce Run Dam. The adjoining USGS gauging station on the west bank of the weir measures the total flow of water that is discharging from Spruce Run, including releases through the pipelines and/or overflow at the spillway. Authority staff has been making "patchwork" repairs to the spillway over the past decade; however, the concrete structure is severely degraded, with large amounts of exposed reinforcing steel and visible through seepage, suggesting that the structure has clearly met the end of its useful life. Authority staff is procuring the services of an engineer to investigate and replace the flow weir, potentially including a bypass gate. As the structure may meet the definition of a dam, the rehabilitation project

includes development of measures to bring the dam into compliance with the New Jersey Bureau of Dam Safety.

B. Spruce Run Primary Overflow Spillway Rehabilitation

The primary ogee overflow spillway is located at the west abutment of the dam with a crest at elevation 273.0, which is the normal full operating pool level of the reservoir. The control weir for the spillway is a 550-foot long, 5-foot high reinforced concrete overflow weir with an ogee downstream face. In plan, the spillway is a circular arc oriented generally north-south. The spillway was constructed in the early 1960s with the rest of the dam. The spillway was rehabilitated in 1987 to repair longitudinal surface cracks, surface spalling, and transverse joint deterioration along the downstream face. As deterioration of the concrete surface of the spillway continued, including spalling and horizontal cracking, a second rehabilitation was done in the fall of 2004. The rehabilitation work consisted of removal of deteriorated concrete from the spillway weir and abutment wall surfaces and the application of gunite to all prepared surfaces. Over time, mild spalling and cracking were observed in the fiber reinforced, gunite overlay. During a recent inspection in March of 2019, more significant concrete/gunite damage was observed at the toe of the ogee. Also, some spalling and cracking has been observed at the bottom of the ogee spillway's abutment walls. The Authority expects the chosen consultant to inspect the concrete structure and make an engineering repair recommendation if necessary.

C. Clearing of Spruce Run Spillway Discharge Channel

The Spruce Run Spillway was cut into the bedrock as part of the original Spruce Run Dam construction. The spillway was kept clean of vegetation for many years after the original dam construction as part of routine grounds clearing work. Many years ago, the Authority stopped removing all vegetation from the banks and within the spillway, instead opting for sporadic removals. Clearing will enable better observation of existing springs and seep locations located within the bedrock base of the spillway that may be related to performance of the dam. Clearing of the spillway is also important in order to allow adequate flow of water during significant spillway flows.

The complete clearing of the trees and shrubs from within and from the banks of the Spruce Run Spillway will help to restore the spillway to its original layout and design capacity.

D. Replace Fixed Cone Valves at Spruce Run Vault

The Spruce Run Reservoir Vault is fitted with two 30-inch fixed cone valves that act as the primary release valves from Spruce Run Reservoir. When compared to other valves, the fixed cone valves allow for increased accuracy in release quantities and also offer significant pressure reduction. Although the structure was reconstructed in 1982, the original valves that were installed in the early 1960s were relocated to their current position. Authority staff performs annual maintenance on the valves, but the external corrosion present on the valves is making this maintenance increasingly difficult over time. Recently, the valves had to be "coerced" to open because they were sticking.

The fixed cone valves are critical to the operation of the reservoir and are at the end of their useful life. Authority staff is procuring the services of an engineer to investigate the vault and recommend the most appropriate replacement for the existing fixed cone valves.

E. Manual Transfer Switch for Emergency Operation

As reservoir release capabilities depend on uninterrupted power supply for the operation of the tower crane to remove stop logs, Authority staff recommends adding an emergency backup power source for the reservoir's vault/tower electrical supply system for drawdown equipment operation. As part of the Round Valley Reservoir Dam Rehabilitation and Resource Preservation Project, a consultant has been directed to size an emergency tow-behind portable generator and to design transfer switches at the Round Valley North and South Dam vaults that will feed power to the towers' hoisting equipment. It is anticipated that the consultant for this project will design for the installation of a manual transfer switch at the Spruce Run vault that is compatible with the tow-behind portable generator for the current Round Valley project.

F. Spruce Run Tower Hoisting Equipment

The existing outlet tower overhead bridge crane is a hand operated geared bridge and trolley type with a motor driven hoist. The bridge is constructed on standard I beams with a hand chain operated drive. The overhead bridge crane is original to the dam construction in the early 1960s and it is still operational to remove and/or reinstall the stop logs during release operations. However, the unit has developed a minor "travel" over the years, which is sometimes observed during stop-plank hoisting. In addition, it has become difficult to purchase parts for the crane system. It is expected that the consulting engineer will investigate the existing overhead bridge crane, review the load rating and recommend a partial or full design replacement of an equal or alternate type of crane in compliance with OSHA regulations.

G. Spruce Run Tower Sluice Gate Operators

The Spruce Run Tower mechanical system includes two sets of three sluice gates each, which are operated with floor stand operators fabricated by Rodney Hunt Machine Co. The stands are mounted to the floor and are equipped with stem covers with visual indicators that show the position of the gate at all times. The stands are suitable for motor operation and are also equipped with a hand crank for manual operation. Currently, the motor operation is typically performed with the aid of a gasoline powered "donkey" engine. The Authority would like to improve the mechanical operation of the sluice gates with an electrically actuated system. The consultant will evaluate conditions of the current system and consider use of the existing floor stand operators with compatible electric actuators or recommend a new, electrically actuated system that reduces operational time and improves labor safety standards.

H. Spruce Run Other Ancillary Works

The multidisciplinary project includes the installation of a door on the southern façade of the vault, OSHA compliant exterior access ladders for the tower and vault, remote reading capability

of the vault releases, thorough inspection of the release tower above elevation 283, replacement of the tower and vault roofs and the installation of a hardened access gate adjacent to the vault.

I. Reservoir Hydrologic and Hydraulic Modeling

The Spruce Run reservoir was constructed at the former confluence of Spruce Run and Mulhockaway Creek. The reservoir is fed by these two major and several other minor streams, with a total drainage area of 41 square miles. The original Spruce Run hydrologic and hydraulic (H&H) calculations were performed by Whitman, Requardt and Associates in March 1960. The engineer used the available historic stream flow records for streams in the reservoir's watershed and assumed values for others in the absence of data. H&H calculations were performed using empirical formulas to predict passing flows over the reservoir's primary spillway and ogee weir.

The 2017 PFMA report concluded in the Major Findings and Understandings section that even though a hydrological analysis showed that the dam was able to pass the Probable Maximum Flood (PMF) without overtopping, an updated hydrological analysis was recommended using the most recent methods. As a result, the Authority is procuring an engineer to assess the current spillway's flow passing capacity using hydrologic and hydraulic models that evaluate the capacity of the existing spillway relative to the occurrence of the Probable Maximum Precipitation (PMP) or resulting PMF and in compliance with spillway design storm requirements as required by the New Jersey Bureau of Dam Safety.

J. Rapid Drawdown Planning

The outlet works at Spruce Run reservoir consist of an intake tower and twin pipes leading to a control vault at the downstream toe of the dam. Each of the twin pipes reduce from 84-inch diameter at the intake tower to 60-inch diameter near the control vault and to 48-inch diameter within the vault. The consultant being procured is expected to review the current drawdown operations and computations, and propose mechanical improvements if necessary.

Improvements to Scudders Falls Wastegate Controls

Scudders Falls is located in Ewing Township at approximate station 821+20 upstream of the Perdicas wastegate in Trenton. This wastegate, along with the Washington Crossing wastegate, allows the Water Supply Operators (WSO) to divert water back to the Delaware River during heavy rains, before it reaches Trenton. The Scudders Falls gates, controls, and gate house were constructed in the mid-1980s. During power outages, the transfer switch should signal the generator to turn on, which will allow the WSO to operate the gates and maintain the level of the Canal. The transfer switch no longer operates, the controls that operate the gates are old and do not work on one of the gates and the generator is in need of repair. Staff would like to upgrade the entire electrical/control system at this location.

Rehabilitation of the Upper Canal Embankment - Raven Rock to Prallsville

Four major flood events in the Delaware River have overtopped the Canal embankment between the Raven Rock Lock and Prallsville Lock since September 2004. The Canal embankment in

this stretch that separates the Canal from the River is very narrow and is inaccessible by vehicle. It is necessary to maintain the embankment by boat, which is challenging. During large flood events, the Canal and the Delaware River water levels are elevated above the embankment and become one body of water. There are several areas in this stretch that experienced heavy deterioration during these events, typically initiated by fallen trees.

The Authority had to implement emergency measures to prevent further erosion of the embankment following Tropical Storms Irene and Lee in 2011. Due to the location and access issues discussed above, all of the work had to be done by hand. Barges were used to supply the materials (riprap and cement bags), and Authority forces placed the materials in the embankment to close the openings. These temporary repairs require replacement with more appropriate materials, both structurally and historically.

A regular procurement process for an engineering consultant and a cultural resources consultant was commenced to repair this section of the embankment. A professional services contract was awarded to a team led by GZA GeoEnvironmental (GZA) as the engineer for the repairs of the embankment. Paulus, Sokolowski, & Sartor (PS&S) was selected as the cultural resource consultant for the project.

Authority staff identified eight primary locations in this reach that require investigation, design and repair. GZA 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 schematic design report identified and prioritized additional areas that warrant attention and have been added to the scope of work. Conceptual approval has been received from the State Historic Preservation Office.

Rehabilitate Flow Control Gate at Back Race at Lambertville

The back raceway in Lambertville, located approximately at Station 371+00, consists of one manually operated gate and was constructed as a by-pass to the Lambertville Lock. Due to the configuration of the raceway, the Authority continues to use this gate during the summer months to prevent the water from stagnating and to flush the algae that may accumulate. Further, it can be used to bypass Canal flow in the event it is necessary to work on the lock. The flow control gate is in need of rehabilitation.

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 assess their condition and determine the required rehabilitation. The structures included Raven Rock Lock, Prallsville Lock, Lambertville Lock, Kingston Lock, Griggstown Lock, Ten Mile Lock, South Bound Brook Lock, Five Mile Lock, and the Waste Gate upcanal from Ten Mile Lock.

In addition to the replacement 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 the structural undermining of the locks.

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

Rehabilitation of the Landing Lane Spillway and Embankment Improvements Downstream of Island Farm Weir

The Landing Lane Spillway is located immediately upcanal of the Landing Lane Bridge in New Brunswick. This spillway was rehabilitated in 1991 with the construction of a concrete cutoff wall on the Canal side slope to control leakage. Timber planks were installed on the concrete wall for historic reasons. 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 spillway is deteriorating. The stones are being dislodged and the spillway crest needs to be stabilized. The planned rehabilitation is expected to consider removal of all stones from the crest and installation of a concrete slab as a substructure to the stones that would be reset.

A narrow embankment separates the Canal from the Raritan River just downstream of the Island Farm Weir on the Raritan. The river side slope has experienced significant erosion and is in need of rehabilitation. Continued erosion and deterioration could lead to a breach of the Canal.

Authority staff has procured an engineer and a cultural resource consultant. The design plans and technical specifications are near complete. The project is currently in the permitting phase. Construction is anticipated to start in FY20.

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 to determine who is responsible for the pipe and assess the condition of the entire pipe length.

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 its 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).

Authority staff placed sandbags on the spillway crest to force spillway discharge away from the northern portion of the spillway. This temporary measure is working to eliminate the seepage. Experience from earlier trials has shown that the seepage returns if the sandbags are removed or washed off and flow discharges from the northernmost 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.

Security System and Upgrades –Clinton and Canal

Several security improvements have been included as part of the large Round Valley Dam Rehabilitation project identified above, such as electrical service improvements and internet communications improvements, which are ongoing. Security monitoring system upgrades will follow the infrastructure upgrades. Other protective measures continue to be considered on an ongoing basis.

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 historic (circa 1834) northeast, center, and southeast stone abutments were rehabilitated in 1989-1990. Recent inspections revealed that all of the abutments have missing mortar on the lower areas, which are continuously exposed to the water level fluctuation. In addition, the northeast abutment shows vegetation covering the structure on the creek side.

It is noted that a new Canal leak was detected in May 2007 below the northeast abutment's masonry. Further investigation revealed that water was percolating between the joint of the concrete aqueduct northeast flap wall and the stone masonry abutment. A temporary repair was made at that time, but this erosive process could lead to a progressive failure of the stone masonry structure, as has been observed on 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 that a corrective action be established to address the leak at the northeast end of the aqueduct.

Rehabilitation of Carnegie Lake Aqueduct

The Carnegie Lake Aqueduct is comprised of 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 few years.

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 obtain and the units are constantly in need of service. Replacement of the units is currently being investigated by Authority staff, including formulating a plan for engineering services required and HVAC construction code permits required.

Rehabilitation of the Wastegate Downstream of Ten Mile Lock

The wastegate 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 wastegate consists of a wooden gate structure set between guides that are 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 wastegate façade and the downstream stone headwall needs to be rehabilitated.

Rehabilitation of the Spillway Upcanal of the Griggstown Lock

The spillway upcanal 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 that the reconstructed spillway does not get damaged during the project. Funding for this project is not included in this five year program.

Rehabilitation of D&R Canal Culvert at Canal Station 2550+90 (1 mile upstream of 10-Mile Lock)

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. Repairs will be scheduled as needed.

Replace Boiler at Canal Field Office

The boiler at the Canal Field Office (CFO) is the original oil fired boiler from the early 1990s. There have been boiler operational issues every heating season for the past few years. Natural gas lines are now available on Bear Tavern Road, close to the CFO. A gas line will need to be installed from the road into the building. This would also allow abandonment of the existing oil tank (underground storage tank). Converting the heating system to natural gas will have several advantages for the Authority. Modern boilers are more efficient and reduce utility costs.

Replace Underground Heating Oil Tank at South Branch Pumping Station

The existing 10,000 gallon steel underground storage tank (UST) which contains heating oil for the pumping station is approximately 30 years old. EPA/NJDEP regulations require cathodic protection and testing. If replaced with an underground tank, the new tank would likely be a modern double-wall fiberglass reinforced UST. This project would also include the abandonment/removal of the existing steel tank with a contracted licensed LSRP and permitting with the NJDEP. However, the recommendation at this time would be to replace the tank with an above ground storage tank in an alternate location. Above ground tanks are not regulated in the same manner as underground storage tanks because it is much easier to detect corrosion. This would reduce the environmental liability of the Authority in the long term and reduce insurance policy costs.

Replace Underground Heating Oil Tank at Spruce Run Administration Building

The existing 5,000 gallon steel underground storage tank (UST) which contains heating oil for the Clinton Administration building is approximately 30 years old. This tank services the boilers, hot water heater, and the building's emergency generator. EPA/NJDEP regulations

require cathodic protection and testing. If replaced, with an underground tank, the new tank would likely be a modern double-wall fiberglass reinforced UST. This project would also include the abandonment/removal of the existing steel tank with a contracted licensed LSRP and permitting with the NJDEP. However, the recommendation at this time would be to replace the tank with an above ground storage tank in an alternate location. Above ground tanks are not regulated in the same manner as underground storage tanks because it is much easier to detect corrosion. This would reduce the environmental liability of the Authority in the long term and reduce insurance policy costs.

Replace Gasoline and Diesel Underground Storage Tanks at Spruce Run Administration Building Fuel Island

The existing 5,000 gallon and 2,000 gallon steel fiberglass coated underground storage tanks (USTs) will be in need of replacement in the near future. These tanks contain gasoline and diesel fuel, respectively, for the maintenance equipment and vehicle fleet being used by the Clinton Administration building staff, South Branch Pump Station staff, and Watershed Protection staff. These are approximately 30 years old. If replaced with an underground tank, the new tanks would likely be modern double-wall fiberglass reinforced USTs. This project would also include the abandonment/removal of the existing fiberglass coated steel tanks with a contracted licensed LSRP and permitting with the NJDEP. However, the recommendation at this time would be to replace the two tanks with above ground storage tanks in an alternate location adjacent to the fueling island. Above ground tanks are not regulated in the same manner as underground storage tanks because it is much easier to detect corrosion. This would reduce the environmental liability of the Authority in the long term and reduce insurance policy costs.

Spruce Run Administration Building Network Data Closet Construction

The Administration Building is in need of the construction of a modern environmentally HVAC-controlled data closet in the basement to isolate the network servers and network switches from high temperatures, dust, and humidity. As the demand for network storage capacity continues to increase exponentially and as more engineering projects are completely reliant upon the transfer of plans, specifications and construction photographs digitally, the need for a dedicated space in the building to accommodate the networking hardware and servers has increased as well. This project will require installation of dedicated HVAC Cooling, installation of HVAC venting, relocation of electrical services, and relocation of network cabling and conduits.

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 $\frac{3}{4}$ 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 an investigation for the rehabilitation of the spillway and to

provide observation during rehabilitation. Rehabilitation of the Trap Rock Spillway will be scheduled after the conclusion of the dredging program between Kingston and Amwell Road.

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 likely be modeled after the dredging program that is being developed for the Canal reach between Kingston and Amwell Road. Funding for this project is not included in this five year program.

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 will focus on the removal of sediment from this reach. Funding for this project is not included in this five year program.

Dredging between Amwell Road and Ten Mile Lock

Dredging is currently being performed in 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 will focus on the removal of sediment from this reach. Funding for this project is not included in this five year program.

Storage Building at Canal Field Office

The Authority is considering the construction of a pole barn, or similar type storage building at the CFO facility. The additional space for storage of equipment will allow staff to keep certain equipment out of the elements which can extend the life expectancy of this equipment.

Spruce Run Administration Building Tie-In to Public Water Supply

The Authority is conducting a preliminary study/investigation into the possibility of connecting to the regional municipal public water supply system. There are allocation and supply issues being experienced by the local water company which may delay this process, as well as the potential for water system connection fees. This would allow the Authority to abandon the local

administration building supply well and the well to the Annex and the Watershed offices. Funding for this project is not included in this five year program.

Storage Building near Spruce Run Annex

The Authority is considering the construction of a pole barn type structure in the Spruce Run Storage Yard. The need for additional space for storage of equipment and materials has been raised. One benefit of this building would be to provide additional space to keep certain equipment stored out of the elements which would potentially extend the service life of equipment. Funding for this project is not included in this five year program.

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 in 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 resulted in a recommendation to construct 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 recommends construction of the structure because of the escalating need to remove bedload from the Canal at this location and the difficulty in performing such removal. This project is currently on hold and has been moved to low priority. Funding for this project is not included in this five year program.

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 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 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 (multi-use trail) is approximately 7,000 feet long, with most of the leakage occurring in a 3,200-foot long section between Station 1477+00 and Station 1509+00.

The construction of a cutoff wall is planned 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 of 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.

Wickecheoke Creek Gates Abandonment

Authority staff has been instructed to not operate these wastegates 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.

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.

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.

Raven Rock Retaining Wall Downcanal of Lock

The control structure at Raven Rock Lock is located at Canal station 0+00 at Bull's 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.

Refurbishment of Main Pumps and Motors No. 3 & 9

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.

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

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 that is 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.

Canal Culvert Rehabilitation 2992+34 (Mile Run Culvert)

The Mile-Run culvert consists of two semi-circular barrels that are approximately 129 feet long, which appear to be founded on natural rock. The culvert conveys 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 was comprised of the restoration of the 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 revealed that the east barrel's first 25-foot brick liner section has minor spalls and the remaining metal liner section appears 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.

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.

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.

Past flooding events washed away some of 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.

Third Hand Shop Culvert under D&R Canal Cleaning (Partially Clogged)

This culvert is located at approximate Station 592+00 of the Canal feeder section and consists of an 18-inch clay pipe that crosses under the D&R Canal. The inlet is located on the eastern end of Route 29 (inbound north). Solids and vegetation may be entering the culvert and partially clogging. An eventual cleanup of the pipe and/or installation of a cage at the inlet end may be recommended.

No-Name Culvert Under Canal at Sta. 936+50 Outlet Cleaning (Partially Clogged)

This culvert crosses under the D&R canal and is located approximately 2600 feet downcanal from Wilburtha Road. The 2019 inspection revealed that the outlet is partially clogged by soil and debris. An inspection of the intake end of the culvert revealed that a big pool has built over time since the exit flow is poor. A cleanup of the culvert's outlet structure is recommended.

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 contain 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 when there were faulty materials being manufactured in the industry, resulting in failures of pipelines of similar vintage.

Funding for a more thorough evaluation by an outside consultant is not included in this five year program; however, the Authority continues to conduct scheduled internal inspection of the release piping. Staff will continue its periodic inspection of the pipeline and take action accordingly.

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 can 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 percent 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 structurally compromised. A stress of a large portion of the prestressing wire was significantly lower than its specified stress as determined by the strain gauge testing. With those structural deficiencies, the pipe was not in a state of incipient failure. Authority staff attempts to perform internal non-destructive pipe inspections that have a high probability of locating pipes in a state of incipient failure.

Funding for a more thorough evaluation by an outside consultant is not included in this five year program; however, the Authority continues to conduct scheduled internal inspections 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, 2020

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 [182.353] **182.339** 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 [2020] 2021	Million Gallons per Day (MGD)	194.00

7:11-2.4 Debt Service Assessments

- (a) (No change.)
- (b) The following Debt Service Assessment rate for the New Jersey Environmental Infrastructure Financing Program loans, based on a sales base of [182.353] **182.339** 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 [2020] 2021	Million Gallons per Day (MGD)	\$85.00

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 [2020] 2021	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>
(State Fiscal Year or otherwise indicated)		
State Fiscal Year [2020] 2021	Million Gallons per Day (MGD)	\$24.00

APPENDICES

I. Report of Mercadien PC – Allocation of Headquarters General and Administrative Expenses – FY2021

II. Report of Mercadien PC – Allocation of Headquarters General and Administrative Expenses – Audited FY2019 Expenditures