

BP-18 Rate Proceeding

Final Proposal

Transmission Revenue Requirement Study Documentation

BP-18-FS-BPA-09A

July 2017



**TRANSMISSION REVENUE REQUIREMENT
STUDY DOCUMENTATION**

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COMMONLY USED ACRONYMS AND SHORT FORMS

| | |
|------------|---|
| AC | Anticipated Accumulation of Cash |
| ACNR | Accumulated Calibrated Net Revenue |
| ACS | Ancillary and Control Area Services |
| AF | Advance Funding |
| AFUDC | Allowance for Funds Used During Construction |
| aMW | average megawatt(s) |
| ANR | Accumulated Net Revenues |
| ASC | Average System Cost |
| BAA | Balancing Authority Area |
| BiOp | Biological Opinion |
| BPA | Bonneville Power Administration |
| Bps | basis points |
| Btu | British thermal unit |
| CIP | Capital Improvement Plan |
| CIR | Capital Investment Review |
| CDQ | Contract Demand Quantity |
| CGS | Columbia Generating Station |
| CHWM | Contract High Water Mark |
| CNR | Calibrated Net Revenue |
| COB | California-Oregon border |
| COE | U.S. Army Corps of Engineers |
| COI | California-Oregon Intertie |
| Commission | Federal Energy Regulatory Commission |
| Corps | U.S. Army Corps of Engineers |
| COSA | Cost of Service Analysis |
| COU | consumer-owned utility |
| Council | Northwest Power and Conservation Council |
| CP | Coincidental Peak |
| CRAC | Cost Recovery Adjustment Clause |
| CSP | Customer System Peak |
| CT | combustion turbine |
| CY | calendar year (January through December) |
| DD | Dividend Distribution |
| DDC | Dividend Distribution Clause |
| dec | decrease, decrement, or decremental |
| DERBS | Dispatchable Energy Resource Balancing Service |
| DFS | Diurnal Flattening Service |
| DNR | Designated Network Resource |
| DOE | Department of Energy |
| DOI | Department of Interior |
| DSI | direct-service industrial customer or direct-service industry |
| DSO | Dispatcher Standing Order |
| EE | Energy Efficiency |
| EIM | Energy imbalance market |

| | |
|--------|--|
| EIS | Environmental Impact Statement |
| EN | Energy Northwest, Inc. |
| ESA | Endangered Species Act |
| ESS | Energy Shaping Service |
| e-Tag | electronic interchange transaction information |
| FBS | Federal base system |
| FCRPS | Federal Columbia River Power System |
| FCRTS | Federal Columbia River Transmission System |
| FELCC | firm energy load carrying capability |
| FOIA | Freedom Of Information Act |
| FORS | Forced Outage Reserve Service |
| FPS | Firm Power and Surplus Products and Services |
| FPT | Formula Power Transmission |
| FY | fiscal year (October through September) |
| G&A | general and administrative (costs) |
| GARD | Generation and Reserves Dispatch (computer model) |
| GMS | Grandfathered Generation Management Service |
| GSP | Generation System Peak |
| GSR | Generation Supplied Reactive |
| GRSPs | General Rate Schedule Provisions |
| GTA | General Transfer Agreement |
| GWh | gigawatthour |
| HLH | Heavy Load Hour(s) |
| HOSS | Hourly Operating and Scheduling Simulator (computer model) |
| HYDSIM | Hydrosystem Simulator (computer model) |
| IE | Eastern Intertie |
| IM | Montana Intertie |
| inc | increase, increment, or incremental |
| IOU | investor owned utility |
| IP | Industrial Firm Power |
| IPR | Integrated Program Review |
| IR | Integration of Resources |
| IRD | Irrigation Rate Discount |
| IRM | Irrigation Rate Mitigation |
| IRPL | Incremental Rate Pressure Limiter |
| IS | Southern Intertie |
| kcfs | thousand cubic feet per second |
| kW | kilowatt |
| kWh | kilowatthour |
| LDD | Low Density Discount |
| LGIA | Large Generator Interconnection Agreement |
| LLH | Light Load Hour(s) |
| LPP | Large Project Program |
| LPTAC | Large Project Targeted Adjustment Charge |
| LTF | Long-term Form |
| Maf | million acre-feet |

| | |
|---------------------|--|
| Mid C | Mid Columbia |
| MMBtu | million British thermal units |
| MNR | Modified Net Revenue |
| MRNR | Minimum Required Net Revenue |
| MW | megawatt |
| MWh | megawatthour |
| NCP | Non-Coincidental Peak |
| NEPA | National Environmental Policy Act |
| NERC | North American Electric Reliability Corporation |
| NFB | National Marine Fisheries Service (NMFS) Federal Columbia River Power System (FCRPS) Biological Opinion (BiOp) |
| NLSL | New Large Single Load |
| NMFS | National Marine Fisheries Service |
| NOAA Fisheries | National Oceanographic and Atmospheric Administration Fisheries |
| NOB | Nevada-Oregon border |
| NORM | Non-Operating Risk Model (computer model) |
| Northwest Power Act | Pacific Northwest Electric Power Planning and Conservation Act |
| NP-15 | North of Path 15 |
| NPCC | Pacific Northwest Electric Power and Conservation Planning Council |
| NPV | net present value |
| NR | New Resource Firm Power |
| NRFS | NR Resource Flattening Service |
| NT | Network Integration |
| NTSA | Non-Treaty Storage Agreement |
| NUG | non-utility generation |
| NWPP | Northwest Power Pool |
| OATT | Open Access Transmission Tariff |
| O&M | operation and maintenance |
| OATI | Open Access Technology International, Inc. |
| OS | Oversupply |
| OY | operating year (August through July) |
| PDCI | Pacific DC Intertie |
| Peak | Peak Reliability (assessment/charge) |
| PF | Priority Firm Power |
| PFp | Priority Firm Public |
| PFx | Priority Firm Exchange |
| PNCA | Pacific Northwest Coordination Agreement |
| PNRR | Planned Net Revenues for Risk |
| PNW | Pacific Northwest |
| POD | Point of Delivery |
| POI | Point of Integration or Point of Interconnection |
| POR | Point of Receipt |
| Project Act | Bonneville Project Act |
| PS | Power Services |
| PSC | power sales contract |

| | |
|-------------------------|--|
| PSW | Pacific Southwest |
| PTP | Point to Point |
| PUD | public or people's utility district |
| PW | WECC and Peak Service |
| RAM | Rate Analysis Model (computer model) |
| RCD | Regional Cooperation Debt |
| RD | Regional Dialogue |
| REC | Renewable Energy Certificate |
| Reclamation | U.S. Bureau of Reclamation |
| RDC | Reserves Distribution Clause |
| REP | Residential Exchange Program |
| REPSIA | REP Settlement Implementation Agreement |
| RevSim | Revenue Simulation Model |
| RFA | Revenue Forecast Application (database) |
| RHWM | Rate Period High Water Mark |
| ROD | Record of Decision |
| RPSA | Residential Purchase and Sale Agreement |
| RR | Resource Replacement |
| RRS | Resource Remarketing Service |
| RSC | Resource Shaping Charge |
| RSS | Resource Support Services |
| RT1SC | RHWM Tier 1 System Capability |
| SCD | Scheduling, System Control, and Dispatch rate |
| SCS | Secondary Crediting Service |
| SDD | Short Distance Discount |
| SILS | Southeast Idaho Load Service |
| Slice | Slice of the System (product) |
| T1SFCO | Tier 1 System Firm Critical Output |
| TCMS | Transmission Curtailment Management Service |
| TGT | Townsend-Garrison Transmission |
| TOCA | Tier 1 Cost Allocator |
| TPP | Treasury Payment Probability |
| TRAM | Transmission Risk Analysis Model |
| Transmission System Act | Federal Columbia River Transmission System Act |
| Treaty | Columbia River Treaty |
| TRL | Total Retail Load |
| TRM | Tiered Rate Methodology |
| TS | Transmission Services |
| TSS | Transmission Scheduling Service |
| UAI | Unauthorized Increase |
| UFT | Use of Facilities Transmission |
| UIC | Unauthorized Increase Charge |
| ULS | Unanticipated Load Service |
| USACE | U.S. Army Corps of Engineers |
| USBR | U.S. Bureau of Reclamation |
| USFWS | U.S. Fish & Wildlife Service |

| | |
|----------|--|
| VERBS | Variable Energy Resources Balancing Service |
| VOR | Value of Reserves |
| VR1-2014 | First Vintage Rate of the BP-14 rate period (PF Tier 2 rate) |
| VR1-2016 | First Vintage Rate of the BP-16 rate period (PF Tier 2 rate) |
| WECC | Western Electricity Coordinating Council |
| WSPP | Western Systems Power Pool |

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1. TRANSMISSION REVENUE REQUIREMENTS

1.1 Introduction

Chapter 1 documents how the Bonneville Power Administration's (BPA) annual transmission revenue requirements are determined. Two tables are presented, each showing both years of the rate period (FY 2018 and FY 2019). On the first table, revenue requirements for FY 2018 and FY 2019 are projected in an income statement format. The second table, a statement of annual cash flows, determines the minimum required net revenues and presents the annual cash flows available for risk mitigation.

1.2 Income Statement

Below is a line-by-line description of each of the components in the Income Statement (Table 1-1).

Transmission operations (line 2). Transmission operations includes spending for technical operations; substation operations; control center support; power system dispatching; Transmission information technology (IT) costs, including corporate agency services IT costs that are allocated to Transmission Services (TS); and scheduling services (reservations, pre-scheduling, real-time and after-the-fact scheduling, and technical support). This category also includes spending for business strategy and assessment, billing, finance, contract management, and internal operations. *See* Ch. 3.

Transmission engineering (line 3). This category includes spending on asset management and planning, design of lines/towers/substations, construction planning, construction management, and real property services. *Id.*

Transmission maintenance (line 4). This category includes spending for all Transmission Services maintenance activities, such as ongoing maintenance of substations, lines, and protection control systems. This category also includes spending on environmental analysis and pollution prevention and abatement. *Id.*

Transmission acquisition & ancillary services (line 5). This category includes inter-business line expenses resulting from functional separation and costs of ancillary services products, including Power Services generation inputs to ancillary services. It also includes the costs of station service and remedial action schemes, Corps of Engineers (Corps) and Bureau of Reclamation (Reclamation) transmission facilities serving the Network and Utility Delivery segments, and payments to other utilities for stability reserves, settlements, and operating leases. *Id.*

BPA internal support (line 6). This category comprises spending on general and administrative programs that are allocated to BPA's two business units. These programs include legal services, finance, risk management, security and emergency management, human resources, and executive oversight and management. *Id.*

Other income, expenses & adjustments (line 7). Generally, this category includes items that do not fit in any other category.

Depreciation & amortization (line 8). Depreciation is the annual capital recovery expense associated with Federal Columbia River Transmission System (FCRTS) plant-in-service. BPA transmission and general plant are depreciated by the straight-line method, using the remaining life technique. Amortization refers to the annual capital recovery expense for deferred transmission assets. *See* Ch. 3 & 4.

Total operating expenses (line 9). Total operating expenses is the sum of the above expenses (lines 2 through 8).

Federal appropriations (line 12). Federal appropriations consists of interest on the appropriations BPA received prior to full implementation of BPA's self-financing authority and is determined in the transmission repayment studies. *See* Ch. 3.

Capitalization adjustment (line 13). Implementation of the BPA Appropriations Refinancing Act (*see* Transmission Revenue Requirement Study, BP-18-FS-BPA-09, § 1.2.1.2) entailed a change in capitalization on BPA's financial statements. Outstanding appropriations attributed to the transmission function were reduced by \$470 million as a result of the refinancing. The reduction is recognized annually over the remaining repayment period of the refinanced appropriations. The annual recognition of this adjustment is based on the increase in annual interest expense resulting from implementation of the Act, as shown in repayment studies for the year of the refinancing transaction (1997). The capitalization adjustment is included on the income statement as a non-cash expense.

Long-term debt (line 14). Long-term debt includes interest on bonds that BPA issues to the U.S. Treasury to fund investments in transmission plant, environment, general plant supportive of transmission, and capital equipment. Such interest expense is determined in the transmission repayment studies. This line includes any payments of call premiums for bonds projected to be amortized. *See* Ch. 3.

Amortization of capitalized bond premiums (line 15). When a bond issued to the U.S. Treasury is refinanced, any call premium resulting from early retirement of the original bond is capitalized and included in the principal of the new bond. The capitalized call premium then is amortized

over the term of the new bond. The annual amortization is a non-cash component of interest expense. *Id.*

Debt service reassignment interest (line 16). Debt service reassignment interest consists of the interest component of the debt service reassigned to TS through the Debt Optimization Program. *See* Ch. 3 & 8.

Non-Federal interest (line 17). Non-Federal interest consists of interest paid on BPA's lease purchase projects and other capital leases as well as interest paid on customer advance funding for generator interconnection agreements and for the California-Oregon Intertie (COI) upgrade. The customers' advanced funds accrue interest on the outstanding balances until they are returned to customers through credits for transmission service. *See* Transmission Revenue Requirement Study, BP-18-FS-BPA-09, § 2.2.5.

Premiums/Discounts (line 18). Premiums and discounts are paid or received on federal bonds. *See* Transmission Revenue Requirement Study, BP-18-FS-BPA-09, at § 2.3.

Allowance for funds used during construction (AFUDC) (line 19). AFUDC for U.S. Treasury-financed transmission projects is a credit against interest on long-term debt (line 14). This non-cash reduction to interest expense reflects an estimate of interest on the funds used during the construction period of facilities that are not yet in service. Also included is the interest accrued on large generator interconnection agreement (LGIA) funds during the construction period of the associated facilities. AFUDC is capitalized, added to other construction costs, and is recovered in rates once the facilities are placed in service. AFUDC is part of the depreciation expense that is recovered over the expected life of the plant. *See* Ch. 3.

Interest income (line 20). Interest income is computed on the projected year-end cash balances in the BPA Fund that are attributed to the transmission function and that carry over into the next year. It is credited against interest on long-term debt. Also included is an interest income credit calculated in the transmission repayment studies on funds to be collected during each year for payments of Federal interest and amortization at the end of the fiscal year. *See* Ch. 5.

Net interest expense (line 21). Net interest expense is computed as the sum of the interest on Federal appropriations (line 12), capitalization adjustment (line 13), long-term debt (line 14), amortization of capitalized bond premiums (line 15), debt service reassignment interest (line 16), non-Federal interest (line 17), premiums/discounts (line 18), AFUDC (line 19), and interest income (line 20).

Total expenses (line 22). Total expenses is the sum of total operating expenses (line 9) and net interest expense (line 21).

Minimum Required Net Revenues (line 23). Minimum required net revenues (MRNR), an input from line 2 of the Statement of Cash Flows (Table 1-2), may be necessary to cover cash requirements in excess of accrued expenses. An explanation of the method used for determining MRNR is included in section 1.3 below.

Planned Net Revenues for Risk (line 24). Planned net revenues for risk (PNRR) is the amount of net revenues, if any, to be included in rates for financial risk mitigation. There are no Planned Net Revenues for Risk included in the Initial Rate Proposal. Starting Transmission reserves in FY 2018 are projected to be sufficient to mitigate risk in FY 2018 and 2019. *See* Power and Transmission Risk Study, BP-18-FS-BPA-05, § 5.2.1.2.

Total planned net revenues (line 25). Total planned net revenues is the sum of Minimum Required Net Revenues (line 23) and Planned Net Revenues for Risk (line 24).

Total revenue requirement (line 26). Total revenue requirement is the sum of total expenses (line 22) and total planned net revenues (line 25).

1.3 Statement of Cash Flows

Below is a line-by-line description of each of the components in the Statement of Cash Flows (Table 1-2).

Minimum Required Net Revenue (MRNR) (line 2). BPA determines whether MRNR is necessary by evaluating the annual cash inflows and outflows shown on the Statement of Cash Flows. MRNR may be necessary to ensure that the cash provided by current operations (line 12) will be sufficient to cover the planned amortization payments (the difference between lines 16 and 23) without causing the annual increase (decrease) in cash (line 24) to be negative. The MRNR determined in the Statement of Cash Flows is incorporated in the Income Statement (Table 1-1, line 23).

Drawdown of cash reserves for capital funding (line 3). The drawdown of cash reserves for capital funding refers to the use of cash accumulated from transmission revenues in prior rate periods to fund a portion of capital expenditures in each year of the rate period rather than borrowing from the U.S. Treasury. It is included on this statement to avoid having the amount of this reserve financing included in the calculation of MRNR.

Depreciation & amortization (line 5). The depreciation amount is from the Income Statement (Table 1-1, line 8). It, like the following five lines, is added back to net revenues in computing cash provided by current operations (Table 1-2, line 12) because it is a non-cash expense.

Transmission credit projects net interest (line 6). Transmission credit projects net interest is the non-cash expenses from the Income Statement for generator interconnection and COI upgrade customers' interest on their credit balances for advance funding (included in Table 1-1, line 17) and the AFUDC on the projects under construction funded by those customers (included in Table 1-1, line 19).

Amortization of capitalized bond premiums (line 7). Amortization of capitalized bond premiums, from the Income Statement (Table 1-1, line 15), is a non-cash expense.

Capitalization adjustment (line 8). The capitalization adjustment, from the Income Statement (Table 1-1, line 13), is a negative non-cash expense.

LGIA (line 10). Revenue credits associated with customer-funded capital projects are recognized as non-cash revenues. Customers provide an up-front deposit for construction of transmission facilities which is returned to them through a transmission credit on their transmission service bill until the deposit is repaid.

AC Intertie/fiber (line 11). Accrual revenues are recognized here because these revenues provide no cash for cost recovery. BPA accounts for the AC Intertie non-Federal capacity ownership lump-sum payments received in FY 1995 as unearned revenues that are recognized annually over the estimated average service life of the associated transmission facilities. Similarly, some leases of fiber optic capacity have included up-front payments, which are being recognized over the life

of the particular contract. The annual accrual revenues, which are part of the total revenues recovering the FCRTS revenue requirement, are included here as a non-cash adjustment to cash from current operations.

Cash provided by current operations (line 12). Cash provided by current operations, the sum of lines 2, 3, 5, 6, 7, 8, 10, and 11, is available for the year to satisfy cash requirements.

Investment in utility plant (line 15). Investment in utility plant represents the annual increase in capital expenditures for additions and replacements to the transmission system funded by U.S. Treasury bonds or available cash reserves. *See* Ch. 7.

Cash used for capital investments (line 16). Cash used for capital investments is the sum of investments in utility plant.

Increase in long-term debt (line 18). Increase in long-term debt reflects the new bonds issued by BPA to the U.S. Treasury to fund the construction and environmental capital equipment programs. This amount also includes any notes issued to the U.S. Treasury. *See* Ch. 7.

Debt service reassignment principal (line 19). Debt service reassignment principal is the principal component of the debt service obligation reassigned to TS through the Debt Optimization Program. *See* Ch. 8.

Repayment of capital leases (line 20). Repayment of capital leases is BPA's payment of the principal component of certain capital leases.

Repayment of long-term debt (line 21). Repayment of long-term debt is BPA's planned repayment of outstanding bonds issued by BPA to the U.S. Treasury, as determined in the repayment studies. *See* Ch. 3.

Repayment of capital appropriations (line 22). Repayment of capital appropriations represents projected amortization of outstanding BPA appropriations (pre-self-financing) as determined in the repayment studies. *Id.*

Cash from treasury borrowing and appropriations (line 23). Cash from treasury borrowing and appropriations is the sum of lines 18 through 22. This is the net cash flow resulting from increases in cash from new long-term debt and decreases in cash from repayment of long-term debt and capital appropriations.

Annual increase (decrease) in cash (line 24). Annual increase (decrease) in cash, the sum of lines 12, 16, and 23, reflects the annual net cash flow from current operations, investing, and financing activities. Revenue requirements are set to meet all projected annual cash flow requirements, as included on the Statement of Cash Flows. A decrease shown in this line would indicate that annual revenues are insufficient to cover the year's cash requirements. In such cases, Minimum Required Net Revenues are included to offset such decrease. *See* above discussion of Minimum Required Net Revenues (line 2).

Planned net revenues for risk (line 25). Planned net revenues for risk reflects the amounts included in revenue requirements to meet BPA's risk mitigation objectives (from Table 1-1, line 24.)

Total annual increase (decrease) in cash (line 26). Total annual increase (decrease) in cash, the sum of Lines 24 and 25, is the total annual cash that is projected to be available to add to BPA's cash reserves.

TABLE 1-1
TRANSMISSION REVENUE REQUIREMENT INCOME STATEMENT
(\$000)

| | <u>A</u> <u>FY 2018</u> | <u>B</u> <u>FY 2019</u> |
|---|----------------------------|----------------------------|
| 1 OPERATING EXPENSES | | |
| 2 TRANSMISSION OPERATIONS | 167,050 | 168,007 |
| 3 TRANSMISSION ENGINEERING | 56,351 | 57,718 |
| 4 TRANSMISSION MAINTENANCE | 176,580 | 178,125 |
| 5 TRANSMISSION ACQUISITION & ANCILLARY SERVICES | 119,460 | 111,983 |
| 6 BPA INTERNAL SUPPORT | 93,940 | 95,607 |
| 7 OTHER INCOME, EXPENSES & ADJUSTMENTS | (7,548) | (8,539) |
| 8 DEPRECIATION & AMORTIZATION | 273,164 | 284,422 |
| 9 TOTAL OPERATING EXPENSES | 878,997 | 887,323 |
| 10 INTEREST EXPENSE | | |
| 11 INTEREST EXPENSE | | |
| 12 FEDERAL APPROPRIATIONS | 1,659 | 1,518 |
| 13 CAPITALIZATION ADJUSTMENT | (18,968) | (18,968) |
| 14 ON LONG-TERM DEBT | 100,999 | 106,597 |
| 15 AMORTIZATION OF CAPITALIZED BOND PREMIUMS | 561 | 561 |
| 16 DEBT SERVICE REASSIGNMENT INTEREST | 13,964 | 5,111 |
| 17 NON-FEDERAL INTEREST | 77,156 | 97,552 |
| 18 PREMIUMS/DISCOUNTS | - | 556 |
| 19 AFUDC | (24,733) | (24,819) |
| 20 INTEREST INCOME | (2,412) | (3,941) |
| 21 NET INTEREST EXPENSE | 148,225 | 164,167 |
| 22 TOTAL EXPENSES | 1,027,222 | 1,051,490 |
| 23 MINIMUM REQUIRED NET REVENUE 1/ | 8,626 | 348 |
| 24 PLANNED NET REVENUES FOR RISK | - | - |
| 25 TOTAL PLANNED NET REVENUE | 8,626 | 348 |
| 26 TOTAL REVENUE REQUIREMENT | 1,035,849 | 1,051,837 |

1/ SEE NOTE ON CASH FLOW TABLE.

TABLE 1-2
TRANSMISSION REVENUE REQUIREMENT STATEMENT OF CASH FLOWS
(\$000)

| | <u>A</u> | <u>B</u> |
|---|----------------|----------------|
| | <u>FY 2018</u> | <u>FY 2019</u> |
| 1 CASH FROM CURRENT OPERATIONS: | | |
| 2 MINIMUM REQUIRED NET REVENUE | 8,626 | 348 |
| 3 DRAWDOWN OF CASH RESERVES FOR CAPITAL FUNDING | 15,000 | 15,000 |
| 4 EXPENSES NOT REQUIRING CASH: | | |
| 5 DEPRECIATION & AMORTIZATION | 273,164 | 284,422 |
| 6 TRANSMISSION CREDIT PROJECTS NET INTEREST | 4,325 | 4,111 |
| 7 AMORTIZATION OF CAPITALIZED BOND PREMIUMS | 561 | 561 |
| 8 CAPITALIZATION ADJUSTMENT | (18,968) | (18,968) |
| 9 NON-CASH REVENUES/ACCRUAL REVENUES | | |
| 10 LGIA | (17,256) | (14,767) |
| 11 AC INTERTIE CO/FIBER | (9,168) | (3,387) |
| 12 CASH PROVIDED BY CURRENT OPERATIONS | 256,283 | 267,319 |
| 13 CASH USED FOR CAPITAL INVESTMENTS: | | |
| 14 INVESTMENT IN: | | |
| 15 UTILITY PLANT | (505,808) | (521,577) |
| 16 CASH USED FOR CAPITAL INVESTMENTS | (505,808) | (521,577) |
| 17 CASH FROM TREASURY BORROWING AND APPROPRIATIONS: | | |
| 18 INCREASE IN LONG-TERM DEBT | 490,808 | 506,577 |
| 19 DEBT SERVICE REASSIGNMENT PRINCIPAL | (191,504) | (4,838) |
| 20 REPAYMENT OF CAPITAL LEASES | (1,874) | (12,466) |
| 21 REPAYMENT OF LONG-TERM DEBT | (45,950) | (213,963) |
| 22 REPAYMENT OF CAPITAL APPROPRIATIONS | (1,956) | (21,053) |
| 23 CASH FROM TREASURY BORROWING AND APPROPRIATIONS | 249,525 | 254,258 |
| 24 ANNUAL INCREASE (DECREASE) IN CASH ^{1/} | - | - |
| 25 PLANNED NET REVENUE FOR RISK | - | - |
| 26 TOTAL ANNUAL INCREASE (DECREASE) IN CASH | - | - |

1/ Line 24 must be greater than or equal to zero, otherwise net revenues will be added so that there are no negative cash flows for the year.

2. SEGMENTATION OF TRANSMISSION REVENUE REQUIREMENT

2.1 Introduction

This chapter documents how the components of the transmission revenue requirements are allocated to the transmission segments, defined in the Transmission Segmentation Study and Documentation, BP-18-FS-BPA-07. This allocation results in the segmented revenue requirements, which are used to develop proposed transmission and ancillary services rates. *See* Transmission Rates Study and Documentation, BP-18-FS-BPA-08.

2.2 Segmentation

The allocation of the revenue requirement components to the transmission segments is described below.

Operations & Maintenance Expense (O&M)

BPA transmission O&M (*see* chapter 3 – Transmission Expenses) is segmented in three steps. Step 1: certain costs are directly assigned to the segments and Ancillary Services to which they are attributed: (1) costs for balancing reserve capacity are assigned to the Ancillary and Control Area Services; (2) the annual costs of transmission facilities owned and operated by the Corps of Engineers and Bureau of Reclamation are assigned to the Network and Utility Delivery segments; (3) costs associated with synchronous condensing and remedial action schemes for generation dropping are assigned to the Network and Southern Intertie segment; (4) costs associated with redispatch provided by Power Services to Transmission Services under Attachment M of the tariff are assigned to the Network segment; (5) portions of Transmission Services O&M (specifically, certain costs associated with the Ancillary Service of Scheduling, System Control and Dispatch (SCD)— the costs of the scheduling program, portions of the costs

of the system operations program, and costs of related pilot programs) are assigned to Ancillary Services.

Step 2: the costs of the direct programs for operating and maintaining the transmission system are allocated. The costs of these direct programs include all of the remaining costs of the system operations program (those not assigned to SCD) and the costs of system maintenance and environmental operations programs. Direct program costs are first allocated between lines and substations according to the percentage share of historical O&M spending on lines and substations. *See* Transmission Segmentation Study and Documentation, BP-18-FS-BPA-07, Table 4.3. Then costs assigned to the lines and substations are allocated to the segments based on the percentage share of historical O&M spending that has been identified for each segment in the Transmission Segmentation Study and Documentation. This method allows BPA to reflect the appropriate division of costs for lines and for substations by segment, as the division of costs between lines and substations historically varies by segment. Therefore, costs are allocated between lines and substations, prior to being allocated to segments. Station service costs are allocated to the segments based on the percentage share of historical substation O&M in each segment. *See id.* This second step results in segmented direct O&M expenses.

Step 3: the directly assigned O&M in step 1 and segmented direct transmission O&M expenses in step 2 are summed for each segment, including ancillary services. The remaining expense programs (marketing, business support, engineering and corporate agency services, and costs associated with General Transfer Agreement (GTA) settlements) are allocated to the segments pro rata based on the ratio of the total direct assigned O&M for each segment to the total direct assigned O&M. Finally, the costs in the one remaining expense category—non-between-business-line ancillary services—are segmented based on the ratio of net plant investment in each segment to total transmission net plant investment; except the payments for operating leases

of transmission facilities, which are directly assigned to the Network segment. The non-between-business-line ancillary services costs are segmented on this basis, rather than by an O&M-based ratio, because they are transmission system overhead not directly associated with or influenced by BPA O&M activities.

Net Interest Expense and Planned Net Revenues

Transmission net interest expense (Table 1-1, line 21) and total planned net revenues (line 25) are segmented similarly in a two-step process. As with O&M, costs that can be directly assigned are allocated to the segments first, after which the remainder are allocated.

Net Interest:

Step 1: interest expense and AFUDC associated with Large and Small Generator Interconnection Agreements (LGIA and SGIA) transmission credits is directly assigned to the Network segment. Interest expense and AFUDC associated with transmission credits related to the California-Oregon Intertie (COI) upgrade project is directly assigned to the Southern Intertie segment. Section 2.2.5 of the Transmission Revenue Requirement Study, BP-18-FS-BPA-09, discusses these credits in more detail.

Step 2: the remaining net interest expense (interest net of AFUDC) is then calculated by taking the total net interest expense and subtracting the total LGIA/SGIA and COI net interest expense that was directly assigned above. The remaining net interest expense is allocated pro rata to the segments and ancillary services based on the ratio of net plant investment in each segment to total transmission net plant.

Total Planned Net Revenue:

Step 1: minimum required net revenue related to LGIA/SGIA transmission credits and COI upgrade transmission credits is calculated and directly assigned to the Network and Southern Intertie segments, respectively. The calculation begins with the total revenue credits to be repaid (that is, non-cash revenues) and subtracts from that net interest and depreciation expense associated with the advance-funded facilities. The result is the minimum required net revenues required to ensure that cash requirements can be met.

Step 2: The total planned net revenue is then reduced by the total LGIA/SGIA and COI minimum required net revenues, resulting in the remaining planned net revenue to be allocated across the segments and ancillary services. The remaining planned net revenue is allocated based on the ratio of net plant investment in each segment to total net plant investment.

Depreciation

Depreciation is segmented in two steps.

Step 1: depreciation is calculated directly for each segment and ancillary service based on gross plant investment for the particular year (see chapter 4 for more discussion on plant investment).

Step 2: after calculating depreciation for the gross investment particular to each segment, general plant depreciation (exclusive of that associated with ancillary services) is allocated to the segments and ancillary services based on the ratio of direct O&M in each segment to total transmission direct O&M.

**TABLE 2-1:
SEGMENTATION OF O&M**

(\$000s)

| FY 2018 | A | B | C | D | E | F | G | H |
|---|---|---------------------------|--------------|----------------------|---------------------|---------------------|-----------------|-----------------------|
| | TOTAL FCRTS | GENERATION INTEGRATION | NETWORK | SOUTHERN INTERTIE | EASTERN INTERTIE | UTILITY DELIVERY | DSI DELIVERY | ANCILLARY SERVICES |
| SEGMENTATION STUDY AVERAGES | | | | | | | | |
| 1 | 7-YEAR AVERAGE O&M: LINES | 50,348 | 468 | 45,547 | 2,369 | 1,956 | 9 | - |
| 2 | 7-YEAR AVERAGE O&M: SUBSTATIONS | 116,681 | 2,822 | 95,923 | 16,064 | 593 | 788 | 491 |
| 3 | TOTAL 7-YEAR AVERAGE O&M (LN 2+3) | 167,029 | | | | | | |
| SYSTEM OPERATION, MAINTENANCE & ENVIRONMENT | | | | | | | | |
| 4 | SYSTEM OPERATION ^{1/} | 25,632 | | 1,100 | | | | 58,549 |
| 5 | SYSTEM MAINTENANCE ^{2/} | 176,580 | | | | | | |
| 6 | TOTAL TO SEGMENT (LN 4+5) | 202,212 | | | | | | |
| 7 | DIRECT LINES O&M | 60,954 | 567 | 55,141 | 2,868 | 2,368 | 10 | - |
| 8 | DIRECT SUBS O&M | 141,258 | 3,416 | 116,128 | 19,448 | 718 | 954 | 595 |
| 9 | DIRECT TRANSMISSION O&M SUBTOTAL (LN 7+8) | 202,212 | 3,983 | 171,269 | 22,315 | 3,086 | 964 | 595 |
| 10 | SCHEDULING | 11,330 | | | | | | 11,330 |
| 11 | TOTAL DIRECT TRANSMISSION O&M W/ANCILLARY SERVICES | 273,191 | 3,983 | 172,369 | 22,315 | 3,086 | 964 | 595 |
| OVERHEAD CATEGORIES | | | | | | | | |
| 12 | MARKETING | 15,826 | 231 | 9,985 | 1,293 | 179 | 56 | 4,048 |
| 13 | BUSINESS SUPPORT | 54,613 | 796 | 34,458 | 4,461 | 617 | 193 | 13,969 |
| 14 | SYSTEM ENGINEERING | 56,351 | 734 | 31,770 | 4,113 | 569 | 178 | 18,877 |
| 15 | CORPORATE | 86,392 | 1,260 | 54,509 | 7,057 | 976 | 305 | 22,098 |
| 16 | OVERHEAD CATEGORIES SUBTOTAL (LN 12+13+14+15) | 213,181 | 3,021 | 130,722 | 16,924 | 2,340 | 731 | 58,993 |
| 17 | TOTAL 2018 O&M (LN 11+16) | 486,373 | 7,003 | 303,091 | 39,239 | 5,426 | 1,696 | 1,046 |
| FY 2019 | | | | | | | | |
| SEGMENTATION STUDY AVERAGES | | | | | | | | |
| 18 | 7-YEAR AVERAGE O&M: LINES | 50,348 | 468 | 45,547 | 2,369 | 1,956 | 9 | - |
| 19 | 7-YEAR AVERAGE O&M: SUBSTATIONS | 116,681 | 2,822 | 95,923 | 16,064 | 593 | 788 | 491 |
| 20 | TOTAL 7-YEAR AVERAGE O&M (LN 18+19) | 167,029 | | | | | | |
| SYSTEM OPERATION, MAINTENANCE & ENVIRONMENT | | | | | | | | |
| 21 | SYSTEM OPERATION ^{1/} | 26,271 | | 1,100 | | | | 59,715 |
| 22 | SYSTEM MAINTENANCE ^{2/} | 178,125 | | | | | | |
| 23 | TOTAL TO SEGMENT (LN 21+22) | 204,396 | | | | | | |
| 24 | DIRECT LINES O&M | 61,612 | 573 | 55,736 | 2,899 | 2,394 | 11 | - |
| 25 | DIRECT SUBS O&M | 142,784 | 3,453 | 117,382 | 19,658 | 725 | 964 | 601 |
| 26 | DIRECT TRANSMISSION O&M SUBTOTAL (LN 24+25) | 204,396 | 4,026 | 173,118 | 22,556 | 3,119 | 975 | 601 |
| 27 | SCHEDULING | 11,758 | | | | | | 11,758 |
| 28 | TOTAL DIRECT TRANSMISSION O&M W/ANCILLARY SERVICES | 276,969 | 4,026 | 174,218 | 22,556 | 3,119 | 975 | 601 |
| OVERHEAD CATEGORIES | | | | | | | | |
| 29 | MARKETING | 16,377 | 238 | 10,301 | 1,334 | 184 | 58 | 4,226 |
| 30 | BUSINESS SUPPORT | 52,787 | 767 | 33,204 | 4,299 | 594 | 186 | 13,622 |
| 31 | SYSTEM ENGINEERING | 57,718 | 750 | 32,461 | 4,203 | 581 | 182 | 19,428 |
| 32 | CORPORATE/OTHER | 87,068 | 1,266 | 54,767 | 7,091 | 980 | 306 | 22,468 |
| 33 | OVERHEAD CATEGORIES SUBTOTAL (LN 29+30+31+32) | 213,949 | 3,021 | 130,734 | 16,926 | 2,341 | 732 | 59,745 |
| 34 | TOTAL 2019 O&M (LN 28+33) | 490,918 | 7,047 | 304,952 | 39,483 | 5,460 | 1,706 | 1,053 |

1/ SYSTEM OPERATION EXPENSES NET OF ANCILLARY SERVICES

2/ INCLUDES ENVIRONMENTAL OPERATIONS

**TABLE 2-2
INVESTMENT BASE
(\$000s)**

| | | A | B | C | D | E | F | G | H |
|----------------|-----------------------|-----------|-------------|-----------|----------|----------|----------|----------|-----------|
| | | TOTAL | GENERATION | NETWORK | SOUTHERN | EASTERN | UTILITY | DSI | ANCILLARY |
| | | FCRTS | INTEGRATION | NETWORK | INTERTIE | INTERTIE | DELIVERY | DELIVERY | SERVICES |
| FY 2018 | | | | | | | | | |
| 1 | FCRTS INVESTMENT BASE | 5,802,497 | 85,596 | 4,721,525 | 731,887 | 88,059 | 10,705 | 6,505 | 158,221 |
| 2 | PERCENT | 100.00% | 1.48% | 81.37% | 12.61% | 1.52% | 0.18% | 0.11% | 2.73% |
| FY 2019 | | | | | | | | | |
| 3 | FCRTS INVESTMENT BASE | 5,945,000 | 83,207 | 4,853,917 | 728,375 | 85,421 | 10,413 | 6,328 | 177,339 |
| 4 | PERCENT | 100.00% | 1.40% | 81.65% | 12.25% | 1.44% | 0.18% | 0.11% | 2.98% |

**TABLE 2-3
SEGMENTATION OF DEPRECIATION
(\$000s)**

| | | A | B | C | D | E | F | G | H |
|----------------|---|----------------|--------------|----------------|---------------|--------------|------------|------------|---------------|
| | | TOTAL | GENERATION | NETWORK | SOUTHERN | EASTERN | UTILITY | DSI | ANCILLARY |
| | | FCRTS | INTEGRATION | NETWORK | INTERTIE | INTERTIE | DELIVERY | DELIVERY | SERVICES |
| FY 2018 | | | | | | | | | |
| 1 | DIRECT DEPRECIATION | 189,615 | 2,439 | 147,453 | 23,256 | 2,748 | 299 | 181 | 13,239 |
| 2 | PERCENTAGE OF DIRECT O&M W/OUT ANCILLARY SERVICES | 100.00% | 1.46% | 63.09% | 8.17% | 1.13% | 0.35% | 0.22% | 25.58% |
| 3 | TRANSMISSION GENERAL PLANT | 75,399 | 1,099 | 47,572 | 6,159 | 852 | 266 | 164 | 19,286 |
| 4 | LGIA DEPRECIATION | 8,151 | | 7,871 | 280 | | | | |
| 5 | TOTAL 2018 DEPRECIATION EXPENSE | 273,164 | 3,538 | 202,895 | 29,695 | 3,600 | 565 | 345 | 32,525 |
| FY 2019 | | | | | | | | | |
| 6 | DIRECT DEPRECIATION | 195,741 | 2,439 | 152,881 | 23,553 | 2,750 | 299 | 181 | 13,638 |
| 7 | PERCENTAGE OF DIRECT O&M W/OUT ANCILLARY SERVICES | 100.00% | 1.45% | 62.90% | 8.14% | 1.13% | 0.35% | 0.22% | 25.81% |
| 8 | TRANSMISSION GENERAL PLANT | 80,312 | 1,167 | 50,518 | 6,541 | 904 | 283 | 174 | 20,725 |
| 9 | LGIA DEPRECIATION | 8,370 | | 8,089 | 280 | | | | |
| 10 | TOTAL 2019 DEPRECIATION EXPENSE | 284,422 | 3,606 | 211,488 | 30,374 | 3,654 | 582 | 355 | 34,362 |

**TABLE 2-4
SEGMENTATION OF INTEREST EXPENSE
(\$000s)**

| | | A | B | C | D | E | F | G | H |
|----------------|---|----------------|--------------|----------------|---------------|--------------|------------|------------|--------------|
| | | TOTAL | GENERATION | NETWORK | SOUTHERN | EASTERN | UTILITY | DSI | ANCILLARY |
| | | FCRTS | INTEGRATION | NETWORK | INTERTIE | INTERTIE | DELIVERY | DELIVERY | SERVICES |
| FY 2018 | | | | | | | | | |
| 1 | TRANSMISSION CREDIT PROJECTS INTEREST EXPENSE | 4,386 | | 4,369 | 17 | | | | |
| 2 | TRANSMISSION CREDIT PROJECTS AFUDC | (61) | | (61) | | | | | |
| 3 | TC PROJECTS NET INTEREST | 4,325 | | 4,308 | 17 | | | | |
| 4 | REMAINING NET INTEREST EXPENSE | 143,901 | 2,123 | 117,093 | 18,151 | 2,184 | 265 | 161 | 3,924 |
| 5 | TOTAL 2018 NET INTEREST | 148,225 | 2,123 | 121,401 | 18,167 | 2,184 | 265 | 161 | 3,924 |
| FY 2019 | | | | | | | | | |
| 8 | TRANSMISSION CREDIT PROJECTS INTEREST EXPENSE | 4,172 | | 4,172 | - | | | | |
| 9 | TRANSMISSION CREDIT PROJECTS AFUDC | (61) | | (61) | | | | | |
| 10 | TC PROJECTS NET INTEREST | 4,111 | | 4,111 | - | | | | |
| 11 | REMAINING NET INTEREST EXPENSE | 160,056 | 2,240 | 130,681 | 19,610 | 2,300 | 280 | 170 | 4,774 |
| 12 | TOTAL 2019 NET INTEREST | 164,167 | 2,240 | 134,792 | 19,610 | 2,300 | 280 | 170 | 4,774 |

**TABLE 2-5
SEGMENTATION OF PLANNED NET REVENUE**

(\$000s)

| | A | B | C | D | E | F | G | H |
|--|--------------|-------------|--------------|--------------|-------------|------------|------------|-------------|
| | TOTAL | GENERATION | NETWORK | SOUTHERN | EASTERN | UTILITY | DSI | ANCILLARY |
| FY 2018 | FCRTS | INTEGRATION | | INTERTIE | INTERTIE | DELIVERY | DELIVERY | SERVICES |
| 1 TRANSMISSION CREDIT PROJECTS REVENUE CREDITS | | | 14,904 | 2,352 | | | | |
| 2 TRANSMISSION CREDIT PROJECTS NET INTEREST | | | 4,308 | 17 | | | | |
| 3 TRANSMISSION CREDIT PROJECTS DEPRECIATION | | | 7,871 | 280 | | | | |
| 4 TC PROJECTS MINIMUM REQUIRED NET REVENUE (LN 1-2-3) | 4,781 | | 2,725 | 2,056 | | | | |
| 5 REMAINING PLANNED NET REVENUE | 3,845 | 57 | 3,129 | 485 | 58 | 7 | 4 | 105 |
| 6 TOTAL PLANNED NET REVENUE (LN 4+5) | 8,626 | 57 | 5,854 | 2,541 | 58 | 7 | 4 | 105 |
| FY 2019 | | | | | | | | |
| 9 TRANSMISSION CREDIT PROJECTS REVENUE CREDITS | | | 14,767 | - | | | | |
| 10 TRANSMISSION CREDIT PROJECTS NET INTEREST | | | 4,111 | - | | | | |
| 11 TRANSMISSION CREDIT PROJECTS DEPRECIATION | | | 8,089 | 280 | | | | |
| 12 TC PROJECTS MINIMUM REQUIRED NET REVENUE (LN 1-2-3) | 2,286 | | 2,567 | (280) | | | | |
| 13 REMAINING PLANNED NET REVENUE | (1,939) | (27) | (1,583) | (238) | (28) | (3) | (2) | (58) |
| 14 TOTAL PLANNED NET REVENUE (LN 12+13) | 348 | (27) | 984 | (518) | (28) | (3) | (2) | (58) |

**TABLE 2-6
SEGMENTATION OF TRANSMISSION ACQUISITION & ANCILLARY SERVICES**

(\$000s)

| | A | B | C | D | E | F | G | H |
|---|----------------|-------------|---------------|--------------|-----------|------------|----------|----------------|
| | TOTAL | GENERATION | NETWORK | SOUTHERN | EASTERN | UTILITY | DSI | ANCILLARY |
| FY 2018 | FCRTS | INTEGRATION | | INTERTIE | INTERTIE | DELIVERY | DELIVERY | SERVICES |
| PAYMENTS TO POWER SERVICES: | | | | | | | | |
| 1 COE/USBR TRANSMISSION | 8,867 | | 8,675 | | | 192 | | |
| 2 GEN DROPPING | 589 | | | 589 | | | | |
| 3 REDISPATCH | | | 225 | | | | | |
| 4 SYNCHRONOUS CONDENSERS | 1,273 | | 802 | 471 | | | | |
| 5 STATION SERVICE | 1,996 | 48 | 1,641 | 275 | 10 | 13 | 8 | |
| 6 GENERATION INPUTS | 95,480 | | | | | | | 95,480 |
| PAYMENTS TO OTHERS (NON-PS): | | | | | | | | |
| 7 NON-BBL ANCILLARY SERVICES | 97 | 1 | 79 | 12 | 1 | 0 | 0 | 3 |
| 8 OPERATING LEASES | 5,746 | | 5,746 | | | | | |
| 9 SETTLEMENT AGREEMENTS | - | - | - | - | - | - | - | - |
| 10 TRANSMISSION RENEWABLES | 5,188 | | | | | | | 5,188 |
| 11 TOTAL 2018 TRANS ACQ & ANCLRY | 119,460 | 50 | 17,168 | 1,347 | 12 | 205 | 9 | 100,670 |
| FY 2019 | | | | | | | | |
| PAYMENTS TO POWER SERVICES: | | | | | | | | |
| 12 COE/USBR TRANSMISSION | 8,867 | | 8,675 | | | 192 | | |
| 13 GEN DROPPING | 589 | | | 589 | | | | |
| 14 REDISPATCH | | | 225 | | | | | |
| 15 SYNCHRONOUS CONDENSERS | 1,273 | | 802 | 471 | | | | |
| 16 STATION SERVICE | 1,996 | 48 | 1,641 | 275 | 10 | 13 | 8 | |
| 17 GENERATION INPUTS | 88,569 | | | | | | | 88,569 |
| PAYMENTS TO OTHERS (NON-PS): | | | | | | | | |
| 18 NON-BBL ANCILLARY SERVICES | 97 | 1 | 79 | 12 | 1 | 0 | 0 | 3 |
| 19 OPERATING LEASES | 5,179 | | 5,179 | | | | | |
| 20 SETTLEMENT AGREEMENTS | - | - | - | - | - | - | - | - |
| 21 TRANSMISSION RENEWABLES | 5,188 | | | | | | | 5,188 |
| 22 TOTAL 2019 TRANS ACQ & ANCLRY | 111,983 | 50 | 16,601 | 1,347 | 12 | 205 | 9 | 93,760 |

TABLE 2-7
REVENUE REQUIREMENTS FOR ANCILLARY SERVICES
(\$000s)

| FY 2018 | A TOTAL ANCILLARY SERVICES | B SCHEDULING, SYST CONTROL, & DISPATCH |
|------------------------------|---|---|
| 1 DIRECT O&M | 69,879 | 69,879 |
| 2 OVERHEADS | 58,993 | 58,993 |
| 3 NON-BBL / ACQ. & ANCILLARY | <u>5,190</u> | <u>5,190</u> |
| 4 TOTAL O&M | 134,063 | 134,063 |
| 5 GENERATION INPUTS | 95,480 | 0 |
| 6 DEPRECIATION | 32,525 | 32,525 |
| 7 NET INTEREST EXPENSE | 3,924 | 3,924 |
| 8 PLANNED NET REVENUE | <u>105</u> | <u>105</u> |
| 9 TOTAL REV REQ | 266,096 | 170,616 |

| FY 2019 | TOTAL ANCILLARY SERVICES | SCHEDULING, SYST CONTROL, & DISPATCH |
|-------------------------------|---|---|
| 10 DIRECT O&M | 71,473 | 71,473 |
| 11 OVERHEADS | 59,745 | 59,745 |
| 12 NON-BBL / ACQ. & ANCILLARY | <u>5,191</u> | <u>5,191</u> |
| 13 TOTAL O&M | 136,408 | 136,408 |
| 14 GENERATION INPUTS | 88,569 | 0 |
| 15 DEPRECIATION | 34,362 | 34,362 |
| 16 NET INTEREST EXPENSE | 4,774 | 4,774 |
| 17 PLANNED NET REVENUE | <u>(58)</u> | <u>(58)</u> |
| 18 TOTAL REV REQ | 264,057 | 175,487 |

TABLE 2-8
SEGMENTED REVENUE REQUIREMENT
(\$000s)

| | A | B | C | D | E | F | G | H |
|---|------------------|-----------------------------------|----------------|------------------------------|-----------------------------|-----------------------------|-------------------------|-------------------------------|
| FY 2018 | TOTAL | GENERATION INTEGRATION | NETWORK | SOUTHERN INTERTIE | EASTERN INTERTIE | UTILITY DELIVERY | DSI DELIVERY | ANCILLARY SERVICES |
| 1 OPERATIONS & MAINTENANCE | 486,373 | 7,003 | 303,091 | 39,239 | 5,426 | 1,696 | 1,046 | 128,872 |
| 2 TRANSMISSION ACQUISITION & ANCILLARY SERVICES | 119,460 | 50 | 17,168 | 1,347 | 12 | 205 | 9 | 100,670 |
| 3 DEPRECIATION | 273,164 | 3,538 | 202,895 | 29,695 | 3,600 | 565 | 345 | 32,525 |
| 4 NET INTEREST EXPENSE | 148,225 | 2,123 | 121,401 | 18,167 | 2,184 | 265 | 161 | 3,924 |
| 5 PLANNED NET REVENUES | <u>8,626</u> | <u>57</u> | <u>5,854</u> | <u>2,541</u> | <u>58</u> | <u>7</u> | <u>4</u> | <u>105</u> |
| 6 TOTAL TRANSMISSION REVENUE REQUIREMENT | 1,035,849 | 12,771 | 650,409 | 90,989 | 11,279 | 2,739 | 1,565 | 266,096 |

| | A | B | C | D | E | F | G | H |
|--|------------------|-----------------------------------|----------------|------------------------------|-----------------------------|-----------------------------|-------------------------|-------------------------------|
| FY 2019 | TOTAL | GENERATION INTEGRATION | NETWORK | SOUTHERN INTERTIE | EASTERN INTERTIE | UTILITY DELIVERY | DSI DELIVERY | ANCILLARY SERVICES |
| 7 OPERATIONS & MAINTENANCE | 490,918 | 7,047 | 304,952 | 39,483 | 5,460 | 1,706 | 1,053 | 131,217 |
| 8 TRANSMISSION ACQUISITION & ANCILLARY SERVICES | 111,983 | 50 | 16,601 | 1,347 | 12 | 205 | 9 | 93,760 |
| 9 DEPRECIATION | 284,422 | 3,606 | 211,488 | 30,374 | 3,654 | 582 | 355 | 34,362 |
| 10 NET INTEREST EXPENSE | 164,167 | 2,240 | 134,792 | 19,610 | 2,300 | 280 | 170 | 4,774 |
| 11 PLANNED NET REVENUES | <u>348</u> | <u>(27)</u> | <u>984</u> | <u>(518)</u> | <u>(28)</u> | <u>(3)</u> | <u>(2)</u> | <u>(58)</u> |
| 12 TOTAL TRANSMISSION REVENUE REQUIREMENT | 1,051,837 | 12,916 | 668,817 | 90,296 | 11,397 | 2,770 | 1,585 | 264,057 |

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3. TRANSMISSION EXPENSES

3.1 Introduction

This chapter compiles the expenses that are included in transmission revenue requirements for the rate period.

3.2 Expenses

Table 3-1 displays the forecast program spending levels that are the basis for the revenue requirement study. There are two types of expenses included in the program spending levels, O&M expenses and inter-business line expenses. O&M expenses came from the Integrated Program Review and Capital Investment Review (IPR/CIR) process. Inter-business line expenses, including the cost of redispatch, are composed of two sub-groups of costs. *See* Transmission Rates Study and Documentation, BP-18-FS-BPA-08, § 2. The first is the generation inputs for ancillary services. The second is the annual cost of Network segment facilities and Utility Delivery segment facilities of the Corps of Engineers and Bureau of Reclamation annual costs of those agencies. These inter-business line expenses are recovered by rates agreed to in the Generation Inputs settlement. *See* Fredrickson & Fisher, BP-18-E-BPA-18.

Depreciation and amortization expense is calculated using the straight-line method and remaining-life technique for lines, substations, and each of the FERC Accounts in the general plant category. *See* Ch. 4.

Interest expense is calculated in the transmission repayment study using the capital appropriations and BPA revenue bonds issued to the U.S. Treasury at individual interest rates. In addition, forecast lease purchase program capital will assume a 3-month LIBOR rate with a 60 basis point spread for the first seven years and then a taxable non-federal interest rate for the

remainder of the time outstanding. See section 5 for calculation of the interest credit on cash reserves.

TABLE 3-1
TRANSMISSION PROGRAM SPENDING FORECAST
(\$000s)

| PROGRAM & OTHER OPERATING COSTS | A FY 2018 | B FY 2019 |
|---|---------------|---------------|
| 1 TRANSMISSION SYSTEM OPERATIONS | | |
| 2 POWER SYSTEM DISPATCHING | 16,082 | 16,376 |
| 3 INFORMATION TECHNOLOGY | 8,523 | 8,668 |
| 4 CONTROL CENTER SUPPORT | 26,398 | 26,919 |
| 5 TECHNICAL OPERATIONS | 7,547 | 7,752 |
| 6 SUBSTATION OPERATIONS | 25,452 | 26,091 |
| 7 OVERSUPPLY ADMIN | 180 | 180 |
| 8 TRANSMISSION OPERATOR SERVICES | 1,100 | 1,100 |
| 9 KSI COMMERCIAL OPERATIONS | 6,670 | 10,005 |
| 10 STRATEGIC INTEGRATION (PREVIOUSLY ENERGY IMBALANCE MARKET) | 1,404 | 1,447 |
| 11 SUB-TOTAL TRANSMISSION SYSTEM OPERATIONS | 93,355 | 98,538 |
| 12 TRANSMISSION SCHEDULING | | |
| 13 RESERVATIONS | 1,498 | 1,561 |
| 14 PRE-SCHEDULING | 426 | 442 |
| 15 REAL-TIME SCHEDULING | 4,765 | 4,957 |
| 16 SCHEDULING TECHNICAL SUPPORT | 4,099 | 4,239 |
| 17 SCHEDULING AFTER-THE-FACT | 542 | 558 |
| 18 SUB-TOTAL TRANSMISSION SCHEDULING | 11,330 | 11,758 |
| 19 TRANSMISSION MARKETING | | |
| 20 TRANSMISSION SALES | 3,491 | 3,600 |
| 21 CONTRACT MANAGEMENT | 4,861 | 5,039 |
| 22 TRANSMISSION BILLING | 2,518 | 2,611 |
| 23 BUSINESS STRATEGY & ASSESSMENT | 4,955 | 5,127 |
| 24 SUB-TOTAL TRANSMISSION MARKETING | 15,826 | 16,377 |
| 25 TRANSMISSION BUSINESS SUPPORT | | |
| 26 EXECUTIVE AND ADMIN SERVICES | 22,488 | 16,863 |
| 27 AIRCRAFT SERVICES | 2,982 | 3,010 |
| 28 TS INTERNAL GENERAL & ADMINISTRATIVE | 12,464 | 12,657 |
| 29 LOGISTICS SERVICES | 4,916 | 5,025 |
| 30 SECURITY ENHANCEMENTS | 644 | 658 |
| 31 LEGAL SUPPORT | 1,716 | 1,792 |
| 32 KSI ASSET MANAGEMENT | 1,300 | 1,300 |
| 33 KSI LONG-TERM FINANCE & RATES | 30 | 30 |
| 34 SUB-TOTAL TRANSMISSION BUSINESS SUPPORT | 46,539 | 41,335 |
| 35 TRANSMISSION ENGINEERING | | |
| 36 RESEARCH & DEVELOPMENT | 7,129 | 7,298 |
| 37 TSD PLANNING & ANALYSIS | 21,292 | 21,752 |
| 38 CAPITAL TO EXPENSE TRANSFER | 4,285 | 4,285 |
| 39 NERC/WECC COMPLIANCE | 19,750 | 20,436 |
| 40 ENVIRONMENTAL POLICY/PLANNING | 1,695 | 1,747 |
| 41 ENG. LINE RATING | 2,200 | 2,200 |
| 42 SUB-TOTAL TRANSMISSION ENGINEERING | 56,351 | 57,718 |

TABLE 3-1
TRANSMISSION PROGRAM SPENDING FORECAST
(\$000s)

| PROGRAM & OTHER OPERATING COSTS | A FY 2018 | B FY 2019 |
|--|----------------|----------------|
| 43 TRANSMISSION SYSTEM MAINTENANCE | | |
| 44 ENVIRONMENTAL ANALYSIS | 8 | 8 |
| 45 HEAVY MOBILE EQUIPMENT MAINTENANCE | 18 | 18 |
| 46 NON-ELECTRIC MAINTENANCE | 32,058 | 31,180 |
| 47 SUBSTATION MAINTENANCE | 36,046 | 36,693 |
| 48 TRANSMISSION LINE MAINTENANCE | 29,817 | 30,228 |
| 49 SYSTEM PROTECTION CONTROL MAINTENANCE | 15,640 | 15,999 |
| 50 POWER SYSTEM CONTROL MAINTENANCE | 20,437 | 20,859 |
| 51 JOINT COST MAINTENANCE | 148 | 149 |
| 52 SYSTEM MAINTENANCE MANAGEMENT | 7,779 | 8,010 |
| 53 RIGHT OF WAY MAINTENANCE | 9,944 | 9,986 |
| 54 POLLUTION PREVENTION & ABATEMENT | 4,860 | 5,028 |
| 55 TECHNICAL TRAINING | 2,471 | 2,526 |
| 56 VEGETATION MANAGEMENT | 17,354 | 17,441 |
| 57 SUB-TOTAL TRANSMISSION SYSTEM MAINTENANCE | 176,580 | 178,125 |
| 58 SUB-TOTAL TRANSMISSION SYSTEM OPERATIONS & MAINTENANCE | 399,981 | 403,850 |
| 59 NON-BETWEEN BUSINESS LINE ANCILLARY SERVICES | | |
| 60 LEASED FACILITIES | 5,746 | 5,179 |
| 61 SETTLEMENT AGREEMENTS | - | - |
| 62 NON-BBL ANCILLARY SERVICES | 97 | 97 |
| 63 TRANSMISSION RENEWABLES | 5,188 | 5,188 |
| 64 SUB-TOTAL NON-BETWEEN BUSINESS LINE ANCILLARY SERVICES | 11,031 | 10,464 |
| 65 CORPORATE EXPENSES | | |
| 66 UNFUNDED RETIREMENT BENEFITS | 14,946 | 15,532 |
| 67 CORPORATE OVERHEAD DISTRIBUTIONS | 78,994 | 80,075 |
| 68 SUB-TOTAL CORPORATE CHARGES | 93,940 | 95,607 |
| 69 OTHER INCOME AND ADJUSTMENTS | (7,548) | (8,539) |
| 70 TOTAL TRANSMISSION IPR PROGRAM LEVELS | 497,403 | 501,381 |

TABLE 3-2
SUMMARY OF TRANSMISSION REPAYMENT STUDY DATA
(\$000s)

| | A | B |
|---------------------------------------|--------------------|--------------------|
| | <u>2018</u> | <u>2019</u> |
| 1 DSR INTEREST | 13,964 | 5,111 |
| 2 NON-FEDERAL/CAPITAL LEASES INTEREST | 77,156 | 97,552 |
| 3 APPROPRIATION INTEREST | 1,659 | 1,518 |
| 4 BOND INTEREST | 100,999 | 106,597 |
| 5 DISCOUNTS / PREMIUMS | <u>-</u> | <u>556</u> |
| 6 TOTAL GROSS INTEREST | 193,778 | 211,334 |
| | | |
| 6 DSR PRINCIPAL | 191,504 | 4,838 |
| 7 NON-FEDERAL/CAPITAL LEASE PRINCIPAL | 1,874 | 12,466 |
| 8 APPROPRIATION PRINCIPAL | 1,956 | 21,053 |
| 9 BOND PRINCIPAL | <u>45,950</u> | <u>213,963</u> |
| 10 TOTAL PRINCIPAL | 241,283 | 252,319 |

TABLE 3-3
ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION
(\$000s)

| | A | B |
|---|--------------------|--------------------|
| <u>PLANT FUNDED FROM BPA BORROWING</u> | | |
| | <u>2018</u> | <u>2019</u> |
| 1 CAPITAL EXPENDITURES | 470,545 | 486,228 |
| 2 PLANT-IN-SERVICE | 449,623 | 506,407 |
| 3 SOY CWIP BALANCE | 790,378 | 811,300 |
| 4 EOY CWIP BALANCE | 811,300 | 791,121 |
| 5 AVERAGE CWIP BALANCE | 800,839 | 801,210 |
| 6 AFUDC RATE | 3.05% | 3.05% |
| 7 CORPORATE CAPITAL (65% OF TOTAL) | 10,530 | 10,530 |
| 8 CORPORATE AFUDC | 246 | 321 |
| 9 TOTAL AFUDC FOR BPA BORROWING | 24,672 | 24,758 |
| <u>PLANT FUNDED FROM REVENUES & BY THIRD PARTIES</u> | | |
| 10 CAPITAL EXPENDITURES | 10,000 | 10,000 |
| 11 PLANT-IN-SERVICE | 10,000 | 10,000 |
| 12 SOY CWIP BALANCE | 2,008 | 2,008 |
| 13 EOY CWIP BALANCE | 2,008 | 2,008 |
| 14 AVERAGE CWIP BALANCE | 2,008 | 2,008 |
| 15 AFUDC RATE | <u>3.05%</u> | <u>3.05%</u> |
| 16 AFUDC FOR NON-FEDERAL PROJECTS | 61 | 61 |
| 17 TOTAL AFUDC | 24,733 | 24,819 |

TABLE 3-4
AMORTIZATION OF PREMIUMS OF BOND REFINANCINGS
(\$000s)

| A | B | C | D | E | F | G | H | I | J | K | L |
|------------------------|--------------|---------------|------------------|-------------------------|-----------------|---------------------------|--------------------------------------|------------|------------|------------|------------|
| DATE OF REFINANCING | PREMIUM | PRORATION | NO. OF MONTHS | MONTHLY AMORTIZATION | TYPE OF BOND | LAST MONTH TO AMORTIZE | <u>CALCULATION OF ANNUAL AMOUNTS</u> | | | | |
| | | | | | | | 2015 | 2016 | 2017 | 2018 | 2019 |
| 1 | 5/31/1998 | 6,322 | 411 | 15 | CONSTRUCTION | Aug-2032 | 184 | 184 | 184 | 184 | 184 |
| 2 | 8/31/1998 | 4,685 | 360 | 13 | CONSTRUCTION | Aug-2028 | 156 | 156 | 156 | 156 | 156 |
| 3 | 8/31/1998 | 6,560 | 360 | 18 | CONSTRUCTION | Aug-2028 | 219 | 219 | 219 | 219 | 219 |
| 4 | Total | 17,567 | | 47 | | | 559 | 559 | 559 | 559 | 559 |

TABLE 3-5
BETWEEN BUSINESS LINE COSTS
(\$000s)

| | A | B | C |
|--|--------------------|--------------------|-----------------------|
| | <u>2018</u> | <u>2019</u> | <u>AVERAGE</u> |
| 1 ANCILLARY SERVICES | 95,480 | 88,569 | 92,025 |
| 2 SYNCHRONOUS CONDENSING | 1,273 | 1,273 | 1,273 |
| 3 GENERATION DROPPING | 589 | 589 | 589 |
| 4 COE/RECLAMATION NETWORK/ DELIVERY FACILITIES SEGMENTATION | 8,867 | 8,867 | 8,867 |
| 5 REDISPATCH | 225 | 225 | 225 |
| 6 STATION SERVICE | <u>1,996</u> | <u>1,996</u> | <u>1,996</u> |
| 7 TOTAL | 108,430 | 101,519 | 104,974 |

TABLE 3-6
SUMMARY OF DEPRECIATION
(\$000s)

| | <u>A</u> <u>2018</u> | <u>B</u> <u>2019</u> |
|---|---------------------------------------|---------------------------------------|
| 1 TRANSMISSION PLANT | | |
| 2 LINES | 82,562 | 85,030 |
| 3 SUBSTATION | 99,421 | 102,826 |
| 4 STATION EQUIPMENT | 2,380 | 3,014 |
| 5 GENERAL PLANT | 75,399 | 80,312 |
| 6 ANCILLARY SERVICES (Excludes Station Equipment) | 10,859 | 10,624 |
| 7 INTANGIBLE ASSETS | 353 | 353 |
| 8 REGULATORY ASSET | <u>2,191</u> | <u>2,263</u> |
| 9 TOTAL | 273,164 | 284,422 |

TABLE 3-7
TRANSMISSION REGULATORY ASSETS
(\$000s)

| | | A | B |
|---|-----------------------------|-----------------------|-----------------------|
| | | <u>FY 2018</u> | <u>FY 2019</u> |
| 1 | SPACER DAMPERS - 30 YR LIFE | | |
| 2 | ADDITIONS | - | - |
| 3 | AMORTIZATION | 956 | 956 |
| 4 | SPACER DAMPERS - 25 YR LIFE | | |
| 5 | ADDITIONS | 2,288 | 1,331 |
| 6 | AMORTIZATION | 1,234 | 1,307 |
| 7 | CAPITALIZED BOND PREMIUMS | 561 | 561 |

4. FCRTS INVESTMENT BASE

4.1 Introduction

This chapter documents the development of the FCRTS investment for the rate period, which is the basis for annual depreciation expense calculations and the allocation of financing-related costs (net interest expense and planned net revenue) to the segments.

4.2 Methodology

The calculation of investment base for each year of the rate period starts with historical transmission plant investment, which is provided by the Transmission Segmentation Study and Documentation, BP-18-FS-BPA-07. The general plant investment is identified according to FERC Account from BPA plant investment records. In addition, general plant investment for facilities required for Ancillary Services is separately identified and treated by FERC Account. The historical investment information includes plant investments associated with Projects Funded In Advance. Entities provide BPA with funding for exclusive use facilities and BPA retains ownership of the facilities. The facilities are excluded from general rate development, but depreciation of the facilities is included in BPA expenses. The depreciation calculated herein on these facilities is used for budgeting purposes, but neither the investment nor associated depreciation is incorporated into ratemaking.

Forecast plant additions, derived from capital budgets, are then added to the historical year investment. The additions are adjusted to take into account retirements by applying a ratio of retirements to additions, using an average of the past five years of actuals by FERC account. The application of the retirement ratio produces the gross investment for lines, substations, and general plant accounts for each year of the cost evaluation period.

The gross investment is then reduced by accumulated depreciation. Depreciation is calculated using the straight-line method, remaining-life technique. For general plant categories, annual depreciation rates are used unadjusted. For lines and substations, the annual depreciation rate has been weighted by the depreciation rates of each FERC account that composes these facilities. Depreciation is calculated on gross plant investment in each plant category according to the category's group rates. For each forecast year, depreciation expense is added to the prior year's accumulated depreciation to establish the forecast of accumulated depreciation.

Calculation of the investment base for each of the segments in each rate period year starts with the average net plant investment for that year (gross investment less accumulated depreciation). Various adjustments are made to the calculated investment base to reflect plant not included in the Transmission Segmentation Study and Documentation's analysis of historical investment and additions, and to remove plant that was funded in advance by customer deposits. First, net investment related to intangible plant (capacity rights acquired by BPA) is added to the Network and Southern Intertie segments based on the facility segmentation in the Transmission Segmentation Study and Documentation, BP-18-FS-BPA-07. The regulatory asset net investment (spacer dampers) is added to the Network segment. Then, net investment in general plant categories is prorated to the segments based on the sum of net plant investment, net intangible plant, and net regulatory assets. Next the Network net plant investment is reduced by the net plant associated with LGIA/SGIA, and the Southern Intertie net plant investment is reduced by the net plant associated with the COI upgrade. The Southern Intertie net plant investment is also reduced to remove the balance of the unearned revenues associated with non-Federal capacity ownership on the AC Intertie. Finally, the unearned revenue balance associated with prepaid fiber optic leases is allocated to each segment pro rata based on the communications plant in each segment.

TABLE 4-1
BPA TRANSMISSION PLANT DEPRECIATION AND ACCUMULATED DEPRECIATION
(\$000s)

| | A | B | C | D | E | F | G | H | I |
|-----------------------------|-------------------------|-------------------------|-----------------------|-------------------------|-------------------------|-----------------------|-------------------------|-------------------------|-----------------------|
| | 2017 PLANT INVEST | 2017 DEPR EXPENSE | 2017 ACCUM DEPR | 2018 PLANT INVEST | 2018 DEPR EXPENSE | 2018 ACCUM DEPR | 2019 PLANT INVEST | 2019 DEPR EXPENSE | 2019 ACCUM DEPR |
| 1 LINES | | | | | | | | | |
| 2 GENERATION-INTEGRATION | 18,371 | 412 | 7,119 | 18,371 | 412 | 7,531 | 18,371 | 412 | 7,943 |
| 3 NETWORK | 3,223,500 | 71,201 | 1,215,346 | 3,319,722 | 73,284 | 1,288,630 | 3,437,163 | 75,677 | 1,364,307 |
| 4 SOUTHERN INTERTIE | 256,207 | 5,112 | 78,222 | 258,082 | 5,760 | 83,982 | 259,937 | 5,802 | 89,784 |
| 5 EASTERN INTERTIE | 94,851 | 2,125 | 36,756 | 94,851 | 2,125 | 38,881 | 94,851 | 2,125 | 41,006 |
| 6 UTILITY DELIVERY | 308 | 7 | 119 | 308 | 7 | 126 | 308 | 7 | 133 |
| 7 DSI DELIVERY | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 TOTAL LINES | 3,593,237 | 78,857 | 1,337,562 | 3,691,334 | 81,588 | 1,419,150 | 3,810,631 | 84,023 | 1,503,173 |
| 9 PFIA | 52,539 | 1,177 | 20,359 | 52,539 | 1,177 | 21,536 | 52,539 | 1,177 | 22,713 |
| 10 SUBSTATIONS | | | | | | | | | |
| 11 GENERATION-INTEGRATION | 92,984 | 2,027 | 28,611 | 92,984 | 2,027 | 30,638 | 92,984 | 2,027 | 32,665 |
| 12 NETWORK | 3,224,909 | 69,080 | 958,977 | 3,359,505 | 71,770 | 1,030,747 | 3,496,707 | 74,733 | 1,105,480 |
| 13 SOUTHERN INTERTIE | 792,364 | 17,193 | 241,613 | 799,468 | 17,351 | 258,964 | 815,759 | 17,606 | 276,570 |
| 14 EASTERN INTERTIE | 28,536 | 621 | 8,749 | 28,609 | 623 | 9,372 | 28,704 | 625 | 9,997 |
| 15 UTILITY DELIVERY | 13,385 | 292 | 4,119 | 13,385 | 292 | 4,411 | 13,385 | 292 | 4,703 |
| 16 DSI DELIVERY | 8,298 | 181 | 2,553 | 8,298 | 181 | 2,734 | 8,298 | 181 | 2,915 |
| 17 TOTAL SUBSTATIONS | 4,160,476 | 89,394 | 1,244,621 | 4,302,249 | 92,244 | 1,336,865 | 4,455,838 | 95,464 | 1,432,329 |
| 18 PFIA | 93,409 | 2,036 | 28,741 | 93,409 | 2,036 | 30,777 | 93,409 | 2,036 | 32,813 |
| 19 INTANGIBLE PLANT | 9,559 | 353 | 1,240 | 9,559 | 353 | 1,593 | 9,559 | 353 | 1,946 |
| 20 NETWORK | 5,633 | 208 | 730 | 5,633 | 208 | 938 | 5,633 | 208 | 1,146 |
| 21 SOUTHERN INTERTIE | 3,925 | 145 | 509 | 3,925 | 145 | 654 | 3,925 | 145 | 799 |

TRANSMISSION DEPRECIATION SUMMARY

| | 2017 | 2018 | 2019 |
|-----------------------------|----------------|----------------|----------------|
| 1 TRANSMISSION PLANT | | | |
| 2 LINES | 78,857 | 81,588 | 84,023 |
| 3 SUBSTATION | 89,394 | 92,244 | 95,464 |
| 4 GENERAL PLANT | 69,779 | 75,399 | 80,312 |
| 5 ANCILLARY SERVICES | 12,638 | 13,239 | 13,638 |
| 6 INTANGIBLE PLANT | 353 | 353 | 353 |
| 7 REGULATORY ASSET | 2,133 | 2,191 | 2,263 |
| 8 LGIA / COI | 8,042 | 8,151 | 8,370 |
| 9 TOTAL FOR TS RATES | 261,196 | 273,164 | 284,422 |

TABLE 4-2
INVESTMENT BASE
(\$000s)

| | A | B | C | D | E | F |
|--|---------------------------------------|------------------|------------------|----------------------|------------------|-------------------|
| | BALANCE-AS-OF | | AVERAGE | BALANCE-AS-OF | | AVERAGE |
| | <u>2017</u> | <u>2018</u> | <u>2018</u> | <u>2018</u> | <u>2019</u> | <u>2019</u> |
| <u>COMPLETED PLANT</u> | | | | | | |
| 1 | GENERATION-INTEGRATION | 111,354 | 111,354 | 111,354 | 111,354 | 111,354 |
| 2 | NETWORK | 6,448,409 | 6,679,227 | 6,563,818 | 6,679,227 | 6,933,871 |
| 3 | SOUTHERN INTERTIE | 1,048,571 | 1,057,549 | 1,053,060 | 1,057,549 | 1,075,697 |
| 4 | EASTERN INERTIE | 123,388 | 123,461 | 123,424 | 123,461 | 123,556 |
| 5 | UTILITY DELIVERY | 13,693 | 13,693 | 13,693 | 13,693 | 13,693 |
| 6 | DSI DELIVERY | 8,298 | 8,298 | 8,298 | 8,298 | 8,298 |
| 7 | REGULATORY ASSET | 58,402 | 60,690 | 59,546 | 60,690 | 62,021 |
| 8 | INTANGIBLE PLANT | 9,559 | 9,559 | 9,559 | 9,559 | 9,559 |
| 9 | ANCILLARY SERVICES | 206,255 | 235,538 | 220,897 | 235,538 | 264,825 |
| 10 | GENERAL PLANT | <u>1,291,550</u> | <u>1,405,014</u> | <u>1,348,282</u> | <u>1,405,014</u> | <u>1,533,601</u> |
| 11 | TOTAL COMPLETED PLANT | 9,319,479 | 9,704,383 | 9,511,931 | 9,704,383 | 10,136,474 |
| <u>ACCUMULATED DEPRECIATION</u> | | | | | | |
| 12 | GENERATION-INTEGRATION | 35,730 | 38,169 | 36,949 | 38,169 | 40,608 |
| 13 | NETWORK | 2,174,323 | 2,319,377 | 2,246,850 | 2,319,377 | 2,469,787 |
| 14 | SOUTHERN INTERTIE | 319,835 | 342,946 | 331,390 | 342,946 | 366,354 |
| 15 | EASTERN INERTIE | 45,504 | 48,252 | 46,878 | 48,252 | 51,002 |
| 16 | UTILITY DELIVERY | 4,238 | 4,537 | 4,388 | 4,537 | 4,836 |
| 17 | DSI DELIVERY | 2,553 | 2,734 | 2,644 | 2,734 | 2,915 |
| 18 | REGULATORY ASSET | 12,445 | 14,635 | 13,540 | 14,635 | 16,898 |
| 19 | INTANGIBLE PLANT | 1,240 | 1,593 | 1,416 | 1,593 | 1,946 |
| 20 | ANCILLARY SERVICES | 76,743 | 89,982 | 83,362 | 89,982 | 103,619 |
| 21 | GENERAL PLANT | <u>496,063</u> | <u>571,461</u> | <u>533,762</u> | <u>571,461</u> | <u>651,773</u> |
| 22 | TOTAL ACCUMULATED DEPRECIATION | 3,168,673 | 3,433,686 | 3,301,180 | 3,433,686 | 3,709,739 |
| <u>NET PLANT INVESTMENT</u> | | | | | | |
| 23 | GENERATION-INTEGRATION | 75,625 | 73,186 | 74,405 | 73,186 | 70,747 |
| 24 | NETWORK | 4,274,086 | 4,359,849 | 4,316,968 | 4,359,849 | 4,464,083 |
| 25 | SOUTHERN INTERTIE | 728,736 | 714,604 | 721,670 | 714,604 | 709,343 |
| 26 | EASTERN INERTIE | 77,883 | 75,208 | 76,546 | 75,208 | 72,553 |
| 27 | UTILITY DELIVERY | 9,455 | 9,156 | 9,305 | 9,156 | 8,857 |
| 28 | DSI DELIVERY | 5,745 | 5,564 | 5,654 | 5,564 | 5,383 |
| 29 | REGULATORY ASSET | 45,957 | 46,055 | 46,006 | 46,055 | 45,123 |
| 30 | INTANGIBLE PLANT | 8,319 | 7,966 | 8,143 | 7,966 | 7,613 |
| 31 | ANCILLARY SERVICES | 129,513 | 145,556 | 137,535 | 145,556 | 161,206 |
| 32 | GENERAL PLANT | <u>795,488</u> | <u>833,553</u> | <u>814,520</u> | <u>833,553</u> | <u>881,828</u> |
| 33 | TOTAL NET PLANT INVESTMENT | 6,150,806 | 6,270,697 | 6,210,751 | 6,270,697 | 6,426,735 |

TABLE 4-3
BPA PROJECTED TRANSMISSION PLANT INVESTMENT
(\$000s)

| | A | B | C | D | E | F |
|--------------------------------|-------------------|-------------------------|-------------------|-------------------------|-------------------|-------------------------|
| | 2017 ADDITIONS | TOTAL 2017 INVEST | 2018 ADDITIONS | TOTAL 2018 INVEST | 2019 ADDITIONS | TOTAL 2019 INVEST |
| 1 GENERATION-INTEGRATION | 0 | 111,354 | 0 | 111,354 | 0 | 111,354 |
| 2 NETWORK | 202,009 | 6,448,409 | 230,818 | 6,679,227 | 254,644 | 6,933,871 |
| 3 SOUTHERN INTERTIE | 63,357 | 1,048,571 | 8,979 | 1,057,549 | 18,147 | 1,075,697 |
| 4 EASTERN INTERTIE | 108 | 123,388 | 73 | 123,461 | 95 | 123,556 |
| 5 UTILITY DELIVERY | 0 | 13,693 | 0 | 13,693 | 0 | 13,693 |
| 6 DSI DELIVERY | 0 | 8,298 | 0 | 8,298 | 0 | 8,298 |
| 7 REGULATORY ASSET | 587 | 58,402 | 2,288 | 60,690 | 1,331 | 62,021 |
| 8 GENERAL PLANT | 137,576 | 1,291,550 | 113,464 | 1,405,014 | 128,586 | 1,533,601 |
| 9 ANCILLARY SERVICES | 20,601 | 206,255 | 29,283 | 235,538 | 29,287 | 264,825 |
| 10 INTANGIBLE - SPACER DAMPERS | <u>0</u> | <u>9,559</u> | <u>0</u> | <u>9,559</u> | <u>0</u> | <u>9,559</u> |
| 11 TOTAL BPA | 424,237 | 9,319,479 | 384,904 | 9,704,383 | 432,091 | 10,136,474 |

TABLE 4-4
INVESTMENT BASE BY SEGMENT
(\$000s)

| | A | B | C | E | F | G | H | I |
|---|------------------|-----------------------------------|------------------|------------------------------|-----------------------------|-----------------------------|-------------------------|-------------------------------|
| FY 2018 | TOTAL | GENERATION INTEGRATION | NETWORK | SOUTHERN INTERTIE | EASTERN INTERTIE | UTILITY DELIVERY | DSI DELIVERY | ANCILLARY SERVICES |
| 1 NET TRANSMISSION PLANT | 5,342,083 | 74,405 | 4,316,968 | 721,670 | 76,546 | 9,305 | 5,654 | 137,535 |
| 2 INTANGIBLE PLANT | 8,143 | | 4,799 | 3,344 | | | | |
| 3 REGULATORY ASSET | 46,006 | | 46,006 | | | | | |
| 4 SUBTOTAL INVESTMENT | 5,396,231 | 74,405 | 4,367,772 | 725,014 | 76,546 | 9,305 | 5,654 | 137,535 |
| 5 PERCENT | 100% | 1.38% | 80.94% | 13.44% | 1.42% | 0.17% | 0.10% | 2.55% |
| 6 GENERAL PLANT | 814,520 | 11,231 | 659,282 | 109,435 | 11,554 | 1,405 | 853 | 20,760 |
| 7 TRANSMISSION CREDIT PROJECTS (NET PLANT) | (312,746) | | (303,189) | (9,556) | | | | |
| 8 ACC REV BAL ADJ - Fiber | (2,891) | (40) | (2,340) | (388) | (41) | (5) | (3) | (74) |
| 9 ACC REV BAL ADJ - 3AC | (92,617) | | | (92,617) | | | | |
| 10 INVESTMENT BASE | 5,802,497 | 85,596 | 4,721,525 | 731,887 | 88,059 | 10,705 | 6,505 | 158,221 |
| FY 2019 | | | | | | | | |
| 11 NET TRANSMISSION PLANT | 5,437,647 | 71,966 | 4,411,966 | 711,973 | 73,881 | 9,006 | 5,473 | 153,381 |
| 12 INTANGIBLE PLANT | 7,790 | | 4,591 | 3,199 | | | | |
| 13 REGULATORY ASSET | 45,589 | | 45,589 | | | | | |
| 14 SUBTOTAL INVESTMENT | 5,491,026 | 71,966 | 4,462,146 | 715,172 | 73,881 | 9,006 | 5,473 | 153,381 |
| 15 PERCENT | 100% | 1.31% | 81.26% | 13.02% | 1.35% | 0.16% | 0.10% | 2.79% |
| 16 GENERAL PLANT | 857,690 | 11,241 | 696,981 | 111,709 | 11,540 | 1,407 | 855 | 23,958 |
| 17 TRANSMISSION CREDIT PROJECTS (NET PLANT) | (314,486) | | (305,209) | (9,276) | | | | |
| 18 ACC REV BAL ADJ - Fiber | - | - | - | - | - | - | - | - |
| 19 ACC REV BAL ADJ - 3AC | (89,230) | | | (89,230) | | | | |
| 20 INVESTMENT BASE | 5,945,000 | 83,207 | 4,853,917 | 728,375 | 85,421 | 10,413 | 6,328 | 177,339 |

**TABLE 4-5
CALCULATION OF RETIREMENT RATIOS
(\$000s)**

| | A | B | C | D | E | F | G | H |
|---------------------------|--------------|--------|--------|--------|--------|---------|---------|----------------|
| <u>RETIREMENTS</u> | FERC Account | 2012 | 2013 | 2014 | 2015 | 2016 | Total | 5-Year Average |
| 1 STRUCTURES/IMPROVEMENTS | 352 | 1,132 | 289 | 329 | 519 | 2,786 | 5,054 | 1,011 |
| 2 STATION EQUIPMENT | 353 | 11,390 | 12,295 | 12,439 | 17,666 | 200,196 | 253,986 | 50,797 |
| 3 TOWERS & FIXTURES | 354 | 1,221 | 62 | 376 | 207 | 100 | 1,966 | 393 |
| 4 POLES & FIXTURES | 355 | 706 | 701 | 5,395 | 1,702 | 1,809 | 10,313 | 2,063 |
| 5 OVERHEAD CONDUCTOR | 356 | 1,001 | 457 | 3,512 | 1,871 | 436 | 7,278 | 1,456 |
| 6 UNDERGROUND CONDUCTOR | 358 | 0 | 0 | 7 | - | - | 7 | 1 |
| 7 ROADS & TRAILS | 359 | 0 | 6 | 0 | 6 | 0 | 12 | 2 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|--------------|----------------|----------------|----------------|----------------|----------------|------------------|--------------------------|------------------------------|---------------|---------------|----------------------|
| <u>ADDITIONS</u> | FERC Account | 2012 | 2013 | 2014 | 2015 | 2016 | Total | 5-Year Average Additions | Additions Net of Retirements | Weighted | Ratio (I/H) | Weighted Ratio (JxK) |
| 8 STRUCTURES/IMPROVEMENTS | 352 | 12,218 | 26,098 | 26,115 | 15,480 | 47,573 | 127,485 | 25,497 | 24,486 | 0.1134 | 0.9604 | 0.1089 |
| 9 STATION EQUIPMENT | 353 | 156,599 | 169,468 | 147,182 | 188,754 | 549,341 | 1,211,344 | 242,269 | 191,472 | 0.8866 | 0.7903 | 0.7007 |
| 10 STATION SUB-TOTAL (Lines 8+9) | | 168,817 | 195,565 | 173,297 | 204,234 | 596,914 | 1,338,829 | 267,766 | 215,958 | 1.0000 | 0.8065 | 0.8096 |
| 11 TOWERS & FIXTURES | 354 | 106,865 | 4,546 | 10,447 | 59,107 | 108,213 | 289,179 | 57,836 | 57,443 | 0.3752 | 0.9932 | 0.3727 |
| 12 POLES & FIXTURES | 355 | 16,255 | 13,061 | 28,434 | 11,328 | 36,463 | 105,541 | 21,108 | 19,046 | 0.1244 | 0.9023 | 0.1123 |
| 13 OVERHEAD CONDUCTOR | 356 | 72,871 | 7,035 | 15,061 | 40,571 | 106,929 | 242,467 | 48,493 | 47,038 | 0.3073 | 0.9700 | 0.2980 |
| 14 UNDERGROUND CONDUCTOR | 358 | - | 49 | - | 52 | 0 | 102 | 20 | 19 | 0.0001 | 0.9280 | 0.0001 |
| 15 ROADS & TRAILS | 359 | 28,411 | 24,632 | 11,234 | 9,550 | 73,898 | 147,726 | 29,545 | 29,543 | 0.1930 | 0.9999 | 0.1930 |
| 16 LINES SUB-TOTAL (Lines 11+12+13+14+15) | | 224,402 | 49,324 | 65,177 | 120,609 | 325,504 | 785,015 | 157,003 | 153,088 | 1.0000 | 0.9751 | 0.9760 |

Ratios of Additions Net of Retirements

| | |
|----------------|---------------|
| 17 Substations | 0.8096 |
| 18 Lines | 0.9760 |

TABLE 4-6
BPA TRANSMISSION PLANT INVESTMENT ADDITIONS
(\$000s)

| | E | F | G | H | | | I | | | J | | | K | | | L | | | M | N | O | P | | |
|---------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|------|-------|-----------|-------|------|-------|-----------|---|---|--|--|
| | TOTAL | | | | | | | | | | | | TOTAL | | | TOTAL | | | | | | | | |
| | 2017 | | | | | | | | | | | | 2018 | | | 2019 | | | | | | | | |
| | LINES | SUBS | OTHER | ADDITIONS | LINES | SUBS | OTHER | ADDITIONS | LINES | SUBS | OTHER | ADDITIONS | LINES | SUBS | OTHER | ADDITIONS | LINES | SUBS | OTHER | ADDITIONS | | | | |
| GROSS INVESTMENTS | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 GENERATION-INTEGRATION | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 2 NETWORK | 91,969 | 138,639 | 0 | 230,608 | 98,583 | 166,249 | 0 | 264,832 | 120,323 | 169,468 | 0 | 289,792 | | | | | | | | | | | | |
| 3 SOUTHERN INTERTIE | 57,338 | 9,130 | 0 | 66,468 | 1,921 | 8,774 | 0 | 10,695 | 1,901 | 20,123 | 0 | 22,024 | | | | | | | | | | | | |
| 4 EASTERN INTERTIE | 0 | 133 | 0 | 133 | 0 | 91 | 0 | 91 | 0 | 117 | 0 | 117 | | | | | | | | | | | | |
| 5 UTILITY DELIVERY | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| 6 DSI DELIVERY | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| 7 REGULATORY ASSET | 0 | 0 | 587 | 587 | 0 | 0 | 2,288 | 2,288 | 0 | 0 | 1,331 | 1,331 | | | | | | | | | | | | |
| 8 GENERAL PLANT | 0 | 0 | 165,897 | 165,897 | 0 | 0 | 147,811 | 147,811 | 0 | 0 | 168,045 | 168,045 | | | | | | | | | | | | |
| 9 TOTAL BPA | 149,307 | 147,903 | 166,485 | 463,694 | 100,504 | 175,113 | 150,099 | 425,717 | 122,225 | 189,708 | 169,376 | 481,309 | | | | | | | | | | | | |
| INVESTMENTS NET OF RETIREMENTS | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 GENERATION-INTEGRATION | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| 11 NETWORK | 89,766 | 112,243 | 0 | 202,009 | 96,222 | 134,596 | 0 | 230,818 | 117,441 | 137,202 | 0 | 254,644 | | | | | | | | | | | | |
| 12 SOUTHERN INTERTIE | 55,965 | 7,392 | 0 | 63,357 | 1,875 | 7,104 | 0 | 8,979 | 1,856 | 16,292 | 0 | 18,147 | | | | | | | | | | | | |
| 13 EASTERN INTERTIE | 0 | 108 | 0 | 108 | 0 | 73 | 0 | 73 | 0 | 95 | 0 | 95 | | | | | | | | | | | | |
| 14 UTILITY DELIVERY | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| 15 DSI DELIVERY | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| 16 REGULATORY ASSET | 0 | 0 | 587 | 587 | 0 | 0 | 2,288 | 2,288 | 0 | 0 | 1,331 | 1,331 | | | | | | | | | | | | |
| 17 GENERAL PLANT | 0 | 0 | 137,576 | 137,576 | 0 | 0 | 113,464 | 113,464 | 0 | 0 | 128,586 | 128,586 | | | | | | | | | | | | |
| 18 TOTAL BPA | 145,730 | 119,743 | 138,163 | 403,636 | 98,097 | 141,773 | 115,752 | 355,621 | 119,297 | 153,589 | 129,918 | 402,804 | | | | | | | | | | | | |

TABLE 4-7
AMORTIZATION OF BPA TRANSMISSION OTHER DEFERRED ASSETS
(\$000s)

SPACER DAMPERS
30-YEAR SERVICE LIFE

| | A | B | C | D | E | F | G | H | I | J |
|----|------------|--------------|--------------|--------------|--------------|------------|------------|------------|------------|-----------------|
| | | PARTIAL YEAR | FULL YEAR | ANNUAL | ACCUMULATED | CUMULATIVE | DEFERRED | NET | ORIGINAL | |
| FY | INVESTMENT | AMORTIZATION | AMORTIZATION | AMORTIZATION | AMORTIZATION | INVESTMENT | INVESTMENT | INVESTMENT | INVESTMENT | RETIREMENT |
| 1 | 2006 | 1,094 | 45 | 36 | | 0 | 1,094 | 5,696 | | 2,728 (1,634) |
| 2 | 2007 | 1,123 | 46 | 37 | | 0 | 2,216 | 5,200 | | 2,800 (1,677) |
| 3 | 2008 | 9,658 | 334 | 322 | | 0 | 11,875 | 11,875 | | 24,091 (14,433) |
| 4 | 2009 | 1,119 | 37 | 37 | | 0 | 12,993 | 12,993 | | 2,790 (1,671) |
| 5 | 2010 | 2,688 | 66 | 90 | | 0 | 15,681 | 15,681 | | 6,704 (4,016) |
| 6 | 2011 | 7,802 | 130 | 260 | | 1,630 | 23,483 | 21,853 | | 39,113 (23,431) |
| 7 | 2012 | 3,888 | 67 | 130 | 850 | 2,480 | 27,371 | 24,891 | | |
| 8 | 2013 | 718 | 25 | 24 | 937 | 3,417 | 28,089 | 24,671 | | |
| 9 | 2014 | 600 | 10 | 20 | 946 | 4,363 | 28,689 | 24,325 | | |
| 10 | 2015 | 4 | 0 | 0 | 956 | 5,320 | 28,692 | 23,373 | | |
| 11 | 2016 | 0 | 0 | 0 | 956 | 6,276 | 28,692 | 22,416 | | |
| 12 | 2017 | 0 | 0 | 0 | 956 | 7,233 | 28,692 | 21,460 | | |
| 13 | 2018 | 0 | 0 | 0 | 956 | 8,189 | 28,692 | 20,503 | | |
| 14 | 2019 | 0 | 0 | 0 | 956 | 9,145 | 28,692 | 19,547 | | |

FY 2008 investment = 9,617 plus total deferred investment from 2006 and 2007.
FY 2011: retirement of \$23,431 of impaired assets

TABLE 4-7
AMORTIZATION OF BPA TRANSMISSION OTHER DEFERRED ASSETS
(\$000s)

SPACER DAMPERS
25-YEAR SERVICE LIFE

| | A | B | C | D | E | F | G | H | |
|----|-------------------|---------------------|---------------------|---------------------|---------------------|-------------------|-------------------|-------------------|--------|
| | | PARTIAL YEAR | FULL YEAR | ANNUAL | ACCUMULATED | CUMULATIVE | DEFERRED | NET | |
| FY | <u>INVESTMENT</u> | <u>AMORTIZATION</u> | <u>AMORTIZATION</u> | <u>AMORTIZATION</u> | <u>AMORTIZATION</u> | <u>INVESTMENT</u> | <u>INVESTMENT</u> | <u>INVESTMENT</u> | |
| 15 | 2012 | 13,090 | 136 | 524 | 136 | 136 | 13,090 | 0 | 12,954 |
| 16 | 2013 | 9,592 | 132 | 384 | 656 | 792 | 22,682 | 0 | 21,890 |
| 17 | 2014 | 4,715 | 94 | 189 | 1,002 | 1,793 | 27,397 | 0 | 25,604 |
| 18 | 2015 | 399 | 8 | 16 | 1,104 | 2,897 | 27,796 | 0 | 24,899 |
| 19 | 2016 | 1,326 | 27 | 53 | 1,138 | 4,035 | 29,122 | 0 | 25,087 |
| 20 | 2017 | 587 | 12 | 23 | 1,177 | 5,212 | 29,710 | 0 | 24,497 |
| 21 | 2018 | 2,288 | 46 | 92 | 1,234 | 6,446 | 31,997 | 0 | 25,551 |
| 22 | 2019 | 1,331 | 27 | 53 | 1,307 | 7,753 | 33,329 | 0 | 25,576 |

**TABLE 4-8
DEPRECIATION OF CUSTOMER-FUNDED INVESTMENTS
(\$000s)**

LARGE GENERATOR INTERCONNECTION AGREEMENTS

| | A | B | C | D | E | F | G | H | I | J |
|----|-------------------|------------------------------|--------------------------------|--------------|--------------------|---------------------|--------------------|---------------------------------|--------------------|--------------|
| | IN-SERVICE | CUMULATIVE INVESTMENT | TOTAL ANNUAL INVESTMENT | LINES | SUBSTATIONS | DEPRECIATION | | ACCUMULATED DEPRECIATION | | |
| | | | | | | LINES | SUBSTATIONS | LINES | SUBSTATIONS | TOTAL |
| 1 | 2006 | 6,980 | 6,980 | 768 | 6,212 | 8 | 77 | 8 | 77 | 85 |
| 2 | 2007 | 33,827 | 26,847 | 2,953 | 23,894 | 49 | 453 | 57 | 530 | 586 |
| 3 | 2008 | 56,641 | 22,814 | 2,510 | 20,304 | 108 | 1,004 | 164 | 1,534 | 1,698 |
| 4 | 2009 | 128,460 | 71,819 | 7,900 | 63,919 | 220 | 2,054 | 384 | 3,588 | 3,972 |
| 5 | 2010 | 136,700 | 8,240 | 1,086 | 7,154 | 317 | 2,940 | 702 | 6,528 | 7,230 |
| 6 | 2011 | 194,898 | 58,198 | 3,446 | 54,752 | 366 | 3,712 | 1,068 | 10,241 | 11,309 |
| 7 | 2012 | 216,898 | 22,000 | 3,300 | 18,700 | 439 | 4,628 | 1,507 | 14,869 | 16,376 |
| 8 | 2013 | 265,102 | 48,204 | 7,299 | 40,905 | 554 | 5,371 | 2,061 | 20,240 | 22,301 |
| 9 | 2014 | 341,286 | 76,184 | 11,428 | 64,757 | 756 | 6,689 | 2,818 | 26,929 | 29,746 |
| 10 | 2015 | 347,001 | 5,715 | 857 | 4,858 | 921 | 6,606 | 3,739 | 33,535 | 37,273 |
| 11 | 2016 | 354,933 | 7,931 | 1,190 | 6,742 | 944 | 6,732 | 4,683 | 40,267 | 44,950 |
| 12 | 2017 | 354,837 | (96) | (14) | (82) | 957 | 6,805 | 5,640 | 47,072 | 52,712 |
| 13 | 2018 | 364,837 | 10,000 | 1,500 | 8,500 | 974 | 6,897 | 6,614 | 53,969 | 60,582 |
| 14 | 2019 | 374,837 | 10,000 | 1,500 | 8,500 | 1,007 | 7,082 | 7,621 | 61,051 | 68,672 |

CALIFORNIA-OREGON INTERTIE (COI)

| | IN-SERVICE | CUMULATIVE INVESTMENT | TOTAL ANNUAL INVESTMENT | LINES | SUBSTATIONS | DEPRECIATION | | ACCUMULATED DEPRECIATION | | |
|----|-------------------|------------------------------|--------------------------------|--------------|--------------------|---------------------|--------------------|---------------------------------|--------------------|--------------|
| | | | | | | LINES | SUBSTATIONS | LINES | SUBSTATIONS | TOTAL |
| 15 | 2012 | 11,238 | 11,238 | 0 | 11,238 | 0 | 140 | 0 | 140 | 140 |
| 16 | 2013 | 11,238 | 0 | 0 | 0 | 0 | 280 | 0 | 420 | 420 |
| 17 | 2014 | 11,238 | 0 | 0 | 0 | 0 | 280 | 0 | 701 | 701 |
| 18 | 2015 | 11,238 | 0 | 0 | 0 | 0 | 280 | 0 | 981 | 981 |
| 19 | 2016 | 11,238 | 0 | 0 | 0 | 0 | 280 | 0 | 1,261 | 1,261 |
| 20 | 2017 | 11,238 | 0 | 0 | 0 | 0 | 280 | 0 | 1,541 | 1,541 |
| 21 | 2018 | 11,238 | 0 | 0 | 0 | 0 | 280 | 0 | 1,822 | 1,822 |
| 22 | 2019 | 11,238 | 0 | 0 | 0 | 0 | 280 | 0 | 2,102 | 2,102 |

TABLE 4-9
BPA GENERAL PLANT CUMULATIVE INVESTMENT
(\$000s)

| | A | B | C | D | E | F | G | H | I |
|---|--------------|-----------------------|----------------------------|----------------------------|--------------------------|----------------------------|----------------------------|--------------------------|----------------------------|
| | FERC ACCT | DEPR ACCRL RATE | FY 2017 TOTAL INVEST | FY 2018 DEPR EXPENSE | FY 2018 ACCUM DEPR | FY 2018 TOTAL INVEST | FY 2019 DEPR EXPENSE | FY 2019 ACCUM DEPR | FY 2019 TOTAL INVEST |
| 1 LAND & LAND RIGHTS | 389 | 0.0642 | 25,436 | 2,040 | 2,856 | 38,109 | 2,843 | 5,699 | 50,456 |
| 2 STRUCTURES & IMPROVEMENTS | 390 | 0.0178 | 324,785 | 6,207 | 76,266 | 372,634 | 7,185 | 83,451 | 434,662 |
| 3 OFFICE FURNITURE & FIXTURES | 391.1 | 0.0527 | 1,245 | 53 | 1,245 | 1,245 | 0 | 1,245 | 1,245 |
| 4 DATA PROCESSING -EQUIPMENT | 391.2 | 0.1327 | 9,851 | 1,307 | 5,608 | 9,851 | 1,307 | 6,915 | 9,851 |
| 5 DATA PROCESSING -SOFTWARE | 391.3 | 0.1710 | 34,733 | 6,279 | 29,316 | 38,710 | 6,966 | 36,282 | 42,759 |
| 6 TRANSPORT EQUIPMENT | 392.1 | 0.0333 | 59,534 | 2,045 | 26,466 | 63,314 | 2,175 | 28,641 | 67,290 |
| 7 HELICOPTERS | 392.2 | 0.0332 | 9,234 | 307 | 3,907 | 9,234 | 307 | 4,214 | 9,234 |
| 8 AIRPLANES | 392.3 | 0.0630 | 8,656 | 545 | 5,714 | 8,656 | 545 | 6,259 | 8,656 |
| 9 STORES EQUIPMENT | 393 | 0.0391 | 3,729 | 146 | 654 | 3,729 | 146 | 800 | 3,729 |
| 10 TOOLS, SHOP & GARAGE EQUIPMENT | 394 | 0.0410 | 12,327 | 528 | 5,035 | 13,423 | 572 | 5,607 | 14,473 |
| 11 LAB EQUIPMENT | 395 | 0.0688 | 27,777 | 1,911 | 15,467 | 27,777 | 1,911 | 17,378 | 27,777 |
| 12 POWER OPERATED EQUIPMENT | 396 | 0.0540 | 28,928 | 1,562 | 17,305 | 28,928 | 1,562 | 18,867 | 28,928 |
| 13 COMMUNICATIONS EQUIPMENT | 397 | 0.0569 | 589,756 | 34,612 | 279,508 | 626,818 | 36,750 | 316,258 | 664,927 |
| 14 MISC EQUIPMENT | 398 | 0.0670 | 46,581 | 3,121 | 27,234 | 46,581 | 3,121 | 30,355 | 46,581 |
| 15 SUBTOTAL GENERAL PLANT | | | 1,182,572 | 60,663 | 496,582 | 1,289,008 | 65,390 | 561,972 | 1,410,568 |
| CORPORATE ASSIGNMENT | | | | | | | | | |
| 18 OFFICE FURNITURE & FIXTURES | 391.1 | 0.05270 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 19 DATA PROCESSING -EQUIPMENT | 391.2 | 0.13270 | 58,118 | 7,984 | 36,366 | 62,220 | 8,529 | 44,895 | 66,322 |
| 20 DATA PROCESSING -SOFTWARE | 391.3 | 0.17100 | 30,128 | 5,338 | 29,562 | 32,309 | 4,929 | 34,491 | 34,491 |
| 21 COMMUNICATIONS EQUIPMENT | 397 | 0.05690 | - | 0 | (14) | - | 0 | (14) | - |
| 22 MISC EQUIPMENT | 398 | 0.06700 | 20,732 | 1,414 | 8,964 | 21,476 | 1,464 | 10,428 | 22,219 |
| 23 SUBTOTAL CORPORATE ASSIGNMENT | | | 108,979 | 14,736 | 74,879 | 116,006 | 14,922 | 89,801 | 123,033 |
| 24 TOTAL GENERAL PLANT | | | 1,291,550 | 75,399 | 571,461 | 1,405,014 | 80,312 | 651,773 | 1,533,601 |

Removed Station Equipment (FERC 353) Line Item, now showing in Ancillary Services Table 4.11

TABLE 4-10
BPA TRANSMISSION GENERAL PLANT PROJECTED PLANT ADDITIONS
(\$000s)

| | A | B | C | D | |
|-----------------------------|-----------------------------------|----------------|----------------|----------------|----------------|
| | FERC ACCT | 2017 ADDTNS | 2018 ADDTNS | 2019 ADDTNS | |
| 1 | LAND & LAND RIGHTS | 389 | 25,436 | 12,673 | 12,347 |
| 2 | STRUCTURES & IMPROVEMENTS | 390 | 71,214 | 49,171 | 63,741 |
| 3 | OFFICE FURNITURE & FIXTURES | 391.1 | 0 | 0 | 0 |
| 4 | DATA PROCESSING -EQUIPMENT | 391.2 | 0 | 0 | 0 |
| 5 | DATA PROCESSING -SOFTWARE | 391.3 | 1,851 | 6,268 | 6,135 |
| 6 | TRANSPORT EQUIPMENT | 392.1 | 7,769 | 8,400 | 8,835 |
| 7 | HELICOPTERS | 392.2 | 0 | 4,388 | 8,590 |
| 8 | AIRPLANES | 392.3 | 0 | 0 | 0 |
| 9 | STORES EQUIPMENT | 393 | 0 | 0 | 0 |
| 10 | TOOLS, SHOP & GARAGE EQUIPMENT | 394 | 908 | 1,109 | 1,063 |
| 11 | LAB EQUIPMENT | 395 | 0 | 0 | 0 |
| 12 | POWER OPERATED EQUIPMENT | 396 | 0 | 0 | 0 |
| 13 | COMMUNICATIONS EQUIPMENT | 397 | 53,071 | 55,273 | 56,803 |
| 14 | METERING STATIONS | 353.03 | 47 | 0 | 0 |
| 15 | SUBTOTAL GENERAL PLANT | | 160,296 | 137,281 | 157,515 |
| 16 | STATION EQUIPMENT | 353 | 23,450 | 36,724 | 36,959 |
| 17 | TOTAL GENERAL PLANT | | 183,745 | 174,005 | 194,474 |
| | | A | B | C | D |
| CORPORATE ASSIGNMENT | | | | | |
| 18 | OFFICE FURNITURE & FIXTURES | 391.1 | 0 | 0 | 0 |
| 19 | DATA PROCESSING -EQUIPMENT | 391.2 | 3,425 | 6,500 | 6,500 |
| 20 | DATA PROCESSING -SOFTWARE | 391.3 | 2,177 | 3,250 | 3,250 |
| 21 | COMMUNICATIONS EQUIPMENT | 397 | 0 | 0 | 0 |
| 22 | MISC EQUIPMENT | 398 | 0 | 780 | 780 |
| 23 | TOTAL CORPORATE ASSIGNMENT | | 5,602 | 10,530 | 10,530 |

TABLE 4-11
ANCILLARY SERVICES
SCHEDULING, SYSTEM CONTROL, AND DISPATCH SERVICES
(\$000s)

| PLANT ADDITIONS | | A | B | C |
|------------------------|--------------|---------------|---------------|---------------|
| FERC ACCOUNT | | 2017 | 2018 | 2019 |
| 1 | 353 | 18,533 | 29,024 | 29,210 |
| 2 | 391.2 | 0 | 0 | 0 |
| 3 | 391.3 | 60 | 229 | 68 |
| 4 | 397 | 2,008 | 29 | 9 |
| 5 | Total | 20,601 | 29,283 | 29,287 |

| | | A | B | C | D | E | F | G | H |
|---------------------|--------------|--------------------------------|----------------------------------|------------------------------|--------------------------------|----------------------------------|------------------------------|--------------------------------|----------------------------------|
| FERC ACCOUNT | | DEPR ACCRL RATE | 2017 TOTAL INVEST | 2018 DEPR EXP | 2018 ACCUM DEPR | 2018 TOTAL INVEST | 2019 DEPR EXP | 2019 ACCUM DEPR | 2019 TOTAL INVEST |
| 6 | 353 | 0.02180 | 94,646 | 2,380 | 26,001 | 123,670 | 3,014 | 29,015 | 152,880 |
| 7 | 391.2 | 0.13270 | 27,994 | 3,715 | 15,939 | 27,994 | 3,715 | 19,654 | 27,994 |
| 8 | 391.3 | 0.17100 | 20,735 | 3,565 | 17,705 | 20,965 | 3,329 | 21,033 | 21,033 |
| 9 | 397 | 0.05690 | 62,880 | 3,579 | 30,336 | 62,909 | 3,580 | 33,916 | 62,918 |
| 10 | Total | | 206,255 | 13,239 | 89,982 | 235,538 | 13,638 | 103,619 | 264,825 |

| | | A | B | C | D | E | F |
|-------------------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|
| FERC ACCOUNT | | AVERAGE | | | AVERAGE | | |
| PLANT INVESTMENT | | 2017 | 2018 | 2018 | 2018 | 2019 | 2019 |
| 11 | 353 | 94,646 | 123,670 | 109,158 | 123,670 | 152,880 | 138,275 |
| 12 | 391.2 | 27,994 | 27,994 | 27,994 | 27,994 | 27,994 | 27,994 |
| 13 | 391.3 | 20,735 | 20,965 | 20,850 | 20,965 | 21,033 | 20,999 |
| 14 | 397 | 62,880 | 62,909 | 62,895 | 62,909 | 62,918 | 62,914 |
| 15 | Total | 206,255 | 235,538 | 220,897 | 235,538 | 264,825 | 250,181 |

| ACCUMULATED DEPRECIATION | | | | | | | |
|---------------------------------|--------------|---------------|---------------|---------------|---------------|----------------|---------------|
| 16 | 353 | 23,621 | 26,001 | 24,811 | 26,001 | 29,015 | 27,508 |
| 17 | 391.2 | 12,224 | 15,939 | 14,082 | 15,939 | 19,654 | 17,797 |
| 18 | 391.3 | 14,140 | 17,705 | 15,922 | 17,705 | 21,033 | 19,369 |
| 19 | 397 | 26,757 | 30,336 | 28,547 | 30,336 | 33,916 | 32,126 |
| 20 | Total | 76,743 | 89,982 | 83,362 | 89,982 | 103,619 | 96,800 |

| NET PLANT INVESTMENT | | | | | | | |
|-----------------------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 21 | 353 | 71,025 | 97,669 | 84,347 | 97,669 | 123,864 | 110,767 |
| 22 | 391.2 | 15,770 | 12,055 | 13,912 | 12,055 | 8,340 | 10,197 |
| 23 | 391.3 | 6,596 | 3,260 | 4,928 | 3,260 | 0 | 1,630 |
| 24 | 397 | 36,123 | 32,573 | 34,348 | 32,573 | 29,002 | 30,787 |
| 25 | Total | 129,513 | 145,556 | 137,535 | 145,556 | 161,206 | 153,381 |

5. PROJECTED CASH BALANCES/INTEREST CREDITS

5.1 Introduction

This chapter projects Transmission Services' cash balances for the rate period and estimates the interest income (credits) to be earned on BPA's projected cash balances and on annual funds to be returned to the U.S. Treasury.

5.2 Interest credits on BPA's projected cash balances

The beginning rate period cash balance was derived from BPA's business unit cash analysis for the end of FY 2016 and from current forecasts of transmission revenues, expenses, and cash flows for FY 2017. The annual incremental cash provided from forecast net revenues is added to the beginning cash balance for revenue requirements and the current and revised revenue tests. Reserves during the rate period are reduced by \$15 million each year for the funding of capital expenditures in lieu of U.S. Treasury borrowing. Using the existing interest earnings rate, annual interest income is calculated from projected average annual cash balances. The resulting interest income is applied as a credit against interest expense in the transmission revenue requirements and in the income statements of the current and revised revenue tests.

5.3 Interest credits on reserves not for risk

The projected interest earnings rate is multiplied by the reserves not for risk (RNFR) average cash balance for each year to determine the annual interest income. The resulting interest income is applied as a credit against interest expense in the transmission revenue requirement.

5.4 Interest income (repayment program calculation)

Separately, interest income rates listed in this chapter are calculated and used within the repayment program to calculate an interest credit based on the average cash necessary to pay the

interest, bond call premiums, and amortization payments calculated by the study for return to the U.S. Treasury in each study year. The repayment program assumes the cash accumulates at a uniform rate throughout the year, except for interest paid on bonds issued to the U.S. Treasury at mid-year. At the end of the year, the cash balance, together with the interest credit earned thereon, is used in the program for payment of interest expense, amortization of the Federal investment, and payment of bond premiums.

TABLE 5-1
INTEREST INCOME FROM PROJECTED CASH BALANCES
REVENUE REQUIREMENT DEVELOPMENT
(\$000s)

| | A | B |
|--|--------------------|--------------------|
| | <u>2018</u> | <u>2019</u> |
| 1 ANNUAL CASH SURPLUS/(DEFICIT) | - | - |
| 2 ADJUSTMENTS TO CASH | (15,000) | (15,000) |
| 3 SOY CASH BALANCE | 402,000 | 387,000 |
| 4 EOY CASH BALANCE | 387,000 | 372,000 |
| 5 AVERAGE CASH BALANCE | 394,500 | 379,500 |
| 6 INTEREST INCOME RATE | 0.45% | 0.66% |
| 7 INTEREST ON BPA FUND/INVESTMENTS (LN 5 X LN 6) | 1,759 | 2,516 |
| 8 REPAYMENT STUDY INTEREST INCOME | 223 | 959 |
| <u>INTEREST EARNED ON RESERVES NOT FOR RISK</u> | | |
| 9 SOY CASH BALANCE | 63,000 | 40,000 |
| 10 EOY CASH BALANCE | 40,000 | 40,000 |
| 11 AVERAGE CASH BALANCE | 51,500 | 40,000 |
| 12 INTEREST ON FUNDS HELD FOR OTHERS (LN 11 X LN 6) | 230 | 265 |
| 13 TRUSTEE INTEREST INCOME | 200 | 200 |
| 14 TOTAL ANNUAL INTEREST INCOME (LN 7+8+12+13) | 2,412 | 3,941 |

TABLE 5-2
INTEREST INCOME FROM PROJECTED CASH BALANCES
REVENUES FROM CURRENT RATES

(\$000s)

| | A | B |
|--|--------------------|--------------------|
| | <u>2018</u> | <u>2019</u> |
| 1 ANNUAL CASH SURPLUS/(DEFICIT) | 21,696 | 13,365 |
| 2 ADJUSTMENTS TO CASH | (15,000) | (15,000) |
| 3 SOY CASH BALANCE | 402,000 | 408,696 |
| 4 EOY CASH BALANCE | 408,696 | 407,060 |
| 5 AVERAGE CASH BALANCE | 405,348 | 407,878 |
| 6 INTEREST INCOME RATE | 0.45% | 0.66% |
| 7 INTEREST ON BPA FUND/INVESTMENTS (LN 5 X LN 6) | 1,808 | 2,704 |
| 8 REPAYMENT STUDY INTEREST INCOME | 223 | 959 |
| <u>INTEREST EARNED ON RESERVES NOT FOR RISK</u> | | |
| 9 SOY CASH BALANCE | 63,000 | 40,000 |
| 10 EOY CASH BALANCE | 40,000 | 40,000 |
| 11 AVERAGE CASH BALANCE | 51,500 | 40,000 |
| 12 INTEREST INCOME (LN 11 X LN 6) | 230 | 265 |
| 13 TRUSTEE INTEREST INCOME | 200 | 200 |
| 14 TOTAL ANNUAL INTEREST INCOME (LN 7+8+12+13) | 2,461 | 4,129 |

TABLE 5-3
INTEREST INCOME FROM PROJECTED CASH BALANCES
REVENUES FROM PROPOSED RATES
(\$000s)

| | A | B |
|--|--------------------|--------------------|
| | <u>2018</u> | <u>2019</u> |
| 1 ANNUAL CASH SURPLUS/(DEFICIT) | 8,022 | (942) |
| 2 ADJUSTMENTS TO CASH | (15,000) | (15,000) |
| 3 SOY CASH BALANCE | 402,000 | 395,022 |
| 4 EOY CASH BALANCE | 395,022 | 379,080 |
| 5 AVERAGE CASH BALANCE | 398,511 | 387,051 |
| 6 INTEREST INCOME RATE | 0.45% | 0.66% |
| 7 INTEREST ON BPA FUND/INVESTMENTS (LN 5 X LN 6) | 1,777 | 2,566 |
| 8 REPAYMENT STUDY INTEREST INCOME | 223 | 959 |
| <u>INTEREST EARNED ON RESERVES NOT FOR RISK</u> | | |
| 9 SOY CASH BALANCE | 63,000 | 40,000 |
| 10 EOY CASH BALANCE | 40,000 | 40,000 |
| 11 AVERAGE CASH BALANCE | 51,500 | 40,000 |
| 12 INTEREST INCOME (LN 11 X LN 6)** | 230 | 265 |
| 13 TRUSTEE INTEREST INCOME | 200 | 200 |
| 14 TOTAL ANNUAL INTEREST INCOME (LN 7+8+12+13) | 2,430 | 3,991 |

**Includes additional \$200k for trustee interest income from lease financing

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6. INTEREST RATES AND PRICE DEFLATORS

6.1 Introduction

Interest rates on bonds issued by BPA to the U.S. Treasury are used in development of repayment studies and projections of Federal interest expense in revenue requirements.

6.2 Source of Forecasts

To project interest rates on bonds issued to the U.S. Treasury, BPA uses U.S. Treasury yield curve forecasts provided by the IHS Global Insights Group (GI). GI is also the source of price deflators that BPA treats as escalators for purposes of developing spending levels. GI develops the price deflators taking into account projections of Gross Domestic Product (GDP). The GDP consists of the sum of consumption, investment, government purchases, and net exports, excluding transfers to foreigners.

6.3 Interest Rate Projections

Projected interest rates for BPA bonds issued to the U.S. Treasury are based on GI's yield curve projections of U.S. Treasury market rates, plus an average markup of up to 56 basis points, depending on the length of time to maturity. The markup estimate reflects an interagency agreement that the U.S. Treasury will price BPA bonds at a level comparable to the price for securities (bonds) issued by U.S. government corporations. The markup estimate reflects the average basis point markup on recent intermediate and long-term bonds issued by BPA.

6.4 Deflators

The current and cumulative price deflators used to escalate midyear dollars are derived from the fiscal and calendar year price deflators provided by GI. They are calculated as follows:

$$[(FY_1/100) \times 0.5] + 1 = \text{Cumulative Price Deflator}_1$$

Thus, the fiscal year GDP price deflator for the current year is divided by one hundred and multiplied by one-half. The result, when added to one, yields the cumulative price deflator for the first year.

$$[1 + (FY_t/100)] \times \text{Cumulative Price Deflator}_{t-1} = \text{Cumulative Price Deflator}_t, \text{ when } t > 1$$

Thus, the fiscal year GDP price deflator for a future year is divided by one hundred and added to one. The result, when multiplied by the cumulative price deflator from the previous year, yields the cumulative price deflator for each successive year.

When deflators are used in developing the FY 2018–2019 spending levels, they are based on the price deflators from the August 2016 GI Base Case forecast.

memorandum

DATE: 11/30/2016

REPLY TO
ATTN OF: FTC-2

SUBJECT: FY 2017 Interest Rate and Inflation Forecast

TO: See Attached "cc:" List

Please see the attached BPA interest rate and inflation forecast for the period FY 2017 through 2046.

These forecasts provide an internally consistent basis for BPA decisions regarding debt management, budget formulation and other financial analyses, as well as capital budgeting and strategic planning efforts. The FY 2017 forecast is summarized in the following tables:

- Table 1: 30 Year Treasury Yields and BPA Borrowing Rates
- Table 2: Forecast Comparison – 30 Year BPA Borrowing Rates – Callable at Par
- Table 3: 20 Year Treasury Yields and BPA Borrowing Rates
- Table 4: 15 Year Treasury Yields and BPA Borrowing Rates
- Table 5: BPA FY 2017 Appropriation Borrowing Rates
- Table 6: BPA FY 2017 BPA Borrowing Rates – No Premium
- Table 7: BPA FY 2017 BPA Borrowing Rates – Coupon Scale-Down
- Table 8: BPA FY 2017 BPA Borrowing Rates – Callable at Par
- Table 9: BPA FY 2017 Third-Party Taxable Borrowing Rates
- Table 10: BPA FY 2017 Third-Party Tax-Exempt Borrowing Rates
- Table 11: BPA FY 2017 FERC Borrowing Rates (Bank Prime)
- Table 12: BPA FY 2017 May 3 Month LIBOR Rates
- Table 13: Comparison of FY 2017 Inflation Forecast Components

Borrowing Rate Forecast Methodology

The FY 2017 forecast is based on the Global Insight (GI) Third Quarter August 2016 Long-Term Economic Outlook.

Tables 1, 3, and 4 illustrate the components of BPA's Treasury borrowing rate forecasts. GI calendar year (CY) projections of 30 Year Treasury bond yields are shown in Column A. BPA fiscal year (FY) projections are shown in Column B. Column C, D, and E reflect BPA's Treasury borrowing rate options.

BPA borrowing rates from the U.S. Treasury reflect a mark-up over the Treasury yield curve. Table 6 is the Government Agency borrowing rate and reflects the rate BPA would borrow at without a call premium. The other two rates {Table 7 and Table 8} reflect the two additional borrowing options BPA can exercise with Treasury: callable at par and coupon-scale down. A callable at par call option allows BPA to redeem the

bond before maturity without paying a call premium at the time of the call. The cost of this call option results in a mark-up to the coupon rate, resulting in higher interest expense paid over the life of the bond. With a coupon scale down call option the call premium is determined at the time of bond issuance for each option call date over the bond's term; this call premium is only paid if the bond is called. In addition to paying a call premium at the time the bond is called, there is also a mark-up to the coupon rate for the coupon scale down option. The premium for these two call options are calculated using historical spread premiums.

Table Descriptions

Tables 1, 3, and 4: Shows the steps involved to arrive at the BPA borrowing rate.

Table 2: Compares the current forecast of the BPA Borrowing Rate - Callable at Par to the FY 2016 forecast.

Table 5: Forecasts a rate equivalent to the Treasury yield curve.

Table 6: Forecasts the rate at which Bonneville would borrow from the U.S. Treasury for a bullet bond with no call option.

Table 7: Forecasts the rate at which Bonneville would borrow from the U.S. Treasury for a bullet bond with a coupon scale-down call option.

Table 8: Forecasts the rate at which Bonneville would borrow from the U.S. Treasury for a bullet bond with a callable at par call option.

Table 9: Forecasts the rate at which Bonneville would back third-party bonds on a taxable basis, as with the Lease Purchase Program.

Table 10: Forecasts the rate at which Bonneville would back third-party bonds on a tax-exempt basis, as with Bonneville-backed Energy Northwest bonds.

Table 11: Forecasts the Prime rate, the rate at which banks charge interest for their most creditworthy customers.

Table 12: Forecasts the 3 Month LIBOR rate, the rate charged by London banks, used as a benchmark rate worldwide.

Table 13: Forecasts the projected change in the Gross Domestic Product (GDP) price deflator and compares to the FY 2016 inflation forecast. The table also forecasts future inflation rates.

Inflation Forecast

BPA inflation assumptions reflect projected changes in the U.S. GDP Price Deflator. The GDP Price Deflator is the broadest measure of inflation in the U.S. economy. GDP reflects the value of all goods and services produced by domestic and foreign capital and labor within the United States. Major components of GDP include: total consumption, investment, government purchases, and net exports. The real GDP calculations reflect both the changing mix of the components in GDP and the relative price changes in these components.

This index assumes a base year of 2009. The projected change in the GDP price deflator and comparison with the FY 2016 inflation forecast is summarized in Table 13. Column A shows the projected trend in GDP inflation rates between 2017-2046 on a calendar year basis and in column B by BPA fiscal year. Column C provides the cumulative price index projections. The forecast expresses fiscal year dollar values as mid-year dollar values.

If you have questions, or suggestions concerning the FY 2017 Interest Rate and Inflation Forecasts, please contact Bill Hendricks at (503) 230-5389.

A handwritten signature in black ink, appearing to be 'BH' with a long horizontal stroke extending to the right.

Bill Hendricks
Financial Analyst, Debt and Investment Management
Attachment

cc:

See Front List

Official File –

<http://internal.bpa.gov/finance/FT/FTC/Common%20Agency%20Assumptions/Forms/AllItems.aspx>

Table 1
30 Year Treasury Yields and BPA Borrowing Rates
 FY 2017 Forecast of BPA Borrowing Rates

Calendar/Fiscal Years 2017-2046

| <u>Year</u> | <u>A</u> Appropriation Rate 1/ <u>Calendar Year</u> | <u>B</u> Appropriation Rate 2/ <u>Fiscal Year</u> | <u>C</u> BPA Rate 3/ No Premium <u>Fiscal Year</u> | <u>D</u> BPA Rate 4/ Coupon Scale-Down <u>Fiscal Year</u> | <u>E</u> BPA Rate 5/ Callable at Par <u>Fiscal Year</u> |
|-------------|--|--|---|--|--|
| 2016 | 3.45 | | | | |
| 2017 | 2.94 | 2.38 | 2.93 | 3.92 | 4.09 |
| 2018 | 3.44 | 3.32 | 3.87 | 5.00 | 5.17 |
| 2019 | 4.01 | 3.87 | 4.43 | 5.69 | 5.86 |
| 2020 | 4.22 | 4.17 | 4.74 | 5.89 | 6.10 |
| 2021 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2022 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2023 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2024 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2025 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2026 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2027 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2028 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2029 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2030 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2031 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2032 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2033 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2034 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2035 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2036 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2037 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2038 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2039 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2040 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2041 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2042 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2043 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2044 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2045 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |
| 2046 | 4.22 | 4.22 | 4.79 | 5.94 | 6.16 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

2/ FY 2017 Appropriation rates are determined in accordance with BPA Appropriations Refinancing Act, 16 U.S.C. 8381 enacted on April 26, 1996, and are independent of the Global Insight Treasury Yield forecasts.

3/ Column C = Column B + U.S. Treasury borrowing markup, no premium.

4/ Column D = Column B + U.S. Treasury borrowing markup + Coupon Scale-Down premium.

5/ Column E = Column B + U.S. Treasury borrowing markup + Callable at Par premium.

Table 2
Forecast Comparison - 30 Year BPA Borrowing Rates - Callable at Par
 BPA FY 2017 vs. BPA FY 2016

Fiscal Years 2017-2046

| <u>Year</u> | A FY 2017 Forecast BPA Rate 1/ <u>Callable at Par</u> | B FY 2016 Forecast BPA Rate 2/ <u>Callable at Par</u> | C Difference <u>(A-B)</u> |
|-------------|--|--|---------------------------------|
| 2017 | 4.09 | 5.86 | -1.78 |
| 2018 | 5.17 | 6.11 | -0.94 |
| 2019 | 5.86 | 6.16 | -0.30 |
| 2020 | 6.10 | 6.17 | -0.07 |
| 2021 | 6.16 | 6.17 | -0.02 |
| 2022 | 6.16 | 6.17 | -0.02 |
| 2023 | 6.16 | 6.17 | -0.02 |
| 2024 | 6.16 | 6.17 | -0.02 |
| 2025 | 6.16 | 6.17 | -0.02 |
| 2026 | 6.16 | 6.17 | -0.02 |
| 2027 | 6.16 | 6.17 | -0.02 |
| 2028 | 6.16 | 6.17 | -0.02 |
| 2029 | 6.16 | 6.17 | -0.02 |
| 2030 | 6.16 | 6.17 | -0.02 |
| 2031 | 6.16 | 6.17 | -0.02 |
| 2032 | 6.16 | 6.17 | -0.02 |
| 2033 | 6.16 | 6.17 | -0.02 |
| 2034 | 6.16 | 6.17 | -0.02 |
| 2035 | 6.16 | 6.17 | -0.02 |
| 2036 | 6.16 | 6.17 | -0.02 |
| 2037 | 6.16 | 6.17 | -0.02 |
| 2038 | 6.16 | 6.17 | -0.02 |
| 2039 | 6.16 | 6.17 | -0.02 |
| 2040 | 6.16 | 6.17 | -0.02 |
| 2041 | 6.16 | 6.17 | -0.02 |
| 2042 | 6.16 | 6.17 | -0.02 |
| 2043 | 6.16 | 6.17 | -0.02 |
| 2044 | 6.16 | 6.17 | -0.02 |
| 2045 | 6.16 | 6.17 | -0.02 |
| 2046 | 6.16 | 6.17 | -0.02 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

2/ Global Insight: The U.S. Economy: 30 Year Focus, August 2015 Forecast, Base Case.

Table 3
20 Year Treasury Yields and BPA Borrowing Rates
 FY 2017 Forecast of BPA Borrowing Rates

Fiscal Years 2017-2046

| <u>Year</u> | <u>A</u> Appropriation Rate 1/ Calendar Year | <u>B</u> Appropriation Rate 2/ Fiscal Year | <u>C</u> BPA Rate 3/ No Premium Fiscal Year | <u>D</u> BPA Rate 4/ Coupon Scale-Down Fiscal Year | <u>E</u> BPA Rate 5/ Callable at Par Fiscal Year |
|-------------|---|---|--|---|---|
| 2016 | 3.12 | | | | |
| 2017 | 2.61 | 2.00 | 2.43 | 3.15 | 3.30 |
| 2018 | 3.16 | 3.02 | 3.46 | 4.31 | 4.46 |
| 2019 | 3.78 | 3.62 | 4.07 | 5.06 | 5.21 |
| 2020 | 4.00 | 3.94 | 4.40 | 5.37 | 5.57 |
| 2021 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2022 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2023 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2024 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2025 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2026 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2027 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2028 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2029 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2030 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2031 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2032 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2033 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2034 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2035 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2036 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2037 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2038 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2039 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2040 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2041 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2042 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2043 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2044 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2045 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |
| 2046 | 4.00 | 4.00 | 4.45 | 5.42 | 5.63 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

2/ FY 2017 Appropriation rates are determined in accordance with BPA Appropriations Refinancing Act, 16 U.S.C. 8381 enacted on April 26, 1996, and are independent of the Global Insight Treasury Yield forecasts.

3/ Column C = Column B + U.S. Treasury borrowing markup, no premium.

4/ Column D = Column B + U.S. Treasury borrowing markup + Coupon Scale-Down premium.

5/ Column E = Column B + U.S. Treasury borrowing markup + Callable at Par premium.

Table 4
15 Year Treasury Yields and BPA Borrowing Rates
 FY 2017 Forecast of BPA Borrowing Rates

Fiscal Years 2017-2046

| <u>Year</u> | <u>A</u> Appropriation Rate 1/ Calendar Year | <u>B</u> Appropriation Rate 2/ Fiscal Year | <u>C</u> BPA Rate 3/ No Premium Fiscal Year | <u>D</u> BPA Rate 4/ Coupon Scale-Down Fiscal Year | <u>E</u> BPA Rate 5/ Callable at Par Fiscal Year |
|-------------|---|---|--|---|---|
| 2016 | 2.95 | | | | |
| 2017 | 2.44 | 1.86 | 2.18 | 2.77 | 2.90 |
| 2018 | 3.02 | 2.87 | 3.25 | 3.97 | 4.11 |
| 2019 | 3.66 | 3.50 | 3.89 | 4.74 | 4.88 |
| 2020 | 3.89 | 3.83 | 4.23 | 5.11 | 5.31 |
| 2021 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2022 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2023 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2024 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2025 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2026 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2027 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2028 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2029 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2030 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2031 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2032 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2033 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2034 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2035 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2036 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2037 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2038 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2039 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2040 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2041 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2042 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2043 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2044 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2045 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |
| 2046 | 3.89 | 3.89 | 4.28 | 5.17 | 5.36 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

2/ FY 2017 Appropriation rates are determined in accordance with BPA Appropriations Refinancing Act, 16 U.S.C. 8381 enacted on April 26, 1996, and are independent of the Global Insight Treasury Yield forecasts.

3/ Column C = Column B + U.S. Treasury borrowing markup, no premium.

4/ Column D = Column B + U.S. Treasury borrowing markup + Coupon Scale-Down premium.

5/ Column E = Column B + U.S. Treasury borrowing markup + Callable at Par premium.

Table 5
BPA FY 2017 Appropriation Borrowing Rates 1/

Fiscal Years 2017-2046
 (continued on next page)

| | <u>Maturity</u> | | | | | | | | | | | | | | |
|-------------|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <u>Year</u> | <u>1 Year</u> | <u>2 Year</u> | <u>3 Year</u> | <u>4 Year</u> | <u>5 Year</u> | <u>6 Year</u> | <u>7 Year</u> | <u>8 Year</u> | <u>9 Year</u> | <u>10 Year</u> | <u>11 Year</u> | <u>12 Year</u> | <u>13 Year</u> | <u>14 Year</u> | <u>15 Year</u> |
| 2017 | 0.69 | 0.84 | 0.97 | 1.10 | 1.26 | 1.40 | 1.50 | 1.59 | 1.63 | 1.63 | 1.67 | 1.75 | 1.75 | 1.75 | 1.86 |
| 2018 | 1.78 | 1.91 | 2.04 | 2.17 | 2.29 | 2.38 | 2.47 | 2.55 | 2.64 | 2.73 | 2.76 | 2.79 | 2.82 | 2.85 | 2.87 |
| 2019 | 2.65 | 2.73 | 2.82 | 2.91 | 3.00 | 3.08 | 3.15 | 3.23 | 3.30 | 3.38 | 3.40 | 3.43 | 3.45 | 3.48 | 3.50 |
| 2020 | 3.09 | 3.13 | 3.22 | 3.31 | 3.40 | 3.47 | 3.53 | 3.59 | 3.66 | 3.72 | 3.74 | 3.76 | 3.79 | 3.81 | 3.83 |
| 2021 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2022 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2023 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2024 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2025 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2026 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2027 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2028 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2029 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2030 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2031 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2032 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2033 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2034 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2035 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2036 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2037 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2038 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2039 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2040 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2041 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2042 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2043 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2044 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2045 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |
| 2046 | 3.16 | 3.19 | 3.28 | 3.38 | 3.48 | 3.54 | 3.60 | 3.66 | 3.72 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 | 3.89 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

2/ FY 2017 Appropriation rates are determined in accordance with BPA Appropriations Refinancing Act, 16 U.S.C. 8381 enacted on April 26, 1996, and are independent of the Global Insight Treasury Yield Forecasts.

Table 5
BPA FY 2017 Appropriation Borrowing Rates 1/

Fiscal Years 2017-2046

| <u>Maturity</u> | | | | | | | | | | | | | | | | |
|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|
| <u>16 Year</u> | <u>17 Year</u> | <u>18 Year</u> | <u>19 Year</u> | <u>20 Year</u> | <u>21 Year</u> | <u>22 Year</u> | <u>23 Year</u> | <u>24 Year</u> | <u>25 Year</u> | <u>26 Year</u> | <u>27 Year</u> | <u>28 Year</u> | <u>29 Year</u> | <u>30 Year</u> | <u>50 Year</u> | <u>Year</u> |
| 1.88 | 1.88 | 1.93 | 2.00 | 2.00 | 2.01 | 2.13 | 2.13 | 2.18 | 2.25 | 2.25 | 2.25 | 2.32 | 2.38 | 2.38 | 2.38 | 2017 |
| 2.90 | 2.93 | 2.96 | 2.99 | 3.02 | 3.05 | 3.08 | 3.11 | 3.14 | 3.17 | 3.20 | 3.23 | 3.26 | 3.29 | 3.32 | 3.32 | 2018 |
| 3.52 | 3.55 | 3.57 | 3.60 | 3.62 | 3.65 | 3.67 | 3.70 | 3.72 | 3.74 | 3.77 | 3.79 | 3.82 | 3.84 | 3.87 | 3.87 | 2019 |
| 3.85 | 3.88 | 3.90 | 3.92 | 3.94 | 3.97 | 3.99 | 4.01 | 4.03 | 4.06 | 4.08 | 4.10 | 4.12 | 4.15 | 4.17 | 4.17 | 2020 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2021 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2022 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2023 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2024 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2025 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2026 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2027 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2028 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2029 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2030 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2031 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2032 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2033 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2034 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2035 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2036 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2037 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2038 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2039 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2040 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2041 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2042 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2043 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2044 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2045 |
| 3.91 | 3.93 | 3.96 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.20 | 4.22 | 4.22 | 2046 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

2/ FY 2017 Appropriation rates are determined in accordance with BPA Appropriations Refinancing Act, 16 U.S.C. 8381 enacted on April 26, 1996, and are independent of the Global Insight Treasury Yield Forecasts.

Table 6
BPA FY 2017 BPA Borrowing Rates - No Premium 1/

Fiscal Years 2017-2046
 (continued on next page)

| <u>Maturity</u> | | | | | | | | | | | | | | | |
|------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <u>Year</u> | <u>1 Year</u> | <u>2 Year</u> | <u>3 Year</u> | <u>4 Year</u> | <u>5 Year</u> | <u>6 Year</u> | <u>7 Year</u> | <u>8 Year</u> | <u>9 Year</u> | <u>10 Year</u> | <u>11 Year</u> | <u>12 Year</u> | <u>13 Year</u> | <u>14 Year</u> | <u>15 Year</u> |
| 2017 | 0.75 | 0.92 | 1.08 | 1.24 | 1.40 | 1.51 | 1.61 | 1.72 | 1.83 | 1.93 | 1.98 | 2.03 | 2.08 | 2.13 | 2.18 |
| 2018 | 1.85 | 2.00 | 2.15 | 2.29 | 2.44 | 2.56 | 2.68 | 2.80 | 2.92 | 3.04 | 3.09 | 3.13 | 3.17 | 3.21 | 3.25 |
| 2019 | 2.72 | 2.83 | 2.94 | 3.05 | 3.16 | 3.27 | 3.38 | 3.49 | 3.59 | 3.70 | 3.74 | 3.78 | 3.81 | 3.85 | 3.89 |
| 2020 | 3.16 | 3.24 | 3.35 | 3.46 | 3.57 | 3.67 | 3.76 | 3.86 | 3.96 | 4.06 | 4.09 | 4.13 | 4.16 | 4.19 | 4.23 |
| 2021 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2022 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2023 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2024 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2025 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2026 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2027 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2028 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2029 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2030 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2031 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2032 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2033 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2034 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2035 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2036 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2037 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2038 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2039 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2040 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2041 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2042 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2043 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2044 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2045 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |
| 2046 | 3.23 | 3.30 | 3.41 | 3.53 | 3.64 | 3.74 | 3.83 | 3.93 | 4.02 | 4.12 | 4.15 | 4.18 | 4.22 | 4.25 | 4.28 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

Table 6
BPA FY 2017 BPA Borrowing Rates - No Premium 1/

Fiscal Years 2017-2046

Maturity

| <u>16 Year</u> | <u>17 Year</u> | <u>18 Year</u> | <u>19 Year</u> | <u>20 Year</u> | <u>21 Year</u> | <u>22 Year</u> | <u>23 Year</u> | <u>24 Year</u> | <u>25 Year</u> | <u>26 Year</u> | <u>27 Year</u> | <u>28 Year</u> | <u>29 Year</u> | <u>30 Year</u> | <u>50 Year</u> | <u>Year</u> |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|
| 2.23 | 2.28 | 2.33 | 2.38 | 2.43 | 2.48 | 2.53 | 2.58 | 2.63 | 2.68 | 2.73 | 2.78 | 2.83 | 2.88 | 2.93 | 2.93 | 2017 |
| 3.29 | 3.33 | 3.38 | 3.42 | 3.46 | 3.50 | 3.54 | 3.58 | 3.62 | 3.67 | 3.71 | 3.75 | 3.79 | 3.83 | 3.87 | 3.87 | 2018 |
| 3.92 | 3.96 | 3.99 | 4.03 | 4.07 | 4.10 | 4.14 | 4.18 | 4.21 | 4.25 | 4.28 | 4.32 | 4.36 | 4.39 | 4.43 | 4.43 | 2019 |
| 4.26 | 4.30 | 4.33 | 4.36 | 4.40 | 4.43 | 4.46 | 4.50 | 4.53 | 4.57 | 4.60 | 4.63 | 4.67 | 4.70 | 4.74 | 4.74 | 2020 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2021 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2022 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2023 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2024 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2025 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2026 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2027 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2028 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2029 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2030 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2031 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2032 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2033 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2034 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2035 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2036 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2037 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2038 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2039 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2040 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2041 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2042 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2043 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2044 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2045 |
| 4.32 | 4.35 | 4.39 | 4.42 | 4.45 | 4.49 | 4.52 | 4.55 | 4.59 | 4.62 | 4.65 | 4.69 | 4.72 | 4.76 | 4.79 | 4.79 | 2046 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

Table 7
BPA FY 2017 BPA Borrowing Rates - Coupon Scale-Down 1/

Fiscal Years 2017-2046
 (continued on next page)

| <u>Maturity</u> | | | | | | | | | | | | | | | |
|------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <u>Year</u> | <u>1 Year</u> | <u>2 Year</u> | <u>3 Year</u> | <u>4 Year</u> | <u>5 Year</u> | <u>6 Year</u> | <u>7 Year</u> | <u>8 Year</u> | <u>9 Year</u> | <u>10 Year</u> | <u>11 Year</u> | <u>12 Year</u> | <u>13 Year</u> | <u>14 Year</u> | <u>15 Year</u> |
| 2017 | 0.80 | 1.01 | 1.21 | 1.42 | 1.63 | 1.78 | 1.93 | 2.08 | 2.23 | 2.38 | 2.46 | 2.54 | 2.61 | 2.69 | 2.77 |
| 2018 | 1.91 | 2.12 | 2.32 | 2.53 | 2.73 | 2.91 | 3.09 | 3.27 | 3.45 | 3.63 | 3.70 | 3.77 | 3.84 | 3.90 | 3.97 |
| 2019 | 2.79 | 2.97 | 3.16 | 3.34 | 3.52 | 3.70 | 3.88 | 4.06 | 4.24 | 4.43 | 4.49 | 4.55 | 4.62 | 4.68 | 4.74 |
| 2020 | 3.24 | 3.40 | 3.59 | 3.78 | 3.97 | 4.14 | 4.32 | 4.50 | 4.67 | 4.85 | 4.90 | 4.95 | 5.01 | 5.06 | 5.11 |
| 2021 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2022 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2023 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2024 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2025 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2026 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2027 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2028 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2029 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2030 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2031 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2032 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2033 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2034 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2035 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2036 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2037 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2038 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2039 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2040 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2041 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2042 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2043 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2044 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2045 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |
| 2046 | 3.31 | 3.46 | 3.65 | 3.84 | 4.04 | 4.21 | 4.39 | 4.56 | 4.74 | 4.91 | 4.96 | 5.01 | 5.06 | 5.12 | 5.17 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

Table 7
BPA FY 2017 BPA Borrowing Rates - Coupon Scale-Down 1/

Fiscal Years 2017-2046

Maturity

| <u>16 Year</u> | <u>17 Year</u> | <u>18 Year</u> | <u>19 Year</u> | <u>20 Year</u> | <u>21 Year</u> | <u>22 Year</u> | <u>23 Year</u> | <u>24 Year</u> | <u>25 Year</u> | <u>26 Year</u> | <u>27 Year</u> | <u>28 Year</u> | <u>29 Year</u> | <u>30 Year</u> | <u>50 Year</u> | <u>Year</u> |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|
| 2.84 | 2.92 | 3.00 | 3.07 | 3.15 | 3.23 | 3.30 | 3.38 | 3.46 | 3.53 | 3.61 | 3.69 | 3.76 | 3.84 | 3.92 | 3.92 | 2017 |
| 4.04 | 4.11 | 4.18 | 4.25 | 4.31 | 4.38 | 4.45 | 4.52 | 4.59 | 4.65 | 4.72 | 4.79 | 4.86 | 4.93 | 5.00 | 5.00 | 2018 |
| 4.80 | 4.87 | 4.93 | 4.99 | 5.06 | 5.12 | 5.18 | 5.25 | 5.31 | 5.37 | 5.44 | 5.50 | 5.56 | 5.62 | 5.69 | 5.69 | 2019 |
| 5.16 | 5.21 | 5.26 | 5.32 | 5.37 | 5.42 | 5.47 | 5.52 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.83 | 5.89 | 5.89 | 2020 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2021 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2022 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2023 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2024 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2025 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2026 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2027 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2028 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2029 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2030 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2031 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2032 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2033 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2034 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2035 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2036 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2037 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2038 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2039 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2040 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2041 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2042 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2043 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2044 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2045 |
| 5.22 | 5.27 | 5.32 | 5.37 | 5.42 | 5.48 | 5.53 | 5.58 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 5.94 | 2046 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

Table 8
BPA FY 2017 BPA Borrowing Rates - Callable at Par 1/

Fiscal Years 2017-2046
 (continued on next page)

Maturity

| <u>Year</u> | <u>1 Year</u> | <u>2 Year</u> | <u>3 Year</u> | <u>4 Year</u> | <u>5 Year</u> | <u>6 Year</u> | <u>7 Year</u> | <u>8 Year</u> | <u>9 Year</u> | <u>10 Year</u> | <u>11 Year</u> | <u>12 Year</u> | <u>13 Year</u> | <u>14 Year</u> | <u>15 Year</u> |
|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 2017 | 0.81 | 1.03 | 1.25 | 1.47 | 1.69 | 1.85 | 2.02 | 2.18 | 2.35 | 2.51 | 2.59 | 2.67 | 2.75 | 2.83 | 2.90 |
| 2018 | 1.92 | 2.14 | 2.36 | 2.58 | 2.80 | 2.99 | 3.18 | 3.37 | 3.56 | 3.76 | 3.83 | 3.90 | 3.97 | 4.04 | 4.11 |
| 2019 | 2.81 | 3.00 | 3.19 | 3.39 | 3.58 | 3.77 | 3.97 | 4.16 | 4.36 | 4.55 | 4.62 | 4.68 | 4.75 | 4.81 | 4.88 |
| 2020 | 3.26 | 3.43 | 3.64 | 3.85 | 4.06 | 4.26 | 4.45 | 4.65 | 4.84 | 5.04 | 5.09 | 5.15 | 5.20 | 5.25 | 5.31 |
| 2021 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2022 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2023 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2024 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2025 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2026 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2027 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2028 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2029 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2030 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2031 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2032 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2033 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2034 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2035 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2036 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2037 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2038 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2039 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2040 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2041 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2042 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2043 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2044 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2045 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |
| 2046 | 3.33 | 3.50 | 3.71 | 3.92 | 4.13 | 4.33 | 4.52 | 4.71 | 4.90 | 5.10 | 5.15 | 5.20 | 5.26 | 5.31 | 5.36 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

Table 8
BPA FY 2017 BPA Borrowing Rates - Callable at Par 1/

Fiscal Years 2017-2046

Maturity

| <u>16 Year</u> | <u>17 Year</u> | <u>18 Year</u> | <u>19 Year</u> | <u>20 Year</u> | <u>21 Year</u> | <u>22 Year</u> | <u>23 Year</u> | <u>24 Year</u> | <u>25 Year</u> | <u>26 Year</u> | <u>27 Year</u> | <u>28 Year</u> | <u>29 Year</u> | <u>30 Year</u> | <u>50 Year</u> | <u>Year</u> |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|
| 2.98 | 3.06 | 3.14 | 3.22 | 3.30 | 3.38 | 3.46 | 3.54 | 3.61 | 3.69 | 3.77 | 3.85 | 3.93 | 4.01 | 4.09 | 4.09 | 2017 |
| 4.18 | 4.25 | 4.32 | 4.39 | 4.46 | 4.53 | 4.60 | 4.67 | 4.74 | 4.82 | 4.89 | 4.96 | 5.03 | 5.10 | 5.17 | 5.17 | 2018 |
| 4.94 | 5.01 | 5.07 | 5.14 | 5.21 | 5.27 | 5.34 | 5.40 | 5.47 | 5.53 | 5.60 | 5.66 | 5.73 | 5.79 | 5.86 | 5.86 | 2019 |
| 5.36 | 5.41 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.78 | 5.84 | 5.89 | 5.94 | 6.00 | 6.05 | 6.10 | 6.10 | 2020 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2021 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2022 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2023 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2024 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2025 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2026 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2027 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2028 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2029 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2030 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2031 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2032 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2033 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2034 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2035 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2036 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2037 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2038 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2039 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2040 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2041 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2042 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2043 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2044 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2045 |
| 5.42 | 5.47 | 5.52 | 5.57 | 5.63 | 5.68 | 5.73 | 5.79 | 5.84 | 5.89 | 5.95 | 6.00 | 6.05 | 6.10 | 6.16 | 6.16 | 2046 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

Table 9
BPA FY 2017 Third-Party Taxable Borrowing Rates 1/

Fiscal Years 2017-2046
 (continued on next page)

| <u>Maturity</u> | | | | | | | | | | | | | | | |
|------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <u>Year</u> | <u>1 Year</u> | <u>2 Year</u> | <u>3 Year</u> | <u>4 Year</u> | <u>5 Year</u> | <u>6 Year</u> | <u>7 Year</u> | <u>8 Year</u> | <u>9 Year</u> | <u>10 Year</u> | <u>11 Year</u> | <u>12 Year</u> | <u>13 Year</u> | <u>14 Year</u> | <u>15 Year</u> |
| 2017 | 1.63 | 1.90 | 2.15 | 2.39 | 2.64 | 2.81 | 2.98 | 3.16 | 3.33 | 3.50 | 3.56 | 3.61 | 3.66 | 3.72 | 3.77 |
| 2018 | 2.47 | 2.64 | 2.81 | 2.97 | 3.14 | 3.32 | 3.50 | 3.68 | 3.86 | 4.05 | 4.10 | 4.15 | 4.20 | 4.25 | 4.30 |
| 2019 | 3.67 | 3.77 | 3.87 | 3.96 | 4.05 | 4.23 | 4.41 | 4.59 | 4.77 | 4.95 | 4.99 | 5.04 | 5.08 | 5.13 | 5.18 |
| 2020 | 4.27 | 4.32 | 4.41 | 4.50 | 4.59 | 4.76 | 4.93 | 5.10 | 5.27 | 5.44 | 5.48 | 5.52 | 5.57 | 5.61 | 5.65 |
| 2021 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2022 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2023 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2024 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2025 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2026 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2027 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2028 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2029 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2030 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2031 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2032 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2033 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2034 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2035 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2036 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2037 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2038 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2039 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2040 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2041 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2042 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2043 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2044 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2045 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |
| 2046 | 4.37 | 4.40 | 4.50 | 4.59 | 4.69 | 4.85 | 5.02 | 5.19 | 5.35 | 5.52 | 5.57 | 5.61 | 5.65 | 5.70 | 5.74 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

Table 9
BPA FY 2017 Third-Party Taxable Borrowing Rates 1/

Fiscal Years 2017-2046

Maturity

| <u>16 Year</u> | <u>17 Year</u> | <u>18 Year</u> | <u>19 Year</u> | <u>20 Year</u> | <u>21 Year</u> | <u>22 Year</u> | <u>23 Year</u> | <u>24 Year</u> | <u>25 Year</u> | <u>26 Year</u> | <u>27 Year</u> | <u>28 Year</u> | <u>29 Year</u> | <u>30 Year</u> | <u>50 Year</u> | <u>Year</u> |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|
| 3.82 | 3.88 | 3.93 | 3.98 | 4.04 | 4.09 | 4.14 | 4.20 | 4.25 | 4.30 | 4.36 | 4.41 | 4.46 | 4.52 | 4.57 | 4.57 | 2017 |
| 4.35 | 4.40 | 4.45 | 4.50 | 4.56 | 4.61 | 4.66 | 4.71 | 4.76 | 4.81 | 4.86 | 4.91 | 4.96 | 5.01 | 5.07 | 5.07 | 2018 |
| 5.22 | 5.27 | 5.31 | 5.36 | 5.40 | 5.45 | 5.50 | 5.54 | 5.59 | 5.63 | 5.68 | 5.73 | 5.77 | 5.82 | 5.86 | 5.86 | 2019 |
| 5.70 | 5.74 | 5.78 | 5.83 | 5.87 | 5.92 | 5.96 | 6.00 | 6.05 | 6.09 | 6.13 | 6.18 | 6.22 | 6.26 | 6.31 | 6.31 | 2020 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2021 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2022 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2023 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2024 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2025 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2026 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2027 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2028 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2029 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2030 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2031 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2032 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2033 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2034 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2035 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2036 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2037 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2038 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2039 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2040 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2041 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2042 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2043 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2044 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2045 |
| 5.78 | 5.83 | 5.87 | 5.91 | 5.95 | 6.00 | 6.04 | 6.08 | 6.13 | 6.17 | 6.21 | 6.26 | 6.30 | 6.34 | 6.39 | 6.39 | 2046 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

Table 10
BPA FY 2017 Third-Party Tax-Exempt Borrowing Rates 1/

Fiscal Years 2017-2046
 (continued on next page)

| <u>Maturity</u> | | | | | | | | | | | | | | | |
|------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <u>Year</u> | <u>1 Year</u> | <u>2 Year</u> | <u>3 Year</u> | <u>4 Year</u> | <u>5 Year</u> | <u>6 Year</u> | <u>7 Year</u> | <u>8 Year</u> | <u>9 Year</u> | <u>10 Year</u> | <u>11 Year</u> | <u>12 Year</u> | <u>13 Year</u> | <u>14 Year</u> | <u>15 Year</u> |
| 2017 | 1.01 | 1.18 | 1.33 | 1.47 | 1.62 | 1.78 | 1.94 | 2.10 | 2.26 | 2.42 | 2.47 | 2.52 | 2.57 | 2.63 | 2.68 |
| 2018 | 1.51 | 1.63 | 1.72 | 1.81 | 1.90 | 2.08 | 2.26 | 2.43 | 2.61 | 2.79 | 2.84 | 2.89 | 2.94 | 2.99 | 3.04 |
| 2019 | 2.24 | 2.33 | 2.38 | 2.44 | 2.49 | 2.68 | 2.87 | 3.07 | 3.26 | 3.45 | 3.50 | 3.55 | 3.60 | 3.64 | 3.69 |
| 2020 | 2.61 | 2.67 | 2.72 | 2.77 | 2.83 | 3.02 | 3.22 | 3.41 | 3.60 | 3.80 | 3.85 | 3.90 | 3.94 | 3.99 | 4.04 |
| 2021 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2022 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2023 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2024 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2025 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2026 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2027 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2028 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2029 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2030 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2031 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2032 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2033 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2034 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2035 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2036 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2037 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2038 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2039 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2040 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2041 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2042 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2043 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2044 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2045 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |
| 2046 | 2.67 | 2.72 | 2.78 | 2.83 | 2.89 | 3.08 | 3.28 | 3.47 | 3.66 | 3.86 | 3.91 | 3.96 | 4.01 | 4.05 | 4.10 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

Table 10
BPA FY 2017 Third-Party Tax-Exempt Borrowing Rates 1/

Fiscal Years 2017-2046

| <u>Maturity</u> | | | | | | | | | | | | | | | | |
|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|
| <u>16 Year</u> | <u>17 Year</u> | <u>18 Year</u> | <u>19 Year</u> | <u>20 Year</u> | <u>21 Year</u> | <u>22 Year</u> | <u>23 Year</u> | <u>24 Year</u> | <u>25 Year</u> | <u>26 Year</u> | <u>27 Year</u> | <u>28 Year</u> | <u>29 Year</u> | <u>30 Year</u> | <u>50 Year</u> | <u>Year</u> |
| 2.73 | 2.79 | 2.84 | 2.89 | 2.94 | 3.00 | 3.05 | 3.10 | 3.15 | 3.21 | 3.26 | 3.31 | 3.36 | 3.42 | 3.47 | 3.47 | 2017 |
| 3.09 | 3.14 | 3.19 | 3.24 | 3.29 | 3.34 | 3.39 | 3.44 | 3.49 | 3.55 | 3.60 | 3.65 | 3.70 | 3.75 | 3.80 | 3.80 | 2018 |
| 3.74 | 3.79 | 3.84 | 3.89 | 3.94 | 3.99 | 4.04 | 4.09 | 4.14 | 4.19 | 4.23 | 4.28 | 4.33 | 4.38 | 4.43 | 4.43 | 2019 |
| 4.09 | 4.14 | 4.19 | 4.24 | 4.29 | 4.34 | 4.39 | 4.43 | 4.48 | 4.53 | 4.58 | 4.63 | 4.68 | 4.73 | 4.78 | 4.78 | 2020 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2021 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2022 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2023 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2024 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2025 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2026 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2027 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2028 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2029 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2030 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2031 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2032 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2033 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2034 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2035 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2036 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2037 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2038 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2039 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2040 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2041 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2042 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2043 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2044 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2045 |
| 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 | 4.50 | 4.54 | 4.59 | 4.64 | 4.69 | 4.74 | 4.79 | 4.84 | 4.84 | 2046 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

Table 11
BPA FY 2017 FERC Borrowing Rates (Bank Prime) 1/

Calendar/Fiscal Years 2017-2046

| <u>Year</u> | <u>A</u> FERC Rate <u>Calendar Year</u> | <u>B</u> FERC Rate <u>Fiscal Year</u> |
|-------------|---|---|
| 2017 | 3.97 | 4.01 |
| 2018 | 4.72 | 4.53 |
| 2019 | 5.65 | 5.42 |
| 2020 | 6.00 | 5.91 |
| 2021 | 6.00 | 6.00 |
| 2022 | 6.00 | 6.00 |
| 2023 | 6.00 | 6.00 |
| 2024 | 6.00 | 6.00 |
| 2025 | 6.00 | 6.00 |
| 2026 | 6.00 | 6.00 |
| 2027 | 6.00 | 6.00 |
| 2028 | 6.00 | 6.00 |
| 2029 | 6.00 | 6.00 |
| 2030 | 6.00 | 6.00 |
| 2031 | 6.00 | 6.00 |
| 2032 | 6.00 | 6.00 |
| 2033 | 6.00 | 6.00 |
| 2034 | 6.00 | 6.00 |
| 2035 | 6.00 | 6.00 |
| 2036 | 6.00 | 6.00 |
| 2037 | 6.00 | 6.00 |
| 2038 | 6.00 | 6.00 |
| 2039 | 6.00 | 6.00 |
| 2040 | 6.00 | 6.00 |
| 2041 | 6.00 | 6.00 |
| 2042 | 6.00 | 6.00 |
| 2043 | 6.00 | 6.00 |
| 2044 | 6.00 | 6.00 |
| 2045 | 6.00 | 6.00 |
| 2046 | 6.00 | 6.00 |

1/ Global Insight: The U.S. Economy: 30 Year Focus,
 August 2016 Forecast, Base Case.

Table 12
BPA FY 2017 May 3 Month LIBOR Rates 1/

Calendar/Fiscal Years 2017-2046

| <u>Year</u> | <u>A</u> 3-Mo LIBOR <u>Calendar Year</u> | <u>B</u> 3-Mo LIBOR <u>Fiscal Year</u> |
|-------------|--|--|
| 2017 | 1.20 | 1.25 |
| 2018 | 2.02 | 1.81 |
| 2019 | 2.97 | 2.73 |
| 2020 | 3.29 | 3.21 |
| 2021 | 3.29 | 3.29 |
| 2022 | 3.29 | 3.29 |
| 2023 | 3.29 | 3.29 |
| 2024 | 3.29 | 3.29 |
| 2025 | 3.29 | 3.29 |
| 2026 | 3.29 | 3.29 |
| 2027 | 3.29 | 3.29 |
| 2028 | 3.29 | 3.29 |
| 2029 | 3.29 | 3.29 |
| 2030 | 3.29 | 3.29 |
| 2031 | 3.29 | 3.29 |
| 2032 | 3.29 | 3.29 |
| 2033 | 3.29 | 3.29 |
| 2034 | 3.29 | 3.29 |
| 2035 | 3.29 | 3.29 |
| 2036 | 3.29 | 3.29 |
| 2037 | 3.29 | 3.29 |
| 2038 | 3.29 | 3.29 |
| 2039 | 3.29 | 3.29 |
| 2040 | 3.29 | 3.29 |
| 2041 | 3.29 | 3.29 |
| 2042 | 3.29 | 3.29 |
| 2043 | 3.29 | 3.29 |
| 2044 | 3.29 | 3.29 |
| 2045 | 3.29 | 3.29 |
| 2046 | 3.29 | 3.29 |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

Table 13
Comparison of FY 2017 Inflation Forecast Components
 Calendar/Fiscal Year Forecasts 2017 vs. 2016

Calendar/Fiscal Years 2017-2046

| <u>YEAR</u> | A CY 2017 1/ Calendar Year GDP Price <u>Deflator</u> (%) | B FY 2017 1/ Fiscal Year GDP Price <u>Deflator</u> (%) | C FY 2016 2/ Fiscal Year Cumulative <u>Price Deflator</u> (Base Year 2016) | D FY 2016 3/ Fiscal Year GDP Price <u>Deflator</u> (%) | E FY 2016 3/ Fiscal Year Cumulative <u>Price Deflator</u> (Base Year 2015) | F Change in the GDP Price <u>Deflator</u> (B-D) | G Change in the Cumulative <u>Price Deflator</u> (C-E) |
|-------------|---|---|---|---|---|---|--|
| 2017 | 2.15% | 1.97% | 1.010 | 1.81% | 1.026 | 0.16% | -0.016 |
| 2018 | 2.08% | 2.10% | 1.031 | 1.84% | 1.045 | 0.26% | -0.014 |
| 2019 | 2.06% | 2.07% | 1.052 | 1.90% | 1.065 | 0.17% | -0.012 |
| 2020 | 2.11% | 2.10% | 1.074 | 1.97% | 1.086 | 0.14% | -0.011 |
| 2021 | 2.11% | 2.11% | 1.097 | 2.04% | 1.108 | 0.07% | -0.011 |
| 2022 | 2.05% | 2.07% | 1.120 | 2.11% | 1.131 | -0.04% | -0.011 |
| 2023 | 2.02% | 2.03% | 1.143 | 2.12% | 1.155 | -0.09% | -0.013 |
| 2024 | 2.00% | 2.00% | 1.165 | 2.10% | 1.179 | -0.09% | -0.014 |
| 2025 | 2.01% | 2.01% | 1.189 | 2.10% | 1.204 | -0.09% | -0.015 |
| 2026 | 2.00% | 2.00% | 1.213 | 2.12% | 1.230 | -0.12% | -0.017 |
| 2027 | 2.04% | 2.03% | 1.237 | 2.14% | 1.256 | -0.11% | -0.019 |
| 2028 | 2.00% | 2.01% | 1.262 | 2.14% | 1.283 | -0.12% | -0.021 |
| 2029 | 2.02% | 2.02% | 1.288 | 2.15% | 1.310 | -0.13% | -0.023 |
| 2030 | 2.06% | 2.05% | 1.314 | 2.16% | 1.339 | -0.11% | -0.025 |
| 2031 | 2.10% | 2.09% | 1.342 | 2.22% | 1.368 | -0.12% | -0.027 |
| 2032 | 2.11% | 2.11% | 1.370 | 2.23% | 1.399 | -0.12% | -0.029 |
| 2033 | 2.12% | 2.11% | 1.399 | 2.23% | 1.430 | -0.12% | -0.031 |
| 2034 | 2.11% | 2.11% | 1.428 | 2.25% | 1.462 | -0.13% | -0.034 |
| 2035 | 2.10% | 2.11% | 1.458 | 2.23% | 1.495 | -0.12% | -0.036 |
| 2036 | 2.11% | 2.11% | 1.489 | 2.22% | 1.528 | -0.12% | -0.039 |
| 2037 | 2.10% | 2.10% | 1.520 | 2.23% | 1.562 | -0.13% | -0.042 |
| 2038 | 2.11% | 2.11% | 1.553 | 2.25% | 1.597 | -0.14% | -0.045 |
| 2039 | 2.12% | 2.11% | 1.585 | 2.27% | 1.633 | -0.15% | -0.048 |
| 2040 | 2.11% | 2.11% | 1.619 | 2.28% | 1.671 | -0.16% | -0.052 |
| 2041 | 2.13% | 2.12% | 1.653 | 2.30% | 1.709 | -0.17% | -0.056 |
| 2042 | 2.13% | 2.13% | 1.688 | 2.32% | 1.749 | -0.19% | -0.060 |
| 2043 | 2.13% | 2.13% | 1.724 | 2.34% | 1.789 | -0.21% | -0.065 |
| 2044 | 2.13% | 2.13% | 1.761 | 2.36% | 1.832 | -0.23% | -0.070 |
| 2045 | 2.12% | 2.12% | 1.799 | 2.37% | 1.875 | -0.25% | -0.076 |
| 2046 | 2.12% | 2.12% | 1.837 | | | | |

1/ Global Insight: The U.S. Economy: 30 Year Focus, August 2016 Forecast, Base Case.

2/ Fiscal Year Cumulative Price Deflator escalates to midyear dollars. The first year, 2017, is determined as follows: $1.010 = ((1.97/100) * 5) + 1$. An example of subsequent year cumulative growth, such as in 2018, is found as: $1.031 = (1 + (2.10/100)) * 1.010$

3/ Global Insight: The U.S. Economy: 30 Year Focus, August 2015 Forecast, Base Case.

7. HISTORICAL AND PROJECTED NEW BONDS ISSUED TO TREASURY

7.1 Purpose

This chapter documents all the bonds that BPA has issued and those it projects it will issue to the U.S. Treasury to finance capital investments.

7.2 Method

New bonds projected to be issued for the cost evaluation period are based on IPR/CIR capital program outlays. Half of the capital program is assumed to be financed with Treasury bonds. The other half is assumed to be financed through the lease purchase program. *See* Ch. 8.

New long-term debt consists of bonds issued by BPA to the U.S. Treasury reflecting projected outlays for BPA transmission, construction, and environmental programs during the cost evaluation period (FY 2017–2019). All bonds projected for issuance are entered into the projected portions of the repayment study.

TABLE 7-1
PROJECTED FEDERAL BORROWING FOR FY 2017 - 2019
(\$000s)

| | A | B | C | D | E |
|----|----------------|-------------------|------------------|------|--------------------|
| | FISCAL YEAR | DESCRIPTION | INTEREST RATE | TERM | TOTAL BORROWING |
| 1 | 2017 | Construction | 2.93% | 30 | 38,000 |
| 2 | | Construction | 2.73% | 26 | 19,000 |
| 3 | | Construction | 2.78% | 27 | 19,000 |
| 4 | | Construction | 2.63% | 24 | 76,000 |
| 5 | | Construction | 2.48% | 22 | 38,000 |
| 6 | | Construction | 2.93% | 30 | 38,000 |
| 7 | | Environment | 2.18% | 15 | 7,000 |
| 8 | | Construction (AS) | 1.51% | 6 | <u>5,850</u> |
| 9 | | Total | | | 240,850 |
| 10 | | | | | |
| 11 | 2018 | Construction | 3.62% | 24 | 26,000 |
| 12 | | Construction | 3.67% | 25 | 26,000 |
| 13 | | Construction | 3.87% | 30 | 26,000 |
| 14 | | Construction | 3.87% | 30 | 50,000 |
| 15 | | Construction | 3.83% | 29 | 29,000 |
| 16 | | Construction | 3.87% | 30 | 79,000 |
| 17 | | Construction (AS) | 2.56% | 6 | 10,400 |
| 18 | | Environment | 3.25% | 15 | <u>7,000</u> |
| 19 | | Total | | | 253,400 |
| 20 | | | | | |
| 21 | 2019 | Construction | 4.43% | 30 | 82,000 |
| 22 | | Construction | 4.43% | 30 | 81,000 |
| 23 | | Construction | 4.43% | 30 | 81,000 |
| 24 | | Construction (AS) | 3.27% | 6 | 11,050 |
| 25 | | Environment | 3.89% | 15 | <u>7,000</u> |
| 26 | | Total | | | 262,050 |

TABLE 7-2
ADJUSTMENTS TO TRANSMISSION CAPITAL FORECAST FOR PROJECTED TREASURY BORROWINGS
(\$000s)

| Forecast Treasury Borrowings ^{1/} | A | B | C |
|---|----------------|----------------|----------------|
| | 2017 | 2018 | 2019 |
| 1 Transmission Construction | 487,834 | 487,743 | 503,390 |
| 2 Less Reserve Financing | (15,000) | (15,000) | (15,000) |
| 3 Less Lease Purchase Signed To-Date | 0 | 0 | 0 |
| 4 Less funds financed through Lease Purchase | (236,417) | (236,372) | (244,195) |
| 5 Less Federal Borrowing To-Date | <u>0</u> | <u>0</u> | <u>0</u> |
| 6 Transmission Construction | 236,417 | 236,372 | 244,195 |
| 7 | | | |
| 8 Environment | 7,190 | 7,289 | 7,336 |
| 9 Less Federal Borrowing To-Date | <u>0</u> | <u>0</u> | <u>0</u> |
| 10 Environment | 7,190 | 7,289 | 7,336 |
| 11 | | | |
| 12 Transmission Agency Services | 5,773 | 10,776 | 10,851 |
| 13 Less Federal Borrowing To-Date | <u>0</u> | <u>0</u> | <u>0</u> |
| 14 Environment | 5,773 | 10,776 | 10,851 |

1/ AFUDC Included

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8. NON-FEDERAL PAYMENT OBLIGATIONS

8.1 Introduction

There are two forms of non-Federal payment obligations associated with transmission assets in this rate proposal. One is a lease-purchase arrangement for capitalized asset purchases. The other is the functional reassignment to transmission of debt service payment obligations associated with non-Federal, Energy Northwest (EN) bonds.

8.2 Capital Leases

BPA entered into a lease-purchase agreement with the Northwest Infrastructure Financing Corporation (NIFC) to provide for the construction of the 500-kV Schultz-Wautoma transmission line. Since the completion of that project, BPA has entered into additional lease-purchase agreements with other NIFC entities, the Port of Morrow, and the Idaho Energy Resources Authority for other capital projects. The resulting payment streams are treated as debt service in the repayment study. BPA also has several legacy capital leases such as those for the Teton-Swan Valley and the Goshen-Drummond lines. Table 8-1 displays the consolidated payment stream of actual capital leases.

BPA also projects that half of the projected capital investments in the 2018-2019 rate period will be financed through the lease purchase program. Projected lease purchase investments are financed for seven years using a line of credit assigned interest rates from forecast of 3-month LIBOR rates of BPA's official forecast. *See* Ch. 6. A 60 basis point adder is also included, reflecting the average cost of issuance of actual lease purchase agreements. At the end of seven years, the line of credit is refinanced using interest rates from the official forecast. *Id.*

8.3 Debt Service Reassignment

Debt Service Reassignment (DSR) is an accounting and ratemaking mechanism created to make full use of the Debt Optimization Program (DOP). It allows the use of cash flows generated by DOP actions for advanced amortization payments of transmission debt. In return, DSR ensures that Transmission revenues repay the full cost of the associated EN debt. DOP and DSR ended in FY 2009, but the associated financial obligations exist through FY 2024.

Under DOP, the proceeds from EN refinancing bonds are used to pay principal on the currently maturing EN bonds in a given fiscal year. Since BPA power rates were set to recover the originally expected EN principal payments on the maturing bonds, and the associated debt service requirement was expected to decrease the EN budget (when the principal was paid from the proceeds of the newly issued refinancing bonds), funds in the BPA Fund then became available for other purposes. The amount made available equals the principal of the amortized EN bonds. BPA uses these funds to amortize Federal obligations associated with generation and transmission assets ahead of schedule, thereby replenishing or creating future opportunities to replenish BPA's available U.S. Treasury borrowing authority.

DSR is applicable when BPA uses the funds made available from DOP to early-amortize Federal Transmission obligations. The stream of annual all-in costs from the DSR transaction is assigned to Transmission Services and recovered in transmission rates. The all-in costs include debt service on tax-exempt and taxable bonds and other costs associated with the DSR transaction, which are described later. Conversely, the costs attached to these EN refinancing bonds are no longer assigned for recovery from Power revenues.

Transmission's total DSR payment obligation and the related relief of Power's payment obligations are shown in Table 8-3. Transmission's total principal obligation can be higher or

lower than the total principal relief for Power if premium or discount bonds are issued. The interest associated with outstanding obligations may change over time if DSR bonds are refinanced for interest savings.

TABLE 8-1
LEASE PURCHASE PAYMENT STREAM
(\$000s)

| | A | B | C | D | E |
|----|--------------------|------------------|------------------|-----------------|------------------|
| | Fiscal Year | Principal | Interest | Expenses | Total |
| 1 | 2017 | 1,777 | 55,919 | 1,019 | 58,715 |
| 2 | 2018 | 1,874 | 72,769 | (692) | 73,951 |
| 3 | 2019 | 12,466 | 93,377 | 1,376 | 107,219 |
| 4 | 2020 | 79,333 | 98,700 | 590 | 178,623 |
| 5 | 2021 | 79,513 | 96,832 | 226 | 176,571 |
| 6 | 2022 | 73,390 | 94,966 | 23 | 168,379 |
| 7 | 2023 | 76,559 | 93,321 | 16 | 169,896 |
| 8 | 2024 | 83,296 | 92,151 | (10) | 175,437 |
| 9 | 2025 | 101,328 | 92,380 | (2) | 193,706 |
| 10 | 2026 | 99,507 | 89,011 | 5 | 188,523 |
| 11 | 2027 | 102,307 | 85,603 | 10 | 187,920 |
| 12 | 2028 | 92,732 | 81,732 | (20) | 174,444 |
| 13 | 2029 | 93,982 | 77,367 | (43) | 171,306 |
| 14 | 2030 | 99,306 | 73,413 | (36) | 172,683 |
| 15 | 2031 | 99,491 | 68,450 | (27) | 167,914 |
| 16 | 2032 | 101,372 | 63,488 | (18) | 164,842 |
| 17 | 2033 | 113,453 | 59,590 | 418 | 173,461 |
| 18 | 2034 | 105,003 | 51,031 | 917 | 156,951 |
| 19 | 2035 | 128,459 | 49,088 | 1,036 | 178,583 |
| 20 | 2036 | 128,548 | 45,190 | 1,000 | 174,738 |
| 21 | 2037 | 104,169 | 41,271 | 1,005 | 146,445 |
| 22 | 2038 | 104,216 | 36,633 | 1,010 | 141,859 |
| 23 | 2039 | 104,962 | 31,864 | 1,016 | 137,842 |
| 24 | 2040 | 123,850 | 24,116 | 1,022 | 148,988 |
| 25 | 2041 | 89,083 | 20,744 | 1,030 | 110,857 |
| 26 | 2042 | 123,761 | 18,750 | 1,024 | 143,535 |
| 27 | 2043 | 121,423 | 14,421 | 375 | 136,219 |
| 28 | 2044 | 119,681 | 11,131 | 39 | 130,851 |
| 29 | 2045 | 123,318 | 8,213 | - | 131,531 |
| 30 | 2046 | 123,318 | 4,107 | - | 127,425 |
| 31 | Total | 2,811,477 | 1,745,628 | 12,308 | 4,569,413 |

TABLE 8-2
PROJECTED LEASE PURCHASE ISSUANCES
(\$000s)

| | A | B | C | D | E | F | G |
|----------------|----------------|------------------------|--------------------------|--------------------------------|----------------------------|----------------------|------------------|
| | Project | In Service Date | Current Principal | Line of Credit Due Date | Line of Credit Rate | Bond Due Date | Bond Rate |
| 1 | Lease Purchase | 07/2017 | 12,000 | 09/2023 | 1.850% | 09/2033 | 5.350% |
| 2 | Lease Purchase | 07/2017 | 2,000 | 09/2023 | 1.850% | 09/2034 | 5.520% |
| 3 | Lease Purchase | 07/2017 | 2,000 | 09/2023 | 1.850% | 09/2035 | 5.570% |
| 4 | Lease Purchase | 07/2017 | 2,000 | 09/2023 | 1.850% | 09/2036 | 5.610% |
| 5 | Lease Purchase | 07/2017 | 3,000 | 09/2023 | 1.850% | 09/2037 | 5.650% |
| 6 | Lease Purchase | 07/2017 | 2,000 | 09/2023 | 1.850% | 09/2038 | 5.700% |
| 7 | Lease Purchase | 07/2017 | 7,000 | 09/2023 | 1.850% | 09/2039 | 5.740% |
| 8 | Lease Purchase | 07/2017 | 18,000 | 09/2023 | 1.850% | 09/2040 | 5.780% |
| 9 | Lease Purchase | 07/2017 | 87,000 | 09/2023 | 1.850% | 09/2041 | 5.830% |
| 10 | Lease Purchase | 07/2017 | 36,809 | 09/2023 | 1.850% | 09/2042 | 5.870% |
| 11 | Lease Purchase | 04/2018 | 119,368 | 09/2024 | 2.410% | 09/2043 | 5.870% |
| 12 | Lease Purchase | 04/2018 | 119,368 | 09/2024 | 2.410% | 09/2044 | 5.910% |
| 13 | Lease Purchase | 04/2019 | 123,319 | 09/2025 | 3.330% | 09/2045 | 5.910% |
| 14 | Lease Purchase | 04/2019 | 123,319 | 09/2025 | 3.330% | 09/2046 | 5.950% |
| Totals: | | | 657,181 | | | | |

TABLE 8-3
RELIEF OF GENERATION & TRANSMISSION'S DSR OBLIGATION
(\$000s)

| | A | B | C | D | E | F | |
|--------|---------------------------------|----------------|----------------|-------------------------------------|------------------|----------------|------------------|
| | Relief of Generation Obligation | | | Transmission DSR Payment Obligation | | | |
| BPA FY | Principal | Interest | Total | Principal | Interest | Total | |
| 1 | 2004 | - | 16,366 | 16,366 | - | 15,088 | 15,088 |
| 2 | 2005 | - | 27,505 | 27,505 | - | 25,240 | 25,240 |
| 3 | 2006 | - | 35,780 | 35,780 | - | 33,041 | 33,041 |
| 4 | 2007 | 674 | 45,812 | 46,486 | 716 | 42,809 | 43,524 |
| 5 | 2008 | 4,271 | 57,069 | 61,340 | 4,518 | 51,369 | 55,887 |
| 6 | 2009 | 9,950 | 61,506 | 71,456 | 10,432 | 56,154 | 66,586 |
| 7 | 2010 | 12 | 62,104 | 62,116 | 12 | 57,152 | 57,164 |
| 8 | 2011 | 147 | 61,993 | 62,140 | 154 | 57,306 | 57,459 |
| 9 | 2012 | 39,287 | 59,873 | 99,160 | 41,165 | 55,030 | 96,195 |
| 10 | 2013 | 157,982 | 57,072 | 215,054 | 165,833 | 51,866 | 217,698 |
| 11 | 2014 | 166,651 | 48,405 | 215,056 | 175,138 | 44,328 | 219,466 |
| 12 | 2015 | 4,802 | 36,004 | 40,806 | 185,178 | 34,307 | 219,485 |
| 13 | 2016 | 5,348 | 26,311 | 31,659 | 185,328 | 24,114 | 209,442 |
| 14 | 2017 | 3,909 | 18,307 | 22,215 | 200,008 | 14,341 | 214,349 |
| 15 | 2018 | 3,225 | 11,115 | 14,341 | 191,418 | 6,841 | 198,259 |
| 16 | 2019 | 5,520 | 3,042 | 8,561 | 4,838 | 3,666 | 8,504 |
| 17 | 2020 | 17,552 | 2,887 | 20,439 | 19,592 | 1,040 | 20,632 |
| 18 | 2021 | 18,068 | 2,372 | 20,441 | 20,571 | 105 | 20,676 |
| 19 | 2022 | 18,666 | 1,770 | 20,436 | 21,596 | (881) | 20,715 |
| 20 | 2023 | 19,297 | 1,145 | 20,442 | 22,678 | (1,912) | 20,767 |
| 21 | 2024 | 14,835 | 498 | 15,333 | 17,640 | (2,037) | 15,603 |
| 22 | Total | 490,196 | 636,939 | 1,127,135 | 1,266,815 | 568,964 | 1,835,779 |

9. REPAYMENT PERIOD REPLACEMENTS

9.1 Introduction

Consistent with the requirements of Department of Energy Order RA 6120.2, each repayment study includes funding for replacements to the transmission system during the repayment period. The purpose of these investments is to maintain the existing revenue-generating capability of the system. This schedule is expressed in mid-year dollars for the study year and is assigned the interest rates of the projected long-term borrowing for the study year.

9.2 Transmission Replacements

BPA's Transmission replacement methodology combines the Iowa Curve methodology, the Handy-Whitman Index, and BPA's expected service lives of its assets to produce projected replacements through the cost evaluation period. The Iowa Curves are a set of curves with different shapes corresponding to how much of an initial asset survives as a function of time. They are described in the book "Statistical Analyses of Industrial Property Retirements" by Robley Winfrey, Bulletin 125 Revised, Engineering Research Institute, Iowa State University, April 1967. The specific curves are assigned to FERC Accounts in BPA's depreciation study.

BPA's total plant is analyzed, by FERC account and in-service date, and assigned the various FERC Accounts Iowa Curves as determined by the depreciation study. A table from Winfrey's book, Table 22 – TOTAL RENEWALS FOR TYPE CURVES, tells what fraction of plant represented by a given curve will have to be replaced each tenth of a lifetime to maintain the initial plant. A data file with the contents of Table 22, accurate to 12 lifetimes, is used in calculating repayment period transmission replacements. For each of the Iowa Curves, Table 22 identifies a percentage of plant to be replaced for each tenth of a lifetime.

The Handy-Whitman Index provides cost trends for electric, gas, telephone, and water utilities in geographical regions of generally similar characteristics. The Handy-Whitman Index numbers are widely used in the industry to trend original cost records to estimate reproduction cost at prices prevailing at a later date. The cost trends for each of the utilities are further subdivided by type of plant. In particular, the cost trends provided by the Index for electrical utilities include trends for total transmission plant and trends for the major FERC accounts within transmission plant. BPA uses the trends for individual FERC accounts when they are available. When the Handy-Whitman Index does not provide a cost trend for a specific account, BPA used the trends for total transmission plant.

To determine replacement costs, BPA also must determine the expected service life of its assets. BPA assigns most assets an expected service life based on its periodic depreciation studies. The service life determined by the depreciation studies reflects early retirements that may occur as a result of facility upgrades to expand the system for load growth and other system conditions. However, for assets that are more likely to be retired early to facilitate upgrades, replacements are based on the expected physical life of the asset, not on a lifetime that is shortened by early retirements. The purpose of repayment period replacements is to maintain the *existing* system's revenue-producing capability over the repayment period. These assets are retired early to facilitate expansion of the system. If service life was used for determining replacements for these assets, we would be forecasting replacements for an expanded system and therefore overstating costs.

BPA has long assumed that transmission towers and fixtures (FERC Account 354) have an expected service life that matches their expected physical life of 100 years, despite the depreciation study assigning that account a service life of 65 years. For other accounts, this study uses the service life developed by the latest BPA depreciation study produced in 2012.

Transmission plant investment by FERC account and in-service year was obtained from BPA's plant investment records. Transmission plant investment is adjusted by removing plant that has been retired. Based on the year plant was placed in service and the year of the cost evaluation period being analyzed, BPA calculated the number of tenths of a lifetime since the plant was placed in service. The result was then indexed using the appropriate survival curve in Table 22 to identify the portion of plant that would be replaced in a given tenth of a lifetime. Next, the original plant investment was inflated to study-year dollars using the Handy-Whitman Index and BPA's inflation forecast. Projected plant investment was added for the rate period. The result was multiplied by the portion of plant that should be replaced, as indicated by Table 22, and the portion of the expected service life to yield a cost of replacement in the cost evaluation year for a given year's investment. The product is the replacement cost for FERC account and in-service year. Finally, these replacement costs were accumulated by future year and FERC account.

BPA's capital program includes a replacement program that recognizes that some historical plant is retired over time. If future replacements were calculated for the planned replacement program, a double counting would occur. Therefore, the projections for a cost evaluation year were reduced by the amount calculated for replacements for the same year. Future replacements were then calculated for only the remaining net initial investment of that year.

9.3 Replacement Credits

Replacement credits are calculated for two sets of customer-funded plant, the AC Intertie and facilities constructed for the dedicated use of a customer through the Projects Funded in Advance mechanism.

The cost evaluation period data for the AC Intertie is determined by multiplying the total replacements for each year by the average proportion of actual plant that is attributed to the AC

Intertie. The result is then multiplied by 22 percent, the AC Intertie capacity owners' share of the Intertie. The results are the future replacements for the total AC. These replacements are multiplied by the appropriate percentage representing the amount that will be allocated to the capacity owners to obtain the future contributions required from capacity owners. The future replacement costs for the cost evaluation period are included in the repayment study, and the associated contributions from capacity owners are also included as negative expenses.

BPA receives funds from customers for the construction of facilities that are dedicated to the use of those customers, known as Projects Funded in Advance (PFIA). Although the customer-financed facilities are BPA assets, the customer is responsible for the future cost of replacement of these facilities. As with the AC Intertie, BPA calculates the future replacement cost of customer-financed facilities. Because the customer will provide the up-front funding for the replacements, that funding is applied as a credit against future replacement costs in the repayment study. The replacement credit for these facilities is calculated as a percentage of the total replacement cost for each account based on the portion of plant in each account that has been funded through customer advances.

**TABLE 9-1
FUTURE REPLACEMENTS FOR FY 2018
(\$000s)**

| | A | B | C |
|----|------|---------|--------|
| | FY | AMOUNT | RATE |
| 1 | 2019 | 182,115 | 3.870% |
| 2 | 2020 | 186,863 | 3.870% |
| 3 | 2021 | 192,088 | 3.870% |
| 4 | 2022 | 196,517 | 3.870% |
| 5 | 2023 | 199,967 | 3.870% |
| 6 | 2024 | 203,394 | 3.870% |
| 7 | 2025 | 206,406 | 3.870% |
| 8 | 2026 | 210,406 | 3.870% |
| 9 | 2027 | 213,646 | 3.870% |
| 10 | 2028 | 217,326 | 3.870% |
| 11 | 2029 | 220,679 | 3.870% |
| 12 | 2030 | 225,275 | 3.870% |
| 13 | 2031 | 229,884 | 3.870% |
| 14 | 2032 | 234,046 | 3.870% |
| 15 | 2033 | 238,584 | 3.870% |
| 16 | 2034 | 243,258 | 3.870% |
| 17 | 2035 | 247,381 | 3.870% |
| 18 | 2036 | 251,489 | 3.870% |
| 19 | 2037 | 255,559 | 3.870% |
| 20 | 2038 | 259,191 | 3.870% |
| 21 | 2039 | 262,385 | 3.870% |
| 22 | 2040 | 265,947 | 3.870% |
| 23 | 2041 | 269,664 | 3.870% |
| 24 | 2042 | 272,791 | 3.870% |
| 25 | 2043 | 276,552 | 3.870% |
| 26 | 2044 | 280,054 | 3.870% |
| 27 | 2045 | 282,291 | 3.870% |
| 28 | 2046 | 285,344 | 3.870% |
| 29 | 2047 | 288,897 | 3.870% |
| 30 | 2048 | 292,110 | 3.870% |
| 31 | 2049 | 294,427 | 3.870% |
| 32 | 2050 | 296,664 | 3.870% |
| 33 | 2051 | 298,495 | 3.870% |
| 34 | 2052 | 301,358 | 3.870% |
| 35 | 2053 | 304,049 | 3.870% |

TABLE 9-2
FUTURE REPLACEMENTS FOR FY 2019
(\$000s)

| | A | B | C | |
|----|------|---------|--------|------|
| | FY | AMOUNT | RATE | DUE |
| 1 | 2020 | 188,713 | 4.430% | 2055 |
| 2 | 2021 | 194,563 | 4.430% | 2056 |
| 3 | 2022 | 199,419 | 4.430% | 2057 |
| 4 | 2023 | 202,949 | 4.430% | 2058 |
| 5 | 2024 | 206,797 | 4.430% | 2059 |
| 6 | 2025 | 210,756 | 4.430% | 2060 |
| 7 | 2026 | 215,497 | 4.430% | 2061 |
| 8 | 2027 | 218,863 | 4.430% | 2062 |
| 9 | 2028 | 223,068 | 4.430% | 2063 |
| 10 | 2029 | 226,543 | 4.430% | 2064 |
| 11 | 2030 | 232,679 | 4.430% | 2065 |
| 12 | 2031 | 237,666 | 4.430% | 2066 |
| 13 | 2032 | 242,244 | 4.430% | 2067 |
| 14 | 2033 | 246,904 | 4.430% | 2068 |
| 15 | 2034 | 252,971 | 4.430% | 2069 |
| 16 | 2035 | 257,499 | 4.430% | 2070 |
| 17 | 2036 | 261,748 | 4.430% | 2071 |
| 18 | 2037 | 265,843 | 4.430% | 2072 |
| 19 | 2038 | 269,568 | 4.430% | 2073 |
| 20 | 2039 | 273,763 | 4.430% | 2074 |
| 21 | 2040 | 277,608 | 4.430% | 2075 |
| 22 | 2041 | 281,120 | 4.430% | 2076 |
| 23 | 2042 | 284,335 | 4.430% | 2077 |
| 24 | 2043 | 288,909 | 4.430% | 2078 |
| 25 | 2044 | 292,755 | 4.430% | 2079 |
| 26 | 2045 | 294,837 | 4.430% | 2080 |
| 27 | 2046 | 298,117 | 4.430% | 2081 |
| 28 | 2047 | 301,722 | 4.430% | 2082 |
| 29 | 2048 | 305,856 | 4.430% | 2083 |
| 30 | 2049 | 308,625 | 4.430% | 2084 |
| 31 | 2050 | 310,888 | 4.430% | 2085 |
| 32 | 2051 | 312,871 | 4.430% | 2086 |
| 33 | 2052 | 316,528 | 4.430% | 2087 |
| 34 | 2053 | 319,592 | 4.430% | 2088 |
| 35 | 2054 | 322,868 | 4.430% | 2089 |

**TABLE 9-3
REPLACEMENT CREDITS
(\$000s)**

| | | A | B | C | D | E | F |
|----|------|---|------------|-----------------------------|------------|------------|------------|
| | | AC INTERTIE | | PFIA | | TOTAL | |
| | | 1.55% of Total Replacements ^{1/} | | 2.61% of Total Replacements | | | |
| | | 2018 STUDY | 2019 STUDY | 2018 STUDY | 2019 STUDY | 2018 STUDY | 2019 STUDY |
| 1 | 2019 | (2,838) | - | (4,717) | - | (7,555) | - |
| 2 | 2020 | (2,912) | (2,941) | (4,840) | (4,888) | (7,752) | (7,829) |
| 3 | 2021 | (2,994) | (3,032) | (4,975) | (5,039) | (7,969) | (8,071) |
| 4 | 2022 | (3,063) | (3,108) | (5,090) | (5,165) | (8,152) | (8,273) |
| 5 | 2023 | (3,116) | (3,163) | (5,179) | (5,256) | (8,296) | (8,419) |
| 6 | 2024 | (3,170) | (3,223) | (5,268) | (5,356) | (8,438) | (8,579) |
| 7 | 2025 | (3,217) | (3,285) | (5,346) | (5,459) | (8,563) | (8,743) |
| 8 | 2026 | (3,279) | (3,358) | (5,450) | (5,581) | (8,729) | (8,940) |
| 9 | 2027 | (3,330) | (3,411) | (5,533) | (5,669) | (8,863) | (9,079) |
| 10 | 2028 | (3,387) | (3,476) | (5,629) | (5,777) | (9,016) | (9,254) |
| 11 | 2029 | (3,439) | (3,531) | (5,716) | (5,867) | (9,155) | (9,398) |
| 12 | 2030 | (3,511) | (3,626) | (5,835) | (6,026) | (9,345) | (9,653) |
| 13 | 2031 | (3,583) | (3,704) | (5,954) | (6,156) | (9,537) | (9,860) |
| 14 | 2032 | (3,648) | (3,775) | (6,062) | (6,274) | (9,709) | (10,049) |
| 15 | 2033 | (3,718) | (3,848) | (6,179) | (6,395) | (9,898) | (10,243) |
| 16 | 2034 | (3,791) | (3,942) | (6,300) | (6,552) | (10,092) | (10,494) |
| 17 | 2035 | (3,855) | (4,013) | (6,407) | (6,669) | (10,263) | (10,682) |
| 18 | 2036 | (3,919) | (4,079) | (6,514) | (6,779) | (10,433) | (10,859) |
| 19 | 2037 | (3,983) | (4,143) | (6,619) | (6,885) | (10,602) | (11,028) |
| 20 | 2038 | (4,039) | (4,201) | (6,713) | (6,982) | (10,752) | (11,183) |
| 21 | 2039 | (4,089) | (4,267) | (6,796) | (7,090) | (10,885) | (11,357) |
| 22 | 2040 | (4,145) | (4,326) | (6,888) | (7,190) | (11,033) | (11,516) |
| 23 | 2041 | (4,203) | (4,381) | (6,984) | (7,281) | (11,187) | (11,662) |
| 24 | 2042 | (4,251) | (4,431) | (7,065) | (7,364) | (11,317) | (11,796) |
| 25 | 2043 | (4,310) | (4,503) | (7,163) | (7,483) | (11,473) | (11,985) |
| 26 | 2044 | (4,365) | (4,563) | (7,253) | (7,582) | (11,618) | (12,145) |
| 27 | 2045 | (4,399) | (4,595) | (7,311) | (7,636) | (11,711) | (12,231) |
| 28 | 2046 | (4,447) | (4,646) | (7,390) | (7,721) | (11,837) | (12,367) |
| 29 | 2047 | (4,502) | (4,702) | (7,482) | (7,815) | (11,985) | (12,517) |
| 30 | 2048 | (4,552) | (4,767) | (7,566) | (7,922) | (12,118) | (12,688) |
| 31 | 2049 | (4,589) | (4,810) | (7,626) | (7,993) | (12,214) | (12,803) |
| 32 | 2050 | (4,623) | (4,845) | (7,684) | (8,052) | (12,307) | (12,897) |
| 33 | 2051 | (4,652) | (4,876) | (7,731) | (8,103) | (12,383) | (12,979) |
| 34 | 2052 | (4,697) | (4,933) | (7,805) | (8,198) | (12,502) | (13,131) |
| 35 | 2053 | (4,739) | (4,981) | (7,875) | (8,277) | (12,613) | (13,258) |
| 36 | 2054 | - | (5,032) | - | (8,362) | - | (13,394) |

1/ Represents share (22%) of the 6.92% average AC plant represents of total Transmission plant.

TABLE 9-4
SUMMARY OF HISTORICAL NET PLANT INVESTMENT
AS OF 9/30/2016

| | A | B | C | D | E | F |
|---|--------------|---------------------------------|--------------------------------|------------------------------|------------------------------|--------------------------------|
| | FERC ACCOUNT | ACCOUNT NAME | TOTAL PLANT | AC INTERTIE | PFIA | ALL OTHER |
| 1 | 352 | STRUCTURES & IMPROVEMENTS | \$ 391,380,974 | \$ 25,843,615 | \$ 3,416,761 | \$ 362,120,597 |
| 2 | 353 | STATION EQUIPMENT | 3,312,697,450 | 371,649,759 | 88,129,712 | 2,852,917,979 |
| 3 | 354 | TOWERS & FIXTURES | 1,248,111,264 | 35,433,594 | 19,276,379 | 1,193,401,291 |
| 4 | 355 | POLES & FIXTURES | 374,570,086 | 1,728,256 | 17,251,892 | 355,589,937 |
| 5 | 356 | CONDUCTOR & CLEARING ROW | 1,287,235,410 | 43,500,715 | 16,765,571 | 1,226,969,123 |
| 6 | 358 | UNDERGROUND CONDUCTOR & DEVICES | 20,794,218 | - | - | 20,794,218 |
| 7 | 359 | ROADS & TRAILS | 273,900,363 | 6,056,355 | 763,641 | 267,080,368 |
| 8 | 397 | COMMUNICATION EQUIPMENT | <u>442,310,698</u> | <u>36,542,160</u> | <u>44,772,567</u> | <u>360,995,971</u> |
| 9 | | TOTAL: | <u>\$ 7,351,000,463</u> | <u>\$ 520,754,455</u> | <u>\$ 190,376,523</u> | <u>\$ 6,639,869,485</u> |

**TABLE 9-5
PLANT INVESTMENT BY ACCOUNT AND YEAR OF INVESTMENT
(FIGURES ARE IN \$ DOLLARS)**

| | A | B | C | D | E | F | G | H | I | J |
|----|--------------|---------------------------|-------------------|-------------------|------------------|--------------------------|---------------------------------|----------------|-------------------------|-------------|
| 1 | ACCOUNT | 352 | 353 | 354 | 355 | 356 | 358 | 359 | 397 | |
| 2 | NAME | STRUCTURES & IMPROVEMENTS | STATION EQUIPMENT | TOWERS & FIXTURES | POLES & FIXTURES | CONDUCTOR & CLEARING ROW | UNDERGROUND CONDUCTOR & DEVICES | ROADS & TRAILS | COMMUNICATION EQUIPMENT | TOTAL |
| 3 | CURVE | R2.5 | S1 | R3 | R2.5 | R4 | S3 | R3 | S2 | |
| 4 | SERVICE LIFE | 65 | 45 | 100 | 55 | 100 | 40 | 75 | 19 | |
| 5 | 1940 | 476,062 | 1,812,502 | 926,103 | 25,606 | 1,079,234 | | 91,782 | | 4,411,289 |
| 6 | 1941 | 927,550 | 917,191 | 3,730,079 | 433,380 | 6,515,414 | | 144,555 | | 12,668,169 |
| 7 | 1942 | 655,363 | 1,339,495 | 67,986 | 210,246 | 1,257,105 | | 289,447 | | 3,819,642 |
| 8 | 1943 | 587,688 | 1,105,707 | 4,226,245 | 36,859 | 2,895,795 | | 381,085 | | 9,233,379 |
| 9 | 1944 | 14,066 | 8,933 | 918 | 16,690 | 305,568 | | 131,489 | | 477,664 |
| 10 | 1945 | 32,032 | 268,695 | 536,141 | 136,702 | 742,578 | | 129,005 | | 1,845,152 |
| 11 | 1946 | 153,424 | 318,920 | 602,984 | 50,451 | 299,611 | | 41,441 | | 1,466,831 |
| 12 | 1947 | 64,746 | 20,890 | 9,107 | 183,835 | 547,687 | | 112,439 | | 938,704 |
| 13 | 1948 | 282,743 | 1,351,847 | 324,789 | 398,494 | 1,761,543 | | 160,519 | | 4,279,935 |
| 14 | 1949 | 88,566 | 1,994,547 | 393,538 | 899,670 | 1,575,879 | | 114,243 | | 5,066,444 |
| 15 | 1950 | 657,081 | 1,797,360 | 3,994,408 | 707,803 | 5,500,526 | | 949,689 | | 13,606,867 |
| 16 | 1951 | 420,867 | 2,705,453 | 2,043,375 | 713,559 | 4,276,588 | | 11,879 | | 10,171,722 |
| 17 | 1952 | 355,096 | 2,054,048 | 7,179,525 | 479,848 | 7,133,967 | 193,932 | 9,140 | | 17,405,556 |
| 18 | 1953 | 1,394,228 | 8,777,672 | 9,406,359 | 3,090,439 | 10,927,304 | | 231,375 | | 33,827,378 |
| 19 | 1954 | 835,601 | 2,876,027 | 13,091,368 | 1,303,062 | 12,296,500 | | 1,581,255 | | 31,983,813 |
| 20 | 1955 | 841,817 | 4,918,080 | 2,126,071 | 386,867 | 2,605,388 | | 49,245 | | 10,927,468 |
| 21 | 1956 | 711,374 | 7,184,829 | 16,294,005 | 349,009 | 12,765,653 | | 355,213 | | 37,660,084 |
| 22 | 1957 | 1,039,728 | 7,209,196 | 1,477,666 | 991,206 | 3,641,597 | | 299,050 | | 14,658,443 |
| 23 | 1958 | 577,916 | 4,155,308 | 5,493,794 | 1,759,261 | 6,958,712 | | 738,896 | | 19,683,887 |
| 24 | 1959 | 308,063 | 6,755,886 | 2,159,559 | 1,035,953 | 3,358,277 | | 236,348 | - | 13,854,086 |
| 25 | 1960 | 121,487 | 2,517,503 | 756,488 | 336,802 | 1,104,808 | | 38,778 | | 4,875,865 |
| 26 | 1961 | 378,023 | 3,682,537 | 3,183,277 | 717,643 | 4,168,609 | | 283,261 | | 12,413,350 |
| 27 | 1962 | 513,912 | 2,532,676 | 11,358,446 | 1,232,702 | 9,760,967 | | 529,044 | | 25,927,747 |
| 28 | 1963 | 257,014 | 1,831,817 | 1,222,631 | 411,811 | 1,840,281 | | 405,707 | | 5,969,261 |
| 29 | 1964 | 545,408 | 2,295,248 | 12,142,615 | 193,118 | 1,538,415 | | 52,736 | | 16,767,540 |
| 30 | 1965 | 164,570 | 2,574,919 | 8,881,139 | 277,461 | 23,513,104 | | 538,436 | | 35,949,629 |
| 31 | 1966 | 534,437 | 6,448,389 | 4,065,177 | 1,078,563 | 6,173,805 | | 264,808 | - | 18,565,178 |
| 32 | 1967 | 1,082,426 | 7,662,147 | 11,213,131 | 775,955 | 11,962,679 | 284,507 | 235,346 | | 33,216,190 |
| 33 | 1968 | 2,586,901 | 14,631,972 | 34,619,212 | 398,131 | 36,706,310 | | 1,035,661 | - | 89,978,187 |
| 34 | 1969 | 1,929,033 | 14,902,901 | 25,131,430 | 1,128,553 | 27,655,524 | | 487,407 | - | 71,234,847 |
| 35 | 1970 | 11,392,850 | 38,007,381 | 26,607,338 | 1,132,938 | 28,490,386 | | 943,394 | | 106,574,287 |
| 36 | 1971 | 1,339,043 | 8,888,950 | 15,948,455 | 724,414 | 14,206,774 | | 328,307 | - | 41,435,943 |
| 37 | 1972 | 2,187,552 | 12,490,376 | 14,909,761 | 1,182,298 | 18,851,150 | | 878,608 | | 50,499,745 |
| 38 | 1973 | 2,032,890 | 11,860,844 | 28,621,272 | 507,773 | 26,205,327 | 1,493,582 | 1,613,013 | - | 72,334,701 |
| 39 | 1974 | 955,300 | 12,475,644 | 6,503,689 | 1,527,927 | 7,245,614 | | 1,101,600 | | 29,809,774 |
| 40 | 1975 | 3,411,759 | 21,707,421 | 20,932,602 | 1,555,515 | 14,493,367 | | 1,319,642 | - | 63,420,306 |
| 41 | 1976 | 1,730,520 | 20,019,399 | 32,771,629 | 2,029,686 | 29,176,322 | 1,317,799 | 860,285 | - | 87,905,640 |
| 42 | 1977 | 2,211,926 | 22,288,765 | 52,128,905 | 1,432,076 | 57,076,176 | 64,799 | 946,696 | - | 136,149,343 |
| 43 | 1978 | 1,156,144 | 33,453,208 | 7,713,140 | 1,381,584 | 7,584,533 | 43,378 | 50,708 | - | 51,382,695 |

**TABLE 9-5
PLANT INVESTMENT BY ACCOUNT AND YEAR OF INVESTMENT
(FIGURES ARE IN \$ DOLLARS)**

| | A | B | C | D | E | F | G | H | I | J |
|----|--------------|---------------------------|----------------------|----------------------|--------------------|--------------------------|---------------------------------|--------------------|-------------------------|----------------------|
| 1 | ACCOUNT | 352 | 353 | 354 | 355 | 356 | 358 | 359 | 397 | |
| 2 | NAME | STRUCTURES & IMPROVEMENTS | STATION EQUIPMENT | TOWERS & FIXTURES | POLES & FIXTURES | CONDUCTOR & CLEARING ROW | UNDERGROUND CONDUCTOR & DEVICES | ROADS & TRAILS | COMMUNICATION EQUIPMENT | TOTAL |
| 3 | CURVE | R2.5 | S1 | R3 | R2.5 | R4 | S3 | R3 | S2 | |
| 4 | SERVICE LIFE | 65 | 45 | 100 | 55 | 100 | 40 | 75 | 19 | |
| 44 | 1979 | 829,125 | 13,900,487 | 9,161,554 | 1,970,345 | 12,018,086 | | 1,336,894 | - | 39,216,491 |
| 45 | 1980 | 1,553,847 | 18,000,316 | 14,400,660 | 780,350 | 16,022,767 | | 201,487 | - | 50,959,427 |
| 46 | 1981 | 2,361,683 | 33,936,118 | 61,360,719 | 1,234,848 | 64,049,936 | | 526,795 | - | 163,470,099 |
| 47 | 1982 | 1,831,205 | 31,235,190 | 3,575,782 | 662,029 | 5,060,449 | | 355,871 | - | 42,720,526 |
| 48 | 1983 | 4,938,306 | 37,003,778 | 28,577,207 | 2,931,584 | 28,663,225 | | 826,879 | - | 102,940,979 |
| 49 | 1984 | 6,818,386 | 52,095,432 | 76,260,479 | 3,244,293 | 78,997,002 | | 8,388,752 | - | 225,804,344 |
| 50 | 1985 | 7,875,754 | 49,228,437 | 286,797 | 1,929,796 | 1,561,203 | 4,573,403 | 59,347 | - | 65,514,737 |
| 51 | 1986 | 4,967,389 | 21,648,043 | 7,491,442 | 8,485,733 | 16,210,096 | | 742,455 | - | 59,545,158 |
| 52 | 1987 | 7,506,190 | 32,340,604 | 100,490,771 | 13,847,331 | 145,470,634 | | 40,286,606 | - | 339,942,136 |
| 53 | 1988 | 8,268,167 | 19,372,113 | 4,837,575 | 2,508,510 | 6,810,774 | | 309,066 | - | 42,106,205 |
| 54 | 1989 | 25,777,277 | 105,837,423 | 2,055,601 | 3,645,863 | 2,294,160 | | 141,340 | - | 139,751,664 |
| 55 | 1990 | 3,704,482 | 51,930,584 | 3,377,301 | 1,341,163 | 2,590,241 | | | - | 62,943,771 |
| 56 | 1991 | 6,621,529 | 93,186,876 | 1,304,831 | 1,493,504 | 3,257,771 | | | - | 105,864,511 |
| 57 | 1992 | 3,157,930 | 118,942,933 | 11,015,954 | 2,025,109 | 20,029,162 | | 2,021,035 | - | 157,192,123 |
| 58 | 1993 | 8,269,431 | 77,266,995 | 14,158,498 | 2,859,084 | 23,645,239 | | 4,253,512 | - | 130,452,759 |
| 59 | 1994 | 28,174,069 | 231,481,549 | 5,806,581 | 3,641,305 | 4,863,220 | | 117,722 | - | 274,084,446 |
| 60 | 1995 | 11,104,797 | 66,685,299 | 825,569 | 996,873 | 5,071,877 | | 201,091 | 21,205,386 | 106,090,892 |
| 61 | 1996 | 6,766,302 | 80,581,744 | 1,685,145 | 198,282 | 3,844,738 | | 1,925 | 39,790,978 | 132,869,114 |
| 62 | 1997 | 7,022,574 | 86,057,649 | 15,093,318 | 2,160,086 | 12,029,703 | 13,996 | 2,634,641 | 46,458,040 | 171,470,007 |
| 63 | 1998 | 11,205,585 | 52,296,087 | 8,932,174 | 2,860,997 | 12,737,573 | 7,328 | 1,782,782 | 49,096,462 | 138,918,988 |
| 64 | 1999 | 5,425,683 | 75,801,415 | (644,635) | 7,715,074 | 121,378 | | 416,353 | 79,012,124 | 167,847,392 |
| 65 | 2000 | (7,164,721) | (44,688,130) | (158,164) | 2,301,241 | 997,491 | | 615,531 | (14,838,174) | (62,934,926) |
| 66 | 2001 | 2,028,911 | 40,956,728 | 1,404,165 | 4,203,037 | 2,102,595 | | 1,197,852 | 2,487,908 | 54,381,196 |
| 67 | 2002 | 5,972,166 | 69,447,481 | 1,935,126 | 23,447,846 | 14,522,549 | 5,548,135 | 806,409 | 23,091,128 | 144,770,841 |
| 68 | 2003 | 4,579,235 | 73,910,538 | 23,207,890 | 6,547,656 | 18,565,932 | 9,405 | 1,142,431 | 27,204,512 | 155,167,600 |
| 69 | 2004 | 3,129,828 | 91,520,922 | 42,648,145 | 11,635,959 | 15,102,341 | 26,853 | 1,126,124 | 20,328,092 | 185,518,263 |
| 70 | 2005 | 6,322,926 | 70,208,709 | 65,105,772 | 18,077,449 | 48,142,209 | | (34,713) | 2,654,650 | 210,477,001 |
| 71 | 2006 | 10,797,235 | 69,783,843 | 73,353,933 | 8,341,249 | 42,980,910 | 7,102,442 | 682,587 | 36,060,181 | 249,102,380 |
| 72 | 2007 | 7,962,660 | 64,028,658 | 1,189,741 | 13,060,262 | 7,640,705 | 20,273 | 5,029,763 | 3,786,537 | 102,718,599 |
| 73 | 2008 | 6,045,011 | 49,435,985 | 4,042,609 | 27,905,460 | 12,888,509 | | 4,455,860 | (2,201,701) | 102,571,733 |
| 74 | 2009 | 7,950,822 | 96,242,826 | 249,512 | 7,305,010 | 3,541,602 | | 3,110,282 | (22,077,833) | 96,322,221 |
| 75 | 2010 | 7,478,117 | 115,154,721 | 30,993,302 | 40,529,852 | 22,798,125 | | 12,874,643 | 13,718,456 | 243,547,216 |
| 76 | 2011 | 8,620,194 | 119,191,735 | 8,884,283 | 22,183,496 | 17,383,772 | | 12,665,460 | (13,076,457) | 175,852,484 |
| 77 | 2012 | 11,086,192 | 145,209,044 | 105,643,825 | 15,616,494 | 71,869,749 | | 28,343,785 | 1,731,339 | 379,500,429 |
| 78 | 2013 | 25,809,021 | 157,173,120 | 4,484,509 | 12,359,701 | 6,577,653 | 49,246 | 24,626,291 | 10,200,184 | 241,279,726 |
| 79 | 2014 | 25,786,027 | 134,741,369 | 10,070,881 | 23,039,275 | 11,549,138 | (7,328) | 11,234,418 | 38,007,574 | 254,421,353 |
| 80 | 2015 | 11,054,910 | (17,666,284) | 3,856,083 | 5,595,577 | 4,290,813 | 52,435 | 9,544,412 | 36,914,451 | 53,642,397 |
| 81 | 2016 | 44,787,523 | 349,144,727 | 108,113,286 | 34,654,471 | 106,493,351 | 33 | 73,898,164 | 42,756,860 | 759,848,416 |
| 82 | Total | 391,380,974 | 3,230,469,747 | 1,247,872,577 | 374,570,086 | 1,286,995,755 | 20,794,218 | 273,895,385 | 442,310,698 | 7,268,289,440 |

TABLE 9-6
PLANT INVESTMENT BY ACCOUNT FOR REPLACEMENT CALCULATIONS
(\$000s)

| | | A | B | C |
|-----------------|--------------|-----------------------|-----------------------|-----------------------|
| ACCOUNTS | | 2017 | 2018 | 2019 |
| 1 | SUBS 353 | 147,820 | 183,613 | 198,208 |
| 2 | LINES 354 | <u>95,666</u> | <u>102,004</u> | <u>123,724</u> |
| 3 | TOTAL | <u>243,486</u> | <u>285,617</u> | <u>321,932</u> |

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
|----|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 | TABLE 9-7: "STATISTICAL ANALYSIS OF INDUSTRIAL PROPERTY RETIREMENTS," TABLE 22 | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Tenth of Life | L0 | L1 | L2 | L3 | L4 | L5 | S0 | S1 | S2 | S3 | S4 | S5 | S6 | R0.5 | R1 | R2 | R2.5 | R3 | R4 | R5 | O1 |
| 5 | 1 | 2.93 | 0.95 | 0.11 | - | - | - | 1.17 | 0.16 | - | - | - | - | - | 2.42 | 2.78 | 1.14 | 0.65 | 0.15 | 0.02 | - | 2.53 |
| 6 | 2 | 4.82 | 2.09 | 0.68 | 0.08 | - | - | 2.68 | 0.89 | 0.12 | - | - | - | - | 3.49 | 3.23 | 1.57 | 0.99 | 0.40 | 0.06 | - | 5.25 |
| 7 | 3 | 5.92 | 3.64 | 1.60 | 0.47 | - | - | 3.84 | 2.03 | 0.58 | 0.06 | - | - | - | 4.29 | 3.69 | 2.12 | 1.50 | 0.88 | 0.19 | - | 5.52 |
| 8 | 4 | 6.72 | 5.35 | 2.78 | 1.22 | 0.16 | - | 4.83 | 3.36 | 1.59 | 0.38 | - | - | - | 4.98 | 4.18 | 2.81 | 2.21 | 1.60 | 0.51 | - | 5.80 |
| 9 | 5 | 7.32 | 6.90 | 4.83 | 2.40 | 0.95 | 0.01 | 5.71 | 4.78 | 3.16 | 1.34 | 0.10 | - | - | 5.64 | 4.76 | 3.67 | 3.13 | 2.59 | 1.18 | 0.05 | 6.10 |
| 10 | 6 | 7.77 | 7.95 | 7.42 | 4.63 | 2.64 | 0.46 | 6.52 | 6.17 | 5.18 | 3.32 | 0.79 | 0.02 | - | 6.31 | 5.47 | 4.73 | 4.28 | 3.83 | 2.45 | 0.46 | 6.41 |
| 11 | 7 | 8.18 | 8.45 | 9.50 | 8.28 | 5.00 | 2.64 | 7.25 | 7.48 | 7.39 | 6.36 | 3.28 | 0.46 | - | 7.01 | 6.31 | 6.01 | 5.69 | 5.37 | 4.53 | 1.96 | 6.74 |
| 12 | 8 | 8.54 | 8.82 | 10.62 | 12.11 | 8.66 | 6.70 | 7.94 | 8.63 | 9.49 | 10.00 | 8.66 | 4.05 | 0.36 | 7.75 | 7.25 | 7.50 | 7.50 | 7.50 | 7.49 | 5.59 | 7.09 |
| 13 | 9 | 8.87 | 9.16 | 10.85 | 14.12 | 16.35 | 14.73 | 8.56 | 9.61 | 11.20 | 13.32 | 15.88 | 15.63 | 8.93 | 8.48 | 8.25 | 9.17 | 9.78 | 10.38 | 11.23 | 13.40 | 7.45 |
| 14 | 10 | 9.16 | 9.47 | 10.58 | 13.60 | 20.53 | 28.50 | 9.14 | 10.37 | 12.30 | 15.36 | 21.28 | 29.85 | 40.71 | 9.20 | 9.24 | 10.85 | 12.21 | 13.57 | 17.14 | 24.92 | 7.83 |
| 15 | 11 | 9.41 | 9.73 | 10.20 | 11.66 | 16.77 | 23.71 | 9.67 | 10.92 | 12.71 | 15.52 | 21.28 | 29.85 | 40.71 | 9.85 | 10.16 | 12.32 | 14.13 | 15.94 | 21.62 | 29.98 | 8.23 |
| 16 | 12 | 9.62 | 9.93 | 9.93 | 9.80 | 11.27 | 12.45 | 10.14 | 11.24 | 12.45 | 13.88 | 15.91 | 15.63 | 8.93 | 10.41 | 10.94 | 13.23 | 14.72 | 16.20 | 18.76 | 18.70 | 8.66 |
| 17 | 13 | 9.78 | 10.08 | 9.86 | 8.80 | 7.93 | 6.23 | 10.54 | 11.34 | 11.68 | 11.17 | 8.80 | 4.05 | 0.36 | 10.84 | 11.52 | 13.26 | 13.53 | 13.79 | 11.69 | 4.71 | 9.10 |
| 18 | 14 | 9.92 | 10.18 | 9.94 | 8.70 | 6.40 | 3.26 | 10.86 | 11.24 | 10.64 | 8.49 | 3.79 | 0.47 | - | 11.12 | 11.84 | 12.34 | 11.16 | 9.97 | 5.69 | 0.49 | 9.57 |
| 19 | 15 | 10.01 | 10.24 | 10.06 | 9.14 | 6.00 | 2.09 | 11.08 | 10.96 | 9.61 | 6.79 | 2.20 | 0.14 | - | 11.20 | 11.86 | 10.85 | 9.24 | 7.63 | 3.08 | 0.65 | 10.06 |
| 20 | 16 | 10.08 | 10.25 | 10.16 | 9.76 | 6.57 | 2.78 | 11.20 | 10.54 | 8.84 | 6.50 | 3.31 | 0.74 | 0.01 | 11.10 | 11.56 | 9.54 | 7.94 | 6.34 | 3.94 | 1.78 | 10.57 |
| 21 | 17 | 10.12 | 10.24 | 10.19 | 10.26 | 8.12 | 5.42 | 11.17 | 10.05 | 8.52 | 7.44 | 6.10 | 2.95 | 0.30 | 10.81 | 10.97 | 8.66 | 7.49 | 6.31 | 5.87 | 4.13 | 11.11 |
| 22 | 18 | 10.15 | 10.21 | 10.16 | 10.48 | 10.34 | 9.68 | 10.95 | 9.55 | 8.69 | 8.99 | 9.76 | 8.16 | 3.18 | 10.37 | 10.18 | 8.04 | 7.86 | 7.68 | 8.19 | 8.17 | 11.68 |
| 23 | 19 | 10.15 | 10.16 | 10.09 | 10.42 | 12.28 | 14.97 | 10.48 | 9.17 | 9.23 | 10.50 | 13.32 | 15.90 | 14.83 | 9.85 | 9.39 | 8.17 | 8.65 | 9.13 | 10.67 | 13.68 | 12.28 |
| 24 | 20 | 10.14 | 10.11 | 10.02 | 10.18 | 12.93 | 18.28 | 9.55 | 9.08 | 9.89 | 11.51 | 15.55 | 22.11 | 31.68 | 9.36 | 8.87 | 8.94 | 9.70 | 10.46 | 12.94 | 18.94 | 12.91 |
| 25 | 21 | 10.12 | 10.06 | 9.96 | 9.94 | 12.22 | 16.98 | 8.86 | 9.43 | 10.38 | 11.87 | 15.61 | 22.11 | 31.68 | 9.12 | 8.74 | 9.66 | 10.57 | 11.48 | 14.43 | 20.78 | 11.01 |
| 26 | 22 | 10.10 | 10.01 | 9.93 | 9.80 | 10.88 | 12.84 | 9.22 | 9.81 | 10.62 | 11.60 | 13.57 | 15.90 | 14.83 | 9.41 | 9.15 | 10.24 | 11.12 | 12.00 | 14.40 | 17.13 | 8.76 |
| 27 | 23 | 10.08 | 9.97 | 9.92 | 9.80 | 9.62 | 8.75 | 9.51 | 10.06 | 10.62 | 10.91 | 10.39 | 8.19 | 3.18 | 9.66 | 9.52 | 10.62 | 11.27 | 11.92 | 12.67 | 10.08 | 8.93 |
| 28 | 24 | 10.05 | 9.95 | 9.94 | 9.89 | 8.78 | 5.94 | 9.73 | 10.20 | 10.48 | 10.07 | 7.45 | 3.11 | 0.30 | 9.87 | 9.84 | 10.79 | 11.04 | 11.29 | 10.00 | 4.35 | 9.10 |
| 29 | 25 | 10.03 | 9.94 | 9.96 | 10.00 | 8.47 | 4.73 | 9.90 | 10.26 | 10.25 | 9.37 | 5.82 | 1.35 | 0.02 | 10.02 | 10.08 | 10.77 | 10.56 | 10.35 | 7.64 | 2.27 | 9.26 |
| 30 | 26 | 10.01 | 9.94 | 9.99 | 10.07 | 8.69 | 5.25 | 10.02 | 10.25 | 10.02 | 8.99 | 5.88 | 2.06 | 0.15 | 10.13 | 10.25 | 10.58 | 10.01 | 9.44 | 6.54 | 3.02 | 9.41 |
| 31 | 27 | 10.00 | 9.94 | 10.00 | 10.10 | 9.33 | 7.28 | 10.10 | 10.20 | 9.84 | 8.99 | 7.34 | 4.82 | 1.23 | 10.20 | 10.34 | 10.30 | 9.57 | 8.84 | 6.85 | 5.40 | 9.56 |
| 32 | 28 | 9.98 | 9.96 | 10.02 | 10.07 | 10.12 | 10.24 | 10.15 | 10.13 | 9.75 | 9.31 | 9.53 | 9.42 | 5.79 | 10.21 | 10.36 | 10.00 | 9.35 | 8.70 | 8.11 | 8.85 | 9.69 |
| 33 | 29 | 9.98 | 9.97 | 10.02 | 10.03 | 10.73 | 13.08 | 10.17 | 10.05 | 9.74 | 9.78 | 11.62 | 14.70 | 16.08 | 10.19 | 10.31 | 9.76 | 9.37 | 8.97 | 9.70 | 12.74 | 9.82 |
| 34 | 30 | 9.98 | 9.99 | 10.02 | 9.98 | 10.96 | 14.53 | 10.16 | 9.99 | 9.79 | 10.23 | 12.94 | 18.34 | 26.73 | 10.15 | 10.23 | 9.61 | 9.55 | 9.49 | 11.13 | 15.91 | 9.93 |
| 35 | 31 | 9.98 | 10.00 | 10.01 | 9.96 | 10.79 | 13.98 | 10.14 | 9.94 | 9.89 | 10.52 | 13.10 | 18.35 | 26.73 | 10.10 | 10.13 | 9.59 | 9.83 | 10.06 | 12.06 | 16.93 | 10.03 |
| 36 | 32 | 9.98 | 10.01 | 10.00 | 9.96 | 10.38 | 11.95 | 10.10 | 9.91 | 9.99 | 10.59 | 12.15 | 14.73 | 16.08 | 10.03 | 10.02 | 9.67 | 10.09 | 10.50 | 12.29 | 15.07 | 10.11 |
| 37 | 33 | 9.98 | 10.01 | 10.00 | 9.98 | 9.93 | 9.53 | 10.06 | 9.91 | 10.07 | 10.47 | 10.54 | 9.55 | 5.79 | 9.98 | 9.93 | 9.82 | 10.28 | 10.73 | 11.77 | 11.12 | 10.17 |
| 38 | 34 | 9.99 | 10.01 | 10.00 | 10.00 | 9.60 | 7.61 | 10.02 | 9.92 | 10.12 | 10.22 | 8.92 | 5.26 | 1.24 | 9.93 | 9.86 | 9.98 | 10.35 | 10.71 | 10.70 | 7.04 | 10.21 |
| 39 | 35 | 9.99 | 10.01 | 10.00 | 10.01 | 9.46 | 6.72 | 9.98 | 9.95 | 10.12 | 9.96 | 7.86 | 3.21 | 0.22 | 9.91 | 9.84 | 10.11 | 10.31 | 10.50 | 9.49 | 4.65 | 10.24 |
| 40 | 36 | 10.00 | 10.01 | 10.00 | 10.02 | 9.52 | 7.04 | 9.94 | 9.98 | 10.09 | 9.76 | 7.67 | 3.60 | 0.51 | 9.91 | 9.84 | 10.19 | 10.19 | 10.18 | 8.57 | 4.54 | 10.23 |
| 41 | 37 | 10.00 | 10.00 | 10.00 | 10.01 | 9.75 | 8.36 | 9.92 | 10.01 | 10.04 | 9.67 | 8.33 | 6.01 | 2.36 | 9.92 | 9.88 | 10.20 | 10.03 | 9.86 | 8.26 | 6.24 | 10.20 |
| 42 | 38 | 10.00 | 10.00 | 10.00 | 10.01 | 10.02 | 10.19 | 9.92 | 10.03 | 10.00 | 9.70 | 9.49 | 9.73 | 7.47 | 9.95 | 9.93 | 10.17 | 9.90 | 9.63 | 8.58 | 8.94 | 10.14 |
| 43 | 39 | 10.00 | 10.00 | 10.00 | 10.00 | 10.23 | 11.82 | 9.93 | 10.04 | 9.96 | 9.82 | 10.70 | 13.56 | 16.07 | 9.98 | 9.99 | 10.10 | 9.82 | 9.54 | 9.33 | 11.83 | 10.05 |
| 44 | 40 | 10.00 | 10.00 | 10.00 | 9.99 | 10.32 | 12.63 | 9.96 | 10.04 | 9.95 | 9.97 | 11.53 | 16.02 | 23.53 | 10.01 | 10.03 | 10.03 | 9.82 | 9.61 | 10.18 | 14.02 | 9.92 |
| 45 | 41 | 10.00 | 10.00 | 10.00 | 9.99 | 10.28 | 12.36 | 9.99 | 10.02 | 9.95 | 10.10 | 11.73 | 16.04 | 23.53 | 10.03 | 10.06 | 9.96 | 9.87 | 9.77 | 10.86 | 14.74 | 9.78 |
| 46 | 42 | 10.00 | 10.00 | 10.00 | 10.00 | 10.15 | 11.24 | 10.02 | 10.01 | 9.96 | 10.17 | 11.30 | 13.66 | 16.07 | 10.04 | 10.07 | 9.92 | 9.95 | 9.97 | 11.18 | 13.67 | 9.80 |
| 47 | 43 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 9.80 | 10.03 | 10.00 | 9.98 | 10.18 | 10.47 | 10.02 | 7.48 | 10.04 | 10.06 | 9.90 | 10.03 | 10.15 | 11.09 | 11.21 | 9.85 |
| 48 | 44 | 10.00 | 10.00 | 10.00 | 10.00 | 9.87 | 8.60 | 10.03 | 9.99 | 10.00 | 10.13 | 9.56 | 6.70 | 2.39 | 10.03 | 10.04 | 9.91 | 10.08 | 10.25 | 10.66 | 8.43 | 9.89 |
| 49 | 45 | 10.00 | 10.00 | 10.00 | 10.00 | 9.81 | 8.02 | 10.03 | 9.99 | 10.02 | 10.05 | 8.91 | 4.88 | 0.70 | 10.02 | 10.02 | 9.94 | 10.10 | 10.26 | 10.06 | 6.47 | 9.93 |
| 50 | 46 | 10.00 | 10.00 | 10.00 | 10.00 | 9.83 | 8.19 | 10.02 | 10.00 | 10.02 | 9.97 | 8.71 | 5.02 | 1.05 | 10.01 | 10.00 | 9.98 | 10.09 | 10.20 | 9.51 | 6.01 | 9.96 |
| 51 | 47 | 10.00 | 10.00 | 10.00 | 10.00 | 9.90 | 9.00 | 10.01 | 10.00 | 10.02 | 9.92 | 8.99 | 6.89 | 3.38 | 10.00 | 9.99 | 10.01 | 10.05 | 10.09 | 9.18 | 7.01 | 9.99 |
| 52 | 48 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.10 | 10.01 | 10.00 | 10.02 | 9.90 | 9.59 | 9.76 | 8.49 | 9.99 | 9.98 | 10.04 | 10.01 | 9.97 | 9.16 | 8.95 | 10.00 |
| 53 | 49 | 10.00 | 10.00 | 10.00 | 10.00 | 10.07 | 11.07 | 10.00 | 10.00 | 10.01 | 9.91 | 10.26 | 12.63 | 15.66 | 9.99 | 9.97 | 10.05 | 9.97 | 9.88 | 9.42 | 11.09 | 10.02 |

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
|-----|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 | TABLE 9-7: "STATISTICAL ANALYSIS OF INDUSTRIAL PROPERTY RETIREMENTS," TABLE 22 | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Tenth of Life | L0 | L1 | L2 | L3 | L4 | L5 | S0 | S1 | S2 | S3 | S4 | S5 | S6 | R0.5 | R1 | R2 | R2.5 | R3 | R4 | R5 | O1 |
| 54 | 50 | 10.00 | 10.00 | 10.00 | 10.00 | 10.11 | 11.55 | 9.99 | 10.00 | 10.00 | 9.95 | 10.77 | 14.42 | 21.26 | 9.98 | 9.97 | 10.04 | 9.94 | 9.84 | 9.84 | 12.73 | 10.03 |
| 55 | 51 | 10.00 | 10.00 | 10.00 | 10.00 | 10.10 | 11.42 | 9.99 | 10.00 | 9.99 | 10.00 | 10.95 | 14.47 | 21.26 | 9.99 | 9.98 | 10.01 | 9.93 | 9.85 | 10.26 | 13.32 | 10.03 |
| 56 | 52 | 10.00 | 10.00 | 10.00 | 10.00 | 10.06 | 10.77 | 9.99 | 10.00 | 9.99 | 10.04 | 10.78 | 12.81 | 15.66 | 9.99 | 9.98 | 9.99 | 9.95 | 9.90 | 10.54 | 12.69 | 10.03 |
| 57 | 53 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.92 | 9.99 | 10.00 | 9.99 | 10.06 | 10.35 | 10.19 | 8.50 | 9.99 | 9.99 | 9.98 | 9.98 | 9.98 | 10.61 | 11.10 | 10.02 |
| 58 | 54 | 10.00 | 10.00 | 10.00 | 10.00 | 9.96 | 9.18 | 10.00 | 10.00 | 9.99 | 10.05 | 9.85 | 7.67 | 3.46 | 10.00 | 10.00 | 9.97 | 10.01 | 10.04 | 10.47 | 9.18 | 10.01 |
| 59 | 55 | 10.00 | 10.00 | 10.00 | 10.00 | 9.94 | 8.81 | 10.00 | 10.00 | 10.00 | 10.04 | 9.46 | 6.19 | 1.40 | 10.01 | 10.01 | 9.97 | 10.03 | 10.08 | 10.20 | 7.70 | 10.00 |
| 60 | 56 | 10.00 | 10.00 | 10.00 | 10.00 | 9.94 | 8.90 | 10.00 | 10.00 | 10.00 | 10.01 | 9.30 | 6.20 | 1.72 | 10.01 | 10.01 | 9.98 | 10.04 | 10.10 | 9.90 | 7.18 | 9.99 |
| 61 | 57 | 10.00 | 10.00 | 10.00 | 10.00 | 9.96 | 9.39 | 10.00 | 10.00 | 10.00 | 9.98 | 9.40 | 7.57 | 4.25 | 10.01 | 10.01 | 10.00 | 10.04 | 10.08 | 9.66 | 7.72 | 9.98 |
| 62 | 58 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.05 | 10.00 | 10.00 | 10.00 | 9.97 | 9.70 | 7.75 | 9.09 | 10.01 | 10.01 | 10.01 | 10.03 | 10.04 | 9.53 | 9.03 | 9.97 |
| 63 | 59 | 10.00 | 10.00 | 10.00 | 10.00 | 10.02 | 10.63 | 10.00 | 10.00 | 10.00 | 9.97 | 10.08 | 11.91 | 15.14 | 10.00 | 10.00 | 10.01 | 10.01 | 10.00 | 9.62 | 10.58 | 9.96 |
| 64 | 60 | 10.00 | 10.00 | 10.00 | 10.00 | 10.04 | 10.92 | 10.00 | 10.00 | 10.00 | 9.98 | 10.38 | 13.27 | 19.53 | 10.00 | 10.00 | 10.02 | 9.99 | 9.96 | 9.79 | 11.82 | 9.96 |
| 65 | 61 | 10.00 | 10.00 | 10.00 | 10.00 | 10.04 | 10.85 | 10.00 | 10.00 | 10.00 | 9.99 | 10.52 | 13.34 | 19.53 | 10.00 | 10.00 | 10.01 | 9.98 | 9.94 | 10.02 | 12.34 | 9.96 |
| 66 | 62 | 10.00 | 10.00 | 10.00 | 10.00 | 10.02 | 10.48 | 10.00 | 10.00 | 10.00 | 10.00 | 10.46 | 12.16 | 15.14 | 10.00 | 9.99 | 10.01 | 9.98 | 9.94 | 10.20 | 11.98 | 9.97 |
| 67 | 63 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.97 | 10.00 | 10.00 | 10.00 | 10.01 | 10.24 | 10.24 | 9.12 | 10.00 | 9.99 | 10.00 | 9.98 | 9.96 | 10.30 | 10.94 | 9.98 |
| 68 | 64 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 9.52 | 10.00 | 10.00 | 10.00 | 10.02 | 9.97 | 8.35 | 4.39 | 10.00 | 9.99 | 10.00 | 9.99 | 9.98 | 10.29 | 9.61 | 9.99 |
| 69 | 65 | 10.00 | 10.00 | 10.00 | 10.00 | 9.98 | 9.29 | 10.00 | 10.00 | 10.00 | 10.02 | 9.74 | 7.18 | 2.18 | 10.00 | 9.99 | 9.99 | 10.00 | 10.01 | 10.18 | 8.51 | 9.99 |
| 70 | 66 | 10.00 | 10.00 | 10.00 | 10.00 | 9.98 | 9.34 | 10.00 | 10.00 | 10.00 | 10.01 | 9.62 | 7.12 | 2.44 | 10.00 | 10.00 | 9.99 | 10.01 | 10.03 | 10.03 | 8.03 | 9.99 |
| 71 | 67 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 9.62 | 10.00 | 10.00 | 10.00 | 10.00 | 9.65 | 8.12 | 4.97 | 10.00 | 10.00 | 9.99 | 10.01 | 10.03 | 9.88 | 8.30 | 9.99 |
| 72 | 68 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.02 | 10.00 | 10.00 | 10.00 | 9.99 | 9.80 | 9.74 | 9.44 | 10.00 | 10.00 | 10.00 | 10.02 | 10.03 | 9.79 | 9.16 | 9.99 |
| 73 | 69 | 10.00 | 10.00 | 10.00 | 10.00 | 10.01 | 10.37 | 10.00 | 10.00 | 10.00 | 9.99 | 10.00 | 11.38 | 14.60 | 10.00 | 10.00 | 10.00 | 10.01 | 10.02 | 9.78 | 10.26 | 9.99 |
| 74 | 70 | 10.00 | 10.00 | 10.00 | 10.00 | 10.01 | 10.55 | 10.00 | 10.00 | 10.00 | 9.99 | 10.18 | 12.42 | 18.17 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.84 | 11.19 | 9.99 |
| 75 | 71 | 10.00 | 10.00 | 10.00 | 10.00 | 10.01 | 10.51 | 10.00 | 10.00 | 10.00 | 9.99 | 10.28 | 12.51 | 18.17 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.94 | 11.63 | 9.99 |
| 76 | 72 | 10.00 | 10.00 | 10.00 | 10.00 | 10.01 | 10.29 | 10.00 | 10.00 | 10.00 | 10.00 | 10.26 | 11.66 | 14.62 | 10.00 | 10.00 | 10.00 | 9.99 | 9.98 | 10.05 | 11.46 | 9.99 |
| 77 | 73 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 10.00 | 10.00 | 10.00 | 10.00 | 10.16 | 10.25 | 9.50 | 10.00 | 10.00 | 10.00 | 9.99 | 9.98 | 10.13 | 10.77 | 9.98 |
| 78 | 74 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.72 | 10.00 | 10.00 | 10.00 | 10.00 | 10.01 | 8.82 | 5.18 | 10.00 | 10.00 | 10.00 | 9.99 | 9.98 | 10.16 | 9.85 | 9.98 |
| 79 | 75 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 9.58 | 10.00 | 10.00 | 10.00 | 10.00 | 9.88 | 7.92 | 2.98 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 10.13 | 9.04 | 9.98 |
| 80 | 76 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 9.60 | 10.00 | 10.00 | 10.00 | 10.00 | 9.80 | 7.83 | 3.18 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.06 | 8.63 | 9.98 |
| 81 | 77 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 9.77 | 10.00 | 10.00 | 10.00 | 10.00 | 9.80 | 8.54 | 5.58 | 10.00 | 10.00 | 10.00 | 10.01 | 10.01 | 9.98 | 8.74 | 9.98 |
| 82 | 78 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.87 | 9.75 | 9.64 | 10.00 | 10.00 | 10.00 | 10.01 | 10.01 | 9.91 | 9.30 | 9.98 |
| 83 | 79 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.22 | 10.00 | 10.00 | 10.00 | 10.00 | 9.98 | 10.99 | 14.09 | 10.00 | 10.00 | 10.00 | 10.01 | 10.01 | 9.88 | 10.08 | 9.98 |
| 84 | 80 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.33 | 10.00 | 10.00 | 10.00 | 10.00 | 10.08 | 11.79 | 17.06 | 10.00 | 10.00 | 10.00 | 10.01 | 10.01 | 9.89 | 10.76 | 9.98 |
| 85 | 81 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.31 | 10.00 | 10.00 | 10.00 | 10.00 | 10.14 | 11.88 | 17.06 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.91 | 11.13 | 9.98 |
| 86 | 82 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.18 | 10.00 | 10.00 | 10.00 | 10.00 | 10.15 | 11.28 | 14.12 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.97 | 11.07 | 9.99 |
| 87 | 83 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.10 | 10.24 | 11.07 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.03 | 10.62 | 9.99 |
| 88 | 84 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.84 | 10.00 | 10.00 | 10.00 | 10.00 | 10.02 | 9.16 | 4.51 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.08 | 9.98 | 9.99 |
| 89 | 85 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.75 | 10.00 | 10.00 | 10.00 | 10.00 | 9.94 | 8.46 | 3.75 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.09 | 9.39 | 9.99 |
| 90 | 86 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.76 | 10.00 | 10.00 | 10.00 | 10.00 | 9.90 | 8.37 | 3.88 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.07 | 9.06 | 9.99 |
| 91 | 87 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.86 | 10.00 | 10.00 | 10.00 | 10.00 | 9.89 | 8.88 | 6.10 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.02 | 9.09 | 9.99 |
| 92 | 88 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.92 | 9.77 | 9.75 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.98 | 9.44 | 9.98 |
| 93 | 89 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.12 | 10.00 | 10.00 | 10.00 | 10.00 | 9.98 | 10.70 | 13.62 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.95 | 9.98 | 9.98 |
| 94 | 90 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.19 | 10.00 | 10.00 | 10.00 | 10.00 | 10.04 | 11.32 | 16.13 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.94 | 10.48 | 9.98 |
| 95 | 91 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.19 | 10.00 | 10.00 | 10.00 | 10.00 | 10.08 | 11.42 | 16.17 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.95 | 10.78 | 9.98 |
| 96 | 92 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.11 | 10.00 | 10.00 | 10.00 | 10.00 | 10.08 | 10.98 | 13.94 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.98 | 10.78 | 9.98 |
| 97 | 93 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.06 | 10.21 | 10.23 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.02 | 10.49 | 9.98 |
| 98 | 94 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.90 | 10.00 | 10.00 | 10.00 | 10.00 | 10.02 | 9.41 | 6.06 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.04 | 10.05 | 9.98 |
| 99 | 95 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.85 | 10.00 | 10.00 | 10.00 | 10.00 | 9.98 | 8.86 | 4.18 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.05 | 9.62 | 9.98 |
| 100 | 96 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.85 | 10.00 | 10.00 | 10.00 | 10.00 | 9.95 | 8.77 | 4.52 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.04 | 9.36 | 9.98 |
| 101 | 97 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.91 | 10.00 | 10.00 | 10.00 | 10.00 | 9.94 | 9.14 | 6.55 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.01 | 9.34 | 9.98 |
| 102 | 98 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.95 | 9.80 | 6.81 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.98 | 9.56 | 9.98 |
| 103 | 99 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.07 | 10.00 | 10.00 | 10.00 | 10.00 | 9.98 | 10.50 | 13.19 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 9.93 | 9.98 |

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V |
|-----|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| 1 | TABLE 9-7: "STATISTICAL ANALYSIS OF INDUSTRIAL PROPERTY RETIREMENTS," TABLE 22 | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Tenth of Life | L0 | L1 | L2 | L3 | L4 | L5 | S0 | S1 | S2 | S3 | S4 | S5 | S6 | R0.5 | R1 | R2 | R2.5 | R3 | R4 | R5 | O1 |
| 104 | 100 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.12 | 10.00 | 10.00 | 10.00 | 10.00 | 10.01 | 10.97 | 15.36 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.01 | 10.30 | 9.98 |
| 105 | 101 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.11 | 10.00 | 10.00 | 10.00 | 10.00 | 10.04 | 11.06 | 15.45 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.01 | 10.53 | 9.98 |
| 106 | 102 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.07 | 10.00 | 10.00 | 10.00 | 10.00 | 10.05 | 10.76 | 13.46 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.02 | 10.56 | 9.98 |
| 107 | 103 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.04 | 10.19 | 10.12 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.02 | 10.38 | 9.98 |
| 108 | 104 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.94 | 10.00 | 10.00 | 10.00 | 10.00 | 10.02 | 9.57 | 6.74 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.02 | 10.08 | 9.98 |
| 109 | 105 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.91 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 9.16 | 4.89 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.01 | 9.77 | 9.98 |
| 110 | 106 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.91 | 10.00 | 10.00 | 10.00 | 10.00 | 9.97 | 9.08 | 5.07 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.56 | 9.98 |
| 111 | 107 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.95 | 10.00 | 10.00 | 10.00 | 10.00 | 9.96 | 9.34 | 6.94 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 9.53 | 9.98 |
| 112 | 108 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.97 | 9.83 | 9.85 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.98 | 9.66 | 9.98 |
| 113 | 109 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.04 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 10.35 | 12.81 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 9.91 | 9.98 |
| 114 | 110 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.07 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.72 | 14.70 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.18 | 9.98 |
| 115 | 111 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.07 | 10.00 | 10.00 | 10.00 | 10.00 | 10.02 | 10.80 | 14.79 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.36 | 9.98 |
| 116 | 112 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.04 | 10.00 | 10.00 | 10.00 | 10.00 | 10.03 | 10.58 | 13.04 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.01 | 10.40 | 9.98 |
| 117 | 113 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.02 | 10.16 | 10.11 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.01 | 10.29 | 9.98 |
| 118 | 114 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.97 | 10.00 | 10.00 | 10.00 | 10.00 | 10.01 | 9.70 | 7.21 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.01 | 10.09 | 9.98 |
| 119 | 115 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.95 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.38 | 5.53 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.87 | 9.98 |
| 120 | 116 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.95 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 9.31 | 5.61 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 9.71 | 9.98 |
| 121 | 117 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.97 | 10.00 | 10.00 | 10.00 | 10.00 | 9.98 | 9.49 | 7.27 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 9.66 | 9.98 |
| 122 | 118 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.98 | 9.85 | 9.86 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 9.74 | 9.98 |
| 123 | 119 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.02 | 10.00 | 10.00 | 10.00 | 10.00 | 9.99 | 10.25 | 12.47 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.91 | 9.98 |
| 124 | 120 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.04 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.53 | 14.13 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.10 | 9.98 | |

**TABLE 9-8
HANDY-WHITMAN INDEX - PACIFIC REGION - JANUARY 1, 2013**

| | A | B | C | D | E | F | G |
|----|---------|-------------|-----------|------------|------------|-----------|-------------|
| | YEAR | TOTAL PLANT | STATION | TOWERS | POLES | OVERHEAD | UNDERGROUND |
| | ACCOUNT | 300 | EQUIPMENT | & FIXTURES | & FIXTURES | CONDUCTOR | CONDUCTOR |
| | | | 353 | 354 | 355 | 356 | 358 |
| 1 | 1940 | 22 | 35 | 17 | 15 | 22 | 22 |
| 2 | 1941 | 23 | 36 | 19 | 17 | 23 | 25 |
| 3 | 1942 | 25 | 37 | 20 | 18 | 25 | 26 |
| 4 | 1943 | 25 | 36 | 20 | 19 | 26 | 26 |
| 5 | 1944 | 25 | 35 | 21 | 21 | 26 | 25 |
| 6 | 1945 | 26 | 35 | 21 | 22 | 26 | 25 |
| 7 | 1946 | 29 | 39 | 24 | 24 | 30 | 30 |
| 8 | 1947 | 34 | 47 | 28 | 29 | 35 | 35 |
| 9 | 1948 | 37 | 49 | 31 | 32 | 39 | 42 |
| 10 | 1949 | 38 | 52 | 32 | 32 | 39 | 46 |
| 11 | 1950 | 40 | 56 | 34 | 33 | 41 | 49 |
| 12 | 1951 | 45 | 63 | 37 | 36 | 47 | 61 |
| 13 | 1952 | 46 | 64 | 39 | 37 | 49 | 63 |
| 14 | 1953 | 49 | 68 | 41 | 39 | 51 | 62 |
| 15 | 1954 | 50 | 69 | 42 | 40 | 52 | 63 |
| 16 | 1955 | 52 | 70 | 43 | 42 | 55 | 66 |
| 17 | 1956 | 56 | 77 | 46 | 44 | 61 | 65 |
| 18 | 1957 | 57 | 81 | 48 | 47 | 63 | 57 |
| 19 | 1958 | 59 | 84 | 51 | 49 | 63 | 57 |
| 20 | 1959 | 60 | 83 | 53 | 50 | 62 | 60 |
| 21 | 1960 | 60 | 77 | 55 | 52 | 63 | 61 |
| 22 | 1961 | 59 | 70 | 57 | 53 | 63 | 61 |
| 23 | 1962 | 59 | 69 | 57 | 54 | 65 | 61 |
| 24 | 1963 | 59 | 65 | 59 | 55 | 61 | 61 |
| 25 | 1964 | 61 | 69 | 61 | 56 | 64 | 66 |
| 26 | 1965 | 64 | 73 | 63 | 58 | 67 | 72 |
| 27 | 1966 | 67 | 75 | 67 | 61 | 70 | 73 |
| 28 | 1967 | 70 | 79 | 71 | 63 | 73 | 75 |
| 29 | 1968 | 73 | 83 | 74 | 65 | 73 | 73 |
| 30 | 1969 | 78 | 85 | 78 | 69 | 80 | 79 |
| 31 | 1970 | 83 | 89 | 82 | 76 | 89 | 82 |
| 32 | 1971 | 89 | 91 | 87 | 81 | 98 | 82 |
| 33 | 1972 | 93 | 94 | 92 | 87 | 99 | 92 |
| 34 | 1973 | 100 | 100 | 100 | 100 | 100 | 100 |
| 35 | 1974 | 123 | 124 | 123 | 126 | 117 | 134 |
| 36 | 1975 | 145 | 148 | 145 | 144 | 146 | 137 |
| 37 | 1976 | 158 | 157 | 149 | 150 | 172 | 143 |

**TABLE 9-8
HANDY-WHITMAN INDEX - PACIFIC REGION - JANUARY 1, 2013**

| A | B | C | D | E | F | G | |
|-----------------|--------------------|-----------------------------|-----------------------------|----------------------------|------------------------------|---------------------------------|-------|
| YEAR ACCOUNT | TOTAL PLANT 300 | STATION EQUIPMENT 353 | TOWERS & FIXTURES 354 | POLES & FIXTURES 355 | OVERHEAD CONDUCTOR 356 | UNDERGROUND CONDUCTOR 358 | |
| 38 | 1977 | 170 | 170 | 155 | 160 | 187 | 158 |
| 39 | 1978 | 175 | 182 | 169 | 171 | 179 | 160 |
| 40 | 1979 | 190 | 197 | 187 | 189 | 193 | 189 |
| 41 | 1980 | 213 | 218 | 210 | 211 | 220 | 221 |
| 42 | 1981 | 231 | 237 | 225 | 233 | 241 | 244 |
| 43 | 1982 | 244 | 253 | 229 | 252 | 251 | 269 |
| 44 | 1983 | 251 | 256 | 234 | 258 | 268 | 273 |
| 45 | 1984 | 252 | 259 | 247 | 260 | 258 | 267 |
| 46 | 1985 | 253 | 260 | 256 | 256 | 252 | 254 |
| 47 | 1986 | 255 | 262 | 261 | 258 | 252 | 275 |
| 48 | 1987 | 257 | 269 | 267 | 261 | 243 | 278 |
| 49 | 1988 | 281 | 281 | 278 | 281 | 311 | 293 |
| 50 | 1989 | 295 | 295 | 287 | 301 | 320 | 314 |
| 51 | 1990 | 304 | 312 | 288 | 312 | 323 | 364 |
| 52 | 1991 | 309 | 315 | 281 | 333 | 333 | 407 |
| 53 | 1992 | 311 | 324 | 284 | 350 | 318 | 416 |
| 54 | 1993 | 323 | 337 | 296 | 360 | 330 | 423 |
| 55 | 1994 | 337 | 352 | 312 | 378 | 340 | 424 |
| 56 | 1995 | 353 | 364 | 322 | 392 | 368 | 436 |
| 57 | 1996 | 359 | 366 | 333 | 407 | 374 | 441 |
| 58 | 1997 | 365 | 372 | 341 | 420 | 379 | 446 |
| 59 | 1998 | 375 | 382 | 348 | 425 | 390 | 450 |
| 60 | 1999 | 372 | 388 | 357 | 417 | 363 | 458 |
| 61 | 2000 | 395 | 415 | 368 | 422 | 398 | 458 |
| 62 | 2001 | 401 | 421 | 377 | 432 | 403 | 447 |
| 63 | 2002 | 411 | 434 | 385 | 448 | 406 | 466 |
| 64 | 2003 | 413 | 432 | 389 | 456 | 412 | 475 |
| 65 | 2004 | 449 | 477 | 422 | 470 | 445 | 528 |
| 66 | 2005 | 478 | 507 | 437 | 503 | 489 | 550 |
| 67 | 2006 | 520 | 546 | 459 | 522 | 568 | 594 |
| 68 | 2007 | 561 | 597 | 498 | 534 | 608 | 608 |
| 69 | 2008 | 613 | 641 | 517 | 576 | 716 | 818 |
| 70 | 2009 | 574 | 657 | 502 | 596 | 525 | 832 |
| 71 | 2010 | 613 | 691 | 520 | 595 | 610 | 829 |
| 72 | 2011 | 640 | 720 | 544 | 602 | 647 | 894 |
| 73 | 2012 | 639 | 738 | 556 | 612 | 598 | 934 |
| 74 | 2013 | 652 | 750 | 559 | 622 | 624 | 969 |
| 75 | 2014 | 665 | 769 | 569 | 621 | 634 | 1,007 |
| 76 | 2015 | 677 | 788 | 579 | 624 | 643 | 1,025 |
| 77 | 2016 | 692 | 795 | 588 | 642 | 666 | 1,040 |

**TABLE 9-9
2018 REPLACEMENTS BY ACCOUNT**

| | | A | B | C | D | E | F | G | H | I |
|----|------|------------|-------------|------------|------------|------------|-----------|-----------|------------|-------------|
| | | 352 | 353 | 354 | 355 | 356 | 358 | 359 | 397 | Total |
| 1 | 2019 | 7,869,438 | 105,547,320 | 13,419,846 | 9,972,427 | 9,853,378 | 1,486,479 | 2,667,756 | 31,298,631 | 182,115,276 |
| 2 | 2020 | 8,100,415 | 108,248,715 | 13,908,583 | 10,135,875 | 10,450,522 | 1,463,864 | 2,710,997 | 31,843,918 | 186,862,889 |
| 3 | 2021 | 8,299,203 | 111,833,704 | 14,584,960 | 10,249,939 | 11,467,297 | 1,454,375 | 2,782,513 | 31,416,254 | 192,088,245 |
| 4 | 2022 | 8,817,783 | 114,249,950 | 15,116,848 | 10,374,648 | 12,141,823 | 1,530,520 | 2,955,094 | 31,330,084 | 196,516,751 |
| 5 | 2023 | 8,991,633 | 116,343,632 | 16,002,402 | 10,429,467 | 12,999,838 | 1,516,514 | 3,020,028 | 30,663,912 | 199,967,428 |
| 6 | 2024 | 9,166,865 | 118,755,667 | 16,749,102 | 10,487,998 | 13,602,878 | 1,472,078 | 3,067,632 | 30,091,337 | 203,393,558 |
| 7 | 2025 | 9,270,935 | 121,087,255 | 17,094,346 | 10,439,446 | 14,226,586 | 1,388,307 | 3,333,007 | 29,566,486 | 206,406,369 |
| 8 | 2026 | 9,340,771 | 124,135,194 | 17,784,636 | 10,517,824 | 14,843,203 | 1,518,356 | 3,419,226 | 28,846,444 | 210,405,654 |
| 9 | 2027 | 9,612,977 | 125,955,854 | 18,385,119 | 10,674,027 | 15,603,504 | 1,516,252 | 3,480,861 | 28,417,587 | 213,646,181 |
| 10 | 2028 | 9,825,079 | 128,316,874 | 18,955,758 | 10,725,419 | 16,503,567 | 1,469,160 | 3,563,844 | 27,965,862 | 217,325,563 |
| 11 | 2029 | 10,266,479 | 130,261,555 | 19,319,083 | 10,761,709 | 17,122,106 | 1,346,417 | 3,710,702 | 27,890,589 | 220,678,639 |
| 12 | 2030 | 10,421,935 | 132,935,424 | 19,937,401 | 10,754,582 | 18,016,588 | 1,520,004 | 3,783,006 | 27,906,010 | 225,274,951 |
| 13 | 2031 | 10,537,871 | 134,712,276 | 20,753,930 | 10,878,567 | 19,603,246 | 1,528,327 | 3,834,105 | 28,035,962 | 229,884,284 |
| 14 | 2032 | 10,644,840 | 136,168,395 | 21,479,154 | 10,988,657 | 20,588,788 | 1,496,749 | 4,058,806 | 28,620,850 | 234,046,239 |
| 15 | 2033 | 10,847,665 | 137,720,646 | 22,574,302 | 11,087,661 | 21,860,727 | 1,378,854 | 4,135,352 | 28,978,377 | 238,583,584 |
| 16 | 2034 | 11,035,332 | 139,172,459 | 23,574,276 | 11,082,334 | 22,728,887 | 1,560,355 | 4,181,807 | 29,922,555 | 243,258,004 |
| 17 | 2035 | 11,503,305 | 141,182,521 | 24,030,737 | 11,136,677 | 23,638,753 | 1,573,907 | 4,238,783 | 30,076,020 | 247,380,702 |
| 18 | 2036 | 11,656,661 | 142,330,952 | 24,944,868 | 11,204,327 | 24,508,520 | 1,566,580 | 4,328,931 | 30,948,240 | 251,489,079 |
| 19 | 2037 | 11,843,746 | 143,810,822 | 25,717,102 | 11,365,495 | 25,736,413 | 1,491,495 | 4,458,943 | 31,135,280 | 255,559,296 |
| 20 | 2038 | 11,906,482 | 144,840,381 | 26,492,906 | 11,511,825 | 27,018,546 | 1,631,862 | 4,513,364 | 31,275,338 | 259,190,704 |
| 21 | 2039 | 11,976,553 | 146,373,156 | 26,983,807 | 11,562,323 | 27,908,977 | 1,645,121 | 4,529,763 | 31,405,000 | 262,384,701 |
| 22 | 2040 | 12,238,894 | 147,361,108 | 27,724,721 | 11,628,687 | 29,129,619 | 1,659,714 | 4,780,952 | 31,423,559 | 265,947,256 |
| 23 | 2041 | 12,481,018 | 148,088,888 | 28,591,136 | 11,794,500 | 30,826,977 | 1,644,467 | 4,810,986 | 31,425,867 | 269,663,839 |
| 24 | 2042 | 12,643,980 | 148,763,420 | 29,507,626 | 11,936,755 | 32,155,363 | 1,702,688 | 4,875,938 | 31,205,363 | 272,791,133 |
| 25 | 2043 | 12,785,959 | 149,441,755 | 30,681,716 | 12,124,476 | 33,819,512 | 1,711,671 | 4,945,953 | 31,040,832 | 276,551,873 |
| 26 | 2044 | 12,894,544 | 150,310,991 | 31,896,922 | 12,249,297 | 35,154,343 | 1,737,391 | 5,000,684 | 30,810,002 | 280,054,174 |
| 27 | 2045 | 13,017,197 | 150,831,661 | 32,474,334 | 12,300,009 | 36,325,993 | 1,777,050 | 5,052,709 | 30,512,240 | 282,291,194 |
| 28 | 2046 | 13,211,674 | 151,451,458 | 33,556,826 | 12,474,019 | 37,607,612 | 1,739,127 | 5,064,802 | 30,238,882 | 285,344,400 |
| 29 | 2047 | 13,352,655 | 151,725,204 | 34,568,097 | 12,694,775 | 39,394,412 | 1,742,441 | 5,433,271 | 29,986,401 | 288,897,257 |
| 30 | 2048 | 13,477,572 | 152,160,194 | 35,564,679 | 12,842,419 | 41,036,017 | 1,768,097 | 5,369,866 | 29,891,127 | 292,109,972 |
| 31 | 2049 | 13,570,578 | 152,476,642 | 36,201,368 | 13,077,326 | 42,144,151 | 1,839,830 | 5,399,383 | 29,718,000 | 294,427,278 |
| 32 | 2050 | 13,719,123 | 152,576,627 | 36,993,347 | 13,174,613 | 43,265,529 | 1,726,628 | 5,466,825 | 29,741,249 | 296,663,939 |
| 33 | 2051 | 13,783,960 | 152,620,074 | 37,787,069 | 13,292,773 | 44,021,029 | 1,724,369 | 5,509,784 | 29,755,932 | 298,494,990 |
| 34 | 2052 | 13,883,068 | 152,567,391 | 38,755,850 | 13,621,722 | 45,365,738 | 1,741,945 | 5,531,386 | 29,890,939 | 301,358,040 |
| 35 | 2053 | 14,085,104 | 152,452,549 | 39,765,854 | 13,703,315 | 46,657,720 | 1,815,888 | 5,562,606 | 30,005,646 | 304,048,681 |

**TABLE 9-10
2019 REPLACEMENTS BY ACCOUNT**

| | | A | B | C | D | E | F | G | H | I |
|----|------|------------|-------------|------------|------------|------------|-----------|-----------|------------|-------------|
| | | 352 | 353 | 354 | 355 | 356 | 358 | 359 | 397 | Total |
| 1 | 2020 | 8,207,055 | 109,231,096 | 14,045,652 | 10,252,765 | 10,531,068 | 1,474,847 | 2,746,302 | 32,224,355 | 188,713,140 |
| 2 | 2021 | 8,407,335 | 113,409,371 | 14,727,104 | 10,367,628 | 11,555,471 | 1,465,287 | 2,818,354 | 31,812,651 | 194,563,201 |
| 3 | 2022 | 8,930,371 | 115,988,461 | 15,262,983 | 10,514,696 | 12,235,057 | 1,542,003 | 2,992,231 | 31,953,121 | 199,418,922 |
| 4 | 2023 | 9,128,952 | 118,097,851 | 16,155,180 | 10,569,926 | 13,099,510 | 1,527,893 | 3,057,963 | 31,311,749 | 202,949,024 |
| 5 | 2024 | 9,305,499 | 120,546,414 | 16,907,482 | 10,628,896 | 13,707,074 | 1,483,124 | 3,130,556 | 31,088,184 | 206,797,230 |
| 6 | 2025 | 9,410,349 | 123,779,995 | 17,255,391 | 10,579,980 | 14,335,484 | 1,398,724 | 3,397,923 | 30,597,733 | 210,755,579 |
| 7 | 2026 | 9,480,710 | 127,076,796 | 17,977,888 | 10,658,860 | 14,960,987 | 1,529,748 | 3,484,788 | 30,326,862 | 215,496,638 |
| 8 | 2027 | 9,754,957 | 128,911,115 | 18,610,307 | 10,848,369 | 15,726,992 | 1,527,635 | 3,546,886 | 29,936,731 | 218,862,993 |
| 9 | 2028 | 9,969,498 | 131,289,848 | 19,185,228 | 10,900,147 | 16,633,808 | 1,480,190 | 3,630,491 | 29,978,947 | 223,068,156 |
| 10 | 2029 | 10,449,351 | 133,270,623 | 19,551,278 | 10,936,709 | 17,256,987 | 1,356,525 | 3,778,451 | 29,942,965 | 226,542,889 |
| 11 | 2030 | 10,605,973 | 136,996,469 | 20,174,236 | 10,929,529 | 18,158,180 | 1,531,414 | 3,851,894 | 30,431,078 | 232,678,774 |
| 12 | 2031 | 10,722,779 | 139,050,313 | 20,996,890 | 11,054,444 | 19,756,742 | 1,539,818 | 3,950,671 | 30,594,459 | 237,666,115 |
| 13 | 2032 | 10,830,550 | 140,517,356 | 21,727,555 | 11,165,241 | 20,749,678 | 1,508,002 | 4,177,059 | 31,568,547 | 242,243,987 |
| 14 | 2033 | 11,034,897 | 142,104,211 | 22,830,919 | 11,309,723 | 22,031,160 | 1,389,223 | 4,254,178 | 31,949,633 | 246,903,945 |
| 15 | 2034 | 11,223,972 | 144,668,662 | 23,838,395 | 11,304,357 | 22,905,833 | 1,572,085 | 4,300,982 | 33,156,215 | 252,970,502 |
| 16 | 2035 | 11,696,635 | 146,975,307 | 24,298,424 | 11,359,107 | 23,822,598 | 1,585,775 | 4,358,385 | 33,403,097 | 257,499,328 |
| 17 | 2036 | 11,900,064 | 148,132,354 | 25,271,307 | 11,427,264 | 24,712,735 | 1,578,393 | 4,449,209 | 34,276,927 | 261,748,254 |
| 18 | 2037 | 12,088,553 | 149,623,326 | 26,102,003 | 11,589,488 | 25,949,840 | 1,502,745 | 4,580,197 | 34,406,860 | 265,843,012 |
| 19 | 2038 | 12,151,759 | 150,683,083 | 26,883,628 | 11,794,883 | 27,241,592 | 1,644,164 | 4,635,922 | 34,533,355 | 269,568,387 |
| 20 | 2039 | 12,222,356 | 153,305,828 | 27,378,212 | 11,845,760 | 28,138,704 | 1,657,577 | 4,723,386 | 34,490,712 | 273,762,534 |
| 21 | 2040 | 12,486,665 | 154,576,746 | 28,124,685 | 11,912,622 | 29,368,504 | 1,672,280 | 4,976,460 | 34,489,672 | 277,607,634 |
| 22 | 2041 | 12,732,134 | 155,309,986 | 28,997,600 | 12,079,679 | 31,078,596 | 1,656,918 | 5,006,719 | 34,257,959 | 281,119,592 |
| 23 | 2042 | 12,959,711 | 156,010,759 | 29,920,966 | 12,223,001 | 32,416,948 | 1,715,576 | 5,072,158 | 34,016,253 | 284,335,372 |
| 24 | 2043 | 13,102,755 | 157,710,582 | 31,103,864 | 12,411,937 | 34,093,582 | 1,724,692 | 5,142,698 | 33,618,700 | 288,908,811 |
| 25 | 2044 | 13,212,154 | 158,846,036 | 32,328,187 | 12,610,154 | 35,438,428 | 1,750,605 | 5,197,840 | 33,371,525 | 292,754,929 |
| 26 | 2045 | 13,335,728 | 159,370,612 | 32,910,145 | 12,661,247 | 36,619,048 | 1,790,562 | 5,251,486 | 32,898,251 | 294,837,079 |
| 27 | 2046 | 13,531,663 | 159,995,059 | 34,078,601 | 12,836,562 | 37,944,360 | 1,752,354 | 5,361,216 | 32,616,768 | 298,116,584 |
| 28 | 2047 | 13,673,702 | 160,289,452 | 35,176,461 | 13,058,975 | 39,744,566 | 1,755,752 | 5,732,448 | 32,290,382 | 301,721,739 |
| 29 | 2048 | 13,801,467 | 161,619,965 | 36,180,520 | 13,207,490 | 41,398,487 | 1,781,601 | 5,668,568 | 32,197,620 | 305,855,717 |
| 30 | 2049 | 13,974,410 | 162,166,764 | 36,821,985 | 13,533,001 | 42,514,935 | 1,853,873 | 5,698,307 | 32,061,450 | 308,624,722 |
| 31 | 2050 | 14,124,069 | 162,267,499 | 37,619,906 | 13,631,017 | 43,644,725 | 1,739,821 | 5,766,254 | 32,095,122 | 310,888,413 |
| 32 | 2051 | 14,189,393 | 162,327,117 | 38,419,583 | 13,750,064 | 44,405,893 | 1,737,581 | 5,809,536 | 32,231,435 | 312,870,602 |
| 33 | 2052 | 14,289,245 | 163,034,399 | 39,395,632 | 14,081,481 | 45,760,691 | 1,755,290 | 5,831,300 | 32,379,980 | 316,528,018 |
| 34 | 2053 | 14,492,796 | 163,112,970 | 40,413,214 | 14,163,686 | 47,062,367 | 1,829,787 | 5,864,295 | 32,653,372 | 319,592,487 |
| 35 | 2054 | 14,708,975 | 163,163,370 | 41,671,447 | 14,461,099 | 48,398,172 | 1,687,971 | 5,987,435 | 32,789,090 | 322,867,559 |

10. REPAYMENT STUDY INPUT DATA

TABLE 10-1
HISTORICAL INVESTMENTS
(\$000s)

| | A | B | C | D | E | F | G | H |
|----|---------------------------------|-----------------|----------|---------------|--------------------|-------------------|--------------------|---------------|
| | PROJECT | IN SERVICE DATE | DUE DATE | INTEREST RATE | ORIGINAL PRINCIPAL | CURRENT PRINCIPAL | Roll Maturity Date | Rollover Rate |
| 1 | Bonneville Power Administration | 09/1940 | 09/1985 | 2.500% | 6,812 | 0 | | |
| 2 | Bonneville Power Administration | 09/1941 | 09/1986 | 2.500% | 18,906 | 0 | | |
| 3 | Bonneville Power Administration | 09/1941 | 09/1986 | 2.500% | 461 | 0 | | |
| 4 | Bonneville Power Administration | 09/1942 | 09/1987 | 2.500% | 8,446 | 0 | | |
| 5 | Bonneville Power Administration | 09/1942 | 09/1987 | 2.500% | 1,052 | 0 | | |
| 6 | Bonneville Power Administration | 09/1943 | 09/1988 | 2.500% | 16,083 | 0 | | |
| 7 | Bonneville Power Administration | 09/1943 | 09/1988 | 2.500% | 4,538 | 0 | | |
| 8 | Bonneville Power Administration | 09/1944 | 09/1989 | 2.500% | 583 | 0 | | |
| 9 | Bonneville Power Administration | 09/1944 | 09/1989 | 2.500% | 249 | 0 | | |
| 10 | Bonneville Power Administration | 09/1945 | 09/1990 | 2.500% | 1,306 | 0 | | |
| 11 | Bonneville Power Administration | 09/1945 | 09/1990 | 2.500% | 3,366 | 0 | | |
| 12 | Bonneville Power Administration | 09/1946 | 09/1991 | 2.500% | 2,488 | 0 | | |
| 13 | Bonneville Power Administration | 09/1946 | 09/1991 | 2.500% | 732 | 0 | | |
| 14 | Bonneville Power Administration | 09/1947 | 09/1992 | 2.500% | 1,330 | 0 | | |
| 15 | Bonneville Power Administration | 09/1947 | 09/1992 | 2.500% | 1,773 | 0 | | |
| 16 | Bonneville Power Administration | 09/1948 | 09/1993 | 2.500% | 7,468 | 0 | | |
| 17 | Bonneville Power Administration | 09/1948 | 09/1993 | 2.500% | 2,290 | 0 | | |
| 18 | Bonneville Power Administration | 09/1949 | 09/1994 | 2.500% | 6,809 | 0 | | |
| 19 | Bonneville Power Administration | 09/1949 | 09/1994 | 2.500% | 2,719 | 0 | | |
| 20 | Bonneville Power Administration | 09/1950 | 09/1995 | 2.500% | 24,111 | 0 | | |
| 21 | Bonneville Power Administration | 09/1950 | 09/1995 | 2.500% | 6,124 | 0 | | |
| 22 | Bonneville Power Administration | 09/1951 | 09/1996 | 2.500% | 7,040 | 0 | | |
| 23 | Bonneville Power Administration | 09/1951 | 09/1996 | 2.500% | 13,266 | 0 | | |
| 24 | Bonneville Power Administration | 09/1952 | 09/1997 | 2.500% | 18,610 | 0 | | |
| 25 | Bonneville Power Administration | 09/1952 | 09/1997 | 2.500% | 8,979 | 0 | | |
| 26 | Bonneville Power Administration | 09/1953 | 09/1998 | 6.330% | 11,605 | 0 | | |
| 27 | Bonneville Power Administration | 09/1953 | 09/1998 | 6.330% | 23,550 | 0 | | |
| 28 | Bonneville Power Administration | 09/1954 | 09/1999 | 6.510% | 23,614 | 0 | | |
| 29 | Bonneville Power Administration | 09/1954 | 09/1999 | 6.510% | 17,370 | 0 | | |
| 30 | Bonneville Power Administration | 09/1955 | 09/2000 | 6.620% | 11,827 | 0 | | |
| 31 | Bonneville Power Administration | 09/1955 | 09/2000 | 6.620% | 10,283 | 0 | | |
| 32 | Bonneville Power Administration | 09/1956 | 09/2001 | 6.710% | 14,573 | 0 | | |
| 33 | Bonneville Power Administration | 09/1956 | 09/2001 | 6.710% | 32,221 | 0 | | |
| 34 | Bonneville Power Administration | 09/1957 | 09/2002 | 6.790% | 7,933 | 0 | | |
| 35 | Bonneville Power Administration | 09/1957 | 09/2002 | 6.790% | 15,980 | 0 | | |
| 36 | Bonneville Power Administration | 09/1958 | 09/2003 | 6.840% | 15,593 | 0 | | |
| 37 | Bonneville Power Administration | 09/1958 | 09/2003 | 6.840% | 10,654 | 0 | | |
| 38 | Bonneville Power Administration | 09/1959 | 09/2004 | 6.880% | 8,157 | 0 | | |
| 39 | Bonneville Power Administration | 09/1959 | 09/2004 | 6.880% | 8,863 | 0 | | |
| 40 | Bonneville Power Administration | 09/1960 | 09/2005 | 6.910% | 3,598 | 0 | | |
| 41 | Bonneville Power Administration | 09/1960 | 09/2005 | 6.910% | 4,218 | 0 | | |
| 42 | Bonneville Power Administration | 09/1961 | 09/2006 | 6.950% | 4,468 | 0 | | |
| 43 | Bonneville Power Administration | 09/1961 | 09/2006 | 6.950% | 11,271 | 0 | | |
| 44 | Bonneville Power Administration | 09/1962 | 09/2007 | 6.980% | 19,597 | 0 | | |
| 45 | Bonneville Power Administration | 09/1962 | 09/2007 | 6.980% | 4,877 | 0 | | |
| 46 | Bonneville Power Administration | 09/1963 | 09/2008 | 7.020% | 4,876 | 0 | | |
| 47 | Bonneville Power Administration | 09/1963 | 09/2008 | 7.020% | 4,330 | 0 | | |
| 48 | Bonneville Power Administration | 09/1963 | 09/2008 | 7.020% | 904 | 0 | | |
| 49 | Bonneville Power Administration | 09/1963 | 09/2008 | 7.020% | 803 | 0 | | |
| 50 | Bonneville Power Administration | 09/1964 | 09/2009 | 7.060% | 4,151 | 0 | | |
| 51 | Bonneville Power Administration | 09/1964 | 09/2009 | 7.060% | 5,738 | 0 | | |
| 52 | Bonneville Power Administration | 09/1965 | 09/2010 | 7.090% | 3,706 | 0 | | |

TABLE 10-1
HISTORICAL INVESTMENTS
(\$000s)

| | A | B | C | D | E | F | G | H |
|-----|---------------------------------|-----------------|----------|---------------|--------------------|-------------------|--------------------|---------------|
| | PROJECT | IN SERVICE DATE | DUE DATE | INTEREST RATE | ORIGINAL PRINCIPAL | CURRENT PRINCIPAL | Roll Maturity Date | Rollover Rate |
| 53 | Bonneville Power Administration | 09/1965 | 09/2010 | 7.090% | 7,248 | 0 | | |
| 54 | Bonneville Power Administration | 09/1965 | 09/2010 | 7.090% | 5,202 | 0 | | |
| 55 | Bonneville Power Administration | 09/1965 | 09/2010 | 7.090% | 10,171 | 0 | | |
| 56 | Bonneville Power Administration | 09/1966 | 09/2011 | 7.130% | 11,830 | 0 | | |
| 57 | Bonneville Power Administration | 09/1966 | 09/2011 | 7.130% | 3,049 | 0 | | |
| 58 | Bonneville Power Administration | 09/1966 | 09/2011 | 7.130% | 6,647 | 0 | | |
| 59 | Bonneville Power Administration | 09/1966 | 09/2011 | 7.130% | 1,714 | 0 | | |
| 60 | Bonneville Power Administration | 09/1967 | 09/2012 | 7.160% | 19,003 | 0 | | |
| 61 | Bonneville Power Administration | 09/1967 | 09/2012 | 7.160% | 4,566 | 0 | | |
| 62 | Bonneville Power Administration | 09/1967 | 09/2012 | 7.160% | 14,300 | 0 | | |
| 63 | Bonneville Power Administration | 09/1967 | 09/2012 | 7.160% | 3,436 | 0 | | |
| 64 | Bonneville Power Administration | 09/1968 | 09/2013 | 7.200% | 41,070 | 0 | | |
| 65 | Bonneville Power Administration | 09/1968 | 09/2013 | 7.200% | 8,076 | 0 | | |
| 66 | Bonneville Power Administration | 09/1968 | 09/2013 | 7.200% | 23,202 | 0 | | |
| 67 | Bonneville Power Administration | 09/1968 | 09/2013 | 7.200% | 4,562 | 0 | | |
| 68 | Bonneville Power Administration | 09/1969 | 09/2014 | 7.230% | 42,237 | 0 | | |
| 69 | Bonneville Power Administration | 09/1969 | 09/2014 | 7.230% | 22,537 | 0 | | |
| 70 | Bonneville Power Administration | 09/1969 | 09/2014 | 7.230% | 384 | 0 | | |
| 71 | Bonneville Power Administration | 09/1969 | 09/2014 | 7.230% | 205 | 0 | | |
| 72 | Bonneville Power Administration | 09/1970 | 09/2015 | 7.270% | 64,977 | 0 | | |
| 73 | Bonneville Power Administration | 09/1970 | 09/2015 | 7.270% | 7,995 | 0 | | |
| 74 | Bonneville Power Administration | 09/1970 | 09/2015 | 7.270% | 24,412 | 0 | | |
| 75 | Bonneville Power Administration | 09/1970 | 09/2015 | 7.270% | 3,003 | 0 | | |
| 76 | Bonneville Power Administration | 09/1971 | 09/2016 | 7.290% | 12,025 | 0 | | |
| 77 | Bonneville Power Administration | 09/1971 | 09/2016 | 7.290% | 17,766 | 0 | | |
| 78 | Bonneville Power Administration | 09/1971 | 09/2016 | 7.290% | 12,051 | 0 | | |
| 79 | Bonneville Power Administration | 09/1971 | 09/2016 | 7.290% | 17,805 | 0 | | |
| 80 | Bonneville Power Administration | 09/1972 | 09/2017 | 7.290% | 29,326 | 0 | | |
| 81 | Bonneville Power Administration | 09/1972 | 09/2017 | 7.290% | 21,170 | 0 | | |
| 82 | Bonneville Power Administration | 09/1972 | 09/2017 | 7.290% | 3,980 | 0 | | |
| 83 | Bonneville Power Administration | 09/1972 | 09/2017 | 7.290% | 2,873 | 0 | | |
| 84 | Bonneville Power Administration | 09/1973 | 09/2018 | 7.280% | 33,788 | 0 | | |
| 85 | Bonneville Power Administration | 09/1973 | 09/2018 | 7.280% | 21,656 | 0 | | |
| 86 | Bonneville Power Administration | 09/1973 | 09/2018 | 7.280% | 16,368 | 0 | | |
| 87 | Bonneville Power Administration | 09/1973 | 09/2018 | 7.280% | 10,491 | 0 | | |
| 88 | Bonneville Power Administration | 09/1974 | 09/2019 | 7.270% | 12,079 | 0 | | |
| 89 | Bonneville Power Administration | 09/1974 | 09/2019 | 7.270% | 20,984 | 0 | | |
| 90 | Bonneville Power Administration | 09/1974 | 09/2019 | 7.270% | 12,563 | 0 | | |
| 91 | Bonneville Power Administration | 09/1974 | 09/2019 | 7.270% | 21,826 | 0 | | |
| 92 | Bonneville Power Administration | 09/1975 | 09/2020 | 7.250% | 11,742 | 8,200 | | |
| 93 | Bonneville Power Administration | 09/1975 | 09/2020 | 7.250% | 32,026 | 0 | | |
| 94 | Bonneville Power Administration | 09/1975 | 09/2020 | 7.250% | 21,916 | 0 | | |
| 95 | Bonneville Power Administration | 09/1975 | 09/2020 | 7.250% | 17,158 | 0 | | |
| 96 | Bonneville Power Administration | 09/1976 | 09/2021 | 7.230% | 61,025 | 61,025 | | |
| 97 | Bonneville Power Administration | 09/1976 | 09/2021 | 7.230% | 2,212 | 2,212 | | |
| 98 | Bonneville Power Administration | 09/1977 | 09/2022 | 7.210% | 3,948 | 3,948 | | |
| 99 | Bonneville Power Administration | 09/1977 | 09/2022 | 7.210% | 5,380 | 5,380 | | |
| 100 | Bonneville Power Administration | 09/1977 | 09/2022 | 7.210% | 33,702 | 33,702 | | |
| 101 | Bonneville Power Administration | 09/1977 | 09/2022 | 7.210% | 4,981 | 4,981 | | |
| 102 | Construction | 09/1978 | 09/2013 | 8.950% | 17,770 | 0 | | |
| 103 | Construction | 09/1978 | 09/2013 | 8.950% | 24,222 | 0 | | |
| 104 | Construction | 09/1978 | 09/2013 | 8.950% | 3,389 | 0 | | |

TABLE 10-1
HISTORICAL INVESTMENTS
(\$000s)

| | A | B | C | D | E | F | G | H |
|-----|--------------|-----------------|----------|---------------|--------------------|-------------------|--------------------|---------------|
| | PROJECT | IN SERVICE DATE | DUE DATE | INTEREST RATE | ORIGINAL PRINCIPAL | CURRENT PRINCIPAL | Roll Maturity Date | Rollover Rate |
| 105 | Construction | 09/1978 | 09/2013 | 8.950% | 4,619 | 0 | | |
| 106 | Construction | 06/1979 | 06/2014 | 9.450% | 7,010 | 0 | | |
| 107 | Construction | 06/1979 | 06/2014 | 9.450% | 9,804 | 0 | | |
| 108 | Construction | 06/1979 | 06/2014 | 9.450% | 26,690 | 0 | | |
| 109 | Construction | 06/1979 | 06/2014 | 9.450% | 21,977 | 0 | | |
| 110 | Construction | 06/1979 | 06/2014 | 9.450% | 6,026 | 0 | | |
| 111 | Construction | 06/1979 | 06/2014 | 9.450% | 1,371 | 0 | | |
| 112 | Construction | 06/1979 | 06/2014 | 9.450% | 1,870 | 0 | | |
| 113 | Construction | 06/1979 | 06/2014 | 9.450% | 150 | 0 | | |
| 114 | Construction | 06/1979 | 06/2014 | 9.450% | 102 | 0 | | |
| 115 | Construction | 09/1979 | 09/2014 | 9.900% | 21,228 | 0 | | |
| 116 | Construction | 09/1979 | 09/2014 | 9.900% | 14,340 | 0 | | |
| 117 | Construction | 09/1979 | 09/2014 | 9.900% | 10,610 | 0 | | |
| 118 | Construction | 09/1979 | 09/2014 | 9.900% | 2,888 | 0 | | |
| 119 | Construction | 09/1979 | 09/2014 | 9.900% | 98 | 0 | | |
| 120 | Construction | 09/1979 | 09/2014 | 9.900% | 66 | 0 | | |
| 121 | Construction | 09/1979 | 09/2014 | 9.900% | 605 | 0 | | |
| 122 | Construction | 09/1979 | 09/2014 | 9.900% | 165 | 0 | | |
| 123 | Construction | 09/1980 | 09/2015 | 13.000% | 39,696 | 0 | | |
| 124 | Construction | 09/1980 | 09/2015 | 13.000% | 10,806 | 0 | | |
| 125 | Construction | 09/1980 | 09/2015 | 13.000% | 44,811 | 0 | | |
| 126 | Construction | 09/1980 | 09/2015 | 13.000% | 1,469 | 0 | | |
| 127 | Construction | 09/1980 | 09/2015 | 13.000% | 9,292 | 0 | | |
| 128 | Construction | 09/1980 | 09/2015 | 13.000% | 4,253 | 0 | | |
| 129 | Construction | 09/1980 | 09/2015 | 13.000% | 2,263 | 0 | | |
| 130 | Construction | 09/1980 | 09/2015 | 13.000% | 616 | 0 | | |
| 131 | Construction | 09/1980 | 09/2015 | 13.000% | 1,707 | 0 | | |
| 132 | Construction | 09/1980 | 09/2015 | 13.000% | 56 | 0 | | |
| 133 | Construction | 09/1980 | 09/2015 | 13.000% | 21 | 0 | | |
| 134 | Construction | 09/1980 | 09/2015 | 13.000% | 10 | 0 | | |
| 135 | Construction | 09/1981 | 09/2016 | 16.600% | 119,775 | 0 | | |
| 136 | Construction | 09/1981 | 09/2016 | 16.600% | 54,821 | 0 | | |
| 137 | Construction | 09/1981 | 09/2016 | 16.600% | 277 | 0 | | |
| 138 | Construction | 09/1981 | 09/2016 | 16.600% | 127 | 0 | | |
| 139 | Construction | 12/1981 | 12/2016 | 14.400% | 34,221 | 0 | | |
| 140 | Construction | 12/1981 | 12/2016 | 14.400% | 15,663 | 0 | | |
| 141 | Construction | 12/1981 | 12/2016 | 14.400% | 80 | 0 | | |
| 142 | Construction | 12/1981 | 12/2016 | 14.400% | 36 | 0 | | |
| 143 | Construction | 04/1982 | 04/2017 | 14.400% | 9,975 | 0 | | |
| 144 | Construction | 04/1982 | 04/2017 | 14.400% | 4,566 | 0 | | |
| 145 | Construction | 04/1982 | 04/2017 | 14.400% | 46,980 | 0 | | |
| 146 | Construction | 04/1982 | 04/2017 | 14.400% | 37,455 | 0 | | |
| 147 | Construction | 04/1982 | 04/2017 | 14.400% | 23 | 0 | | |
| 148 | Construction | 04/1982 | 04/2017 | 14.400% | 11 | 0 | | |
| 149 | Construction | 04/1982 | 04/2017 | 14.400% | 551 | 0 | | |
| 150 | Construction | 04/1982 | 04/2017 | 14.400% | 439 | 0 | | |
| 151 | Construction | 07/1982 | 07/2017 | 14.150% | 3,677 | 0 | | |
| 152 | Construction | 07/1982 | 07/2017 | 14.150% | 2,932 | 0 | | |
| 153 | Construction | 07/1982 | 07/2017 | 14.150% | 77,807 | 0 | | |
| 154 | Construction | 07/1982 | 07/2017 | 14.150% | 43 | 0 | | |
| 155 | Construction | 07/1982 | 07/2017 | 14.150% | 34 | 0 | | |
| 156 | Construction | 07/1982 | 07/2017 | 14.150% | 402 | 0 | | |

TABLE 10-1
HISTORICAL INVESTMENTS
(\$000s)

| | A | B | C | D | E | F | G | H |
|-----|--------------|-----------------|----------|---------------|--------------------|-------------------|--------------------|---------------|
| | PROJECT | IN SERVICE DATE | DUE DATE | INTEREST RATE | ORIGINAL PRINCIPAL | CURRENT PRINCIPAL | Roll Maturity Date | Rollover Rate |
| 157 | Construction | 07/1982 | 07/2017 | 14.150% | 105 | 0 | | |
| 158 | Construction | 11/1982 | 11/2017 | 10.850% | 205 | 0 | | |
| 159 | Construction | 11/1982 | 11/2017 | 10.850% | 54 | 0 | | |
| 160 | Construction | 11/1982 | 11/2017 | 10.850% | 39,741 | 0 | | |
| 161 | Construction | 06/1983 | 06/2018 | 11.700% | 154 | 0 | | |
| 162 | Construction | 06/1983 | 06/2018 | 11.700% | 29,806 | 0 | | |
| 163 | Construction | 06/1983 | 06/2018 | 11.700% | 40 | 0 | | |
| 164 | Construction | 09/1983 | 09/2018 | 12.250% | 814 | 0 | | |
| 165 | Construction | 09/1983 | 09/2018 | 12.250% | 37,235 | 0 | | |
| 166 | Construction | 09/1983 | 09/2018 | 12.250% | 6,708 | 0 | | |
| 167 | Construction | 09/1983 | 09/2018 | 12.250% | 4 | 0 | | |
| 168 | Construction | 09/1983 | 09/2018 | 12.250% | 1 | 0 | | |
| 169 | Construction | 09/1983 | 09/2018 | 12.250% | 203 | 0 | | |
| 170 | Construction | 09/1983 | 09/2018 | 12.250% | 35 | 0 | | |
| 171 | Construction | 11/1983 | 11/2018 | 12.300% | 25,283 | 0 | | |
| 172 | Construction | 11/1983 | 11/2018 | 12.300% | 4,555 | 0 | | |
| 173 | Construction | 11/1983 | 11/2018 | 12.300% | 138 | 0 | | |
| 174 | Construction | 11/1983 | 11/2018 | 12.300% | 24 | 0 | | |
| 175 | Construction | 09/1984 | 09/2019 | 13.050% | 50,567 | 0 | | |
| 176 | Construction | 09/1984 | 09/2019 | 13.050% | 9,109 | 0 | | |
| 177 | Construction | 09/1984 | 09/2019 | 13.050% | 276 | 0 | | |
| 178 | Construction | 09/1984 | 09/2019 | 13.050% | 48 | 0 | | |
| 179 | Construction | 06/1985 | 06/2029 | 11.250% | 15,182 | 0 | | |
| 180 | Construction | 06/1985 | 06/2029 | 11.250% | 460 | 0 | | |
| 181 | Construction | 06/1985 | 06/2029 | 11.250% | 80 | 0 | | |
| 182 | Construction | 06/1985 | 06/2030 | 11.250% | 84,278 | 0 | | |
| 183 | Construction | 03/1986 | 03/1996 | 8.150% | 870 | 0 | | |
| 184 | Construction | 03/1986 | 03/1996 | 8.150% | 157 | 0 | | |
| 185 | Construction | 03/1986 | 03/1996 | 8.150% | 30,161 | 0 | | |
| 186 | Construction | 03/1986 | 03/1996 | 8.150% | 68,194 | 0 | | |
| 187 | Construction | 03/1986 | 03/1996 | 8.150% | 5 | 0 | | |
| 188 | Construction | 03/1986 | 03/1996 | 8.150% | 1 | 0 | | |
| 189 | Construction | 03/1986 | 03/1996 | 8.150% | 443 | 0 | | |
| 190 | Construction | 03/1986 | 03/1996 | 8.150% | 169 | 0 | | |
| 191 | Construction | 06/1986 | 06/2031 | 8.950% | 5,161 | 0 | | |
| 192 | Construction | 06/1986 | 06/2031 | 8.950% | 11,668 | 0 | | |
| 193 | Construction | 06/1986 | 06/2031 | 8.950% | 180,054 | 0 | | |
| 194 | Construction | 06/1986 | 06/2031 | 8.950% | 3,117 | 0 | | |
| 195 | Construction | 06/1986 | 06/2031 | 8.950% | 40,000 | 0 | | |
| 196 | Construction | 06/1986 | 06/2031 | 8.950% | 57,354 | 0 | | |
| 197 | Construction | 06/1986 | 06/2031 | 8.950% | 76 | 0 | | |
| 198 | Construction | 06/1986 | 06/2031 | 8.950% | 29 | 0 | | |
| 199 | Construction | 06/1986 | 06/2031 | 8.950% | 1,819 | 0 | | |
| 200 | Construction | 06/1986 | 06/2031 | 8.950% | 722 | 0 | | |
| 201 | Construction | 04/1987 | 04/2032 | 9.300% | 43,236 | 0 | | |
| 202 | Construction | 04/1987 | 04/2032 | 9.300% | 54,409 | 0 | | |
| 203 | Construction | 04/1987 | 04/2032 | 9.300% | 111 | 0 | | |
| 204 | Construction | 04/1987 | 04/2032 | 9.300% | 281 | 0 | | |
| 205 | Construction | 04/1987 | 04/2032 | 9.300% | 554 | 0 | | |
| 206 | Construction | 04/1987 | 04/2032 | 9.300% | 1,409 | 0 | | |
| 207 | Construction | 06/1987 | 06/1992 | 8.350% | 96,519 | 0 | | |
| 208 | Construction | 06/1987 | 06/1992 | 8.350% | 2,498 | 0 | | |

TABLE 10-1
HISTORICAL INVESTMENTS
(\$000s)

| | A | B | C | D | E | F | G | H |
|-----|--------------|-----------------|----------|---------------|--------------------|-------------------|--------------------|---------------|
| | PROJECT | IN SERVICE DATE | DUE DATE | INTEREST RATE | ORIGINAL PRINCIPAL | CURRENT PRINCIPAL | Roll Maturity Date | Rollover Rate |
| 209 | Construction | 06/1987 | 06/1992 | 8.350% | 983 | 0 | | |
| 210 | Construction | 07/1987 | 07/2017 | 9.550% | 4,113 | 0 | | |
| 211 | Construction | 07/1987 | 07/2017 | 9.550% | 86,958 | 0 | | |
| 212 | Construction | 07/1987 | 07/2017 | 9.550% | 569 | 0 | | |
| 213 | Construction | 07/1987 | 07/2017 | 9.550% | 38 | 0 | | |
| 214 | Construction | 07/1987 | 07/2017 | 9.550% | 3,274 | 0 | | |
| 215 | Construction | 07/1987 | 07/2017 | 9.550% | 48 | 0 | | |
| 216 | Construction | 07/1987 | 07/2032 | 9.550% | 618 | 0 | | |
| 217 | Construction | 07/1987 | 07/2032 | 9.550% | 112 | 0 | | |
| 218 | Construction | 07/1987 | 07/2032 | 9.550% | 7,903 | 0 | | |
| 219 | Construction | 07/1987 | 07/2032 | 9.550% | 3,109 | 0 | | |
| 220 | Construction | 07/1987 | 07/2032 | 9.550% | 37,342 | 0 | | |
| 221 | Construction | 07/1987 | 07/2032 | 9.550% | 285 | 0 | | |
| 222 | Construction | 07/1987 | 07/2032 | 9.550% | 631 | 0 | | |
| 223 | Construction | 02/1988 | 02/2018 | 9.500% | 283 | 0 | | |
| 224 | Construction | 02/1988 | 02/2018 | 9.500% | 43,417 | 0 | | |
| 225 | Construction | 02/1988 | 02/2033 | 9.500% | 28,513 | 0 | | |
| 226 | Construction | 02/1988 | 02/2033 | 9.500% | 27,887 | 0 | | |
| 227 | Construction | 02/1988 | 02/2033 | 9.500% | 20,677 | 0 | | |
| 228 | Construction | 02/1988 | 02/2033 | 9.500% | 22,923 | 0 | | |
| 229 | Construction | 02/1988 | 02/2033 | 9.500% | 45,870 | 0 | | |
| 230 | Construction | 02/1988 | 02/2033 | 9.500% | 954 | 0 | | |
| 231 | Construction | 02/1988 | 02/2033 | 9.500% | 933 | 0 | | |
| 232 | Construction | 02/1988 | 02/2033 | 9.500% | 518 | 0 | | |
| 233 | Construction | 02/1988 | 02/2033 | 9.500% | 1,725 | 0 | | |
| 234 | Construction | 06/1988 | 06/2033 | 9.900% | 9,018 | 0 | | |
| 235 | Construction | 06/1988 | 06/2033 | 9.900% | 30,004 | 0 | | |
| 236 | Construction | 06/1988 | 06/2033 | 9.900% | 226 | 0 | | |
| 237 | Construction | 06/1988 | 06/2033 | 9.900% | 752 | 0 | | |
| 238 | Construction | 05/1989 | 05/1999 | 8.950% | 16,909 | 0 | | |
| 239 | Construction | 05/1989 | 05/1999 | 8.950% | 56,257 | 0 | | |
| 240 | Construction | 05/1989 | 05/1999 | 8.950% | 424 | 0 | | |
| 241 | Construction | 05/1989 | 05/1999 | 8.950% | 1,410 | 0 | | |
| 242 | Construction | 01/1990 | 01/2030 | 9.250% | 41,894 | 0 | | |
| 243 | Construction | 01/1990 | 01/2030 | 9.250% | 1,149 | 0 | | |
| 244 | Construction | 01/1990 | 01/2030 | 9.250% | 3,824 | 0 | | |
| 245 | Construction | 01/1990 | 01/2030 | 9.250% | 29 | 0 | | |
| 246 | Construction | 01/1990 | 01/2030 | 9.250% | 96 | 0 | | |
| 247 | Construction | 01/1990 | 01/2030 | 9.250% | 3,008 | 0 | | |
| 248 | Construction | 02/1991 | 02/1995 | 7.550% | 54,145 | 0 | | |
| 249 | Construction | 02/1991 | 02/1995 | 7.550% | 5,855 | 0 | | |
| 250 | Construction | 04/1992 | 04/1995 | 6.200% | 80,000 | 0 | | |
| 251 | Construction | 04/1992 | 04/1997 | 7.000% | 50,000 | 0 | | |
| 252 | Construction | 04/1992 | 04/1997 | 7.000% | 28,300 | 0 | | |
| 253 | Construction | 04/1992 | 04/2032 | 8.800% | 147,521 | 0 | | |
| 254 | Construction | 04/1992 | 04/2032 | 8.800% | 2,479 | 0 | | |
| 255 | Construction | 07/1992 | 07/2032 | 8.130% | 150,000 | 0 | | |
| 256 | Construction | 08/1992 | 08/2000 | 6.600% | 107,800 | 0 | | |
| 257 | Construction | 08/1992 | 08/2007 | 7.250% | 107,700 | 0 | | |
| 258 | Construction | 10/1992 | 10/1997 | 6.050% | 50,000 | 0 | | |
| 259 | Construction | 02/1993 | 02/2033 | 7.800% | 130,000 | 0 | | |
| 260 | Construction | 04/1993 | 04/2033 | 7.500% | 100,000 | 0 | | |

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HISTORICAL INVESTMENTS
(\$000s)

| | A | B | C | D | E | F | G | H |
|-----|--------------|-----------------|----------|---------------|--------------------|-------------------|--------------------|---------------|
| | PROJECT | IN SERVICE DATE | DUE DATE | INTEREST RATE | ORIGINAL PRINCIPAL | CURRENT PRINCIPAL | Roll Maturity Date | Rollover Rate |
| 261 | Construction | 08/1993 | 08/2033 | 6.950% | 110,000 | 0 | | |
| 262 | Construction | 10/1993 | 10/2033 | 6.850% | 50,000 | 0 | | |
| 263 | Construction | 10/1993 | 10/2033 | 6.850% | 108,400 | 0 | | |
| 264 | Construction | 01/1994 | 01/2034 | 7.050% | 50,000 | 0 | | |
| 265 | Construction | 05/1994 | 05/1998 | 7.100% | 43,155 | 0 | | |
| 266 | Construction | 05/1994 | 05/1998 | 7.100% | 49,489 | 0 | | |
| 267 | Construction | 05/1994 | 05/1998 | 7.100% | 4,456 | 0 | | |
| 268 | Construction | 05/1994 | 05/2034 | 8.200% | 50,000 | 0 | | |
| 269 | Construction | 09/1994 | 09/1999 | 7.650% | 55,000 | 0 | | |
| 270 | Construction | 01/1995 | 01/2001 | 8.350% | 55,000 | 0 | | |
| 271 | Construction | 08/1995 | 08/2025 | 7.700% | 65,000 | 0 | | |
| 272 | Construction | 08/1996 | 08/2006 | 7.050% | 70,000 | 0 | | |
| 273 | Construction | 05/1997 | 05/2005 | 6.900% | 80,000 | 0 | | |
| 274 | Construction | 08/1997 | 08/2007 | 6.650% | 111,254 | 0 | | |
| 275 | Construction | 04/1998 | 04/2008 | 6.000% | 75,300 | 0 | | |
| 276 | Construction | 04/1998 | 04/2028 | 6.650% | 50,000 | 0 | | |
| 277 | Construction | 05/1998 | 05/2009 | 6.000% | 72,700 | 0 | | |
| 278 | Construction | 05/1998 | 05/2011 | 6.200% | 40,000 | 0 | | |
| 279 | Construction | 05/1998 | 05/2032 | 6.700% | 98,900 | 0 | | |
| 280 | Construction | 08/1998 | 08/2028 | 5.850% | 106,500 | 106,500 | | |
| 281 | Construction | 08/1998 | 08/2028 | 5.850% | 112,300 | 112,300 | | |
| 282 | Construction | 05/1999 | 05/2004 | 5.950% | 26,200 | 0 | | |
| 283 | Construction | 09/1999 | 09/2002 | 6.200% | 40,000 | 0 | | |
| 284 | Construction | 11/1999 | 11/2002 | 6.400% | 40,000 | 0 | | |
| 285 | Construction | 01/2000 | 01/2005 | 7.150% | 53,500 | 0 | | |
| 286 | Construction | 08/2000 | 08/2003 | 6.850% | 15,300 | 0 | | |
| 287 | Construction | 09/2000 | 09/2006 | 6.750% | 40,000 | 0 | | |
| 288 | Construction | 01/2001 | 01/2005 | 5.650% | 20,000 | 0 | | |
| 289 | Construction | 06/2001 | 06/2011 | 5.950% | 25,000 | 0 | | |
| 290 | Construction | 08/2001 | 08/2011 | 5.750% | 50,000 | 0 | | |
| 291 | Construction | 06/2002 | 06/2005 | 3.750% | 60,000 | 0 | | |
| 292 | Construction | 09/2002 | 09/2006 | 3.050% | 100,000 | 0 | | |
| 293 | Construction | 11/2002 | 11/2005 | 2.800% | 40,000 | 0 | | |
| 294 | Construction | 04/2003 | 04/2007 | 2.900% | 40,000 | 0 | | |
| 295 | Construction | 04/2003 | 04/2033 | 5.550% | 40,000 | 0 | | |
| 296 | Construction | 07/2003 | 07/2006 | 2.300% | 75,000 | 0 | | |
| 297 | Construction | 07/2003 | 07/2007 | 2.950% | 25,000 | 0 | | |
| 298 | Construction | 09/2003 | 09/2006 | 2.500% | 20,000 | 0 | | |
| 299 | Construction | 01/2004 | 01/2008 | 2.950% | 65,000 | 0 | | |
| 300 | Construction | 04/2004 | 04/2007 | 2.950% | 65,000 | 0 | | |
| 301 | Construction | 07/2004 | 07/2007 | 3.450% | 50,000 | 0 | | |
| 302 | Construction | 07/2004 | 07/2008 | 3.800% | 25,000 | 0 | | |
| 303 | Construction | 09/2004 | 09/2007 | 3.100% | 30,000 | 0 | | |
| 304 | Construction | 09/2004 | 09/2034 | 5.600% | 40,000 | 0 | | |
| 305 | Construction | 01/2005 | 01/2035 | 5.400% | 40,000 | 0 | | |
| 306 | Construction | 04/2005 | 04/2035 | 5.500% | 40,000 | 0 | | |
| 307 | Construction | 06/2005 | 06/2009 | 4.000% | 40,000 | 0 | | |
| 308 | Construction | 09/2005 | 09/2035 | 5.250% | 45,000 | 0 | | |
| 309 | Construction | 03/2006 | 03/2009 | 5.050% | 20,000 | 0 | | |
| 310 | Construction | 07/2006 | 07/2009 | 5.350% | 70,000 | 0 | | |
| 311 | Construction | 09/2006 | 09/2010 | 4.950% | 20,000 | 0 | | |
| 312 | Construction | 01/2007 | 01/2010 | 5.100% | 25,000 | 0 | | |

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(\$000s)

| | A | B | C | D | E | F | G | H |
|-----|--------------|-----------------|----------|---------------|--------------------|-------------------|--------------------|---------------|
| | PROJECT | IN SERVICE DATE | DUE DATE | INTEREST RATE | ORIGINAL PRINCIPAL | CURRENT PRINCIPAL | Roll Maturity Date | Rollover Rate |
| 313 | Construction | 03/2007 | 03/2012 | 4.850% | 40,000 | 0 | | |
| 314 | Construction | 06/2007 | 06/2037 | 6.400% | 35,000 | 0 | | |
| 315 | Construction | 07/2007 | 07/2010 | 5.200% | 50,000 | 0 | | |
| 316 | Construction | 05/2008 | 05/2011 | 3.358% | 40,000 | 0 | | |
| 317 | Construction | 07/2008 | 07/2012 | 3.913% | 30,000 | 0 | | |
| 318 | Construction | 09/2008 | 09/2011 | 3.151% | 25,000 | 0 | | |
| 319 | Construction | 01/2009 | 01/2020 | 3.830% | 50,000 | 50,000 | | |
| 320 | Construction | 01/2009 | 01/2022 | 4.200% | 20,000 | 20,000 | | |
| 321 | Construction | 04/2009 | 04/2022 | 4.253% | 35,000 | 35,000 | | |
| 322 | Construction | 06/2009 | 06/2039 | 5.192% | 35,000 | 35,000 | | |
| 323 | Construction | 07/2009 | 07/2019 | 4.026% | 46,940 | 46,940 | 07/2031 | 3.777% |
| 324 | Construction | 09/2009 | 09/2019 | 3.699% | 35,000 | 35,000 | 09/2029 | 3.705% |
| 325 | Construction | 10/2009 | 10/2018 | 3.719% | 23,000 | 23,000 | | |
| 326 | Construction | 10/2009 | 10/2019 | 3.842% | 43,000 | 43,000 | | |
| 327 | Construction | 11/2009 | 11/2018 | 3.533% | 15,000 | 15,000 | | |
| 328 | Construction | 12/2009 | 12/2018 | 4.069% | 13,000 | 13,000 | | |
| 329 | Construction | 01/2010 | 01/2019 | 3.714% | 30,000 | 30,000 | 52627 | 4.248% |
| 330 | Construction | 02/2010 | 02/2019 | 0.165% | 10,000 | 0 | | |
| 331 | Construction | 03/2010 | 03/2021 | 4.188% | 15,000 | 15,000 | | |
| 332 | Construction | 04/2010 | 04/2021 | 4.094% | 22,000 | 22,000 | | |
| 333 | Construction | 05/2010 | 05/2021 | 3.694% | 22,000 | 22,000 | | |
| 334 | Construction | 06/2010 | 06/2021 | 3.374% | 22,000 | 22,000 | | |
| 335 | Construction | 07/2010 | 07/2022 | 3.372% | 30,000 | 30,000 | | |
| 336 | Construction | 07/2010 | 07/2020 | 3.118% | 50,000 | 50,000 | 50617 | 4.329% |
| 337 | Construction | 08/2010 | 08/2022 | 0.165% | 5,000 | 0 | | |
| 338 | Construction | 08/2010 | 08/2022 | 3.029% | 20,000 | 20,000 | | |
| 339 | Construction | 09/2010 | 09/2023 | 3.161% | 46,000 | 46,000 | | |
| 340 | Construction | 10/2010 | 10/2025 | 3.494% | 45,000 | 45,000 | | |
| 341 | Construction | 01/2011 | 01/2036 | 4.952% | 50,000 | 50,000 | | |
| 342 | Construction | 02/2011 | 02/2038 | 4.935% | 55,000 | 55,000 | | |
| 343 | Construction | 04/2011 | 04/2039 | 4.794% | 40,000 | 40,000 | | |
| 344 | Construction | 05/2011 | 09/2011 | 0.076% | 40,000 | 0 | | |
| 345 | Construction | 05/2011 | 09/2011 | 0.076% | 40,000 | 0 | | |
| 346 | Construction | 06/2011 | 06/2040 | 4.775% | 25,000 | 25,000 | | |
| 347 | Construction | 06/2011 | 06/2036 | 4.629% | 50,000 | 50,000 | 06/2045 | 4.021% |
| 348 | Construction | 06/2011 | 09/2011 | 0.072% | 25,000 | 0 | | |
| 349 | Construction | 08/2011 | 08/2029 | 4.238% | 50,000 | 50,000 | | |
| 350 | Construction | 08/2011 | 08/2032 | 4.355% | 98,900 | 98,900 | | |
| 351 | Construction | 08/2011 | 08/2033 | 4.386% | 40,000 | 40,000 | | |
| 352 | Construction | 08/2011 | 08/2035 | 4.446% | 45,000 | 45,000 | | |
| 353 | Construction | 08/2011 | 08/2035 | 4.446% | 40,000 | 40,000 | 08/2037 | 3.299% |
| 354 | Construction | 08/2011 | 08/2035 | 4.446% | 40,000 | 40,000 | 08/2038 | 3.413% |
| 355 | Construction | 08/2011 | 08/2034 | 4.416% | 40,000 | 40,000 | 08/2039 | 3.642% |
| 356 | Construction | 08/2011 | 08/2039 | 4.295% | 50,000 | 0 | | |
| 357 | Construction | 09/2011 | 09/2040 | 3.796% | 35,000 | 0 | | |
| 358 | Construction | 10/2011 | 10/2039 | 0.069% | 45,000 | 0 | | |
| 359 | Construction | 01/2012 | 01/2040 | 0.947% | 30,000 | 30,000 | | |
| 360 | Construction | 01/2012 | 09/2012 | 0.146% | 30,000 | 0 | | |
| 361 | Construction | 03/2012 | 09/2012 | 0.210% | 40,000 | 0 | | |
| 362 | Construction | 03/2012 | 03/2024 | 0.947% | 45,000 | 45,000 | | |
| 363 | Construction | 05/2012 | 05/2027 | 0.697% | 17,000 | 17,000 | | |
| 364 | Construction | 06/2012 | 09/2015 | 0.671% | 26,000 | 0 | | |

TABLE 10-1
HISTORICAL INVESTMENTS
(\$000s)

| | A | B | C | D | E | F | G | H |
|-----|--------------|-----------------|----------|---------------|--------------------|-------------------|--------------------|---------------|
| | PROJECT | IN SERVICE DATE | DUE DATE | INTEREST RATE | ORIGINAL PRINCIPAL | CURRENT PRINCIPAL | Roll Maturity Date | Rollover Rate |
| 365 | Construction | 06/2012 | 06/2037 | 3.503% | 35,000 | 0 | | |
| 366 | Construction | 08/2012 | 08/2015 | 0.589% | 37,000 | 0 | | |
| 367 | Construction | 09/2012 | 09/2017 | 0.891% | 36,400 | 36,400 | 43373 | 0.750% |
| 368 | Construction | 09/2012 | 09/2039 | 3.627% | 39,000 | 0 | | |
| 369 | Construction | 11/2012 | 10/2042 | 5.687% | 55,000 | 0 | | |
| 370 | Construction | 01/2013 | 01/2043 | 6.194% | 30,000 | 0 | | |
| 371 | Construction | 02/2013 | 02/2043 | 5.993% | 15,000 | 0 | | |
| 372 | Construction | 03/2013 | 03/2043 | 5.958% | 18,000 | 0 | | |
| 373 | Construction | 04/2013 | 04/2043 | 5.633% | 28,000 | 0 | | |
| 374 | Construction | 05/2013 | 05/2043 | 6.192% | 20,000 | 0 | | |
| 375 | Construction | 06/2013 | 06/2043 | 6.938% | 36,000 | 0 | | |
| 376 | Construction | 08/2013 | 02/2014 | 0.090% | 39,000 | 0 | | |
| 377 | Construction | 08/2013 | 08/2034 | 7.413% | 20,000 | 0 | | |
| 378 | Construction | 09/2013 | 02/2014 | 0.021% | 5,000 | 0 | | |
| 379 | Construction | 09/2013 | 09/2034 | 4.214% | 9,000 | 9,000 | | |
| 380 | Construction | 10/2013 | 10/2035 | 4.222% | 64,000 | 64,000 | 53996 | 4.184% |
| 381 | Construction | 11/2013 | 09/2014 | 0.140% | 14,000 | 0 | | |
| 382 | Construction | 11/2013 | 10/2029 | 4.093% | 55,000 | 55,000 | | |
| 383 | Construction | 11/2013 | 01/2031 | 4.162% | 30,000 | 30,000 | | |
| 384 | Construction | 11/2013 | 02/2031 | 4.166% | 15,000 | 15,000 | | |
| 385 | Construction | 11/2013 | 03/2031 | 4.171% | 18,000 | 18,000 | | |
| 386 | Construction | 11/2013 | 08/2034 | 4.324% | 6,000 | 6,000 | | |
| 387 | Construction | 11/2013 | 05/2035 | 4.354% | 20,000 | 20,000 | | |
| 388 | Construction | 11/2013 | 06/2036 | 4.397% | 36,000 | 36,000 | | |
| 389 | Construction | 11/2013 | 04/2034 | 4.311% | 28,000 | 28,000 | 04/2037 | 3.413% |
| 390 | Construction | 11/2013 | 11/2035 | 4.365% | 15,000 | 15,000 | | |
| 391 | Construction | 12/2013 | 02/2014 | 0.052% | 9,000 | 0 | | |
| 392 | Construction | 12/2013 | 12/2035 | 4.472% | 10,000 | 10,000 | | |
| 393 | Construction | 01/2014 | 12/2018 | 1.943% | 33,000 | 33,000 | | |
| 394 | Construction | 01/2014 | 12/2018 | 1.943% | 30,000 | 30,000 | | |
| 395 | Construction | 01/2014 | 12/2018 | 1.943% | 31,000 | 31,000 | | |
| 396 | Construction | 01/2014 | 12/2018 | 1.943% | 48,000 | 48,000 | | |
| 397 | Construction | 01/2014 | 06/2014 | 0.083% | 10,000 | 0 | | |
| 398 | Construction | 01/2014 | 01/2043 | 4.380% | 15,000 | 15,000 | | |
| 399 | Construction | 02/2014 | 09/2014 | 0.077% | 53,000 | 0 | | |
| 400 | Construction | 04/2014 | 02/2034 | 0.947% | 45,000 | 45,000 | | |
| 401 | Construction | 04/2014 | 03/2034 | 0.947% | 45,000 | 45,000 | | |
| 402 | Construction | 04/2014 | 10/2039 | 0.947% | 45,000 | 45,000 | | |
| 403 | Construction | 05/2014 | 05/2036 | 0.732% | 29,000 | 29,000 | 05/2047 | 4.150% |
| 404 | Construction | 06/2014 | 06/2015 | 0.303% | 11,000 | 0 | | |
| 405 | Construction | 06/2014 | 06/2015 | 0.303% | 63,000 | 0 | | |
| 406 | Construction | 06/2014 | 11/2032 | 0.713% | 21,000 | 21,000 | | |
| 407 | Construction | 07/2014 | 04/2032 | 0.674% | 9,000 | 9,000 | | |
| 408 | Construction | 08/2014 | 06/2015 | 0.262% | 14,000 | 0 | | |
| 409 | Construction | 08/2014 | 07/2035 | 0.674% | 10,000 | 10,000 | | |
| 410 | Construction | 08/2014 | 08/2035 | 0.697% | 15,000 | 15,000 | 54666 | 4.251% |
| 411 | Construction | 09/2014 | 04/2028 | 0.713% | 17,000 | 17,000 | 54543 | 4.486% |
| 412 | Construction | 09/2014 | 09/2028 | 3.094% | 3,000 | 3,000 | 54696 | 4.486% |
| 413 | Construction | 10/2014 | 06/2015 | 0.180% | 23,000 | 0 | | |
| 414 | Construction | 10/2014 | 10/2023 | 2.521% | 20,000 | 20,000 | | |
| 415 | Construction | 11/2014 | 06/2015 | 0.168% | 18,000 | 0 | | |
| 416 | Construction | 11/2014 | 11/2023 | 2.361% | 20,000 | 20,000 | | |

TABLE 10-1
HISTORICAL INVESTMENTS
(\$000s)

| | A | B | C | D | E | F | G | H |
|-----|-------------------|-----------------|----------|---------------|--------------------|-------------------|--------------------|---------------|
| | PROJECT | IN SERVICE DATE | DUE DATE | INTEREST RATE | ORIGINAL PRINCIPAL | CURRENT PRINCIPAL | Roll Maturity Date | Rollover Rate |
| 417 | Construction | 12/2014 | 12/2022 | 2.274% | 16,000 | 16,000 | | |
| 418 | Construction | 12/2014 | 12/2022 | 2.274% | 4,000 | 4,000 | | |
| 419 | Construction | 01/2015 | 06/2015 | 0.151% | 35,000 | 0 | | |
| 420 | Construction | 02/2015 | 06/2015 | 0.149% | 30,000 | 0 | | |
| 421 | Construction | 02/2015 | 02/2026 | 2.416% | 19,000 | 19,000 | | |
| 422 | Construction | 03/2015 | 03/2024 | 2.200% | 17,000 | 17,000 | | |
| 423 | Construction | 03/2015 | 03/2026 | 2.370% | 15,000 | 15,000 | | |
| 424 | Construction | 03/2015 | 03/2030 | 2.626% | 3,000 | 3,000 | | |
| 425 | Construction | 04/2015 | 06/2015 | 0.118% | 20,000 | 0 | | |
| 426 | Construction | 04/2015 | 04/2023 | 2.163% | 3,000 | 3,000 | | |
| 427 | Construction | 04/2015 | 04/2023 | 2.163% | 12,000 | 12,000 | | |
| 428 | Construction | 05/2015 | 05/2022 | 2.103% | 11,000 | 11,000 | 54939 | 4.722% |
| 429 | Construction | 05/2015 | 05/2022 | 2.103% | 14,000 | 14,000 | 54939 | 4.722% |
| 430 | Construction | 06/2015 | 02/2016 | 0.261% | 11,000 | 0 | | |
| 431 | Construction | 06/2015 | 02/2016 | 0.261% | 63,000 | 0 | | |
| 432 | Construction | 06/2015 | 02/2016 | 0.261% | 14,000 | 0 | | |
| 433 | Construction | 06/2015 | 02/2016 | 0.261% | 23,000 | 0 | | |
| 434 | Construction | 06/2015 | 02/2016 | 0.261% | 18,000 | 0 | | |
| 435 | Construction | 06/2015 | 02/2016 | 0.261% | 35,000 | 0 | | |
| 436 | Construction | 06/2015 | 02/2016 | 0.261% | 30,000 | 0 | | |
| 437 | Construction | 06/2015 | 02/2016 | 0.261% | 20,000 | 0 | | |
| 438 | Construction | 06/2015 | 06/2023 | 2.443% | 11,000 | 11,000 | | |
| 439 | Construction | 06/2015 | 06/2023 | 2.443% | 8,000 | 8,000 | | |
| 440 | Construction | 07/2015 | 02/2016 | 0.272% | 25,000 | 0 | | |
| 441 | Construction | 07/2015 | 07/2026 | 2.707% | 18,000 | 18,000 | | |
| 442 | Construction | 07/2015 | 07/2026 | 2.707% | 10,000 | 10,000 | | |
| 443 | Construction | 08/2015 | 02/2016 | 0.286% | 13,000 | 0 | | |
| 444 | Construction | 08/2015 | 08/2025 | 2.598% | 14,000 | 14,000 | | |
| 445 | Construction | 09/2015 | 09/2030 | 2.905% | 15,000 | 15,000 | | |
| 446 | Construction | 10/2015 | 02/2016 | 0.216% | 12,000 | 0 | | |
| 447 | Construction | 10/2015 | 10/2034 | 3.198% | 2,000 | 2,000 | | |
| 448 | Construction | 10/2015 | 06/2034 | 0.713% | 21,000 | 21,000 | 50221 | 3.413% |
| 449 | Construction | 10/2015 | 08/2034 | 0.713% | 19,000 | 19,000 | 08/2051 | 4.352% |
| 450 | Construction | 12/2015 | 12/2026 | 2.762% | 9,000 | 9,000 | | |
| 451 | Construction | 12/2015 | 12/2026 | 2.762% | 29,000 | 29,000 | | |
| 452 | Construction | 01/2016 | 01/2027 | 2.352% | 13,000 | 13,000 | | |
| 453 | Construction | 02/2016 | 04/2016 | 0.436% | 25,000 | 0 | | |
| 454 | Construction | 02/2016 | 04/2016 | 0.436% | 14,000 | 0 | | |
| 455 | Construction | 02/2016 | 04/2016 | 0.436% | 250,000 | 0 | | |
| 456 | Construction | 02/2016 | 02/2027 | 2.236% | 13,000 | 13,000 | | |
| 457 | Construction | 03/2016 | 03/2026 | 2.177% | 6,000 | 6,000 | | |
| 458 | Construction | 03/2016 | 03/2026 | 2.177% | 12,000 | 12,000 | 55243 | 4.621% |
| 459 | Construction | 05/2016 | 05/2025 | 2.101% | 20,000 | 20,000 | | |
| 460 | Construction | 07/2016 | 07/2025 | 1.713% | 48,000 | 48,000 | | |
| 461 | Construction (AS) | 10/1992 | 10/2032 | 8.350% | 99,962 | 0 | | |
| 462 | Construction (AS) | 07/1995 | 07/2025 | 7.700% | 49,933 | 0 | | |
| 463 | Construction (AS) | 01/1996 | 01/2003 | 5.900% | 54,378 | 0 | | |
| 464 | Construction (AS) | 01/1997 | 01/2004 | 6.800% | 22,600 | 0 | | |
| 465 | Construction (AS) | 08/1998 | 08/2008 | 5.750% | 36,819 | 0 | | |
| 466 | Construction (AS) | 02/1999 | 02/2014 | 5.900% | 59,050 | 0 | | |
| 467 | Construction (AS) | 07/2000 | 07/2004 | 7.000% | 39,052 | 0 | | |
| 468 | Construction (AS) | 01/2001 | 01/2010 | 6.050% | 59,932 | 0 | | |

TABLE 10-1
HISTORICAL INVESTMENTS
(\$000s)

| | A | B | C | D | E | F | G | H |
|-----|-------------------|-----------------|----------|---------------|--------------------|-------------------|--------------------|---------------|
| | PROJECT | IN SERVICE DATE | DUE DATE | INTEREST RATE | ORIGINAL PRINCIPAL | CURRENT PRINCIPAL | Roll Maturity Date | Rollover Rate |
| 469 | Construction (AS) | 03/2002 | 03/2005 | 4.600% | 108,010 | 0 | | |
| 470 | Construction (AS) | 10/2002 | 10/2005 | 3.000% | 4,938 | 0 | | |
| 471 | Construction (AS) | 01/2004 | 01/2007 | 2.500% | 46,643 | 0 | | |
| 472 | Construction (AS) | 11/2004 | 11/2008 | 3.750% | 27,010 | 0 | | |
| 473 | Construction (AS) | 09/2006 | 09/2010 | 4.950% | 5,319 | 0 | | |
| 474 | Construction (AS) | 01/2008 | 01/2012 | 3.200% | 30,000 | 0 | | |
| 475 | Construction (AS) | 09/2008 | 09/2012 | 3.444% | 25,000 | 0 | | |
| 476 | Construction (AS) | 09/2009 | 09/2014 | 2.746% | 14,000 | 0 | | |
| 477 | Construction (AS) | 02/2010 | 02/2015 | 0.165% | 7,500 | 0 | | |
| 478 | Construction (AS) | 08/2010 | 08/2015 | 1.619% | 15,000 | 0 | | |
| 479 | Construction (AS) | 06/2011 | 06/2016 | 1.957% | 13,000 | 0 | | |
| 480 | Construction (AS) | 08/2011 | 08/2016 | 1.423% | 6,500 | 0 | | |
| 481 | Construction (AS) | 06/2012 | 09/2015 | 0.671% | 14,300 | 0 | | |
| 482 | Construction (AS) | 11/2012 | 11/2018 | 1.109% | 9,750 | 9,750 | | |
| 483 | Construction (AS) | 04/2013 | 04/2017 | 0.622% | 4,550 | 0 | | |
| 484 | Construction (AS) | 06/2013 | 06/2019 | 1.962% | 5,000 | 5,000 | | |
| 485 | Construction (AS) | 08/2013 | 08/2019 | 2.279% | 3,000 | 3,000 | | |
| 486 | Construction (AS) | 10/2013 | 10/2019 | 2.039% | 7,800 | 7,800 | | |
| 487 | Construction (AS) | 01/2014 | 01/2020 | 2.183% | 3,250 | 3,250 | | |
| 488 | Construction (AS) | 02/2014 | 09/2014 | 0.117% | 59,050 | 0 | | |
| 489 | Construction (AS) | 04/2014 | 03/2020 | 0.526% | 2,600 | 2,600 | | |
| 490 | Construction (AS) | 05/2014 | 04/2020 | 0.526% | 1,300 | 1,300 | | |
| 491 | Construction (AS) | 07/2014 | 07/2020 | 0.526% | 1,950 | 1,950 | | |
| 492 | Construction (AS) | 11/2014 | 11/2020 | 1.809% | 3,900 | 3,900 | | |
| 493 | Construction (AS) | 12/2014 | 12/2020 | 1.922% | 1,950 | 1,950 | | |
| 494 | Construction (AS) | 02/2015 | 02/2021 | 1.761% | 3,250 | 3,250 | | |
| 495 | Construction (AS) | 05/2015 | 05/2021 | 1.898% | 3,900 | 3,900 | | |
| 496 | Construction (AS) | 08/2015 | 08/2025 | 2.598% | 11,000 | 11,000 | | |
| 497 | Construction (AS) | 10/2015 | 10/2021 | 1.942% | 5,200 | 5,200 | | |
| 498 | Construction (AS) | 02/2016 | 02/2022 | 1.631% | 5,000 | 5,000 | | |
| 499 | Construction (AS) | 06/2016 | 09/2016 | 0.436% | 13,000 | 0 | | |
| 500 | Construction (AS) | 04/2017 | 01/2018 | 1.051% | 4,550 | 4,550 | | |
| 501 | Environment | 11/1996 | 11/2011 | 6.950% | 40,000 | 0 | | |
| 502 | Environment | 01/2001 | 01/2010 | 6.050% | 30,000 | 0 | | |
| 503 | Environment | 09/2002 | 09/2006 | 3.050% | 30,000 | 0 | | |
| 504 | Environment | 03/2006 | 03/2009 | 5.050% | 20,000 | 0 | | |
| 505 | Environment | 09/2008 | 09/2011 | 3.151% | 10,000 | 0 | | |
| 506 | Environment | 02/2010 | 02/2025 | 4.279% | 10,000 | 10,000 | | |
| 507 | Environment | 05/2012 | 05/2027 | 0.697% | 13,000 | 13,000 | | |
| 508 | Environment | 11/2012 | 11/2027 | 5.046% | 5,000 | 0 | | |
| 509 | Environment | 10/2013 | 10/2028 | 3.880% | 6,000 | 6,000 | | |
| 510 | Environment | 11/2013 | 11/2027 | 3.967% | 5,000 | 5,000 | | |
| 511 | Environment | 01/2014 | 01/2029 | 3.896% | 3,000 | 3,000 | | |
| 512 | Environment | 07/2014 | 07/2029 | 0.526% | 3,000 | 3,000 | | |
| 513 | Environment | 01/2015 | 01/2024 | 1.908% | 4,000 | 4,000 | | |
| 514 | Environment | 10/2015 | 09/2027 | 0.674% | 5,000 | 5,000 | | |
| 515 | Environment | 05/2016 | 05/2025 | 2.101% | 5,000 | 5,000 | | |
| 516 | Technology (T) | 02/2015 | 02/2021 | 1.761% | 23,000 | 23,000 | | |
| 517 | Technology (T) | 10/2015 | 09/2018 | 0.674% | 5,000 | 5,000 | | |
| 518 | Totals: | | | | 12,452,108 | 2,937,888 | | |

TABLE 10-2
PROJECTED FEDERAL INVESTMENTS
(\$000s)

| A | B | C | D | F | E |
|-----------------------|--------------------|-------------------|---------------|-----------------|-----------|
| PROJECT | ORIGINAL PRINCIPAL | CURRENT PRINCIPAL | INTEREST RATE | IN SERVICE DATE | DUE DATE |
| 1 Construction | 19,000 | 19,000 | 2.730% | 7/31/2017 | 7/31/2043 |
| 2 Construction | 19,000 | 19,000 | 2.780% | 7/31/2017 | 7/31/2044 |
| 3 Construction | 38,000 | 38,000 | 2.930% | 7/31/2017 | 7/31/2047 |
| 4 Construction | 76,000 | 76,000 | 2.630% | 8/31/2017 | 8/31/2041 |
| 5 Construction | 38,000 | 38,000 | 2.480% | 9/30/2017 | 9/30/2039 |
| 6 Construction | 38,000 | 38,000 | 2.930% | 9/30/2017 | 9/30/2047 |
| 7 Construction (AS) | 5,850 | 5,850 | 1.510% | 9/30/2017 | 9/30/2023 |
| 8 Environment | 7,000 | 7,000 | 2.180% | 9/30/2017 | 9/30/2032 |
| 9 2017 TOTAL: | 240,850 | 240,850 | | | |
| 10 Construction | 26,000 | 26,000 | 3.620% | 7/31/2018 | 7/31/2042 |
| 11 Construction | 26,000 | 26,000 | 3.670% | 7/31/2018 | 7/31/2043 |
| 12 Construction | 26,000 | 26,000 | 3.870% | 7/31/2018 | 7/31/2048 |
| 13 Construction | 29,000 | 29,000 | 3.830% | 8/31/2018 | 8/31/2047 |
| 14 Construction | 50,000 | 50,000 | 3.870% | 8/31/2018 | 8/31/2048 |
| 15 Construction | 79,000 | 79,000 | 3.870% | 9/30/2018 | 9/30/2048 |
| 16 Construction (AS) | 10,400 | 10,400 | 2.560% | 9/30/2018 | 9/30/2024 |
| 17 Environment | 7,000 | 7,000 | 3.250% | 9/30/2018 | 9/30/2033 |
| 18 2018 TOTAL: | 253,400 | 253,400 | | | |
| 19 Construction | 82,000 | 82,000 | 4.430% | 7/31/2019 | 7/31/2049 |
| 20 Construction | 81,000 | 81,000 | 4.430% | 8/31/2019 | 8/31/2049 |
| 21 Construction | 81,000 | 81,000 | 4.430% | 9/30/2019 | 9/30/2049 |
| 22 Construction (AS) | 11,050 | 11,050 | 3.270% | 9/30/2019 | 9/30/2025 |
| 23 Environment | 7,000 | 7,000 | 3.890% | 9/30/2019 | 9/30/2034 |
| 24 2019 TOTAL: | 262,050 | 262,050 | | | |

11. REPAYMENT STUDY RESULTS

**TABLE 11-1
SUMMARY OF INTEREST (\$000S) (FY 2018)**

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | |
|----|----------------------|---|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------|
| 1 | Obligation Type | General Project | Specific Project | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | |
| 2 | Appropriation | Bonneville Power Administration | Bonneville Power Administration | 8,628 | 1,659 | 1,518 | 1,151 | - | - | - | - | - | - | - | - | - | |
| 3 | | | Bonneville Power Administration Subtotal: | 8,628 | 1,659 | 1,518 | 1,151 | - | - | - | - | - | - | - | - | - | - |
| 4 | | Appropriation Subtotal: | 8,628 | 1,659 | 1,518 | 1,151 | - | - | - | - | - | - | - | - | - | - | - |
| 5 | | (Less Interest Income) | (131) | (223) | (608) | (422) | (422) | (435) | (429) | (426) | (420) | (428) | (424) | (448) | (453) | | |
| 6 | | Construction | 90,872 | 97,030 | 104,005 | 99,571 | 97,275 | 93,677 | 89,094 | 84,879 | 83,401 | 80,101 | 76,607 | 75,492 | 68,177 | | |
| 7 | | Interest Accrual | 17,493 | 18,229 | 16,379 | 15,098 | 14,214 | 12,980 | 12,513 | 12,103 | 11,739 | 10,880 | 10,444 | 9,803 | 9,270 | | |
| 8 | | Interest Accrual Reversal | (16,968) | (17,493) | (18,229) | (16,379) | (15,098) | (14,214) | (12,980) | (12,513) | (12,103) | (11,739) | (10,880) | (10,444) | (9,803) | | |
| 9 | | Construction (AS) | 1,254 | 1,354 | 1,542 | 1,200 | 978 | 731 | 640 | 551 | 285 | - | - | - | - | | |
| 10 | | Interest Accrual | 292 | 284 | 218 | 136 | 73 | 24 | 24 | 24 | - | - | - | - | - | | |
| 11 | | Interest Accrual Reversal | (284) | (292) | (284) | (218) | (136) | (73) | (24) | (24) | (24) | - | - | - | - | | |
| 12 | | BPA Borrowing | Environment | 1,296 | 1,449 | 1,676 | 1,676 | 1,676 | 1,676 | 1,676 | 1,638 | 1,386 | 1,068 | 1,068 | 845 | 571 | |
| 13 | Treasury | | Interest Accrual | 299 | 299 | 299 | 299 | 299 | 299 | 299 | 287 | 215 | 215 | 185 | 119 | - | |
| 14 | | | Interest Accrual Reversal | (299) | (299) | (299) | (299) | (299) | (299) | (299) | (299) | (287) | (215) | (215) | (185) | (119) | |
| 15 | | | Technology (T) | 438 | 438 | 404 | 404 | 201 | - | - | - | - | - | - | - | - | |
| 16 | | | Interest Accrual | 34 | 34 | 34 | 34 | - | - | - | - | - | - | - | - | - | |
| 17 | | | Interest Accrual Reversal | (34) | (34) | (34) | (34) | (34) | - | - | - | - | - | - | - | - | |
| 18 | | | BPA Borrowing Subtotal: | 94,262 | 100,776 | 105,103 | 101,066 | 98,728 | 94,367 | 90,515 | 86,219 | 84,192 | 79,883 | 76,786 | 75,181 | 67,643 | |
| 19 | | | Federal Transmission Replacement | Replacements | - | - | 3,524 | 10,664 | 17,996 | 25,516 | 33,188 | 40,993 | 48,923 | 56,988 | 65,193 | 73,533 | 82,008 |
| 20 | | Federal Transmission Replacement Subtotal: | - | - | 3,524 | 10,664 | 17,996 | 25,516 | 33,188 | 40,993 | 48,923 | 56,988 | 65,193 | 73,533 | 82,008 | | |
| 21 | | Treasury Subtotal: | 94,262 | 100,776 | 108,626 | 111,729 | 116,725 | 119,882 | 123,702 | 127,212 | 133,115 | 136,871 | 141,979 | 148,714 | 149,651 | | |
| 22 | Grand Total: | | | \$102,890 | \$102,435 | \$110,144 | \$112,881 | \$116,725 | \$119,882 | \$123,702 | \$127,212 | \$133,115 | \$136,871 | \$141,979 | \$148,714 | \$149,651 | |
| 23 | | | | | | | | | | | | | | | | | |

**TABLE 11-1
SUMMARY OF INTEREST (\$000S) (FY 2018)**

| | A | B | C | Q | R | S | T | U | V | W | X | Y | Z | AA | AB | AC | | |
|----|-----------------|---|---|---------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|---|
| 1 | Obligation Type | General Project | Specific Project | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | | |
| 2 | Appropriation | Bonneville Power Administration | Bonneville Power Administration | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| 3 | | | Bonneville Power Administration Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 4 | | | Appropriation Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 | | | (Less Interest Income) | (448) | (454) | (456) | (434) | (466) | (410) | (412) | (469) | (473) | (476) | (445) | (520) | (440) | | |
| 6 | | Construction | 61,695 | 57,256 | 53,683 | 48,102 | 45,518 | 43,982 | 40,784 | 35,723 | 31,709 | 26,996 | 23,149 | 21,414 | 17,249 | | | |
| 7 | | Interest Accrual | 7,906 | 7,553 | 7,137 | 6,771 | 5,771 | 4,668 | 1,706 | 1,594 | 1,594 | 1,533 | 1,262 | 1,093 | 937 | | | |
| 8 | | Interest Accrual Reversal | (9,270) | (7,906) | (7,553) | (7,137) | (6,771) | (5,771) | (4,668) | (1,706) | (1,594) | (1,594) | (1,533) | (1,262) | (1,093) | | | |
| 9 | | Construction (AS) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 10 | | Interest Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 11 | | Interest Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 12 | | BPA Borrowing | Environment | 380 | 380 | 380 | 228 | - | - | - | - | - | - | - | - | - | - | |
| 13 | | | Interest Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 14 | | | Interest Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 15 | | | Technology (T) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 16 | | | Interest Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 17 | | | Interest Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 18 | | | BPA Borrowing Subtotal: | 60,263 | 56,829 | 53,190 | 47,530 | 44,052 | 42,469 | 37,410 | 35,142 | 31,236 | 26,460 | 22,432 | 20,725 | 16,654 | | |
| 19 | | Federal Transmission Replacement | Replacements | 90,637 | 99,444 | 108,421 | 117,567 | 126,891 | 136,384 | 146,038 | 155,849 | 165,809 | 175,902 | 186,125 | 196,489 | 206,986 | | |
| 20 | | | Federal Transmission Replacement Subtotal: | 90,637 | 99,444 | 108,421 | 117,567 | 126,891 | 136,384 | 146,038 | 155,849 | 165,809 | 175,902 | 186,125 | 196,489 | 206,986 | | |
| 21 | | | Treasury Subtotal: | 150,900 | 156,274 | 161,612 | 165,097 | 170,943 | 178,853 | 183,448 | 190,991 | 197,045 | 202,362 | 208,557 | 217,214 | 223,639 | | |
| 22 | | Grand Total: | | | \$150,900 | \$156,274 | \$161,612 | \$165,097 | \$170,943 | \$178,853 | \$183,448 | \$190,991 | \$197,045 | \$202,362 | \$208,557 | \$217,214 | \$223,639 | |
| 23 | | | | | | | | | | | | | | | | | | |

**TABLE 11-1
SUMMARY OF INTEREST (\$000S) (FY 2018)**

| | A | B | C | AD | AE | AF | AG | AH | AI | AJ | AK | AL | AM | AN | AO | |
|----|---------------------|---|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------------------|-----------|
| 1 | Obligation Type | General Project | Specific Project | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | Total | |
| 2 | Appropriation | Bonneville Power Administration | Bonneville Power Administration | - | - | - | - | - | - | - | - | - | - | - | 12,956 | |
| 3 | | | Bonneville Power Administration Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | 12,956 |
| 4 | | | Appropriation Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 | | | (Less Interest Income) | (448) | (450) | (715) | (712) | (707) | (704) | (699) | (695) | (690) | (685) | (679) | (18,356) | |
| 6 | | | Construction | 14,350 | 10,869 | 5,363 | 814 | - | - | - | - | - | - | - | - | 1,678,841 |
| 7 | | | Interest Accrual | 694 | 571 | 85 | - | - | - | - | - | - | - | - | - | 222,020 |
| 8 | | | Interest Accrual Reversal | (937) | (694) | (571) | (85) | - | - | - | - | - | - | - | - | (238,988) |
| 9 | | | Construction (AS) | - | - | - | - | - | - | - | - | - | - | - | - | 8,534 |
| 10 | | | Interest Accrual | - | - | - | - | - | - | - | - | - | - | - | - | 1,075 |
| 11 | | | Interest Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | (1,360) |
| 12 | | BPA Borrowing | Environment | - | - | - | - | - | - | - | - | - | - | - | 19,070 | |
| 13 | Treasury | | Interest Accrual | - | - | - | - | - | - | - | - | - | - | - | 3,116 | |
| 14 | | | Interest Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | (3,415) | |
| 15 | | | Technology (T) | - | - | - | - | - | - | - | - | - | - | - | 1,884 | |
| 16 | | | Interest Accrual | - | - | - | - | - | - | - | - | - | - | - | 137 | |
| 17 | | | Interest Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | (171) | |
| 18 | | | BPA Borrowing Subtotal: | 13,659 | 10,295 | 4,162 | 18 | (707) | (704) | (699) | (695) | (690) | (685) | (679) | 1,672,388 | |
| 19 | | Federal Transmission Replacement | Replacements | 217,615 | 228,386 | 239,267 | 247,558 | 252,285 | 256,214 | 260,404 | 264,845 | 269,539 | 274,507 | 279,776 | 5,161,462 | |
| 20 | | | Federal Transmission Replacement Subtotal: | 217,615 | 228,386 | 239,267 | 247,558 | 252,285 | 256,214 | 260,404 | 264,845 | 269,539 | 274,507 | 279,776 | 5,161,462 | |
| 21 | | Treasury Subtotal: | 231,275 | 238,681 | 243,430 | 247,576 | 251,577 | 255,511 | 259,705 | 264,151 | 268,849 | 273,822 | 279,097 | 6,833,850 | | |
| 22 | Grand Total: | | | \$231,275 | \$238,681 | \$243,430 | \$247,576 | \$251,577 | \$255,511 | \$259,705 | \$264,151 | \$268,849 | \$273,822 | \$279,097 | \$6,846,807 | |
| 23 | | | | | | | | | | | | | | | | |

**TABLE 11-2
INTEREST CALCULATION SUMMARY (\$000S)
(FY 2018)**

| A | C | D | E | F | G | H | I | J |
|-------------|--------------------------------------|------------------|-------------------|--------|----------------|---------|----------------------|----------------|
| Fiscal Year | Project | Type | Current Principal | Rate | Interest | Premium | Net Interest Accrual | Total |
| 1 | 2017 Bonneville Power Administration | Historical | 119,448 | 7.223% | 8,628 | - | - | 8,628 |
| 2 | 2017 Construction | Historical | 2,663,040 | 3.412% | 90,872 | - | - | 90,872 |
| 3 | 2017 Construction | New | 152,000 | - | - | - | 525 | 525 |
| 4 | 2017 Construction (AS) | Historical | 68,850 | 1.803% | 1,242 | - | - | 1,242 |
| 5 | 2017 Construction (AS) | New | 4,550 | 0.263% | 12 | - | 8 | 20 |
| 6 | 2017 Environment | Historical | 54,000 | 2.400% | 1,296 | - | - | 1,296 |
| 7 | 2017 Technology (T) | Historical | 28,000 | 1.563% | 438 | - | - | 438 |
| 8 | 2017 Float | Historical | - | - | (131) | - | - | (131) |
| 9 | FY 2017 | Subtotal: | 3,089,888 | | 102,357 | - | 533 | 102,890 |
| 10 | 2018 Bonneville Power Administration | Historical | 23,008 | 7.210% | 1,659 | - | - | 1,659 |
| 11 | 2018 Construction | Historical | 2,891,040 | 3.356% | 97,030 | - | - | 97,030 |
| 12 | 2018 Construction | New | 157,000 | - | - | - | 736 | 736 |
| 13 | 2018 Construction (AS) | Historical | 79,250 | 1.708% | 1,354 | - | (8) | 1,346 |
| 14 | 2018 Environment | Historical | 61,000 | 2.375% | 1,449 | - | - | 1,449 |
| 15 | 2018 Technology (T) | Historical | 28,000 | 1.563% | 438 | - | - | 438 |
| 16 | 2018 Float | Historical | - | - | (223) | - | - | (223) |
| 17 | FY 2018 | Subtotal: | 3,239,298 | | 101,706 | - | 728 | 102,435 |
| 18 | 2019 Bonneville Power Administration | Historical | 21,053 | 7.210% | 1,518 | - | - | 1,518 |
| 19 | 2019 Construction | Historical | 3,090,640 | 3.365% | 104,005 | - | (1,850) | 102,155 |
| 20 | 2019 Construction (AS) | Historical | 85,100 | 1.812% | 1,542 | - | (67) | 1,476 |
| 21 | 2019 Environment | Historical | 68,000 | 2.465% | 1,676 | - | - | 1,676 |
| 22 | 2019 Replacements | New | 182,115 | 1.935% | 3,524 | - | - | 3,524 |
| 23 | 2019 Technology (T) | Historical | 23,000 | 1.756% | 404 | - | - | 404 |
| 24 | 2019 Float | Historical | - | - | (608) | - | - | (608) |
| 25 | FY 2019 | Subtotal: | 3,469,908 | | 112,061 | - | (1,917) | 110,144 |
| 26 | 2020 Bonneville Power Administration | Historical | 15,971 | 7.210% | 1,151 | - | - | 1,151 |
| 27 | 2020 Construction | Historical | 2,897,640 | 3.436% | 99,571 | - | (1,281) | 98,290 |
| 28 | 2020 Construction (AS) | Historical | 67,350 | 1.782% | 1,200 | - | (82) | 1,118 |
| 29 | 2020 Environment | Historical | 68,000 | 2.465% | 1,676 | - | - | 1,676 |
| 30 | 2020 Replacements | Historical | 182,115 | 3.870% | 7,048 | - | - | 7,048 |
| 31 | 2020 Replacements | New | 186,863 | 1.935% | 3,616 | - | - | 3,616 |
| 32 | 2020 Technology (T) | Historical | 23,000 | 1.756% | 404 | - | - | 404 |
| 33 | 2020 Float | Historical | - | - | (422) | - | - | (422) |
| 34 | FY 2020 | Subtotal: | 3,440,939 | | 114,244 | - | (1,363) | 112,881 |
| 35 | 2021 Construction | Historical | 2,800,126 | 3.474% | 97,275 | - | (884) | 96,391 |
| 36 | 2021 Construction (AS) | Historical | 50,450 | 1.939% | 978 | - | (63) | 916 |
| 37 | 2021 Environment | Historical | 68,000 | 2.465% | 1,676 | - | - | 1,676 |
| 38 | 2021 Replacements | Historical | 368,978 | 3.870% | 14,279 | - | - | 14,279 |
| 39 | 2021 Replacements | New | 192,088 | 1.935% | 3,717 | - | - | 3,717 |
| 40 | 2021 Technology (T) | Historical | 23,000 | 0.876% | 201 | - | (34) | 167 |
| 41 | 2021 Float | Historical | - | - | (422) | - | - | (422) |
| 42 | FY 2021 | Subtotal: | 3,502,642 | | 117,706 | - | (981) | 116,725 |
| 43 | 2022 Construction | Historical | 2,708,469 | 3.459% | 93,677 | - | (1,234) | 92,444 |
| 44 | 2022 Construction (AS) | Historical | 37,450 | 1.951% | 731 | - | (49) | 682 |
| 45 | 2022 Environment | Historical | 68,000 | 2.465% | 1,676 | - | - | 1,676 |
| 46 | 2022 Replacements | Historical | 561,066 | 3.870% | 21,713 | - | - | 21,713 |
| 47 | 2022 Replacements | New | 196,517 | 1.935% | 3,803 | - | - | 3,803 |
| 48 | 2022 Float | Historical | - | - | (435) | - | - | (435) |
| 49 | FY 2022 | Subtotal: | 3,571,502 | | 121,165 | - | (1,282) | 119,882 |
| 50 | 2023 Construction | Historical | 2,586,677 | 3.444% | 89,094 | - | (467) | 88,627 |
| 51 | 2023 Construction (AS) | Historical | 27,250 | 2.347% | 640 | - | - | 640 |
| 52 | 2023 Environment | Historical | 68,000 | 2.465% | 1,676 | - | - | 1,676 |
| 53 | 2023 Replacements | Historical | 757,583 | 3.870% | 29,318 | - | - | 29,318 |
| 54 | 2023 Replacements | New | 199,967 | 1.935% | 3,869 | - | - | 3,869 |
| 55 | 2023 Float | Historical | - | - | (429) | - | - | (429) |
| 56 | FY 2023 | Subtotal: | 3,639,477 | | 124,169 | - | (467) | 123,702 |
| 57 | 2024 Construction | Historical | 2,466,006 | 3.442% | 84,879 | - | (411) | 84,469 |
| 58 | 2024 Construction (AS) | Historical | 21,400 | 2.576% | 551 | - | - | 551 |
| 59 | 2024 Environment | Historical | 68,000 | 2.409% | 1,638 | - | (13) | 1,626 |
| 60 | 2024 Replacements | Historical | 957,551 | 3.870% | 37,057 | - | - | 37,057 |
| 61 | 2024 Replacements | New | 203,394 | 1.935% | 3,936 | - | - | 3,936 |
| 62 | 2024 Float | Historical | - | - | (426) | - | - | (426) |
| 63 | FY 2024 | Subtotal: | 3,716,350 | | 127,635 | - | (423) | 127,212 |

**TABLE 11-2
INTEREST CALCULATION SUMMARY (\$000S)
(FY 2018)**

| | A | C | D | E | F | G | H | I | J |
|------------|----------------|-------------------|------------|-------------------|--------|----------------|----------|----------------------|----------------|
| | Fiscal Year | Project | Type | Current Principal | Rate | Interest | Premium | Net Interest Accrual | Total |
| 64 | 2025 | Construction | Historical | 2,355,281 | 3.541% | 83,401 | - | (364) | 83,037 |
| 65 | 2025 | Construction (AS) | Historical | 11,000 | 2.591% | 285 | - | (24) | 261 |
| 66 | 2025 | Environment | Historical | 64,000 | 2.166% | 1,386 | - | (71) | 1,315 |
| 67 | 2025 | Replacements | Historical | 1,160,944 | 3.870% | 44,929 | - | - | 44,929 |
| 68 | 2025 | Replacements | New | 206,406 | 1.935% | 3,994 | - | - | 3,994 |
| 69 | 2025 | Float | Historical | - | - | (420) | - | - | (420) |
| 70 | FY 2025 | Subtotal: | | 3,797,632 | | 133,574 | - | (460) | 133,115 |
| 71 | 2026 | Construction | Historical | 2,261,789 | 3.541% | 80,101 | - | (858) | 79,243 |
| 72 | 2026 | Environment | Historical | 49,000 | 2.180% | 1,068 | - | - | 1,068 |
| 73 | 2026 | Replacements | Historical | 1,367,351 | 3.870% | 52,916 | - | - | 52,916 |
| 74 | 2026 | Replacements | New | 210,406 | 1.935% | 4,071 | - | - | 4,071 |
| 75 | 2026 | Float | Historical | - | - | (428) | - | - | (428) |
| 76 | FY 2026 | Subtotal: | | 3,888,545 | | 137,729 | - | (858) | 136,871 |
| 77 | 2027 | Construction | Historical | 2,140,298 | 3.579% | 76,607 | - | (436) | 76,172 |
| 78 | 2027 | Environment | Historical | 49,000 | 2.180% | 1,068 | - | (30) | 1,038 |
| 79 | 2027 | Replacements | Historical | 1,577,756 | 3.870% | 61,059 | - | - | 61,059 |
| 80 | 2027 | Replacements | New | 213,646 | 1.935% | 4,134 | - | - | 4,134 |
| 81 | 2027 | Float | Historical | - | - | (424) | - | - | (424) |
| 82 | FY 2027 | Subtotal: | | 3,980,701 | | 142,445 | - | (466) | 141,979 |
| 83 | 2028 | Construction | Historical | 2,041,341 | 3.698% | 75,492 | - | (641) | 74,851 |
| 84 | 2028 | Environment | Historical | 31,000 | 2.725% | 845 | - | (66) | 778 |
| 85 | 2028 | Replacements | Historical | 1,791,402 | 3.870% | 69,327 | - | - | 69,327 |
| 86 | 2028 | Replacements | New | 217,326 | 1.935% | 4,205 | - | - | 4,205 |
| 87 | 2028 | Float | Historical | - | - | (448) | - | - | (448) |
| 88 | FY 2028 | Subtotal: | | 4,081,069 | | 149,421 | - | (708) | 148,714 |
| 89 | 2029 | Construction | Historical | 1,921,840 | 3.547% | 68,177 | - | (533) | 67,644 |
| 90 | 2029 | Environment | Historical | 26,000 | 2.195% | 571 | - | (119) | 452 |
| 91 | 2029 | Replacements | Historical | 2,008,728 | 3.870% | 77,738 | - | - | 77,738 |
| 92 | 2029 | Replacements | New | 220,679 | 1.935% | 4,270 | - | - | 4,270 |
| 93 | 2029 | Float | Historical | - | - | (453) | - | - | (453) |
| 94 | FY 2029 | Subtotal: | | 4,177,247 | | 150,302 | - | (652) | 149,651 |
| 95 | 2030 | Construction | Historical | 1,809,541 | 3.409% | 61,695 | - | (1,364) | 60,331 |
| 96 | 2030 | Environment | Historical | 14,000 | 2.715% | 380 | - | - | 380 |
| 97 | 2030 | Replacements | Historical | 2,229,407 | 3.870% | 86,278 | - | - | 86,278 |
| 98 | 2030 | Replacements | New | 225,275 | 1.935% | 4,359 | - | - | 4,359 |
| 99 | 2030 | Float | Historical | - | - | (448) | - | - | (448) |
| 100 | FY 2030 | Subtotal: | | 4,278,222 | | 152,264 | - | (1,364) | 150,900 |
| 101 | 2031 | Construction | Historical | 1,688,497 | 3.391% | 57,256 | - | (353) | 56,903 |
| 102 | 2031 | Environment | Historical | 14,000 | 2.715% | 380 | - | - | 380 |
| 103 | 2031 | Replacements | Historical | 2,454,682 | 3.870% | 94,996 | - | - | 94,996 |
| 104 | 2031 | Replacements | New | 229,884 | 1.935% | 4,448 | - | - | 4,448 |
| 105 | 2031 | Float | Historical | - | - | (454) | - | - | (454) |
| 106 | FY 2031 | Subtotal: | | 4,387,063 | | 156,627 | - | (353) | 156,274 |
| 107 | 2032 | Construction | Historical | 1,565,326 | 3.430% | 53,683 | - | (417) | 53,267 |
| 108 | 2032 | Environment | Historical | 14,000 | 2.715% | 380 | - | - | 380 |
| 109 | 2032 | Replacements | Historical | 2,684,566 | 3.870% | 103,893 | - | - | 103,893 |
| 110 | 2032 | Replacements | New | 234,046 | 1.935% | 4,529 | - | - | 4,529 |
| 111 | 2032 | Float | Historical | - | - | (456) | - | - | (456) |
| 112 | FY 2032 | Subtotal: | | 4,497,938 | | 162,029 | - | (417) | 161,612 |
| 113 | 2033 | Construction | Historical | 1,450,844 | 3.315% | 48,102 | - | (366) | 47,736 |
| 114 | 2033 | Environment | Historical | 7,000 | 3.250% | 228 | - | - | 228 |
| 115 | 2033 | Replacements | Historical | 2,918,612 | 3.870% | 112,950 | - | - | 112,950 |
| 116 | 2033 | Replacements | New | 238,584 | 1.935% | 4,617 | - | - | 4,617 |
| 117 | 2033 | Float | Historical | - | - | (434) | - | - | (434) |
| 118 | FY 2033 | Subtotal: | | 4,615,039 | | 165,463 | - | (366) | 165,097 |

**TABLE 11-2
INTEREST CALCULATION SUMMARY (\$000S)
(FY 2018)**

| | A | C | D | E | F | G | H | I | J |
|-----|----------------|------------------|------------|-------------------|--------|----------------|---------|----------------------|----------------|
| | Fiscal Year | Project | Type | Current Principal | Rate | Interest | Premium | Net Interest Accrual | Total |
| 119 | 2034 | Construction | Historical | 1,349,758 | 3.372% | 45,518 | - | (1,000) | 44,519 |
| 120 | 2034 | Replacements | Historical | 3,157,196 | 3.870% | 122,183 | - | - | 122,183 |
| 121 | 2034 | Replacements | New | 243,258 | 1.935% | 4,707 | - | - | 4,707 |
| 122 | 2034 | Float | Historical | - | - | (466) | - | - | (466) |
| 123 | FY 2034 | Subtotal: | | 4,750,211 | | 171,942 | - | (1,000) | 170,943 |
| 124 | 2035 | Construction | Historical | 1,228,811 | 3.579% | 43,982 | - | (1,103) | 42,879 |
| 125 | 2035 | Replacements | Historical | 3,400,454 | 3.870% | 131,598 | - | - | 131,598 |
| 126 | 2035 | Replacements | New | 247,381 | 1.935% | 4,787 | - | - | 4,787 |
| 127 | 2035 | Float | Historical | - | - | (410) | - | - | (410) |
| 128 | FY 2035 | Subtotal: | | 4,876,645 | | 179,956 | - | (1,103) | 178,853 |
| 129 | 2036 | Construction | Historical | 1,136,980 | 3.587% | 40,784 | - | (2,962) | 37,822 |
| 130 | 2036 | Replacements | Historical | 3,647,834 | 3.870% | 141,171 | - | - | 141,171 |
| 131 | 2036 | Replacements | New | 251,489 | 1.935% | 4,866 | - | - | 4,866 |
| 132 | 2036 | Float | Historical | - | - | (412) | - | - | (412) |
| 133 | FY 2036 | Subtotal: | | 5,036,303 | | 186,410 | - | (2,962) | 183,448 |
| 134 | 2037 | Construction | Historical | 1,046,420 | 3.414% | 35,723 | - | (112) | 35,611 |
| 135 | 2037 | Replacements | Historical | 3,899,323 | 3.870% | 150,904 | - | - | 150,904 |
| 136 | 2037 | Replacements | New | 255,559 | 1.935% | 4,945 | - | - | 4,945 |
| 137 | 2037 | Float | Historical | - | - | (469) | - | - | (469) |
| 138 | FY 2037 | Subtotal: | | 5,201,303 | | 191,103 | - | (112) | 190,991 |
| 139 | 2038 | Construction | Historical | 934,623 | 3.393% | 31,709 | - | - | 31,709 |
| 140 | 2038 | Replacements | Historical | 4,154,883 | 3.870% | 160,794 | - | - | 160,794 |
| 141 | 2038 | Replacements | New | 259,191 | 1.935% | 5,015 | - | - | 5,015 |
| 142 | 2038 | Float | Historical | - | - | (473) | - | - | (473) |
| 143 | FY 2038 | Subtotal: | | 5,348,696 | | 197,045 | - | - | 197,045 |
| 144 | 2039 | Construction | Historical | 824,029 | 3.276% | 26,996 | - | (60) | 26,936 |
| 145 | 2039 | Replacements | Historical | 4,414,073 | 3.870% | 170,825 | - | - | 170,825 |
| 146 | 2039 | Replacements | New | 262,385 | 1.935% | 5,077 | - | - | 5,077 |
| 147 | 2039 | Float | Historical | - | - | (476) | - | - | (476) |
| 148 | FY 2039 | Subtotal: | | 5,500,487 | | 202,422 | - | (60) | 202,362 |
| 149 | 2040 | Construction | Historical | 714,663 | 3.239% | 23,149 | - | (272) | 22,877 |
| 150 | 2040 | Replacements | Historical | 4,676,458 | 3.870% | 180,979 | - | - | 180,979 |
| 151 | 2040 | Replacements | New | 265,947 | 1.935% | 5,146 | - | - | 5,146 |
| 152 | 2040 | Float | Historical | - | - | (445) | - | - | (445) |
| 153 | FY 2040 | Subtotal: | | 5,657,068 | | 208,829 | - | (272) | 208,557 |
| 154 | 2041 | Construction | Historical | 621,688 | 3.445% | 21,414 | - | (169) | 21,245 |
| 155 | 2041 | Replacements | Historical | 4,942,405 | 3.870% | 191,271 | - | - | 191,271 |
| 156 | 2041 | Replacements | New | 269,664 | 1.935% | 5,218 | - | - | 5,218 |
| 157 | 2041 | Float | Historical | - | - | (520) | - | - | (520) |
| 158 | FY 2041 | Subtotal: | | 5,833,757 | | 217,383 | - | (169) | 217,214 |
| 159 | 2042 | Construction | Historical | 499,415 | 3.454% | 17,249 | - | (155) | 17,094 |
| 160 | 2042 | Replacements | Historical | 5,212,069 | 3.870% | 201,707 | - | - | 201,707 |
| 161 | 2042 | Replacements | New | 272,791 | 1.935% | 5,279 | - | - | 5,279 |
| 162 | 2042 | Float | Historical | - | - | (440) | - | - | (440) |
| 163 | FY 2042 | Subtotal: | | 5,984,275 | | 223,794 | - | (155) | 223,639 |
| 164 | 2043 | Construction | Historical | 416,877 | 3.442% | 14,350 | - | (243) | 14,107 |
| 165 | 2043 | Replacements | Historical | 5,484,860 | 3.870% | 212,264 | - | - | 212,264 |
| 166 | 2043 | Replacements | New | 276,552 | 1.935% | 5,351 | - | - | 5,351 |
| 167 | 2043 | Float | Historical | - | - | (448) | - | - | (448) |
| 168 | FY 2043 | Subtotal: | | 6,178,289 | | 231,518 | - | (243) | 231,275 |
| 169 | 2044 | Construction | Historical | 334,717 | 3.247% | 10,869 | - | (124) | 10,746 |
| 170 | 2044 | Replacements | Historical | 5,761,412 | 3.870% | 222,967 | - | - | 222,967 |
| 171 | 2044 | Replacements | New | 280,054 | 1.935% | 5,419 | - | - | 5,419 |
| 172 | 2044 | Float | Historical | - | - | (450) | - | - | (450) |
| 173 | FY 2044 | Subtotal: | | 6,376,183 | | 238,805 | - | (124) | 238,681 |
| 174 | 2045 | Construction | Historical | 254,305 | 2.109% | 5,363 | - | (486) | 4,878 |
| 175 | 2045 | Replacements | Historical | 6,041,466 | 3.870% | 233,805 | - | - | 233,805 |
| 176 | 2045 | Replacements | New | 282,291 | 1.935% | 5,462 | - | - | 5,462 |
| 177 | 2045 | Float | Historical | - | - | (715) | - | - | (715) |
| 178 | FY 2045 | Subtotal: | | 6,578,062 | | 243,915 | - | (486) | 243,430 |

TABLE 11-2
INTEREST CALCULATION SUMMARY (\$000S)
(FY 2018)

| | A | C | D | E | F | G | H | I | J |
|-----|---------------------|------------------|------------|----------------------|--------|--------------------|---------|----------------------|--------------------|
| | Fiscal Year | Project | Type | Current Principal | Rate | Interest | Premium | Net Interest Accrual | Total |
| 179 | 2046 | Construction | Historical | 55,572 | 1.465% | 814 | - | (85) | 729 |
| 180 | 2046 | Replacements | Historical | 6,323,758 | 3.827% | 242,037 | - | - | 242,037 |
| 181 | 2046 | Replacements | New | 285,344 | 1.935% | 5,521 | - | - | 5,521 |
| 182 | 2046 | Float | Historical | - | - | (712) | - | - | (712) |
| 183 | FY 2046 | Subtotal: | | 6,664,674 | | 247,661 | - | (85) | 247,576 |
| 184 | 2047 | Replacements | Historical | 6,469,961 | 3.813% | 246,694 | - | - | 246,694 |
| 185 | 2047 | Replacements | New | 288,897 | 1.935% | 5,590 | - | - | 5,590 |
| 186 | 2047 | Float | Historical | - | - | (707) | - | - | (707) |
| 187 | FY 2047 | Subtotal: | | 6,758,858 | | 251,577 | - | - | 251,577 |
| 188 | 2048 | Replacements | Historical | 6,567,999 | 3.815% | 250,562 | - | - | 250,562 |
| 189 | 2048 | Replacements | New | 292,110 | 1.935% | 5,652 | - | - | 5,652 |
| 190 | 2048 | Float | Historical | - | - | (704) | - | - | (704) |
| 191 | FY 2048 | Subtotal: | | 6,860,108 | | 255,511 | - | - | 255,511 |
| 192 | 2049 | Replacements | Historical | 6,673,049 | 3.817% | 254,707 | - | - | 254,707 |
| 193 | 2049 | Replacements | New | 294,427 | 1.935% | 5,697 | - | - | 5,697 |
| 194 | 2049 | Float | Historical | - | - | (699) | - | - | (699) |
| 195 | FY 2049 | Subtotal: | | 6,967,477 | | 259,705 | - | - | 259,705 |
| 196 | 2050 | Replacements | Historical | 6,784,516 | 3.819% | 259,105 | - | - | 259,105 |
| 197 | 2050 | Replacements | New | 296,664 | 1.935% | 5,740 | - | - | 5,740 |
| 198 | 2050 | Float | Historical | - | - | (695) | - | - | (695) |
| 199 | FY 2050 | Subtotal: | | 7,081,179 | | 264,151 | - | - | 264,151 |
| 200 | 2051 | Replacements | Historical | 6,902,571 | 3.821% | 263,763 | - | - | 263,763 |
| 201 | 2051 | Replacements | New | 298,495 | 1.935% | 5,776 | - | - | 5,776 |
| 202 | 2051 | Float | Historical | - | - | (690) | - | - | (690) |
| 203 | FY 2051 | Subtotal: | | 7,201,066 | | 268,849 | - | - | 268,849 |
| 204 | 2052 | Replacements | Historical | 7,027,081 | 3.823% | 268,675 | - | - | 268,675 |
| 205 | 2052 | Replacements | New | 301,358 | 1.935% | 5,831 | - | - | 5,831 |
| 206 | 2052 | Float | Historical | - | - | (685) | - | - | (685) |
| 207 | FY 2052 | Subtotal: | | 7,328,439 | | 273,822 | - | - | 273,822 |
| 208 | 2053 | Replacements | Historical | 7,159,307 | 3.826% | 273,892 | - | - | 273,892 |
| 209 | 2053 | Replacements | New | 304,049 | 1.935% | 5,883 | - | - | 5,883 |
| 210 | 2053 | Float | Historical | - | - | (679) | - | - | (679) |
| 211 | FY 2053 | Subtotal: | | 7,463,356 | | 279,097 | - | - | 279,097 |
| 212 | Grand Total: | | | \$189,019,897 | | \$6,864,392 | - | (\$17,585) | \$6,846,807 |

**TABLE 11-3:
SUMMARY OF AMORTIZATION (\$000S) (FY 2018)**

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | |
|----|---|---|---|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---|
| 1 | Obligation Type | General Project | Specific Project | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | |
| 2 | Appropriation | Bonneville Power Administration | Bonneville Power Administration | 96,439 | 1,956 | 5,082 | 15,971 | - | - | - | - | - | - | - | - | - | |
| 3 | | | Bonneville Power Administration Subtotal: | 96,439 | 1,956 | 5,082 | 15,971 | - | - | - | - | - | - | - | - | - | - |
| 4 | | | Appropriation Subtotal: | 96,439 | 1,956 | 5,082 | 15,971 | - | - | - | - | - | - | - | - | - | - |
| 5 | | | Construction | - | 36,400 | 193,000 | 97,514 | 91,657 | 121,792 | 120,670 | 110,725 | 93,492 | 121,491 | 98,957 | 119,501 | 112,299 | |
| 6 | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 7 | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 8 | | Construction (AS) | - | 4,550 | 17,750 | 16,900 | 13,000 | 10,200 | 5,850 | 10,400 | 11,000 | - | - | - | - | - | |
| 9 | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 10 | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 11 | Bond | BPA Borrowing | Environment | - | - | - | - | - | - | - | 4,000 | 15,000 | - | 18,000 | 5,000 | 12,000 | |
| 12 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 13 | | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 14 | | | Technology (T) | - | 5,000 | - | - | 23,000 | - | - | - | - | - | - | - | - | - |
| 15 | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 16 | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 17 | | BPA Borrowing Subtotal: | - | 45,950 | 210,750 | 114,414 | 127,657 | 131,992 | 126,520 | 125,125 | 119,492 | 121,491 | 116,957 | 124,501 | 124,299 | | |
| 18 | | Replacements | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 19 | Federal Transmission Replacement | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 20 | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 21 | | Federal Transmission Replacement Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 22 | Make Whole Call | Premiums | - | - | - | 646 | 1,391 | 2,029 | 2,251 | 834 | 913 | 513 | 680 | - | 2,520 | | |
| 23 | | Make Whole Call Subtotal: | - | - | - | 646 | 1,391 | 2,029 | 2,251 | 834 | 913 | 513 | 680 | - | 2,520 | | |
| 24 | Bond Subtotal: | | - | 45,950 | 210,750 | 114,414 | 127,657 | 131,992 | 126,520 | 125,125 | 119,492 | 121,491 | 116,957 | 124,501 | 124,299 | | |
| 25 | Grand Total: | | | 96,439 | 47,906 | 215,832 | 130,385 | 127,657 | 131,992 | 126,520 | 125,125 | 119,492 | 121,491 | 116,957 | 124,501 | 124,299 | |

**TABLE 11-3:
SUMMARY OF AMORTIZATION (\$000S) (FY 2018)**

| | A | B | C | Q | R | S | T | U | V | W | X | Y | Z | AA | AB | AC | AD | |
|----|---|---|---|-----------------------|---------|---------|---------|---------|---------|--------|---------|---------|---------|---------|---------|---------|--------|--------|
| 1 | Obligation Type | General Project | Specific Project | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | |
| 2 | Appropriation | Bonneville Power Administration | Bonneville Power Administration | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 3 | | | Bonneville Power Administration Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 | | Appropriation Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 | | | | Construction | 121,044 | 123,171 | 114,483 | 101,086 | 120,946 | 91,831 | 90,560 | 111,798 | 110,594 | 109,366 | 92,975 | 122,273 | 82,538 | 82,160 |
| 6 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 7 | | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 8 | | | Construction (AS) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 9 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 10 | | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 11 | Bond | BPA Borrowing | Environment | - | - | 7,000 | 7,000 | - | - | - | - | - | - | - | - | - | - | |
| 12 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 13 | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 14 | | | | Technology (T) | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 15 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 16 | | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 17 | | | BPA Borrowing Subtotal: | 121,044 | 123,171 | 121,483 | 108,086 | 120,946 | 91,831 | 90,560 | 111,798 | 110,594 | 109,366 | 92,975 | 122,273 | 82,538 | 82,160 | |
| 18 | | | Replacements | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 19 | | Federal Transmission Replacement | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 20 | Principal Accrual Reversal | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 21 | Federal Transmission Replacement Subtotal: | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 22 | | Make Whole Call | Premiums | 3,347 | 816 | 419 | 2,337 | 833 | 697 | 1,351 | 1,037 | 929 | 995 | 198 | 537 | 1,293 | 860 | |
| 23 | | | Make Whole Call Subtotal: | 3,347 | 816 | 419 | 2,337 | 833 | 697 | 1,351 | 1,037 | 929 | 995 | 198 | 537 | 1,293 | 860 | |
| 24 | | Bond Subtotal: | | 121,044 | 123,171 | 121,483 | 108,086 | 120,946 | 91,831 | 90,560 | 111,798 | 110,594 | 109,366 | 92,975 | 122,273 | 82,538 | 82,160 | |
| 25 | Grand Total: | | | 121,044 | 123,171 | 121,483 | 108,086 | 120,946 | 91,831 | 90,560 | 111,798 | 110,594 | 109,366 | 92,975 | 122,273 | 82,538 | 82,160 | |

**TABLE 11-3:
SUMMARY OF AMORTIZATION (\$000S) (FY 2018)**

| | A | B | C | AE | AF | AG | AH | AI | AJ | AK | AL | AM | AN | AO | |
|----|---|---|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|-----------|
| 1 | Obligation Type | General Project | Specific Project | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | Total | |
| 2 | Appropriation | Bonneville Power Administration | Bonneville Power Administration | - | - | - | - | - | - | - | - | - | - | 119,448 | |
| 3 | | | Bonneville Power Administration Subtotal: | - | - | - | - | - | - | - | - | - | - | - | 119,448 |
| 4 | | Appropriation Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | 119,448 |
| 5 | | | Construction | 80,412 | 198,733 | 55,572 | - | - | - | - | - | - | - | - | 3,127,040 |
| 6 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | |
| 7 | | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | |
| 8 | | | Construction (AS) | - | - | - | - | - | - | - | - | - | - | 89,650 | |
| 9 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | |
| 10 | | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | |
| 11 | Bond | BPA Borrowing | Environment | - | - | - | - | - | - | - | - | - | - | 68,000 | |
| 12 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - |
| 13 | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | |
| 14 | | | Technology (T) | - | - | - | - | - | - | - | - | - | - | - | 28,000 |
| 15 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - |
| 16 | | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - |
| 17 | | | BPA Borrowing Subtotal: | 80,412 | 198,733 | 55,572 | - | - | - | - | - | - | - | - | 3,312,690 |
| 18 | | | Replacements | - | - | 139,141 | 190,859 | 187,059 | 182,961 | 178,608 | 173,986 | 169,131 | 163,968 | - | 1,385,714 |
| 19 | Federal Transmission Replacement | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | |
| 20 | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | |
| 21 | | Federal Transmission Replacement Subtotal: | - | - | 139,141 | 190,859 | 187,059 | 182,961 | 178,608 | 173,986 | 169,131 | 163,968 | - | 1,385,714 | |
| 22 | Make Whole Call | Premiums | 379 | - | - | - | - | - | - | - | - | - | - | 27,806 | |
| 23 | | Make Whole Call Subtotal: | 379 | - | - | - | - | - | - | - | - | - | - | 27,806 | |
| 24 | | Bond Subtotal: | 80,412 | 198,733 | 194,713 | 190,859 | 187,059 | 182,961 | 178,608 | 173,986 | 169,131 | 163,968 | - | 4,698,404 | |
| 25 | Grand Total: | | | 80,412 | 198,733 | 194,713 | 190,859 | 187,059 | 182,961 | 178,608 | 173,986 | 169,131 | 163,968 | 4,817,852 | |

**TABLE 11-4
APPLICATION OF AMORTIZATION (\$000S) (FY 2018)**

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
|-------------|---------|---------------------------------|---------------------------------|---------------|-------------------|-------------------|----------------|----------------|----------------|-----------------|----------------------|-----------|----------------|---------|----------|---------|----------------|
| Fiscal Year | Project | Debt Type | In Service | Bond Due Date | Initial Principal | Current Principal | Original Rate | Effective Rate | Refinance Type | Refinanced Date | Rolled Maturity Date | Roll Rate | Principal Paid | Premium | Discount | Accrual | Reversal |
| 1 | 2017 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1975 | 9/30/2020 | 11,742 | 8,200 | 7.250% | 7.250% | | | | | | | | 8,200 |
| 2 | 2017 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1976 | 9/30/2021 | 61,025 | 61,025 | 7.230% | 7.230% | | | | | | | | 61,025 |
| 3 | 2017 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1976 | 9/30/2021 | 2,212 | 2,212 | 7.230% | 7.230% | | | | | | | | 2,212 |
| 4 | 2017 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1977 | 9/30/2022 | 33,702 | 33,702 | 7.210% | 7.210% | | | | | | | | 20,022 |
| 5 | 2017 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1977 | 9/30/2022 | 4,981 | 4,981 | 7.210% | 7.210% | | | | | | | | 4,981 |
| 6 | | FY 2017 Subtotal: | - | - | - | 113,662 | 110,120 | - | - | | | | | | | | 96,439 |
| 7 | 2018 | Construction | - | 9/30/2012 | 9/30/2017 | 36,400 | 36,400 | 0.891% | 0.750% | Global | 9/30/2017 | 9/30/2018 | 0.750% | | | | 36,400 |
| 8 | 2018 | Construction (AS) | - | 4/30/2017 | 1/31/2018 | 4,550 | 4,550 | 1.051% | 1.051% | | | | | | | | 4,550 |
| 9 | 2018 | Technology (T) | - | 10/31/2015 | 9/30/2018 | 5,000 | 5,000 | 0.674% | 0.674% | | | | | | | | 5,000 |
| 10 | 2018 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1977 | 9/30/2022 | 33,702 | 13,680 | 7.210% | 7.210% | | | | | | | | 1,956 |
| 11 | | FY 2018 Subtotal: | - | - | - | 79,652 | 59,630 | - | - | | | | | | | | 47,906 |
| 12 | 2019 | Construction | - | 10/31/2009 | 10/31/2018 | 23,000 | 23,000 | 3.719% | 3.719% | | | | | | | | 23,000 |
| 13 | 2019 | Construction | - | 11/30/2009 | 11/30/2018 | 15,000 | 15,000 | 3.533% | 3.533% | | | | | | | | 15,000 |
| 14 | 2019 | Construction (AS) | - | 11/30/2012 | 11/30/2018 | 9,750 | 9,750 | 1.109% | 1.109% | | | | | | | | 9,750 |
| 15 | 2019 | Construction | - | 12/31/2009 | 12/31/2018 | 13,000 | 13,000 | 4.069% | 4.069% | | | | | | | | 13,000 |
| 16 | 2019 | Construction | - | 1/16/2014 | 12/31/2018 | 33,000 | 33,000 | 1.943% | 1.943% | | | | | | | | 33,000 |
| 17 | 2019 | Construction | - | 1/16/2014 | 12/31/2018 | 30,000 | 30,000 | 1.943% | 1.943% | | | | | | | | 30,000 |
| 18 | 2019 | Construction | - | 1/16/2014 | 12/31/2018 | 31,000 | 31,000 | 1.943% | 1.943% | | | | | | | | 31,000 |
| 19 | 2019 | Construction | - | 1/16/2014 | 12/31/2018 | 48,000 | 48,000 | 1.943% | 1.943% | | | | | | | | 48,000 |
| 20 | 2019 | Construction (AS) | - | 6/30/2013 | 6/30/2019 | 5,000 | 5,000 | 1.962% | 1.962% | | | | | | | | 5,000 |
| 21 | 2019 | Construction (AS) | - | 8/31/2013 | 8/31/2019 | 3,000 | 3,000 | 2.279% | 2.279% | | | | | | | | 3,000 |
| 22 | 2019 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1977 | 9/30/2022 | 33,702 | 11,725 | 7.210% | 7.210% | | | | | | | | 5,082 |
| 23 | | FY 2019 Subtotal: | - | - | - | 244,452 | 222,475 | - | - | | | | | | | | 215,832 |
| 24 | 2020 | Construction (AS) | - | 10/31/2013 | 10/31/2019 | 7,800 | 7,800 | 2.039% | 2.039% | | | | | | | | 7,800 |
| 25 | 2020 | Construction | - | 10/31/2009 | 10/31/2019 | 43,000 | 43,000 | 3.842% | 3.842% | | | | | | | | 43,000 |
| 26 | 2020 | Construction (AS) | - | 1/31/2014 | 1/31/2020 | 3,250 | 3,250 | 2.183% | 2.183% | | | | | | | | 3,250 |
| 27 | 2020 | Construction | - | 1/31/2009 | 1/31/2020 | 50,000 | 50,000 | 3.830% | 3.830% | | | | | | | | 50,000 |
| 28 | 2020 | Construction (AS) | - | 4/30/2014 | 3/31/2020 | 2,600 | 2,600 | 0.526% | 0.526% | | | | | | | | 2,600 |
| 29 | 2020 | Construction (AS) | - | 5/31/2014 | 4/30/2020 | 1,300 | 1,300 | 0.526% | 0.526% | | | | | | | | 1,300 |
| 30 | 2020 | Construction (AS) | - | 7/31/2014 | 7/31/2020 | 1,950 | 1,950 | 0.526% | 0.526% | | | | | | | | 1,950 |
| 31 | 2020 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1977 | 9/30/2022 | 3,948 | 3,948 | 7.210% | 7.210% | | | | | | | | 3,948 |
| 32 | 2020 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1977 | 9/30/2022 | 5,380 | 5,380 | 7.210% | 7.210% | | | | | | | | 5,380 |
| 33 | 2020 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1977 | 9/30/2022 | 33,702 | 6,643 | 7.210% | 7.210% | | | | | | | | 6,643 |
| 34 | 2020 | Construction | - | 8/31/1998 | 8/31/2028 | 112,300 | 112,300 | 5.850% | 5.850% | | | | | | | | 4,514 |
| 35 | | FY 2020 Subtotal: | - | - | - | 265,230 | 238,171 | - | - | | | | | | | | 130,385 |
| 36 | 2021 | Construction (AS) | - | 11/30/2014 | 11/30/2020 | 3,900 | 3,900 | 1.809% | 1.809% | | | | | | | | 3,900 |
| 37 | 2021 | Construction (AS) | - | 12/31/2014 | 12/31/2020 | 1,950 | 1,950 | 1.922% | 1.922% | | | | | | | | 1,950 |
| 38 | 2021 | Construction (AS) | - | 2/28/2015 | 2/28/2021 | 3,250 | 3,250 | 1.761% | 1.761% | | | | | | | | 3,250 |
| 39 | 2021 | Technology (T) | - | 2/28/2015 | 2/28/2021 | 23,000 | 23,000 | 1.761% | 1.761% | | | | | | | | 23,000 |
| 40 | 2021 | Construction | - | 3/31/2010 | 3/31/2021 | 15,000 | 15,000 | 4.188% | 4.188% | | | | | | | | 15,000 |
| 41 | 2021 | Construction | - | 4/30/2010 | 4/30/2021 | 22,000 | 22,000 | 4.094% | 4.094% | | | | | | | | 22,000 |
| 42 | 2021 | Construction | - | 5/31/2010 | 5/31/2021 | 22,000 | 22,000 | 3.694% | 3.694% | | | | | | | | 22,000 |
| 43 | 2021 | Construction (AS) | - | 5/31/2015 | 5/31/2021 | 3,900 | 3,900 | 1.898% | 1.898% | | | | | | | | 3,900 |
| 44 | 2021 | Construction | - | 6/30/2010 | 6/30/2021 | 22,000 | 22,000 | 3.374% | 3.374% | | | | | | | | 22,000 |
| 45 | 2021 | Construction | - | 8/31/1998 | 8/31/2028 | 112,300 | 107,786 | 5.850% | 5.850% | | | | | | | | 10,657 |
| 46 | | FY 2021 Subtotal: | - | - | - | 229,300 | 224,786 | - | - | | | | | | | | 127,657 |
| 47 | 2022 | Construction (AS) | - | 10/31/2015 | 10/31/2021 | 5,200 | 5,200 | 1.942% | 1.942% | | | | | | | | 5,200 |
| 48 | 2022 | Construction | - | 1/31/2009 | 1/31/2022 | 20,000 | 20,000 | 4.200% | 4.200% | | | | | | | | 20,000 |
| 49 | 2022 | Construction (AS) | - | 2/29/2016 | 2/28/2022 | 5,000 | 5,000 | 1.631% | 1.631% | | | | | | | | 5,000 |
| 50 | 2022 | Construction | - | 4/30/2009 | 4/30/2022 | 35,000 | 35,000 | 4.253% | 4.253% | | | | | | | | 35,000 |
| 51 | 2022 | Construction | - | 7/31/2010 | 7/31/2022 | 30,000 | 30,000 | 3.372% | 3.372% | | | | | | | | 30,000 |
| 52 | 2022 | Construction | - | 8/31/2010 | 8/31/2022 | 20,000 | 20,000 | 3.029% | 3.029% | | | | | | | | 20,000 |
| 53 | 2022 | Construction | - | 8/31/1998 | 8/31/2028 | 112,300 | 97,129 | 5.850% | 5.850% | | | | | | | | 16,792 |
| 54 | | FY 2022 Subtotal: | - | - | - | 227,500 | 212,329 | - | - | | | | | | | | 131,992 |
| 55 | 2023 | Construction | - | 12/31/2014 | 12/31/2022 | 16,000 | 16,000 | 2.274% | 2.274% | | | | | | | | 16,000 |
| 56 | 2023 | Construction | - | 12/31/2014 | 12/31/2022 | 4,000 | 4,000 | 2.274% | 2.274% | | | | | | | | 4,000 |

**TABLE 11-4
APPLICATION OF AMORTIZATION (\$000S) (FY 2018)**

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
|-------------|---------|--------------------------|------------|---------------|-------------------|-------------------|----------------|----------------|----------------|-----------------|----------------------|-----------|----------------|--------------|----------|---------|----------|
| Fiscal Year | Project | Debt Type | In Service | Bond Due Date | Initial Principal | Current Principal | Original Rate | Effective Rate | Refinance Type | Refinanced Date | Rolled Maturity Date | Roll Rate | Principal Paid | Premium | Discount | Accrual | Reversal |
| 57 | 2023 | Construction | - | 4/30/2015 | 4/30/2023 | 3,000 | 3,000 | 2.163% | 2.163% | | | | | | | | 3,000 |
| 58 | 2023 | Construction | - | 4/30/2015 | 4/30/2023 | 12,000 | 12,000 | 2.163% | 2.163% | | | | | | | | 12,000 |
| 59 | 2023 | Construction | - | 6/30/2015 | 6/30/2023 | 11,000 | 11,000 | 2.443% | 2.443% | | | | | | | | 11,000 |
| 60 | 2023 | Construction | - | 6/30/2015 | 6/30/2023 | 8,000 | 8,000 | 2.443% | 2.443% | | | | | | | | 8,000 |
| 61 | 2023 | Construction | - | 9/30/2010 | 9/30/2023 | 46,000 | 46,000 | 3.161% | 3.161% | | | | | | | | 46,000 |
| 62 | 2023 | Construction (AS) | - | 9/30/2017 | 9/30/2023 | 5,850 | 5,850 | 1.510% | 1.510% | | | | | | | | 5,850 |
| 63 | 2023 | Construction | - | 8/31/1998 | 8/31/2028 | 112,300 | 80,337 | 5.850% | 5.850% | | | | | 20,670 | 2,251 | | |
| 64 | | FY 2023 Subtotal: | - | - | - | 218,150 | 186,187 | - | - | | | | 126,520 | 2,251 | | | |
| 65 | 2024 | Construction | - | 10/31/2014 | 10/31/2023 | 20,000 | 20,000 | 2.521% | 2.521% | | | | | | | | 20,000 |
| 66 | 2024 | Construction | - | 11/30/2014 | 11/30/2023 | 20,000 | 20,000 | 2.361% | 2.361% | | | | | | | | 20,000 |
| 67 | 2024 | Environment | - | 1/31/2015 | 1/31/2024 | 4,000 | 4,000 | 1.908% | 1.908% | | | | | | | | 4,000 |
| 68 | 2024 | Construction | - | 3/31/2015 | 3/31/2024 | 17,000 | 17,000 | 2.200% | 2.200% | | | | | | | | 17,000 |
| 69 | 2024 | Construction | - | 3/31/2012 | 3/31/2024 | 45,000 | 45,000 | 0.947% | 0.947% | | | | | | | | 45,000 |
| 70 | 2024 | Construction (AS) | - | 9/30/2018 | 9/30/2024 | 10,400 | 10,400 | 2.560% | 2.560% | | | | | | | | 10,400 |
| 71 | 2024 | Construction | - | 8/31/1998 | 8/31/2028 | 112,300 | 59,666 | 5.850% | 5.850% | | | | | 8,725 | 834 | | |
| 72 | | FY 2024 Subtotal: | - | - | - | 228,700 | 176,066 | - | - | | | | 125,125 | 834 | | | |
| 73 | 2025 | Environment | - | 2/28/2010 | 2/28/2025 | 10,000 | 10,000 | 4.279% | 4.279% | | | | | | | | 10,000 |
| 74 | 2025 | Construction | - | 5/31/2016 | 5/31/2025 | 20,000 | 20,000 | 2.101% | 2.101% | | | | | | | | 20,000 |
| 75 | 2025 | Environment | - | 5/31/2016 | 5/31/2025 | 5,000 | 5,000 | 2.101% | 2.101% | | | | | | | | 5,000 |
| 76 | 2025 | Construction | - | 7/31/2016 | 7/31/2025 | 48,000 | 48,000 | 1.713% | 1.713% | | | | | | | | 48,000 |
| 77 | 2025 | Construction (AS) | - | 8/31/2015 | 8/31/2025 | 11,000 | 11,000 | 2.598% | 2.598% | | | | | | | | 11,000 |
| 78 | 2025 | Construction | - | 8/31/2015 | 8/31/2025 | 14,000 | 14,000 | 2.598% | 2.598% | | | | | | | | 14,000 |
| 79 | 2025 | Construction | - | 8/31/1998 | 8/31/2028 | 112,300 | 50,941 | 5.850% | 5.850% | | | | | 11,492 | 913 | | |
| 80 | | FY 2025 Subtotal: | - | - | - | 220,300 | 158,941 | - | - | | | | 119,492 | 913 | | | |
| 81 | 2026 | Construction | - | 10/31/2010 | 10/31/2025 | 45,000 | 45,000 | 3.494% | 3.494% | | | | | | | | 45,000 |
| 82 | 2026 | Construction | - | 2/28/2015 | 2/28/2026 | 19,000 | 19,000 | 2.416% | 2.416% | | | | | | | | 19,000 |
| 83 | 2026 | Construction | - | 3/31/2015 | 3/31/2026 | 15,000 | 15,000 | 2.370% | 2.370% | | | | | | | | 15,000 |
| 84 | 2026 | Construction | - | 3/31/2016 | 3/31/2026 | 6,000 | 6,000 | 2.177% | 2.177% | | | | | | | | 6,000 |
| 85 | 2026 | Construction | - | 7/31/2015 | 7/31/2026 | 18,000 | 18,000 | 2.707% | 2.707% | | | | | | | | 18,000 |
| 86 | 2026 | Construction | - | 7/31/2015 | 7/31/2026 | 10,000 | 10,000 | 2.707% | 2.707% | | | | | | | | 10,000 |
| 87 | 2026 | Construction | - | 8/31/1998 | 8/31/2028 | 112,300 | 39,449 | 5.850% | 5.850% | | | | | 8,491 | 513 | | |
| 88 | | FY 2026 Subtotal: | - | - | - | 225,300 | 152,449 | - | - | | | | 121,491 | 513 | | | |
| 89 | 2027 | Construction | - | 12/31/2015 | 12/31/2026 | 9,000 | 9,000 | 2.762% | 2.762% | | | | | | | | 9,000 |
| 90 | 2027 | Construction | - | 12/31/2015 | 12/31/2026 | 29,000 | 29,000 | 2.762% | 2.762% | | | | | | | | 29,000 |
| 91 | 2027 | Construction | - | 1/31/2016 | 1/31/2027 | 13,000 | 13,000 | 2.352% | 2.352% | | | | | | | | 13,000 |
| 92 | 2027 | Construction | - | 2/29/2016 | 2/28/2027 | 13,000 | 13,000 | 2.236% | 2.236% | | | | | | | | 13,000 |
| 93 | 2027 | Construction | - | 5/3/2012 | 5/31/2027 | 17,000 | 17,000 | 0.697% | 0.697% | | | | | | | | 17,000 |
| 94 | 2027 | Environment | - | 5/3/2012 | 5/31/2027 | 13,000 | 13,000 | 0.697% | 0.697% | | | | | | | | 13,000 |
| 95 | 2027 | Environment | - | 10/31/2015 | 9/30/2027 | 5,000 | 5,000 | 0.674% | 0.674% | | | | | | | | 5,000 |
| 96 | 2027 | Construction | - | 8/31/1998 | 8/31/2028 | 112,300 | 30,958 | 5.850% | 5.850% | | | | | 17,957 | 680 | | |
| 97 | | FY 2027 Subtotal: | - | - | - | 211,300 | 129,958 | - | - | | | | 116,957 | 680 | | | |
| 98 | 2028 | Environment | - | 11/20/2013 | 11/30/2027 | 5,000 | 5,000 | 3.967% | 3.967% | | | | | | | | 5,000 |
| 99 | 2028 | Construction | - | 8/31/1998 | 8/31/2028 | 106,500 | 106,500 | 5.850% | 5.850% | | | | | | | | 106,500 |
| 100 | 2028 | Construction | - | 8/31/1998 | 8/31/2028 | 112,300 | 13,001 | 5.850% | 5.850% | | | | | | | | 13,001 |
| 101 | | FY 2028 Subtotal: | - | - | - | 223,800 | 124,501 | - | - | | | | 124,501 | | | | |
| 102 | 2029 | Construction | - | 9/30/2009 | 9/30/2019 | 35,000 | 35,000 | 3.699% | 3.705% | Global | 9/30/2019 | 9/30/2029 | 3.705% | | | | 35,000 |
| 103 | 2029 | Environment | - | 10/31/2013 | 10/31/2028 | 6,000 | 6,000 | 3.880% | 3.880% | | | | | | | | 6,000 |
| 104 | 2029 | Environment | - | 1/31/2014 | 1/31/2029 | 3,000 | 3,000 | 3.896% | 3.896% | | | | | | | | 3,000 |
| 105 | 2029 | Environment | - | 7/31/2014 | 7/31/2029 | 3,000 | 3,000 | 0.526% | 0.526% | | | | | | | | 3,000 |
| 106 | 2029 | Construction | - | 8/2/2011 | 8/31/2029 | 50,000 | 50,000 | 4.238% | 4.238% | | | | | | | | 50,000 |
| 107 | 2029 | Construction | - | 6/30/2009 | 6/30/2039 | 35,000 | 35,000 | 5.192% | 5.192% | | | | | 27,299 | 2,520 | | |
| 108 | | FY 2029 Subtotal: | - | - | - | 132,000 | 132,000 | - | - | | | | 124,299 | 2,520 | | | |
| 109 | 2030 | Construction | - | 11/20/2013 | 10/31/2029 | 55,000 | 55,000 | 4.093% | 4.093% | | | | | | | | 55,000 |
| 110 | 2030 | Construction | - | 3/31/2015 | 3/31/2030 | 3,000 | 3,000 | 2.626% | 2.626% | | | | | | | | 3,000 |
| 111 | 2030 | Construction | - | 9/30/2015 | 9/30/2030 | 15,000 | 15,000 | 2.905% | 2.905% | | | | | | | | 15,000 |

**TABLE 11-4
APPLICATION OF AMORTIZATION (\$000S) (FY 2018)**

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
|-------------|---------|--------------------------|------------|---------------|-------------------|-------------------|----------------|----------------|----------------|-----------------|----------------------|-----------|----------------|--------------|----------|---------|----------|
| Fiscal Year | Project | Debt Type | In Service | Bond Due Date | Initial Principal | Current Principal | Original Rate | Effective Rate | Refinance Type | Refinanced Date | Rolled Maturity Date | Roll Rate | Principal Paid | Premium | Discount | Accrual | Reversal |
| 112 | 2030 | Construction | - | 1/31/2011 | 1/31/2036 | 50,000 | 50,000 | 4.952% | 4.952% | | | | 40,343 | 2,632 | | | |
| 113 | 2030 | Construction | - | 6/30/2009 | 6/30/2039 | 35,000 | 7,701 | 5.192% | 5.192% | | | | 7,701 | 715 | | | |
| 114 | | FY 2030 Subtotal: | - | - | - | 158,000 | 130,701 | - | - | | | | 121,044 | 3,347 | | | |
| 115 | 2031 | Construction | - | 7/31/2009 | 7/31/2019 | 46,940 | 46,940 | 4.026% | 3.777% | Global | 7/31/2019 | 7/31/2031 | 3.777% | 46,940 | | | |
| 116 | 2031 | Construction | - | 11/20/2013 | 1/31/2031 | 30,000 | 30,000 | 4.162% | 4.162% | | | | 30,000 | | | | |
| 117 | 2031 | Construction | - | 11/20/2013 | 2/28/2031 | 15,000 | 15,000 | 4.166% | 4.166% | | | | 15,000 | | | | |
| 118 | 2031 | Construction | - | 11/20/2013 | 3/31/2031 | 18,000 | 18,000 | 4.171% | 4.171% | | | | 18,000 | | | | |
| 119 | 2031 | Construction | - | 1/31/2011 | 1/31/2036 | 50,000 | 9,657 | 4.952% | 4.952% | | | | 9,657 | 576 | | | |
| 120 | 2031 | Construction | - | 2/28/2011 | 2/28/2038 | 55,000 | 55,000 | 4.935% | 4.935% | | | | 3,574 | 239 | | | |
| 121 | | FY 2031 Subtotal: | - | - | - | 214,940 | 174,597 | - | - | | | | 123,171 | 816 | | | |
| 122 | 2032 | Construction | - | 7/31/2014 | 4/30/2032 | 9,000 | 9,000 | 0.674% | 0.674% | | | | 9,000 | | | | |
| 123 | 2032 | Construction | - | 8/2/2011 | 8/31/2032 | 98,900 | 98,900 | 4.355% | 4.355% | | | | 98,900 | | | | |
| 124 | 2032 | Environment | - | 9/30/2017 | 9/30/2032 | 7,000 | 7,000 | 2.180% | 2.180% | | | | 7,000 | | | | |
| 125 | 2032 | Construction | - | 2/28/2011 | 2/28/2038 | 55,000 | 51,426 | 4.935% | 4.935% | | | | 6,583 | 419 | | | |
| 126 | | FY 2032 Subtotal: | - | - | - | 169,900 | 166,326 | - | - | | | | 121,483 | 419 | | | |
| 127 | 2033 | Construction | - | 6/30/2014 | 11/30/2032 | 21,000 | 21,000 | 0.713% | 0.713% | | | | 21,000 | | | | |
| 128 | 2033 | Construction | - | 8/2/2011 | 8/31/2033 | 40,000 | 40,000 | 4.386% | 4.386% | | | | 40,000 | | | | |
| 129 | 2033 | Environment | - | 9/30/2018 | 9/30/2033 | 7,000 | 7,000 | 3.250% | 3.250% | | | | 7,000 | | | | |
| 130 | 2033 | Construction | - | 2/28/2011 | 2/28/2038 | 55,000 | 44,844 | 4.935% | 4.935% | | | | 40,086 | 2,337 | | | |
| 131 | | FY 2033 Subtotal: | - | - | - | 123,000 | 112,844 | - | - | | | | 108,086 | 2,337 | | | |
| 132 | 2034 | Construction | - | 4/30/2014 | 2/28/2034 | 45,000 | 45,000 | 0.947% | 0.947% | | | | 45,000 | | | | |
| 133 | 2034 | Construction | - | 4/30/2014 | 3/31/2034 | 45,000 | 45,000 | 0.947% | 0.947% | | | | 45,000 | | | | |
| 134 | 2034 | Construction | - | 11/20/2013 | 8/31/2034 | 6,000 | 6,000 | 4.324% | 4.324% | | | | 6,000 | | | | |
| 135 | 2034 | Construction | - | 9/30/2013 | 9/30/2034 | 9,000 | 9,000 | 4.214% | 4.214% | | | | 9,000 | | | | |
| 136 | 2034 | Construction | - | 2/28/2011 | 2/28/2038 | 55,000 | 4,758 | 4.935% | 4.935% | | | | 4,758 | 246 | | | |
| 137 | 2034 | Construction | - | 4/30/2011 | 4/30/2039 | 40,000 | 40,000 | 4.794% | 4.794% | | | | 11,189 | 587 | | | |
| 138 | | FY 2034 Subtotal: | - | - | - | 200,000 | 149,758 | - | - | | | | 120,946 | 833 | | | |
| 139 | 2035 | Construction | - | 10/31/2015 | 10/31/2034 | 2,000 | 2,000 | 3.198% | 3.198% | | | | 2,000 | | | | |
| 140 | 2035 | Construction | - | 11/20/2013 | 5/31/2035 | 20,000 | 20,000 | 4.354% | 4.354% | | | | 20,000 | | | | |
| 141 | 2035 | Construction | - | 8/31/2014 | 7/31/2035 | 10,000 | 10,000 | 0.674% | 0.674% | | | | 10,000 | | | | |
| 142 | 2035 | Construction | - | 8/2/2011 | 8/31/2035 | 45,000 | 45,000 | 4.446% | 4.446% | | | | 45,000 | | | | |
| 143 | 2035 | Construction | - | 4/30/2011 | 4/30/2039 | 40,000 | 28,811 | 4.794% | 4.794% | | | | 14,831 | 697 | | | |
| 144 | | FY 2035 Subtotal: | - | - | - | 117,000 | 105,811 | - | - | | | | 91,831 | 697 | | | |
| 145 | 2036 | Construction | - | 11/30/2013 | 11/30/2035 | 15,000 | 15,000 | 4.365% | 4.365% | | | | 15,000 | | | | |
| 146 | 2036 | Construction | - | 12/31/2013 | 12/31/2035 | 10,000 | 10,000 | 4.472% | 4.472% | | | | 10,000 | | | | |
| 147 | 2036 | Construction | - | 11/20/2013 | 6/30/2036 | 36,000 | 36,000 | 4.397% | 4.397% | | | | 36,000 | | | | |
| 148 | 2036 | Construction | - | 4/30/2011 | 4/30/2039 | 40,000 | 13,980 | 4.794% | 4.794% | | | | 13,980 | 547 | | | |
| 149 | 2036 | Construction | - | 6/22/2011 | 6/30/2040 | 25,000 | 25,000 | 4.775% | 4.775% | | | | 15,580 | 805 | | | |
| 150 | | FY 2036 Subtotal: | - | - | - | 126,000 | 99,980 | - | - | | | | 90,560 | 1,351 | | | |
| 151 | 2037 | Construction | - | 5/31/2015 | 5/31/2022 | 14,000 | 14,000 | 2.103% | 4.722% | Global | 5/31/2022 | 5/31/2050 | 4.722% | 13,377 | 617 | | |
| 152 | 2037 | Construction | - | 11/20/2013 | 4/30/2034 | 28,000 | 28,000 | 4.311% | 3.413% | Global | 4/30/2034 | 4/30/2037 | 3.413% | 28,000 | | | |
| 153 | 2037 | Construction | - | 10/31/2015 | 6/30/2034 | 21,000 | 21,000 | 0.713% | 3.413% | Global | 6/30/2034 | 6/30/2037 | 3.413% | 21,000 | | | |
| 154 | 2037 | Construction | - | 8/2/2011 | 8/31/2035 | 40,000 | 40,000 | 4.446% | 3.299% | Global | 8/31/2035 | 8/31/2037 | 3.299% | 40,000 | | | |
| 155 | 2037 | Construction | - | 6/22/2011 | 6/30/2040 | 25,000 | 9,420 | 4.775% | 4.775% | | | | 9,420 | 421 | | | |
| 156 | | FY 2037 Subtotal: | - | - | - | 128,000 | 112,420 | - | - | | | | 111,798 | 1,037 | | | |
| 157 | 2038 | Construction | - | 7/31/2010 | 7/31/2020 | 50,000 | 50,000 | 3.118% | 4.329% | Global | 7/31/2020 | 7/31/2038 | 4.329% | 50,000 | | | |
| 158 | 2038 | Construction | - | 5/31/2015 | 5/31/2022 | 11,000 | 11,000 | 2.103% | 4.722% | Global | 5/31/2022 | 5/31/2050 | 4.722% | 11,000 | 513 | | |
| 159 | 2038 | Construction | - | 5/31/2015 | 5/31/2022 | 14,000 | 623 | 2.103% | 4.722% | Global | 5/31/2022 | 5/31/2050 | 4.722% | 623 | 29 | | |
| 160 | 2038 | Construction | - | 3/31/2016 | 3/31/2026 | 12,000 | 12,000 | 2.177% | 4.621% | Global | 3/31/2026 | 3/31/2051 | 4.621% | 8,971 | 387 | | |
| 161 | 2038 | Construction | - | 8/2/2011 | 8/31/2035 | 40,000 | 40,000 | 4.446% | 3.413% | Global | 8/31/2035 | 8/31/2038 | 3.413% | 40,000 | | | |
| 162 | | FY 2038 Subtotal: | - | - | - | 127,000 | 113,623 | - | - | | | | 110,594 | 929 | | | |
| 163 | 2039 | Construction | - | 3/31/2016 | 3/31/2026 | 12,000 | 3,029 | 2.177% | 4.621% | Global | 3/31/2026 | 3/31/2051 | 4.621% | 3,029 | 134 | | |

**TABLE 11-4
APPLICATION OF AMORTIZATION (\$000S) (FY 2018)**

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
|-------------|---------|--------------------------|------------|---------------|-------------------|-------------------|----------------|----------------|----------------|-----------------|----------------------|------------|----------------|----------------|--------------|---------|----------|
| Fiscal Year | Project | Debt Type | In Service | Bond Due Date | Initial Principal | Current Principal | Original Rate | Effective Rate | Refinance Type | Refinanced Date | Rolled Maturity Date | Roll Rate | Principal Paid | Premium | Discount | Accrual | Reversal |
| 164 | 2039 | Construction | - | 9/30/2014 | 4/30/2028 | 17,000 | 17,000 | 0.713% | 4.486% | Global | 4/30/2028 | 4/30/2049 | 4.486% | 17,000 | 498 | | |
| 165 | 2039 | Construction | - | 9/30/2014 | 9/30/2028 | 3,000 | 3,000 | 3.094% | 4.486% | Global | 9/30/2028 | 9/30/2049 | 4.486% | 3,000 | 99 | | |
| 166 | 2039 | Construction | - | 8/2/2011 | 8/31/2034 | 40,000 | 40,000 | 4.416% | 3.642% | Global | 8/31/2034 | 8/31/2039 | 3.642% | 40,000 | | | |
| 167 | 2039 | Construction | - | 9/30/2017 | 9/30/2039 | 76,000 | 38,000 | 2.480% | 2.480% | | | | | 38,000 | | | |
| 168 | 2039 | Construction | - | 1/31/2014 | 1/31/2043 | 15,000 | 15,000 | 4.380% | 4.380% | | | | | 8,337 | 264 | | |
| 169 | | FY 2039 Subtotal: | - | - | - | 163,000 | 116,029 | - | - | | | | | 109,366 | 995 | | |
| 170 | 2040 | Construction | - | 10/31/2015 | 8/31/2034 | 19,000 | 19,000 | 0.713% | 4.352% | Global | 8/31/2034 | 8/31/2051 | 4.352% | 11,312 | 16 | | |
| 171 | 2040 | Construction | - | 4/30/2014 | 10/31/2039 | 45,000 | 45,000 | 0.947% | 0.947% | | | | | 45,000 | | | |
| 172 | 2040 | Construction | - | 1/27/2012 | 1/31/2040 | 30,000 | 30,000 | 0.947% | 0.947% | | | | | 30,000 | | | |
| 173 | 2040 | Construction | - | 1/31/2014 | 1/31/2043 | 15,000 | 6,663 | 4.380% | 4.380% | | | | | 6,663 | 183 | | |
| 174 | | FY 2040 Subtotal: | - | - | - | 109,000 | 100,663 | - | - | | | | | 92,975 | 198 | | |
| 175 | 2041 | Construction | - | 1/31/2010 | 1/31/2019 | 30,000 | 30,000 | 3.714% | 4.248% | Global | 1/31/2019 | 1/31/2044 | 4.248% | 23,585 | 403 | | |
| 176 | 2041 | Construction | - | 10/31/2015 | 8/31/2034 | 19,000 | 7,688 | 0.713% | 4.352% | Global | 8/31/2034 | 8/31/2051 | 4.352% | 7,688 | 25 | | |
| 177 | 2041 | Construction | - | 8/31/2014 | 8/31/2035 | 15,000 | 15,000 | 0.697% | 4.251% | Global | 8/31/2035 | 8/31/2049 | 4.251% | 15,000 | 109 | | |
| 178 | 2041 | Construction | - | 8/31/2017 | 8/31/2041 | 76,000 | 76,000 | 2.630% | 2.630% | | | | | 76,000 | | | |
| 179 | | FY 2041 Subtotal: | - | - | - | 140,000 | 128,688 | - | - | | | | | 122,273 | 537 | | |
| 180 | 2042 | Construction | - | 1/31/2010 | 1/31/2019 | 30,000 | 6,415 | 3.714% | 4.248% | Global | 1/31/2019 | 1/31/2044 | 4.248% | 6,415 | 83 | | |
| 181 | 2042 | Construction | - | 10/31/2013 | 10/31/2035 | 64,000 | 64,000 | 4.222% | 4.184% | Global | 10/31/2035 | 10/31/2048 | 4.184% | 50,123 | 1,209 | | |
| 182 | 2042 | Construction | - | 7/31/2018 | 7/31/2042 | 78,000 | 26,000 | 3.620% | 3.620% | | | | | 26,000 | | | |
| 183 | | FY 2042 Subtotal: | - | - | - | 172,000 | 96,415 | - | - | | | | | 82,538 | 1,293 | | |
| 184 | 2043 | Construction | - | 10/31/2013 | 10/31/2035 | 64,000 | 13,877 | 4.222% | 4.184% | Global | 10/31/2035 | 10/31/2047 | 4.184% | 13,877 | 357 | | |
| 185 | 2043 | Construction | - | 5/31/2014 | 5/31/2036 | 29,000 | 29,000 | 0.732% | 4.150% | Global | 5/31/2036 | 5/31/2047 | 4.150% | 23,283 | 503 | | |
| 186 | 2043 | Construction | - | 7/31/2017 | 7/31/2043 | 76,000 | 19,000 | 2.730% | 2.730% | | | | | 19,000 | | | |
| 187 | 2043 | Construction | - | 7/31/2018 | 7/31/2043 | 78,000 | 26,000 | 3.670% | 3.670% | | | | | 26,000 | | | |
| 188 | | FY 2043 Subtotal: | - | - | - | 247,000 | 87,877 | - | - | | | | | 82,160 | 860 | | |
| 189 | 2044 | Construction | - | 5/31/2014 | 5/31/2036 | 29,000 | 5,717 | 0.732% | 4.150% | Global | 5/31/2036 | 5/31/2047 | 4.150% | 5,717 | 118 | | |
| 190 | 2044 | Construction | - | 6/22/2011 | 6/30/2036 | 50,000 | 50,000 | 4.629% | 4.021% | Global | 6/30/2036 | 6/30/2045 | 4.021% | 50,000 | 262 | | |
| 191 | 2044 | Construction | - | 7/31/2017 | 7/31/2044 | 76,000 | 19,000 | 2.780% | 2.780% | | | | | 19,000 | | | |
| 192 | 2044 | Construction | - | 7/31/2018 | 7/31/2048 | 78,000 | 26,000 | 3.870% | 3.870% | | | | | 5,695 | | | |
| 193 | | FY 2044 Subtotal: | - | - | - | 233,000 | 100,717 | - | - | | | | | 80,412 | 379 | | |
| 194 | 2045 | Construction | - | 7/31/2017 | 7/31/2047 | 76,000 | 38,000 | 2.930% | 2.930% | | | | | 20,428 | | | |
| 195 | 2045 | Construction | - | 8/31/2018 | 8/31/2047 | 79,000 | 29,000 | 3.830% | 3.830% | | | | | 29,000 | | | |
| 196 | 2045 | Construction | - | 7/31/2018 | 7/31/2048 | 78,000 | 20,305 | 3.870% | 3.870% | | | | | 20,305 | | | |
| 197 | 2045 | Construction | - | 8/31/2018 | 8/31/2048 | 79,000 | 50,000 | 3.870% | 3.870% | | | | | 50,000 | | | |
| 198 | 2045 | Construction | - | 9/30/2018 | 9/30/2048 | 79,000 | 79,000 | 3.870% | 3.870% | | | | | 79,000 | | | |
| 199 | | FY 2045 Subtotal: | - | - | - | 391,000 | 216,305 | - | - | | | | | 198,733 | | | |
| 200 | 2046 | Construction | - | 7/31/2017 | 7/31/2047 | 76,000 | 17,572 | 2.930% | 2.930% | | | | | 17,572 | | | |
| 201 | 2046 | Construction | - | 9/30/2017 | 9/30/2047 | 76,000 | 38,000 | 2.930% | 2.930% | | | | | 38,000 | | | |
| 202 | 2046 | Replacements | - | 3/31/2019 | 3/31/2054 | 182,115 | 182,115 | 3.870% | 3.870% | | | | | 139,141 | | | |
| 203 | | FY 2046 Subtotal: | - | - | - | 334,115 | 237,687 | - | - | | | | | 194,713 | | | |
| 204 | 2047 | Replacements | - | 3/31/2019 | 3/31/2054 | 182,115 | 42,974 | 3.870% | 3.870% | | | | | 42,974 | | | |
| 205 | 2047 | Replacements | - | 3/31/2020 | 3/31/2055 | 186,863 | 186,863 | 3.870% | 3.870% | | | | | 147,885 | | | |
| 206 | | FY 2047 Subtotal: | - | - | - | 368,978 | 229,837 | - | - | | | | | 190,859 | | | |
| 207 | 2048 | Replacements | - | 3/31/2020 | 3/31/2055 | 186,863 | 38,977 | 3.870% | 3.870% | | | | | 38,977 | | | |
| 208 | 2048 | Replacements | - | 3/31/2021 | 3/31/2056 | 192,088 | 192,088 | 3.870% | 3.870% | | | | | 148,082 | | | |
| 209 | | FY 2048 Subtotal: | - | - | - | 378,951 | 231,066 | - | - | | | | | 187,059 | | | |
| 210 | 2049 | Replacements | - | 3/31/2021 | 3/31/2056 | 192,088 | 44,007 | 3.870% | 3.870% | | | | | 44,007 | | | |
| 211 | 2049 | Replacements | - | 3/31/2022 | 3/31/2057 | 196,517 | 196,517 | 3.870% | 3.870% | | | | | 138,955 | | | |
| 212 | | FY 2049 Subtotal: | - | - | - | 388,605 | 240,523 | - | - | | | | | 182,961 | | | |
| 213 | 2050 | Replacements | - | 3/31/2022 | 3/31/2057 | 196,517 | 57,562 | 3.870% | 3.870% | | | | | 57,562 | | | |
| 214 | 2050 | Replacements | - | 3/31/2023 | 3/31/2058 | 199,967 | 199,967 | 3.870% | 3.870% | | | | | 121,046 | | | |
| 215 | | FY 2050 Subtotal: | - | - | - | 396,484 | 257,530 | - | - | | | | | 178,608 | | | |

**TABLE 11-4
APPLICATION OF AMORTIZATION (\$000S) (FY 2018)**

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
|-------------|---------|--------------------------|------------|---------------|-------------------|--------------------|--------------------|----------------|----------------|-----------------|----------------------|-----------|--------------------|-----------------|----------|---------|----------|
| Fiscal Year | Project | Debt Type | In Service | Bond Due Date | Initial Principal | Current Principal | Original Rate | Effective Rate | Refinance Type | Refinanced Date | Rolled Maturity Date | Roll Rate | Principal Paid | Premium | Discount | Accrual | Reversal |
| 216 | 2051 | Replacements | - | 3/31/2023 | 3/31/2058 | 199,967 | 78,922 | 3.870% | 3.870% | | | | | | | | 78,922 |
| 217 | 2051 | Replacements | - | 3/31/2024 | 3/31/2059 | 203,394 | 203,394 | 3.870% | 3.870% | | | | | | | | 95,064 |
| 218 | | FY 2051 Subtotal: | - | - | - | 403,361 | 282,315 | - | - | | | | 173,986 | | | | |
| 219 | 2052 | Replacements | - | 3/31/2024 | 3/31/2059 | 203,394 | 108,330 | 3.870% | 3.870% | | | | | | | | 108,330 |
| 220 | 2052 | Replacements | - | 3/31/2025 | 3/31/2060 | 206,406 | 206,406 | 3.870% | 3.870% | | | | | | | | 60,802 |
| 221 | | FY 2052 Subtotal: | - | - | - | 409,800 | 314,736 | - | - | | | | 169,131 | | | | |
| 222 | 2053 | Replacements | - | 3/31/2025 | 3/31/2060 | 206,406 | 145,605 | 3.870% | 3.870% | | | | | | | | 145,605 |
| 223 | 2053 | Replacements | - | 3/31/2026 | 3/31/2061 | 210,406 | 210,406 | 3.870% | 3.870% | | | | | | | | 18,364 |
| 224 | | FY 2053 Subtotal: | - | - | - | 416,812 | 356,010 | - | - | | | | 163,968 | | | | |
| 225 | | Grand Total | | | | \$8,535,293 | \$6,290,067 | - | - | | | | \$4,817,852 | \$27,806 | | | |

**TABLE 11-5
SUMMARY OF INTEREST (\$000S) (FY 2019)**

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | |
|----|----------------------------------|---|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|---|
| 1 | Obligation Type | General Project | Specific Project | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | |
| 2 | Appropriation | Bonneville Power Administration | Bonneville Power Administration | 8,628 | 1,659 | 1,518 | - | - | - | - | - | - | - | - | - | - | |
| 3 | | | Bonneville Power Administration Subtotal: | 8,628 | 1,659 | 1,518 | - | - | - | - | - | - | - | - | - | - | - |
| 4 | | Appropriation Subtotal: | 8,628 | 1,659 | 1,518 | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 | | (Less Interest Income) | (131) | (223) | (959) | (686) | (687) | (707) | (696) | (692) | (682) | (693) | (685) | (719) | (725) | | |
| 6 | Treasury | BPA Borrowing | Construction | 90,872 | 97,030 | 104,005 | 109,324 | 105,747 | 101,302 | 95,882 | 90,844 | 88,865 | 85,084 | 80,827 | 76,189 | 73,040 | |
| 7 | | | Interest Accrual | 17,493 | 18,229 | 17,266 | 15,839 | 14,883 | 13,578 | 13,041 | 12,561 | 12,181 | 11,257 | 10,758 | 9,674 | 8,976 | |
| 8 | | | Interest Accrual Reversal | (16,968) | (17,493) | (18,229) | (17,266) | (15,839) | (14,883) | (13,578) | (13,041) | (12,561) | (12,181) | (11,257) | (10,758) | (9,674) | |
| 9 | | | Construction (AS) | 1,254 | 1,354 | 1,542 | 1,561 | 1,340 | 1,092 | 1,001 | 913 | 646 | - | - | - | - | - |
| 10 | | | Interest Accrual | 292 | 284 | 218 | 136 | 73 | 24 | 24 | 24 | - | - | - | - | - | - |
| 11 | | | Interest Accrual Reversal | (284) | (292) | (284) | (218) | (136) | (73) | (24) | (24) | (24) | - | - | - | - | - |
| 12 | | | Environment | 1,296 | 1,449 | 1,676 | 1,949 | 1,949 | 1,949 | 1,949 | 1,910 | 1,658 | 1,341 | 1,341 | 1,117 | 843 | |
| 13 | | | Interest Accrual | 299 | 299 | 299 | 299 | 299 | 299 | 299 | 287 | 215 | 215 | 185 | 119 | | |
| 14 | | | Interest Accrual Reversal | (299) | (299) | (299) | (299) | (299) | (299) | (299) | (299) | (287) | (215) | (215) | (185) | (119) | |
| 15 | | | Technology (T) | 438 | 438 | 404 | 404 | 201 | - | - | - | - | - | - | - | - | |
| 16 | Interest Accrual | 34 | 34 | 34 | 34 | - | - | - | - | - | - | - | - | - | | | |
| 17 | Interest Accrual Reversal | (34) | (34) | (34) | (34) | (34) | - | - | - | - | - | - | - | - | | | |
| 18 | | BPA Borrowing Subtotal: | 94,262 | 100,776 | 105,638 | 111,043 | 107,496 | 102,282 | 97,599 | 92,483 | 90,012 | 84,808 | 80,952 | 75,437 | 72,342 | | |
| 19 | Federal Transmission Replacement | Replacements | - | - | - | 4,180 | 12,670 | 21,396 | 30,309 | 39,385 | 48,633 | 58,075 | 67,696 | 77,485 | 87,444 | | |
| 20 | | Federal Transmission Replacement Subtotal: | - | - | - | 4,180 | 12,670 | 21,396 | 30,309 | 39,385 | 48,633 | 58,075 | 67,696 | 77,485 | 87,444 | | |
| 21 | | Treasury Subtotal: | 94,262 | 100,776 | 105,638 | 115,223 | 120,166 | 123,678 | 127,907 | 131,867 | 138,645 | 142,883 | 148,648 | 152,921 | 159,786 | | |
| 22 | Grand Total: | | | \$102,890 | \$102,435 | \$107,156 | \$115,223 | \$120,166 | \$123,678 | \$127,907 | \$131,867 | \$138,645 | \$142,883 | \$148,648 | \$152,921 | \$159,786 | |

**TABLE 11-5
SUMMARY OF INTEREST (\$000S) (FY 2019)**

| | A | B | C | Q | R | S | T | U | V | W | X | Y | Z | AA | AB | AC | |
|----|----------------------|---|---|--------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|---------|
| 1 | Obligation Type | General Project | Specific Project | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | |
| 2 | Appropriation | Bonneville Power Administration | Bonneville Power Administration | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 3 | | | Bonneville Power Administration Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 | | Appropriation Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 | | | (Less Interest Income) | (713) | (721) | (724) | (688) | (734) | (648) | (649) | (730) | (731) | (733) | (683) | (791) | (668) | |
| 6 | | | Construction | 66,040 | 60,851 | 56,968 | 51,201 | 48,397 | 45,863 | 43,603 | 38,959 | 35,095 | 30,594 | 27,043 | 25,672 | 21,895 | |
| 7 | | | Interest Accrual | 7,406 | 7,147 | 6,758 | 6,336 | 5,529 | 4,433 | 1,820 | 1,738 | 1,672 | 1,594 | 1,370 | 1,201 | 939 | |
| 8 | | | Interest Accrual Reversal | (8,976) | (7,406) | (7,147) | (6,758) | (6,336) | (5,529) | (4,433) | (1,820) | (1,738) | (1,672) | (1,594) | (1,370) | (1,201) | |
| 9 | | | Construction (AS) | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 10 | | | Interest Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 11 | | | Interest Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 12 | Treasury | BPA Borrowing | Environment | 652 | 652 | 652 | 500 | 272 | - | - | - | - | - | - | - | - | |
| 13 | | | | Interest Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 14 | | | | Interest Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 15 | | | | Technology (T) | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 16 | | | | Interest Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 17 | | | | Interest Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 18 | | | | BPA Borrowing Subtotal: | 64,409 | 60,524 | 56,507 | 50,591 | 47,130 | 44,117 | 40,342 | 38,148 | 34,297 | 29,782 | 26,136 | 24,712 | 20,965 |
| 19 | | | | | Replacements | 97,615 | 108,034 | 118,664 | 129,498 | 140,570 | 151,877 | 163,379 | 175,065 | 186,924 | 198,959 | 211,172 | 223,548 |
| 20 | | Federal Transmission Replacement | Federal Transmission Replacement Subtotal: | 97,615 | 108,034 | 118,664 | 129,498 | 140,570 | 151,877 | 163,379 | 175,065 | 186,924 | 198,959 | 211,172 | 223,548 | 236,072 | |
| 21 | | Treasury Subtotal: | | 162,025 | 168,557 | 175,171 | 180,089 | 187,700 | 195,995 | 203,721 | 213,213 | 221,221 | 228,741 | 237,308 | 248,260 | 257,037 | |
| 22 | Grand Total: | | | \$162,025 | \$168,557 | \$175,171 | \$180,089 | \$187,700 | \$195,995 | \$203,721 | \$213,213 | \$221,221 | \$228,741 | \$237,308 | \$248,260 | \$257,037 | |

**TABLE 11-5
SUMMARY OF INTEREST (\$000S) (FY 2019)**

| | A | B | C | AD | AE | AF | AG | AH | AI | AJ | AK | AL | AM | AN | AO | AP | |
|----|----------------------|---|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|----------|
| 1 | Obligation Type | General Project | Specific Project | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | 2054 | Total | |
| 2 | Appropriation | Bonneville Power Administration | Bonneville Power Administration | - | - | - | - | - | - | - | - | - | - | - | - | 11,805 | |
| 3 | | | Bonneville Power Administration Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - | 11,805 |
| 4 | | Appropriation Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 11,805 |
| 5 | | | (Less Interest Income) | (675) | (675) | (655) | (651) | (1,055) | (1,043) | (1,030) | (1,019) | (1,006) | (994) | (980) | (965) | | (28,244) |
| 6 | | | Construction | 19,492 | 17,276 | 15,208 | 12,296 | 10,856 | 5,780 | - | - | - | - | - | - | 1,832,100 | |
| 7 | | | Interest Accrual | 694 | 607 | 607 | 607 | 294 | - | - | - | - | - | - | - | 226,491 | |
| 8 | | | Interest Accrual Reversal | (939) | (694) | (607) | (607) | (607) | (294) | - | - | - | - | - | - | (243,458) | |
| 9 | | | Construction (AS) | - | - | - | - | - | - | - | - | - | - | - | - | 10,702 | |
| 10 | | | Interest Accrual | - | - | - | - | - | - | - | - | - | - | - | - | 1,075 | |
| 11 | | BPA Borrowing | Interest Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | (1,360) | |
| 12 | | | Environment | - | - | - | - | - | - | - | - | - | - | - | - | 23,155 | |
| 13 | Treasury | | Interest Accrual | - | - | - | - | - | - | - | - | - | - | - | - | 3,116 | |
| 14 | | | Interest Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | (3,415) | |
| 15 | | | Technology (T) | - | - | - | - | - | - | - | - | - | - | - | - | 1,884 | |
| 16 | | | Interest Accrual | - | - | - | - | - | - | - | - | - | - | - | - | 137 | |
| 17 | | | Interest Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | (171) | |
| 18 | | | BPA Borrowing Subtotal: | 18,572 | 16,514 | 14,553 | 11,646 | 9,488 | 4,443 | (1,030) | (1,019) | (1,006) | (994) | (980) | (965) | 1,822,012 | |
| 19 | | Federal Transmission Replacement | Replacements | 248,770 | 261,654 | 274,669 | 287,803 | 301,089 | 314,485 | 324,765 | 332,110 | 339,880 | 348,125 | 356,891 | 366,191 | 6,345,078 | |
| 20 | | | Federal Transmission Replacement Subtotal: | 248,770 | 261,654 | 274,669 | 287,803 | 301,089 | 314,485 | 324,765 | 332,110 | 339,880 | 348,125 | 356,891 | 366,191 | 6,345,078 | |
| 21 | | Treasury Subtotal: | 267,342 | 278,168 | 289,222 | 299,448 | 310,578 | 318,928 | 323,735 | 331,091 | 338,874 | 347,132 | 355,911 | 365,226 | | 8,167,090 | |
| 22 | Grand Total: | | | \$267,342 | \$278,168 | \$289,222 | \$299,448 | \$310,578 | \$318,928 | \$323,735 | \$331,091 | \$338,874 | \$347,132 | \$355,911 | \$365,226 | \$8,178,895 | |

**TABLE 11-6
INTEREST CALCULATION SUMMARY (\$000S) (FY 2019)**

| | A | B | C | D | E | F | G | H | I |
|----|--------------------------|---------------------------------|-------------|--------------------------|-------------|-----------------|----------------|-----------------------------|----------------|
| | Fiscal Year | Project | Type | Current Principal | Rate | Interest | Premium | Net Interest Accrual | Total |
| 1 | | | | | | | | | |
| 2 | 2017 | Bonneville Power Administration | Historical | 119,448 | 7.223% | 8,628 | - | - | 8,628 |
| 3 | 2017 | Construction | Historical | 2,663,040 | 3.412% | 90,872 | - | - | 90,872 |
| 4 | 2017 | Construction | New | 152,000 | - | - | - | 525 | 525 |
| 5 | 2017 | Construction (AS) | Historical | 68,850 | 1.803% | 1,242 | - | - | 1,242 |
| 6 | 2017 | Construction (AS) | New | 4,550 | 0.263% | 12 | - | 8 | 20 |
| 7 | 2017 | Environment | Historical | 54,000 | 2.400% | 1,296 | - | - | 1,296 |
| 8 | 2017 | Technology (T) | Historical | 28,000 | 1.563% | 438 | - | - | 438 |
| 9 | 2017 | Float | Historical | - | - | (131) | - | - | (131) |
| 10 | FY 2017 Subtotal: | | | 3,089,888 | | 102,357 | - | 533 | 102,890 |
| 11 | 2018 | Bonneville Power Administration | Historical | 23,008 | 7.210% | 1,659 | - | - | 1,659 |
| 12 | 2018 | Construction | Historical | 2,891,040 | 3.356% | 97,030 | - | - | 97,030 |
| 13 | 2018 | Construction | New | 157,000 | - | - | - | 736 | 736 |
| 14 | 2018 | Construction (AS) | Historical | 79,250 | 1.708% | 1,354 | - | (8) | 1,346 |
| 15 | 2018 | Environment | Historical | 61,000 | 2.375% | 1,449 | - | - | 1,449 |
| 16 | 2018 | Technology (T) | Historical | 28,000 | 1.563% | 438 | - | - | 438 |
| 17 | 2018 | Float | Historical | - | - | (223) | - | - | (223) |
| 18 | FY 2018 Subtotal: | | | 3,239,298 | | 101,706 | - | 728 | 102,435 |
| 19 | 2019 | Bonneville Power Administration | Historical | 21,053 | 7.210% | 1,518 | - | - | 1,518 |
| 20 | 2019 | Construction | Historical | 3,090,640 | 3.365% | 104,005 | - | (1,866) | 102,139 |
| 21 | 2019 | Construction | New | 163,000 | - | - | - | 903 | 903 |
| 22 | 2019 | Construction (AS) | Historical | 85,100 | 1.812% | 1,542 | - | (67) | 1,476 |
| 23 | 2019 | Environment | Historical | 68,000 | 2.465% | 1,676 | - | - | 1,676 |
| 24 | 2019 | Technology (T) | Historical | 23,000 | 1.756% | 404 | - | - | 404 |
| 25 | 2019 | Float | Historical | - | - | (959) | - | - | (959) |
| 26 | FY 2019 Subtotal: | | | 3,450,793 | | 108,186 | - | (1,030) | 107,156 |
| 27 | 2020 | Construction | Historical | 3,138,427 | 3.483% | 109,324 | - | (1,426) | 107,898 |
| 28 | 2020 | Construction (AS) | Historical | 78,400 | 1.991% | 1,561 | - | (82) | 1,479 |
| 29 | 2020 | Environment | Historical | 75,000 | 2.598% | 1,949 | - | - | 1,949 |
| 30 | 2020 | Replacements | New | 188,713 | 2.215% | 4,180 | - | - | 4,180 |
| 31 | 2020 | Technology (T) | Historical | 23,000 | 1.756% | 404 | - | - | 404 |
| 32 | 2020 | Float | Historical | - | - | (686) | - | - | (686) |
| 33 | FY 2020 Subtotal: | | | 3,503,540 | | 116,732 | - | (1,509) | 115,223 |

**TABLE 11-6
INTEREST CALCULATION SUMMARY (\$000S) (FY 2019)**

| | A | B | C | D | E | F | G | H | I |
|----|--------------------------|-------------------|-------------|--------------------------|-------------|-----------------|----------------|-----------------------------|----------------|
| 1 | Fiscal Year | Project | Type | Current Principal | Rate | Interest | Premium | Net Interest Accrual | Total |
| 34 | 2021 | Construction | Historical | 3,011,554 | 3.511% | 105,747 | - | (957) | 104,790 |
| 35 | 2021 | Construction (AS) | Historical | 61,500 | 2.178% | 1,340 | - | (63) | 1,277 |
| 36 | 2021 | Environment | Historical | 75,000 | 2.598% | 1,949 | - | - | 1,949 |
| 37 | 2021 | Replacements | Historical | 188,713 | 4.430% | 8,360 | - | - | 8,360 |
| 38 | 2021 | Replacements | New | 194,563 | 2.215% | 4,310 | - | - | 4,310 |
| 39 | 2021 | Technology (T) | Historical | 23,000 | 0.876% | 201 | - | (34) | 167 |
| 40 | 2021 | Float | Historical | - | - | (687) | - | - | (687) |
| 41 | FY 2021 Subtotal: | | | 3,554,331 | | 121,219 | - | (1,053) | 120,166 |
| 42 | 2022 | Construction | Historical | 2,905,286 | 3.487% | 101,302 | - | (1,305) | 99,997 |
| 43 | 2022 | Construction (AS) | Historical | 48,500 | 2.251% | 1,092 | - | (49) | 1,043 |
| 44 | 2022 | Environment | Historical | 75,000 | 2.598% | 1,949 | - | - | 1,949 |
| 45 | 2022 | Replacements | Historical | 383,276 | 4.430% | 16,979 | - | - | 16,979 |
| 46 | 2022 | Replacements | New | 199,419 | 2.215% | 4,417 | - | - | 4,417 |
| 47 | 2022 | Float | Historical | - | - | (707) | - | - | (707) |
| 48 | FY 2022 Subtotal: | | | 3,611,481 | | 125,032 | - | (1,354) | 123,678 |
| 49 | 2023 | Construction | Historical | 2,769,056 | 3.463% | 95,882 | - | (537) | 95,345 |
| 50 | 2023 | Construction (AS) | Historical | 38,300 | 2.613% | 1,001 | - | - | 1,001 |
| 51 | 2023 | Environment | Historical | 75,000 | 2.598% | 1,949 | - | - | 1,949 |
| 52 | 2023 | Replacements | Historical | 582,695 | 4.430% | 25,813 | - | - | 25,813 |
| 53 | 2023 | Replacements | New | 202,949 | 2.215% | 4,495 | - | - | 4,495 |
| 54 | 2023 | Float | Historical | - | - | (696) | - | - | (696) |
| 55 | FY 2023 Subtotal: | | | 3,668,001 | | 128,444 | - | (537) | 127,907 |
| 56 | 2024 | Construction | Historical | 2,634,159 | 3.449% | 90,844 | - | (480) | 90,364 |
| 57 | 2024 | Construction (AS) | Historical | 32,450 | 2.812% | 913 | - | - | 913 |
| 58 | 2024 | Environment | Historical | 75,000 | 2.547% | 1,910 | - | (13) | 1,898 |
| 59 | 2024 | Replacements | Historical | 785,644 | 4.430% | 34,804 | - | - | 34,804 |
| 60 | 2024 | Replacements | New | 206,797 | 2.215% | 4,581 | - | - | 4,581 |
| 61 | 2024 | Float | Historical | - | - | (692) | - | - | (692) |
| 62 | FY 2024 Subtotal: | | | 3,734,051 | | 132,360 | - | (492) | 131,867 |

**TABLE 11-6
INTEREST CALCULATION SUMMARY (\$000S) (FY 2019)**

| | A | B | C | D | E | F | G | H | I |
|----|--------------------------|-------------------|-------------|--------------------------|-------------|-----------------|----------------|-----------------------------|----------------|
| 1 | Fiscal Year | Project | Type | Current Principal | Rate | Interest | Premium | Net Interest Accrual | Total |
| 63 | 2025 | Construction | Historical | 2,509,429 | 3.541% | 88,865 | - | (380) | 88,485 |
| 64 | 2025 | Construction (AS) | Historical | 22,050 | 2.931% | 646 | - | (24) | 622 |
| 65 | 2025 | Environment | Historical | 71,000 | 2.336% | 1,658 | - | (71) | 1,587 |
| 66 | 2025 | Replacements | Historical | 992,442 | 4.430% | 43,965 | - | - | 43,965 |
| 67 | 2025 | Replacements | New | 210,756 | 2.215% | 4,668 | - | - | 4,668 |
| 68 | 2025 | Float | Historical | - | - | (682) | - | - | (682) |
| 69 | FY 2025 Subtotal: | | | 3,805,676 | | 139,120 | - | (475) | 138,645 |
| 70 | 2026 | Construction | Historical | 2,412,733 | 3.526% | 85,084 | - | (924) | 84,160 |
| 71 | 2026 | Environment | Historical | 56,000 | 2.394% | 1,341 | - | - | 1,341 |
| 72 | 2026 | Replacements | Historical | 1,203,197 | 4.430% | 53,302 | - | - | 53,302 |
| 73 | 2026 | Replacements | New | 215,497 | 2.215% | 4,773 | - | - | 4,773 |
| 74 | 2026 | Float | Historical | - | - | (693) | - | - | (693) |
| 75 | FY 2026 Subtotal: | | | 3,887,427 | | 143,806 | - | (924) | 142,883 |
| 76 | 2027 | Construction | Historical | 2,277,987 | 3.548% | 80,827 | - | (500) | 80,327 |
| 77 | 2027 | Environment | Historical | 56,000 | 2.394% | 1,341 | - | (30) | 1,310 |
| 78 | 2027 | Replacements | Historical | 1,418,694 | 4.430% | 62,848 | - | - | 62,848 |
| 79 | 2027 | Replacements | New | 218,863 | 2.215% | 4,848 | - | - | 4,848 |
| 80 | 2027 | Float | Historical | - | - | (685) | - | - | (685) |
| 81 | FY 2027 Subtotal: | | | 3,971,544 | | 149,178 | - | (530) | 148,648 |
| 82 | 2028 | Construction | Historical | 2,166,114 | 3.517% | 76,189 | - | (1,084) | 75,105 |
| 83 | 2028 | Environment | Historical | 38,000 | 2.940% | 1,117 | - | (66) | 1,051 |
| 84 | 2028 | Replacements | Historical | 1,637,557 | 4.430% | 72,544 | - | - | 72,544 |
| 85 | 2028 | Replacements | New | 223,068 | 2.215% | 4,941 | - | - | 4,941 |
| 86 | 2028 | Float | Historical | - | - | (719) | - | - | (719) |
| 87 | FY 2028 Subtotal: | | | 4,064,739 | | 154,072 | - | (1,150) | 152,921 |
| 88 | 2029 | Construction | Historical | 2,040,307 | 3.580% | 73,040 | - | (698) | 72,342 |
| 89 | 2029 | Environment | Historical | 33,000 | 2.555% | 843 | - | (119) | 725 |
| 90 | 2029 | Replacements | Historical | 1,860,625 | 4.430% | 82,426 | - | - | 82,426 |
| 91 | 2029 | Replacements | New | 226,543 | 2.215% | 5,018 | - | - | 5,018 |
| 92 | 2029 | Float | Historical | - | - | (725) | - | - | (725) |
| 93 | FY 2029 Subtotal: | | | 4,160,475 | | 160,602 | - | (816) | 159,786 |

**TABLE 11-6
INTEREST CALCULATION SUMMARY (\$000S) (FY 2019)**

| | A | B | C | D | E | F | G | H | I |
|-----|--------------------------|--------------|------------|-------------------|--------|----------------|---------|----------------------|----------------|
| 1 | Fiscal Year | Project | Type | Current Principal | Rate | Interest | Premium | Net Interest Accrual | Total |
| 94 | 2030 | Construction | Historical | 1,917,797 | 3.444% | 66,040 | - | (1,570) | 64,470 |
| 95 | 2030 | Environment | Historical | 21,000 | 3.107% | 652 | - | - | 652 |
| 96 | 2030 | Replacements | Historical | 2,087,168 | 4.430% | 92,462 | - | - | 92,462 |
| 97 | 2030 | Replacements | New | 232,679 | 2.215% | 5,154 | - | - | 5,154 |
| 98 | 2030 | Float | Historical | - | - | (713) | - | - | (713) |
| 99 | FY 2030 Subtotal: | | | 4,258,644 | | 163,595 | - | (1,570) | 162,025 |
| 100 | 2031 | Construction | Historical | 1,787,234 | 3.405% | 60,851 | - | (259) | 60,592 |
| 101 | 2031 | Environment | Historical | 21,000 | 3.107% | 652 | - | - | 652 |
| 102 | 2031 | Replacements | Historical | 2,319,847 | 4.430% | 102,769 | - | - | 102,769 |
| 103 | 2031 | Replacements | New | 237,666 | 2.215% | 5,264 | - | - | 5,264 |
| 104 | 2031 | Float | Historical | - | - | (721) | - | - | (721) |
| 105 | FY 2031 Subtotal: | | | 4,365,746 | | 168,816 | - | (259) | 168,557 |
| 106 | 2032 | Construction | Historical | 1,655,940 | 3.440% | 56,968 | - | (389) | 56,578 |
| 107 | 2032 | Environment | Historical | 21,000 | 3.107% | 652 | - | - | 652 |
| 108 | 2032 | Replacements | Historical | 2,557,513 | 4.430% | 113,298 | - | - | 113,298 |
| 109 | 2032 | Replacements | New | 242,244 | 2.215% | 5,366 | - | - | 5,366 |
| 110 | 2032 | Float | Historical | - | - | (724) | - | - | (724) |
| 111 | FY 2032 Subtotal: | | | 4,476,696 | | 175,560 | - | (389) | 175,171 |
| 112 | 2033 | Construction | Historical | 1,534,579 | 3.336% | 51,201 | - | (422) | 50,779 |
| 113 | 2033 | Environment | Historical | 14,000 | 3.570% | 500 | - | - | 500 |
| 114 | 2033 | Replacements | Historical | 2,799,757 | 4.430% | 124,029 | - | - | 124,029 |
| 115 | 2033 | Replacements | New | 246,904 | 2.215% | 5,469 | - | - | 5,469 |
| 116 | 2033 | Float | Historical | - | - | (688) | - | - | (688) |
| 117 | FY 2033 Subtotal: | | | 4,595,239 | | 180,511 | - | (422) | 180,089 |
| 118 | 2034 | Construction | Historical | 1,427,175 | 3.391% | 48,397 | - | (806) | 47,591 |
| 119 | 2034 | Environment | Historical | 7,000 | 3.890% | 272 | - | - | 272 |
| 120 | 2034 | Replacements | Historical | 3,046,661 | 4.430% | 134,967 | - | - | 134,967 |
| 121 | 2034 | Replacements | New | 252,971 | 2.215% | 5,603 | - | - | 5,603 |
| 122 | 2034 | Float | Historical | - | - | (734) | - | - | (734) |
| 123 | FY 2034 Subtotal: | | | 4,733,806 | | 188,506 | - | (806) | 187,700 |
| 124 | 2035 | Construction | Historical | 1,309,121 | 3.503% | 45,863 | - | (1,097) | 44,766 |
| 125 | 2035 | Replacements | Historical | 3,299,631 | 4.430% | 146,174 | - | - | 146,174 |
| 126 | 2035 | Replacements | New | 257,499 | 2.215% | 5,704 | - | - | 5,704 |
| 127 | 2035 | Float | Historical | - | - | (648) | - | - | (648) |
| 128 | FY 2035 Subtotal: | | | 4,866,251 | | 197,091 | - | (1,097) | 195,995 |

**TABLE 11-6
INTEREST CALCULATION SUMMARY (\$000S) (FY 2019)**

| | A | B | C | D | E | F | G | H | I |
|-----|--------------------------|----------------|-------------|--------------------------|-------------|-----------------|----------------|-----------------------------|----------------|
| | Fiscal Year | Project | Type | Current Principal | Rate | Interest | Premium | Net Interest Accrual | Total |
| 129 | 2036 | Construction | Historical | 1,213,457 | 3.593% | 43,603 | - | (2,612) | 40,991 |
| 130 | 2036 | Replacements | Historical | 3,557,130 | 4.430% | 157,581 | - | - | 157,581 |
| 131 | 2036 | Replacements | New | 261,748 | 2.215% | 5,798 | - | - | 5,798 |
| 132 | 2036 | Float | Historical | - | - | (649) | - | - | (649) |
| 133 | FY 2036 Subtotal: | | | 5,032,336 | | 206,333 | - | (2,612) | 203,721 |
| 134 | 2037 | Construction | Historical | 1,121,536 | 3.474% | 38,959 | - | (82) | 38,877 |
| 135 | 2037 | Replacements | Historical | 3,818,879 | 4.430% | 169,176 | - | - | 169,176 |
| 136 | 2037 | Replacements | New | 265,843 | 2.215% | 5,888 | - | - | 5,888 |
| 137 | 2037 | Float | Historical | - | - | (730) | - | - | (730) |
| 138 | FY 2037 Subtotal: | | | 5,206,258 | | 213,295 | - | (82) | 213,213 |
| 139 | 2038 | Construction | Historical | 1,010,639 | 3.473% | 35,095 | - | (66) | 35,029 |
| 140 | 2038 | Replacements | Historical | 4,084,722 | 4.430% | 180,953 | - | - | 180,953 |
| 141 | 2038 | Replacements | New | 269,568 | 2.215% | 5,971 | - | - | 5,971 |
| 142 | 2038 | Float | Historical | - | - | (731) | - | - | (731) |
| 143 | FY 2038 Subtotal: | | | 5,364,929 | | 221,287 | - | (66) | 221,221 |
| 144 | 2039 | Construction | Historical | 903,004 | 3.388% | 30,594 | - | (79) | 30,515 |
| 145 | 2039 | Replacements | Historical | 4,354,290 | 4.430% | 192,895 | - | - | 192,895 |
| 146 | 2039 | Replacements | New | 273,763 | 2.215% | 6,064 | - | - | 6,064 |
| 147 | 2039 | Float | Historical | - | - | (733) | - | - | (733) |
| 148 | FY 2039 Subtotal: | | | 5,531,057 | | 228,820 | - | (79) | 228,741 |
| 149 | 2040 | Construction | Historical | 798,693 | 3.386% | 27,043 | - | (224) | 26,819 |
| 150 | 2040 | Replacements | Historical | 4,628,053 | 4.430% | 205,023 | - | - | 205,023 |
| 151 | 2040 | Replacements | New | 277,608 | 2.215% | 6,149 | - | - | 6,149 |
| 152 | 2040 | Float | Historical | - | - | (683) | - | - | (683) |
| 153 | FY 2040 Subtotal: | | | 5,704,354 | | 237,532 | - | (224) | 237,308 |
| 154 | 2041 | Construction | Historical | 713,930 | 3.596% | 25,672 | - | (169) | 25,503 |
| 155 | 2041 | Replacements | Historical | 4,905,660 | 4.430% | 217,321 | - | - | 217,321 |
| 156 | 2041 | Replacements | New | 281,120 | 2.215% | 6,227 | - | - | 6,227 |
| 157 | 2041 | Float | Historical | - | - | (791) | - | - | (791) |
| 158 | FY 2041 Subtotal: | | | 5,900,710 | | 248,429 | - | (169) | 248,260 |
| 159 | 2042 | Construction | Historical | 601,833 | 3.638% | 21,895 | - | (262) | 21,633 |
| 160 | 2042 | Replacements | Historical | 5,186,780 | 4.430% | 229,774 | - | - | 229,774 |
| 161 | 2042 | Replacements | New | 284,335 | 2.215% | 6,298 | - | - | 6,298 |
| 162 | 2042 | Float | Historical | - | - | (668) | - | - | (668) |
| 163 | FY 2042 Subtotal: | | | 6,072,948 | | 257,299 | - | (262) | 257,037 |

**TABLE 11-6
INTEREST CALCULATION SUMMARY (\$000S) (FY 2019)**

| | A | B | C | D | E | F | G | H | I |
|-----|--------------------------|--------------|------------|-------------------|--------|----------------|---------|----------------------|----------------|
| 1 | Fiscal Year | Project | Type | Current Principal | Rate | Interest | Premium | Net Interest Accrual | Total |
| 164 | 2043 | Construction | Historical | 531,229 | 3.669% | 19,492 | - | (245) | 19,247 |
| 165 | 2043 | Replacements | Historical | 5,471,115 | 4.430% | 242,370 | - | - | 242,370 |
| 166 | 2043 | Replacements | New | 288,909 | 2.215% | 6,399 | - | - | 6,399 |
| 167 | 2043 | Float | Historical | - | - | (675) | - | - | (675) |
| 168 | FY 2043 Subtotal: | | | 6,291,253 | | 267,587 | - | (245) | 267,342 |
| 169 | 2044 | Construction | Historical | 464,222 | 3.721% | 17,276 | - | (87) | 17,189 |
| 170 | 2044 | Replacements | Historical | 5,760,024 | 4.430% | 255,169 | - | - | 255,169 |
| 171 | 2044 | Replacements | New | 292,755 | 2.215% | 6,485 | - | - | 6,485 |
| 172 | 2044 | Float | Historical | - | - | (675) | - | - | (675) |
| 173 | FY 2044 Subtotal: | | | 6,517,001 | | 278,255 | - | (87) | 278,168 |
| 174 | 2045 | Construction | Historical | 402,728 | 3.776% | 15,208 | - | - | 15,208 |
| 175 | 2045 | Replacements | Historical | 6,052,779 | 4.430% | 268,138 | - | - | 268,138 |
| 176 | 2045 | Replacements | New | 294,837 | 2.215% | 6,531 | - | - | 6,531 |
| 177 | 2045 | Float | Historical | - | - | (655) | - | - | (655) |
| 178 | FY 2045 Subtotal: | | | 6,750,344 | | 289,222 | - | - | 289,222 |
| 179 | 2046 | Construction | Historical | 352,728 | 3.486% | 12,296 | - | - | 12,296 |
| 180 | 2046 | Replacements | Historical | 6,347,616 | 4.430% | 281,199 | - | - | 281,199 |
| 181 | 2046 | Replacements | New | 298,117 | 2.215% | 6,603 | - | - | 6,603 |
| 182 | 2046 | Float | Historical | - | - | (651) | - | - | (651) |
| 183 | FY 2046 Subtotal: | | | 6,998,460 | | 299,448 | - | - | 299,448 |
| 184 | 2047 | Construction | Historical | 309,645 | 3.506% | 10,856 | - | (313) | 10,544 |
| 185 | 2047 | Replacements | Historical | 6,645,733 | 4.430% | 294,406 | - | - | 294,406 |
| 186 | 2047 | Replacements | New | 301,722 | 2.215% | 6,683 | - | - | 6,683 |
| 187 | 2047 | Float | Historical | - | - | (1,055) | - | - | (1,055) |
| 188 | FY 2047 Subtotal: | | | 7,257,099 | | 310,890 | - | (313) | 310,578 |
| 189 | 2048 | Construction | Historical | 149,489 | 3.866% | 5,780 | - | (294) | 5,485 |
| 190 | 2048 | Replacements | Historical | 6,947,454 | 4.429% | 307,710 | - | - | 307,710 |
| 191 | 2048 | Replacements | New | 305,856 | 2.215% | 6,775 | - | - | 6,775 |
| 192 | 2048 | Float | Historical | - | - | (1,043) | - | - | (1,043) |
| 193 | FY 2048 Subtotal: | | | 7,402,800 | | 319,222 | - | (294) | 318,928 |
| 194 | 2049 | Replacements | Historical | 7,250,517 | 4.385% | 317,929 | - | - | 317,929 |
| 195 | 2049 | Replacements | New | 308,625 | 2.215% | 6,836 | - | - | 6,836 |
| 196 | 2049 | Float | Historical | - | - | (1,030) | - | - | (1,030) |
| 197 | FY 2049 Subtotal: | | | 7,559,142 | | 323,735 | - | - | 323,735 |

**TABLE 11-6
INTEREST CALCULATION SUMMARY (\$000S) (FY 2019)**

| | A | B | C | D | E | F | G | H | I |
|-----|--------------------------|----------------|-------------|--------------------------|-------------|--------------------|----------------|-----------------------------|--------------------|
| | Fiscal Year | Project | Type | Current Principal | Rate | Interest | Premium | Net Interest Accrual | Total |
| 198 | 2050 | Replacements | Historical | 7,411,551 | 4.388% | 325,223 | - | - | 325,223 |
| 199 | 2050 | Replacements | New | 310,888 | 2.215% | 6,886 | - | - | 6,886 |
| 200 | 2050 | Float | Historical | - | - | (1,019) | - | - | (1,019) |
| 201 | FY 2050 Subtotal: | | | 7,722,439 | | 331,091 | - | - | 331,091 |
| 202 | 2051 | Replacements | Historical | 7,582,111 | 4.391% | 332,950 | - | - | 332,950 |
| 203 | 2051 | Replacements | New | 312,871 | 2.215% | 6,930 | - | - | 6,930 |
| 204 | 2051 | Float | Historical | - | - | (1,006) | - | - | (1,006) |
| 205 | FY 2051 Subtotal: | | | 7,894,982 | | 338,874 | - | - | 338,874 |
| 206 | 2052 | Replacements | Historical | 7,762,354 | 4.394% | 341,114 | - | - | 341,114 |
| 207 | 2052 | Replacements | New | 316,528 | 2.215% | 7,011 | - | - | 7,011 |
| 208 | 2052 | Float | Historical | - | - | (994) | - | - | (994) |
| 209 | FY 2052 Subtotal: | | | 8,078,882 | | 347,132 | - | - | 347,132 |
| 210 | 2053 | Replacements | Historical | 7,954,361 | 4.398% | 349,812 | - | - | 349,812 |
| 211 | 2053 | Replacements | New | 319,592 | 2.215% | 7,079 | - | - | 7,079 |
| 212 | 2053 | Float | Historical | - | - | (980) | - | - | (980) |
| 213 | FY 2053 Subtotal: | | | 8,273,953 | | 355,911 | - | - | 355,911 |
| 214 | 2054 | Replacements | Historical | 8,158,084 | 4.401% | 359,040 | - | - | 359,040 |
| 215 | 2054 | Replacements | New | 322,868 | 2.215% | 7,152 | - | - | 7,152 |
| 216 | 2054 | Float | Historical | - | - | (965) | - | - | (965) |
| 217 | FY 2054 Subtotal: | | | 8,480,951 | | 365,226 | - | - | 365,226 |
| 218 | Grand Total: | | | \$203,077,524 | | \$8,196,480 | - | (\$17,585) | \$8,178,895 |

**TABLE 11-7
SUMMARY OF AMORTIZATION (\$000S) (FY 2019)**

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | |
|----|----------------------|---|---|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|
| 1 | Obligation Type | General Project | Specific Project | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | |
| 2 | Appropriation | Bonneville Power Administration | Bonneville Power Administration | 96,439 | 1,956 | 21,053 | - | - | - | - | - | - | - | - | - | - | |
| 3 | | | Bonneville Power Administration Subtotal: | 96,439 | 1,956 | 21,053 | - | - | - | - | - | - | - | - | - | - | - |
| 4 | | Appropriation Subtotal: | | 96,439 | 1,956 | 21,053 | - | - | - | - | - | - | - | - | - | - | - |
| 5 | | | Construction | | - | 36,400 | 196,213 | 126,873 | 106,268 | 136,230 | 134,897 | 124,730 | 96,695 | 134,746 | 111,873 | 125,807 | 122,510 |
| 6 | | | Principal Accrual | | - | - | - | - | - | - | - | - | - | - | - | - | |
| 7 | | | Principal Accrual Reversal | | - | - | - | - | - | - | - | - | - | - | - | - | |
| 8 | | | Construction (AS) | | - | 4,550 | 17,750 | 16,900 | 13,000 | 10,200 | 5,850 | 10,400 | 22,050 | - | - | - | |
| 9 | | | Principal Accrual | | - | - | - | - | - | - | - | - | - | - | - | - | |
| 10 | | | Principal Accrual Reversal | | - | - | - | - | - | - | - | - | - | - | - | - | |
| 11 | Bond | BPA Borrowing | Environment | | - | - | - | - | - | - | 4,000 | 15,000 | - | 18,000 | 5,000 | 12,000 | |
| 12 | | | Principal Accrual | | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 13 | | | Principal Accrual Reversal | | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 14 | | | Technology (T) | | - | 5,000 | - | - | 23,000 | - | - | - | - | - | - | - | - |
| 15 | | | Principal Accrual | | - | - | - | - | - | - | - | - | - | - | - | - | |
| 16 | | | Principal Accrual Reversal | | - | - | - | - | - | - | - | - | - | - | - | - | |
| 17 | | | BPA Borrowing Subtotal: | | - | 45,950 | 213,963 | 143,773 | 142,268 | 146,430 | 140,747 | 139,130 | 133,745 | 134,746 | 129,873 | 130,807 | 134,510 |
| 18 | | | Replacements | | - | - | - | - | - | - | - | - | - | - | - | - | |
| 19 | | Federal Transmission Replacement | Principal Accrual | | - | - | - | - | - | - | - | - | - | - | - | - | |
| 20 | | | Principal Accrual Reversal | | - | - | - | - | - | - | - | - | - | - | - | - | |
| 21 | | | Federal Transmission Replacement Subtotal: | | - | - | - | - | - | - | - | - | - | - | - | - | |
| 22 | | Make Whole Call | Premiums | | - | - | 556 | 4,851 | 3,299 | 3,774 | 3,801 | 2,172 | 1,167 | 1,315 | 1,168 | 9,582 | 2,275 |
| 23 | | | Make Whole Call Subtotal: | | - | - | 556 | 4,851 | 3,299 | 3,774 | 3,801 | 2,172 | 1,167 | 1,315 | 1,168 | 9,582 | 2,275 |
| 24 | | | Bond Subtotal: | | - | 45,950 | 213,963 | 143,773 | 142,268 | 146,430 | 140,747 | 139,130 | 133,745 | 134,746 | 129,873 | 130,807 | 134,510 |
| 25 | Grand Total: | | | \$96,439 | \$47,906 | \$235,016 | \$143,773 | \$142,268 | \$146,430 | \$140,747 | \$139,130 | \$133,745 | \$134,746 | \$129,873 | \$130,807 | \$134,510 | |

**TABLE 11-7
SUMMARY OF AMORTIZATION (\$000S) (FY 2019)**

| | A | B | C | Q | R | S | T | U | V | W | X | Y | Z | AA | AB | AC | |
|----|----------------------------|---|---|-----------------------|-----------|-----------|-----------|-----------|----------|----------|-----------|-----------|-----------|----------|-----------|----------|-----|
| 1 | Obligation Type | General Project | Specific Project | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | |
| 2 | Appropriation | Bonneville Power Administration | Bonneville Power Administration | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 3 | | | Bonneville Power Administration Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 | | Appropriation Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 | | | Construction | 130,564 | 131,294 | 121,361 | 107,404 | 118,054 | 95,663 | 91,921 | 110,898 | 107,635 | 104,311 | 84,763 | 112,097 | 70,604 | |
| 6 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 7 | | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 8 | | | Construction (AS) | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 9 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 10 | | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 11 | Bond | BPA Borrowing | Environment | - | - | 7,000 | 7,000 | 7,000 | - | - | - | - | - | - | - | - | |
| 12 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 13 | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 14 | | | | Technology (T) | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 15 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 16 | | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 17 | | | BPA Borrowing Subtotal: | 130,564 | 131,294 | 128,361 | 114,404 | 125,054 | 95,663 | 91,921 | 110,898 | 107,635 | 104,311 | 84,763 | 112,097 | 70,604 | |
| 18 | | | Replacements | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 19 | | Federal Transmission Replacement | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 20 | Principal Accrual Reversal | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 21 | | | Federal Transmission Replacement Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 22 | | Make Whole Call | Premiums | 2,867 | 589 | 179 | 1,229 | 228 | - | - | - | - | - | - | - | 165 | |
| 23 | | | Make Whole Call Subtotal: | 2,867 | 589 | 179 | 1,229 | 228 | - | - | - | - | - | - | - | - | 165 |
| 24 | | | Bond Subtotal: | 130,564 | 131,294 | 128,361 | 114,404 | 125,054 | 95,663 | 91,921 | 110,898 | 107,635 | 104,311 | 84,763 | 112,097 | 70,604 | |
| 25 | Grand Total: | | | \$130,564 | \$131,294 | \$128,361 | \$114,404 | \$125,054 | \$95,663 | \$91,921 | \$110,898 | \$107,635 | \$104,311 | \$84,763 | \$112,097 | \$70,604 | |

**TABLE 11-7
SUMMARY OF AMORTIZATION (\$000S) (FY 2019)**

| | A | B | C | AD | AE | AF | AG | AH | AI | AJ | AK | AL | AM | AN | AO | AP | |
|----|----------------------------|---|---|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|-----------|
| 1 | Obligation Type | General Project | Specific Project | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | 2054 | Total | |
| 2 | Appropriation | Bonneville Power Administration | Bonneville Power Administration | - | - | - | - | - | - | - | - | - | - | - | - | 119,448 | |
| 3 | | | Bonneville Power Administration Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - | 119,448 |
| 4 | | Appropriation Subtotal: | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 119,448 |
| 5 | | | Construction | 67,007 | 61,495 | 50,000 | 43,083 | 160,155 | 149,489 | - | - | - | - | - | - | - | 3,371,040 |
| 6 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 7 | | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 8 | | | Construction (AS) | - | - | - | - | - | - | - | - | - | - | - | - | 100,700 | |
| 9 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 10 | | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 11 | Bond | BPA Borrowing | Environment | - | - | - | - | - | - | - | - | - | - | - | - | 75,000 | |
| 12 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 13 | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 14 | | | Technology (T) | - | - | - | - | - | - | - | - | - | - | - | - | - | 28,000 |
| 15 | | | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 16 | | | Principal Accrual Reversal | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 17 | | | BPA Borrowing Subtotal: | 67,007 | 61,495 | 50,000 | 43,083 | 160,155 | 149,489 | - | - | - | - | - | - | 3,574,740 | |
| 18 | | | Replacements | - | - | - | - | - | 2,793 | 147,591 | 140,328 | 132,628 | 124,521 | 115,870 | 106,690 | 770,421 | |
| 19 | | Federal Transmission Replacement | Principal Accrual | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 20 | Principal Accrual Reversal | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 21 | | | Federal Transmission Replacement Subtotal: | - | - | - | - | - | 2,793 | 147,591 | 140,328 | 132,628 | 124,521 | 115,870 | 106,690 | 770,421 | |
| 22 | | Make Whole Call | Premiums | 316 | 194 | - | 933 | 306 | - | - | - | - | - | - | - | 40,967 | |
| 23 | | | Make Whole Call Subtotal: | 316 | 194 | - | 933 | 306 | - | - | - | - | - | - | - | - | 40,967 |
| 24 | | | Bond Subtotal: | 67,007 | 61,495 | 50,000 | 43,083 | 160,155 | 152,283 | 147,591 | 140,328 | 132,628 | 124,521 | 115,870 | 106,690 | 4,345,161 | |
| 25 | Grand Total: | | | \$67,007 | \$61,495 | \$50,000 | \$43,083 | \$160,155 | \$152,283 | \$147,591 | \$140,328 | \$132,628 | \$124,521 | \$115,870 | \$106,690 | \$4,464,608 | |

**TABLE 11-8
APPLICATION OF AMORTIZATION (\$000S) (FY 2019)**

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
|-------------|---------|---------------------------------|---------------------------------|---------------|-------------------|-------------------|---------------|----------------|----------------|-----------------|----------------------|-----------|----------------|--------------|----------|---------|----------|
| Fiscal Year | Project | Debt Type | In Service | Bond Due Date | Initial Principal | Current Principal | Original Rate | Effective Rate | Refinance Type | Refinanced Date | Rolled Maturity Date | Roll Rate | Principal Paid | Premium | Discount | Accrual | Reversal |
| 1 | 2017 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1975 | 9/30/2020 | 11,742 | 8,200 | 7.250% | 7.250% | | | | 8,200 | | | | |
| 2 | 2017 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1976 | 9/30/2021 | 61,025 | 61,025 | 7.230% | 7.230% | | | | 61,025 | | | | |
| 3 | 2017 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1976 | 9/30/2021 | 2,212 | 2,212 | 7.230% | 7.230% | | | | 2,212 | | | | |
| 4 | 2017 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1977 | 9/30/2022 | 33,702 | 33,702 | 7.210% | 7.210% | | | | 20,022 | | | | |
| 5 | 2017 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1977 | 9/30/2022 | 4,981 | 4,981 | 7.210% | 7.210% | | | | 4,981 | | | | |
| 6 | | FY 2017 Subtotal: | - | - | 113,662 | 110,120 | - | | | | | | 96,439 | | | | |
| 7 | 2018 | Construction | - | 9/30/2012 | 9/30/2017 | 36,400 | 36,400 | 0.891% | 0.750% | Global | 9/30/2017 | 9/30/2018 | 0.750% | 36,400 | | | |
| 8 | 2018 | Construction (AS) | - | 4/30/2017 | 1/31/2018 | 4,550 | 4,550 | 1.051% | 1.051% | | | | 4,550 | | | | |
| 9 | 2018 | Technology (T) | - | 10/31/2015 | 9/30/2018 | 5,000 | 5,000 | 0.674% | 0.674% | | | | 5,000 | | | | |
| 10 | 2018 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1977 | 9/30/2022 | 33,702 | 13,680 | 7.210% | 7.210% | | | | 1,956 | | | | |
| 11 | | FY 2018 Subtotal: | - | - | 79,652 | 59,630 | - | | | | | | 47,906 | | | | |
| 12 | 2019 | Construction | - | 10/31/2009 | 10/31/2018 | 23,000 | 23,000 | 3.719% | 3.719% | | | | 23,000 | | | | |
| 13 | 2019 | Construction | - | 11/30/2009 | 11/30/2018 | 15,000 | 15,000 | 3.533% | 3.533% | | | | 15,000 | | | | |
| 14 | 2019 | Construction (AS) | - | 11/30/2012 | 11/30/2018 | 9,750 | 9,750 | 1.109% | 1.109% | | | | 9,750 | | | | |
| 15 | 2019 | Construction | - | 12/31/2009 | 12/31/2018 | 13,000 | 13,000 | 4.069% | 4.069% | | | | 13,000 | | | | |
| 16 | 2019 | Construction | - | 1/16/2014 | 12/31/2018 | 33,000 | 33,000 | 1.943% | 1.943% | | | | 33,000 | | | | |
| 17 | 2019 | Construction | - | 1/16/2014 | 12/31/2018 | 30,000 | 30,000 | 1.943% | 1.943% | | | | 30,000 | | | | |
| 18 | 2019 | Construction | - | 1/16/2014 | 12/31/2018 | 31,000 | 31,000 | 1.943% | 1.943% | | | | 31,000 | | | | |
| 19 | 2019 | Construction | - | 1/16/2014 | 12/31/2018 | 48,000 | 48,000 | 1.943% | 1.943% | | | | 48,000 | | | | |
| 20 | 2019 | Construction (AS) | - | 6/30/2013 | 6/30/2019 | 5,000 | 5,000 | 1.962% | 1.962% | | | | 5,000 | | | | |
| 21 | 2019 | Construction (AS) | - | 8/31/2013 | 8/31/2019 | 3,000 | 3,000 | 2.279% | 2.279% | | | | 3,000 | | | | |
| 22 | 2019 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1977 | 9/30/2022 | 3,948 | 3,948 | 7.210% | 7.210% | | | | 3,948 | | | | |
| 23 | 2019 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1977 | 9/30/2022 | 5,380 | 5,380 | 7.210% | 7.210% | | | | 5,380 | | | | |
| 24 | 2019 | Bonneville Power Administration | Bonneville Power Administration | 9/30/1977 | 9/30/2022 | 33,702 | 11,725 | 7.210% | 7.210% | | | | 11,725 | | | | |
| 25 | 2019 | Construction | - | 8/31/1998 | 8/31/2028 | 112,300 | 112,300 | 5.850% | 5.850% | | | | 3,213 | 556 | | | |
| 26 | | FY 2019 Subtotal: | - | - | 366,080 | 344,103 | - | | | | | | 235,016 | 556 | | | |
| 27 | 2020 | Construction (AS) | - | 10/31/2013 | 10/31/2019 | 7,800 | 7,800 | 2.039% | 2.039% | | | | 7,800 | | | | |
| 28 | 2020 | Construction | - | 10/31/2009 | 10/31/2019 | 43,000 | 43,000 | 3.842% | 3.842% | | | | 43,000 | | | | |
| 29 | 2020 | Construction (AS) | - | 1/31/2014 | 1/31/2020 | 3,250 | 3,250 | 2.183% | 2.183% | | | | 3,250 | | | | |
| 30 | 2020 | Construction | - | 1/31/2009 | 1/31/2020 | 50,000 | 50,000 | 3.830% | 3.830% | | | | 50,000 | | | | |
| 31 | 2020 | Construction (AS) | - | 4/30/2014 | 3/31/2020 | 2,600 | 2,600 | 0.526% | 0.526% | | | | 2,600 | | | | |
| 32 | 2020 | Construction (AS) | - | 5/31/2014 | 4/30/2020 | 1,300 | 1,300 | 0.526% | 0.526% | | | | 1,300 | | | | |
| 33 | 2020 | Construction (AS) | - | 7/31/2014 | 7/31/2020 | 1,950 | 1,950 | 0.526% | 0.526% | | | | 1,950 | | | | |
| 34 | 2020 | Construction | - | 8/31/1998 | 8/31/2028 | 112,300 | 109,087 | 5.850% | 5.850% | | | | 33,873 | 4,851 | | | |
| 35 | | FY 2020 Subtotal: | - | - | 222,200 | 218,987 | - | | | | | | 143,773 | 4,851 | | | |
| 36 | 2021 | Construction (AS) | - | 11/30/2014 | 11/30/2020 | 3,900 | 3,900 | 1.809% | 1.809% | | | | 3,900 | | | | |
| 37 | 2021 | Construction (AS) | - | 12/31/2014 | 12/31/2020 | 1,950 | 1,950 | 1.922% | 1.922% | | | | 1,950 | | | | |
| 38 | 2021 | Construction (AS) | - | 2/28/2015 | 2/28/2021 | 3,250 | 3,250 | 1.761% | 1.761% | | | | 3,250 | | | | |
| 39 | 2021 | Technology (T) | - | 2/28/2015 | 2/28/2021 | 23,000 | 23,000 | 1.761% | 1.761% | | | | 23,000 | | | | |
| 40 | 2021 | Construction | - | 3/31/2010 | 3/31/2021 | 15,000 | 15,000 | 4.188% | 4.188% | | | | 15,000 | | | | |
| 41 | 2021 | Construction | - | 4/30/2010 | 4/30/2021 | 22,000 | 22,000 | 4.094% | 4.094% | | | | 22,000 | | | | |
| 42 | 2021 | Construction | - | 5/31/2010 | 5/31/2021 | 22,000 | 22,000 | 3.694% | 3.694% | | | | 22,000 | | | | |
| 43 | 2021 | Construction (AS) | - | 5/31/2015 | 5/31/2021 | 3,900 | 3,900 | 1.898% | 1.898% | | | | 3,900 | | | | |
| 44 | 2021 | Construction | - | 6/30/2010 | 6/30/2021 | 22,000 | 22,000 | 3.374% | 3.374% | | | | 22,000 | | | | |
| 45 | 2021 | Construction | - | 8/31/1998 | 8/31/2028 | 112,300 | 75,214 | 5.850% | 5.850% | | | | 25,268 | 3,299 | | | |
| 46 | | FY 2021 Subtotal: | - | - | 229,300 | 192,214 | - | | | | | | 142,268 | 3,299 | | | |
| 47 | 2022 | Construction (AS) | - | 10/31/2015 | 10/31/2021 | 5,200 | 5,200 | 1.942% | 1.942% | | | | 5,200 | | | | |
| 48 | 2022 | Construction | - | 1/31/2009 | 1/31/2022 | 20,000 | 20,000 | 4.200% | 4.200% | | | | 20,000 | | | | |
| 49 | 2022 | Construction (AS) | - | 2/29/2016 | 2/28/2022 | 5,000 | 5,000 | 1.631% | 1.631% | | | | 5,000 | | | | |
| 50 | 2022 | Construction | - | 4/30/2009 | 4/30/2022 | 35,000 | 35,000 | 4.253% | 4.253% | | | | 35,000 | | | | |
| 51 | 2022 | Construction | - | 7/31/2010 | 7/31/2022 | 30,000 | 30,000 | 3.372% | 3.372% | | | | 30,000 | | | | |
| 52 | 2022 | Construction | - | 8/31/2010 | 8/31/2022 | 20,000 | 20,000 | 3.029% | 3.029% | | | | 20,000 | | | | |
| 53 | 2022 | Construction | - | 8/31/1998 | 8/31/2028 | 112,300 | 49,946 | 5.850% | 5.850% | | | | 31,230 | 3,774 | | | |
| 54 | | FY 2022 Subtotal: | - | - | 227,500 | 165,146 | - | | | | | | 146,430 | 3,774 | | | |

**TABLE 11-8
APPLICATION OF AMORTIZATION (\$000S) (FY 2019)**

| A | | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
|-------------|---------|--------------------------|------------|---------------|-------------------|-------------------|----------------|----------------|----------------|-----------------|----------------------|-----------|----------------|--------------|----------|---------|----------|
| Fiscal Year | Project | Debt Type | In Service | Bond Due Date | Initial Principal | Current Principal | Original Rate | Effective Rate | Refinance Type | Refinanced Date | Rolled Maturity Date | Roll Rate | Principal Paid | Premium | Discount | Accrual | Reversal |
| 55 | 2023 | Construction | - | 12/31/2014 | 12/31/2022 | 16,000 | 16,000 | 2.274% | 2.274% | | | | 16,000 | | | | |
| 56 | 2023 | Construction | - | 12/31/2014 | 12/31/2022 | 4,000 | 4,000 | 2.274% | 2.274% | | | | 4,000 | | | | |
| 57 | 2023 | Construction | - | 4/30/2015 | 4/30/2023 | 3,000 | 3,000 | 2.163% | 2.163% | | | | 3,000 | | | | |
| 58 | 2023 | Construction | - | 4/30/2015 | 4/30/2023 | 12,000 | 12,000 | 2.163% | 2.163% | | | | 12,000 | | | | |
| 59 | 2023 | Construction | - | 6/30/2015 | 6/30/2023 | 11,000 | 11,000 | 2.443% | 2.443% | | | | 11,000 | | | | |
| 60 | 2023 | Construction | - | 6/30/2015 | 6/30/2023 | 8,000 | 8,000 | 2.443% | 2.443% | | | | 8,000 | | | | |
| 61 | 2023 | Construction | - | 9/30/2010 | 9/30/2023 | 46,000 | 46,000 | 3.161% | 3.161% | | | | 46,000 | | | | |
| 62 | 2023 | Construction (AS) | - | 9/30/2017 | 9/30/2023 | 5,850 | 5,850 | 1.510% | 1.510% | | | | 5,850 | | | | |
| 63 | 2023 | Construction | - | 8/31/1998 | 8/31/2028 | 106,500 | 106,500 | 5.850% | 5.850% | | | | 16,181 | 1,762 | | | |
| 64 | 2023 | Construction | - | 8/31/1998 | 8/31/2028 | 112,300 | 18,716 | 5.850% | 5.850% | | | | 18,716 | 2,038 | | | |
| 65 | | FY 2023 Subtotal: | - | - | - | 324,650 | 231,066 | - | - | | | | 140,747 | 3,801 | | | |
| 66 | 2024 | Construction | - | 10/31/2014 | 10/31/2023 | 20,000 | 20,000 | 2.521% | 2.521% | | | | 20,000 | | | | |
| 67 | 2024 | Construction | - | 11/30/2014 | 11/30/2023 | 20,000 | 20,000 | 2.361% | 2.361% | | | | 20,000 | | | | |
| 68 | 2024 | Environment | - | 1/31/2015 | 1/31/2024 | 4,000 | 4,000 | 1.908% | 1.908% | | | | 4,000 | | | | |
| 69 | 2024 | Construction | - | 3/31/2015 | 3/31/2024 | 17,000 | 17,000 | 2.200% | 2.200% | | | | 17,000 | | | | |
| 70 | 2024 | Construction | - | 3/31/2012 | 3/31/2024 | 45,000 | 45,000 | 0.947% | 0.947% | | | | 45,000 | | | | |
| 71 | 2024 | Construction (AS) | - | 9/30/2018 | 9/30/2024 | 10,400 | 10,400 | 2.560% | 2.560% | | | | 10,400 | | | | |
| 72 | 2024 | Construction | - | 8/31/1998 | 8/31/2028 | 106,500 | 90,319 | 5.850% | 5.850% | | | | 22,730 | 2,172 | | | |
| 73 | | FY 2024 Subtotal: | - | - | - | 222,900 | 206,719 | - | - | | | | 139,130 | 2,172 | | | |
| 74 | 2025 | Environment | - | 2/28/2010 | 2/28/2025 | 10,000 | 10,000 | 4.279% | 4.279% | | | | 10,000 | | | | |
| 75 | 2025 | Construction | - | 5/31/2016 | 5/31/2025 | 20,000 | 20,000 | 2.101% | 2.101% | | | | 20,000 | | | | |
| 76 | 2025 | Environment | - | 5/31/2016 | 5/31/2025 | 5,000 | 5,000 | 2.101% | 2.101% | | | | 5,000 | | | | |
| 77 | 2025 | Construction | - | 7/31/2016 | 7/31/2025 | 48,000 | 48,000 | 1.713% | 1.713% | | | | 48,000 | | | | |
| 78 | 2025 | Construction (AS) | - | 8/31/2015 | 8/31/2025 | 11,000 | 11,000 | 2.598% | 2.598% | | | | 11,000 | | | | |
| 79 | 2025 | Construction | - | 8/31/2015 | 8/31/2025 | 14,000 | 14,000 | 2.598% | 2.598% | | | | 14,000 | | | | |
| 80 | 2025 | Construction (AS) | - | 9/30/2019 | 9/30/2025 | 11,050 | 11,050 | 3.270% | 3.270% | | | | 11,050 | | | | |
| 81 | 2025 | Construction | - | 8/31/1998 | 8/31/2028 | 106,500 | 67,589 | 5.850% | 5.850% | | | | 14,695 | 1,167 | | | |
| 82 | | FY 2025 Subtotal: | - | - | - | 225,550 | 186,639 | - | - | | | | 133,745 | 1,167 | | | |
| 83 | 2026 | Construction | - | 10/31/2010 | 10/31/2025 | 45,000 | 45,000 | 3.494% | 3.494% | | | | 45,000 | | | | |
| 84 | 2026 | Construction | - | 2/28/2015 | 2/28/2026 | 19,000 | 19,000 | 2.416% | 2.416% | | | | 19,000 | | | | |
| 85 | 2026 | Construction | - | 3/31/2015 | 3/31/2026 | 15,000 | 15,000 | 2.370% | 2.370% | | | | 15,000 | | | | |
| 86 | 2026 | Construction | - | 3/31/2016 | 3/31/2026 | 6,000 | 6,000 | 2.177% | 2.177% | | | | 6,000 | | | | |
| 87 | 2026 | Construction | - | 7/31/2015 | 7/31/2026 | 18,000 | 18,000 | 2.707% | 2.707% | | | | 18,000 | | | | |
| 88 | 2026 | Construction | - | 7/31/2015 | 7/31/2026 | 10,000 | 10,000 | 2.707% | 2.707% | | | | 10,000 | | | | |
| 89 | 2026 | Construction | - | 8/31/1998 | 8/31/2028 | 106,500 | 52,893 | 5.850% | 5.850% | | | | 21,746 | 1,315 | | | |
| 90 | | FY 2026 Subtotal: | - | - | - | 219,500 | 165,893 | - | - | | | | 134,746 | 1,315 | | | |
| 91 | 2027 | Construction | - | 12/31/2015 | 12/31/2026 | 9,000 | 9,000 | 2.762% | 2.762% | | | | 9,000 | | | | |
| 92 | 2027 | Construction | - | 12/31/2015 | 12/31/2026 | 29,000 | 29,000 | 2.762% | 2.762% | | | | 29,000 | | | | |
| 93 | 2027 | Construction | - | 1/31/2016 | 1/31/2027 | 13,000 | 13,000 | 2.352% | 2.352% | | | | 13,000 | | | | |
| 94 | 2027 | Construction | - | 2/29/2016 | 2/28/2027 | 13,000 | 13,000 | 2.236% | 2.236% | | | | 13,000 | | | | |
| 95 | 2027 | Construction | - | 5/3/2012 | 5/31/2027 | 17,000 | 17,000 | 0.697% | 0.697% | | | | 17,000 | | | | |
| 96 | 2027 | Environment | - | 5/3/2012 | 5/31/2027 | 13,000 | 13,000 | 0.697% | 0.697% | | | | 13,000 | | | | |
| 97 | 2027 | Environment | - | 10/31/2015 | 9/30/2027 | 5,000 | 5,000 | 0.674% | 0.674% | | | | 5,000 | | | | |
| 98 | 2027 | Construction | - | 8/31/1998 | 8/31/2028 | 106,500 | 31,147 | 5.850% | 5.850% | | | | 30,873 | 1,168 | | | |
| 99 | | FY 2027 Subtotal: | - | - | - | 205,500 | 130,147 | - | - | | | | 129,873 | 1,168 | | | |
| 100 | 2028 | Environment | - | 11/20/2013 | 11/30/2027 | 5,000 | 5,000 | 3.967% | 3.967% | | | | 5,000 | | | | |
| 101 | 2028 | Construction | - | 8/31/1998 | 8/31/2028 | 106,500 | 274 | 5.850% | 5.850% | | | | 274 | | | | |
| 102 | 2028 | Construction | - | 1/31/2011 | 1/31/2036 | 50,000 | 50,000 | 4.952% | 4.952% | | | | 50,000 | 3,530 | | | |
| 103 | 2028 | Construction | - | 2/28/2011 | 2/28/2038 | 55,000 | 55,000 | 4.935% | 4.935% | | | | 40,533 | 2,696 | | | |
| 104 | 2028 | Construction | - | 6/30/2009 | 6/30/2039 | 35,000 | 35,000 | 5.192% | 5.192% | | | | 35,000 | 3,357 | | | |
| 105 | | FY 2028 Subtotal: | - | - | - | 251,500 | 145,274 | - | - | | | | 130,807 | 9,582 | | | |

**TABLE 11-8
APPLICATION OF AMORTIZATION (\$000S) (FY 2019)**

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | |
|-----|-------------|--------------------------|-----------|------------|---------------|-------------------|-------------------|---------------|----------------|----------------|-----------------|----------------------|-----------|----------------|--------------|----------|---------|----------|
| | Fiscal Year | Project | Debt Type | In Service | Bond Due Date | Initial Principal | Current Principal | Original Rate | Effective Rate | Refinance Type | Refinanced Date | Rolled Maturity Date | Roll Rate | Principal Paid | Premium | Discount | Accrual | Reversal |
| 106 | 2029 | Construction | - | 9/30/2009 | 9/30/2019 | 35,000 | 35,000 | 3.699% | 3.705% | Global | 9/30/2019 | 9/30/2029 | 3.705% | 35,000 | | | | |
| 107 | 2029 | Environment | - | 10/31/2013 | 10/31/2028 | 6,000 | 6,000 | 3.880% | 3.880% | | | | | 6,000 | | | | |
| 108 | 2029 | Environment | - | 1/31/2014 | 1/31/2029 | 3,000 | 3,000 | 3.896% | 3.896% | | | | | 3,000 | | | | |
| 109 | 2029 | Environment | - | 7/31/2014 | 7/31/2029 | 3,000 | 3,000 | 0.526% | 0.526% | | | | | 3,000 | | | | |
| 110 | 2029 | Construction | - | 8/2/2011 | 8/31/2029 | 50,000 | 50,000 | 4.238% | 4.238% | | | | | 50,000 | | | | |
| 111 | 2029 | Construction | - | 2/28/2011 | 2/28/2038 | 55,000 | 14,467 | 4.935% | 4.935% | | | | | 14,467 | 988 | | | |
| 112 | 2029 | Construction | - | 4/30/2011 | 4/30/2039 | 40,000 | 40,000 | 4.794% | 4.794% | | | | | 23,043 | 1,287 | | | |
| 113 | | FY 2029 Subtotal: | - | - | - | 192,000 | 151,467 | - | - | | | | | 134,510 | 2,275 | | | |
| 114 | 2030 | Construction | - | 5/31/2015 | 5/31/2022 | 11,000 | 11,000 | 2.103% | 4.722% | Global | 5/31/2022 | 5/31/2050 | 4.722% | 1,606 | 47 | | | |
| 115 | 2030 | Construction | - | 5/31/2015 | 5/31/2022 | 14,000 | 14,000 | 2.103% | 4.722% | Global | 5/31/2022 | 5/31/2050 | 4.722% | 14,000 | 414 | | | |
| 116 | 2030 | Construction | - | 11/20/2013 | 10/31/2029 | 55,000 | 55,000 | 4.093% | 4.093% | | | | | 55,000 | | | | |
| 117 | 2030 | Construction | - | 3/31/2015 | 3/31/2030 | 3,000 | 3,000 | 2.626% | 2.626% | | | | | 3,000 | | | | |
| 118 | 2030 | Construction | - | 9/30/2015 | 9/30/2030 | 15,000 | 15,000 | 2.905% | 2.905% | | | | | 15,000 | | | | |
| 119 | 2030 | Construction | - | 4/30/2011 | 4/30/2039 | 40,000 | 16,957 | 4.794% | 4.794% | | | | | 16,957 | 992 | | | |
| 120 | 2030 | Construction | - | 6/22/2011 | 6/30/2040 | 25,000 | 25,000 | 4.775% | 4.775% | | | | | 25,000 | 1,414 | | | |
| 121 | | FY 2030 Subtotal: | - | - | - | 163,000 | 139,957 | - | - | | | | | 130,564 | 2,867 | | | |
| 122 | 2031 | Construction | - | 7/31/2009 | 7/31/2019 | 46,940 | 46,940 | 4.026% | 3.777% | Global | 7/31/2019 | 7/31/2031 | 3.777% | 46,940 | | | | |
| 123 | 2031 | Construction | - | 5/31/2015 | 5/31/2022 | 11,000 | 9,394 | 2.103% | 4.722% | Global | 5/31/2022 | 5/31/2050 | 4.722% | 9,394 | 311 | | | |
| 124 | 2031 | Construction | - | 3/31/2016 | 3/31/2026 | 12,000 | 12,000 | 2.177% | 4.621% | Global | 3/31/2026 | 3/31/2051 | 4.621% | 11,960 | 279 | | | |
| 125 | 2031 | Construction | - | 11/20/2013 | 1/31/2031 | 30,000 | 30,000 | 4.162% | 4.162% | | | | | 30,000 | | | | |
| 126 | 2031 | Construction | - | 11/20/2013 | 2/28/2031 | 15,000 | 15,000 | 4.166% | 4.166% | | | | | 15,000 | | | | |
| 127 | 2031 | Construction | - | 11/20/2013 | 3/31/2031 | 18,000 | 18,000 | 4.171% | 4.171% | | | | | 18,000 | | | | |
| 128 | | FY 2031 Subtotal: | - | - | - | 132,940 | 131,334 | - | - | | | | | 131,294 | 589 | | | |
| 129 | 2032 | Construction | - | 3/31/2016 | 3/31/2026 | 12,000 | 40 | 2.177% | 4.621% | Global | 3/31/2026 | 3/31/2051 | 4.621% | 40 | 1 | | | |
| 130 | 2032 | Construction | - | 9/30/2014 | 4/30/2028 | 17,000 | 17,000 | 0.713% | 4.486% | Global | 4/30/2028 | 4/30/2049 | 4.486% | 13,421 | 178 | | | |
| 131 | 2032 | Construction | - | 7/31/2014 | 4/30/2032 | 9,000 | 9,000 | 0.674% | 0.674% | | | | | 9,000 | | | | |
| 132 | 2032 | Construction | - | 8/2/2011 | 8/31/2032 | 98,900 | 98,900 | 4.355% | 4.355% | | | | | 98,900 | | | | |
| 133 | 2032 | Environment | - | 9/30/2017 | 9/30/2032 | 7,000 | 7,000 | 2.180% | 2.180% | | | | | 7,000 | | | | |
| 134 | | FY 2032 Subtotal: | - | - | - | 143,900 | 131,940 | - | - | | | | | 128,361 | 179 | | | |
| 135 | 2033 | Construction | - | 9/30/2014 | 4/30/2028 | 17,000 | 3,579 | 0.713% | 4.486% | Global | 4/30/2028 | 4/30/2049 | 4.486% | 3,579 | 60 | | | |
| 136 | 2033 | Construction | - | 9/30/2014 | 9/30/2028 | 3,000 | 3,000 | 3.094% | 4.486% | Global | 9/30/2028 | 9/30/2049 | 4.486% | 3,000 | 61 | | | |
| 137 | 2033 | Construction | - | 6/30/2014 | 11/30/2032 | 21,000 | 21,000 | 0.713% | 0.713% | | | | | 21,000 | | | | |
| 138 | 2033 | Construction | - | 8/2/2011 | 8/31/2033 | 40,000 | 40,000 | 4.386% | 4.386% | | | | | 40,000 | | | | |
| 139 | 2033 | Environment | - | 9/30/2018 | 9/30/2033 | 7,000 | 7,000 | 3.250% | 3.250% | | | | | 7,000 | | | | |
| 140 | 2033 | Construction | - | 8/2/2011 | 8/31/2035 | 45,000 | 45,000 | 4.446% | 4.446% | | | | | 29,825 | 808 | | | |
| 141 | 2033 | Construction | - | 12/31/2013 | 12/31/2035 | 10,000 | 10,000 | 4.472% | 4.472% | | | | | 10,000 | 300 | | | |
| 142 | | FY 2033 Subtotal: | - | - | - | 143,000 | 129,579 | - | - | | | | | 114,404 | 1,229 | | | |
| 143 | 2034 | Construction | - | 4/30/2014 | 2/28/2034 | 45,000 | 45,000 | 0.947% | 0.947% | | | | | 45,000 | | | | |
| 144 | 2034 | Construction | - | 4/30/2014 | 3/31/2034 | 45,000 | 45,000 | 0.947% | 0.947% | | | | | 45,000 | | | | |
| 145 | 2034 | Construction | - | 11/20/2013 | 8/31/2034 | 6,000 | 6,000 | 4.324% | 4.324% | | | | | 6,000 | | | | |
| 146 | 2034 | Environment | - | 9/30/2019 | 9/30/2034 | 7,000 | 7,000 | 3.890% | 3.890% | | | | | 7,000 | | | | |
| 147 | 2034 | Construction | - | 9/30/2013 | 9/30/2034 | 9,000 | 9,000 | 4.214% | 4.214% | | | | | 9,000 | | | | |
| 148 | 2034 | Construction | - | 8/2/2011 | 8/31/2035 | 45,000 | 15,175 | 4.446% | 4.446% | | | | | 13,054 | 228 | | | |
| 149 | | FY 2034 Subtotal: | - | - | - | 157,000 | 127,175 | - | - | | | | | 125,054 | 228 | | | |
| 150 | 2035 | Construction | - | 10/31/2015 | 10/31/2034 | 2,000 | 2,000 | 3.198% | 3.198% | | | | | 2,000 | | | | |
| 151 | 2035 | Construction | - | 11/20/2013 | 5/31/2035 | 20,000 | 20,000 | 4.354% | 4.354% | | | | | 20,000 | | | | |
| 152 | 2035 | Construction | - | 8/31/2014 | 7/31/2035 | 10,000 | 10,000 | 0.674% | 0.674% | | | | | 10,000 | | | | |
| 153 | 2035 | Construction | - | 8/2/2011 | 8/31/2035 | 45,000 | 2,121 | 4.446% | 4.446% | | | | | 2,121 | | | | |
| 154 | 2035 | Construction | - | 7/31/2019 | 7/31/2049 | 82,000 | 82,000 | 4.430% | 4.430% | | | | | 61,543 | | | | |
| 155 | | FY 2035 Subtotal: | - | - | - | 159,000 | 116,121 | - | - | | | | | 95,663 | | | | |

**TABLE 11-8
APPLICATION OF AMORTIZATION (\$000S) (FY 2019)**

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | |
|-----|-------------|--------------------------|-----------|------------|---------------|-------------------|-------------------|---------------|----------------|----------------|-----------------|----------------------|-----------|----------------|------------|----------|---------|----------|
| | Fiscal Year | Project | Debt Type | In Service | Bond Due Date | Initial Principal | Current Principal | Original Rate | Effective Rate | Refinance Type | Refinanced Date | Rolled Maturity Date | Roll Rate | Principal Paid | Premium | Discount | Accrual | Reversal |
| 156 | 2036 | Construction | - | 11/30/2013 | 11/30/2035 | 15,000 | 15,000 | 4.365% | 4.365% | | | | | 15,000 | | | | |
| 157 | 2036 | Construction | - | 11/20/2013 | 6/30/2036 | 36,000 | 36,000 | 4.397% | 4.397% | | | | | 36,000 | | | | |
| 158 | 2036 | Construction | - | 7/31/2019 | 7/31/2049 | 82,000 | 20,457 | 4.430% | 4.430% | | | | | 20,457 | | | | |
| 159 | 2036 | Construction | - | 8/31/2019 | 8/31/2049 | 81,000 | 81,000 | 4.430% | 4.430% | | | | | 20,464 | | | | |
| 160 | | FY 2036 Subtotal: | - | - | - | 214,000 | 152,457 | - | - | | | | | 91,921 | | | | |
| 161 | 2037 | Construction | - | 11/20/2013 | 4/30/2034 | 28,000 | 28,000 | 4.311% | 3.413% | Global | 4/30/2034 | 4/30/2037 | 3.413% | 28,000 | | | | |
| 162 | 2037 | Construction | - | 10/31/2015 | 6/30/2034 | 21,000 | 21,000 | 0.713% | 3.413% | Global | 6/30/2034 | 6/30/2037 | 3.413% | 21,000 | | | | |
| 163 | 2037 | Construction | - | 8/2/2011 | 8/31/2035 | 40,000 | 40,000 | 4.446% | 3.299% | Global | 8/31/2035 | 8/31/2037 | 3.299% | 40,000 | | | | |
| 164 | 2037 | Construction | - | 8/31/2019 | 8/31/2049 | 81,000 | 60,536 | 4.430% | 4.430% | | | | | 21,898 | | | | |
| 165 | | FY 2037 Subtotal: | - | - | - | 170,000 | 149,536 | - | - | | | | | 110,898 | | | | |
| 166 | 2038 | Construction | - | 7/31/2010 | 7/31/2020 | 50,000 | 50,000 | 3.118% | 4.329% | Global | 7/31/2020 | 7/31/2038 | 4.329% | 50,000 | | | | |
| 167 | 2038 | Construction | - | 8/2/2011 | 8/31/2035 | 40,000 | 40,000 | 4.446% | 3.413% | Global | 8/31/2035 | 8/31/2038 | 3.413% | 40,000 | | | | |
| 168 | 2038 | Construction | - | 8/31/2019 | 8/31/2049 | 81,000 | 38,639 | 4.430% | 4.430% | | | | | 17,635 | | | | |
| 169 | | FY 2038 Subtotal: | - | - | - | 171,000 | 128,639 | - | - | | | | | 107,635 | | | | |
| 170 | 2039 | Construction | - | 8/2/2011 | 8/31/2034 | 40,000 | 40,000 | 4.416% | 3.642% | Global | 8/31/2034 | 8/31/2039 | 3.642% | 40,000 | | | | |
| 171 | 2039 | Construction | - | 9/30/2017 | 9/30/2039 | 76,000 | 38,000 | 2.480% | 2.480% | | | | | 38,000 | | | | |
| 172 | 2039 | Construction | - | 8/31/2019 | 8/31/2049 | 81,000 | 21,004 | 4.430% | 4.430% | | | | | 21,004 | | | | |
| 173 | 2039 | Construction | - | 9/30/2019 | 9/30/2049 | 81,000 | 81,000 | 4.430% | 4.430% | | | | | 5,307 | | | | |
| 174 | | FY 2039 Subtotal: | - | - | - | 278,000 | 180,004 | - | - | | | | | 104,311 | | | | |
| 175 | 2040 | Construction | - | 4/30/2014 | 10/31/2039 | 45,000 | 45,000 | 0.947% | 0.947% | | | | | 45,000 | | | | |
| 176 | 2040 | Construction | - | 1/27/2012 | 1/31/2040 | 30,000 | 30,000 | 0.947% | 0.947% | | | | | 30,000 | | | | |
| 177 | 2040 | Construction | - | 9/30/2019 | 9/30/2049 | 81,000 | 75,693 | 4.430% | 4.430% | | | | | 9,763 | | | | |
| 178 | | FY 2040 Subtotal: | - | - | - | 156,000 | 150,693 | - | - | | | | | 84,763 | | | | |
| 179 | 2041 | Construction | - | 8/31/2017 | 8/31/2041 | 76,000 | 76,000 | 2.630% | 2.630% | | | | | 76,000 | | | | |
| 180 | 2041 | Construction | - | 9/30/2019 | 9/30/2049 | 81,000 | 65,930 | 4.430% | 4.430% | | | | | 36,097 | | | | |
| 181 | | FY 2041 Subtotal: | - | - | - | 157,000 | 141,930 | - | - | | | | | 112,097 | | | | |
| 182 | 2042 | Construction | - | 7/31/2018 | 7/31/2042 | 78,000 | 26,000 | 3.620% | 3.620% | | | | | 26,000 | | | | |
| 183 | 2042 | Construction | - | 1/31/2014 | 1/31/2043 | 15,000 | 15,000 | 4.380% | 4.380% | | | | | 14,771 | 165 | | | |
| 184 | 2042 | Construction | - | 9/30/2019 | 9/30/2049 | 81,000 | 29,833 | 4.430% | 4.430% | | | | | 29,833 | | | | |
| 185 | | FY 2042 Subtotal: | - | - | - | 174,000 | 70,833 | - | - | | | | | 70,604 | 165 | | | |
| 186 | 2043 | Construction | - | 10/31/2015 | 8/31/2034 | 19,000 | 19,000 | 0.713% | 4.352% | Global | 8/31/2034 | 8/31/2051 | 4.352% | 19,000 | 276 | | | |
| 187 | 2043 | Construction | - | 8/31/2014 | 8/31/2035 | 15,000 | 15,000 | 0.697% | 4.251% | Global | 8/31/2035 | 8/31/2049 | 4.251% | 2,778 | 40 | | | |
| 188 | 2043 | Construction | - | 1/31/2014 | 1/31/2043 | 15,000 | 229 | 4.380% | 4.380% | | | | | 229 | | | | |
| 189 | 2043 | Construction | - | 7/31/2017 | 7/31/2043 | 76,000 | 19,000 | 2.730% | 2.730% | | | | | 19,000 | | | | |
| 190 | 2043 | Construction | - | 7/31/2018 | 7/31/2043 | 78,000 | 26,000 | 3.670% | 3.670% | | | | | 26,000 | | | | |
| 191 | | FY 2043 Subtotal: | - | - | - | 203,000 | 79,229 | - | - | | | | | 67,007 | 316 | | | |
| 192 | 2044 | Construction | - | 1/31/2010 | 1/31/2019 | 30,000 | 30,000 | 3.714% | 4.248% | Global | 1/31/2019 | 1/31/2044 | 4.248% | 30,000 | | | | |
| 193 | 2044 | Construction | - | 8/31/2014 | 8/31/2035 | 15,000 | 12,222 | 0.697% | 4.251% | Global | 8/31/2035 | 8/31/2049 | 4.251% | 12,222 | 187 | | | |
| 194 | 2044 | Construction | - | 10/31/2013 | 10/31/2035 | 64,000 | 64,000 | 4.222% | 4.184% | Global | 10/31/2035 | 10/31/2048 | 4.184% | 272 | 7 | | | |
| 195 | 2044 | Construction | - | 7/31/2017 | 7/31/2044 | 76,000 | 19,000 | 2.780% | 2.780% | | | | | 19,000 | | | | |
| 196 | | FY 2044 Subtotal: | - | - | - | 185,000 | 125,222 | - | - | | | | | 61,495 | 194 | | | |
| 197 | 2045 | Construction | - | 6/22/2011 | 6/30/2036 | 50,000 | 50,000 | 4.629% | 4.021% | Global | 6/30/2036 | 6/30/2045 | 4.021% | 50,000 | | | | |
| 198 | | FY 2045 Subtotal: | - | - | - | 50,000 | 50,000 | - | - | | | | | 50,000 | | | | |
| 199 | 2046 | Construction | - | 10/31/2013 | 10/31/2035 | 64,000 | 63,728 | 4.222% | 4.184% | Global | 10/31/2035 | 10/31/2048 | 4.184% | 43,083 | 933 | | | |
| 200 | | FY 2046 Subtotal: | - | - | - | 64,000 | 63,728 | - | - | | | | | 43,083 | 933 | | | |
| 201 | 2047 | Construction | - | 10/31/2013 | 10/31/2035 | 64,000 | 20,645 | 4.222% | 4.184% | Global | 10/31/2035 | 10/31/2047 | 4.184% | 20,645 | 306 | | | |
| 202 | 2047 | Construction | - | 5/31/2014 | 5/31/2036 | 29,000 | 29,000 | 0.732% | 4.150% | Global | 5/31/2036 | 5/31/2047 | 4.150% | 29,000 | | | | |
| 203 | 2047 | Construction | - | 7/31/2017 | 7/31/2047 | 76,000 | 38,000 | 2.930% | 2.930% | | | | | 38,000 | | | | |
| 204 | 2047 | Construction | - | 8/31/2018 | 8/31/2047 | 79,000 | 29,000 | 3.830% | 3.830% | | | | | 29,000 | | | | |
| 205 | 2047 | Construction | - | 9/30/2017 | 9/30/2047 | 76,000 | 38,000 | 2.930% | 2.930% | | | | | 38,000 | | | | |
| 206 | 2047 | Construction | - | 7/31/2018 | 7/31/2048 | 78,000 | 26,000 | 3.870% | 3.870% | | | | | 5,511 | | | | |
| 207 | | FY 2047 Subtotal: | - | - | - | 402,000 | 180,645 | - | - | | | | | 160,155 | 306 | | | |

**TABLE 11-8
APPLICATION OF AMORTIZATION (\$000S) (FY 2019)**

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
|-------------|---------|--------------------------|------------|---------------|-------------------|--------------------|--------------------|----------------|----------------|-----------------|----------------------|-----------|--------------------|-----------------|----------|---------|----------|
| Fiscal Year | Project | Debt Type | In Service | Bond Due Date | Initial Principal | Current Principal | Original Rate | Effective Rate | Refinance Type | Refinanced Date | Rolled Maturity Date | Roll Rate | Principal Paid | Premium | Discount | Accrual | Reversal |
| 208 | 2048 | Construction | - | 7/31/2018 | 7/31/2048 | 78,000 | 20,489 | 3.870% | 3.870% | | | | 20,489 | | | | |
| 209 | 2048 | Construction | - | 8/31/2018 | 8/31/2048 | 79,000 | 50,000 | 3.870% | 3.870% | | | | 50,000 | | | | |
| 210 | 2048 | Construction | - | 9/30/2018 | 9/30/2048 | 79,000 | 79,000 | 3.870% | 3.870% | | | | 79,000 | | | | |
| 211 | 2048 | Replacements | - | 3/31/2020 | 3/31/2055 | 188,713 | 188,713 | 4.430% | 4.430% | | | | 2,793 | | | | |
| 212 | | FY 2048 Subtotal: | - | - | - | 424,713 | 338,203 | - | | | | | 152,283 | | | | |
| 213 | 2049 | Replacements | - | 3/31/2020 | 3/31/2055 | 188,713 | 185,920 | 4.430% | 4.430% | | | | 147,591 | | | | |
| 214 | | FY 2049 Subtotal: | - | - | - | 188,713 | 185,920 | - | | | | | 147,591 | | | | |
| 215 | 2050 | Replacements | - | 3/31/2020 | 3/31/2055 | 188,713 | 38,329 | 4.430% | 4.430% | | | | 38,329 | | | | |
| 216 | 2050 | Replacements | - | 3/31/2021 | 3/31/2056 | 194,563 | 194,563 | 4.430% | 4.430% | | | | 101,999 | | | | |
| 217 | | FY 2050 Subtotal: | - | - | - | 383,276 | 232,893 | - | | | | | 140,328 | | | | |
| 218 | 2051 | Replacements | - | 3/31/2021 | 3/31/2056 | 194,563 | 92,564 | 4.430% | 4.430% | | | | 92,564 | | | | |
| 219 | 2051 | Replacements | - | 3/31/2022 | 3/31/2057 | 199,419 | 199,419 | 4.430% | 4.430% | | | | 40,063 | | | | |
| 220 | | FY 2051 Subtotal: | - | - | - | 393,982 | 291,983 | - | | | | | 132,628 | | | | |
| 221 | 2052 | Replacements | - | 3/31/2022 | 3/31/2057 | 199,419 | 159,356 | 4.430% | 4.430% | | | | 124,521 | | | | |
| 222 | | FY 2052 Subtotal: | - | - | - | 199,419 | 159,356 | - | | | | | 124,521 | | | | |
| 223 | 2053 | Replacements | - | 3/31/2022 | 3/31/2057 | 199,419 | 34,834 | 4.430% | 4.430% | | | | 34,834 | | | | |
| 224 | 2053 | Replacements | - | 3/31/2023 | 3/31/2058 | 202,949 | 202,949 | 4.430% | 4.430% | | | | 81,035 | | | | |
| 225 | | FY 2053 Subtotal: | - | - | - | 402,368 | 237,783 | - | | | | | 115,870 | | | | |
| 226 | 2054 | Replacements | - | 3/31/2023 | 3/31/2058 | 202,949 | 121,914 | 4.430% | 4.430% | | | | 106,690 | | | | |
| 227 | | FY 2054 Subtotal: | - | - | - | 202,949 | 121,914 | - | | | | | 106,690 | | | | |
| 228 | | Grand Total | | | | \$8,198,255 | \$6,124,479 | - | | | | | \$4,464,608 | \$40,967 | | | |

12. REPAYMENT THEORY OF OPERATION

12.1 Introduction

BPA is required to collect revenues sufficient to meet BPA's annual transmission expenses and cover the long-term obligations of the Federal Columbia River Transmission System.

The repayment program is used to determine whether a given set of annual revenues is sufficient to meet a given set of annual expenses and cover a given set of long-term obligations when applied in accordance with the requirements of Department of Energy Order RA 6120.2. The program is also used to determine the minimum factor by which future revenues can be multiplied to obtain a new set of revenues that will be sufficient to recover amortization costs.

The revenues and the expenses of the cost evaluation year will be assigned to all future years, in effect assigning the net operating revenue of the cost evaluation year to all future years and levelizing the long-term obligations over all future years.

12.2 Repayment Program Logic

The diagrams on the following pages show the flow of logic in BPA's repayment program. The first diagram shows the logic of the binary search used to locate minimum sufficient revenues. A necessary part of this search is the test for sufficiency. The logic of the test for sufficiency is shown on the remaining two diagrams.

The equations referred to are:

Revenue Equation: Net revenues of each year are expended on interest and payments on the principals.

Investment equation: The payments on each investment are less than or equal to the principal of that investment (and equal to the principal of that investment after the investment is due).

Predictor equation: For each future year, the accumulated revenues less the accumulated interest less the accumulated investments due is equal to the accumulated payments on high interest rate investments which are not due.

12.3 Bond Rollover Feature

Since the 2004 transmission rate case, BPA has incorporated a data manipulation feature associated with the repayment program. This feature does not change any methodology of the model but allows the user to assume that any short-term bonds associated with assets with average service lives longer than the bond maturity date can be refinanced on the original maturity date, and recognizes replacement bonds with new maturity dates and corresponding interest rates. This feature reflects BPA's practice of rolling a bond when it comes due if funds are not available to pay it at that time, if market conditions justify refinancing such bonds within the allowable repayment period of the associated assets, or if it will eliminate a critical year. Reflecting this practice in the model allows a more realistic calculation of interest expense.

FIGURES

Figure 12-1 Repayment Program (Test for Sufficiency)

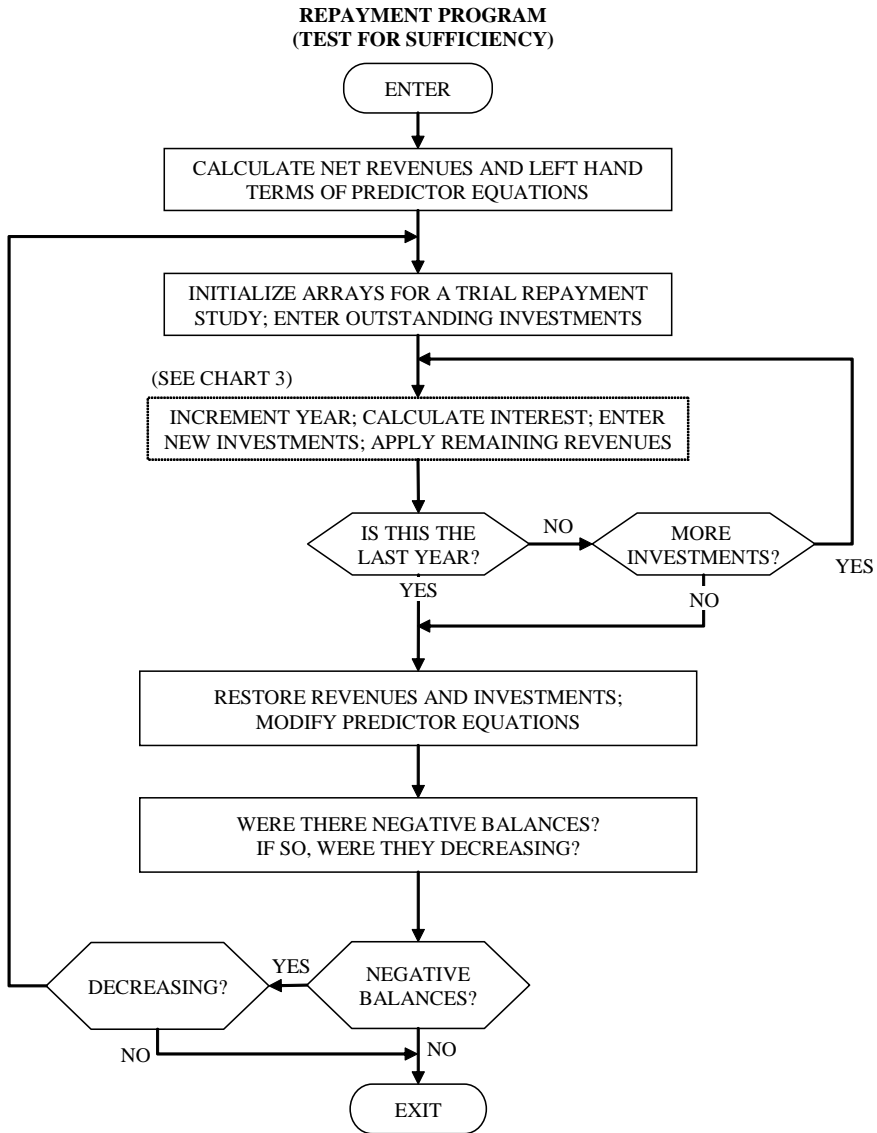


Figure 12-2 Repayment Program (Application of Revenues)

