

In the opinion of Norton Rose Fulbright US LLP, San Francisco, California, Bond Counsel to the SFPUC (“Bond Counsel”), interest on the 2019 Series ABC Bonds is exempt from personal income taxes imposed by the State of California. Interest on the 2019 Series ABC Bonds is includable in the gross income of the owners of the 2019 Series ABC Bonds for federal income tax purposes. Bond Counsel expresses no opinion regarding any other tax consequences related to the ownership or disposition of, or the accrual or receipt of interest on, the 2019 Series ABC Bonds. See “TAX MATTERS” herein.

**\$656,955,000**

PUBLIC UTILITIES COMMISSION OF THE CITY AND COUNTY OF SAN FRANCISCO
San Francisco Water Revenue Bonds, 2019 Series ABC

\$622,580,000
2019 Sub-Series A Bonds
(Refunding – Federally Taxable) (WSIP)
(Green Bonds)

\$16,450,000
2019 Sub-Series B Bonds
(Refunding – Federally Taxable)
(Hetch Hetchy)

\$17,925,000
2019 Sub-Series C Bonds
(Refunding – Federally Taxable)
(Local Water Main)

**Dated:** Date of Delivery**Due:** November 1, as shown on inside front cover

General. This cover page contains certain information for quick reference only. It is not intended to be a summary of the security or terms of the water revenue bonds captioned above. Potential investors are instructed to read the entire Official Statement, including the appendices hereto, to obtain information essential to making an informed investment decision.

Authority for Issuance. The Public Utilities Commission of the City and County of San Francisco (the “SFPUC”) is issuing the 2019 Series ABC Bonds in three Sub-Series, the San Francisco Water Revenue Bonds, 2019 Series ABC, 2019 Sub-Series A Bonds (Refunding – Federally Taxable) (WSIP) (Green Bonds) (the “2019 Sub-Series A Bonds”), the San Francisco Water Revenue Bonds, 2019 Series ABC, 2019 Sub-Series B Bonds (Refunding – Federally Taxable) (Hetch Hetchy) (the “2019 Sub-Series B Bonds”), and the San Francisco Water Revenue Bonds, 2019 Series ABC, 2019 Sub-Series C Bonds (Refunding – Federally Taxable) (Local Water Main) (the “2019 Sub-Series C Bonds”) and, together with the 2019 Sub-Series A Bonds and the 2019 Sub-Series B Bonds, the “2019 Series ABC Bonds”, pursuant to authority granted by the Charter of the City and County of San Francisco (the “City”). The 2019 Sub-Series A Bonds will be issued under a Thirty-Second Supplemental Indenture, dated as of December 1, 2019 (the “Thirty-Second Supplemental Indenture”), by and between the SFPUC and U.S. Bank National Association, as trustee (the “Trustee”). The 2019 Sub-Series B Bonds will be issued under a Thirty-Third Supplemental Indenture, dated as of December 1, 2019 (the “Thirty-Third Supplemental Indenture”), by and between the SFPUC and the Trustee. The 2019 Sub-Series C Bonds will be issued under a Thirty-Fourth Supplemental Indenture, dated as of December 1, 2019 (the “Thirty-Fourth Supplemental Indenture”), by and between the SFPUC and the Trustee. The Thirty-Second Supplemental Indenture, the Thirty-Third Supplemental Indenture and the Thirty-Fourth Supplemental Indenture supplement the Amended and Restated Indenture, dated as of August 1, 2002 (as supplemented and amended to date, the “Indenture”), by and between the SFPUC and the Trustee. See “SECURITY FOR THE BONDS.”

Plan of Refunding. The 2019 Series ABC Bonds are being issued to (i) refund and defease all or a portion of certain outstanding water revenue bonds of the SFPUC, as applicable, and (ii) pay the costs of issuance of the 2019 Series ABC Bonds. See “PLAN OF REFUNDING” and “ESTIMATED SOURCES AND USES OF FUNDS.”

Denominations and Interest. The 2019 Series ABC Bonds will be available in denominations of \$5,000 or any integral multiple thereof and will mature in the years and amounts and accrue interest from their date of delivery at the rates set forth on the inside cover page of this Official Statement. Interest on the 2019 Series ABC Bonds is payable semiannually on May 1 and November 1 of each year, commencing November 1, 2020. See “THE 2019 SERIES ABC BONDS.”

Book-Entry Only. The 2019 Series ABC Bonds will be issued as fully registered bonds, registered in the name of Cede & Co., as nominee of The Depository Trust Company (“DTC”), New York, New York, and will be available to ultimate purchasers (the “Beneficial Owners”) under the book-entry only system maintained by DTC. Beneficial Owners will not receive physical certificates representing their interests in the 2019 Series ABC Bonds. The principal of, premium, if any, and interest on the 2019 Series ABC Bonds are payable to DTC by the Trustee, and, so long as DTC is acting as securities depository for the 2019 Series ABC Bonds, disbursements of such payments to DTC Participants is the responsibility of DTC and disbursements of such payments to the Beneficial Owners is the responsibility of DTC Participants. See “THE 2019 SERIES ABC BONDS.”

Redemption. The 2019 Series ABC Bonds are subject to redemption prior to maturity as described herein. See “THE 2019 SERIES ABC BONDS – Redemption.”

Security. Under the Indenture, the SFPUC has irrevocably pledged the Revenues of its Water Enterprise and all Refundable Credits (in the case of Bonds issued as Build America Bonds) received by the SFPUC to the punctual payment of principal of, premium, if any, and interest on the 2019 Series ABC Bonds and all outstanding parity revenue bonds, notes or other evidences of indebtedness authorized under the Indenture, subject to the allocation of funds provided in the Indenture. The 2019 Series ABC Bonds are payable on parity with certain Outstanding Bonds previously issued by the SFPUC under the Indenture and all outstanding parity revenue bonds, notes or other evidences of indebtedness authorized under the Indenture. No Bond Reserve Account will be established for the 2019 Series ABC Bonds. See “SECURITY FOR THE BONDS.”

Limited Obligation. The SFPUC is not obligated to pay the principal of, premium, if any, or interest on the 2019 Series ABC Bonds except from Revenues. The SFPUC has no taxing power. The General Fund of the City is not liable for the payment of the principal of, premium, if any, or interest on the 2019 Series ABC Bonds, and neither the credit nor the taxing power of the City is pledged to the payment of the principal of, premium, if any, or interest on the 2019 Series ABC Bonds. The 2019 Series ABC Bonds are not secured by a legal or equitable pledge of, or charge, lien or encumbrance upon, any of the property of the City or of the SFPUC or any of its income or receipts, except Revenues. See “SECURITY FOR THE BONDS.”

MATURITY SCHEDULES
 (See inside cover)

The 2019 Series ABC Bonds are offered when, as and if issued by the SFPUC and received by the Underwriters, subject to the approval of validity by Norton Rose Fulbright US LLP, San Francisco, California, Bond Counsel to the SFPUC, and to certain other conditions. Certain matters will be passed upon for the SFPUC and the City by Orrick, Herrington & Sutcliffe LLP, San Francisco, California, Disclosure Counsel, and by the City Attorney of the City and County of San Francisco. Backstrom McCarley Bery & Co., LLC, San Francisco, California, and Montague DeRose and Associates, LLC, Walnut Creek, California, Co-Municipal Advisors to the SFPUC, assisted in the structuring of this financing. Certain matters will be passed upon for the Underwriters by Kutak Rock LLP, Irvine, California. It is expected that the 2019 Series ABC Bonds in fully registered form will be available for delivery in book-entry form through the facilities of DTC, on or about January 9, 2020.

Morgan Stanley
Goldman Sachs & Co. LLC

BofA Securities

Citigroup

J.P. Morgan

MATURITY SCHEDULES

2019 Sub-Series A Bonds (Refunding – Federally Taxable) (WSIP) (Green Bonds)

\$109,345,000 Serial Bonds

Maturity (November 1)	Principal Amount	Interest Rate	Price*	CUSIP† Base Number 79765R
2020	\$ 6,855,000	1.814%	100.00	4K2
2021	24,405,000	1.864	100.00	4L0
2022	3,495,000	1.949	100.00	4M8
2023	3,565,000	1.982	100.00	4N6
2024	3,640,000	2.082	100.00	4P1
2025	3,720,000	2.261	100.00	4Q9
2026	3,805,000	2.371	100.00	4R7
2027	3,900,000	2.483	100.00	4S5
2028	4,000,000	2.533	100.00	4T3
2029	4,105,000	2.593	100.00	4U0
2030	4,215,000	2.703	100.00	4V8
2031	31,095,000	2.803	100.00	4W6
2032	4,055,000	2.953	100.00	4X4
2033	4,180,000	3.053	100.00	4Y2
2034	4,310,000	3.153	100.00	4Z9

\$308,895,000 3.303% Term Bonds due November 1, 2039 Price* 100.00 CUSIP† 79765R 5A3

\$204,340,000 3.473% Term Bonds due November 1, 2043 Price* 100.00 CUSIP† 79765R 5B1

2019 Sub-Series B Bonds (Refunding – Federally Taxable) (Hetch Hetchy)

\$5,015,000 3.153% Term Bonds due November 1, 2034 Price* 100.00 CUSIP† 79765R 5C9

\$11,435,000 3.523% Term Bonds due November 1, 2041 Price* 100.00 CUSIP† 79765R 5D7

2019 Sub-Series C Bonds (Refunding – Federally Taxable) (Local Water Main)

\$5,470,000 3.153% Term Bonds due November 1, 2034 Price* 100.00 CUSIP† 79765R 5E5

\$12,455,000 3.523% Term Bonds due November 1, 2041 Price* 100.00 CUSIP† 79765R 5F2

* Reoffering prices have been provided by the Underwriters. See “UNDERWRITING.”

† CUSIP is a registered trademark of the American Bankers Association. CUSIP data herein are provided by CUSIP Global Services (CGS), which is managed on behalf of the American Bankers Association by S&P Global Market Intelligence. This data is not intended to create a database and does not serve in any way as a substitute for the CGS data base. Neither the SFPUC nor the Underwriters assume any responsibility for the accuracy of the CUSIP data.

Map of Hetch Hetchy Regional Water System

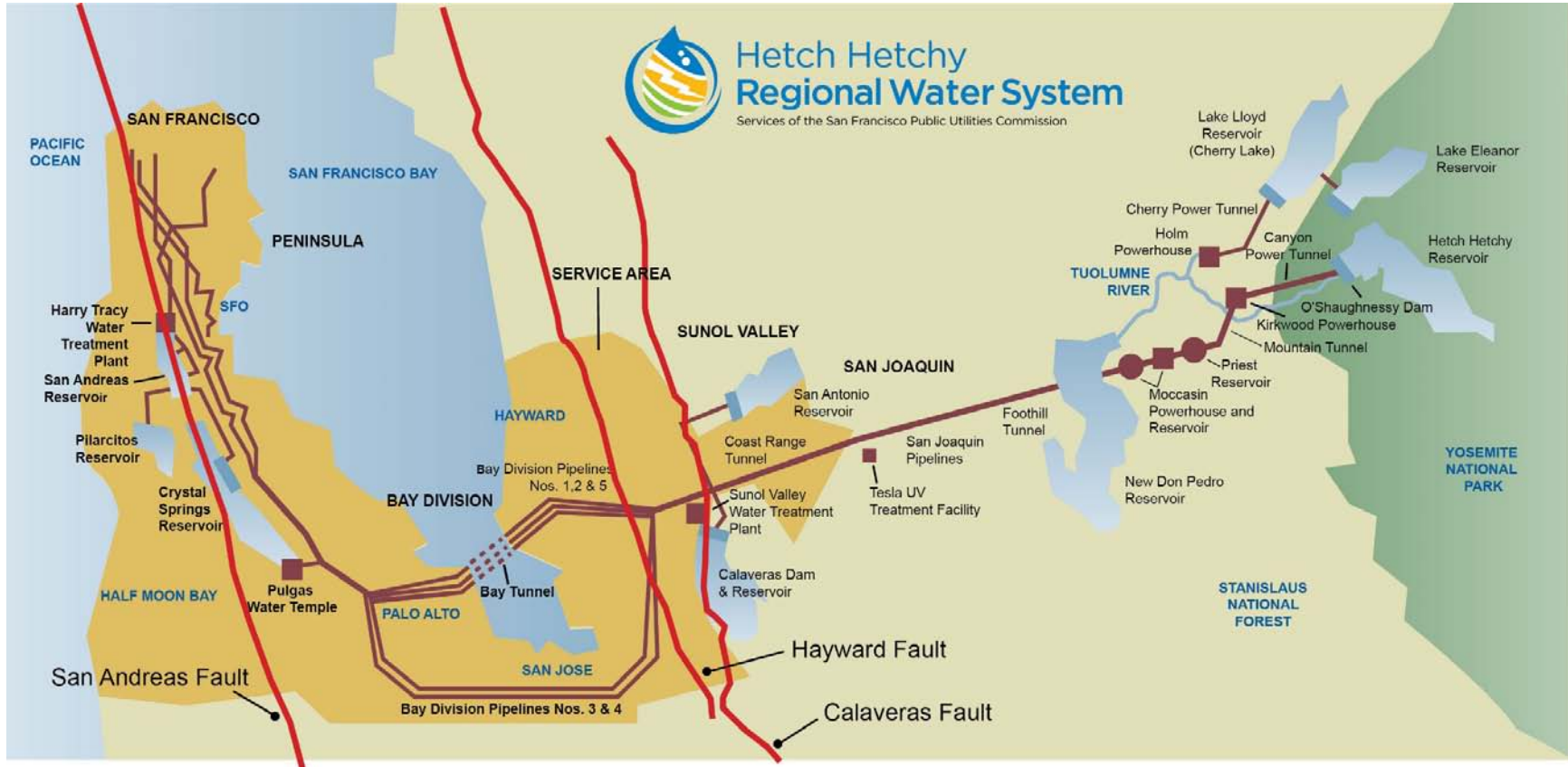
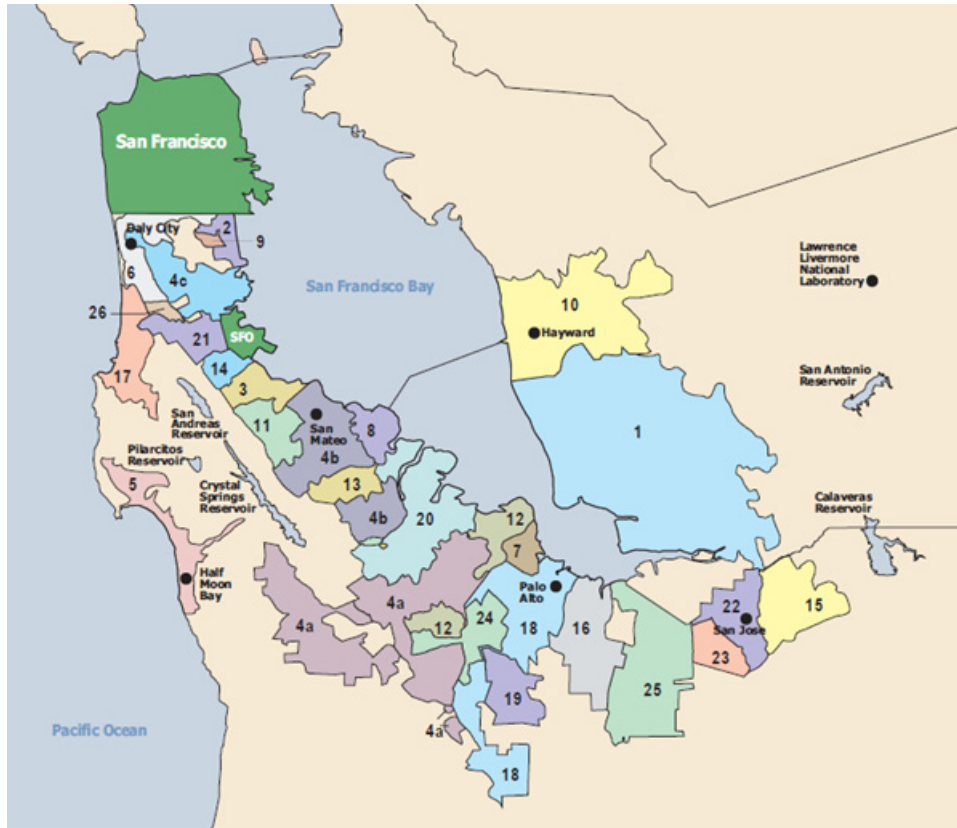


Figure 1-1 (Not to Scale) – The above map depicts the Hetch Hetchy Regional Water System. For further description of the SFPUC’s Water System, see “THE WATER ENTERPRISE.”

The 2019 Series ABC Bonds are not secured by a legal or equitable pledge of, or charge, lien or encumbrance upon, any of the property of the SFPUC or any of its income or receipts, except Revenues. See “SECURITY FOR THE BONDS.”

Map of Service Area and Locations of Wholesale Customers



- | | |
|--|---------------------------------------|
| 1. Alameda County Water District | 13. Mid-Peninsula Water District |
| 2. City of Brisbane | 14. City of Millbrae |
| 3. City of Burlingame | 15. City of Milpitas |
| 4a. CWS - Bear Gulch | 16. City of Mountain View |
| 4b. CWS - Mid-Peninsula | 17. North Coast County Water District |
| 4c. CWS - South San Francisco | 18. City of Palo Alto |
| 5. Coastside County Water District | 19. Purissima Hills Water District |
| 6. City of Daly City | 20. City of Redwood City |
| 7. City of East Palo Alto | 21. City of San Bruno |
| 8. Estero Municipal Improvement District | 22. San Jose Municipal Water System |
| 9. Guadalupe Valley MID | 23. City of Santa Clara |
| 10. City of Hayward | 24. Stanford University |
| 11. Town of Hillsborough | 25. City of Sunnyvale |
| 12. City of Menlo Park | 26. Westborough Water District |

Figure 1-2 (Not to Scale) – The above map depicts the Water Enterprise service area (not including the Groveland Community Service District) and the locations of the Wholesale Customers (not including Cordilleras Mutual Water Company). For further description of the Wholesale Customers, see “THE WATER ENTERPRISE – Wholesale Deliveries.”

TABLE OF CONTENTS

<p>INTRODUCTION1</p> <p style="padding-left: 20px;">General1</p> <p style="padding-left: 20px;">Authority for Issuance1</p> <p style="padding-left: 20px;">Plan of Refunding2</p> <p style="padding-left: 20px;">The SFPUC and the Water Enterprise2</p> <p style="padding-left: 20px;">Security for the Bonds2</p> <p style="padding-left: 20px;">Outstanding and Future Parity Bonds and Other Indebtedness3</p> <p style="padding-left: 20px;">Risk Factors3</p> <p style="padding-left: 20px;">Continuing Disclosure3</p> <p style="padding-left: 20px;">Other Matters3</p> <p>THE 2019 SERIES ABC BONDS4</p> <p style="padding-left: 20px;">General4</p> <p style="padding-left: 20px;">Securities Depository and Book-Entry Only System4</p> <p style="padding-left: 20px;">Redemption4</p> <p style="padding-left: 20px;">Defeasance10</p> <p>PLAN OF REFUNDING10</p> <p style="padding-left: 20px;">General10</p> <p style="padding-left: 20px;">Refunded Bonds10</p> <p>ESTIMATED SOURCES AND USES OF FUNDS13</p> <p>GREEN BONDS DESIGNATION AND CLIMATE CERTIFICATION13</p> <p style="padding-left: 20px;">Designation as Green Bonds13</p> <p style="padding-left: 20px;">The Climate Bonds Initiative and Climate Bonds13</p> <p style="padding-left: 20px;">United Nations Sustainable Development Goals15</p> <p style="padding-left: 20px;">Use of Proceeds15</p> <p style="padding-left: 20px;">Process for Project Evaluation and Selection16</p> <p style="padding-left: 20px;">Management of Proceeds16</p> <p style="padding-left: 20px;">Green Bond Reporting16</p> <p>SECURITY FOR THE BONDS17</p> <p style="padding-left: 20px;">Pledge of Revenues17</p> <p style="padding-left: 20px;">Flow of Funds18</p> <p style="padding-left: 20px;">Rate Covenants20</p> <p style="padding-left: 20px;">Bond Reserve Accounts22</p> <p style="padding-left: 20px;">Additional Series of Bonds23</p> <p style="padding-left: 20px;">Refunding Bonds24</p> <p style="padding-left: 20px;">Other Parity Obligations; Subordinate Obligations; Obligations Not Payable from Revenues25</p> <p style="padding-left: 20px;">Investments25</p> <p>OBLIGATIONS PAYABLE FROM REVENUES25</p> <p style="padding-left: 20px;">Authority for Issuance of Revenue Bonds and Other Obligations Payable from Revenues25</p> <p style="padding-left: 20px;">Outstanding Parity Revenue Bonds27</p> <p style="padding-left: 20px;">State and Federal Loans27</p> <p style="padding-left: 20px;">Contingent Payment Obligations28</p>	<p style="padding-left: 20px;">Subordinate Debt and Interim Funding Program28</p> <p style="padding-left: 20px;">Other Subordinate Obligations Payable from Revenues29</p> <p style="padding-left: 20px;">Revenue Bond Oversight Committee29</p> <p style="padding-left: 20px;">Debt Service Requirements30</p> <p>THE CITY AND COUNTY OF SAN FRANCISCO31</p> <p>THE PUBLIC UTILITIES COMMISSION32</p> <p style="padding-left: 20px;">General32</p> <p style="padding-left: 20px;">Organization, Purposes and Powers32</p> <p style="padding-left: 20px;">Commission Members33</p> <p style="padding-left: 20px;">Management34</p> <p style="padding-left: 20px;">Labor Relations36</p> <p style="padding-left: 20px;">Employee Benefit Plans37</p> <p style="padding-left: 20px;">Pension and Health Care Costs Reforms41</p> <p>THE WATER ENTERPRISE43</p> <p style="padding-left: 20px;">General43</p> <p style="padding-left: 20px;">Water Rights and Related Proceedings43</p> <p style="padding-left: 20px;">Current Water Supply Sources44</p> <p style="padding-left: 20px;">Water Supply Storage45</p> <p style="padding-left: 20px;">Projected Demand45</p> <p style="padding-left: 20px;">Water Supply Reliability and Drought Planning47</p> <p style="padding-left: 20px;">Water Supply Initiatives48</p> <p style="padding-left: 20px;">Wholesale Deliveries50</p> <p style="padding-left: 20px;">Retail Deliveries58</p> <p style="padding-left: 20px;">Historic Water Sales and Top Customers59</p> <p style="padding-left: 20px;">Recent Drought; Current Water Conditions61</p> <p style="padding-left: 20px;">Curtailment Actions by the State Water Resources Control Board62</p> <p style="padding-left: 20px;">Proposals to Restore Hetch Hetchy Valley63</p> <p>WATER FACILITIES63</p> <p style="padding-left: 20px;">General63</p> <p style="padding-left: 20px;">Water Conveyance and Distribution64</p> <p style="padding-left: 20px;">Water Treatment65</p> <p style="padding-left: 20px;">Water Storage66</p> <p style="padding-left: 20px;">Physical Condition of Certain Facilities68</p> <p style="padding-left: 20px;">Seismic Hazards69</p> <p style="padding-left: 20px;">Wildfire Considerations71</p> <p style="padding-left: 20px;">Safety and Security71</p> <p>CAPITAL IMPROVEMENT PROGRAM71</p> <p style="padding-left: 20px;">Capital and Financial Planning Process71</p> <p style="padding-left: 20px;">Regional Water Program72</p> <p style="padding-left: 20px;">Local Water Program72</p> <p style="padding-left: 20px;">Hetch Hetchy Water72</p> <p style="padding-left: 20px;">Water System Improvement Program (WSIP)74</p> <p style="padding-left: 20px;">Environmental Considerations76</p> <p>FINANCING OF CAPITAL IMPROVEMENTS77</p>
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TABLE OF CONTENTS

(continued)

<p>Long Term Financing of Capital Program.....77 Interim Funding Program Facilities.....77 Sources of Funding the Capital Improvement Program77 FINANCIAL OPERATIONS78 General78 Wholesale Water Sales Revenue79 Retail Water Sales Revenue81 Impact of Weather on Revenues.....86 Capacity Charges.....86 Operating and Maintenance Expenses.....87 Financial Management Policies.....87 Investment of SFPUC Funds89 Risk Management and Insurance.....90 HISTORICAL OPERATING RESULTS.....92 PROJECTED OPERATING RESULTS94 Management Discussion of Projections.....97 RISK FACTORS97 General97 Limited Obligation97 No Bond Reserve Account98 Risks Related to Water Enterprise Facilities and Operations.....98 Cybersecurity.....100 Construction Related Risks101 Limitations on Rate-Setting.....101 Initiative, Referendum, Charter Amendments and Future Legislation101 Increased Operating and Maintenance Expenses102 Interim Funding Program Facilities.....102 Climate Change102 Green Bonds105 Inverse Condemnation.....105 Economic, Political, Social and Environmental Conditions106 Bankruptcy or Financial Failure of Wholesale Customers.....106</p>	<p>Bankruptcy of the City106 Limitations on Remedies107 Failure to Maintain Credit Ratings108 Secondary Market.....108 Uncertainties of Projections, Forecasts and Assumptions.....108 Other Risks108 REGULATORY MATTERS.....109 General109 Drinking Water Requirements.....109 Public Water System Discharges.....113 Bay-Delta Water Quality Standards113 FERC Proceeding to Increase Flows in the Lower Tuolumne River114 Dam Licensing and Safety Issues115 Hazardous Material Management.....118 Endangered Species.....118 Required Instream Flow Schedules from Regional Water System Dams118 CONSTITUTIONAL, STATUTORY AND CHARTER LIMITATIONS.....119 State Law Limitations.....119 Initiative and Referendum121 Charter Limitations.....121 Future Charter Amendments122 LITIGATION122 TAX MATTERS122 CERTAIN LEGAL MATTERS126 RATINGS.....127 UNDERWRITING127 FINANCIAL STATEMENTS.....128 CONTINUING DISCLOSURE.....129 CO-MUNICIPAL ADVISORS129 VERIFICATION OF MATHEMATICAL ACCURACY129 MISCELLANEOUS.....130 APPROVAL AND DELIVERY131</p>
<p>APPENDIX A SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE APPENDIX B SUMMARY OF CERTAIN PROVISIONS OF THE WATER SUPPLY AGREEMENT APPENDIX C SFPUC WATER ENTERPRISE FINANCIAL STATEMENTS APPENDIX D PROPOSED FORM OF OPINION OF BOND COUNSEL APPENDIX E FORM OF CONTINUING DISCLOSURE CERTIFICATE APPENDIX F INFORMATION REGARDING BOOK-ENTRY ONLY SYSTEM AND GLOBAL CLEARANCE PROCEDURES</p>	

GENERAL INFORMATION

No dealer, broker, salesperson or other person has been authorized by the SFPUC to give any information or to make any representation other than those contained herein and, if given or made, such other information or representation must not be relied upon as having been authorized by the SFPUC.

This Official Statement does not constitute an offer to sell or the solicitation of an offer to buy, nor shall there be any sale of the 2019 Series ABC Bonds, by any person in any jurisdiction in which it is unlawful for such person to make such an offer, solicitation or sale. This Official Statement is not to be construed as a contract with the initial purchasers of the 2019 Series ABC Bonds. Any statement made in this Official Statement involving any forecast or matter of estimates or opinion, whether or not expressly so stated, is intended solely as such and not as a representation of fact.

The information set forth herein other than that provided by the SFPUC, although obtained from sources which are believed to be reliable, is not guaranteed as to accuracy or completeness. The information and expressions of opinion herein are subject to change without notice and neither delivery of this Official Statement nor any sale made hereunder shall, under any circumstances, create any implication that there has been no change in the affairs of the SFPUC or the City since the date hereof.

The Underwriters have provided the following sentence for inclusion in this Official Statement: The Underwriters have reviewed the information in this Official Statement in accordance with, and as part of, their responsibilities to investors under the federal securities laws as applied to the facts and circumstances of this transaction, but the Underwriters do not guarantee the accuracy or completeness of such information.

The City maintains a website at <http://www.sfgov.org> and the SFPUC maintains a website at <http://www.sfwater.org>. In addition, certain information and reports found on other websites, and other information and reports, are referred to in this Official Statement. *The information and reports available on such websites, and the other referenced information and reports, are not incorporated by reference into this Official Statement and should not be relied upon in making an investment in the 2019 Series ABC Bonds.*

The issuance and sale of the 2019 Series ABC Bonds have not been registered under the Securities Act of 1933 in reliance upon the exemption provided thereunder by Section 3(a)(2) for the issuance and sale of municipal securities.

IN CONNECTION WITH THE OFFERING OF THE 2019 SERIES ABC BONDS, THE UNDERWRITERS MAY OVERALLOT OR EFFECT TRANSACTIONS WHICH STABILIZE OR MAINTAIN THE MARKET PRICE OF THE 2019 SERIES ABC BONDS AT LEVELS ABOVE THAT WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. SUCH STABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME. CONSEQUENTLY, THE MARKET PRICE PAID BY AN INVESTOR DURING THE STABILIZATION PERIOD MAY BE HIGHER THAN THE PREVAILING MARKET PRICE.

This Official Statement is delivered for use in connection with the issuance, sale and delivery of the 2019 Series ABC Bonds and may not be reproduced or used, in whole or in part, for any other purpose.

FORWARD-LOOKING STATEMENTS

CERTAIN STATEMENTS CONTAINED IN THIS OFFICIAL STATEMENT REFLECT NOT HISTORICAL FACTS BUT FORECASTS AND “FORWARD-LOOKING STATEMENTS.” ALL FORWARD-LOOKING STATEMENTS ARE PREDICTIONS AND ARE SUBJECT TO KNOWN AND UNKNOWN RISKS AND UNCERTAINTIES. NO ASSURANCE CAN BE GIVEN THAT THE FUTURE RESULTS DISCUSSED HEREIN WILL BE ACHIEVED, AND ACTUAL RESULTS MAY DIFFER MATERIALLY FROM THE FORECASTS DESCRIBED HEREIN. IN THIS RESPECT, THE WORDS “ESTIMATE,” “PROJECT,” “ANTICIPATE,” “EXPECT,” “INTEND,” “BELIEVE” AND SIMILAR EXPRESSIONS ARE INTENDED TO IDENTIFY FORWARD-LOOKING STATEMENTS. ALL PROJECTIONS, FORECASTS, ASSUMPTIONS, EXPRESSIONS OF OPINIONS, ESTIMATES AND OTHER FORWARD-LOOKING STATEMENTS ARE EXPRESSLY QUALIFIED IN THEIR ENTIRETY BY THE CAUTIONARY STATEMENTS SET FORTH IN THIS OFFICIAL STATEMENT. GIVEN THEIR UNCERTAINTY, INVESTORS ARE CAUTIONED NOT TO PLACE UNDUE RELIANCE ON SUCH STATEMENTS.

INFORMATION CONCERNING OFFERING RESTRICTIONS IN CERTAIN JURISDICTIONS OUTSIDE THE UNITED STATES

REFERENCES HEREIN TO THE “ISSUER” MEAN THE PUBLIC UTILITIES COMMISSION OF THE CITY AND COUNTY OF SAN FRANCISCO AND REFERENCES TO “BONDS” OR “SECURITIES” MEAN THE 2019 SERIES ABC BONDS OFFERED HEREBY. **NEITHER THE SFPUC NOR THE UNDERWRITERS ASSUME ANY RESPONSIBILITY FOR THIS SECTION.**

MINIMUM UNIT SALES

EACH SERIES OF BONDS WILL TRADE AND SETTLE ON A UNIT BASIS (ONE UNIT EQUALING ONE BOND OF \$5,000 PRINCIPAL AMOUNT). FOR ANY SALES MADE OUTSIDE THE UNITED STATES, THE MINIMUM PURCHASE AND TRADING AMOUNT IS 30 UNITS (BEING 30 BONDS IN AN AGGREGATE PRINCIPAL AMOUNT OF \$150,000).

NOTICE TO PROSPECTIVE INVESTORS IN THE EUROPEAN ECONOMIC AREA

THIS OFFICIAL STATEMENT HAS BEEN PREPARED ON THE BASIS THAT ALL OFFERS OF THE SECURITIES TO ANY PERSON THAT IS LOCATED WITHIN A MEMBER STATE OF THE EUROPEAN ECONOMIC AREA (“EEA”) WILL BE MADE PURSUANT TO AN EXEMPTION UNDER ARTICLE 1(4) REGULATION (EU) 2017/1129 (THE “PROSPECTUS REGULATION”) FROM THE REQUIREMENT TO PRODUCE A PROSPECTUS FOR OFFERS OF THE SECURITIES. ACCORDINGLY, ANY PERSON MAKING OR INTENDING TO MAKE ANY OFFER TO ANY PERSON LOCATED WITHIN A MEMBER STATE OF THE EEA OF THE SECURITIES SHOULD ONLY DO SO IN CIRCUMSTANCES IN WHICH NO OBLIGATION ARISES FOR THE ISSUER OR ANY OF THE INITIAL PURCHASERS TO PRODUCE A PROSPECTUS OR SUPPLEMENT FOR SUCH AN OFFER. NEITHER THE ISSUER NOR THE INITIAL PURCHASERS HAVE AUTHORIZED, NOR DO THEY AUTHORIZE, THE MAKING OF ANY OFFER OF SECURITIES THROUGH ANY FINANCIAL INTERMEDIARY, OTHER THAN OFFERS MADE BY THE INITIAL PURCHASERS, WHICH CONSTITUTE THE FINAL PLACEMENT OF THE SECURITIES CONTEMPLATED IN THIS OFFICIAL STATEMENT.

THE OFFER OF ANY SECURITIES WHICH IS THE SUBJECT OF THE OFFERING CONTEMPLATED BY THIS OFFICIAL STATEMENT IS NOT BEING MADE AND WILL NOT BE MADE TO THE PUBLIC IN ANY MEMBER STATE OF THE EEA, OTHER THAN: (A) TO ANY LEGAL ENTITY WHICH IS A “QUALIFIED INVESTOR” AS SUCH TERM IS DEFINED IN THE PROSPECTUS REGULATION; (B) TO FEWER THAN 150 NATURAL OR LEGAL PERSONS (OTHER THAN “QUALIFIED INVESTORS” AS SUCH TERM IS DEFINED IN THE PROSPECTUS REGULATION) OR (C) IN ANY OTHER CIRCUMSTANCES FALLING WITHIN ARTICLE 1(4) OF THE PROSPECTUS REGULATION, SUBJECT TO OBTAINING THE PRIOR CONSENT OF THE RELEVANT UNDERWRITER OR THE CORPORATION FOR ANY SUCH OFFER; PROVIDED THAT NO SUCH OFFER OF THE SECURITIES SHALL REQUIRE THE ISSUER OR THE INITIAL PURCHASERS TO PUBLISH A PROSPECTUS PURSUANT TO ARTICLE 3 OF

THE PROSPECTUS REGULATION OR A SUPPLEMENT TO A PROSPECTUS PURSUANT TO ARTICLE 23 OF THE PROSPECTUS REGULATION.

FOR THE PURPOSES OF THIS PROVISION, THE EXPRESSION AN “OFFER OF SECURITIES TO THE PUBLIC” IN RELATION TO THE SECURITIES IN ANY MEMBER STATE OF THE EEA MEANS THE COMMUNICATION IN ANY FORM AND BY ANY MEANS OF SUFFICIENT INFORMATION ON THE TERMS OF THE OFFER AND THE SECURITIES TO BE OFFERED SO AS TO ENABLE AN INVESTOR TO DECIDE TO PURCHASE THE SECURITIES.

EACH SUBSCRIBER FOR OR PURCHASER OF THE BONDS IN THE OFFERING LOCATED WITHIN A MEMBER STATE WILL BE DEEMED TO HAVE REPRESENTED, ACKNOWLEDGED AND AGREED THAT IT IS A “QUALIFIED INVESTOR” AS DEFINED IN THE PROSPECTUS REGULATION. THE CORPORATION AND EACH UNDERWRITER AND OTHERS WILL RELY ON THE TRUTH AND ACCURACY OF THE FOREGOING REPRESENTATION, ACKNOWLEDGEMENT AND AGREEMENT.

PROHIBITION OF SALES TO EEA RETAIL INVESTORS – THE BONDS ARE NOT INTENDED TO BE OFFERED, SOLD OR OTHERWISE MADE AVAILABLE TO AND SHOULD NOT BE OFFERED, SOLD OR OTHERWISE MADE AVAILABLE TO ANY RETAIL INVESTOR IN THE EEA. FOR THESE PURPOSES, A RETAIL INVESTOR MEANS A PERSON WHO IS ONE (OR MORE) OF: (I) A RETAIL CLIENT AS DEFINED IN POINT (11) OF ARTICLE 4(1) OF DIRECTIVE 2014/65/EU (AS AMENDED, “MIFID II”); OR (II) A CUSTOMER WITHIN THE MEANING OF DIRECTIVE (EU) 2016/97 (THE “INSURANCE DISTRIBUTION DIRECTIVE”), WHERE THAT CUSTOMER WOULD NOT QUALIFY AS A PROFESSIONAL CLIENT AS DEFINED IN POINT (10) OF ARTICLE 4(1) OF MIFID II. CONSEQUENTLY NO KEY INFORMATION DOCUMENT REQUIRED BY REGULATION (EU) NO 1286/2014 (THE “PRIIPS REGULATION”) FOR OFFERING OR SELLING THE NOTES OR OTHERWISE MAKING THEM AVAILABLE TO RETAIL INVESTORS IN THE EEA HAS BEEN PREPARED AND THEREFORE OFFERING OR SELLING THE NOTES OR OTHERWISE MAKING THEM AVAILABLE TO ANY RETAIL INVESTOR IN THE EEA MAY BE UNLAWFUL UNDER THE PRIIPS REGULATION.

NOTICE TO PROSPECTIVE INVESTORS IN THE UNITED KINGDOM

THIS OFFICIAL STATEMENT HAS NOT BEEN APPROVED FOR THE PURPOSES OF SECTION 21 OF THE FINANCIAL SERVICES AND MARKETS ACT 2000 (“FSMA”) AND DOES NOT CONSTITUTE AN OFFER TO THE PUBLIC IN ACCORDANCE WITH THE PROVISIONS OF SECTION 85 OF THE FSMA. THIS OFFICIAL STATEMENT IS FOR DISTRIBUTION ONLY TO, AND IS DIRECTED SOLELY AT, PERSONS WHO (I) ARE OUTSIDE THE UNITED KINGDOM, (II) ARE INVESTMENT PROFESSIONALS, AS SUCH TERM IS DEFINED IN ARTICLE 19(5) OF THE FINANCIAL SERVICES AND MARKETS ACT 2000 (FINANCIAL PROMOTION) ORDER 2005, AS AMENDED (THE “FINANCIAL PROMOTION ORDER”), (III) ARE PERSONS FALLING WITHIN ARTICLE 49(2)(A) TO (D) OF THE FINANCIAL PROMOTION ORDER, OR (IV) ARE PERSONS TO WHOM AN INVITATION OR INDUCEMENT TO ENGAGE IN INVESTMENT ACTIVITY (WITHIN THE MEANING OF SECTION 21 OF THE FINANCIAL SERVICES AND MARKETS ACT 2000) IN CONNECTION WITH THE ISSUE OR SALE OF ANY BONDS MAY OTHERWISE BE LAWFULLY COMMUNICATED OR CAUSED TO BE COMMUNICATED (ALL SUCH PERSONS TOGETHER BEING REFERRED TO AS “RELEVANT PERSONS”). THIS OFFICIAL STATEMENT IS DIRECTED ONLY AT RELEVANT PERSONS AND MUST NOT BE ACTED ON OR RELIED ON BY PERSONS WHO ARE NOT RELEVANT PERSONS. ANY INVESTMENT OR INVESTMENT ACTIVITY TO WHICH THIS OFFICIAL STATEMENT RELATES IS AVAILABLE ONLY TO RELEVANT PERSONS AND WILL BE ENGAGED IN ONLY WITH RELEVANT PERSONS. ANY PERSON WHO IS NOT A RELEVANT PERSON SHOULD NOT ACT OR RELY ON THIS OFFICIAL STATEMENT OR ANY OF ITS CONTENTS.

NOTICE TO RESIDENTS OF HONG KONG

WARNING. THE CONTENTS OF THIS OFFICIAL STATEMENT HAVE NOT BEEN REVIEWED BY ANY REGULATORY AUTHORITY IN HONG KONG. YOU ARE ADVISED TO EXERCISE CAUTION IN

RELATION TO THE OFFER OF THE BONDS. IF YOU ARE IN ANY DOUBT ABOUT ANY OF THE CONTENTS OF THIS DOCUMENT, YOU SHOULD OBTAIN INDEPENDENT PROFESSIONAL ADVICE.

THIS DOCUMENT HAS NOT BEEN, AND WILL NOT BE, REGISTERED AS A PROSPECTUS IN HONG KONG NOR HAS IT BEEN APPROVED BY THE SECURITIES AND FUTURES COMMISSION OF HONG KONG PURSUANT TO THE SECURITIES AND FUTURES ORDINANCE (CHAPTER 571 OF THE LAWS OF HONG KONG) (“SFO”). ACCORDINGLY, THE BONDS MAY NOT BE OFFERED OR SOLD IN HONG KONG BY MEANS OF THIS DOCUMENT OR ANY OTHER DOCUMENT, AND THIS DOCUMENT MUST NOT BE ISSUED, CIRCULATED OR DISTRIBUTED IN HONG KONG, OTHER THAN TO ‘PROFESSIONAL INVESTORS’ AS DEFINED IN THE SFO AND ANY RULES MADE THEREUNDER. IN ADDITION, NO PERSON MAY ISSUE OR HAVE IN ITS POSSESSION FOR THE PURPOSES OF ISSUE, WHETHER IN HONG KONG OR ELSEWHERE, ANY ADVERTISEMENT, INVITATION OR DOCUMENT RELATING TO THE BONDS, WHICH IS DIRECTED AT, OR THE CONTENTS OF WHICH ARE LIKELY TO BE ACCESSED OR READ BY, THE PUBLIC OF HONG KONG (EXCEPT IF PERMITTED TO DO SO UNDER THE SECURITIES LAWS OF HONG KONG) OTHER THAN WITH RESPECT TO BONDS WHICH ARE OR ARE INTENDED TO BE DISPOSED OF ONLY (A) TO PERSONS OUTSIDE HONG KONG, (B) TO ‘PROFESSIONAL INVESTORS’ AS DEFINED IN THE SFO AND ANY RULES MADE THEREUNDER.

NOTICE TO PROSPECTIVE INVESTORS IN SWITZERLAND

THIS OFFICIAL STATEMENT IS NOT INTENDED TO CONSTITUTE AN OFFER OR A SOLICITATION TO PURCHASE OR INVEST IN THE BONDS. THE BONDS MAY NOT BE PUBLICLY OFFERED, SOLD OR ADVERTISED, DIRECTLY OR INDIRECTLY, IN, INTO OR FROM SWITZERLAND AND WILL NOT BE LISTED ON THE SIX SWISS EXCHANGE OR ON ANY OTHER EXCHANGE OR REGULATED TRADING FACILITY IN SWITZERLAND. NEITHER THIS OFFICIAL STATEMENT NOR ANY OTHER OFFERING OR MARKETING MATERIAL RELATING TO THE BONDS CONSTITUTES A PROSPECTUS AS SUCH TERM IS UNDERSTOOD PURSUANT TO ART. 652A OR ART. 1156 OF THE SWISS CODE OF OBLIGATIONS OR A LISTING PROSPECTUS WITHIN THE MEANING OF THE LISTING RULES OF THE SIX SWISS EXCHANGE OR ANY OTHER REGULATED TRADING FACILITY IN SWITZERLAND, AND NEITHER THIS OFFICIAL STATEMENT NOR ANY OTHER OFFERING OR MARKETING MATERIAL RELATING TO THE BONDS MAY BE PUBLICLY DISTRIBUTED OR OTHERWISE MADE PUBLICLY AVAILABLE IN SWITZERLAND. NEITHER THIS OFFICIAL STATEMENT NOR ANY OTHER OFFERING OR MARKETING MATERIAL RELATING TO THE OFFERING, NOR THE ISSUER, NOR THE BONDS HAVE BEEN OR WILL BE FILED WITH OR APPROVED BY ANY SWISS REGULATORY AUTHORITY. IN PARTICULAR, THIS OFFICIAL STATEMENT WILL NOT BE FILED WITH, AND THE OFFER OF THE BONDS WILL NOT BE SUPERVISED BY, THE SWISS FINANCIAL MARKET SUPERVISORY AUTHORITY (“FINMA”), AND THE OFFER OF BONDS HAS NOT BEEN AND WILL NOT BE AUTHORIZED UNDER THE SWISS FEDERAL ACT ON COLLECTIVE INVESTMENT SCHEMES (“CISA”). ACCORDINGLY, INVESTORS DO NOT HAVE THE BENEFIT OF THE SPECIFIC INVESTOR PROTECTION PROVIDED UNDER THE CISA.

SELLING RESTRICTIONS FOR OFFER OF SECURITIES IN SINGAPORE

THIS OFFICIAL STATEMENT HAS NOT BEEN AND WILL NOT BE REGISTERED AS A PROSPECTUS WITH THE MONETARY AUTHORITY OF SINGAPORE. ACCORDINGLY, THIS OFFICIAL STATEMENT AND ANY OTHER DOCUMENT OR MATERIAL IN CONNECTION WITH THE OFFER OR SALE, OR INVITATION FOR SUBSCRIPTION OR PURCHASE, OF THE BONDS MAY NOT BE CIRCULATED OR DISTRIBUTED, NOR MAY THE BONDS BE OFFERED OR SOLD, OR BE MADE THE SUBJECT OF AN INVITATION FOR SUBSCRIPTION OR PURCHASE, WHETHER DIRECTLY OR INDIRECTLY, TO PERSONS IN SINGAPORE OTHER THAN (I) TO AN INSTITUTIONAL INVESTOR (AS DEFINED IN SECTION 4A OF THE SECURITIES AND FUTURES ACT, CHAPTER 289 OF SINGAPORE (THE “SFA”)) UNDER SECTION 274 OF THE SFA, (II) TO A RELEVANT PERSON (AS DEFINED IN SECTION 275(2) OF THE SFA) PURSUANT TO SECTION 275(1), OR ANY PERSON PURSUANT TO SECTION 275(1A), AND IN ACCORDANCE WITH THE CONDITIONS SPECIFIED IN SECTION 275, OF THE SFA AND (WHERE APPLICABLE) REGULATION 3 OF THE SECURITIES AND FUTURES (CLASSES

OF INVESTORS) REGULATIONS 2018, WHERE EACH SUCH PERSON IS (1) AN EXPERT INVESTOR (AS DEFINED IN SECTION 4A OF THE SFA) OR (2) NOT AN INDIVIDUAL.

WHERE THE BONDS ARE SUBSCRIBED OR PURCHASED UNDER SECTION 275 OF THE SFA BY A RELEVANT PERSON WHICH IS:

- (A) A CORPORATION (WHICH IS NOT AN ACCREDITED INVESTOR (AS DEFINED IN SECTION 4A OF THE SFA)) THE SOLE BUSINESS OF WHICH IS TO HOLD INVESTMENTS AND THE ENTIRE SHARE CAPITAL OF WHICH IS OWNED BY ONE OR MORE INDIVIDUALS, EACH OF WHOM IS AN ACCREDITED INVESTOR; OR
- (B) A TRUST (WHERE THE TRUSTEE IS NOT AN ACCREDITED INVESTOR) WHOSE SOLE PURPOSE IS TO HOLD INVESTMENTS AND EACH BENEFICIARY OF THE TRUST IS AN INDIVIDUAL WHO IS AN ACCREDITED INVESTOR,

SECURITIES OR SECURITIES-BASED DERIVATIVES CONTRACTS (EACH TERM AS DEFINED IN THE SFA) OF THAT CORPORATION OR THE BENEFICIARIES' RIGHTS AND INTEREST (HOWSOEVER DESCRIBED) IN THAT TRUST SHALL NOT BE TRANSFERRED WITHIN SIX MONTHS AFTER THAT CORPORATION OR THAT TRUST HAS ACQUIRED SUCH BONDS PURSUANT TO AN OFFER MADE UNDER SECTION 275 OF THE SFA, EXCEPT:

- (1) TO AN INSTITUTIONAL INVESTOR OR TO A RELEVANT PERSON, OR TO ANY PERSON ARISING FROM AN OFFER REFERRED TO IN SECTION 275(1A) OR SECTION 276(4)(I)(B) OF THE SFA;
- (2) WHERE NO CONSIDERATION IS OR WILL BE GIVEN FOR THE TRANSFER;
- (3) WHERE THE TRANSFER IS BY OPERATION OF LAW;
- (4) AS SPECIFIED IN SECTION 276(7) OF THE SFA; OR
- (5) AS SPECIFIED IN REGULATION 37A OF THE SECURITIES AND FUTURES (OFFERS OF INVESTMENTS) (SECURITIES-BASED DERIVATIVES CONTRACTS) REGULATIONS 2018 OF SINGAPORE.

NOTICE TO INVESTORS IN JAPAN

THE BONDS HAVE NOT BEEN AND WILL NOT BE REGISTERED UNDER THE FINANCIAL INSTRUMENTS AND EXCHANGE ACT OF JAPAN (NO. 25 OF 1948, AS AMENDED, THE "FIEA"). NEITHER THE BONDS NOR ANY INTEREST THEREIN MAY BE OFFERED OR SOLD, DIRECTLY OR INDIRECTLY, IN JAPAN OR TO, OR FOR THE BENEFIT OF, ANY "RESIDENT" OF JAPAN (AS DEFINED UNDER ITEM 5, PARAGRAPH 1, ARTICLE G OF THE FOREIGN EXCHANGE AND FOREIGN TRADE ACT (ACT NO. 228 OF 1949, AS AMENDED)), OR TO OTHERS FOR RE-OFFERING OR RESALE, DIRECTLY OR INDIRECTLY, IN JAPAN OR TO, OR FOR THE BENEFIT OF, ANY RESIDENT OF JAPAN, EXCEPT PURSUANT TO AN EXEMPTION FROM THE REGISTRATION REQUIREMENTS OF, AND OTHERWISE IN COMPLIANCE WITH, THE FIEA AND ANY OTHER APPLICABLE LAWS, REGULATIONS AND MINISTERIAL GUIDELINES OF JAPAN.

THE PRIMARY OFFERING OF THE BONDS AND THE SOLICITATION OF AN OFFER FOR ACQUISITION THEREOF HAVE NOT BEEN AND WILL NOT BE REGISTERED UNDER PARAGRAPH I, ARTICLE 4 OF THE FIEA. AS IT IS A PRIMARY OFFERING, IN JAPAN, THE BONDS MAY ONLY BE OFFERED, SOLD, RESOLD OR OTHERWISE TRANSFERRED, DIRECTLY OR INDIRECTLY TO, OR FOR THE BENEFIT OF CERTAIN QUALIFIED INSTITUTIONAL INVESTORS AS DEFINED IN THE FIEA ("QIIs"). A QII WHO PURCHASED OR OTHERWISE OBTAINED THE BONDS CANNOT RESELL OR OTHERWISE TRANSFER THE BONDS IN JAPAN TO ANY PERSON EXCEPT ANOTHER QII.

SAN FRANCISCO PUBLIC UTILITIES COMMISSION

Ann Moller Caen, President
Francesca Vietor, Vice President
Anson Moran, Commissioner
Sophie Maxwell, Commissioner
Tim Paulson, Commissioner

PUBLIC UTILITIES COMMISSION OFFICIALS

Harlan L. Kelly, Jr., General Manager
Michael Carlin, Deputy General Manager and Chief Operating Officer
Steven R. Ritchie, Assistant General Manager, Water Enterprise
Eric L. Sandler, Assistant General Manager, Business Services and Chief Financial Officer
Juliet Ellis, Assistant General Manager, External Affairs and Chief Strategy Officer
Barbara Hale, Assistant General Manager, Power Enterprise
Kathy How, Assistant General Manager, Infrastructure Division
Gregory J. Norby, Assistant General Manager, Wastewater Enterprise

CITY AND COUNTY OF SAN FRANCISCO

MAYOR

London Breed

BOARD OF SUPERVISORS

Norman Yee, District 7, President

Matt Haney, District 6
Sandra Lee Fewer, District 1
Rafael Mandelman, District 8
Gordon Mar, District 4
Aaron Peskin, District 3

Dean Preston, District 5
Hillary Ronen, District 9
Ahsha Safai, District 11
Catherine Stefani, District 2
Shamann Walton, District 10

CITY ATTORNEY

Dennis J. Herrera

CITY TREASURER

José Cisneros

OTHER CITY AND COUNTY OFFICIALS

Benjamin Rosenfield, Controller
Naomi Kelly, City Administrator

SPECIAL SERVICES

Bond Counsel

Norton Rose Fulbright US LLP
San Francisco, California

Disclosure Counsel

Orrick, Herrington & Sutcliffe LLP
San Francisco, California

Verification Agent

Casey Demgen & Moore P.C.
Denver, Colorado

Co-Municipal Advisors

Backstrom McCarley Berry & Co., LLC
San Francisco, California

Montague DeRose and Associates, LLC
Walnut Creek, California

Trustee

U.S. Bank National Association
San Francisco, California

OFFICIAL STATEMENT

\$656,955,000

**PUBLIC UTILITIES COMMISSION OF THE CITY AND COUNTY OF SAN FRANCISCO
San Francisco Water Revenue Bonds, 2019 Series ABC**

\$622,580,000
2019 Sub-Series A Bonds
(Refunding – Federally Taxable) (WSIP)
(Green Bonds)

\$16,450,000
2019 Sub-Series B Bonds
(Refunding – Federally Taxable)
(Hetch Hetchy)

\$17,925,000
2019 Sub-Series C Bonds
(Refunding – Federally Taxable)
(Local Water Main)

INTRODUCTION

This Introduction is qualified in its entirety by reference to the more detailed information included and referred to elsewhere in this Official Statement. The offering of the 2019 Series ABC Bonds to potential investors is made only by means of the entire Official Statement. Terms used in this Introduction and not otherwise defined have the respective meanings assigned to them elsewhere in this Official Statement, including “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE.”

General

This Official Statement, including the cover page and Appendices hereto, is provided to furnish certain information in connection with the offering by the Public Utilities Commission of the City and County of San Francisco (the “**SFPUC**”) of its San Francisco Water Revenue Bonds, 2019 Series ABC, 2019 Sub-Series A Bonds (Refunding – Federally Taxable) (WSIP) (Green Bonds) (the “**2019 Sub-Series A Bonds**”), its San Francisco Water Revenue Bonds, 2019 Series ABC, 2019 Sub-Series B Bonds (Refunding – Federally Taxable) (Hetch Hetchy) (the “**2019 Sub-Series B Bonds**”), and its San Francisco Water Revenue Bonds, 2019 Series ABC, 2019 Sub-Series C Bonds (Refunding – Federally Taxable) (Local Water Main) (the “**2019 Sub-Series C Bonds**” and, together with the 2019 Sub-Series A Bonds and the 2019 Sub-Series B Bonds, the “**2019 Series ABC Bonds**”).

Authority for Issuance

The SFPUC is issuing the 2019 Series ABC Bonds pursuant to authority granted by Section 9.109 of the Charter (the “**Charter**”) of the City and County of San Francisco (the “**City**”) and Ordinance No. 143-18, passed by the Board of Supervisors of the City (the “**Board of Supervisors**”) on June 12, 2018 (“**Ordinance No. 143-18**”), as amended by Ordinance No. 153-19, passed by the Board of Supervisors on June 25, 2019 (“**Ordinance No. 153-19**”). The 2019 Series ABC Bonds are being issued under a resolution adopted by the SFPUC governing body (the “**Commission**”) on November 26, 2019.

The 2019 Sub-Series A Bonds will be issued under a Thirty-Second Supplemental Indenture, dated as of December 1, 2019 (the “**Thirty-Second Supplemental Indenture**”), by and between the SFPUC and U.S. Bank National Association, as trustee (the “**Trustee**”). The 2019 Sub-Series B Bonds will be issued under a Thirty-Third Supplemental Indenture, dated as of December 1, 2019 (the “**Thirty-Third Supplemental Indenture**”), by and between the SFPUC and the Trustee. The 2019 Sub-Series C Bonds will be issued under a Thirty-Fourth Supplemental Indenture, dated as of December 1, 2019 (the “**Thirty-Fourth Supplemental Indenture**”), by and between the SFPUC and the Trustee. The Thirty-Second Supplemental Indenture, the Thirty-Third Supplemental Indenture and the Thirty-Fourth Supplemental Indenture each supplement the Amended and Restated Indenture, dated as of August 1, 2002 (as supplemented and amended to date, the “**Indenture**”), by and between the SFPUC and the Trustee.

See “OBLIGATIONS PAYABLE FROM REVENUES – Authority for Issuance of Revenue Bonds and Other Obligations Payable from Revenues.”

Plan of Refunding

The 2019 Series ABC Bonds are being issued to (i) refund and defease all or a portion of various series of the SFPUC's Outstanding Bonds (as defined herein), as applicable, and (ii) pay the costs of issuance of the 2019 Series ABC Bonds. See "PLAN OF REFUNDING," "ESTIMATED SOURCES AND USES OF FUNDS" and "OBLIGATIONS PAYABLE FROM REVENUES – Outstanding Parity Revenue Bonds."

The SFPUC and the Water Enterprise

The SFPUC is a department of the City responsible for the maintenance, operation and development of three utility enterprises. See "THE PUBLIC UTILITIES COMMISSION."

The SFPUC owns and operates a municipal water supply, storage and distribution system (the "**Water Enterprise**") that provides drinking water to retail customers in the City and certain retail customers outside of the City (the "**Retail Customers**") and to wholesale customers in three other San Francisco Bay Area counties (the "**Wholesale Customers**"). The Water Enterprise consists of water treatment and distribution facilities located outside of the City (the "**Regional Water System**") and water treatment and distribution facilities located inside the City (the "**In-City Distribution System**"). See "WATER FACILITIES."

Water rates for Retail Customers are set by the SFPUC, subject to rejection by resolution of the Board of Supervisors. Water rates for Wholesale Customers are set pursuant to the Water Supply Agreement, which became effective in July 2009 (the "**Water Supply Agreement**" or "**WSA**"), between the City and the Wholesale Customers. See "FINANCIAL OPERATIONS" and "APPENDIX B – SUMMARY OF CERTAIN PROVISIONS OF THE WATER SUPPLY AGREEMENT."

The other two enterprises of the SFPUC provide wastewater services to customers in the City and to several wholesale customers outside of the City, and power, mainly hydroelectric, for City government operations and to other users. The revenues of these other two enterprises are not available for, and do not secure, payment of the principal of, premium, if any, or interest on the Bonds (as defined herein), including the 2019 Series ABC Bonds.

Security for the Bonds

Under the Indenture, the SFPUC has irrevocably pledged the Revenues of its Water Enterprise and all Refundable Credits (in the case of Bonds issued as Build America Bonds) received by the SFPUC to the punctual payment of principal of, premium, if any, and interest on the 2019 Series ABC Bonds and all outstanding parity revenue bonds, notes or other evidences of indebtedness authorized by the Indenture (collectively, the "**Bonds**"), subject to the allocation of funds provided in the Indenture. The 2019 Series ABC Bonds are payable on parity with certain Outstanding Bonds previously issued by the SFPUC under the Indenture.

The SFPUC is not obligated to pay the principal of, premium, if any, or interest on the 2019 Series ABC Bonds except from Revenues of the Water Enterprise. The SFPUC has no taxing power. The General Fund of the City is not liable for the payment of the principal of, premium, if any, or interest on the 2019 Series ABC Bonds, and neither the credit nor the taxing power of the City is pledged to the payment of the principal of, premium, if any, or interest on the 2019 Series ABC Bonds. The 2019 Series ABC Bonds are not secured by a legal or equitable pledge of, or charge, lien or encumbrance upon, any of the property of the City or of the SFPUC or any of its income or receipts, except Revenues of the Water Enterprise.

No Bond Reserve Account will be established for the 2019 Series ABC Bonds. Bond Reserve Accounts have been established with respect to certain other series of Bonds but such Bond Reserve Accounts do not secure the 2019 Series ABC Bonds.

See "SECURITY FOR THE BONDS."

Outstanding and Future Parity Bonds and Other Indebtedness

The SFPUC has previously issued Bonds, and in the future expects to issue additional Bonds, pursuant to the Indenture and secured by Revenues of the Water Enterprise on parity with the 2019 Series ABC Bonds. See “OBLIGATIONS PAYABLE FROM REVENUES.”

The Indenture provides that additional series of Bonds secured by Revenues on parity with the Outstanding Bonds and the 2019 Series ABC Bonds (each an “**Additional Series of Bonds**”) may be issued if certain conditions are met. See “SECURITY FOR THE BONDS – Additional Series of Bonds.”

The SFPUC may issue additional Bonds from time to time to fund additional capital projects (see “FINANCING OF CAPITAL IMPROVEMENTS”) and may also issue refunding Bonds in response to market conditions in order to achieve debt service savings (see “SECURITY FOR THE BONDS – Refunding Bonds”).

Risk Factors

Investment in the 2019 Series ABC Bonds is subject to material risks. For a general overview of certain risk factors which should be considered, in addition to other matters set forth in this Official Statement, in evaluating an investment in the 2019 Series ABC Bonds, see “RISK FACTORS.”

Continuing Disclosure

The SFPUC has covenanted for the benefit of the Owners and Beneficial Owners of the 2019 Series ABC Bonds to provide certain financial information and operating data not later than nine months following the end of its Fiscal Year (presently June 30), beginning on March 31, 2020, with the report for Fiscal Year 2018-19, and to provide notices of the occurrence of certain enumerated events. These covenants have been made in order to assist the Underwriters in complying with Rule 15c2-12(b)(5) of the Securities and Exchange Commission (the “**Rule**”). See “CONTINUING DISCLOSURE” and “APPENDIX E – FORM OF CONTINUING DISCLOSURE CERTIFICATE.”

Other Matters

Brief descriptions of the 2019 Series ABC Bonds, the security and sources of payment for the 2019 Series ABC Bonds, the SFPUC, the Water Enterprise, the SFPUC’s capital improvement program are provided herein. Such descriptions do not purport to be comprehensive or definitive. Definitions of certain capitalized terms used herein may be found in “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE.” All references made to various documents herein are qualified in their entirety by reference to the forms thereof, all of which are available for inspection at the office of the SFPUC at:

San Francisco Public Utilities Commission
525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102
Attention: Assistant General Manager, Business Services and Chief Financial Officer
(415) 554-3155

THE 2019 SERIES ABC BONDS

General

The 2019 Series ABC Bonds will be dated as of their date of delivery and will accrue interest from their date of delivery at the rates per annum set forth on the inside cover page of this Official Statement. Interest on the 2019 Series ABC Bonds will be calculated on the basis of a 360-day year composed of twelve 30-day months. Interest on the 2019 Series ABC Bonds is payable on May 1 and November 1 of each year, beginning November 1, 2020.

The 2019 Series ABC Bonds will mature on the dates and in the principal amounts set forth on the inside cover page of this Official Statement. The 2019 Series ABC Bonds will be issued in fully registered form in denominations of \$5,000 or any integral multiple of \$5,000.

Under the Indenture, the record date with respect to the payment of principal of and interest on the 2019 Series ABC Bonds is the 15th day of the month immediately preceding an interest payment date, whether or not such day is a Business Day.

Securities Depository and Book-Entry Only System

The 2019 Series ABC Bonds will be registered in the name of Cede & Co., as nominee for The Depository Trust Company (“DTC”), New York, New York, as the Owner of the 2019 Series ABC Bonds. So long as DTC, or its nominee, Cede & Co., is the Owner of the 2019 Series ABC Bonds, all payments on the 2019 Series ABC Bonds will be made directly to DTC. Disbursement of such payments to the DTC Participants will be the responsibility of DTC, and disbursement of such payments to the Beneficial Owners of the 2019 Series ABC Bonds will be the responsibility of the DTC Participants. See “APPENDIX F – INFORMATION REGARDING BOOK-ENTRY ONLY SYSTEM AND GLOBAL CLEARANCE PROCEDURES.”

Redemption

Make-Whole Optional Redemption of 2019 Sub-Series A Bonds. The 2019 Sub-Series A Bonds maturing on or before November 1, 2029, shall be subject to redemption either in whole or in part, at the option of the SFPUC, at any time, at a redemption price equal to the greater of (i) 100% of the principal amount thereof or (ii) the Discounted Value thereof, plus in either case, accrued interest thereon to the date of redemption. The 2019 Sub-Series A Bonds may be redeemed in any order of maturity and in any principal amount within a maturity as selected by the SFPUC in its sole discretion. All calculations and determinations referred to under this caption “Make-Whole Optional Redemption of 2019 Sub-Series A Bonds,” except as provided in the preceding sentence, are expected (but not required) to be made by a financial advisor or other agent selected by the SFPUC for such purposes (the “**Calculation Agent**”).

“**Discounted Value**” means, with respect to each outstanding maturity of the 2019 Sub-Series A Bonds to be redeemed, the sum as determined by the SFPUC or the Calculation Agent of the amounts obtained by discounting all remaining scheduled payments of principal and interest (exclusive of interest accrued to the date of redemption) on such maturity from their respective scheduled payment dates to the applicable redemption date, at a yield (computed on a semi-annual basis, assuming a 360-day year consisting of twelve 30-day months) equal to the applicable Discount Yield.

“**Discount Yield**” means, the Blended Treasury Yield determined by the SFPUC or the Calculation Agent with respect to the 2019 Sub-Series A Bonds maturity to be redeemed, plus 10 basis points. The Discount Yield will be calculated assuming semi-annual compounding based upon a 360-day year consisting of twelve 30-day months.

“**Blended Treasury Yield**” means, with respect to the 2019 Sub-Series A Bonds of a particular maturity, the yield computed by the SFPUC or the Calculation Agent as the linear interpolation of two Market Treasury Yields such that the theoretical maturity that corresponds to the interpolated Market Treasury Yield equals the date that corresponds to the remaining average life of the 2019 Sub-Series A Bonds maturity to be redeemed from the

redemption date. The first Market Treasury Yield shall be based on an actively traded U.S. Treasury security or U.S. Treasury index whose maturity is closest to but no later than the date corresponding to the remaining average life of the 2019 Sub-Series A Bonds maturity to be redeemed; the second Market Treasury Yield shall be based on an actively traded U.S. Treasury security or U.S. Treasury index whose maturity is closest to but no earlier than the date corresponding to the remaining average life of the 2019 Sub-Series A Bonds maturity to be redeemed.

“**Market Treasury Yield**” means that yield, as determined by the SFPUC or the Calculation Agent, assuming semi-annual compounding based upon a 360-day year consisting of twelve 30-day months, which is equal to:

(i) the yield for the applicable maturity of an actively traded U.S. Treasury security, reported, as of 11:00 a.m., New York City time, on the Valuation Date on the display designated as “Page PXI” of the Bloomberg Financial Markets Services Screen (or, if not available, any other nationally recognized trading screen reporting on-line intraday trading in U.S. Treasury securities); or

(ii) if the yield described in (i) above is not reported as of such time or the yield reported as of such time is not ascertainable, the most recent yield data for the applicable U.S. Treasury maturity index from the federal Reserve Statistical Release H.15 Daily Update (or any comparable or successor publication) reported, as of 11:00 a.m., New York City time, on the Valuation Date; or

(iii) if the yields described in (i) and (ii) above are not reported as of such time or the yields reported as of such time are not ascertainable, the yield for the applicable maturity of any actively traded U.S. Treasury security shall be based upon the average of yield quotations for such security (after excluding the highest and lowest quotations) as of 3:30 p.m., New York City time, on the Valuation Date received from no less than five primary dealers in U.S. Government securities selected by the SFPUC.

“**Valuation Date**” means no less than the third Business Day nor more than the twentieth Business Day preceding the redemption date.

Each yield quotation for each actively traded U.S. Treasury security required in (i) and (iii) of the definition of Market Treasury Yield above shall be determined using the average of the bid and ask prices for that security.

Optional Redemption of 2019 Sub-Series A Bonds. The 2019 Sub-Series A Bonds maturing on and after November 1, 2030, are subject to redemption prior to their stated maturity, at the option of the SFPUC, from any source of available funds, as a whole or in part, on any date on or after November 1, 2029, from such maturities or portions of maturities as are determined by the SFPUC and by lot within any one maturity, at a redemption price equal to 100% of the principal amount of the 2019 Sub-Series A Bonds to be redeemed, plus accrued interest thereon to the date fixed for redemption, without premium.

Optional Redemption of 2019 Sub-Series B Bonds. The 2019 Sub-Series B Bonds maturing on and after November 1, 2030, are subject to redemption prior to their stated maturity, at the option of the SFPUC, from any source of available funds, as a whole or in part, on any date on or after November 1, 2029, from such maturities or portions of maturities as are determined by the SFPUC and by lot within any one maturity, at a redemption price equal to 100% of the principal amount of the 2019 Sub-Series B Bonds to be redeemed, plus accrued interest thereon to the date fixed for redemption, without premium.

Optional Redemption of 2019 Sub-Series C Bonds. The 2019 Sub-Series C Bonds maturing on and after November 1, 2030, are subject to redemption prior to their stated maturity, at the option of the SFPUC, from any source of available funds, as a whole or in part, on any date on or after November 1, 2029, from such maturities or portions of maturities as are determined by the SFPUC and by lot within any one maturity, at a redemption price equal to 100% of the principal amount of the 2019 Sub-Series C Bonds to be redeemed, plus accrued interest thereon to the date fixed for redemption, without premium.

Mandatory Sinking Fund Redemption of 2019 Sub-Series A Bonds. The 2019 Sub-Series A Bonds maturing on November 1, 2039 (the “**2039 Sub-Series A Term Bonds**”), are further subject to redemption prior to their stated maturity, and payable from the 2019 Sub-Series A Sinking Fund Account, on each November 1 on and after November 1, 2035, by lot within any such maturity if less than all of the 2019 Sub-Series A Bonds of such maturity are then being redeemed, upon payment of the principal amount thereof and accrued interest thereon to the date fixed for redemption, without premium.

The 2039 Sub-Series A Term Bonds are subject to mandatory redemption on November 1 in each of the years and in the respective principal amounts as follows (such schedule subject to adjustment as directed by the SFPUC in the event of optional redemption of any portion of such 2039 Sub-Series A Term Bonds prior to maturity as described above):

Redemption Date (November 1)	Principal Amount
2035	\$63,930,000
2036	80,670,000
2037	86,145,000
2038	38,500,000
2039*	39,650,000

*Maturity.

The 2019 Sub-Series A Bonds maturing on November 1, 2043 (the “**2043 Sub-Series A Term Bonds**”), are further subject to redemption prior to their stated maturity, and payable from the 2019 Sub-Series A Sinking Fund Account, on each November 1 on and after November 1, 2040, by lot within any such maturity if less than all of the 2019 Sub-Series A Bonds of such maturity are then being redeemed, upon payment of the principal amount thereof and accrued interest thereon to the date fixed for redemption, without premium.

The 2043 Sub-Series A Term Bonds are subject to mandatory redemption on November 1 in each of the years and in the respective principal amounts as follows (such schedule subject to adjustment as directed by the SFPUC in the event of optional redemption of any portion of such 2043 Sub-Series A Term Bonds prior to maturity as described above):

Redemption Date (November 1)	Principal Amount
2040	\$40,970,000
2041	42,370,000
2042	59,450,000
2043*	61,550,000

*Maturity.

Mandatory Sinking Fund Redemption of 2019 Sub-Series B Bonds. The 2019 Sub-Series B Bonds maturing on November 1, 2034 (the “**2034 Sub-Series B Term Bonds**”), are further subject to redemption prior to their stated maturity, and payable from the 2019 Sub-Series B Sinking Fund Account, on each November 1 on and after November 1, 2021, by lot within any such maturity if less than all of the 2019 Sub-Series B Bonds of such maturity are then being redeemed, upon payment of the principal amount thereof and accrued interest thereon to the date fixed for redemption, without premium.

The 2034 Sub-Series B Term Bonds are subject to mandatory redemption on November 1 in each of the years and in the respective principal amounts as follows (such schedule subject to adjustment as directed by the SFPUC in the event of optional redemption of any portion of such 2034 Sub-Series B Term Bonds prior to maturity as described above):

Redemption Date (November 1)	Principal Amount
2021	\$ 65,000
2022	70,000
2023	70,000
2024	75,000
2025	75,000
2026	80,000
2027	80,000
2028	85,000
2029	85,000
2030	90,000
2031	90,000
2032	1,340,000
2033	1,385,000
2034*	1,425,000

*Maturity.

The 2019 Sub-Series B Bonds maturing on November 1, 2041 (the “**2041 Sub-Series B Term Bonds**”), are further subject to redemption prior to their stated maturity, and payable from the 2019 Sub-Series B Sinking Fund Account, on each November 1 on and after November 1, 2035, by lot within any such maturity if less than all of the 2019 Sub-Series B Bonds of such maturity are then being redeemed, upon payment of the principal amount thereof and accrued interest thereon to the date fixed for redemption, without premium.

The 2041 Sub-Series B Term Bonds are subject to mandatory redemption on November 1 in each of the years and in the respective principal amounts as follows (such schedule subject to adjustment as directed by the SFPUC in the event of optional redemption of any portion of such 2041 Sub-Series B Term Bonds prior to maturity as described above):

Redemption Date (November 1)	Principal Amount
2035	\$1,470,000
2036	1,525,000
2037	1,575,000
2038	1,630,000
2039	1,690,000
2040	1,745,000
2041*	1,800,000

*Maturity.

Mandatory Sinking Fund Redemption of 2019 Sub-Series C Bonds. The 2019 Sub-Series C Bonds maturing on November 1, 2034 (the “**2034 Sub-Series C Term Bonds**”), are further subject to redemption prior to their stated maturity, and payable from the 2019 Sub-Series C Sinking Fund Account, on each November 1 on and after November 1, 2021, by lot within any such maturity if less than all of the 2019 Sub-Series C Bonds of such maturity are then being redeemed, upon payment of the principal amount thereof and accrued interest thereon to the date fixed for redemption, without premium.

The 2034 Sub-Series C Term Bonds are subject to mandatory redemption on November 1 in each of the years and in the respective principal amounts as follows (such schedule subject to adjustment as directed by the SFPUC in the event of optional redemption of any portion of such 2034 Sub-Series C Term Bonds prior to maturity as described above):

Redemption Date (November 1)	Principal Amount
2021	\$ 75,000
2022	75,000
2023	80,000
2024	80,000
2025	80,000
2026	85,000
2027	90,000
2028	90,000
2029	95,000
2030	95,000
2031	100,000
2032	1,465,000
2033	1,510,000
2034*	1,550,000

*Maturity.

The 2019 Sub-Series C Bonds maturing on November 1, 2041 (the “**2041 Sub-Series C Term Bonds**” and, together with the 2039 Sub-Series A Term Bonds, the 2043 Sub-Series A Term Bonds, the 2034 Sub-Series B Term Bonds, the 2041 Sub-Series B Term Bonds and the 2034 Sub-Series C Term Bonds, the “**2019 Series ABC Term Bonds**”), are further subject to redemption prior to their stated maturity, and payable from the 2019 Sub-Series C Sinking Fund Account, on each November 1 on and after November 1, 2035, by lot within any such maturity if less than all of the 2019 Sub-Series C Bonds of such maturity are then being redeemed, upon payment of the principal amount thereof and accrued interest thereon to the date fixed for redemption, without premium.

The 2041 Sub-Series C Term Bonds are subject to mandatory redemption on November 1 in each of the years and in the respective principal amounts as follows (such schedule subject to adjustment as directed by the SFPUC in the event of optional redemption of any portion of such 2041 Sub-Series C Term Bonds prior to maturity as described above):

Redemption Date (November 1)	Principal Amount
2035	\$1,600,000
2036	1,660,000
2037	1,720,000
2038	1,775,000
2039	1,835,000
2040	1,900,000
2041*	1,965,000

*Maturity.

Purchase In Lieu of Mandatory Sinking Fund Redemption. In lieu of mandatory sinking fund redemption of the 2019 Series ABC Bonds as described above, the SFPUC may satisfy, in whole or in part, the related minimum Sinking Fund Account payment amounts and redemption of 2019 Series ABC Term Bonds of the respective Sub-Series by depositing with the Trustee 2019 Series ABC Term Bonds of the respective Sub-Series for cancellation prior to the Trustee’s selection of the 2019 Series ABC Term Bonds of such Sub-Series for redemption, or may request the Trustee to purchase 2019 Series ABC Term Bonds of the respective Sub-Series, at public or private sale as and when and at such prices (including brokerage and other charges and including accrued interest) as the SFPUC

may direct, not to exceed the principal amount thereof. The par amount of any of such 2019 Series ABC Bonds so deposited or purchased in any twelve-month period ending on September 15 in any year will be credited towards and will reduce the par amount of such 2019 Series ABC Bonds required to be redeemed as described above on the next succeeding November 1.

Selection of 2019 Series ABC Bonds for Redemption. If the 2019 Series ABC Bonds are not registered in book-entry only form, any redemption of less than all of a maturity of the 2019 Series ABC Bonds shall be effected by the SFPUC or the Paying Agent among owners on a pro rata basis in the principal amount of \$5,000 or any integral multiple thereof. The particular 2019 Series ABC Bonds to be redeemed shall be determined by the SFPUC or the Paying Agent, using such method as the SFPUC or the Paying Agent shall deem fair and appropriate.

If the 2019 Series ABC Bonds are registered in book-entry only form and so long as DTC or a successor securities depository is the sole registered owner of the 2019 Series ABC Bonds, if less than all of the 2019 Series ABC Bonds of a maturity are called for prior redemption, the particular 2019 Series ABC Bonds or portions thereof to be redeemed shall be selected on a “Pro Rata Pass-Through Distribution of Principal” basis in accordance with DTC procedures, provided that, so long as the 2019 Series ABC Bonds are held in book-entry form, the selection for redemption of such 2019 Series ABC Bonds shall be made in accordance with the operational arrangements of DTC then in effect that currently provide for adjustment of the principal by a factor provided by the SFPUC or the Paying Agent pursuant to DTC operational arrangements. If the SFPUC or the Paying Agent do not provide the necessary information and identify the redemption as on a Pro Rata Pass-Through Distribution of Principal basis, the 2019 Series ABC Bonds will be selected for redemption in accordance with DTC procedures by lot.

It is the SFPUC’s intent with respect to the 2019 Series ABC Bonds that redemption allocations made by DTC, the DTC Participants or such other intermediaries that may exist between the SFPUC and the Beneficial Owners be made on a “Pro Rata Pass-Through Distribution of Principal” basis as described above. However, the SFPUC can provide no assurance that DTC, the DTC Participants or any other intermediaries will allocate redemptions among Beneficial Owners on such basis. If the DTC operational arrangements do not allow for the redemption of the 2019 Series ABC Bonds on a Pro Rata Pass-Through Distribution of Principal basis as discussed above, then the 2019 Series ABC Bonds will be selected for redemption in accordance with DTC procedures by lot.

Notice of Redemption. Notice of redemption will be mailed by the Trustee at least 30 days but not more than 60 days prior to the redemption date, to DTC (so long as DTC’s book-entry system is used). The actual receipt by the owner of any 2019 Series ABC Bond of notice of such redemption is not a condition precedent to redemption, and failure to receive a redemption notice or any defect in a redemption notice will not affect the validity of the proceedings for the redemption of such 2019 Series ABC Bond or the cessation of the accrual of interest on the date fixed for such redemption. See “APPENDIX F – INFORMATION REGARDING BOOK-ENTRY ONLY SYSTEM AND GLOBAL CLEARANCE PROCEDURES.”

Rescission of Notice of Redemption. The SFPUC may, at its option, prior to the date fixed for redemption in any notice of optional redemption, rescind and cancel such notice of redemption by written request to the Trustee and the Trustee will mail notice of such cancellation to the recipients of the notice of redemption being cancelled.

Effect of Redemption. When notice of redemption has been duly given as described above, and moneys for payment of the redemption price are held by the Trustee, the 2019 Series ABC Bonds called for redemption will, on the redemption date designated in such notice, become due and payable at the redemption price specified in such notice; and from and after the date so designated interest on such 2019 Series ABC Bonds called for redemption will cease to accrue, and such 2019 Series ABC Bonds will cease to be entitled to any benefit or security under the Indenture, and the Owners of said 2019 Series ABC Bonds will have no rights in respect thereof except to receive payment of the redemption price thereof. The Trustee, upon surrender for payment of any of said 2019 Series ABC Bonds will pay such 2019 Series ABC Bonds at the applicable redemption price, together with accrued interest thereon. All 2019 Series ABC Bonds redeemed will be cancelled upon surrender and no 2019 Series ABC Bonds will be issued in place thereof.

Defeasance

The obligations of the SFPUC and the pledge, lien, covenants and agreements of the SFPUC made or provided for in the Indenture will be fully discharged and satisfied as to any 2019 Series ABC Bond will no longer be deemed outstanding thereunder if certain conditions set forth in the Indenture are satisfied. See “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE – DEFEASANCE.”

PLAN OF REFUNDING

General

The proceeds of the 2019 Sub-Series A Bonds, together with certain other moneys available for such purpose, will be applied to (i) refund all of the SFPUC’s outstanding San Francisco Water Revenue Bonds, 2010 Sub-Series F Bonds (the “**2010 Sub-Series F Bonds**”), (ii) refund all of the SFPUC’s outstanding San Francisco Water Revenue Bonds, 2011 Sub-Series A Bonds (WSIP) (the “**2011 Sub-Series A Bonds**”), (iii) refund a portion of the SFPUC’s outstanding San Francisco Water Revenue Bonds, 2012 Sub-Series A Bonds (WSIP) (the “**2012 Sub-Series A Bonds**”), and (iv) pay the costs of issuance of the 2019 Sub-Series A Bonds.

The proceeds of the 2019 Sub-Series B Bonds, together with certain other moneys available for such purpose, will be applied to (i) refund a portion of the SFPUC’s outstanding San Francisco Water Revenue Bonds, 2011 Sub-Series B Bonds (Hetch Hetchy), and (ii) pay the costs of issuance of the 2019 Sub-Series B Bonds.

The proceeds of the 2019 Sub-Series C Bonds, together with certain other moneys available for such purpose, will be applied to (i) refund a portion of the SFPUC’s outstanding San Francisco Water Revenue Bonds, 2011 Sub-Series C Bonds (Local Water Main), and (ii) pay the costs of issuance of the 2019 Sub-Series C Bonds.

See “OBLIGATIONS PAYABLE FROM REVENUES – Outstanding Parity Revenue Bonds.”

The following tables detail the Series, maturity dates and principal amounts of Bonds which will be refunded with proceeds of the 2019 Series ABC Bonds (the “**Refunded Bonds**”).

Refunded Bonds

*Public Utilities Commission of the City and County of San Francisco,
San Francisco Water Revenue Bonds, 2010 Sub-Series F Bonds*

Maturity	Outstanding Principal Amount	Interest Rate	CUSIP* (Base No. 79765R)	Principal Amount to be Refunded	Payment or Redemption Date
11/1/2020	\$ 5,405,000	4.000%	TQ2	\$ 5,405,000	11/01/2020
11/1/2021	13,395,000	5.000	TR0	13,395,000	11/01/2020
Total:				\$18,800,000	

* CUSIP is a registered trademark of the American Bankers Association. CUSIP data herein are provided by CUSIP Global Services (CGS), which is managed on behalf of the American Bankers Association by S&P Global Market Intelligence. This data is not intended to create a database and does not serve in any way as a substitute for the CGS data base. Neither the SFPUC nor the Underwriters assume any responsibility for the accuracy of the CUSIP data.

**Public Utilities Commission of the City and County of San Francisco,
San Francisco Water Revenue Bonds, 2011 Sub-Series A Bonds (WSIP)**

Maturity	Outstanding Principal Amount	Interest Rate	CUSIP* (Base No. 79765R)	Principal Amount to be Refunded	Payment or Redemption Date
11/1/2020	\$ 15,760,000	5.000%	UA5	\$ 15,760,000	11/01/2020
11/1/2021	16,550,000	5.000	UB3	16,550,000	11/01/2021
11/1/2031	26,960,000	4.250	UM9	26,960,000	11/01/2021
11/1/2035	32,540,000	4.500	UR8	32,540,000	11/01/2021
11/1/2036	34,000,000	5.000	US6	34,000,000	11/01/2021
11/1/2037	35,695,000	5.000	UT4	35,695,000	11/01/2021
11/1/2038	37,485,000	4.500	UU1	37,485,000	11/01/2021
11/1/2041	123,490,000	5.000	UV9	123,490,000	11/01/2021
Total:				\$322,480,000	

**Public Utilities Commission of the City and County of San Francisco,
San Francisco Water Revenue Bonds, 2011 Sub-Series B Bonds (Hetch Hetchy)**

Maturity	Outstanding Principal Amount	Interest Rate	CUSIP* (Base No. 79765R)	Principal Amount to be Refunded	Payment or Redemption Date
11/1/2032	\$1,255,000	4.500%	VW6	\$ 1,255,000	11/01/2021
11/1/2033	1,315,000	4.500	VX4	1,315,000	11/01/2021
11/1/2034	1,375,000	5.000	VY2	1,375,000	11/01/2021
11/1/2035	1,440,000	5.000	VZ9	1,440,000	11/01/2021
11/1/2036	1,515,000	5.000	WB1	1,515,000	11/01/2021
11/1/2041	8,785,000	5.000	WA3	8,785,000	11/01/2021
Total:				\$15,685,000	

**Public Utilities Commission of the City and County of San Francisco,
San Francisco Water Revenue Bonds, 2011 Sub-Series C Bonds (Local Water Main)**

Maturity	Outstanding Principal Amount	Interest Rate	CUSIP* (Base No. 79765R)	Principal Amount to be Refunded	Payment or Redemption Date
11/1/2032	\$1,370,000	4.500%	WW5	\$ 1,370,000	11/01/2021
11/1/2033	1,435,000	4.500	WX3	1,435,000	11/01/2021
11/1/2034	1,495,000	5.000	WY1	1,495,000	11/01/2021
11/1/2035	1,570,000	5.000	WZ8	1,570,000	11/01/2021
11/1/2036	1,650,000	5.000	XA2	1,650,000	11/01/2021
11/1/2041	9,575,000	5.000	XB0	9,575,000	11/01/2021
Total:				\$17,095,000	

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**Public Utilities Commission of the City and County of San Francisco,
San Francisco Water Revenue Bonds, 2012 Sub-Series A Bonds (WSIP)**

<u>Maturity</u>	<u>Outstanding Principal Amount</u>	<u>Interest Rate</u>	<u>CUSIP* (Base No. 79765R)</u>	<u>Principal Amount to be Refunded</u>	<u>Payment or Redemption Date</u>
11/1/2035	\$ 27,375,000	5.000%	XL8	\$ 27,375,000	05/01/2022
11/1/2036	43,615,000	5.000	XM6	43,615,000	05/01/2022
11/1/2037	48,695,000	5.000	XN4	48,695,000	05/01/2022
11/1/2043	123,230,000	5.000	XP9	123,230,000	05/01/2022
Total:				\$242,915,000	

A portion of the proceeds of the 2019 Series ABC Bonds in an amount sufficient to refund and legally defease the Refunded Bonds will be deposited in an Escrow Fund established by the Trustee, acting as escrow agent (the “**Escrow Agent**”), under an Escrow Agreement, dated as of December 1, 2019 (the “**Escrow Agreement**”), by and between the SFPUC and the Escrow Agent. A portion of the funds deposited in the Escrow Fund will be invested in federal securities, the principal of and interest on which, when received, will be sufficient, together with other available amounts held in the Escrow Fund, to pay the principal of and interest on the Refunded Bonds on their respective payment or redemption dates. Pursuant to the Indenture and the irrevocable instructions in the Escrow Agreement, the Refunded Bonds will be paid on their respective payment dates or redeemed on their respective redemption dates at a redemption price equal to the principal amount of the Refunded Bonds, plus accrued interest to the redemption date, without premium. As a result of the deposit and application of funds as provided in the Escrow Agreement, the Refunded Bonds will be defeased pursuant to the Indenture as of the date of issuance of the 2019 Series ABC Bonds.

Sufficiency of the deposits in the Escrow Fund for the purposes described in the previous paragraph will be verified by Causey Demgen & Moore P.C., Denver, Colorado. See “VERIFICATION OF MATHEMATICAL ACCURACY.”

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ESTIMATED SOURCES AND USES OF FUNDS

The proceeds of the 2019 Series ABC Bonds are expected to be applied as follows:

	2019 Sub-Series A Bonds	2019 Sub-Series B Bonds	2019 Sub-Series C Bonds	Total 2019 Series ABC Bonds
<u>Sources of Funds</u>				
Par Amount	\$622,580,000.00	\$16,450,000.00	\$17,925,000.00	\$656,955,000.00
Bond Reserve Fund Releases	5,172,261.98	364,444.33	397,205.99	5,933,912.30
Total Sources	<u>\$627,752,261.98</u>	<u>\$16,814,444.33</u>	<u>\$18,322,205.99</u>	<u>\$662,888,912.30</u>
<u>Uses of Funds</u>				
Deposit to Escrow Fund ⁽¹⁾	\$625,897,094.42	\$16,761,851.80	\$18,268,616.03	\$660,927,562.25
Underwriters' Discount	971,024.05	25,656.70	27,957.22	1,024,637.97
Costs of Issuance ⁽²⁾	884,143.51	26,935.83	25,632.74	936,712.08
Total Uses	<u>\$627,752,261.98</u>	<u>\$16,814,444.33</u>	<u>\$18,322,205.99</u>	<u>\$662,888,912.30</u>

⁽¹⁾ Represents deposits to the Escrow Fund established under the Escrow Agreement. See "PLAN OF REFUNDING."

⁽²⁾ The costs of issuance include amounts for legal fees, Trustee and Escrow Agent fees, municipal advisor fees, Verification Agent fees, escrow bidding agent fees, rating agency fees, printing costs, and other issuance costs relating to the issuance of the 2019 Series ABC Bonds.

GREEN BONDS DESIGNATION AND CLIMATE CERTIFICATION

Designation as Green Bonds

The SFPUC is committed to providing retail drinking water services to San Francisco and wholesale water to three Bay Area counties in a manner that values environmental and community interests, and sustains the resources entrusted to its care. The SFPUC maintains a Sustainability Plan and Program. This plan and program, among other sustainability-related information, are available at www.sfwater.org/index.aspx?page=166. *The information available on such website is not incorporated by reference into this Official Statement and should not be relied upon in making an investment in the 2019 Series ABC Bonds.*

The SFPUC is issuing the 2019 Sub-Series A Bonds as "Green Bonds" based on the climate adaptation and/or mitigation benefits of the projects financed and refinanced by the 2019 Sub-Series A Bonds.

The purpose of designating the 2019 Sub-Series A Bonds as Green Bonds is to allow investors to invest directly in bonds which finance environmentally beneficial projects ("**Green Projects**"). For purposes of such determination, the SFPUC considers the projects included in its Water System Improvement Program ("**WSIP**") to be Green Projects. The proceeds of the 2010 Sub-Series F Bonds, the 2011 Sub-Series A Bonds and the 2012 Sub-Series A Bonds, and proceeds of the 2019 Sub-Series A Bonds will be, applied to finance and refinance WSIP projects. See "PLAN OF REFUNDING," "ESTIMATED SOURCES AND USES OF FUNDS", and "CAPITAL IMPROVEMENT PROGRAM – Water System Improvement Program (WSIP)." The 2019 Sub-Series A Bonds will not constitute "exempt facility bonds" issued to finance "qualified green building and sustainable design projects" within the meaning of Section 142(1) of the Code.

The Climate Bonds Initiative and Climate Bonds

The Climate Bonds Initiative (the "**CBI**") is an international, investor-focused non-profit organization working to focus the global bond market on climate change solutions through the development and promotion of an efficient "green" bond market. The CBI has established and manages the Climate Bonds Standard (the "**Climate Bonds Standard**") under which the 2019 Sub-Series A Bonds have been certified in accordance with the "Water Criteria" of such standard. The certification of the 2019 Sub-Series A Bonds reflects only the views of the third-party verifier report approved by the Climate Bonds Standard Board. The explanation of the significance of this certification may be obtained from the CBI. The SFPUC has provided a third-party verified report to the Climate Bonds Standard Board, including information concerning prior and anticipated capital project expenditures related

to the WSIP (some of which does not appear in this Official Statement). As part of the certification process, the SFPUC retained Sustainalytics U.S., Inc., a subsidiary of Sustainalytics Holding, B.V, Netherlands (collectively, “**Sustainalytics**”), to provide a third-party verification that the 2019 Sub-Series A Bonds are aligned with the Climate Bonds Standard.

The certification of the 2019 Sub-Series A Bonds as “Climate Bonds” by the CBI is based solely on the Climate Bonds Standard and does not, and is not intended to make any representation or give any assurance with respect to any other matter relating to the 2019 Sub-Series A Bonds or any WSIP project, including but not limited to this Official Statement, the transaction documents, the SFPUC or the management of the SFPUC.

The certification of the 2019 Sub-Series A Bonds as “Climate Bonds” by the CBI was addressed solely to the SFPUC and is not a recommendation to any person to purchase, hold or sell the 2019 Sub-Series A Bonds and such certification does not address the market price or suitability of the 2019 Sub-Series A Bonds for a particular investor. The certification also does not address the merits of the decision by the SFPUC or any third party to participate in any WSIP project and does not express and should not be deemed to be an expression of an opinion as to the SFPUC or any aspect of any WSIP project (including but not limited to the financial viability of any WSIP project) other than with respect to conformance with the Climate Bonds Standard.

In issuing or monitoring, as applicable, the certification, the CBI has assumed and relied upon and will assume and rely upon the accuracy and completeness in all material respects of the information supplied or otherwise made available to the CBI. The CBI does not assume or accept any responsibility to any person for independently verifying (and it has not verified) such information or to undertake (and it has not undertaken) any independent evaluation of any WSIP project or the SFPUC. In addition, the CBI does not assume any obligation to conduct (and it has not conducted) any physical inspection of any WSIP project. The certification may only be used with the 2019 Sub-Series A Bonds and may not be used for any other purpose without the CBI’s prior written consent.

The certification does not and is not in any way intended to address the likelihood of timely payment of interest when due on the 2019 Sub-Series A Bonds and/or the payment of principal at maturity or any other date.

The certification may be withdrawn at any time in the CBI’s sole and absolute discretion and there can be no assurance that such certification will not be withdrawn.

The CBI is not a licensed broker-dealer or a nationally recognized statistical ratings organization. Certification by the CBI is not a recommendation to buy, sell or hold securities, and such certification may be subject to revision or withdrawal. The SFPUC will undertake reasonable efforts to ensure that any actions taken with respect to the 2019 Sub-Series A Bonds will not result in revision or withdrawal of the CBI’s certification; however, there can be no guarantee future actions or a future revision to the CBI’s criteria for certifying bonds will not result in a withdrawal or revision of the CBI’s certification. The proceeds of the bonds to be refunded by the 2019 Sub-Series A Bonds were expended on WSIP projects and the SFPUC posts information of WSIP projects on its website.

The repayment obligations of the SFPUC with respect to the 2019 Sub-Series A Bonds are not conditioned on the completion of any particular project or the satisfaction of any condition relating to the status of the 2019 Sub-Series A Bonds as Green Bonds or the certification of such bonds by the CBI. The SFPUC assumes no obligation to ensure compliance with any legal or other principles of Green Bonds, as such principles may evolve over time. See “SECURITY FOR THE BONDS.”

The terms “Climate Bond” and “green bonds” are neither defined in, nor related to the Indenture, and their use herein is for identification purposes only and is not intended to provide or imply that a holder of the 2019 Sub-Series A Bonds is entitled to any additional security other than as provided in the Indenture. The SFPUC has no continuing legal obligation to maintain the Climate Bond certification of the 2019 Sub-Series A Bonds.

The 2019 Sub-Series B Bonds and the 2019 Sub-Series C Bonds are not being designated as “Green Bonds.” The Indenture does not restrict the use of proceeds of future issuances of Bonds to the financing of Green

Projects and in the future the SFPUC may issue Additional Bonds which are not designated as Green Bonds or certified by the CBI.

United Nations Sustainable Development Goals

Impacts from WSIP projects financed by the SFPUC's Green Bonds are also aligned with several United Nations Sustainable Development Goals ("UN SDG"). By reference to the International Capital Market Association ("ICMA") "Green and Social Bonds: A High-Level Mapping to the Sustainable Development Goals" (June 2019), the projects financed or refinanced by the 2019 Sub-Series A Bonds primarily aim to address goals 6 (Clean Water and Sanitation), 9 (Industry, Innovation and Infrastructure), 11 (Sustainable Cities and Communities), 13 (Climate Action), 14 (Life Below Water) and 15 (Life on Land).

As promulgated by the ICMA and most recently updated in June 2018, the "Green Bond Principles" have four core components (Use of Proceeds, Process for Project Evaluation and Selection, Management of Proceeds, and Green Bond Reporting), each of which are further described below.

Use of Proceeds

The 2019 Sub-Series A Bonds are being issued to finance and refinance projects related to WSIP, which achieves the following goals:

- Improve the system to provide high-quality water that reliably meets all current and foreseeable local, State, and Federal requirements.
- Reduce vulnerability of the water system to damage from earthquakes.
- Increase system reliability to deliver water by providing the redundancy needed to accommodate outages.
- Provide improvements related to water supply/drought protection.
- Enhance sustainability through improvements that optimize protection of the natural and human environment.

These WSIP projects include, but are not limited to, the following:

- ***Bioregional Habitat Reserve Program:*** Coordinate and consolidate approach to preserve, enhance, restore or create about 2,350 acres of various habitats. (UN SDG 14 and 15)
- ***Calaveras Dam Replacement:*** Replace a seismically-vulnerable old dam with a new dam, including a fish ladder that supports and restores native aquatic resources. (UN SDG 6, 9, 11, 13 and 14)
- ***Harry Tracy Water Treatment Plant Long Term Improvements:*** Improve seismic and delivery reliability for the water treatment plant for San Francisco Peninsula's sole source of emergency water, impacting 2.7 million customers. (UN SDG 6, 9 and 11)
- ***New Irvington Tunnel:*** Guarantee water service to 2.7 million customers in four Bay Area counties within 24 hours of a major weather or seismic event. (UN SDG 9 and 11)
- ***Peninsula Pipeline Seismic Upgrade:*** Ensure seismic and supply reliability of pipelines on the San Francisco Peninsula, including preparedness for pipeline ruptures from landslides. (UN SDG 9 and 11)

- **Regional Groundwater Storage and Recovery:** Store 7.5 years of drinking water supply to use in drought years impacting 2.7 million customers. (UN SDG 6, 9, 11 and 13)
- **San Joaquin Pipeline System:** Improve delivery reliability and provide operational flexibility during maintenance activities or unplanned outages resulting from seismic or extreme weather, impacting 2.7 million customers. (UN SDG 9 and 11)
- **Vegetation Restoration of WSIP Sites:** Restore and re-vegetate habitat areas temporarily impacted by construction at Water System Improvement Program sites to pre-construction condition. (UN SDG 14 and 15)

See “CAPITAL IMPROVEMENT PROGRAM – Water System Improvement Program (WSIP).”

Process for Project Evaluation and Selection

As described in “CAPITAL IMPROVEMENT PROGRAM – Water System Improvement Program (WSIP),” WSIP is a \$4.788 billion program consisting of 87 capital projects to repair, replace and upgrade critical portions of the Regional Water System and the Local Water System to meet specific level of service goals and objectives for seismic reliability, delivery reliability, water quality and water supply in an environmentally sustainable manner.

On November 5, 2002, San Francisco residents voted to approve Proposition A, a \$1.628 billion revenue bond measure to fund the capital improvement program and undertake the most extensive upgrade of the local and regional water delivery systems in the City’s history. The original program contained a total of 77 water infrastructure projects designed to replace or repair key facilities, improve the system’s seismic robustness, enhance water quality, and improve water supply reliability.

On November 5, 2002 the voters also approved Proposition E, which authorizes the SFPUC, subject to the referendum process, to issue revenue bonds, notes and other forms of indebtedness when authorized by ordinance approved by a two-thirds vote of the Board of Supervisors, for the purpose of reconstructing, replacing, expanding, preparing or improving water facilities or wastewater facilities or combinations of water and wastewater facilities under the jurisdiction of the SFPUC.

Management of Proceeds

The proceeds of the 2010 Sub-Series F Bonds, the 2011 Sub-Series A Bonds and the 2012 Sub-Series A Bonds to be refunded with the proceeds of the 2019 Sub-Series A Bonds have all been expended on projects the SFPUC considers to be “Green Projects.”

Green Bond Reporting

As part of the certification process, the SFPUC will provide a post-issuance verification of compliance to the CBI. The SFPUC will also provide an annual report to bondholders of the 2019 Sub-Series A Bonds regarding the projects refinanced by proceeds of the 2019 Sub-Series A Bonds and make the report available at www.sfwater.org/index.aspx?page=1182. *The information available on such website is not incorporated by reference into this Official Statement and should not be relied upon in making an investment in the 2019 Series ABC Bonds.*

SECURITY FOR THE BONDS

Pledge of Revenues

General. Under the Indenture, the SFPUC has irrevocably pledged the Revenues of the Water Enterprise and all Refundable Credits (with respect to Bonds issued as Build America Bonds) received by the SFPUC to the punctual payment of principal of, premium, if any, and interest on the Bonds, including the 2019 Series ABC Bonds and the Outstanding Bonds described below (see “OBLIGATIONS PAYABLE FROM REVENUES – Outstanding Parity Revenue Bonds”), and any Additional Series of Bonds. This pledge is subject to the allocation of funds provided in the Indenture, as described below. See “– Flow of Funds.”

Pursuant to Section 5451 of the California Government Code, the pledge of, lien on and security interest in Revenues and certain other funds granted by the Indenture is valid and binding in accordance with the terms thereof from the time of issuance of the 2019 Series ABC Bonds without any further action by the SFPUC; the Revenues and such other funds shall be immediately subject to such pledge; and such pledge shall constitute a lien and security interest which shall immediately attach to such Revenues and other funds and shall be effective, binding and enforceable against the SFPUC, its successors, creditors, and all others asserting rights therein to the extent set forth and in accordance with the terms of the Indenture irrespective of whether those parties have notice of such pledge and without the need for any physical delivery, recordation, filing or other further act. Such pledge, lien and security interest are not subject to the provisions of Article 9 of the California Uniform Commercial Code.

Limited Obligation. THE SFPUC IS NOT OBLIGATED TO PAY THE PRINCIPAL OF, PREMIUM, IF ANY, OR INTEREST ON THE 2019 SERIES ABC BONDS EXCEPT FROM REVENUES. THE SFPUC HAS NO TAXING POWER. THE GENERAL FUND OF THE CITY IS NOT LIABLE FOR THE PAYMENT OF THE PRINCIPAL OF, PREMIUM, IF ANY, OR INTEREST ON THE 2019 SERIES ABC BONDS, AND NEITHER THE CREDIT NOR THE TAXING POWER OF THE CITY IS PLEDGED TO THE PAYMENT OF THE PRINCIPAL OF, PREMIUM, IF ANY, OR INTEREST ON THE 2019 SERIES ABC BONDS. THE 2019 SERIES ABC BONDS ARE NOT SECURED BY A LEGAL OR EQUITABLE PLEDGE OF, OR CHARGE, LIEN OR ENCUMBRANCE UPON, ANY OF THE PROPERTY OF THE CITY OR OF THE SFPUC OR ANY OF ITS INCOME OR RECEIPTS, EXCEPT REVENUES.

Water Enterprise. The Indenture defines “**Enterprise**” (referred to in this Official Statement as the “**Water Enterprise**”) as the whole and each and every part of the municipal water supply, storage and distribution system of the SFPUC, located partially within and partially outside of the City, including all of the presently existing municipal water system of the City and all additions, betterments and extensions to that water system. The Water Enterprise is defined to exclude any water supply, storage or distribution facilities under the jurisdiction of the Hetch Hetchy Water and Power Project (“**Hetch Hetchy Water and Power**”), which consists of upcountry water supply and power generating facilities, including the Power Enterprise, all of which are also under the jurisdiction of the SFPUC. See “THE PUBLIC UTILITIES COMMISSION – General” and “– Organization, Purposes and Powers.”

Revenues. The Indenture defines “**Revenues**” as all gross revenues of the Water Enterprise, including all charges received for and all other income and receipts derived by the SFPUC or the City from the operation of the Water Enterprise, or arising from the Water Enterprise, including water connection and installation charges, but excluding:

- (1) any money received by or for the account of the City or the SFPUC from the levy or collection of taxes;
- (2) moneys received from the State of California (the “**State**”) and the United States of America and required to be deposited in restricted funds;
- (3) refundable deposits made to establish credit;
- (4) advances and contributions made to the SFPUC or the City to be applied to construction;

- (5) moneys required to be paid to the State and the United States of America pursuant to agreements with the City or the SFPUC;
- (6) moneys received from insurance proceeds or the sale of or upon the taking by or under the threat of eminent domain of all or any part of the Water Enterprise;
- (7) proceeds from Bonds issued by the SFPUC or proceeds from loans obtained by the SFPUC;
- (8) moneys or securities received by the City or the SFPUC as gifts or grants, the use of which is restricted by the donor or grantor;
- (9) sewer service fees or charges; and
- (10) any surcharge imposed by, or upon the direction of any joint powers agency or other governmental entity, other than the SFPUC, the City or any department or agency of the City, whether or not collected by the SFPUC, the City or any department or agency of the City, for the purpose of financing improvements to the facilities comprising the Water Enterprise.

The term “**Revenues**” also includes (i) all interest, profits or other income derived from the deposit or investment of any moneys in any fund or account established under the Indenture (excluding any Rebate Fund and any escrow fund pledged for the payment of defeased bonds) or in any fund or account of the Water Enterprise and legally available to pay Debt Service on the Bonds, and (ii) any other moneys, proceeds and other amounts that the SFPUC determines should be “Revenues” under the Indenture.

Refundable Credits. The Indenture defines “**Refundable Credits**” as (a) with respect to a Series of Bonds issued as Build America Bonds under Section 54AA of the Code, the amounts which are payable by the Federal government under Section 6431 of the Code, which the SFPUC has elected to receive under Section 54AA(g)(1) of the Code, and (b) with respect to a Series of Bonds issued as Build America Bonds under any other provisions of the Code that creates, in the determination of the SFPUC, a substantially similar direct-pay subsidy program, the amounts which are payable by the Federal government under the applicable provisions of the Code, which the SFPUC has elected to receive under the applicable provisions of the Code. As described below under “– Rate Covenants – Debt Service Coverage,” the SFPUC is permitted to include within the calculation of Revenues any Refundable Credits which are required or permitted to be made under Federal sequestration legislation.

Flow of Funds

Deposits to Revenue Fund and Interest Fund. In accordance with the Charter, but subject to the budget and fiscal provisions of the Charter, the entire gross revenue of the Water Enterprise will be deposited into the Revenue Fund held by the Treasurer of the City (the “**Treasurer**”). The Treasurer will hold the amounts in the Revenue Fund separate from all other City funds. The SFPUC will transfer to the Trustee for deposit into the Interest Fund all Refundable Credits received by the SFPUC.

Application of Revenue Fund. The Treasurer will pay over to the Trustee all moneys in the Revenue Fund, after paying operation and maintenance expenses and making required deposits into pensions or other funds established with respect to SFPUC employees (as required by the Indenture), to the extent necessary to make the following deposits:

Interest. First, on or before the fifth Business Day preceding each interest payment date, the Treasurer is required to pay to the Trustee for deposit in the Interest Fund an amount equal to the sum of the following:

- (1) The amount of interest becoming due and payable on the Outstanding Bonds of such Series that are Current Interest Bonds (except for Bonds constituting Variable Rate Indebtedness) on such interest payment date (less any amounts on deposit in such fund, including, but not limited to, Refundable Credits available to pay such interest, but

excluding amounts on deposit which are reserved as capitalized interest to pay interest during any subsequent period); and

- (2) 110% of the estimated aggregate amount of interest due on such interest payment date on the Outstanding Bonds of such Series that are Variable Rate Indebtedness. However, the amount required to be deposited to the Interest Fund for any period may be reduced by the amount by which the deposit in the prior period for interest estimated to accrue on Outstanding Variable Rate Indebtedness exceeded the actual amount of interest accrued during that period. Also, the amount required to be deposited into the Interest Fund for any period will be increased by the amount by which the deposit in the prior period for interest estimated to accrue on Outstanding Variable Rate Indebtedness was less than the actual amount of interest accruing during that period. Finally, the amount required to be deposited into the Interest Fund for any period will be reduced by any Refundable Credits on deposit in the Interest Fund and available to pay interest for such period.

No deposit needs to be made into the Interest Fund if the amount contained in that fund is at least equal to the interest to become due and payable on the next interest payment date upon all Bonds that are Outstanding (but excluding any moneys on deposit in the Interest Fund from the proceeds of any Series of Bonds or other source and reserved as capitalized interest to pay interest on any interest payment dates following said next interest payment date). See “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE – REVENUES AND FUNDS – Establishment and Maintenance of Funds for Revenues; Use and Withdrawal of Revenues – Interest Fund, Refundable Credits.”

Moneys in the Interest Fund will be used and withdrawn by the Trustee solely to pay the interest on the Bonds as it becomes due and payable (including accrued interest on any Bonds purchased or redeemed prior to maturity under the Indenture).

Principal. Second, on or before the fifth Business Day preceding each principal payment date, the Treasurer is required to pay to the Trustee for deposit in the Principal Fund an amount equal to the sum of the following:

- (1) the aggregate amount of Bond Obligation of such Series (less any amounts on deposit in such fund) becoming due and payable on such principal payment date, plus
- (2) the Minimum Sinking Fund Account Payments required to be made with respect to any Term Bonds of such Series on such principal payment date, plus
- (3) if any Letter of Credit Agreement has been entered into on parity with the Bonds, sufficient amounts to pay the obligations of the SFPUC under the Letter of Credit Agreement due on such principal payment date.

If the amounts on deposit in the Principal Fund are insufficient to make all deposits required to be made with respect to any principal payment date, such amounts will be applied on a Proportionate Basis and in such proportion as the Serial Bonds, the Minimum Sinking Fund Payments for Term Bonds, and the Letter of Credit Agreement obligations shall bear to each other. See “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE – REVENUES AND FUNDS – Establishment and Maintenance of Funds for Revenues; Use and Withdrawal of Revenues – Principal Fund; Sinking Fund Accounts.”

Bond Reserve Fund. Third, in the event of any withdrawal from any Bond Reserve Account, the Treasurer is required to pay to the Trustee for deposit in such Bond Reserve Account, on a *pari passu* basis with transfers to any other Bond Reserve Account, on or before the fifth Business Day preceding each interest payment date following such withdrawal, an amount sufficient to replenish any prior withdrawal from such Bond Reserve Account, either in two semi-annual installments for Bond Reserve Accounts established with respect to fixed rate Bonds only or in equal installments over a 12-month period for Bond

Reserve Accounts established with respect to any Variable Rate Bonds, so that the balance in such Bond Reserve Account is equal to the Required Reserve with respect to the applicable Series of Bonds (or such larger balance as may be required by any Supplemental Indenture) at the end of such 12-month period.

If a Bond Reserve Fund Policy satisfies all or a portion of the Required Reserve for any Series of Bonds and a drawing is made on the Bond Reserve Fund Policy, on or before the fifth Business Day prior to each interest payment date following such drawing, the Treasurer must pay, either in two semi-annual installments for Bond Reserve Accounts established with respect to fixed rate Bonds only or in equal installments over a 12-month period for Bond Reserve Accounts established with respect to any Variable Rate Bonds, an amount sufficient to repay the aggregate amount of Policy Costs owing with respect to such drawing by the end of such 12-month period to the Reserve Provider (as defined in the Indenture) or to the Trustee (who will remit the payment to the Reserve Provider). See “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE.”

Funds or a Bond Reserve Fund Policy on deposit in a Bond Reserve Account will be applied solely to the payment of the Series of Bonds to which such Bond Reserve Account relates and will not be available for payment for any other Series of Bonds. **No Bond Reserve Account has been established with respect to the 2019 Series ABC Bonds.**

Rate Covenants

Sufficiency of Revenues. The SFPUC has covenanted in the Indenture that it will, at all times while any of the Bonds remain Outstanding, establish, fix, prescribe and collect rates, fees and charges in connection with the water, services and facilities furnished by the Water Enterprise so as to yield Revenues at least sufficient, after making reasonable allowances for contingencies and errors in the estimates, to pay the following amounts:

- (1) the interest on and principal of the Bonds as they become due and payable (but not including any interest moneys for the payment of which have been deposited in the Interest Fund from the proceeds of any Series of Bonds or from any other source);
- (2) all other payments required for compliance with the terms of the Indenture and of any Supplemental Indenture providing for the issuance of Additional Series of Bonds pursuant to the Indenture;
- (3) all other payments to meet any other obligations of the SFPUC which are charges, liens or encumbrances upon, or payable from, the Revenues; and
- (4) all current Operation and Maintenance Costs of the Enterprise (but not including such Operation and Maintenance Costs of the Enterprise as are scheduled to be paid by the SFPUC from moneys other than Revenues, such money to be clearly available for such purpose).

Debt Service Coverage. In addition to the requirements set forth in “– Sufficiency of Revenues” above, the Indenture provides that the SFPUC will, at all times while any of the Bonds remain Outstanding, establish, fix, prescribe and collect rates, fees and charges in connection with the water, services and facilities furnished by the Water Enterprise so as to yield Net Revenues for the twelve months following the date of calculation, which (together with any fund balances of the SFPUC or the Water Enterprise legally available for payment of Debt Service and not budgeted to be expended during such twelve months but excluding the Bond Reserve Fund and Rebate Fund) are equal to at least 1.25 times Annual Debt Service for such twelve-month period, but from such Annual Debt Service excluding any funded interest.

For the purpose of calculating Maximum Annual Debt Service, Annual Debt Service, Debt Service, and Average Annual Debt Service, in determining the amount of interest coming due during any twelve-month period ending June 30 on any Series of Bonds that were issued as Build America Bonds, such amount will be reduced by an amount equal to the Refundable Credits the SFPUC is scheduled to receive during each such twelve-month period ending June 30. Under the Indenture, if the amount of Refundable Credits received by the SFPUC for any Series of

Bonds that were issued as Build America Bonds is reduced or not received during any twelve-month period ending June 30, the SFPUC will calculate the amount of interest coming due for the subsequent twelve-month period ending June 30 without deducting an amount equal to the Refundable Credits for the purpose of calculating Maximum Annual Debt Service, Annual Debt Service, Debt Service and Average Annual Debt Service until the receipt of such Refundable Credits resumes and all prior deficiencies are cured.

Pursuant to Federal sequestration legislation passed by Congress in 2011 and 2013, Federal subsidy payments for direct pay bonds, including Build America Bonds, have been reduced (by formula) from the original funding subsidy level of 35% of interest costs on direct pay bonds, including Build America Bonds. The sequestration reduction rate of the Federal subsidy payment for Build America Bonds is 6.2% for the Federal government's fiscal year beginning October 1, 2019, which means that refundable credits sought by the SFPUC for its Build America Bonds will be reduced by this percentage. This reduction will increase the SFPUC's net interest cost. The percentage reduction is re-determined for each Federal fiscal year. The SFPUC can give no assurance regarding the level of subsidy payments or changes in the sequestration rate, if any, in the future. In Fiscal Year 2018-19, the SFPUC received approximately \$22.0 million in Refundable Credits for the Water Enterprise.

The Indenture did not originally contemplate the reduction of Federal subsidies in the manner established by Federal sequestration legislation; however, the SFPUC has amended the Indenture to clarify that Refundable Credits scheduled to be paid pursuant to Federal sequestration legislation ("**Partial BABs Subsidy Payments**") will be permitted to be included as "Revenues" under the Indenture (although such Refundable Credits will not be permitted to be used as a credit against Debt Service for any purposes under the Indenture). The SFPUC has also proposed another amendment, which will not become effective until approval by a majority of the aggregate principal amount of Bond Obligation of the Bonds then Outstanding and certain notice requirements contained in the Indenture have been satisfied (the date of effectiveness of such amendment hereinafter referred to as the "**Amendment Effective Date**"), which will permit Refundable Credits scheduled to be received under Federal sequestration legislation (or under other Federal regulation, pronouncement or similar action) to be used as a credit against interest coming due on the Build America Bonds for the purpose of calculating Maximum Annual Debt Service, Annual Debt Service, Debt Service and Average Annual Debt Service. To avoid double counting, Refundable Credits used as a credit against Debt Service are not included in the calculation of Revenues for any purpose under the Indenture. See the footnote to "APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE – DEFINITIONS – Maximum Annual Debt Service, Annual Debt Service, Debt Service, Average Annual Debt Service." **By their purchase of 2019 Series ABC Bonds, the purchasers of 2019 Series ABC Bonds irrevocably consent to the provisions of such amendment. The Amendment Effective Date is expected to be the date of issuance of the 2019 Series ABC Bonds.**

Net Revenues and Operation and Maintenance Costs. "Net Revenues" and "Operation and Maintenance Costs of the Enterprise" are defined as follows:

The term "Net Revenues" is defined in the Indenture as:

- all of the Revenues (but not including interest on investment of funds required to be deposited in said funds or investment earnings required to be deposited in the Improvement Fund) less
- all Operation and Maintenance Costs of the Enterprise (but not including such Operation and Maintenance Costs of the Enterprise as are scheduled to be paid by the SFPUC from moneys other than Revenues, such moneys to be clearly available for such purpose).

The Indenture defines the term "**Operation and Maintenance Costs of the Enterprise**" as the reasonable and necessary costs of operating and maintaining the Water Enterprise, calculated on sound accounting principles, including (among other things) salaries and wages, fees for services, costs of materials, supplies and fuel, reasonable expenses of management, legal fees, accounting fees, repairs and other expenses necessary to maintain and preserve the Water Enterprise in good repair and working order, and reasonable amounts for administration, overhead, insurance, taxes (if any), other similar costs, and the payment of pension charges and proportionate payments to such compensation and other insurance or outside reserve funds as the SFPUC may establish or the Board of Supervisors may require with respect to employees of the SFPUC.

“**Operation and Maintenance Costs of the Enterprise**” exclude in all cases the following:

- (1) depreciation and obsolescence charges or reserves therefor,
- (2) amortization of intangibles or other bookkeeping entries of a similar nature,
- (3) costs of capital additions, replacements, betterments, extensions or improvements to the Water Enterprise, which under generally accepted accounting principles are chargeable to a capital account or to a reserve for depreciation, and
- (4) charges for the payment of principal and interest on any general obligation bonds, revenue bonds or other indebtedness heretofore or hereafter issued for Water Enterprise purposes.

See “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE – DEFINITIONS.”

Bond Reserve Accounts

No Bond Reserve Account for the 2019 Series ABC Bonds. The Indenture establishes the Bond Reserve Fund and requires the establishment of a bond reserve account (each, a “**Bond Reserve Account**”) within the Bond Reserve Fund for each Series of Bonds issued under the Indenture, if and to the extent required by a Supplemental Indenture pursuant to which that Series of Bonds is issued, and requires the deposit in each Bond Reserve Account of an amount equal to the Required Reserve for the related Series of Bonds. Each Bond Reserve Account is available only for the payment of debt service on the Series of Bonds for which such Bond Reserve Account was established. For any Additional Series of Bonds, the Required Reserve will be the amount, if any, required to be deposited into the Bond Reserve Account for such Additional Series of Bonds as set forth in the Supplemental Indenture pursuant to which such Additional Series of Bonds is issued. See “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE – DEFINITIONS – Required Reserve.”

Pursuant to the Indenture, the Required Reserve for any Series of Bonds may be funded with cash, bond proceeds or through a Bond Reserve Fund Policy, which is a policy of insurance or surety bond issued by a Municipal Bond Insurer, or a letter of credit issued by a Qualified Bank.

However, pursuant to the Thirty-Second Supplemental Indenture, the Thirty-Third Supplemental Indenture and the Thirty-Fourth Supplemental Indenture, no Bond Reserve Account has been established for the 2019 Sub-Series A Bonds, the 2019 Sub-Series B Bonds or the 2019 Sub-Series C Bonds, respectively. The Bond Reserve Accounts established with respect to other Series of Bonds do not secure, and will not be available for, the 2019 Series ABC Bonds.

Uses of Bond Reserve Accounts. The Trustee will use and withdraw moneys in a Bond Reserve Account solely to pay the principal of, sinking fund account payments and interest on the related Series of Bonds if no other moneys are available for these purposes, or to pay or redeem all of the Bonds of such Series then Outstanding. Each such Bond Reserve Account will be applied solely to the payment of debt service on the Series of Bonds for which such Bond Reserve Account was established and will not be available for the payment of any other Series of Bonds.

So long as the SFPUC is not in default under the Indenture, and in each Bond Reserve Account there is a balance equal to the Required Reserve for the related Series of Bonds, the Trustee will withdraw any amount in a Bond Reserve Account in excess of the related Required Reserve semiannually, on May 1 and November 1 of each year, and transfer that excess amount to the Treasurer for deposit in the Revenue Fund or, during the period of construction of the Project (as such term is defined in the Indenture) or any portion thereof, the Improvement Fund. Notwithstanding the foregoing, the SFPUC has the right to withdraw excess amounts on deposit in the Bond Reserve Fund at any time upon request to the Trustee.

Bond Debt Service Reserve Fund Policy. In November 2016, the SFPUC caused to be supplied by MUFG Union Bank, N.A. (“**MUFG Union Bank**”), a Qualified Bank, lines of credit constituting bond debt service reserve fund policies to satisfy all or a portion of certain required reserves for its Bonds, and entered into a credit agreement with respect to each bond debt service reserve fund policy. Upon the issuance of the 2019 Series ABC Bonds and the anticipated refunding of all of the outstanding 2010 Sub-Series F Bonds and 2011 Sub-Series A Bonds, and a portion of the outstanding 2012 Sub-Series A Bonds, the only series of outstanding Bonds that will be secured by a bond debt service reserve fund policy (the “**Bond Debt Service Reserve Fund Policy**”) will be the Water Revenue Bonds, 2012 Series ABC (the “**2012 Series ABC Bonds**”). A portion of the Required Reserve for the 2012 Series ABC Bonds is also funded with cash.

The Bond Debt Service Reserve Fund Policy has a stated term of approximately six years and is subject to earlier termination upon the occurrence of certain events. The SFPUC anticipates that the 2012 Series ABC Bonds will be refunded prior to the termination of the Bond Debt Service Reserve Fund Policy with Bonds for which no Bond Reserve Account will be required to be funded. Were the 2012 Series ABC Bonds to remain Outstanding upon the termination of the Bond Debt Service Reserve Fund Policy and the SFPUC were unable to deliver either a replacement bond debt service reserve fund policy or cash in the amount necessary to fully fund the Required Reserve, the Bond Debt Service Reserve Account for the 2012 Series ABC Bonds would be funded with a draw on the Bond Debt Service Reserve Fund Policy and the SFPUC would be obligated pursuant to the credit agreement for the 2012 Series ABC Bonds to reimburse MUFG Union Bank for the amount of such draw. The SFPUC’s reimbursement obligation would be payable on a basis subordinate to the payment of principal and interest on the Bonds.

The Bond Debt Service Reserve Fund Policy will not secure the 2019 Series ABC Bonds.

Additional Series of Bonds

Additional Series of Bonds Test in the Indenture. The Indenture provides that Additional Series of Bonds secured by Revenues on parity with the Outstanding Bonds and the 2019 Series ABC Bonds may be issued if certain conditions are met, including the SFPUC’s delivery to the Trustee of the following documents (among others):

- (1) A certificate of the SFPUC setting forth the following:
 - (a) Net Revenues for any period of twelve consecutive calendar months out of the eighteen calendar months next preceding the authentication and delivery of the Additional Series of Bonds, and
 - (b) the Debt Service for such 12-month period, and demonstrating that for such 12-month period Net Revenues equaled at least 1.25 times the Debt Service.
- (2) If any portion of the proceeds of such Additional Series of Bonds is to be used to finance construction, a certificate of the Consulting Engineers setting forth:
 - (a) the estimated date of completion for the portion of the Project for which such Additional Series of Bonds is being issued and for any other uncompleted portion of the Project, and
 - (b) an estimate of the cost of construction of such portion of the Project and of any other uncompleted portion of the Project.
- (3) A written report of a Qualified Independent Consultant setting forth estimates for each of the next three Fiscal Years of:
 - (a) Revenues,
 - (b) Operation and Maintenance Costs of the Enterprise, and

- (c) Net Revenues,

if any portion of the proceeds of such Additional Series of Bonds is to be used to finance construction, the estimate will be made for the three Fiscal Years following the Fiscal Year in which the Consulting Engineers estimate such portion of the Project will be completed.

- (4) A certificate of the SFPUC setting forth the following:
 - (a) the estimates of Net Revenues provided by the Qualified Independent Consultant pursuant to paragraph (3) above for each of such three Fiscal Years, and
 - (b) the Annual Debt Service for such three Fiscal Years (including estimated Annual Debt Service for future Additional Series of Bonds, if any), that will be required to complete payment of any uncompleted portion of the Project (based on the estimate of the Consulting Engineers), which certificate demonstrates that the estimated Net Revenues in each of such three Fiscal Years is at least equal to 1.25 times the Annual Debt Service for the corresponding Fiscal Year.

Such certificate may anticipate projected rates not yet enacted and such certificate and the certificate delivered pursuant to clause (1) may also include as an offset to Operation and Maintenance Costs of the Enterprise any such costs which are scheduled to be paid from moneys other than Revenues which are clearly available for such purpose, and include as Revenues any other moneys, proceeds and other amounts that the SFPUC determines should be “Revenues” under the Indenture.

All certificates and written reports will be based upon the actual interest rate or rates determined at the time the Additional Series of Bonds are sold.

Issuance of Additional Series of Bonds with Consent of Bond Owners and Credit Provider. The Indenture also provides that Additional Series of Bonds may be issued without compliance with any of the requirements described above with the written consent of Owners of a majority of the aggregate Bond Obligations of Bonds Outstanding and any Credit Provider, if applicable. See “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE.” Any Additional Series of Bonds issued under this provision would, however, be subject to the requirements for issuing revenue bonds under the Charter. See “OBLIGATIONS PAYABLE FROM REVENUES – Authority for Issuance of Revenue Bonds and Other Obligations Payable from Revenues.”

Refunding Bonds

Indenture Requirements. The Indenture provides that Additional Series of Bonds may be issued to refund any Bonds, including the 2019 Series ABC Bonds, without meeting the test for the issuance of Additional Series of Bonds described above, if the SFPUC delivers to the Trustee (among other documents) a certificate of an Independent Certified Public Accountant to the effect that the Average Annual Debt Service for the Additional Series of Bonds will be equal to or less than the Average Annual Debt Service on the Bonds to be refunded.

City Charter Requirements. The Charter allows refunding bonds to be issued without voter approval if such refunding results in net debt service savings on a present value basis, calculated as provided by ordinance.

Ordinance No. 143-18 and Ordinance No. 153-19 Requirements. Ordinance No. 143-18 and Ordinance No. 153-19 authorize refunding bonds to be issued by the Commission without limitation as to the principal amount, provided that such refunding bonds are permitted under the applicable policies and procedures of the City and authorized by either Section 9.109 of the Charter or Proposition E (as described herein).

Other Parity Obligations; Subordinate Obligations; Obligations Not Payable from Revenues

The Indenture permits the SFPUC to incur obligations payable from Revenues and Refundable Credits on a parity with the payment of principal of and interest on the Bonds upon satisfaction of the requirements set forth in the Indenture. See “SECURITY FOR THE BONDS – Additional Series of Bonds.”

The Indenture permits the SFPUC to authorize and issue bonds, notes, warrants, certificates or other obligations or evidences of indebtedness, the principal of or interest on which would be payable either (i) from Revenues after and subordinate to the payment from Revenues of the principal of and interest on the Bonds, or (ii) from moneys which are not Revenues. See “OBLIGATIONS PAYABLE FROM REVENUES – Subordinate Debt and Interim Funding Program” and “– State and Federal Loans.”

Investments

The Indenture provides that moneys in all funds and accounts held by the Trustee under the Indenture shall be invested upon receipt in time or demand deposits (including certificates of deposit) in any bank or trust company (including the Trustee) authorized to accept deposits of public funds, and may be invested in Permitted Investments (as defined in Appendix A) as directed by the SFPUC, and all accounts funds and accounts held by the Treasurer shall be invested in Legal Investments. “**Legal Investments**” means any bonds, notes, certificates of indebtedness, bills, acceptances or other securities in which the Treasurer may legally invest the SFPUC’s funds. For information regarding the investment of moneys held in the various funds and accounts of the SFPUC, see “FINANCIAL OPERATIONS – Investment of SFPUC Funds.”

OBLIGATIONS PAYABLE FROM REVENUES

Authority for Issuance of Revenue Bonds and Other Obligations Payable from Revenues

City Charter. The Charter authorizes the SFPUC to issue revenue bonds and commercial paper notes and to incur other obligations payable from or secured by a pledge of Revenues. The Charter requires voter approval of revenue bonds issued by the SFPUC unless a specific exception to the voter approval requirement applies. See “– Reconstruction or Replacement of Existing Facilities” and “– Refunding Bonds.”

Proposition A. On November 5, 2002, voters of the City approved Proposition A (“**Proposition A**”), specifically authorizing the issuance of up to \$1.628 billion of revenue bonds for the purpose of funding the SFPUC’s Water Enterprise capital improvement program. The SFPUC has previously issued \$1.348 billion aggregate principal amount of Bonds pursuant to such Proposition A authorization.

Proposition E. Section 8B.124 of the Charter, enacted by voters of the City on November 5, 2002 as part of Proposition E (“**Proposition E**”), authorizes the SFPUC to issue revenue bonds, including notes, commercial paper or other forms of indebtedness, when authorized by ordinance approved by two-thirds vote of the Board of Supervisors, for purposes of reconstructing, replacing, expanding, repairing or improving water facilities or clean water facilities or combinations of water and clean water facilities under the jurisdiction of the SFPUC.

Proposition E also authorizes the Board of Supervisors to take any and all actions necessary to authorize, issue and repay such revenue bonds, including, but not limited to, modifying schedules of rates and charges to provide for the payment and retirement of such revenue bonds. Issuance of such revenue bonds is subject to the following additional conditions set forth in Proposition E:

- (a) Certification by an independent engineer retained by the SFPUC that:
 - (1) the projects to be financed by the revenue bonds, including the prioritization, cost estimates and scheduling, meet utility standards; and

- (2) estimated net revenue after payment of operating and maintenance expenses will be sufficient to meet debt service coverage and other indenture or resolution requirements, including debt service on the revenue bonds to be issued, and estimated repair and replacement costs.
- (b) Certification by the San Francisco Planning Department that facilities under the jurisdiction of the SFPUC funded with such bonds will comply with applicable requirements of the California Environmental Quality Act (“CEQA”).

Any ordinance approving bonds adopted pursuant to Proposition E will become effective 30 days after its adoption unless it is opposed through the referendum process. Opposition may be made by filing with the Board of Supervisors a petition protesting the passage of that ordinance. Such petition must be signed by voters in a number equal to at least 10% of the votes cast for all candidates for Mayor in the last preceding general municipal election for Mayor. If a referendum passes, the ordinance is suspended from becoming effective. The Board of Supervisors may reconsider the ordinance. If it is not entirely repealed, the Board of Supervisors is required to submit the ordinance to voters at the next general municipal or statewide election or at a special municipal election and it will not become effective until approved by voters at such an election.

Reconstruction or Replacement of Existing Facilities. Section 9.107(6) of the Charter provides that no voter approval is required for bonds issued for the purpose of the reconstruction or replacement of existing water facilities or electric power facilities or combinations of water and electric power facilities under the jurisdiction of the SFPUC when authorized by resolution adopted by a three-fourths affirmative vote of all members of the Board of Supervisors.

Refunding Bonds. Section 9.109 of the Charter authorizes the Board of Supervisors to provide for the issuance of bonds for the purpose of refunding revenue bonds without voter approval if the issuance and sale of such refunding bonds are expected to result in net debt service savings on a present value basis, calculated as provided by ordinance.

The 2019 Series ABC Bonds are being issued under Section 9.109 of the Charter and pursuant to Ordinance No. 143-18, passed by the Board of Supervisors on June 12, 2018, as amended by Ordinance No. 153-19, passed by the Board of Supervisors on June 25, 2019. The ordinances authorize and approve the issuance by the SFPUC of refunding bonds and other forms of indebtedness, without limitation as to principal amount, provided that each such refunding bonds are permitted under the applicable policies and procedures of the City and authorized by either Section 9.109 of the Charter or Proposition E. Such refunding bonds are also subject to the following conditions: (i) three percent (3%) net present value debt service savings or greater is achieved to ensure ratepayer savings; (ii) the authorization is subject to a two-year term through June 30, 2020, at which time the Board of Supervisors may consider an extension; principal payments and term may be adjusted, where permitted under federal and state tax law, only if and when the underlying capital asset funded through said refunded bonds has a useful life not in excess of any limit permitted under federal and state tax law than the refunded term; and (iii) the SFPUC will within 30 days of any executed refunding transaction provide a savings report prepared by its financial advisors to the Board of Supervisors, together with a copy of the final official statement with respect to such series of refunding bonds.

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Outstanding Parity Revenue Bonds

All Bonds in the table below (the “**Outstanding Bonds**”) have been issued pursuant to the Indenture and secured by a pledge of Revenues on parity with the 2019 Series ABC Bonds.

Series of Bonds	Purpose	Principal Amount Outstanding as of November 2, 2019
Water Revenue Bonds, 2010 Series ABC ⁽¹⁾⁽²⁾	Water system improvements under Proposition E	\$373,420,000
Water Revenue Bonds, 2010 Series DE ⁽¹⁾	Water system improvements under Proposition E	375,190,000
Water Revenue Bonds, 2010 Series FG ⁽¹⁾⁽³⁾	Water system improvements under Proposition E	370,270,000
Water Revenue Bonds, 2011 Series ABCD ⁽³⁾	Water system improvements under Proposition E and refund previously outstanding Bonds of the SFPUC	377,500,000
Water Revenue Bonds, 2012 Series ABC ⁽³⁾	Water system improvements under Proposition E and refund previously outstanding Bonds of the SFPUC	554,010,000
Water Revenue Bonds, 2015 Series A (Refunding)	Refund previously outstanding Bonds of the SFPUC	412,380,000
Water Revenue Bonds, 2016 Series AB (Refunding)	Refund previously outstanding Bonds of the SFPUC	858,985,000
Water Revenue Bonds, 2016 Series C	Water system improvements under Proposition E	242,755,000
Water Revenue Bonds, 2017 Series ABC	Water system improvements under Proposition E	339,540,000
Water Revenue Bonds, 2017 Series DEFG (Refunding)	Refund previously outstanding Bonds of the SFPUC	439,485,000
Total		\$4,343,535,000

⁽¹⁾ The 2010 Sub-Series B, Sub-Series E, and Sub-Series G Bonds were issued as Build America Bonds.

⁽²⁾ The 2010 Sub-Series A Bonds and 2010 Sub-Series C Bonds are no longer outstanding.

⁽³⁾ All or a portion of the outstanding San Francisco Water Revenue Bonds, 2010 Sub-Series F Bonds, San Francisco Water Revenue Bonds, 2011 Sub-Series A Bonds (WSIP), San Francisco Water Revenue Bonds, 2011 Sub-Series B Bonds (Hetch Hetchy), San Francisco Water Revenue Bonds, 2011 Sub-Series C Bonds (Local Water Main) and San Francisco Water Revenue Bonds, 2012 Sub-Series A Bonds (WSIP), as applicable, will be refunded by the 2019 Series ABC Bonds. See “PLAN OF REFUNDING.”

State and Federal Loans

In September 2017, the SFPUC entered into an Installment Sale Agreement and Grant (the “**CWSRF Agreement**”) with the State Water Resources Control Board (“**SWRCB**”) to finance a portion of the cost of the SFPUC’s San Francisco Westside Recycled Water Project (the “**Westside Recycled Water Project**”), a Water Enterprise recycled water project expected to satisfy the drought mitigation financing criteria and Proposition 1 grant guidelines of the SWRCB’s Water Recycling Funding Program. The CWSRF Agreement was entered into pursuant to the SWRCB’s Clean Water State Revolving Fund Loan Program.

The CWSRF Agreement provides for a \$15 million grant and a \$171.2 million loan (the “**CWSRF Loan**”). The CWSRF Loan has a 30-year, level amortizing fixed interest rate loan bearing interest at a rate of 1% per annum. Repayment of the CWSRF Loan begins one year after completion of the Westside Recycled Water Project (which is expected to occur in May 2021). The SFPUC’s obligation to repay the CWSRF Loan will be payable from and secured by a pledge of the Revenues of the Water Enterprise on a parity with the pledge and lien of the Indenture securing payment of principal of and interest on the Bonds. The SFPUC submitted a request for reimbursement for approximately \$20.2 million on September 4, 2019.

In connection with the execution and delivery of the CWSRF Agreement, the SFPUC adopted the Twenty-Fourth Supplemental Indenture which amends the Indenture to clarify the status of “Parity State Loans”, defined as “loan agreements or installment sale agreements entered into between the SFPUC and the State of California (or any board, department or agency thereof) to finance additions, betterments, extensions, repairs, renewals or replacements to the Water Enterprise which, by their terms, are payable from Revenues on a parity basis with debt service on the Bonds”, as “evidences of indebtedness” within the meaning of the term “Bond” for certain purposes of the Indenture, and to make other technical amendments to facilitate the repayment of the CWSRF Loan on a parity with the payment of debt service on the Bonds.

In August 2019, the SFPUC applied to the SWRCB requesting a \$240 million loan (the “**DWSRF Loan**”) to finance a portion of the cost of the SFPUC’s Mountain Tunnel Project pursuant to the SWRCB’s Drinking Water State Revolving Fund Program. If approved, the SFPUC expects that (i) the DWSRF Loan will have a 30-year, level amortizing fixed interest rate at a rate of 50% of the average interest rate paid by the State on tax-exempt general obligation bonds issued in the prior calendar year, (ii) repayment of the DWSRF Loan will begin one year after completion of the Mountain Tunnel Project (which is expected to occur in 2026) and (iii) the obligation of the SFPUC to repay such DWSRF Loan will be payable from and secured by a pledge of Revenues of the Water Enterprise on a parity with the pledge and lien of the Indenture securing payment of principal of and interest on the Bonds, and the SFPUC’s obligation to repay the CWSRF Loan. See “CAPITAL IMPROVEMENT PROGRAM – Hetch Hetchy Water.” Although the SFPUC anticipates approval of the DWSRF Loan in spring 2020 and to close on the DWSRF Loan in fall 2020, the SFPUC can provide no assurance that the DWSRF Loan will be approved by the SWRCB.

The SFPUC has no outstanding loan obligations with respect to the Water Enterprise payable to the Federal government from Revenues.

Contingent Payment Obligations

The Water Enterprise has no interest rate swaps, caps or hedges or other contingent payment obligations payable from Revenues. The Water Enterprise may in the future, however, incur contingent payment obligations payable from Revenues. Such contingent payment obligations may be payable on parity with the 2019 Series ABC Bonds if the conditions for the issuance of parity debt under the Indenture are met. See “SECURITY FOR THE BONDS – Additional Series of Bonds.”

Subordinate Debt and Interim Funding Program

Interim Funding Program. The SFPUC has established an Interim Funding Program (the “**Interim Funding Program**”) (formerly known as the “Commercial Paper Program”) to fund construction costs relating to capital projects. See “FINANCING OF CAPITAL IMPROVEMENTS.”

The Interim Funding Program is authorized for the Water Enterprise in the aggregate principal amount of \$500 million. Of this amount, \$400 million is authorized for the SFPUC to issue tax-exempt and taxable commercial paper notes (“**Commercial Paper Notes**”) secured by three separate bank credit facilities, as set forth below. The remaining \$100 million of the Interim Funding Program is in the form of a bank revolving credit agreement, as set forth below. The revolving credit agreement permits the SFPUC to make draws directly from the bank, with the SFPUC’s payment obligation evidenced by a tax-exempt revolving note and a taxable revolving note (the “**Revolving Notes**”).

The Commercial Paper Notes and the Revolving Notes are payable from Revenues, and are secured on a parity lien basis with each other. The Commercial Paper Notes and the Revolving Notes, collectively, are secured on a basis subordinate to the payment of debt service on the Bonds.

The Commercial Paper Notes are secured by (i) a \$200 million liquidity facility from Sumitomo Mitsui Banking Corporation, acting through its New York Branch, which expires on June 16, 2022, (ii) a \$100 million letter of credit from Bank of America, NA, which expires on July 24, 2020, and (iii) a \$100 million letter of credit from Barclays Bank PLC which expires on July 23, 2021. The Revolving Notes were issued pursuant to a \$100 million revolving credit agreement with U.S. Bank National Association which expires on July 25, 2020.

As of November 1, 2019, the SFPUC had approximately \$162.1 million principal amount of Commercial Paper Notes outstanding and no amount under the Revolving Notes is outstanding.

Other Subordinate Obligations Payable from Revenues

The SFPUC completed the construction of a 13-story office building at 525 Golden Gate Avenue in San Francisco to house the administrative offices of the SFPUC's three utility enterprises and moved into the building in July 2012. Total project costs were approximately \$202 million and were financed with land and property sale proceeds, fund balances, grants and the proceeds of certificates of participation (the "**2009 Golden Gate COPs**"), representing interests in a City General Fund lease, executed and delivered in two series (one of which constitutes Build America Bonds) on October 7, 2009, in the aggregate principal amount of \$167,670,000. As of November 2, 2019, the principal amount outstanding of the 2009 Golden Gate COPs was \$142,040,000. Pursuant to a Memorandum of Understanding between the City and the SFPUC, the SFPUC will reimburse the City General Fund for all debt service in connection with this City financing (net of Refundable Credits received). The SFPUC allocates such payment obligations internally among its three utility enterprises based on percentage usage. The Water Enterprise has been allocated 71.4% of such obligations, payable from Revenues on a basis subordinate to the payment of principal of and interest on the Bonds and any parity State or federal loans.

Revenue Bond Oversight Committee

On November 5, 2002, the voters of the City adopted Proposition P, an ordinance that established the Public Utilities Revenue Bond Oversight Committee ("**RBOC**") to report publicly to the Mayor, the SFPUC and the Board of Supervisors regarding the expenditure of revenue bond proceeds on the repair, replacement, upgrading and expansion of the Water Enterprise, the Wastewater Enterprise and the Power Enterprise (each as defined herein).

The RBOC has seven members appointed as follows: two by the Mayor, two by the Board of Supervisors, one by the City Controller, one by the Bay Area Water Users Association ("**BAWUA**") under the auspices of the Bay Area Water Supply and Conservation Agency ("**BAWSCA**"). The seventh member is the City's Budget Analyst or his or her representative. The work of the RBOC is funded by 1/20th of 1% of the gross bond proceeds of new money revenue bond issuances or sales to the extent permitted by law. The RBOC's current term expires on January 1, 2025.

The RBOC may, by majority vote of all its members, prohibit the issuance or sale of authorized SFPUC revenue bonds which have yet to be issued or sold if, after reviewing materials provided by the SFPUC and conducting its own independent audit, and after consultation with the City Attorney, the RBOC determines that revenue bond proceeds have been or are being spent on purposes not authorized by the authorizing bond resolution or otherwise in a manner amounting to an illegal expenditure or illegal waste of such revenue bond proceeds. The SFPUC may appeal such a decision to the Board of Supervisors within 30 days. The Board of Supervisors may overturn such a decision by the RBOC by a two-thirds vote of all members of the Board of Supervisors with evidence from the SFPUC of corrective measures satisfactory to the Board of Supervisors or may remand the decision to the RBOC for further consideration. To date, the RBOC has not prohibited the issuance or sale of any authorized SFPUC revenue bonds.

Debt Service Requirements

Set forth in the following table are debt service requirements on the Outstanding Bonds, the 2019 Series ABC Bonds and Parity Obligations.

DEBT SERVICE REQUIREMENTS ON OUTSTANDING BONDS, 2019 SERIES ABC BONDS AND PARITY OBLIGATIONS

Fiscal Year (ending June 30)	Outstanding Bonds (1)(2)(3)	2019 Sub- Series A Bonds Principal	2019 Sub- Series A Bonds Interest	2019 Sub- Series B Bonds Principal	2019 Sub- Series B Bonds Interest	2019 Sub- Series C Bonds Principal	2019 Sub- Series C Bonds Interest	Other Parity Obligations (4)	Total Debt Service (2)(3)(5)
2020	\$ 87,357,547	--	--	--	--	--	--	--	\$ 87,357,547
2021	269,653,541	\$ 6,855,000	\$ 26,082,762	--	\$ 735,504	--	\$ 801,428	--	304,128,235
2022	265,718,549	24,405,000	19,589,249	\$ 65,000	559,953	\$ 75,000	610,076	\$ 6,632,026	317,654,854
2023	299,017,122	3,495,000	19,327,735	70,000	557,825	75,000	607,712	6,632,026	329,782,420
2024	298,890,719	3,565,000	19,258,348	70,000	555,618	80,000	605,268	6,632,026	329,656,979
2025	298,359,633	3,640,000	19,185,126	75,000	553,332	80,000	602,746	6,632,026	329,127,862
2026	302,340,130	3,720,000	19,105,179	75,000	550,967	80,000	600,223	6,632,026	333,103,525
2027	300,911,287	3,805,000	19,018,016	80,000	548,524	85,000	597,622	6,632,026	331,677,475
2028	298,852,387	3,900,000	18,924,489	80,000	546,001	90,000	594,863	6,632,026	329,619,767
2029	298,254,206	4,000,000	18,825,411	85,000	543,400	90,000	592,025	6,632,026	329,022,068
2030	298,408,395	4,105,000	18,721,530	85,000	540,720	95,000	589,109	6,632,026	329,176,779
2031	296,669,469	4,215,000	18,611,342	90,000	537,961	95,000	586,114	6,632,026	327,436,912
2032	270,896,379	31,095,000	18,118,580	90,000	535,123	100,000	583,039	6,632,026	328,050,147
2033	289,528,771	4,055,000	17,622,912	1,340,000	512,579	1,465,000	558,367	6,632,026	321,714,655
2034	288,438,482	4,180,000	17,499,232	1,385,000	469,620	1,510,000	511,466	6,632,026	320,625,826
2035	285,952,281	4,310,000	17,367,477	1,425,000	425,320	1,550,000	463,225	6,632,026	318,125,330
2036	232,569,027	63,930,000	16,243,726	1,470,000	376,961	1,600,000	410,606	6,632,026	323,232,345
2037	219,980,821	80,670,000	13,855,657	1,525,000	324,204	1,660,000	353,181	6,632,026	325,000,889
2038	186,786,632	86,145,000	11,100,707	1,575,000	269,598	1,720,000	293,642	6,632,026	294,522,605
2039	235,372,230	38,500,000	9,042,195	1,630,000	213,142	1,775,000	232,078	6,632,026	293,396,670
2040	233,994,527	39,650,000	7,751,548	1,690,000	154,660	1,835,000	168,487	6,632,026	291,876,248
2041	182,336,508	40,970,000	6,385,284	1,745,000	94,152	1,900,000	102,695	6,632,026	240,165,666
2042	129,811,906	42,370,000	4,938,085	1,800,000	31,707	1,965,000	34,613	6,632,026	187,583,338
2043	70,806,254	59,450,000	3,169,981	--	--	--	--	6,632,026	140,058,261
2044	70,365,220	61,550,000	1,068,816	--	--	--	--	6,632,026	139,616,062
2045	68,246,515	--	--	--	--	--	--	6,632,026	74,878,541
2046	67,745,746	--	--	--	--	--	--	6,632,026	74,377,771
2047	67,229,139	--	--	--	--	--	--	6,632,026	73,861,164
2048	52,126,058	--	--	--	--	--	--	6,632,026	58,758,083
2049	28,221,241	--	--	--	--	--	--	6,632,026	34,853,267
2050	27,625,789	--	--	--	--	--	--	6,632,026	34,257,815
2051	27,006,975	--	--	--	--	--	--	6,632,026	33,639,001
Total ⁽⁵⁾	\$6,349,473,485	\$622,580,000	\$360,813,388	\$16,450,000	\$9,636,872	\$17,925,000	\$10,498,587	\$198,960,775	\$7,586,338,107

(1) Reflects the refunding of the Refunded Bonds. See "PLAN OF REFUNDING."

(2) Net of capitalized interest payments.

(3) Calculation of interest due on Bonds shown without an offset for Refundable Credits.

(4) Consists of Clean Water State Revolving Fund Loan. See "OBLIGATIONS PAYABLE FROM REVENUES – State and Federal Loans."

(5) Totals may not add due to independent rounding.

THE CITY AND COUNTY OF SAN FRANCISCO

THE FOLLOWING INFORMATION IS PROVIDED FOR CONVENIENCE ONLY. THE GENERAL FUND OF THE CITY IS NOT LIABLE FOR THE PAYMENT OF THE PRINCIPAL OF, PREMIUM, IF ANY, OR INTEREST ON THE 2019 SERIES ABC BONDS, AND NEITHER THE CREDIT NOR THE TAXING POWER OF THE CITY IS PLEDGED TO THE PAYMENT OF THE PRINCIPAL OF, PREMIUM, IF ANY, OR INTEREST ON THE 2019 SERIES ABC BONDS. THE 2019 SERIES ABC BONDS ARE NOT SECURED BY A LEGAL OR EQUITABLE PLEDGE OF, OR CHARGE, LIEN, OR ENCUMBRANCE UPON, ANY OF THE PROPERTY OF THE CITY.

The City is the economic and cultural center of the San Francisco Bay Area and northern California. The limits of the City encompass over 93 square miles, of which 49 square miles are land, with the balance consisting of tidelands and a portion of the San Francisco Bay (the “**Bay**”). The City is located at the northern tip of the San Francisco Peninsula, bounded by the Pacific Ocean to the west, the Bay and the San Francisco-Oakland Bay Bridge to the east, the entrance to the Bay and the Golden Gate Bridge to the north, and San Mateo County to the south. Silicon Valley is about a 40-minute drive to the south, and the Napa and Sonoma “wine country” is about an hour’s drive to the north. According to the State Department of Finance, the City’s population as of January 1, 2019 was 883,869.

The San Francisco Bay Area consists of the nine counties contiguous to the Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma counties (collectively, the “**Bay Area**”). The economy of the Bay Area includes a wide range of industries, supplying local needs as well as the needs of national and international markets. Major business sectors in the Bay Area include technology, retail, entertainment and the arts, conventions and tourism, service businesses, banking, professional and financial services, corporate headquarters, international and wholesale trade, multimedia and advertising and higher education. The California State Supreme Court is also based in San Francisco.

The City is a major convention and tourist destination. According to the San Francisco Travel Association, a nonprofit membership organization, during the calendar year 2018, approximately 25.8 million tourists visited the City, with total direct spending estimated at \$9.3 billion. Direct spending from conventions, trade shows and group meetings generated approximately \$707.6 million in 2018.

The City is also a leading center for financial activity in the State. The headquarters of the Twelfth Federal Reserve District and the Eleventh District Federal Home Loan Bank are located in the City.

The City benefits from a highly skilled, educated and professional labor force. According to the U.S. Department of Commerce Bureau of Economic Analysis, the per-capita personal income of the City for calendar year 2017 was \$119,868. According to the U.S. Department of Labor Bureau of Labor Statistics, the average unemployment rate for calendar year 2018 was 2.4%. As of the 2018-19 school year, the San Francisco Unified School District (“**SFUSD**”), which is a separate legal entity from the City, operates 64 elementary schools serving grades TK-5, 8 schools serving grades TK-8, 13 middle schools serving grades 6-8, 15 high schools serving grades 9-12, 12 early education schools, and 14 active charter schools authorized by SFUSD. Higher education institutions located in the City include the University of San Francisco, California State University – San Francisco, University of California – San Francisco (a medical school and health science campus), the University of California Hastings College of the Law, the University of the Pacific’s School of Dentistry, Golden Gate University, City College of San Francisco (a public community college), the Art Institute of California – San Francisco, the San Francisco Conservatory of Music, and the Academy of Art University.

San Francisco International Airport (“**SFO**”), located 14 miles south of downtown San Francisco in an unincorporated area of San Mateo County and owned and operated by the City, is the principal commercial service airport for the Bay Area and one of the nation’s principal gateways for Pacific Rim traffic. In fiscal year 2017-18, SFO serviced approximately 58 million passengers and handled 561,150 metric tons of cargo. The City is also served by the Bay Area Rapid Transit District, an electric rail commuter service linking the City with the East Bay and the San Francisco Peninsula, including SFO), Caltrain (a conventional commuter rail line linking the City with the San Francisco Peninsula), and bus and ferry services between the City and residential areas to the north, east and south of the City. San Francisco Municipal Railway, operated by the San Francisco Municipal Transportation

Agency (“SFMTA”), provides bus and streetcar service within the City. The Port of San Francisco (the “Port”), which administers 7.5 miles of Bay waterfront held in “public trust” by the Port on behalf of the people of the State, promotes a balance of maritime-related commerce, fishing, recreational, industrial and commercial activities, and natural resource protection.

San Francisco is a city and county chartered pursuant to Article XI, Sections 3, 4, 5 and 6 of the Constitution of the State of California and is the only consolidated city and county in the State. Voters approved the City’s current Charter at the November 1995 election. The City is governed by a Board of Supervisors elected from 11 districts to serve 4-year terms, and a Mayor who serves as chief executive officer, elected citywide to a 4-year term. The City’s adopted budget for fiscal years 2019-20 and 2020-21 totals \$12.3 billion and \$12.0 billion, respectively. The General Fund portion of each year’s adopted budget is \$6.1 billion in fiscal year 2019-20 and \$6.0 billion in fiscal year 2020-21, with the balance being allocated to all other funds, including enterprise fund departments, such as SFO, SFMTA, the Port Commission and the SFPUC. The City’s budget for fiscal year 2019-20 and 2020-21 includes 37,907 and 38,122 budgeted and funded City positions, respectively. According to the Controller of the City (the “Controller”), the fiscal year 2019-20 total net assessed valuation of taxable property in the City is approximately \$281.1 billion.

THE PUBLIC UTILITIES COMMISSION

General

The SFPUC is a department of the City responsible for the maintenance, operation and development of three utility enterprises: the Water Enterprise, the Wastewater Enterprise and the Power Enterprise (which is a component of Hetch Hetchy Water and Power). The SFPUC’s enterprises are operated and managed as separate financial entities with separate enterprise funds.

- The Water Enterprise provides drinking water to Retail Customers in the City, to certain Retail Customers outside the City and to Wholesale Customers in three other Bay Area counties.
- The Wastewater Enterprise provides wastewater and stormwater collection, treatment and disposal services for the City (the “**Wastewater Enterprise**”).
- Hetch Hetchy Water and Power operates dams (including O’Shaughnessy Dam), reservoirs (including Hetch Hetchy Reservoir), hydroelectric generation and transmission facilities and water transmission facilities from Hetch Hetchy Valley to the connection with the Water Enterprise (collectively, the “**Hetch Hetchy Project**”). In addition, Hetch Hetchy Water and Power provides hydroelectric, solar and other power for municipal and public infrastructure, services and facilities (the “**Power Enterprise**”). CleanPowerSF, managed by the Power Enterprise, is a Community Choice Aggregation program.

The revenues of the Wastewater Enterprise, the Power Enterprise and CleanPowerSF are not available for payment of the principal of, premium, if any, or interest on the Bonds. See “SECURITY FOR THE BONDS – Pledge of Revenues.”

Organization, Purposes and Powers

Water Enterprise. The SFPUC serves as the retail water supplier for the City and is responsible for water deliveries to residents and institutions within the City limits, as well as to a number of retail accounts outside of the City limits. In addition, the SFPUC sells water to 27 Wholesale Customer entities in San Mateo, Alameda and Santa Clara counties under the WSA and related individual contractual agreements. Approximately 67% of the SFPUC’s water supply is delivered to the Wholesale Customers and approximately 33% of the SFPUC’s remaining water supply is delivered to Retail Customers. See “THE WATER ENTERPRISE.”

Wastewater Enterprise. The Wastewater Enterprise’s collection and treatment system consists of a combined sewer collection system conveying sewage and stormwater flows within the City to three water pollution

control plants, also located within the City. Treated effluent flows are then discharged through deep-water outfalls into the San Francisco Bay and the Pacific Ocean. The Wastewater Enterprise also currently provides sewage treatment service on Treasure Island pursuant to contract, and operates an onsite sewage and stormwater reclamation and treatment facility at the SFPUC headquarters at 525 Golden Gate Avenue.

The revenues of the Wastewater Enterprise are not “Revenues” under the Indenture and do not secure the payment of the principal of, premium, if any, or interest on the Bonds. See “SECURITY FOR THE BONDS – Pledge of Revenues.”

Hetch Hetchy – Water and Power Operations. Hetch Hetchy Water and Power operates the dams (among them O’Shaughnessy Dam being the largest), reservoirs (among them Hetch Hetchy Reservoir being the largest), hydroelectric generation and transmission facilities and water transmission facilities from Hetch Hetchy Valley to the connection with the Water Enterprise (collectively, the “**Hetch Hetchy Project**”), which provides water for distribution through the Water Enterprise and hydroelectric, solar and other power for municipal and public infrastructure, services and facilities of the City (the “**Power Enterprise**”). The Power Enterprise, which is a component of the Hetch Hetchy Project, was created in February 2005 as a separate system within Hetch Hetchy Water and Power. The Power Enterprise provides electric power to meet the municipal requirements of the City, including power to operate municipal streetcars and electric buses, street and traffic lights, municipal buildings and other City facilities, including SFO. Additionally, the Power Enterprise provides power to the Modesto Irrigation District and Turlock Irrigation District (collectively, the “**Irrigation Districts**”), located in the central valley of California, to certain commercial customers consistent with prescribed contractual obligations and federal law and to certain retail customers in the City. CleanPowerSF, managed by the Power Enterprise, is a Community Choice Aggregation program, pursuant to which the SFPUC pools the electricity demands of CleanPowerSF customers, including certain of the City’s residents and businesses, for the purpose of buying electricity on behalf of such customers. CleanPowerSF provides San Francisco with new clean energy alternatives at competitive rates. In connection with the recent bankruptcy of Pacific Gas & Electric Company (“**PG&E**”) the City has submitted an indication of interest in the acquisition of PG&E transmission and distribution assets serving retail customers in the City. The SFPUC is unable to predict whether such acquisition will occur.

The revenues of the Power Enterprise and the revenues of CleanPowerSF are not “Revenues” under the Indenture and do not secure the payment of the principal of, premium, if any, or interest on the Bonds. See “SECURITY FOR THE BONDS – Pledge of Revenues.”

Commission Members

Under the Charter, the SFPUC is given exclusive charge of the operation and management of all water, wastewater and municipal customers’ energy supplies and utilities of the City, as well as the real, personal and financial assets under the SFPUC’s jurisdiction. The SFPUC is governed by the Commission.

In June 2008, an initiative measure amended the Charter, changing the process for Commission appointments, and establishing qualifications for commissioners, as follows:

- The Commission consists of five members appointed by the Mayor, subject to confirmation by a majority of the Board of Supervisors.
- Seat 1 is designated for a member with experience in environmental policy and an understanding of environmental justice issues.
- Seat 2 is designated for a member with experience in ratepayer or consumer advocacy.
- Seat 3 is designated for a member with experience in project finance.
- Seat 4 is designated for a member with expertise in water systems, power systems, or public utility management.

- Seat 5 is designated for an at-large member.
- Members may be suspended by the Mayor and may be removed by a three-fourths vote of the Board of Supervisors for official misconduct.

The current members of the Commission and the appointment and expiration dates of their terms are:

<u>Name and Title</u>	<u>Seat</u>	<u>Originally Appointed</u>	<u>Term Expires</u>
Ann Moller Caen, President	3	March 1997	August 2020
Francesca Vietor, Vice President	1	September 2008	August 2020
Anson Moran	4	July 2009	August 2022
Sophie Maxwell	2	April 2019	August 2022
Tim Paulson	5	April 2019	August 2020

Management

Management of the SFPUC is led by the General Manager. The General Manager is appointed by the Mayor from candidates submitted by the Commission. Once appointed by the Mayor, the General Manager serves at the pleasure of the Commission; however, the Commission also has Charter authority to employ the General Manager under an individual contract.

Brief biographies of the General Manager and principal members of the senior management of the SFPUC are set forth below.

Harlan L. Kelly, Jr. Harlan L. Kelly, Jr. was appointed General Manager of the SFPUC in September 2012. He previously served as the SFPUC’s Assistant General Manager, Infrastructure, overseeing \$10 billion in capital programs for water, sewer and power, including the \$4.788 billion Water System Improvement Program, the \$7.045 billion Sewer System Improvement Program, and the \$1.0 billion Hetch Hetchy System Improvement Program. His civil engineering career spanning three decades includes his tenure as the City Engineer of San Francisco. At San Francisco Department of Public Works, he held functional and project management positions, including Interim General Manager, and Deputy Director of Engineering, during which he managed complex capital improvement programs that included the rebuild and seismic retrofit of City Hall, and expansions of convention, hospital, county jail, and public arts facilities. He is a licensed professional engineer, and a graduate of the University of California at Berkeley in Civil Engineering. He is the recipient of numerous awards, including the Silver SPUR Award from the San Francisco Bay Area Planning and Urban Research Association; the Eminent Engineer Award from the National Engineering Honor Society Tau Beta Pi; and the Heroes and Hearts Award from the San Francisco General Hospital Foundation for exceptional community service. He is on the Board of Directors of the National Association of Clean Water Agencies, as well as the Bay Area Council. He is a member of the National Society of Black Engineers. He co-founded the youth internship program Project Pull, which has been in continuous operation since 1995.

Michael Carlin. Michael Carlin is the SFPUC Deputy General Manager and Chief Operating Officer, reporting directly to the General Manager. He was appointed in 2009. As the Deputy General Manager and Chief Operating Officer, Mr. Carlin supervises the SFPUC’s efforts in capital planning, emergency response, asset management, and other functions across the three business lines – water, power and wastewater. Prior to this position, Mr. Carlin served as the Assistant General Manager for the Water Enterprise where he led the effort to diversify the water supply portfolio. He continues in that role leading many of the environmental initiatives including addressing the impact of climate change on the organization. Mr. Carlin joined the SFPUC in 1996 as the Water Resources Planning Manager where he led the effort to develop comprehensive capital plans. That effort led to the establishment and execution of the Water System Improvement Program. Prior to joining the City, Mr. Carlin worked for more than a decade at the San Francisco Regional Water Board where he was the Planning Chief. Mr. Carlin holds a B.A. in Biology from San Francisco State University and an M.P.A. with an emphasis in Environmental Management from Golden Gate University.

Steven R. Ritchie. Steven Ritchie is the Assistant General Manager of the Water Enterprise, responsible for overseeing water system operations and planning from the Hetch Hetchy Project through the Regional Water System to the City Distribution Division. He is also responsible for the management of the SFPUC's lands and natural resources. Mr. Ritchie was the Manager of Planning at the SFPUC from 1995 to 1998. Prior to his current assignment, he managed the South Bay Salt Pond Restoration Project, a multi-agency effort to restore 15,100 acres of valuable habitat in South San Francisco Bay, while providing for flood risk management and public access. In addition, Mr. Ritchie has worked at management positions at the San Francisco Bay Regional Water Quality Control Board (1987-1995), the CalFed Bay Delta Program (1998-2000), and URS consultants (2000-2004). He has a B.S. and M.S. in Civil Engineering from Stanford University.

Eric L. Sandler. Eric L. Sandler is Assistant General Manager, Business Services and Chief Financial Officer and is responsible for managing a range of internal and external service functions of the SFPUC including Finance, Customer Service, Information Technology, and Assurance and Internal Controls. Appointed in 2015, he has over 25 years of experience in municipal and infrastructure financing and over 15 years of experience in public utility management. Prior to joining the SFPUC, he served as Director of Finance/Treasurer for the East Bay Municipal Utility District, Director of Finance/Treasurer for the San Diego County Water Authority and Director of Financial Planning for the SFPUC. Before joining public service, Mr. Sandler worked in several infrastructure finance positions including renewable energy project finance and municipal investment banking. Mr. Sandler serves on boards and committees of various industry organizations including the Association of California Water Agencies and the National Association of Clean Water Agencies. He has a B.S. in Biology from Stanford University and an M.B.A. from the University of California, Berkeley.

Juliet Ellis. Juliet Ellis is the Assistant General Manager for External Affairs at the SFPUC and Chief Strategy Officer. Prior to joining the SFPUC as an Assistant General Manager, Ms. Ellis served as a Commissioner for two years. She now oversees the implementation of Environmental Justice and Community Benefits policies as Assistant General Manager, along with the Policy and Government Affairs, Communications, and Sustainability Planning teams within the SFPUC. Ms. Ellis also oversees the SFPUC's national partnerships with other public utilities with the goal of scaling community benefits programs within the public sector. Before joining the SFPUC, Ms. Ellis spent nine years as the Executive Director of Urban Habitat, a regional social and environmental justice organization. She also served as the Associate Program Officer for Neighborhood and Community Development at The San Francisco Foundation. Ms. Ellis received her M.S. in Business Administration at San Francisco State University with an emphasis in Environmental and Urban Studies

Barbara Hale. Barbara Hale is Assistant General Manager of the Power Enterprise. Ms. Hale oversees the Power Enterprise, including Power Retail Services, Utilities Services, Regulatory Affairs, Infrastructure Development and Power Purchasing and Scheduling. She is responsible for the development of a strategic business plan for the organization, setting out priorities, objectives, schedules and policy issues. Ms. Hale oversees all power-related inter-governmental relations, works directly with the Commission on policy and capital matters, and provides direction and leadership to a multi-discipline staff at remote and downtown locations. Ms. Hale provides strategic advice on energy policy matters to the General Manager and manages a staff responsible for developing specific energy efficiency projects and renewable and other advanced sources of electrical generation. Ms. Hale also acts as liaison between the SFPUC and State and federal agencies responsible for energy policy, such as the California Public Utilities Commission, the California Energy Commission, the California Power Authority, the Federal Energy Regulatory Commission, and the United States Department of Energy. Ms. Hale graduated cum laude from San Francisco State University with a B.A. in Economics, receiving special recognition for high achievement with the Department Honors Award. Ms. Hale has pursued extensive graduate coursework in Applied Economics.

Kathy How. Kathy How is Assistant General Manager of Infrastructure, responsible for capital programs and projects implementation for SFPUC facilities, including the Water System Improvement Program, Sewer System Improvement Program and the Hetchy System Capital Improvement Program. Prior to this position, Ms. How was Deputy Assistant General Manager for Project Delivery, and was responsible for managing engineering design, construction management, and environmental review for all capital projects, whether in-house or consultant designed. Prior to joining the SFPUC in 2003, Ms. How was Assistant City Engineer at the Department of Public Works overseeing project management, architectural and engineering design and construction management for projects in the Seismic Safety bond programs, and Program Director for the Marina Yacht Harbor

Renovations at the Recreation and Park Department. She joined the SFPUC to work on development of program goals and objectives for the WSIP, and development of the engineering alternatives for program environmental review. She developed and led the team that set up the program controls system to track and report on the WSIP projects' progress relative to scope, schedule and budget. In 2008, she took over the design team of SFPUC and consultant staff to lead production of project designs for construction, working to ensure that projects met the WSIP level of service goals and objectives for seismic and delivery reliability, water quality, and water supply. She is a licensed professional civil engineer in California, and holds a degree in Civil Engineering from the University of California, Berkeley.

Gregory J. Norby. Gregory J. Norby was appointed in April 2018 to serve as Assistant General Manager of the Wastewater Enterprise, effective July 2, 2018. Mr. Norby has over 20 years of experience in private sector water infrastructure engineering and public utility management, most recently as General Manager of the Ross Valley Sanitary District. He also previously served as General Manager of the Mammoth Community Water District. He is a licensed professional engineer with a B.S. in Civil Engineering California State University, Chico, and an M.S. in Civil Engineering from Utah State University.

Labor Relations

San Francisco. The City's budget for fiscal years 2019-20 and 2020-21 includes 37,907 and 38,122 budgeted and funded City positions, respectively. Wages, hours and working conditions of City employees, including employees of the SFPUC, are determined by collective bargaining pursuant to State law (the Meyers-Milias-Brown Act, California Government Code Sections 3500-3511) and the City Charter. San Francisco is unusual among California's cities and counties in that nearly all of its employees, even managerial and executive-level employees, are represented by labor organizations.

Further, the City Charter requires binding arbitration to resolve negotiations in the event of impasse. If impasse occurs, the parties are required to convene a tripartite arbitration panel, chaired by an impartial third-party arbitrator, which sets the disputed terms of the new agreement. The award of the arbitration panel is final and binding. This process applies to all City employees except for nurses and a small group of unrepresented employees. Wages, hours and working conditions of nurses are not subject to interest arbitration but are subject to Charter-mandated economic limits. Since 1976, no City employees have participated in a union-authorized strike, which is prohibited by the City Charter. See "RISK FACTORS – Risks Related to Water Enterprise Facilities and Operation – Labor Actions."

The City's employee selection procedures are established and maintained through a civil service system. In general, selection procedures and other merit system issues, with the exception of discipline, are not subject to arbitration. Disciplinary actions are generally subject to grievance arbitration, with the exception of sworn police officers and fire fighters.

In May 2019, the City negotiated three-year agreements (for fiscal years 2019-20 through 2021-22) with 27 labor unions. For fiscal year 2019-20, the parties agreed to wage increases of 3% on July 1, 2019 and 1% on December 28, 2019. For fiscal year 2020-21, the parties agreed to a wage increase schedule of 3% on July 1, 2020 and 1% on December 26, 2020, with a provision to delay the fiscal year 2020-21 adjustment by six months if the City's deficit for fiscal year 2020-21, as projected in the March 2020 update to the five-year financial plan, exceeds \$200 million. For fiscal year 2021-22, the parties agreed to a wage increase schedule of 3% on July 1, 2021 and 0.5% on January 8, 2022, with a provision to delay the fiscal year 2021-22 adjustment by six months if the City's deficit for fiscal year 2021-22, as projected in the March 2021 update to the five-year financial plan, exceeds \$200 million. Also, in May 2019, the SFMTA negotiated three-year agreements (for fiscal years 2019-20 through 2021-22) with the unions that represent Transit Operators, Mechanics, Station Agents, Parking Control Officers and others. The parties agreed to the same wage increase schedule as the City.

SFPUC. The SFPUC currently employs 2,488 of the City's workers. The Charter governs the SFPUC's employment policies and authorizes the San Francisco Civil Service Commission to establish rules and procedures to implement those policies. Of the 37 labor unions representing City workers more broadly, 14 presently represent SFPUC employees.

Over the next five years, approximately 40.4% of the SFPUC workforce agency-wide will be eligible for retirement. A new generation of jobs will require workers with specialized training, skills and experience, while local hiring requirements will need to be observed. The SFPUC’s 2020 Strategic Sustainability Plan includes an “effective workforce” goal, which focuses on a number of workforce development and sustainability initiatives. The SFPUC also provides ethics training, diversity training, management training, environmental management system training, as well as fraud prevention and awareness training.

The following table summarizes the number of SFPUC and Water Enterprise employees covered by a memorandum of understanding (similar to a collective bargaining agreement) as of July 1, 2019, each of which expire on June 30, 2022.

**TABLE 1
MEMORANDA OF UNDERSTANDING**

Employee Bargaining Unit	SFPUC Full-Time Equivalent Employment⁽¹⁾	Water Enterprise Full-Time Equivalent Employment⁽¹⁾
International Association of Machinists, Lodge 1414	51	35
Carpenters, Local 22	20	13
International Brotherhood of Electrical Workers, Local 6	122	29
Laborers, Local 261	153	85
Municipal Executives Association	168	35
Operating Engineers, Local 3	24	19
Plumbers, Local 38	231	166
International Federation of Professional and Technical Engineers, Local 21	1,000	214
Service Employees International Union, Local 1021	338	87
San Francisco City Workers United	14	5
Stationary Engineers, Local 39	321	92
Teamsters, Local 856	1	0
Teamsters, Local 853	39	19
Transport Workers Union Local 250-A, Automotive Service Workers	5	4
Unrepresented Employees ⁽²⁾	1	0
Total	2,488	803

⁽¹⁾ Represents budgeted numbers as of July 1, 2019. Actual full-time equivalent employment totals will differ from the number of positions budgeted by the SFPUC for a variety of reasons, including certain requirements in the respective memoranda of understanding (similar to collective bargaining agreements).

⁽²⁾ Not covered by a memorandum of understanding (similar to a collective bargaining agreement).
Source: SFPUC Human Resource Services.

Employee Benefit Plans

History and Administration. The San Francisco City and County Employees’ Retirement System (the “**Retirement System**” or “**SFERS**”) is charged with administering a defined-benefit pension plan (the “**Retirement Plan**”) that covers substantially all City employees, including employees of the SFPUC, and certain other employees. The Retirement System was initially established by approval of City voters on November 2, 1920 and the State Legislature on January 12, 1921 and is currently codified in the City Charter. The Charter provisions governing the Retirement System may be revised only by a Charter amendment, which requires an affirmative public vote at a duly called election.

The Retirement System is administered by the Retirement Board consisting of seven members, three appointed by the Mayor, three elected from among the members of the Retirement System, at least two of whom must be actively employed, and a member of the Board of Supervisors appointed by the President of the Board of Supervisors.

The Retirement Board appoints an Executive Director and an Actuary to aid in the administration of the Retirement System. The Executive Director serves as chief executive officer of SFERS. The Actuary’s responsibilities include advising the Retirement Board on actuarial matters and monitoring of actuarial service providers. The Retirement Board retains an independent consulting actuarial firm to prepare the annual valuation reports and other analyses. The independent consulting actuarial firm is currently Cheiron, Inc., a nationally recognized firm selected by the Retirement Board pursuant to a competitive process.

The Internal Revenue Service (“IRS”) issued a favorable Determination Letter for SFERS in July 2014 (the “2014 Determination Letter”). Issuance of the 2014 Determination Letter constitutes a finding by the IRS that operation of the defined benefit plan in accordance with the plan provisions and documents disclosed in the application qualifies the plan for federal tax-exempt status. A tax qualified plan also provides tax advantages to the City and to members of the Retirement System. The 2014 Determination Letter followed IRS review of all SFERS provisions, including the provisions of Proposition C approved by the City voters in November 2011. The 2014 Determination Letter has no operative expiration date and IRS practice is to not issue new determination letters except under special exceptions.

Retirement Plan Financial Reports. The Retirement System issues a publicly available financial report that includes financial statements and required supplementary information for the Retirement Plan. That report may be obtained by writing to the San Francisco City and County Employees’ Retirement System, 1145 Market Street, 5th Floor, San Francisco, CA 94103, or by calling (415) 487-7000.

Retirement Plan Contributions and Funding Policy. The following table shows Retirement Plan contributions for Fiscal Years 2013-14 through 2017-18 (the most recent date for which information is available):

TABLE 2
CITY AND COUNTY OF SAN FRANCISCO
EMPLOYEES’ RETIREMENT SYSTEM
Fiscal Years 2013-14 through 2017-18
(IN THOUSANDS)

Fiscal Year	Market Value of Assets	Actuarial Value of Assets	Actuarial Liability	Actuarial Percent Funded	Employee and Employer Contribution	Employer Contribution Rates⁽¹⁾
2013-14	\$19,920,607	\$18,012,088	\$21,122,567	85.3%	\$821,902	24.82%
2014-15	20,428,069	19,653,338	22,970,892	85.6	894,325	26.76
2015-16	20,154,503	20,654,703	24,403,882	84.6	849,569	22.80
2016-17	22,410,350	22,185,244	25,706,090	86.3	868,653	21.40
2017-18	24,557,966	23,866,028	27,335,417	87.3	983,763	23.31

⁽¹⁾ Contribution rates are shown before required employer/employee cost-sharing first effective for Fiscal Year 2012-13. Source: SFERS Actuarial Valuation reports as of July 1, 2013, July 1, 2014, July 1, 2015, July 1, 2016 and July 1, 2017.

Contributions to the basic Retirement Plan are made by both the SFPUC and its employees. Employee contributions are mandatory. Employee contribution rates are approved through collective bargaining and vary by union and employment category. For Fiscal Years 2015-16 through 2019-20, the SFPUC’s employee contribution rates varied from 7.5% to 12.0% as a percentage of gross covered salary. For Fiscal Year 2018-19, most employee groups agreed through collective bargaining that employees would contribute the full amount of the employee contribution on a pretax basis. The SFPUC is required to contribute at an actuarially determined rate and allocates the applicable portions of such contribution to the separate enterprises, including the Water Enterprise. For Fiscal Years 2013-14 through 2017-18, the Water Enterprise has paid 100% of its required contributions. The contributions by the Water Enterprise required for Fiscal Years 2013-14 through 2018-19 are summarized in the following table.

TABLE 3
WATER ENTERPRISE RETIREMENT PLAN CONTRIBUTIONS
Fiscal Years 2013-14 through 2018-19

<u>Fiscal Year</u>	<u>Actuarially Determined Rate as a Percentage of Covered Payroll</u>	<u>Water Enterprise Contribution (000s)</u>
2013-14	24.8%	\$25,396
2014-15	26.8	28,280
2015-16	22.8	24,497
2016-17	21.4	24,638
2017-18	23.5	25,922
2018-19	23.3	26,440

Source: SFERS July 1, 2018 Actuarial Valuation Report, Produced by Cheiron, February 2019, SFPUC audited financial statements for Fiscal Years 2013-14 through 2018-19.

Funding Practices. The annual actuarial valuation of the Retirement System is a joint effort of the Retirement System and its independent consulting actuarial firm. The Charter prescribes certain actuarial methods and amortization periods to be used by the Retirement System in preparing the actuarial valuation.

The Retirement Board adopts the economic and demographic assumptions used in the annual valuations. Demographic assumptions such as retirement, termination and disability rates are based upon periodic demographic studies performed by the consulting actuarial firm approximately every five years. Economic assumptions are reviewed each year by the Retirement Board after receiving an economic experience analysis from the consulting actuarial firm. At the November 2018 Retirement Board meeting, the Retirement Board voted to lower the assumed long-term investment earnings assumption from 7.50% to 7.40%, maintain the long-term wage inflation assumption at 3.50%, and lower the long-term consumer price inflation assumption from 3.00% to 2.75%. These economic assumptions were first effective for the July 1, 2018, actuarial valuation and were approved again by the Retirement Board for the July 1, 2019, actuarial valuation at their July 2019 meeting. The Retirement Board had previously lowered the long-term wage inflation assumption from 3.75% to 3.50% at its November 2017 meeting effective for the July 1, 2017 actuarial valuation. In November 2015, the Retirement Board voted to update demographic assumptions, including mortality, after review of a new demographic assumptions study by the consulting actuarial firm.

Upon receipt of the consulting actuarial firm’s valuation report, Retirement System staff provides a recommendation to the Retirement Board for their acceptance of the consulting actuary’s valuation report. In connection with such acceptance, the Retirement Board acts to set the annual employer contribution rates required by the Retirement System as determined by the consulting actuarial firm and approved by the Retirement Board. This process is mandated by the Charter.

Pursuant to the Charter, the consulting actuarial firm and the Retirement Board set the actuarially required employer contribution rate using three related calculations:

First, the normal cost is established for the Retirement System. The normal cost of the Retirement System represents the portion of the actuarial present value of benefits that SFERS will be expected to fund that is attributable to a current year’s employment. The Retirement System uses the entry age normal cost method, which is an actuarial method of calculating the anticipated cost of pension liabilities, designed to fund promised benefits over the working careers of the Retirement System members.

Second, the contribution calculation takes account of the amortization of a portion of the amount by which the actuarial accrued liability of the Retirement System exceeds the actuarial value of Retirement System assets, such amount being known as an “unfunded actuarial accrued liability” or “UAAL.” The UAAL can be thought of as a snapshot of the funding of benefits as of the valuation date. There are a number of assumptions and calculation methods that bear on each side of this asset-liability comparison.

On the asset side, the actuarial value of Retirement System assets is calculated using a five-year smoothing technique, so that gains or losses in asset value are recognized over that longer period rather than in the immediate time period such gain or loss is identified. On the liability side, assumptions must be made regarding future costs of pension benefits in addition to demographic assumptions regarding the Retirement System members including rates of disability, retirement, and death. When the actual experience of the Retirement System differs from the expected experience, the impacts on UAAL are called actuarial gains or losses. Under the Retirement Board's updated Actuarial Funding Methods Policy (the "**Policy**") any such gain or loss is amortized over a closed 20-year period. Similarly, if the estimated liabilities change due to an update in any of the assumptions, the impact on UAAL is also amortized over a closed 20-year period. Prior to the updated Policy which became effective with the July 1, 2014 actuarial valuation, the amortization period for gains, losses and assumption changes was 15 years at the valuation date.

Third, supplemental costs associated with the various SFERS benefit plans are amortized. Supplemental costs are additional costs resulting from the past service component of SFERS benefit increases. In other words, when the Charter is amended to increase benefits to some or all beneficiaries of the Retirement System, the Retirement System's liability is correspondingly increased in proportion to the amount of the new benefit associated with service time already accrued by the then current-beneficiaries. These supplemental costs are required to be amortized over no more than 20 years according to the Charter. The Retirement Board has adopted a 15-year closed period for changes to active member benefits and a five-year closed period for changes to inactive or retired members effective for all changes on or after July 1, 2014. The prior Board Retirement Policy specified closed 20-year periods for all benefit changes.

The consulting actuarial firm combines the three calculations described above to arrive at a total contribution requirement for funding the Retirement System in the next Fiscal Year. This total contribution amount is satisfied from a combination of employer and employee contributions. Employee contribution rates are mandated by the Charter. Sources of payment of employee contributions (i.e. in the case of the SFPUC, the SFPUC, or its employee) are the subject of collective bargaining agreements with each bargaining unit. As described above, most of the SFPUC's employee groups have agreed through collective bargaining that employees would contribute the full amount of the employee contribution on a pretax basis. The employer contribution rate is established by Retirement Board action each year and is expressed as a percentage of salary applied to all wages covered under the Retirement System.

The assumptions and calculations described above were made as of their respective dates and are subject to change thereafter, including, for example, as a result of a subsequent Retirement Board action to revise the actuarial assumptions applied in the calculations. There is a risk that actual results will differ significantly from such assumptions and calculations.

Governmental Accounting Standards Board Disclosures. The Retirement System discloses accounting and financial reporting information under GASB Statement No. 67 (first implemented by the Retirement System in Fiscal Year 2013-14) and the City reports accounting and financial information about the Retirement System under GASB Statement No. 68 (first implemented by the City in Fiscal Year 2014-15). The accounting statements separated retirement system financial reporting from retirement system funding and required certain additional information in the notes to the City's financial statements. In general, the City's funding of its pension obligations is not affected by the changes to its reporting requirements under GASB Statement No. 68, though such changes did result in changes to the SFPUC's reported salary and working capital costs. See "HISTORICAL OPERATING RESULTS."

Healthcare Benefits. The SFPUC participates in the City's agent multiple employer defined benefit plan, which operates as a cost-sharing multiple employer defined benefit plan for the SFPUC (the "**OPEB Plan**"). The OPEB Plan is maintained by the City and is administered through the City's Health Service System and provides postemployment medical, dental and vision insurance benefits to eligible employees, retired employees, and surviving spouses. Health benefit provisions are established and may be amended through negotiations between the City and the respective bargaining units. The City does not issue a separate report on its other post-employment benefit plan.

As prescribed under GASB Statement No. 75, Accounting and Financial Reporting for Postemployment Benefits Other than Pensions, net OPEB liability, deferred outflows/inflows of resources related to OPEB, and OPEB expense are actuarially determined on a citywide basis. Net OPEB liability is measured as the portion of the present value of projected benefit payments to be provided to current active and inactive employees attributed to those employees' past service, less the amount of the Retiree Healthcare Trust Fund investments measured at fair value.

The provisions of GASB Statement No. 75 are effective for the Water Enterprise's year ended June 30, 2019 and 2018. While restatement of all prior periods was not practical because the actuarial information was not available, the cumulative effect of applying GASB Statement No. 75 is reported as a restatement of beginning net position as of July 1, 2017 as follows:

**TABLE 4
RESTATEMENT OF BEGINNING NET POSITION
AS OF JULY 1, 2017
(IN THOUSANDS)**

Record Beginning Net OPEB Liability	\$(158,939)
Record Beginning Deferred Outflows of Resources – OPEB Items	8,229
Remove Net OPEB Obligation (Change from GASB 45)	121,330
Total Cumulative Effect of Change in Account Principle	\$ (29,380)

Source: SFPUC, Financial Services.

The following table shows the components of the City's annual OPEB allocations for the Water Enterprise for Fiscal Year 2017-18 and Fiscal Year 2018-19, for the amount contributed to the plan, and changes in the City's net OPEB obligation:

**TABLE 5
ANNUAL OPEB OBLIGATION
FOR FISCAL YEARS 2017-18 AND 2018-19
(IN THOUSANDS)**

	2018	2019
City's reported net OPEB liabilities	\$3,717,207	\$3,600,967
Water Enterprise's proportionate share of City's contribution	9,122	9,154
Water Enterprise's proportionate share of City's OPEB liability	166,336	150,771

Source: SFPUC, Financial Services.

The City issues a publicly available financial report on a City-wide level that includes the complete note disclosures and required supplementary information related to the City's post-retirement health care obligations. The report may be obtained by writing to the City and County of San Francisco, Office of the Controller, 1 Dr. Carlton B. Goodlett Place, Room 316, San Francisco, CA 94102, or by calling (415) 554-7500.

Pension and Health Care Costs Reforms

Voters implemented City employee pension and health care cost reforms to help mitigate future cost increases. These include the following propositions:

Proposition B. Proposition B was a Charter amendment approved by voters in June 2008 that increased the years of service required to qualify for employer-funded retiree health benefits for City employees who retire under SFERS and were hired on or after January 10, 2009. Previously, employees became eligible to participate in the retirement health care system after five years of service and the employer paid 100% of the contribution. Beginning with employees hired on or after January 10, 2009, employees remain eligible to participate in the retirement health care system after five years of service, however, no employer contributions are required until 10 years of service.

From 10 to 15 years of service, employers pay 50% of the contribution, from 15 to 20 years of service 75%, and for employees with 20 years or more of service, 100%.

Proposition B also established a health care trust fund to pay for future costs relating to retiree health care. Employees hired on or after January 10, 2009, contribute up to 2% of their pre-tax pay, with employers contributing an additional 1%, to the health care trust fund. Proposition B also increased maximum pension benefits for employees retiring at and after age 60 and enhances cost of living increases for pensions.

Proposition C. Proposition C was a Charter amendment approved by voters in November 2011 that changed the way the City and current and future employees share in funding SFERS pension and health benefits.

With regard to pension benefits, the base employee contribution rate remains at 7.5% for most employees when the City contribution rate is between 11% and 12% of City payroll. Employees making at least \$50,000 will pay an additional amount up to 6% of compensation when the City contribution rate is over 12% of City payroll. When the City contribution rate falls below 11%, employee contributions will be decreased proportionately.

Proposition C creates new retirement plans for employees hired on or after January 7, 2012 that: (1) for miscellaneous employees, increased the minimum retirement age to 53 with 20 years of service or 60 with 10 years; (2) for safety employees, kept the minimum retirement age at 50 with five years of service, but increased the age for maximum benefits to 58; (3) for all employees, limited covered compensation, calculated final compensation from a three-year average, and changed the multipliers used to calculate pension benefits; and (4) for miscellaneous employees, raised the age of eligibility to receive vesting allowance to 53 and reduced by half the City's contribution to vesting allowances.

With regard to health benefits, elected officials and employees hired on or before January 9, 2009, contribute up to 1% of compensation toward their retiree health care, with matching contribution by the City. For employees or elected officials who left the City workforce before June 30, 2001, and retire after January 6, 2012, Proposition C requires that the City contributions toward retiree health benefits remain at the same levels they were when the employee left the City workforce.

Proposition C also limits cost-of-living adjustments for SFERS retirees; however, in 2015, the Court of Appeals held in a suit against the City brought by a retiree organization, *Protect Our Benefits v. City and County of San Francisco*, 235 Cal. App. 4th 619 (2015) that certain changes to payment of supplemental cost of living allowances imposed by Proposition C could not be applied to current City employees and those who retired after November 1996 when the supplemental cost of living allowance provisions were originally adopted, but could be applied to SFERS members who retired before November 1996. This decision is now final and its implementation increased the July 1, 2016 unfunded actuarial liability by \$429.3 million for Supplemental COLAs granted retroactive to July 1, 2013 and July 1, 2014.

On July 13, 2016, the Retirement Board adopted a resolution to exempt members who retired before November 6, 1996, from the "fully funded" provision related to payment of Supplemental COLAs under Proposition C. The resolution directed that retroactive payments for Supplemental COLAs be made to these retirees. After the Retirement Board adopted said resolution, the Retirement System published an actuarial study on the cost to the fund of payments to the pre-1996 retirees. The study reports that the two retroactive supplemental payments will trigger immediate payments of \$34 million, create additional liability for continuing payments of \$114 million, and cause a new unfunded liability of \$148 million. This liability does not include the Supplemental COLA payments that may be triggered in the future. Under the cost sharing formulas in Proposition C, the City and its employees will pay for these costs in the form of higher yearly contribution rates. The Controller has projected the future cost to the City and its employees to be \$260 million, with over \$200 million to be paid in the next five fiscal years. The City obtained a permanent injunction to prevent SFERS from making Supplemental COLA payments to these members who retired before November 6, 1996. The Superior Court's injunction was affirmed by the Court of Appeal.

THE WATER ENTERPRISE

General

The SFPUC operates the facilities of its Water Enterprise to optimize the reliability and quality of its water deliveries. The SFPUC has made and will continue to make significant capital investments in the facilities of the Water Enterprise, designed to maximize the Water Enterprise's ability to deliver water sufficient to meet the needs of its customers following the occurrence of a major seismic event or during an extended period of drought.

The SFPUC serves as the retail water supplier for the City and is responsible for water deliveries to residents and institutions within the City limits, as well as to several retail accounts outside of the City limits. In addition, the SFPUC sells water to 27 Wholesale Customer entities in San Mateo, Alameda and Santa Clara counties under the WSA and related individual contractual agreements. Collectively, except for the Cordilleras Mutual Water Company, the Wholesale Customers are members of BAWSCA, which is a public agency separate and apart from the 27 Wholesale Customers. Altogether, nearly 2.7 million people rely on water supplied by the Water Enterprise.

The Water Enterprise consists of over 389 miles of pipeline, over 74 miles of tunnels, 11 reservoirs, 13 groundwater wells, five pump stations, and three water treatment plants located outside of the City, and over 1,235 miles of pipeline, 11 reservoirs, six groundwater wells, eight storage tanks, 24 pump stations, eight hydropneumatic stations and 17 chlorination stations located within the City limit.

The Regional Water System draws approximately 85% of its water from the Upper Tuolumne River Watershed feeding a single aqueduct system, delivering water 120 miles by gravity to Bay Area reservoirs and users. The remaining water supply is drawn from local surface waters in the Alameda and Peninsula watersheds.

Water Rights and Related Proceedings

Prior to the Gold Rush in 1849, local water supplies were largely adequate to meet the needs of what is now San Francisco. The Spring Valley Water Company, purchased by the City in 1930, developed much of the local water supplies now available to the Water Enterprise. The City's population grew rapidly after the Gold Rush to nearly 400,000 by the time of the Great Earthquake of 1906.

As early as the 1880s, the City began looking to the Sierra Nevada and the Tuolumne River in what is now Yosemite National Park as a possible source of abundant, clean water for the City and the Bay Area. Hetch Hetchy Valley, which is located on the Tuolumne River in Yosemite National Park, was first recommended as a reservoir site at the turn of the 20th century in a United States Geological Survey Study. Then-Mayor James D. Phelan made the first filings for water rights and reservoir rights-of-way in the Tuolumne River watershed as a private citizen and transferred those filings to the City in 1903.

Following the Great Earthquake of 1906, the City again sought water rights and reservoir rights-of-way in the Tuolumne River watershed and began to develop a preliminary design for the Hetch Hetchy System (as defined herein). It also entered into negotiations with the Irrigation Districts to protect the Irrigation Districts' existing water rights and to provide them a share of the hydroelectric power to be produced by Hetch Hetchy facilities, at cost-based rates.

The federal Raker Act, enacted on December 19, 1913 (the "**Raker Act**"), grants to the City rights-of-way and public land use on United States government property in the Sierra Nevada to construct, operate and maintain reservoirs, dams, conduits and other structures necessary or incidental to developing and using water and power. It also imposes restrictions on the City's use of Hetch Hetchy Reservoir, including (among others) the requirement that the City recognize the prior rights of the Irrigation Districts to receive water, up to specified amounts of natural daily flow, for direct use and storage. After 20 years of construction of dams and aqueducts, water from the Hetch Hetchy System was first delivered to the Bay Area on October 24, 1934.

The City holds rights of way under the Raker Act and releases water from its facilities under stipulations with the United States Department of the Interior, which administers the Raker Act. The SFPUC diverts water under its water rights acquired under State water law, which entitles the SFPUC to appropriate more than 400 million gallons per day (“**mgd**”) from the Tuolumne River and its tributaries.

The City holds “pre-1914” appropriative water rights for the storage and diversion of water for the Hetch Hetchy and local water systems, except with respect to San Antonio Reservoir. San Antonio Reservoir has a post-1914 appropriative water right license from the SWRCB. Pre-1914 water rights are not subject to the water right permitting authority of the SWRCB but remain subject to jurisdiction concerning adequacy of the right and reasonableness of water use.

See “– Current Water Supply Sources” and “– Proposals to Restore Hetch Hetchy Valley.”

Current Water Supply Sources

The Regional Water System. The Regional Water System is a complex system which supplies water from two primary sources: the Tuolumne River through Hetch Hetchy Reservoir and local runoff into Bay Area reservoirs in the Alameda and Peninsula watersheds. Water developed via Hetch Hetchy Reservoir through Hetch Hetchy facilities represents the majority of the water supply available to the SFPUC. On average, Hetch Hetchy Reservoir provides approximately 85% of the water delivered, and Bay Area reservoirs provide approximately 15% of the water delivered. The local watershed facilities are operated to capture local runoff for delivery. Local area water production is dependent on precipitation and the ability of the SFPUC to regulate watershed runoff.

Local Groundwater. The City overlies all or part of seven groundwater basins: the Westside, Lobos, Marina, Downtown, Islais Valley, South and Visitacion Valley basins. The Lobos, Marina, Downtown and South basins are located wholly within the City limits, while the remaining three extend south into San Mateo County. The portion of the Westside Basin aquifer located within the City is commonly referred to as the North Westside Basin. Except for the Westside and Lobos basins, all of the basins are generally inadequate to supply a significant amount of groundwater for municipal supply due to low yield.

Early in its history, the City made significant use of local groundwater, springs, and spring-fed surface water. However, after the development of surface water supplies in the Peninsula and Alameda watersheds by Spring Valley Water Company and the subsequent completion of Hetch Hetchy Reservoir and aqueduct in the 1930’s, the municipal water supply system has relied almost exclusively on surface water from local runoff, the Alameda and Peninsula watersheds, and the Tuolumne River watershed. Local groundwater use, however, has continued in the City primarily for irrigation purposes. The San Francisco Zoo and Golden Gate Park use groundwater for non-potable purposes. In April 2017, the SFPUC began pumping groundwater from the North Westside Basin aquifer. The groundwater is treated and blended with the SFPUC’s regional drinking water supplies before it is delivered to the SFPUC’s customers. Currently, about 0.5 mgd of groundwater is being delivered. See also “– Water Supply Initiatives – Local Groundwater and Recycled Water Projects.”

Approximately 0.4 mgd of groundwater is delivered to Castlewood Country Club from well fields operated by the SFPUC in Pleasanton and drawn from the Central Groundwater Sub Basin in the Livermore/Amador Valley. These wells are metered and have been in operation for several decades. There is no physical connection between the Castlewood Country Club wells and the Regional Water System. For purposes of water accounting and billing, these deliveries to Castlewood Country Club are accounted for as part of the SFPUC’s Retail Customer base.

Local Recycled Water. Current use of recycled water for these purposes in the City is less than one mgd and does not materially contribute to overall retail demands. The Sharp Park Recycled Water Project (0.1 mgd) and the Harding Park Recycled Water Project (0.2 mgd) provide recycled water for irrigating golf courses. The City also uses disinfected secondary-treated recycled water from the SFPUC’s Southeast Water Pollution Control Plant on a limited basis for wash-down operations and provides it to construction contractors, City departments, and other interested parties for use within the City via a truck-fill station. Permitted uses include soil compaction, dust control, landscape irrigation, street cleaning, and sewer flushing.

Local Water Conservation. The SFPUC is committed to demand-side management programs; the City’s per capita water use has dropped by about one-third since 1977 in part due to these programs. The first substantial decrease came following the 1976-77 drought in which gross per capita water use dropped from 160 to 130 gallons per capita per day (“gpcd”). Despite nearly continuous growth in the City since then, water demand levels have remained lower than water demand levels prior to the 1976-77 drought.

A second substantial decrease in water use within the City occurred because of the 1987-92 drought, when a new level of conservation activities resulted in further water use savings. In the most recent 2012-2015 drought, gross per capita water use within the City decreased to 72 gpcd in Fiscal Year 2016-17, with residential water use calculated to be approximately 41 gpcd in Fiscal Year 2016-17, one of the lowest per-capita rates of any major urban area in the State, and approximately one-half of the statewide average. It is anticipated that through the continuation and expansion of these programs, per capita water use will remain low.

The SFPUC’s water conservation program offers financial incentives, services and educational assistance, all aimed at promoting efficient water use. The conservation program implemented by the SFPUC is based on, among other things, State and local indoor and outdoor efficiency requirements, the WSIP, and analysis of local efficient plumbing fixture saturation rates and water-saving opportunities in our service area.

Water Supply Storage

The amount of water available to the SFPUC’s Retail Customers and Wholesale Customers is constrained by hydrology, physical facilities, and the institutional parameters that allocate the water supply of the Tuolumne River. While in most years the SFPUC receives adequate water supply to meet its demands during dry years, the SFPUC has only a small share of Tuolumne River runoff available and the local Bay Area watersheds produce little water. Due to these constraints, the SFPUC is dependent on reservoir storage to firm up its water supplies. More importantly, reservoir storage provides the Regional Water System with year-to-year water supply carry-over capability. Reservoir storage is critical to the SFPUC during drought cycles since it enables the SFPUC to carry-over water supply from wet years to dry years. See “WATER FACILITIES – Water Storage.”

Projected Demand

Retail Demand. Prior to 2015, the SFPUC had projected its retail demands and conservation potential using an end-use model that was initially developed in 2004. Projections from this model have been used in the 2005 and 2010 updates to the SFPUC’s Urban Water Management Plan (“UWMP”). For the 2015 update to the UWMP, the SFPUC developed a new set of models that, in addition to other factors, incorporate socioeconomic factors to project demands through 2040. By including socioeconomic factors, the models are able to capture a more complete demand picture. The new set of models relies on household and employment forecasts provided by the San Francisco Planning Department’s Land Use Allocation (“LUA”). The LUA forecasts are a City-specific refinement of growth forecasts from the Association of Bay Area Governments (“ABAG”), ABAG Projections 2013, which reflect the growth that is assumed in ABAG’s Plan Bay Area, and Sustainable Communities Strategy Jobs-Housing Connections Scenario.

The water demand projections show that single family and multi-family residential water use throughout the retail service area is projected to increase by 45% and 18%, respectively, between 2015 and 2040. In comparison, the total number of City households is projected to increase by 23% during the same period. In the non-residential sector, non-residential water use throughout the retail service area is projected to increase 30%, while the total number of jobs in the City is projected to increase by 23%. These projections will be updated in 2020 as the SFPUC compiles the 2020 Urban Water Management Plan, which is due in 2021.

**TABLE 6
PROJECTED RETAIL WATER DEMAND
(IN MGD)**

	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>2035</u>	<u>2040</u>
In-City Residential Demand (Single and Multiple Family)	37.6	39.1	41.8	44.5	47.3
In-City Non-residential (Business/Industrial/Municipal Demands) ⁽¹⁾	28.9	28.9	29.5	30.4	31.6
Subtotal – In-City Retail	66.5	68.0	71.3	74.9	78.9
In-City Water Loss ⁽²⁾	6.0	6.0	6.0	6.0	6.0
Subtotal – In-City Losses	6.0	6.0	6.0	6.0	6.0
Suburban Residential	0.1	0.1	0.1	0.1	0.1
Suburban Non-residential ⁽³⁾	4.4	4.4	4.4	4.4	4.4
Groveland CSD	0.5	0.5	0.5	0.5	0.5
Subtotal – Suburban Retail⁽⁴⁾	5.0	5.0	5.0	5.0	5.0
Total – Retail Demand	77.5	79.0	82.3	85.9	89.9
Local Water Supplies	4.6	7.1	7.1	7.2	7.3
Net Retail Demand from Regional Water System	72.9	71.9	75.2	78.7	82.0

⁽¹⁾ Includes Builders & Contractors, Docks & Shipping, and all dedicated irrigation.

⁽²⁾ Water losses include both apparent and real losses.

⁽³⁾ Includes the San Francisco County Jail, San Francisco International Airport, Lawrence Livermore National Laboratory, Castlewood Country Club, Sunol Valley Golf Course, and other non-residential suburban or municipal accounts.

⁽⁴⁾ Suburban retail water losses are considered to be negligible.

Note: Amounts set forth in this table are projections. Actual results may differ materially from these projections. See “FORWARD-LOOKING STATEMENTS” above.

Source: 2015 Urban Water Management Plan, released June 2016.

Wholesale Demand. As part of the development of its Long-Term Reliable Water Supply Strategy, BAWSCA has updated demand projections for each of the Wholesale Customers, which BAWSCA published in its Final report entitled “Regional Water Demand and Conservation Projections Final Report,” released in September 2014. While some Wholesale Customers have used the strategy projections for their individual UWMP updates for 2015, others are opting to use more recent projections. The most recent set of projections across all Wholesale Customers are provided in the SFPUC’s 2040 Water Management Action Plan (“**WaterMAP**”), which aims to establish a water supply planning framework for the planning period of 2019 through 2040. The WaterMAP provides necessary information to address key water supply decisions.

Water supplied by the SFPUC to the Wholesale Customers is metered. The total projected water demands of the Wholesale Customers, as provided in WaterMAP, are shown in Table 7.

In Fiscal Year 2017-18, Wholesale Customers collectively received approximately 66.7% of their water supply from the Regional Water System. By 2041 this figure is projected to be 57.2%. For the year 2041, water demands of the Wholesale Customers (regardless of water source) are projected to increase to approximately 303.8 mgd and other water supplies available and developed by the Wholesale Customers, which include increased water conservation and recycling, are projected to increase to approximately 129.9 mgd.

**TABLE 7
PROJECTED WHOLESALE CUSTOMER WATER DEMAND AND SUPPLIES
(IN MGD)**

	<u>2021</u>	<u>2026</u>	<u>2031</u>	<u>2036</u>	<u>2041</u>
Wholesale Customer Purchases from the Regional Water System ⁽¹⁾	157.28	162.40	165.90	169.55	173.83
Other Supplies ⁽²⁾	103.21	113.10	120.08	125.02	129.93
Total Wholesale Customer Demand	260.49	275.50	285.98	294.57	303.76

⁽¹⁾ This projected demand includes increased deliveries to interruptible customers, the cities of San Jose and Santa Clara, as well as to a permanent customer, the City of East Palo Alto, consistent with WaterMAP.

⁽²⁾ Estimated as the difference between the Total Wholesale Customer Demand and the Wholesale Customer Purchases from the Regional Water System.

Note: Amounts set forth in the table are projections. Actual results may differ materially from these projections. See “FORWARD-LOOKING STATEMENTS” above.

Source: BAWSCA Annual Survey Fiscal Year 2017-18, released March 2019.

The SFPUC plans to meet its contractual obligation of serving the Wholesale Customers Supply Assurance (as defined herein) of 184 mgd and providing 81 mgd to the City. In addition to the Supply Assurance, the SFPUC provides 9 mgd to the City of San Jose (“**San Jose**”) and the City of Santa Clara (“**Santa Clara**”) as interruptible customers. However, San Jose and Santa Clara are requesting up to a total of 14.5 mgd in future years, and City of East Palo Alto (“**East Palo Alto**”), a permanent customer, is requesting an additional 1.5 mgd above its Individual Supply Guarantee. In 2017, the City of Mountain View (“**Mountain View**”) agreed to a permanent one mgd transfer of its Individual Supply Guarantee to East Palo Alto. See “– Wholesale Deliveries – Creation of Transfer Market” and “– 2028 Water Supply Decisions.”

Water Supply Reliability and Drought Planning

The SFPUC water supply system reliability is expressed in terms of its ability to deliver water during droughts. Reliability is defined by the amount and frequency of water delivery reductions required to balance customer demands with available supplies in droughts. The total amount of water the SFPUC has available to deliver to its Retail and Wholesale Customers during a defined period is dependent on several factors that include the amount of water that is available to SFPUC from natural runoff, the amount of water in reservoir storage, groundwater and the amount of water that must be released from the SFPUC’s system for commitments for purposes other than customer deliveries (such as releases below Hetch Hetchy Reservoir to meet Raker Act and fishery purposes).

The SFPUC operates its system to optimize the reliability and quality of its water deliveries. Hetch Hetchy Reservoir operations are guided by two principal objectives: collection of Tuolumne River water runoff for diversion to the Bay Area; and fulfillment of the SFPUC’s downstream release obligations. To ensure water supply, Hetch Hetchy Project reservoirs remain high through the early winter, until sufficient snowmelt runoff is forecasted at 90% certainty to fill all Tuolumne reservoirs. When the forecasted snowmelt is certain to be in excess of the fill volume, the reservoirs may be drawn down through power operations to increase revenue without risking water supply.

Similarly, the Regional Water System Bay Area reservoirs are operated to conserve watershed runoff. As such, reservoirs are drawn down early in the winter period to capture storms and reduce the potential for spilling water out of the reservoirs. In the spring, Hetch Hetchy water (snowmelt) is often transferred to three of the Bay Area reservoirs that are capable of receiving the water so that any unused local reservoir storage is filled prior to July 1.

Prior to 1976, droughts had not seriously affected the ability of the SFPUC to sustain full deliveries to its customers. During a subsequent drought in 1987-92, as reservoir storage continued to decline it became apparent that continued full deliveries could not be sustained without the risk of running out of water before the drought

ended. As a result of these experiences, to provide some level of assurance that water could be delivered continuously throughout a drought (although at reduced levels), the SFPUC adopted a drought planning sequence, incorporating an 8.5 year drought scenario for planning purposes (based on combined number of actual drought years from 1976-1977 and 1986-92), and associated operating procedures that trigger different levels of water delivery reduction rationing relative to the volume of water actually stored in SFPUC reservoirs. Each year, during the snowmelt period, the SFPUC evaluates the amount of total water storage expected to occur throughout the Regional Water System. If this evaluation finds the projected total water storage to be less than an identified level sufficient to provide sustained deliveries during the drought scenario, the SFPUC may impose delivery reductions or rationing.

Rationing. At current contractual obligations to deliver 184 mgd to the SFPUC’s Wholesale Customers and 81 mgd to its Retail Customers combined with current water supplies and reservoir storages, the Regional Water System can be expected to experience up to a 25% shortage from 15% to 20% of the time, over multiple-year drought sequences. During a drought, Retail and Wholesale Customers could experience a reduction in the amount of water received from the Regional Water System. The amount of the reduction would be dictated by existing contractual agreements between the SFPUC and the Wholesale Customers, as detailed in the existing Water Shortage Allocation Plan (“**WSAP**”). The WSAP provides specific allocations of available water between the Retail and Wholesale Customers collectively associated with different levels of systemwide shortage. Under the WSAP, specific rationing amounts applied to the Retail and Wholesale Customers will be determined by their subsequent shortage plans as required to remain with their share of the systemwide allocation.

The WSAP has been carried forward in the WSA for systemwide shortages of up to 20%. For shortages in excess of this amount, the WSA provides that the SFPUC may allocate water at its discretion, subject to legal challenge by Wholesale Customers, if agreement cannot be reached regarding treatment of shortages in excess of 20%. The WSA also includes provisions for drought and emergency pricing. See “**FINANCIAL OPERATIONS.**”

System Delivery Capability. System delivery capability is defined as the water delivery the Regional Water System is able to sustain over historical hydrologic conditions including multiple-year drought sequences. Under existing SFPUC operations policies and procedures, the SFPUC has a system delivery capability of 258 mgd. That is, the Regional Water System is capable of sustaining a 258 mgd annual average delivery over a hydrologic period equivalent to that experienced from 1921 to 2002 with shortages due to drought. After completion of the WSIP and development of dry-year supplies, the system delivery capability is anticipated to increase to 262 mgd. During non-drought years, the Regional Water System is capable of sustainably delivering 265 mgd.

Water Supply Initiatives

To ensure that the future water needs and contractual obligations of its Retail and Wholesale Customers will be met in a more reliable and sustainable manner, the SFPUC has undertaken water supply projects in the WSIP to improve dry year supplies, and is looking to diversify the City’s water supply portfolio through the development of conservation programs and local and regional water supplies such as recycled water, groundwater and potable reuse. The SFPUC is also identifying opportunities for storage to increase dry year reliability using existing supplies. Projects related to these efforts are described briefly below. The SFPUC is also continuing its efforts to advance the use of greywater and stormwater recapture in the City, and continues to research opportunities in areas including non-potable supply, desalination and innovative technologies.

New Drought Supplies. The WSIP water supply program includes development of dry-year supplies for the Regional Water System. The WSIP Program Environmental Impact Report included an analysis of dry-year water supply transfers from the senior water right holders on the Tuolumne River, the Irrigation Districts; a groundwater conjunctive use project; and a regional desalination project. The latter two projects are described below. The SFPUC has had continued discussions for a 2 mgd dry-year water transfer with Modesto Irrigation District and Oakdale Irrigation District and is exploring opportunities throughout the San Joaquin Valley.

Groundwater Conjunctive Use. The SFPUC, in conjunction with the City of Daly City (“**Daly City**”), California Water Service Company (South San Francisco District) (“**Cal Water**”) and the City of San Bruno (“**San Bruno**”), approved the Groundwater Storage and Recovery Project in August 2014. The Groundwater Storage and Recovery Project, located in the southern portion of the Westside Groundwater Basin in northern San Mateo

County, is designed to create a new dry year groundwater supply that can be utilized over the course of the SFPUC “design drought,” which is a combination of the last two most severe historic droughts on record – 1987-91 and 1976-77. During normal and wet years, the SFPUC will deliver supplemental surface water to Daly City, San Bruno and Cal Water in place of groundwater pumping. Reducing pumping in normal and wet years allows the basin to naturally recharge creating an alternative groundwater source that can be pumped in dry years. The SFPUC adopted the project following CEQA certification in August 2014. The SFPUC began storing groundwater from the Groundwater Storage and Recovery Project in Fiscal Year 2016-17. Over 19,000 acre feet of groundwater for dry year supply has been stored to date. The wells for the Groundwater Storage and Recovery Project are expected to be online in 2020.

Recycled Water / Groundwater Offset. In coordination with Daly City and Cal Water, the SFPUC is evaluating a recycled water project that would provide an irrigation supply to replace groundwater pumping in Colma. In addition to providing the appropriate water supply for irrigation, by reducing pumping in the Westside Groundwater Basin, this project enhances the drought year reliability of the Groundwater Storage and Recovery Project.

Purified Water. In partnership with both water and wastewater agencies, the SFPUC is assessing the feasibility of several projects that rely on advanced water treatment to take treated water from wastewater facilities to develop new potable water supplies. The Crystal Springs Purified Water Project could generate over 6 mgd in new purified water supply that could be blended at Crystal Springs Reservoir before being treated again at the Harry Tracy Water Treatment Plant. A separate partnership could result in over 4 mgd of purified water being developed for groundwater recharge before it is extracted and desalinated. In San Francisco, a 5 mgd purified water project could augment future water supplies. Research is ongoing to determine feasibility.

Storage. The SFPUC is investigating opportunities for storage to improve water supply management during droughts. Two projects that are being analyzed include the expansion of Calaveras Reservoir and the expansion of the Los Vaqueros Reservoir.

Desalination. The SFPUC and several other Bay Area water supply agencies are participating in a Bay Area Regional Reliability Partnership and Drought Contingency Planning effort, which includes the exploration of desalination as a means of meeting regional water needs. The Bay Area Brackish Water Treatment (Regional Desalination) Project could provide approximately 10 mgd through a shared facility with a capacity of up to 20 mgd. This water could be stored in Los Vaqueros Reservoir for dry year supply through transfers and/or exchanges. Review of this project is ongoing alongside other potential drought supply options.

Local Groundwater and Recycled Water Projects. The water supply projects being funded as a part of the WSIP include groundwater and recycled water projects that will result in new water supply for the Retail Customers. In April 2017, the SFPUC began pumping groundwater from the Westside Groundwater Basin aquifer that extends from approximately 270 feet to 460 feet below the surface. The groundwater is treated and blended with the SFPUC’s regional drinking water supplies before it is delivered to the SFPUC’s customers. Over the next few years the SFPUC anticipates continuing to add groundwater in order to reach its goal of blending 4 mgd of treated groundwater with regional water supplies. To date, four wells have been completed, with the remaining two still in construction. The groundwater is treated with chlorine and then delivered to the Sunset and Sutro reservoirs where it is blended with the regional water supplies. The blended water is served to more than half of the Retail Customers. The Westside Recycled Water Project will provide approximately 1.6 mgd of recycled water for major irrigation users on the west side of the City, including Golden Gate Park, Lincoln Park Golf Course and the Presidio of San Francisco. The SFPUC issued a notice to proceed for construction contracts for the Westside Recycled Water Project on October 18, 2017. The SFPUC is evaluating the feasibility of the San Francisco Eastside Satellite Recycled Water Project to supply unmet demand on the east side of San Francisco

Local Water Conservation. The SFPUC maintains a robust water conservation program and has one of the lowest rates of per capita water use in the State. New conservation programs include high efficiency toilet replacement in low income communities and water efficient irrigation installation in municipal parks.

Onsite Water Reuse. In September 2012, the City adopted Ordinance No. 109-15 (the “**Non-Potable Water Ordinance**”). The Non-Potable Water Ordinance added Article 12C to the City’s Health Code (“**Article 12C**”), which allows the collection, treatment, and use of alternate water sources for non-potable applications. In October 2013, Article 12C was amended to allow district-scale water systems consisting of two or more buildings sharing non-potable water. In July 2015, Article 12C was further amended to require that, beginning November 1, 2015, all new development projects of 250,000 square feet or more of gross floor area located within the boundaries of the City’s designated recycled water use areas install onsite water systems to treat and reuse available alternate water sources for toilet flushing and irrigation. This requirement expanded to the entire City on November 1, 2016. Article 12C details the steps that must be taken to collect, treat, and use non-potable water in commercial, mixed-use, and multi-family residential developments. Article 12C also outlines the oversight of the SFPUC and the City’s Departments of Public Health and Building Inspection during the review process.

Innovation. The SFPUC is investing in innovative technologies and approaches to increase water supply and water resource efficiency in San Francisco. The SFPUC is researching the feasibility of potable reuse through treated water augmentation through PureWaterSF, a decentralized potable reuse application. The SFPUC is also considering the use of brewery process water to offset potable water demands. In addition, new areas of research and testing such as rainwater for potable use are also in progress.

Wholesale Deliveries

Wholesale Service Area and Customer Base. The Water Enterprise provides wholesale water service to 27 Wholesale Customers, which consist of 25 public agencies, one private utility and one private, not-for-profit educational institution. All of the Wholesale Customers are located within Alameda County, Santa Clara County or San Mateo County.

- Alameda County is located to the east of San Francisco Bay and extends from the cities of Berkeley and Albany in the north to the City of Fremont in the south. Alameda County contains 14 incorporated cities. The California Department of Finance Demographic Research Unit estimated Alameda County’s population at 1,669,301 as of January 1, 2019. Most of its population is concentrated in a highly urbanized area between the San Francisco Bay and the East Bay Hills.
- Santa Clara County lies immediately south of San Mateo County and encompasses an area of approximately 1,316 square miles. Santa Clara County contains 15 incorporated cities, including San Jose, the third largest city in the State. The California Department of Finance Demographic Research Unit estimated Santa Clara County’s population at 1,954,286 as of January 1, 2019. Most of its population is concentrated in the extensively urbanized and heavily industrialized northern portion of Santa Clara County.
- San Mateo County is located on the San Francisco Peninsula, west of the San Francisco Bay. San Mateo County covers 446 square miles and contains 20 incorporated cities. Coastal mountains run north and south, dividing the lightly populated western part of the county from the heavily populated eastern corridor between San Francisco and Santa Clara/Silicon Valley. The California Department of Finance Demographic Research Unit estimated San Mateo County’s population at 774,485 as of January 1, 2019.
- Alameda County, Santa Clara County and San Mateo County all have diversified economies and median household incomes higher than State and national averages.

Collectively, the Wholesale Customers provide retail water service to over 1.7 million people in their respective service areas, with the balance of the respective population being serviced by other providers. All Wholesale Customers are billed monthly on the basis of metered water use and in accordance with the WSA.

The following is a list of the 27 Wholesale Customers:

Wholesale Customers

Municipalities	Water Purveying Districts	Private Entities
City of Brisbane	Alameda County Water District	California Water Service Company ⁽¹⁾
City of Burlingame	Coastside County Water District	Stanford University
City of Daly City	Cordilleras Mutual Water Company ⁽³⁾	
City of East Palo Alto	Estero Municipal Improvement District	
City of Hayward	Guadalupe Valley Municipal Improvement District	
City of Menlo Park	Mid-Peninsula Water District	
City of Millbrae	North Coast County Water District	
City of Milpitas	Purissima Hills Water District	
City of Mountain View	Westborough County Water District	
City of Palo Alto		
City of Redwood City		
City of San Bruno		
City of San Jose ⁽²⁾		
City of Santa Clara ⁽²⁾		
City of Sunnyvale		
Town of Hillsborough		

⁽¹⁾ California Water Service Company, an investor-owned utility, provides water service to three separate districts: Bear Gulch (Atherton/Woodside vicinity and including the former Skyline County Water District), Mid-Peninsula (San Carlos/San Mateo vicinity), and South San Francisco. California Water Service Company purchases approximately 15% of the water delivered annually by the SFPUC. Such purchases account for approximately 10% of the SFPUC’s yearly revenues.

⁽²⁾ The SFPUC provides water on an interruptible basis to fixed service areas in the northern portions of the cities of San Jose and Santa Clara. See “– Status of San Jose and Santa Clara” below.

⁽³⁾ Cordilleras Mutual Water Company is the only Wholesale Customer that is not a member of BAWSCA.

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The following table shows the percentage of water purchased from the Regional Water System by Wholesale Customers (not including Cordilleras Mutual Water Company) in Fiscal Year 2017-18 (the most recent data available). Of the 26 Wholesale Customers listed, 16 derived over 90% of their water from the SFPUC.

**TABLE 8
PERCENTAGE OF WATER PURCHASED FROM THE REGIONAL WATER SYSTEM
BY WHOLESALE CUSTOMERS IN FISCAL YEAR 2017-18⁽¹⁾**

	Population	Water Purchased (mgd)		
		SFPUC⁽²⁾	Total	% SFPUC⁽²⁾
California Water Service Company	258,701	28.95	29.29	98.8%
City of Hayward	160,500	14.55	14.55	100.0
City of Palo Alto	67,320	9.96	10.76	92.6
City of Sunnyvale	153,389	9.09	17.08	53.2
City of Redwood City	87,023	8.47	9.14	92.7
Alameda County Water District	356,000	7.62	37.01	20.6
City of Mountain View	79,027	7.41	8.80	84.2
City of Milpitas	78,106	5.02	9.03	55.6
San Jose Municipal Water District	16,084	4.53	5.38	84.2
Estero Municipal Improvement District	37,687	4.24	4.24	100.0
City of Burlingame	31,109	3.48	3.78	92.1
City of Daly City	109,139	5.69	6.26	90.9
North Coast County Water District	40,000	2.40	2.40	100.0
City of Menlo Park	17,071	2.86	2.86	100.0
Town of Hillsborough	10,869	2.53	2.53	100.0
Mid-Peninsula Water District	26,924	2.50	2.50	100.0
City of Millbrae	22,848	2.03	2.03	100.0
Stanford University	32,218	1.49	2.59	57.5
City of Santa Clara	129,604	2.13	20.41	10.4
Purissima Hills Water District	6,150	1.67	1.67	100.0
City of East Palo Alto	26,181	1.58	1.58	100.0
Coastside County Water District	16,776	0.10	1.85	5.1
City of San Bruno	44,409	2.68	3.05	87.9
Westborough Water District	12,703	0.79	0.79	100.0
City of Brisbane / Guadalupe Valley Municipal Improvement District	4,573	0.68	0.68	100.0
Total All Agencies⁽³⁾	1,824,411	112.64	175.56	64.2%

⁽¹⁾ Fiscal Year 2018-19 data is not yet available.

⁽²⁾ Purchases from the Regional Water System. Does not include Cordilleras Mutual Water Company, which is the only Wholesale customer that is not a member of BAWSCA.

⁽³⁾ Totals may not add due to rounding.

Source: March 2019 Bay Area Water Supply and Conservation Agency Annual Survey for Fiscal Year 2017-18.

The following table summarizes the sources of supply for the Wholesale Customers (not including the Cordilleras Mutual Water Company) collectively during Fiscal Year 2017-18 (the most recent data available).

TABLE 9
WATER DELIVERIES TO WHOLESALE CUSTOMERS BY SOURCE
FISCAL YEAR 2017-18⁽¹⁾

<u>Source</u>	<u>Acre-Feet</u>	<u>Percent of Total</u>
San Francisco Public Utilities Commission	149,529	66.7%
Other Sources (Includes State/Federal)	39,883	17.8
Groundwater	21,715	9.7
Surface Water	3,967	1.8
Recycled Water	9,249	4.1
Total⁽²⁾	224,343	100.0%

⁽¹⁾ Fiscal Year 2018-19 data is not yet available.

⁽²⁾ Totals may not add due to rounding.

Source: SFPUC.

The Bay Area Water Supply and Conservation Agency. BAWSCA is the successor agency to the Bay Area Water Users Authority (“BAWUA”). BAWUA was originally formed as a non-profit mutual benefit corporation to represent the Wholesale Customers’ collective interests in their interactions with the SFPUC. Concerned that their needs and interests were not properly represented by the SFPUC, BAWUA lobbied for the creation of an entity with authority to plan for and acquire supplemental water supplies, encourage water conservation and use of recycled water on a regional basis, and assist in the financing of essential repairs and improvements to the Regional Water System.

BAWSCA is governed by a 26-member Board of Directors which is composed of community leaders representing its 26 members. BAWSCA has the authority to coordinate water conservation, supply and recycling activities for its agencies; acquire water and make it available to other agencies on a wholesale basis; finance projects, including improvements to the Regional Water System; and build facilities jointly with other local public agencies or on its own to carry out its purposes. BAWSCA has not, to date, acquired water or built facilities. In February 2013, BAWSCA financed an early repayment of certain capital charges under the WSA. See “FINANCIAL OPERATIONS – Wholesale Water Sales Revenue – Capital Cost Recovery Prepayment.”

Regional Water System Financing Authority. The Wholesale Customers, together with the SFPUC, formed the San Francisco Bay Area Regional Water System Financing Authority (“RFA”) in 2002. While BAWSCA focuses on planning and water management and may engage in public works projects, the RFA exists solely to help fund capital improvements to the Regional Water System. The RFA has the power to issue revenue bonds to fund projects to improve the reliability of the Regional Water System; provide proceeds of revenue bonds to the City under specified conditions to improve reliability of the system; and apply for and receive State and federal grants, loans and other financial assistance.

Debt service on any bonds issued by RFA in the future would be secured by, and paid from, a surcharge imposed by the SFPUC upon Wholesale Customers and, under specific conditions, upon Retail Customers. This surcharge would be imposed in an amount sufficient to pay debt service on the RFA’s bonds and its operating expenses. Proceeds of the surcharge would not constitute Revenues under the Indenture, and debt service on these bonds, if issued, would not be a debt or liability of the SFPUC or the City.

The RFA has not, to date, issued any revenue bonds, and the SFPUC is not now aware of any current plans by the RFA to do so. The ability of the RFA to issue bonds expires in December 2020.

Prior Master Water Sales Contract. Between 1984 and 2009, Wholesale Customer rates were set pursuant to a Settlement Agreement and Master Water Sales Contract (the “**Prior Master Water Sales Contract**”). The Prior Master Water Sales Contract put in place a comprehensive method for allocating the costs of the water system between the SFPUC’s Retail Customers and the Wholesale Customers. Capital costs and most operations and maintenance expenses of the Regional Water System were distributed between the SFPUC and its Retail Customers and the Wholesale Customers on proportional water usage: approximately one-third to the City and two-thirds to the Wholesale Customers.

The Prior Master Water Sales Contract resolved litigation over certain rate-setting practices. Both sides dismissed, with prejudice, the claims related to water sales overcharges and undercharges with the signing of the Prior Master Water Sales Contract. However, the litigation left open certain questions, such as whether the Wholesale Customers are “Co-Grantees” under the Raker Act and, if so, what rights, benefits and privileges accrue to them by reason of such status, including the right to receive water at cost, and the extent to which the City may be legally obligated to provide water to meet growth demands in Wholesale Customer service areas.

Water Supply Agreement. In 2009, the SFPUC and the Wholesale Customers entered into the Water Supply Agreement, with an effective date of July 1, 2009, which replaced the Prior Master Water Sales Contract. The WSA has a 25-year term (through June 30, 2034), with provisions for two conditional five-year extensions.

The WSA provides for the separation of asset and expense categories among wholesale only, regional, and retail only. Annual operations and maintenance expenses are recovered on the basis of proportional annual use of the Regional Water System in most cases. Costs and revenues of the Hetch Hetchy Project are also separated – the Wholesale Customers do not pay for power-related costs, which are borne by the Power Enterprise, and do not share in power revenues.

The WSA includes a “Supply Assurance” of 184 mgd (measured on an annual average basis), in favor of 23 of the Wholesale Customers (the “**Supply Assurance**”). The cities of San Jose and Santa Clara are served wholesale water on an interruptible basis and such sales are not deemed to be within the Supply Assurance. The City of Hayward (“**Hayward**”) does not have an individual supply guarantee as it had previously negotiated an individual contract that did not limit its water use. Hayward continues to receive water under a contract entered into in 1960 with no expiration date or limitation in supply. If the demand of the 23 Wholesale Customers with individual supply guarantees exceeds the 184 mgd Supply Assurance, the 23 Wholesale Customers with individual supply guarantees would be required to reduce their allocation to accommodate the needs of Hayward. For Fiscal Year 2018-19, total water purchases by the Wholesale Customers with individual supply guarantees (including Hayward’s current use, but excluding San Jose and Santa Clara) were approximately 63.8% of the combined Supply Assurance.

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The following table shows the Individual Supply Guarantee and actual Fiscal Year 2018-19 purchases for the Wholesale Customers.

TABLE 10
WHOLESALE CONTRACTUAL OBLIGATIONS
(IN MGD)

	Individual Supply Guarantee⁽¹⁾	Actual 2018-19 Purchases
Alameda County Water District	13.76	7.68
City of Brisbane / Guadalupe Valley Municipal Improvement District ⁽²⁾	0.98	0.41
City of Burlingame	5.23	3.48
California Water Service Company ⁽³⁾	35.68	26.28
Coastside County Water District	2.18	1.15
City of Daly City	4.29	3.59
City of East Palo Alto	1.96	1.52
Estero Municipal Improvement District	5.90	4.03
City of Hayward	22.10	13.98
Town of Hillsborough	4.09	2.31
City of Menlo Park	4.46	2.84
Mid-Peninsula Water District	3.89	2.50
City of Millbrae	3.15	1.95
City of Milpitas	9.23	5.13
City of Mountain View	13.46	7.28
North Coast County Water District	3.84	2.29
City of Palo Alto	17.07	9.43
Purissima Hills Water District	1.62	1.60
City of Redwood City	10.93	8.09
City of San Bruno	3.25	0.86
City of San Jose ⁽⁴⁾	0.00	4.31
City of Santa Clara ⁽⁴⁾	0.00	3.01
Stanford University	3.03	1.43
City of Sunnyvale	12.58	8.77
Westborough County Water District	1.32	0.79
Subtotal BAWSCA Demand	184.00	124.70
Cordilleras Mutual Water Company ⁽⁵⁾	--	0.01
Total Wholesale Demand⁽⁶⁾	--	124.70

(1) "Individual Supply Guarantee" refers to each Wholesale Customer's share of the Supply Assurance as defined in the Prior Master Water Sales Contract. The Supply Assurance is the 184 mgd maximum annual average metered supply of water dedicated by SFPUC to public use in the wholesale service area (not including the cities of San Jose and Santa Clara). Hayward's allocation is calculated as 184 mgd less the total of permanent customer Individual Supply Guarantees (161.92 mgd).

(2) Brisbane and Guadalupe Valley Municipal Improvement District are two Wholesale Customers that are jointly operated.

(3) Includes individual Supply Guarantee of Skyline County Water District, which was purchased by California Water Service Company-Bear Gulch in 2009.

(4) San Jose and Santa Clara do not have an allocated share of Supply Assurance due to their temporary, interruptible status under the WSA.

(5) Cordilleras Mutual Water Company is not a member of BAWSCA, and therefore does not have an Individual Supply Guarantee.

(6) Totals may not add due to rounding.

Sources: Water Supply Agreement; SFPUC Customer Care and Billing System.

The basic framework of the Prior Master Water Sales Contract regarding coordination of wholesale rates with the annual SFPUC budget process, annual compliance audits, resolution of disputes concerning the SFPUC's determination of the annual Wholesale Revenue Requirement (as defined herein) via binding arbitration and the annual true up of costs using a balancing account continue, but the WSA effected significant changes in the arrangement between the SFPUC and the Wholesale Customers. The WSA included the following significant changes:

Allocation of Capital Costs. Instead of continuing with the utility method, the WSA more timely recovers capital costs as follows:

- The costs of existing assets placed in service prior to June 30, 2009, approximately \$367 million in 2009 dollars, were to be repaid based on audited actual costs in monthly installments by Wholesale Customers at an annual interest rate of 5.13% over a 25-year period, in lieu of depreciation and a weighted return on these assets. In February 2013, the Wholesale Customers, through BAWSCA, made an early repayment of the entire cost recovery payment balance. See “FINANCIAL OPERATIONS – Wholesale Water Sales Revenue – Capital Cost Recovery Prepayment.”
- The costs of new regional assets placed in service after June 30, 2009 are to be paid for using the cash method. Annual wholesale rates are set to recover the Wholesale Customers' share of regional asset costs from current revenues for cash-funded assets. Wholesale contributions for debt-financed assets include appropriate contributions towards debt service and coverage based on the Wholesale Customers' proportionate annual use of the Regional Water System.
- For the portion of capital projects costs that were appropriated but not expended as of June 30, 2009, a 10-year repayment schedule including 4.00% interest has been calculated, based on audited actual costs.

For more information regarding the wholesale rate setting mechanism, see “FINANCIAL OPERATIONS – Wholesale Water Sales Revenue,” and “APPENDIX B – SUMMARY OF CERTAIN PROVISIONS OF THE WATER SUPPLY AGREEMENT – Wholesale Revenue Requirement,” “– Capital Cost Contribution – New Regional Assets” and “– Hetch Hetchy Enterprise Expenses.”

Treatment of Water Supply Issues. The 184 mgd Supply Assurance continues in existence in the WSA. The WSA includes an “**Interim Supply Limitation**” which limits the amount of water delivered to the Retail Customers and Wholesale Customers from the SFPUC watersheds to 265 mgd through 2028. Under the Interim Supply Limitation, Retail Customers will receive up to 81 mgd and the Wholesale Customers will receive up to 184 mgd from the Regional Water System.

Status of San Jose and Santa Clara. The cities of San Jose and Santa Clara retain their temporary, interruptible status. The SFPUC agrees to supply a combined annual average of 9 mgd to the two cities through 2028. The 9 mgd allocated to San Jose and Santa Clara is not a part of the Supply Assurance, but is included within the wholesale portion of the Interim Supply Limitation of 184 mgd.

To establish a water supply planning framework for the planning period of 2019 through 2040, the SFPUC developed the WaterMAP. The WaterMAP provides necessary information to address key water supply decisions, including the options the SFPUC should consider in making San Jose and Santa Clara permanent customers of the Regional Water System. See “– 2028 Water Supply Decisions” below.

Creation of Transfer Market. The WSA contemplates the creation of a water transfer market that enhances the Wholesale Customers' ability to keep purchases within the amounts of their respective Interim Supply Allocations (as defined in the WSA). These transfers would remain in effect until rescinded by the transferring parties, and otherwise continue in force until December 31, 2028. In addition, Wholesale Customers may agree to the permanent transfer of portions of their Individual Supply Guarantees. All such transfers are subject to SFPUC approval regarding operational and Raker Act concerns. In Fiscal Year 2016-17, Mountain View agreed to a

permanent one mgd transfer of its supply guarantee to East Palo Alto, which transfer has been approved by the SFPUC.

Enforcement of Interim Supply Limitation. Commencing in Fiscal Year 2011-12, the SFPUC established a volume-based “Environmental Enhancement Surcharge” to enforce the Interim Supply Limitation. The Environmental Enhancement Surcharge would apply only if combined retail and wholesale water deliveries from the Regional Water System watersheds exceed 265 mgd. Environmental Enhancement Surcharge proceeds will be placed in a restricted reserve fund to be used only for specific environmental restoration and enhancement measures in the SFPUC’s Sierra and local watersheds, such as those identified in the Watershed Environmental Improvement Program. Specific restoration and enhancement projects would be selected by the SFPUC and BAWSCA, following input from environmental stakeholders and other interested members of the public. No surcharges have been imposed, and as discussed above, it appears unlikely that any surcharges will be imposed through 2028.

Other Significant Provisions. The WSA also contains the following provisions:

- The SFPUC agrees to operate system reservoirs in a manner that assigns higher priority to the delivery of water to the Bay Area and the environment than to generation of hydroelectric power.
- The “Shortage Allocation Plan,” which establishes an allocation of water between the Retail Customers and Wholesale Customers to be applied during droughts, and governs drought shortages of up to 20%.
- Drought pricing and emergency rate increases are allowed.

2028 Water Supply Decisions. Subject to completion of necessary CEQA review and the exercise of retained discretion by the SFPUC to reject or modify proposed projects, the WSA requires the SFPUC to make several decisions by December 31, 2028 as follows:

- Whether to make San Jose and Santa Clara permanent customers to the extent that the SFPUC determines that long-term Regional Water System supplies are available.
- Whether to provide water in excess of the Supply Assurance to meet the Wholesale Customers’ projected future water demands until the year 2030, and whether to offer a corresponding increase in the Supply Assurance.

Converting San Jose and Santa Clara to permanent, non-interruptible customers would require the SFPUC to secure nine to 14.5 mgd of additional water supply, reflecting historic and projected demand estimates. As noted above, San Jose and Santa Clara are currently temporary customers with an interruptible status. Through updated demand forecasts prepared in tandem with the development of the WaterMAP and other planning efforts, the SFPUC anticipates that there is sufficient supply availability to continue to serve the needs of San Jose and Santa Clara past 2030. Therefore, the 2028 Water Supply Decisions, which were assumed to be necessary by 2028, are no longer imminently required. The SFPUC is continuing to evaluate several water supply alternatives that can meet the long-term needs of San Jose and Santa Clara. In the meantime, the SFPUC will continue to meet the two cities’ demands. While it is not anticipated, if water use by the Wholesale Customers is projected to exceed 184 mgd before new supplies are identified and the SFPUC decides to make San Jose and Santa Clara permanent customers, the SFPUC may issue a conditional five-year notice of termination or reduction in supply to San Jose and Santa Clara. During Fiscal Year 2016-17, Mountain View approved a permanent one mgd Individual Supply Guarantee transfer to East Palo Alto to address a portion of East Palo Alto’s projected demand increase. An additional supply of up to 0.5 mgd to meet the balance of East Palo Alto’s outstanding request is being considered at this time. In addition, as noted above, interruptible customers San Jose and Santa Clara anticipate an additional demand of 5.5 mgd by 2040, over their prior purchases of 9 mgd from the Regional Water System. Inclusive of these anticipated demands, on a cumulative basis, the Wholesale Customer purchase requests through 2040 are expected to be 179.9 mgd by 2040, lower than the 184 mgd Supply Assurance.

The SFPUC is currently evaluating several purified water project alternatives as well as regional water supply options such as desalination to provide up to 15 mgd of water supply for San Jose, Santa Clara and East Palo Alto. It remains unclear if, and how much, water supply could be available through these alternatives. The SFPUC plans to develop a water supply program by 2023 that will enable it to continue to meet its commitments and responsibilities to the Wholesale Customers and Retail Customers, consistent with the WSA and SFPUC's priorities.

For a more detailed summary of the WSA, see "APPENDIX B – SUMMARY OF CERTAIN PROVISIONS OF THE WATER SUPPLY AGREEMENT."

Individual Water Supply Contracts. While the WSA establishes the rate-setting mechanism and the overall supply assurance level for Wholesale Customers, each Wholesale Customer has an individual water supply contract with the City that defines the terms and conditions (including, among others, the point of delivery and service area) by which water is supplied to each such Wholesale Customer.

Minimum Annual Purchases. Pursuant to the WSA, Alameda County Water District and the cities of Milpitas, Mountain View and Sunnyvale may purchase water from sources other than the SFPUC, provided that each agency purchase a minimum annual quantity of water from the SFPUC. Due to continued dry years from Fiscal Year 2012-2015, and the call for voluntary rationing from the wholesale and retail customers, the SFPUC waived the minimum purchase requirements from these agencies from Fiscal Year 2013-14 through Fiscal Year 2016-17. See "APPENDIX B – SUMMARY OF CERTAIN PROVISIONS OF THE WATER SUPPLY AGREEMENT – Restrictions on Purchases of Water from Others; Minimum Annual Purchases."

Retail Deliveries

Retail Service Area and Customer Base. The SFPUC's retail water customers include the residents, businesses and industries located within the corporate boundaries of the City. In addition to these customers, retail water service is also provided to other customers located outside of the City, such as the Town of Sunol, San Francisco International Airport, Lawrence Livermore National Laboratory, Castlewood Country Club and Groveland Community Services District. All of the SFPUC's Retail Customers have been metered since 1916.

Residential Water Use. Due to the moderate climate and the high-density housing in the City, much of the water use within the City is indoors. For the City's many multi-family units, the average outdoor water use is considerably lower than the statewide residential outdoor average water use. Residential per capita water usage has been less than 50 gallons per person per day since 2011, and is currently averaging 43 gallons per person per day. By comparison, the State statewide average water use in 2018 was 91 gallons per person per day.

Non-Residential Water Use. Non-residential water use includes all sectors of water users not designated as residential, such as manufacturing, transportation, trade, finance, and government employment sectors, and the large services sector.

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Historic Water Sales and Top Customers

Water Sales. The following table shows water sales to Retail Customers and Wholesale Customers for the five Fiscal Years 2014-15 through 2018-19.

TABLE 11
HISTORIC WHOLESALE AND RETAIL WATER SALES
FISCAL YEARS 2014-15 THROUGH 2018-19
(IN MGD)

	2014-15	2015-16	2016-17	2017-18	2018-19	2018-19 % of Total
<u>Retail Customers</u>						
Multi-Family Residential	22.4	21.5	22.0	22.7	22.5	12.2%
Single-Family Residential	14.5	13.6	13.9	14.3	13.9	7.5
Commercial	18.2	17.3	17.0	17.5	16.7	9.1
Industrial	0.2	0.2	0.2	0.2	0.2	0.1
Municipal ⁽¹⁾	2.8	2.6	3.1	3.2	3.3	1.8
Suburban Retail	3.8	3.2	2.9	3.1	2.9	1.6
Retail water sales⁽³⁾	61.9⁽²⁾	58.4⁽²⁾	59.1	61.0	59.5	32.2%
<u>Wholesale Customers</u>						
California Water Service	29.1	23.4	24.3	27.5	26.3	14.2%
Hayward Municipal Water	13.6	12.2	12.9	14.6	14.0	7.6
City of Palo Alto	9.6	8.2	9.0	10.0	9.4	5.1
City of Sunnyvale	7.8	7.8	8.1	9.5	8.8	4.8
City of Redwood City	8.0	7.1	7.7	8.4	8.1	4.4
Alameda County Water District	8.0	6.0	6.2	7.9	7.7	4.2
City of Mountain View	7.6	6.7	6.9	7.5	7.3	3.9
City of Milpitas	5.2	4.5	4.8	5.2	5.1	2.8
City of San Jose	4.5	4.1	4.1	4.5	4.3	2.3
Estero Municipal Improvement District	4.0	3.6	3.8	4.2	4.0	2.2
All Other Wholesale Customers	30.7	27.2	27.6	29.6	30.0	16.3
Wholesale water sales⁽³⁾	128.0	110.8	115.5	129.3	125.0	67.8%
Total water sales⁽³⁾	189.9	169.2	174.6	190.3	184.4	100%
% Change from prior year	-12.8%	-10.9%	3.2%	9.0%	-3.1%	

⁽¹⁾ The Municipal category includes the San Bruno Jail, a City department located outside San Francisco. San Francisco International Airport was historically included as Municipal customer, but has been restated as a Suburban Retail Customer because water sales represent resale to its tenants and not for its own consumption. Treasure Island consumption was historically included as “Commercial,” but has been restated as “Suburban Retail” because its water sales include both commercial and residential usage.

⁽²⁾ Reflects decline in water sales due to declaration of emergency by California Governor Jerry Brown in January 2014.

⁽³⁾ Totals may not add due to rounding.

Source: SFPUC Customer Care and Billing System.

Wholesale and retail sales figures do not include “nonrevenue water.” Nonrevenue water includes water delivery system leaks and water not billed in the system (i.e., water used for firefighting, flushing water system pipes, or a small volume of unbilled metered municipal use). Nonrevenue water for In-City Distribution System has averaged approximately 10.6% of water supplied per year over the last five years.

Prior to Fiscal Year 2013-14, water sales remained relatively flat, as moderate conservation practices compensated for a growing population and strong local economy. Following the Governor’s drought declaration in

January 2014, water sales dropped by over 12% from Fiscal Year 2013-14 through Fiscal Year 2014-15, and by approximately 10% from Fiscal Year 2014-15 through Fiscal Year 2015-16. Fiscal Year 2016-17 sales increased by 3% following the wet winter and the easing of drought restrictions. Overall, water sales increased in Fiscal Year 2017-18 by 9% over Fiscal Year 2016-17, but dropped by 3% in Fiscal Year 2018-19. See also “THE WATER ENTERPRISE – Recent Drought; Current Water Conditions.”

Top Five Retail and Top Ten Wholesale Customers. The following table sets forth the top five Retail Customers and top ten Wholesale Customers based on water sales revenues for Fiscal Year 2017-18 (the most recent data available).

**TABLE 12
TOP FIVE RETAIL CUSTOMERS
AND TOP TEN WHOLESALE CUSTOMERS
FISCAL YEAR 2017-18⁽¹⁾**

	Water Sales Revenue (In Thousands)	Percent of all Water Revenues	Percent of Wholesale Customer Revenues⁽²⁾	Percent of Retail Customer Revenues⁽²⁾
<u>Retail Customers</u>				
San Francisco International Airport ⁽³⁾	\$ 4,452	0.9%	N/A	1.7%
NASA Shared Services Center, LLC	2,514	0.5	N/A	1.0
Parkmerced Investors Properties, LLC	1,840	0.4	N/A	0.7
University of California San Francisco Recreation and Parks Department	1,689	0.3	N/A	0.7
	1,397	0.3	N/A	0.5
Total:	<u>\$11,892</u>	<u>2.3%</u>	<u>N/A</u>	<u>4.6%</u>
<u>Wholesale Customers</u>				
Calif. Water Service Company	\$ 55,142	10.6%	21.0%	N/A
Hayward Muni Water System	29,373	5.6	11.2%	N/A
City of Palo Alto	20,203	3.9	7.7%	N/A
City of Sunnyvale	19,199	3.7	7.3%	N/A
City of Redwood City	17,113	3.3	6.5%	N/A
City of Mountain View	15,288	2.9	5.8%	N/A
Alameda County Water District	16,256	3.1	6.2%	N/A
City of Milpitas	10,603	2.0	4.0%	N/A
ESD/San Jose Muni Water System	9,134	1.8	3.5%	N/A
City of Daly City	7,478	1.4	2.8%	N/A
Total:	<u>\$199,789</u>	<u>38.4%</u>	<u>76.0%</u>	<u>N/A</u>

⁽¹⁾ Fiscal Year 2018-19 data is not yet available.

⁽²⁾ Percentages based on total Wholesale Revenues of \$262.8 million and total Retail Revenues of \$257.4 million.

⁽³⁾ Represents water sales to customers through the City enterprise fund for San Francisco International Airport, which is paid through the City’s inter-departmental billing system.

Source: SFPUC Customer Care and Billing System.

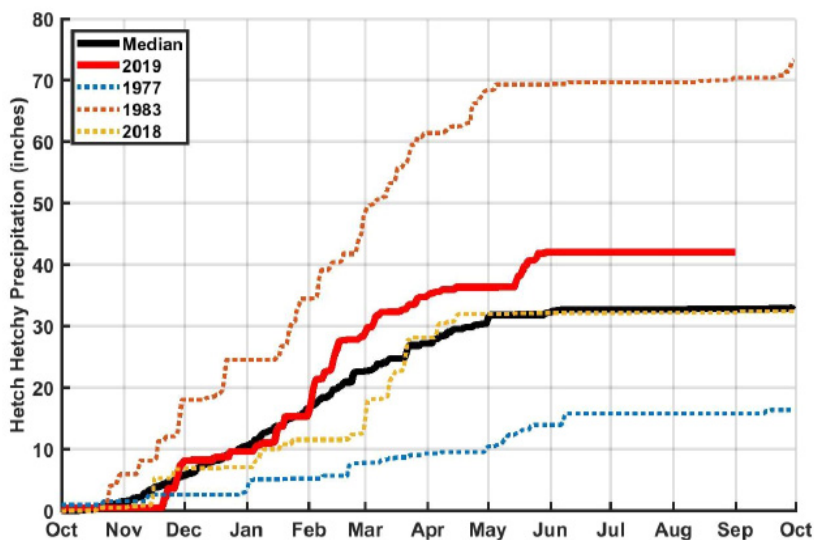
Recent Drought; Current Water Conditions

The drought of 2012-2015 represented the driest four-year sequence in the region’s hydrologic record. The SFPUC and its customers responded well to calls for conservation during the drought.

On January 17, 2014, California Governor Jerry Brown issued a State of Declaration of Emergency for California due to drought and severe water supply conditions in various parts of the State. On January 31, 2014, the SFPUC issued a press release asking all customers of its Hetch Hetchy Regional Water System, including its residential, commercial, industrial and municipal Retail Customers, as well as the Wholesale Customers, to voluntarily reduce water consumption by at least 10%. In June 2015, the SWRCB imposed restrictions to achieve a statewide reduction of 25% from 2013 water demand. All water utilities within the SFPUC service area were assigned a water use reduction requirement ranging from 8% to 36%. In June 2016, the SWRCB replaced the water use reduction requirement with a self-certification process that allows for water utilities to implement water use restrictions based on their ability to meet average annual 2013-14 demand with a repeat of Water Year 2014-15 hydrology. A Water Year is the period of October 1 of the prior year through September 30 of the year in question. In June 2016, the SFPUC certified that it had the requisite supplies to serve all of its Retail and Wholesale Customers without any additional reductions. The SFPUC continued to ask for a voluntary 10% reduction from average annual 2013 water demand in its retail and wholesale service area in Water Year 2016 to ensure its reservoirs were able to rebound from the prolonged drought.

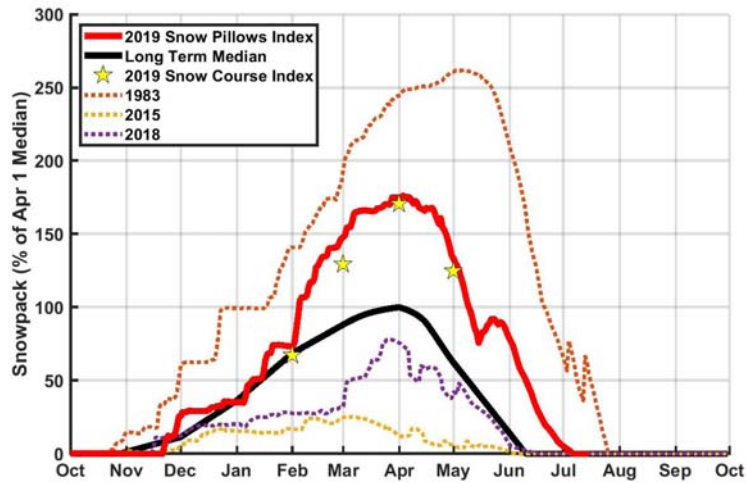
A combination of Water Bank (as defined herein) drawdowns in New Don Pedro Reservoir, managing storage and reduced customer demand contributed towards the SFPUC effectively managing Water Year 2016. Hetch Hetchy Reservoir was filled to up to 100% of capacity toward the end of the Water Year 2016 snowmelt runoff period (the end of the run off occurred in mid-June 2016). Since then, hydrologic conditions have been favorable with well above average precipitation in Water Year 2017. In Water Year 2017, precipitation totals were over 150% of average values. In Water Year 2018 and Water Year 2019, hydrologic conditions continued to favor water supply with precipitation totals at nearly average and slightly above average for those next two years, respectively. See “WATER FACILITIES – Water Storage.”

**GRAPH 1
PRECIPITATION AT HETCH HETCHY – WATER YEAR 2019**



Source: SFPUC.

**GRAPH 2
PERCENTAGE OF MEDIAN APRIL 1 SNOWPACK CONDITIONS**



Source: SFPUC.

Curtailement Actions by the State Water Resources Control Board

The SWRCB sought to curtail the exercise of water rights in 2014 and 2015 in response to the recent drought. In 2014, the SWRCB enacted emergency regulations for the purpose of curtailing the exercise of junior, post-1914 water rights. The City was not impacted as it relies on senior, pre-1914 water rights to divert water from the Tuolumne River. In 2015, the SWRCB again sought to curtail the exercise of water rights, but without the authority provided by emergency regulations. Instead, the SWRCB issued curtailment notices to thousands of water right holders across the State, including senior, pre-1914 water right holders, and subsequently prosecuted several enforcement proceedings. The City’s water rights were never curtailed. The City did, however, participate in one of the enforcement proceedings – the Administrative Civil Liability complaint against Byron Bethany Irrigation District (“**BBID**”) – in order to challenge the SWRCB’s assertion of jurisdiction over pre-1914 water rights. The SWRCB ultimately concluded the prosecution team had failed to carry its burden, and thus, dismissed the enforcement proceeding against BBID on the merits. (The SWRCB also dismissed its enforcement proceeding against the West Side Irrigation District (“**WSID**”) in the same order.) However, in its order the SWRCB reached the jurisdictional issue and concluded that it may exercise its enforcement authority against a pre-1914 water right holder if water is unavailable under the diverter’s priority of right. The San Joaquin Tributaries Authority (“**SJTA**”), a joint powers authority comprised of five member agencies, including the City, sought writ relief from the SWRCB’s order. The City believes that the SWRCB’s order in the BBID enforcement proceeding is inconsistent with established appellate case law. Two other challenges to the SWRCB’s order were filed and these three challenges, along with other pending challenges to the SWRCB’s 2014 and 2015 curtailment actions, were assigned to a coordination judge in Santa Clara Superior Court. The petitioners in all of these challenges have agreed to resolve certain legal issues, including the jurisdictional issues surrounding pre-1914 water rights, through summary adjudication. The City anticipates that any ruling on the jurisdictional issues will be appealed. The SFPUC is unable to predict whether future SWRCB initiatives to curtail the exercise of pre-1914 water rights might affect water supplies available to the SFPUC. See “REGULATORY MATTERS – Bay-Delta Water Quality Standards” and “–FERC Proceeding to Increase Flows in the Lower Tuolumne River.”

Proposals to Restore Hetch Hetchy Valley

Some environmental organizations advocate for the removal of Hetch Hetchy Reservoir and the restoration of Hetch Hetchy Valley. For example, an initiative ordinance entitled the “Water Sustainability and Environmental Restoration Planning Act of 2012” qualified for the November 2012 City ballot with support from an organization called “Restore Hetch Hetchy” and would have required the City to identify alternative sources of water and, subject to certain additional conditions, end its use of Hetch Hetchy Reservoir. This initiative was rejected by the City’s voters.

There have been previous studies that examined prior proposals to remove Hetch Hetchy Reservoir. For example, the California Department of Water Resources and the California Department of Parks and Recreation issued a comprehensive report in 2006 and concluded that it does appear technically feasible to restore Hetch Hetchy Valley, but expressed caution about the financial feasibility. The study estimated that the total cost for such a project would range from nearly \$3 billion to \$10 billion. The planning effort alone, they concluded, would take up to 10 years to complete and would cost an additional \$65 million dollars.

On April 21, 2015, Restore Hetch Hetchy filed a complaint against the City in Tuolumne County Superior Court alleging that the SFPUC’s operation of Hetch Hetchy Reservoir is an “unreasonable method of diversion of water” in violation of California Constitution Article X, Section 2 because of the O’Shaughnessy Dam’s location within a national park. The City prevailed in a motion to dismiss the complaint at the trial court level. Restore Hetch Hetchy appealed the trial court’s decision at the 5th District Court of Appeal in Fresno, California. After full briefing and a hearing, the Court of Appeal ruled in favor of the City (i.e., affirming the trial court). The Court of Appeal published its opinion on August 1, 2018. Restore Hetch Hetchy filed a petition for review of the Court of Appeal’s decision with the California Supreme Court. The City opposed this petition, and on October 17, 2018, the California Supreme Court denied Restore Hetch Hetchy’s petition. The case is now fully and finally resolved in the City’s favor.

The SFPUC is unable to predict whether any similar initiatives, or similar federal or state legislation, might be approved by the voters or adopted by legislative bodies in the future, or the potential impact of such efforts on the SFPUC or the Water Enterprise.

WATER FACILITIES

General

The facilities of the Water Enterprise consist of Regional Water System facilities and In-City Distribution System facilities. The Regional Water System evolved through the development of two separate water systems: the Spring Valley Water Company and the Hetch Hetchy Project.

- The Spring Valley Water Company was established in 1858, developing a spring and several creeks into a local water system. It expanded over the years with the construction of Pilarcitos Reservoir, followed by San Andreas Reservoir, Upper Crystal Springs Reservoir and Lower Crystal Springs Dam, all on the Peninsula in San Mateo County. Later the company extended its system to additional sources on Alameda Creek in Alameda County and expanded its service area to include additional Peninsula and South Bay customers. The City acquired the local supplies and retail distribution system of the Spring Valley Water Company in 1930.
- Following enactment of the Raker Act in 1913, the City was able to proceed with plans to develop its own water supply system. The construction of the Hetch Hetchy Project began in earnest in 1914, and after almost 20 years of construction, including building of O’Shaughnessy Dam and a required transmission system, Sierra Nevada water began flowing into the local distribution system in 1934. The Hetch Hetchy Project is operated as a combined water storage and conveyance and electric generation and transmission system. The Water Enterprise and the Power Enterprise coordinate operation of the Hetch Hetchy Project to ensure reliable utility services are provided by the combined system. Pursuant to State statute, the Charter and the terms of the WSA, the SFPUC operates the Hetch

Hetchy Project pursuant to a “water first” policy to optimize the reliability and quality of its water deliveries and ensure that hydroelectric generation does not cause any reasonably anticipated adverse impact on water service. Power is generated when water is delivered to meet water system operational requirements.

See “THE WATER ENTERPRISE – Water Rights and Related Proceedings.”

Since the 1930s, the major additions to the SFPUC’s water system have included the raising of O’Shaughnessy Dam at Hetch Hetchy Reservoir and the development of Lake Lloyd Reservoir, the construction of additional pipelines across the San Joaquin Valley, and the local construction of San Antonio Reservoir in Alameda County and the Bay Division Pipelines 2, 3 and 4. Other local projects included Crystal Springs Pipeline No. 3, Sunol Valley and San Andreas Filtration Plants, and the Crystal Springs Bypass Tunnel and Balancing Reservoir. The SFPUC has completed several WSIP projects including the Irvington Tunnels 1 and 2, Bay Division Pipeline 5, and a new tunnel under San Francisco Bay between Newark in Alameda County and East Palo Alto in San Mateo County that replaced the transbay portion of Bay Division Pipelines 1 and 2.

The Regional Water System is geographically delineated between the Hetch Hetchy Project and the Bay Area water system facilities.

- The Hetch Hetchy Project is generally comprised of the reservoirs, hydroelectric generation and transmission facilities, and water transmission facilities from Hetch Hetchy Reservoir west to the Alameda East Portal of the Coast Range Tunnel in Sunol Valley.
- The Bay Area water system is generally comprised of the facilities west of Alameda East Portal and includes the Alameda and Peninsula watershed reservoirs, two water treatment plants and the conveyance system that delivers water to the SFPUC’s Retail Customers and Wholesale Customers.

Water Conveyance and Distribution

Regional Water System. The Regional Water System comprises three regional water supply and conveyance systems: the Hetch Hetchy System; the Alameda System; and the Peninsula System (as herein defined).

Hetch Hetchy System. In the Hetch Hetchy System, water is diverted from Hetch Hetchy Reservoir into a series of tunnels and aqueducts from the Sierra Nevada to the San Joaquin Pipelines that cross the San Joaquin Valley to the Coast Range Tunnel (collectively, the “**Hetch Hetchy System**”) which connects to the Alameda system at the Alameda East Portal. The Tesla Treatment Facility disinfects Hetch Hetchy Water. See “– Water Treatment – Hetch Hetchy Water.”

Alameda System. The “Alameda System” includes two reservoirs, San Antonio Reservoir and Calaveras Reservoir, which collect water from the upper Alameda and San Antonio Creek watersheds in Alameda County plus conveyance facilities connecting the Hetch Hetchy System and Alameda water sources to the Peninsula System. These conveyance facilities include pipelines known as the Alameda Siphons that connect the Coast Range Tunnel to Irvington Tunnels 1 and 2.

Irvington Tunnels 1 and 2 supply the five Bay Division Pipelines that cross the South Bay Area to the Peninsula System. Bay Division Pipelines 1, 2 and 5 connect with the recently completed Bay Tunnel on opposite sides of the San Francisco Bay near the Dumbarton Bridge. The Bay Tunnel itself runs beneath the floor of the San Francisco Bay. Bay Division Pipelines 3 and 4 traverse the southerly edge of the San Francisco Bay delivering water to SFPUC customers along the way. All five pipelines reconnect near the inlet to the Pulgas Tunnel on the Peninsula.

The Sunol Valley Water Treatment Plant filters and disinfects water supplied from San Antonio and Calaveras Reservoirs, and, when necessary, water from the Sierra Nevada.

A turnout from the South Bay Aqueduct of the California State Water Project (the “**State Water Project**”) can supply limited supplemental water to San Antonio Reservoir. However, the SFPUC currently possesses no entitlements to water from the State Water Project.

Peninsula System. Two reservoirs, Crystal Springs and San Andreas, collect runoff from the San Mateo Creek watershed. Water from Pilarcitos Reservoir, on Pilarcitos Creek, directly serves one of the Wholesale Customers, the Coastside County Water District (which includes the City of Half Moon Bay), and can also deliver water to Crystal Springs and San Andreas Reservoirs. Water delivered from the Bay Division Pipelines in excess of Peninsula System and in-City demands spills into Crystal Springs and San Andreas Reservoirs. The Harry Tracy Water Treatment Plant filters and disinfects water supplied from Crystal Springs and San Andreas Reservoirs before it is delivered to Peninsula customers and the In-City Distribution System. The “Peninsula System” includes conveyance facilities connecting the Bay Division Pipelines to the In-City Distribution System and to other SFPUC customers on the Peninsula.

In-City Distribution System. The City’s retail water supply is delivered to the City in several major pipelines. Water to the east side of the In-City Distribution System is fed by two pipelines that terminate at University Mound. Water to the west side of the In-City Distribution System is fed by two pipelines that terminate at Sunset Reservoir and one that terminates at Merced Manor Reservoir. The In-City Distribution System to homes and businesses in the City is comprised of 1,235 miles of pipeline.

Summary of System Facilities. The Regional Water System and the In-City Distribution System facilities are summarized below.

**TABLE 13
SUMMARY OF SYSTEM FACILITIES**

	<u>Regional Water System</u>	<u>In-City Distribution System</u>
Pipelines	389 miles	1,235 miles
Tunnels	74.5 miles	None
Pump Stations	5	24
Reservoirs and/or Water Tanks	11 reservoirs	11 reservoirs/8 water tanks
Treatment Plants	3	None

Source: SFPUC, Water Enterprise.

Water Treatment

Hetch Hetchy Water. Hetch Hetchy Reservoir is the largest unfiltered water supply on the West Coast and one of only a few large unfiltered municipal water supplies in the nation. The water originates from spring snowmelt flowing down the Tuolumne River to Hetch Hetchy Reservoir, where it is stored.

This water source is located in the well-protected Yosemite National Park and the High Sierra region. This area meets or exceeds all federal and State criteria for watershed protection. The water originating from Hetch Hetchy Reservoir is protected in pipes and tunnels as it is conveyed to the Bay Area, and requires pH adjustment to control pipeline corrosion and disinfection for bacteria control. Based on the SFPUC’s disinfection treatment practice, extensive bacteriological-quality monitoring, and high-operational standards, the United States Environmental Protection Agency (the “EPA”) and the State of California Department of Health Services have determined that the Hetch Hetchy water source meets federal and State drinking water quality requirements without filtration, and thus the SFPUC is not required to filter water from Hetch Hetchy Reservoir. For further discussion of the State and federal regulatory requirements affecting the Water Enterprise, see “REGULATORY MATTERS.”

The Tesla Treatment Facility, a key component of the WSIP, enhances high water quality through ultraviolet (“UV”) treatment. The Tesla Treatment Facility was officially dedicated in July 2011, following two years of construction. The facility uses UV light to disinfect Hetch Hetchy water to meet new federal requirements to control the waterborne parasite *Cryptosporidium*, and is among the largest drinking-water UV disinfection

facilities in North America. In the same location, a new chlorine disinfection station constructed to meet current fire and earthquake safety standards replaced the old station, which was built in 1937. See “CAPITAL IMPROVEMENT PROGRAM – Water System Improvement Program (WSIP).”

Local Water. All water derived from surface water sources other than Hetch Hetchy Reservoir requires filtration and is currently treated at one of two treatment plants: the Sunol Valley Water Treatment Plant (“**Sunol Valley WTP**”) and the Harry Tracy Water Treatment Plant (“**Harry Tracy WTP**”). Major upgrades of these two facilities have been completed as part of the WSIP. See “CAPITAL IMPROVEMENT PROGRAM – Water System Improvement Program (WSIP).” New groundwater supply from the San Francisco Groundwater Supply Project does not require filtration. Treatment of groundwater for hexavalent chromium (Chrome-6), nitrate, manganese and other constituents to meet federal and state drinking water regulations will be achieved through blending. Blending treatment is currently taking place within distribution pipelines and Sunset Reservoir.

Sunol Valley Water Treatment Plant. The Sunol Valley Water Treatment Plant treats all water from the two reservoirs in the Alameda System, Calaveras and San Antonio. Sunol Valley WTP has a capacity of 160 mgd. Treatment processes at Sunol Valley WTP include coagulation, flocculation, sedimentation, filtration, and disinfection. Fluoridation, chloramination and corrosion control treatment are provided for the combined Hetch Hetchy Project and Sunol Valley WTP water at the chloramination and fluoridation facilities in Sunol. Sunol Valley WTP also filters Hetch Hetchy water on the occasions when the Sierra supply does not meet required drinking water standards.

The Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir Project added a fifth sedimentation basin to increase reliable capacity, retrofitted existing filters, and created a 17.5 million gallon circular treated water reservoir as it leaves the plant. The project included other new connections and facilities that enable the plant to treat enough water to meet basic customer demands alone for up to 60 days after a major earthquake in conjunction with other facilities. These improvements help increase delivery reliability and water quality.

Harry Tracy Water Treatment Plant. The Harry Tracy WTP primarily treats water from the Peninsula System reservoirs and has a peak capacity of 140 mgd and a sustainable capacity of 120 mgd. Treatment processes at the Harry Tracy WTP include ozonation, coagulation, flocculation, filtration, disinfection, fluoridation, corrosion control treatment and chloramination.

Updates to the Harry Tracy WTP included the addition of filters, upgrades to various systems, construction of a new treated water reservoir, and seismic retrofits of critical process units. As a result of the upgrades, the Harry Tracy WTP has improved its delivery reliability and can now achieve a sustained capacity of 140 mgd for at least 60 days and provide 140 mgd within 24 hours following a seismic event on the San Andreas Fault.

Water Storage

Up-Country Storage. The majority of the water delivered by the SFPUC is supplied by runoff from the upper Tuolumne River watershed on the western slope of the central Sierra Nevada. Three major reservoirs collect runoff: Hetch Hetchy Reservoir, Lake Lloyd Reservoir and Lake Eleanor Reservoir.

Water stored in Hetch Hetchy Reservoir is also used for hydroelectric generation and released downstream to satisfy instream flow requirements. Normally, only Hetch Hetchy Reservoir supplies water exported to the Bay Area for municipal and industrial uses. Releases from Lake Eleanor Reservoir and Lake Lloyd Reservoir are used to satisfy instream flow requirements, satisfy the Irrigation Districts’ Raker Act entitlements and produce hydroelectric power.

Downstream of the Hetch Hetchy System on the Tuolumne River is the New Don Pedro Project, owned and operated by the Irrigation Districts. The New Don Pedro Project includes a dam that impounds the Tuolumne River, creating the New Don Pedro Reservoir, also owned by the Irrigation Districts. The City helped fund the original construction of the New Don Pedro Project in exchange for eliminating the City’s flood control responsibility and establishing a water bank account (the “**Water Bank**”) allowing the SFPUC to receive water

credits for advanced releases from the Hetch Hetchy Project to the New Don Pedro Reservoir to meet the Irrigation Districts' downstream requirements. Water Bank storage space in New Don Pedro Reservoir is integrated into the Water System's operations.

Certain water stored in New Don Pedro Reservoir is credited to the City's Water Bank, which allows the City to meet its Raker Act water obligations to the Irrigation Districts and divert water supply from Hetch Hetchy Reservoir to the Bay Area.

Local Storage. On the San Francisco Peninsula, the SFPUC uses Crystal Springs Reservoir, San Andreas Reservoir and Pilarcitos Reservoir located in San Mateo County to capture local watershed runoff. In the Alameda Creek watershed (Alameda County), the SFPUC manages Calaveras Reservoir and San Antonio Reservoir. In addition to using these facilities to capture runoff, San Andreas, San Antonio and Crystal Springs reservoirs also provide storage for Hetch Hetchy Project diversions, and, along with Calaveras Reservoir and Pilarcitos Reservoir, serve as water supply delivery facilities in the event of an interruption to Hetch Hetchy Project deliveries.

Dam Supervision. Eighteen dams under the jurisdiction of the SFPUC are presently licensed and regulated by the California Department of Water Resources' Division of Safety of Dams ("DSOD"). The SFPUC's Calaveras Dam Replacement Project was completed in September 2018. Since that time, SFPUC's Calaveras Reservoir has been operating under DSOD imposed storage restrictions as the reservoir refills. See "REGULATORY MATTERS – Dam Licensing and Safety Issues."

System Storage Capacity. The following table summarizes the regional water system reservoirs within the Water Enterprise.

**TABLE 14
REGIONAL WATER SYSTEM STORAGE CAPACITY
(AS OF NOVEMBER 1, 2019)**

	Current Storage (Acre-Feet)	Maximum Storage (Acre-Feet)	Available Capacity (Acre-Feet)	Percent of Maximum Storage
<u>Tuolumne Storage</u>				
Hetch Hetchy Reservoir ⁽¹⁾	291,840	340,830	48,990	86%
Cherry Reservoir ⁽²⁾	214,604	268,810	54,206	80
Lake Eleanor Reservoir ⁽³⁾	17,976	21,495	3,519	84
Water Bank	569,824	570,000	176	99
Total Tuolumne Storage:	1,094,244	1,201,135	106,891	91%
<u>Local Storage</u>				
Calaveras Reservoir	60,930	96,824	35,894	63%
San Antonio Reservoir	43,522	50,496	6,974	86
Crystal Springs Reservoir	52,652	58,377	5,724	90
San Andreas Reservoir	15,221	18,996	3,775	80
Pilarcitos Reservoir	2,542	2,995	453	85
Total Local Storage:	174,868	227,688	52,820	77%
Total Regional Water System⁽⁴⁾	1,269,112	1,428,822	159,711	89%

(1) Maximum Hetch Hetchy Reservoir storage with drum gates deactivated.

(2) Maximum Cherry Reservoir storage with flash-boards out.

(3) Maximum Lake Eleanor storage with flash-boards out.

(4) Total may not add due to rounding.

Source: SFPUC.

Table 14 shows storage levels as of November 1, 2019. Total Regional Water System storage levels would normally be at approximately 79% of Total Regional Water System storage capacity as of this date. The level as of November 1, 2019 is higher than that at approximately 89% of Total Regional Water System storage capacity. Total Regional Water System storage levels are higher than normal because all reservoirs, except for Calaveras Reservoir,

and Water Bank are either at or above their normal storage levels for November 1. The current storage level of Calaveras Reservoir, the largest of the local storage facilities, is about two-thirds of its capacity on November 1, 2019, due to the DSOD imposed storage restrictions as the reservoir refills. See “WATER FACILITIES – Water Storage – System Storage Capacity” and “CAPITAL IMPROVEMENT PROGRAM – Water System Improvement Program (WSIP).”

In-City Storage. The Water Enterprise’s in-City reservoirs and storage tanks have the capacity to hold approximately 412.8 million gallons, or 1,267 acre-feet. The SFPUC estimates this capacity to be an approximate five-day supply at the current average rate of consumption for the City. In-City reservoirs that are also terminal reservoirs for the Regional Water System moderate flow peaking for the Regional Water System, and water stored in them can be conveyed back to the San Francisco Peninsula.

The following table summarizes the in-City reservoirs and storage tanks maintained by the Water Enterprise.

**TABLE 15
IN-CITY DISTRIBUTION SYSTEM POTABLE WATER STORAGE CAPACITY**

<u>Reservoir</u>	<u>Millions of Gallons</u>
Sunset ⁽¹⁾	176.7
University Mound ⁽¹⁾	140.9
Sutro	31.4
Summit	14.0
College Hill	13.5
Stanford Heights	12.9
Merced Manor ⁽¹⁾	9.5
Lombard	2.7
Potrero	1.0
Storage Tanks	10.2
Total	412.8

⁽¹⁾ Terminal reservoirs for the Regional Water System.
Source: SFPUC.

In addition, there is an emergency supply of existing non-potable water immediately available within the City at Lake Merced. Lake Merced currently holds approximately 1.5 billion gallons or approximately 4,603.3 acre-feet.

Physical Condition of Certain Facilities

Certain of the Water Enterprise’s facilities are near the end of their useful life. Long-lived facilities result in decreased reliability due to unplanned outages and place a greater maintenance burden on SFPUC operations. In addition, the vulnerabilities of the Regional Water System are increased by its linear nature and limited redundancy. Outages at critical points could disrupt delivery to large portions of the Regional Water System. See “RISK FACTORS – Risks Related to Water Enterprise Facilities and Operations.”

Built between 1917 and 1925, Mountain Tunnel extends 18.9 miles from the Early Intake Dam to Priest Reservoir. The upper 7.4 miles are not lined, and the lower 11.5 miles are lined. Inspections in 1989, 2006, 2008 and 2017 identified signs of deterioration in the lining which were projected to increase over time. The risk of failure of Mountain Tunnel, defined as a loss of 25% carrying capacity, is currently low but will increase over time. Failure of Mountain Tunnel would have a significant impact on the Hetch Hetchy water system (“**Hetch Hetchy Water**”) operations and could cause up to six or more months of water supply disruption. See “CAPITAL IMPROVEMENT PROGRAM – Hetch Hetchy Water – Mountain Tunnel.”

The Coast Range Tunnel is a 26-mile long tunnel running from Tesla Portal to the Alameda East Portal and was put into operation in 1934. The Coast Range Tunnel was inspected in January 2015 after having been last inspected in 1995. The recent inspection revealed that the Coast Range Tunnel is still in good condition, with little change noted since the 1995 inspection. Irvington Tunnel 1 was also inspected in winter 2015 and was also found to be in good condition.

The WSIP was designed in part to reduce vulnerability of the Regional Water System and increase reliability of the system to deliver water by improving redundancy needed to accommodate planned outages for maintenance and unplanned outages resulting from facility failure. The WSIP was not designed to replace or upgrade the entire water system. Repair of Mountain Tunnel as well as the replacement, rehabilitation and repair of water transmission pipelines and other Regional Water System and in-City facilities are included in the SFPUC's Ten-Year Capital Plan. See "CAPITAL IMPROVEMENT PROGRAM."

Seismic Hazards

The Hetch Hetchy Project is located largely in Yosemite National Park, one of the most stable seismic zones in the State, and there are no known major faults in the area. The Water Enterprise's distribution and transmission systems and its customers are, however, located in seismically active regions of the State. The San Andreas Fault lies immediately west of the City, and the Hayward Fault is approximately 15 miles to the east. A third major fault, the Calaveras Fault, is a branch of the Hayward Fault and lies east of the Hayward Fault.

During the past 150 years, the San Francisco Bay Area has experienced several major and numerous minor earthquakes. The largest was the 1906 San Francisco earthquake along the San Andreas Fault with an estimated magnitude of 8.2 on the Richter scale. The 1868 Hayward earthquake along the Hayward Fault had an estimated magnitude of between 6.8 and 7.0 on the Richter scale. The 1989 Loma Prieta earthquake along the San Andreas Fault had an estimated magnitude of 7.1 on the Richter scale. The most recent significant earthquake was the August 2014 South Napa earthquake on the West Napa Fault, the northern extension of the Calaveras Fault, which had a magnitude of 6.0 on the Richter scale and an epicenter near the city of Napa, approximately 50 miles north of San Francisco. According to United States Geological Survey findings, a significant earthquake along these or other faults is probable during the period the 2019 Series ABC Bonds will be outstanding.

The Regional Water System crosses several active and potentially active faults, including major strike-slip faults within the San Francisco Bay region. Major fault crossings along the pipeline delivery system include the Orestimba fault at Tesla Portal, the Greenville fault in the Coast Range Tunnel, the Calaveras fault at the Alameda Siphons, and the southern Hayward fault at the Bay Division Pipelines numbers 1, 2, 3, 4 and 5. In addition, other lower slip rate but potentially active faults cross the water system. These faults potentially move by secondary or triggered slip during large earthquakes on the San Andreas fault. Furthermore, three main transmission pipelines from Harry Tracy WTP – San Andreas Pipeline No. 2, San Andreas Pipeline No. 3 and Sunset Supply Branch Pipeline – cross the Serra fault, a secondary fault located along the peninsula in San Mateo County.

According to the United States Geological Survey, the Greenville, Calaveras, Hayward and San Andreas faults have a high likelihood of producing a major (magnitude ≥ 6.7) earthquake in the San Francisco Bay region in the next 30 years. A large earthquake on these faults has the potential for generating surface-fault rupture that is hazardous to specific SFPUC facilities. A major goal of the WSIP is to rehabilitate and strengthen the tunnels, pipelines and other Water Enterprise facilities that cross or are situated near known active faults.

If a major seismic event or other emergency occurs, the SFPUC is authorized under the WSA to adopt emergency rate surcharges outside of the normal budget development process. Such rate surcharges will be applicable to both Retail Customers and Wholesale Customers and incorporate the same percentage increase for all customers. See "FINANCIAL OPERATIONS – Wholesale Water Sales Revenue." Any emergency rate surcharge adopted by the SFPUC will remain in effect only until the next budget-coordinated rate-setting cycle, at which time it can be reviewed for continuance and modification.

If a significant earthquake occurs that affects the Water Enterprise's tunnels, pipelines or other facilities, the SFPUC would attempt to repair any damage as quickly as possible, and the amount of time required to return the facilities to service would depend on the nature and extent of damage incurred. A prolonged reduction in the Water Enterprise's water supply resulting from a major earthquake could have a material adverse effect on Revenues.

A major seismic event affecting critical locations prior to completion of WSIP improvements could result in service interruptions of 60 days or longer. The SFPUC has established intertie connections with the East Bay Municipal Utility District and the Santa Clara Valley Water District to diversify water supply options in case of a major seismic event. Should the Irvington Tunnels or the five major pipelines branching from the Irvington Tunnels become inoperable, the SFPUC would attempt to negotiate additional water sharing agreements with these and other regional water utilities which interconnect with Water Enterprise facilities, but there is no assurance that such negotiations would be successful.

If damage to the Irvington Tunnels or the pipelines that connect to the tunnels resulted in the loss of water transported through the tunnel, the remaining water supply would be limited to storage in three reservoirs in San Mateo County (the Crystal Springs, San Andreas and Pilarcitos Reservoirs) and three terminal reservoirs located in San Francisco as well as existing intertie connections. The combined capacity of the three San Mateo County reservoirs is approximately 29.8 billion gallons. The SFPUC has historically kept these reservoirs filled to a combined capacity of approximately 18 billion gallons, or an estimated two and one-half month water supply based on historical average daily water demand of both the Retail Customers and Wholesale Customers. It is anticipated that in-City storage alone would last approximately four to seven days.

Separate from the SFPUC system, individual Wholesale Customers have storage ranging from zero to seven days.

System Level of Service Criteria after Seismic Events. The SFPUC has established basic "Level of Service" criteria for the design of new facilities and upgrade of existing facilities, including projects within the WSIP: to deliver winter day demand ("WDD") of 215 mgd (projected February 2030 demand) within 24 hours after a major earthquake. This embodies the following primary criteria and assumptions to be used in examining system reliability with system retrofit projects in place:

- Deliver WDD to at least 70% of the Wholesale Customers' turnouts within each of the three customer groups (Santa Clara/Alameda/South San Mateo County, Northern San Mateo County, and City of San Francisco).
- Achieve a 90% confidence level of meeting the above goal, given the occurrence of a major earthquake. The earthquakes considered are treated independently and with equal weighting, without regard to their return period.
- To achieve the basic level of service, the SFPUC will rely on the Wholesale Customers' own water systems and supply or other regional water purveyors' systems. The SFPUC will work with the Wholesale Customers to assess their ability to contribute to their own system reliability.
- The SFPUC will consider a facility to have failed if it cannot be brought back to its intended purpose within twenty-four hours without secondary damage resulting.
- To achieve the basic level of service, the SFPUC will assume that power supplies are available, whether from the grid or from standby sources.

No particular item in the Regional Water System is required to be seismically upgraded or retrofitted as long as the system-wide performance goals established by the SFPUC can be satisfied. Earthquake damage to selected components and systems is acceptable, as long as the system-wide performance remains acceptable.

Wildfire Considerations

The SFPUC's Power Enterprise owns and operates about 107 miles of overhead electrical lines that have been determined to be within geographical areas that are at risk of wildfire due to overhead electrical lines and equipment. About 75 miles of overhead electrical lines are within the Hetch Hetchy Project. The Hetch Hetchy Project lines are primarily located in the Sierra Nevada and surrounding foothills, where wildfire is a risk, particularly in the Stanislaus National Forest and nearby communities such as Groveland and Big Oak Flat. Wildfires can disrupt the operation of, or cause damage to, facilities used to convey the SFPUC's water supply, e.g., hydro-generation, power and water transmission, and valve house buildings. Wildfires can also significantly impact vegetation and soils which can adversely impact water quality within SFPUC water supply and regulating reservoirs. The Rim Fire, a wildfire in 2013, substantially burned the forest around the Holm and Kirkwood Powerhouses and reached the edges of all three Sierra Nevada reservoirs. Though the Rim Fire, by consuming potential fuel, has reduced some near-term risk of wildfire in the region, the SFPUC's Power Enterprise, still owns many miles of overhead electrical lines through highly forested areas. See also "RISK FACTORS – Inverse Condemnation."

Safety and Security

The safety of the facilities of the Water Enterprise is maintained via a combination of regular inspections by SFPUC employees, electronic monitoring, and analysis of unusual incident reports. Most above-ground facilities operated and maintained by the SFPUC are controlled-access facilities with fencing, gates, closed circuit television systems and security officers at certain points. Smaller, above-ground and subterranean pumping stations operated and maintained by the SFPUC are locked with padlock or internal locking mechanisms, and most are monitored via access/intrusion alarms. Security improvements are evaluated on an ongoing basis. The electronic operations and controls have been evaluated and designed to reduce exposure using a series of technology systems enhancements and integration.

CAPITAL IMPROVEMENT PROGRAM

Capital and Financial Planning Process

The SFPUC's long-term capital and financial planning is performed on an annual rolling ten-year forward looking basis. The SFPUC prepares a ten-year capital plan for each of its enterprises, as required by the Charter. The ten-year capital plan serves as the basis for the development of the annual ten-year financial plan. Proposed long-term capital programs, projects and investments, and related costs are included in the ten-year financial plan. Consistent with the Charter, updates to the ten-year capital plan and ten-year financial plan are annually reviewed and adopted by the Commission each February. The ten-year financial plan provides estimated rate impacts of projected capital and operating spending and assures compliance with debt service coverage and other financial policy requirements.

The ten-year capital plan is not a budget and is not "appropriated" like a budget. The annual capital programs can be revised during the development of the budget and final projects, costs and totals for specific capital improvements to be financed can change. Consequently, even though the annual budgets passed are based on the ten-year capital plan, they may occasionally differ from it.

The Water Enterprise Ten-Year Capital Plan ("**Ten-Year Capital Plan**") for Fiscal Year 2019-20 to Fiscal Year 2028-29, which includes the Water Enterprise-related components of the Hetch Hetchy Water and Power Ten-Year Capital Plan, most recently adopted by the Commission in February 2019, totals approximately \$2.15 billion. The Ten-Year Capital Plan includes projects in four major Water Enterprise categories: (i) Regional Water; (ii) Local Water; (iii) Hetch Hetchy Water; and (iv) Auxiliary Water Supply System. The Regional Water, Local Water and Hetch Hetchy Water categories of the Water Enterprise's CIP are expected to be financed by a combination of revenue bonds, commercial paper, revolving notes, a Parity State Loan, revenues (pay-as-you-go) and capacity charges. For more information regarding the Ten-Year Capital Plan programs, see "– Regional Water Program," "– Local Water Program," and "– Hetch Hetchy Water" below. See also "FINANCING OF CAPITAL IMPROVEMENTS."

The Auxiliary Water Supply System (“AWSS”) is a capital program administered by the SFPUC, but funded with general obligations bonds issued by the City pursuant to voter authorization. As such, the ratepayers of the Water Enterprise are not responsible for funding the AWSS. The AWSS is designed to improve fire, earthquake and emergency response and ensure firefighters a reliable water supply for fires and disasters through projects, including improving deteriorating pipes, hydrants, reservoirs, water cisterns and pumps built after the 1906 earthquake in San Francisco. The AWSS comprises approximately \$125 million of the Ten-Year Capital Plan.

The following table sets forth the first five years of the Water Enterprise’s capital improvement program (excluding the AWSS) as set forth in the Ten-Year Capital Plan for Fiscal Year 2019-20 to Fiscal Year 2028-29.

TABLE 16
WATER ENTERPRISE CAPITAL IMPROVEMENT PROGRAM
FOR FISCAL YEARS ENDED JUNE 30
(IN THOUSANDS)⁽¹⁾

	<u>2020⁽²⁾</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>Total</u>
Regional Water	\$131,204	\$181,638	\$61,871	\$63,578	\$67,041	\$505,332
Local Water	80,011	89,813	82,949	96,650	60,249	409,672
Hetch Hetchy Water	72,763	64,631	119,812	83,991	50,462	391,659
Total Appropriations⁽³⁾	\$283,978	\$336,083	\$264,631	\$244,219	\$177,752	\$1,306,663

⁽¹⁾ Amounts are based on anticipated appropriations and are projections from the Water Enterprise Ten-Year Capital Plan. Actual results may differ materially from these projections. See “FORWARD-LOOKING STATEMENTS” above.

⁽²⁾ Budgeted.

⁽³⁾ Totals may not add due to rounding.

Source: SFPUC.

Regional Water Program

The Regional Water Program, projected to comprise approximately \$763.2 million of the Ten-Year Capital Plan, finances capital improvements to the Regional Water System. Regional Water Program capital investments include, but are not limited to, water treatment, water transmission, water supply and storage, watersheds and land management, communication and monitoring, and building and grounds management.

Local Water Program

The Local Water Program, projected to comprise approximately \$736.0 million of the Ten-Year Capital Plan, finances capital improvements to the In-City Distribution System. The primary component of the Local Water Program, projected to comprise approximately \$615.0 million, is for in-City pipe repair and replacement. To address concerns regarding an aging in-City potable water conveyance/distribution system, the SFPUC has established a goal to accelerate the pipe repair and replacement rate to 15 miles per year, from a previous rate of 5 miles per year.

Hetch Hetchy Water

General. Upgrades to the aging facilities of Hetch Hetchy Water and Power are being planned to ensure reliability and preparedness for the future. The Hetch Hetchy Water category of the Ten-Year Capital Plan is projected to cost approximately \$526.0 million. Upcountry water and power facilities being assessed and rehabilitated, where needed, include three impounding reservoirs, three regulating reservoirs, three large powerhouses, one small powerhouse, two switchyards, three substations, 170 miles of pipeline and tunnels, almost 100 miles of paved road, over 160 miles of transmission lines, watershed land and rights-of-way property. The Water Enterprise will fund all assets relating to Hetch Hetchy Water (consisting of approximately \$353.3 million of Hetch Hetchy Water costs) and the Hetch Hetchy Water portion of jointly-owned assets of Hetch Hetchy Water and the Power Enterprise in the Hetch Hetchy Water and Power System (consisting of approximately \$172.6 million of Hetch Hetchy Water costs). See “THE PUBLIC UTILITIES COMMISSION – Organization, Purposes and Powers – Hetch Hetchy – Water and Power Operations.” A significant project among the Hetch Hetchy Water category is the

repair of the existing Mountain Tunnel which conveys all Tuolumne River supplies through a single conduit. See “– Mountain Tunnel.”

Mountain Tunnel. As part of the Hetch Hetchy Regional Water System, Mountain Tunnel is a critical water conveyance facility. Built between 1917 and 1925, Mountain Tunnel extends 18.9 miles from the Early Intake Dam to Priest Reservoir. The upper 7.4 miles are not lined and the lower 11.5 miles are lined. Inspections in 1989, 2006, 2008 and 2017 identified signs of deterioration in the lining which were projected to increase over time. The risk of failure of Mountain Tunnel, defined as a loss of 25% carrying capacity, is currently low but will increase over time. Failure of Mountain Tunnel would have a significant impact on Hetch Hetchy Water operations, and could cause up to six months of water supply disruption. Options evaluated to remedy the problem include repairs to the existing tunnel and construction of a bypass tunnel. The SFPUC has engaged an expert Technical Advisory Panel to review alternatives.

The SFPUC is currently active on three parallel tracks regarding Mountain Tunnel: (1) the Mountain Tunnel Inspection and Interim Repairs Project, (2) the Mountain Tunnel Adits and Access Improvement Project, and (3) the Mountain Tunnel Improvements Project. A complete shutdown and draining of Mountain Tunnel was performed during January and February 2017 to accomplish the Inspection and Interim Repairs Project and the Adits and Access Improvement Project, as well as to develop information and knowledge for the design and construction of the Long-Term Improvements Project.

The Mountain Tunnel Inspection and Repairs Project resulted in the successful completion of a detailed inspection of the entire length of the tunnel, including visual inspections, photography and video documentation of lining defects, more than 50 core samples of lining material, and survey marking of all lining defects. It also included repairs of different lining defect locations in about 8,000 lineal feet of the tunnel sites. Additional interim repairs were performed in January and February 2019 to complete the most significant repairs needed to reduce the risk of failures in the concrete lining.

The Mountain Tunnel Adits and Access Improvement Project was intended to address the critical nature of the potential impact of lining failure on water delivery obligations. Mountain Tunnel must be returned to service within three months in the event of a water service interruption. In order to accommodate quick entry of construction crews and equipment into Mountain Tunnel, improvements at Adit 5/6 and Adit 8/9 and access roads were constructed to minimize the time required to return the tunnel to service. An Emergency Restoration Plan (“ERP”) has been prepared to establish an outline for basic service restoration plans and procedures. The monitoring system to assess changed conditions in the tunnel also was enhanced to complement the existing system.

The Mountain Tunnel Improvements Project provides for evaluation of alternatives for the Mountain Tunnel facility, and eventually, the design and construction of the preferred engineering alternative that will keep this vital component of the Hetch Hetchy Water and Power System in reliable service. Sufficient information was collected during the early 2017 shutdown, inspection and repairs to allow for the development of a proposed preferred alternative for the Mountain Tunnel Improvements Project. The preferred alternative is a rehabilitation/repair project with the addition of flow controls (valving) on the downstream end of the tunnel in or near Priest Reservoir. The flow controls will allow the tunnel to be operated in a full state at different flow rates which will reduce lining deterioration.

Based on the preferred alternative described in the preceding paragraph, improvements to Mountain Tunnel, a jointly-owned asset with the Power Enterprise, are now projected to cost approximately \$238 million over the Ten-Year Capital Plan period, not including the costs of the interim repairs performed in 2017 and 2019. The revised cost of the Mountain Tunnel improvements is reflected in the Ten-Year Capital Plan for Fiscal Year 2019-20 to Fiscal Year 2028-29, which was adopted by the Commission in February 2019. The improvements are expected to be funded pursuant to existing cost-sharing agreements with Wholesale Customers. The Water Enterprise has a 45% share of the funding of the Mountain Tunnel projects. The remaining 55% share of funding of the Mountain Tunnel projects is to be funded by the Power Enterprise. See “FINANCIAL OPERATIONS – General – Allocation of Hetch Hetchy Project Costs.”

Water System Improvement Program (WSIP)

General. The Water System Improvement Program is a \$4.788 billion program that consists of 87 capital projects to repair, replace and upgrade critical portions of the Regional Water System and the Local Water System to meet specific level of service goals and objectives for seismic reliability, delivery reliability, water quality and water supply in an environmentally sustainable manner. As of June 30, 2019, the WSIP was approximately 98% complete. Pursuant to the March 2018 Approved Scopes, Schedules and Budget (the “**March 2018 Approved Budget**”), the most recent revision adopted in April 2018, the overall approved program completion date is December 2021.

Background. The SFPUC began development of a capital improvement program (the “**CIP**”) in the late 1990s and approved the original framework of the CIP in May 2002. In 2004, the SFPUC reviewed the program, developed program-specific goals and objectives, refined the project scope of the program and renamed the program from the CIP to the WSIP. In 2005, the SFPUC identified specific levels of service goals and objectives, and further refined the scopes, schedules and budget of the WSIP in a December 2005 report that is considered the “Original or Baseline Scopes, Schedules and Budget” for the WSIP (the “**Baseline Budget**”). The SFPUC subsequently approved major schedule and cost revisions to the Baseline Budget in 2008 (the December 2007 Approved Budget), 2009 (the June 2009 Approved Budget), 2011 (the July 2011 Approved Budget), 2013 (the March 2013 Approved Budget), 2014 (the March 2014 Approved Budget) and 2016 (the March 2016 Approved Budget), and most recently, pursuant to the March 2018 Approved Budget. Budget changes to the Baseline Budget, as subsequently revised, were also approved by the SFPUC several times since 2005.

Program Objectives. The WSIP is based on two principles – a clean, unfiltered water source and a gravity-driven system. Objectives for WSIP include (i) furnishing system improvements to provide high quality water that reliably meets current and foreseeable local, State and federal requirements; (ii) reducing vulnerability of the water system to damage from earthquakes; (iii) increasing reliability of the system to deliver water by improving redundancy needed to accommodate planned outages for maintenance and unplanned outages resulting from facility failure; (iv) providing near-term improvement of water supply/drought protection; (v) setting forth long-term water supply/drought management options for technical evaluation, cost analysis and environmental review; (vi) enhancing sustainability through improvements that optimize protection of the natural and human environment; and (vii) providing improvements resulting in a cost-effective, fully-operational water system.

Levels of Service Goals. In 2005, the SFPUC developed levels of service goals and objectives to provide a quantifiable means of setting project specific design criteria and project scopes for addressing the program objectives described above. The levels of service goals address:

- **Water Quality (maintain high water quality)** – design improvements to meet current and foreseeable future federal and State water quality requirements; provide clean, unfiltered water originating from Hetch Hetchy Reservoir and filtered water from local watersheds; and continue to implement watershed protection measures.
- **Seismic Reliability (reduce vulnerability to earthquakes)** – design improvements to meet current seismic standards; deliver basic service to the three regions in the service area (East/South Bay, Peninsula, and San Francisco) within 24 hours after a major earthquake; the performance objective is to provide delivery to at least 70 percent of the turnouts in each region; and restore facilities to meet average-day demand of up to 300 mgd within 30 days after a major earthquake.
- **Delivery Reliability (increase delivery reliability and improve ability to maintain the system)** – provide operational flexibility to allow planned maintenance shutdown of individual facilities without interrupting customer service and to minimize the risk of service interruption due to unplanned facility upsets or outages; provide operational flexibility and system capacity to replenish local reservoirs as needed; and meet the estimated average annual demand of up to 300 mgd under the conditions of one planned shutdown of a major facility for maintenance concurrent with one unplanned facility outage due to a natural disaster, emergency or facility failure/upset.

- **Water Supply (meet customer water needs in non-drought and drought periods)** – meet average annual water demand of 265 mgd from the SFPUC watersheds for retail and wholesale customers during non-drought years for system demands; meet dry year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts; diversify water supply options during non-drought and drought periods; and improve use of new water sources and drought management, including groundwater, recycled water, conservation and transfers.
- **Sustainability (enhance sustainability in all system activities)** – Manage natural resources and physical systems to protect watershed ecosystems; meet all current and anticipated legal requirements for protection of fish and wildlife habitat; and manage natural resources and physical systems to protect public health and safety.
- **Cost effectiveness (achieve a cost effective, fully operational system)** – Ensure cost effective use of funds; maintain a gravity driven system; and implement regular inspection and maintenance program for all facilities.

The first four goals, Water Quality, Seismic Reliability, Delivery Reliability, and Water Supply are used to determine project design criteria. The last two goals, Sustainability and Cost Effectiveness, are overarching program goals that are not applied to specific criteria at the project level and thus are only infrequently described in project and program documents.

Project Scope. WSIP projects are divided into two sub-programs – the Local Program and the Regional Program. The Local Program consists of 35 projects that are located within the city limits of San Francisco and benefit only San Francisco residents. Local Program projects are typically smaller in size than Regional Program projects and include improvements to existing in-City distribution pipelines, storage reservoirs/tanks, pump stations and miscellaneous facilities. The cost of Local Program projects is absorbed into the retail rates of San Francisco customers. The Regional Program consists of 52 projects that are located mostly outside of the city limits of San Francisco and benefit both San Francisco residents and the 27 Wholesale Customers. Regional Program projects are typically much larger than Local Program projects and include improvements such as upgrades to and the addition of new treatment, transmission (pipelines, tunnels and pump stations) and storage (dams and reservoirs) facilities spread over seven counties (Tuolumne, Stanislaus, San Joaquin, Alameda, Santa Clara, San Mateo and San Francisco). The cost of Regional Program projects is incorporated into rates paid by both Retail Customers and Wholesale Customers.

The list of WSIP projects has not changed significantly since the program was initiated in 2002. Descriptions of the WSIP projects can be found at www.sfwater.org under “Construction/Contracts – Water System Improvement Program – WSIP Reports.” *The information and reports available on such website are not incorporated by reference into this Official Statement and should not be relied upon in making an investment in the 2019 Series ABC Bonds.*

As part of the Baseline Budget, the SFPUC approved a \$4.342 billion program. As part of the March 2018 Approved Budget, the SFPUC approved a \$4.788 billion program. The variance between the Baseline Budget and the March 2018 Approved Budget is an increase of \$446 million, or a 10.3% increase, and due mainly to cost increases to the following projects: (i) the Calaveras Dam Replacement Project, which included a sub-project known as the Fish Passage Facilities at Alameda Creek Diversion Dam Project, (ii) the Harry Tracy Water Treatment Plant Long-Term Improvements Project, (iii) the New Irvington Tunnel Project, (iv) the Regional Groundwater Storage and Recovery Project, (v) the Crystal Springs/San Andreas Transmission Upgrade Project, and (vi) the Alameda Creek Recapture Project. All appropriations for the WSIP have been made and WSIP is consequently not included in the Ten-Year Capital Plan for Fiscal Year 2019-20 to Fiscal Year 2028-29.

Current Status of WSIP. As of June 30, 2019, WSIP was approximately 98% complete. The overall status of WSIP can be assessed by examining the number of projects and the value of such projects in each of the major implementation phases of the program. The Local Program is essentially complete, with only one active project remaining in the close-out phase, and the Regional Program is approximately 97% complete, with two projects in the design phase, five projects in the construction phase and one project in the close-out phase remaining.

The largest WSIP project, the Calaveras Dam Replacement Project, which included a main dam project and a sub-project, the Fish Passage Facilities at Alameda Creek Diversion Dam (“ACDD”) project, achieved substantial construction completion by June 2019. As of June 2019, only two projects within the Regional Program with specific level of service goals remain to be completed with design and/or construction – the Regional Groundwater Storage and Recovery Project (the “RGSRP”) and the Alameda Creek Recapture Project (the “ACRP”). In addition, the four WSIP close-out projects for each of the San Joaquin, Sunol Valley, Bay Division and Peninsula Regions remain to be completed.

The RGSRP, which includes the construction of up to 16 new groundwater recovery and test wells and facilities consisting of chemical treatment equipment, pumping systems and associated pipelines, is 77% complete and construction is anticipated to be finished in 2021. The ACRP includes construction of several improvements in and around an existing quarry pit in Sunol Valley to recapture water that will be released from Calaveras Reservoir and/or bypassed around the ACDD during future operations of Calaveras Reservoir. A re-circulated draft environmental impact report for the ACRP is scheduled to be released by the end of 2019. Project approval is anticipated in late spring 2020, and construction is anticipated to start in fall 2020. In addition, four close-out projects created in March 2016 to address various issues to meet levels of service goals for each of San Joaquin, Sunol Valley, Bay Division and Peninsula regions are expected to be completed in December 2021.

Environmental Considerations

Projects undertaken by the SFPUC are generally subject to CEQA and certain projects involving the participation of federal agencies, including projects on federal land, are also subject to the National Environmental Policy Act of 1969, as amended (42 U.S.C. Section 4321) (“NEPA”). The San Francisco Planning Department, acting as lead agency under Chapter 31 of the City’s Administrative Code, generally coordinates environmental review of SFPUC projects. Federal agencies which issued permits for WSIP projects completed the necessary reviews under NEPA prior to issuance of the requested permits or other regulatory approvals.

Under CEQA, a project that may have a significant effect on the environment and is to be carried out or approved by a public agency must comply with a comprehensive environmental review process, including the preparation of an Environmental Impact Report (“EIR”). The EIR reflects not only an independent technical analysis of the project’s potential impacts, but also the comments of other agencies with some form of jurisdiction over the project and the comments of interested members of the public. Contents of the EIR include a detailed statement of the project’s significant environmental effects; any such effects that cannot be avoided if the project is implemented; mitigation measures proposed to minimize such effects; alternatives to the proposed project; the relationship between local and short-term uses and long-term productivity; any significant irreversible environmental changes that would result from the project; the project’s growth-inducing impacts; and a brief statement setting forth the agency’s reasons for determining that certain effects are not significant and hence do not require discussion in the EIR. Before approving a project the SFPUC must make findings on whether or how it can mitigate the significant environmental effects of the project. If the project requires mitigation, the SFPUC must adopt a mitigation monitoring plan to determine whether the mitigation is carried out during project implementation. If the SFPUC determines that the project itself will not have a significant effect on the environment, it may adopt a written statement (called a negative declaration) to that effect and need not prepare an EIR. After deciding to approve or carry out a project, either following the EIR process or after adopting a negative declaration, the SFPUC must file notice of such determination.

Prior to the sale of bonds, the San Francisco Planning Department Environmental Review Officer will issue a “Planning Certificate” required under Proposition E. The Planning Certificate will identify the status of environmental review for each capital project to be funded under the proposed bond sale and the type of CEQA document either completed or to be completed for each project. CEQA compliance must be completed for each project prior to project approval or approval to award a construction contract to implement any project to be funded by the proposed bond sale.

Any action or proceeding challenging the SFPUC’s determination must be brought within 30 days following the filing of such notice. Actions have been, and in the future may be, filed against the SFPUC challenging a project’s compliance with CEQA, including the adequacy of the EIR and other environmental documents, for particular projects. If an action challenging the SFPUC’s compliance with CEQA is successful, the

particular project could be delayed, revised, suspended or canceled. CEQA also contains a number of exemptions, which the SFPUC uses for its projects when appropriate.

As part of its regular planning and budgetary process, the San Francisco Planning Department gives careful attention to environmental considerations. All projects are evaluated under the SFPUC's environmental evaluation procedures, developed in compliance with federal and State laws and regulations, and City Ordinances and Administrative Code procedures.

FINANCING OF CAPITAL IMPROVEMENTS

Long Term Financing of Capital Program

Pursuant to the Water Enterprise's Ten-Year Financial Plan for Fiscal Year 2019-20 to Fiscal Year 2028-29, adopted by the Commission in March 2019, long-term debt financing is projected to fund approximately \$1.3 billion of the Ten-Year Capital Plan. Revenue (pay-as-you-go) funding is expected to provide approximately \$714 million of funds for a portion of the remaining funding of the Ten-Year Capital Plan. Long-term debt financing is expected to be comprised primarily of Additional Series of Bonds and the CWSRF Loan for the Westside Recycled Water Project. See "OBLIGATIONS PAYABLE FROM REVENUES – State and Federal Loans."

Interim Funding Program Facilities

The SFPUC utilizes the Interim Funding Program to meet the expenditure and encumbrance needs of capital projects on an interim basis through design and into the early project construction phase. The Interim Funding Program is authorized for the Water Enterprise in the aggregate principal amount of \$500 million. Of this amount, \$400 million is authorized for the SFPUC to issue Commercial Paper Notes and the remaining \$100 million is in the form of a bank revolving credit agreement, which permits the SFPUC to make draws directly from the bank, with the SFPUC's payment obligation evidenced by the Revolving Notes.

Interim funding program obligations are then refunded and consolidated into either long-term revenue bond issues or a Parity State Loan when the outstanding and encumbered amount of the interim funding obligations approaches authorized limits. This approach allows the SFPUC to take advantage of lower short-term interest rates, and to size and closely time long-term financings with projected need.

As of November 1, 2019, the SFPUC had approximately \$162.1 million principal amount of Commercial Paper Notes and no amount under the Revolving Notes outstanding. The SFPUC anticipates issuing additional Commercial Paper Notes and making draws directly on the U.S. Bank National Association facility to provide interim financing for Water Enterprise capital projects. See "OBLIGATIONS PAYABLE FROM REVENUES – Subordinate Debt and Interim Funding Program."

Sources of Funding the Capital Improvement Program

The following table sets forth the projected sources of funds for the first five years of the Water Enterprise's capital improvement program as set forth in the Ten-Year Capital Plan for Fiscal Year 2019-20 to Fiscal Year 2028-29. The repayment of projected principal and interest on these future debt issues was incorporated into the development of the SFPUC's approved retail water rates through Fiscal Year 2021-22, and has also been reflected in the remaining projection period set forth in the Ten-Year Financial Plan for Fiscal Year 2019-20 to Fiscal Year 2028-29. Pursuant to the WSA, a share of debt service associated with improvements to the Regional Water System, including debt service associated with WSIP financing, is the responsibility of the Wholesale Customers.

Pursuant to the Ten-Year Financial Plan for Fiscal Year 2019-20 to Fiscal Year 2028-29, the SFPUC projects that retail water rates will increase annually by an average of approximately 6.4% from Fiscal Year 2018-19 to Fiscal Year 2023-24. However, no retail rate increases beyond June 30, 2022 have been proposed to, or adopted by, the Commission or submitted to the Board of Supervisors, and any future retail water rate increases are subject

to future approval by the Commission, subject to the Board of Supervisors' ability to reject rate increases. See "FINANCIAL OPERATIONS."

TABLE 17
WATER ENTERPRISE CAPITAL IMPROVEMENT PROGRAM
FUNDING SOURCES
FOR FISCAL YEARS ENDED JUNE 30
(IN THOUSANDS)⁽¹⁾

Appropriations	2020⁽²⁾	2021	2022	2023	2024	Total
Revenue Bonds / Parity State Loan	\$225,163	\$287,473	\$215,527	\$179,790	\$112,565	\$1,020,518
Water Revenues	57,304	47,056	47,584	62,909	63,667	278,520
Capacity Charge Revenues	1,511	1,554	1,520	1,520	1,520	7,625
Total Sources	\$283,978	\$336,083	\$264,631	\$244,219	\$177,752	\$1,306,663

⁽¹⁾ Amounts are based on anticipated appropriations and are projections from the Water Enterprise Ten-Year Capital Plan. Actual results may differ materially from these projections. See "FORWARD-LOOKING STATEMENTS" above.

⁽²⁾ Budgeted.

Source: SFPUC.

FINANCIAL OPERATIONS

General

The SFPUC is a department of the City and, as such, the financial operations of the SFPUC's three enterprises are included in the Comprehensive Annual Financial Report of the City and shown as enterprise funds.

The following information is provided with respect to the Water Enterprise only and does not purport to reflect the financial position of the SFPUC or the City as a whole.

Basis of Accounting. The accounts of the Water Enterprise are organized on the basis of a proprietary fund type, specifically an enterprise fund. The financial activities of the Water Enterprise are accounted for on a flow of economic resources measurement focus, using the accrual basis of accounting. Under this method, all assets and liabilities associated with its operations are included on the statement of net assets; revenues are recorded when earned, and expenses are recorded when liabilities are incurred.

The SFPUC applies all applicable GASB pronouncements.

City Budget Process. The SFPUC's operating and capital budget preparation and approval is a part of a City-wide process. The SFPUC is one of several departments that prepare biannual budgets. The Commission reviews and approves the SFPUC's two-year budget, which is then submitted to the Mayor's Office for review. The Mayor then incorporates the proposed budget, with amendments, into the City-wide budget that is submitted to the Board of Supervisors for approval. Under the Charter, the Board of Supervisors may increase or decrease any proposed expenditure in the Mayor's budget so long as the aggregate changes do not cause the expenditures to exceed the total amount of expenditures proposed by the Mayor. The Charter further provides that the Mayor may reduce or reject any expenditure authorized by the Board of Supervisors except appropriations for bond interest, redemption or other fixed charges, subject to reinstatement of any such expenditure by a two-thirds vote of the Board of Supervisors.

City Services Auditor. On November 4, 2003, voters in the City adopted Proposition C, an ordinance that established the City Services Auditor ("CSA"), an audit function within the Office of the City Controller. Pursuant to the provisions of this ordinance, which have been incorporated into the Charter, the CSA has broad oversight authority and responsibilities including, but not limited to, (i) reporting upon level of effectiveness for City public services, (ii) auditing financial and management performance of City departments and functions, (iii) ensuring the financial integrity and improving the overall performance and efficiency of City government, and (iv) maintaining a whistleblower hotline to investigate upon reports of fraud, waste and abuse.

Sources of Revenue. The Water Enterprise’s principal source of revenue is the sale of water to its Retail Customers and Wholesale Customers.

The setting of water rates by the City is not subject to any State or federal regulatory approval. The SFPUC’s ability to generate revenue may be limited by certain provisions of the State Constitution and the Charter of the City. See “CONSTITUTIONAL, STATUTORY AND CHARTER LIMITATIONS.”

Allocation of Hetch Hetchy Project Costs. A number of the facilities of the Hetch Hetchy Project are joint assets and are used for both water transmission and power generation and transmission, benefitting both Hetch Hetchy Water and the Power Enterprise. All power sales revenues are allocated to the Power Enterprise. Per negotiation with Wholesale Customers, operating and capital costs benefitting the Power Enterprise and 55% of operating and capital costs that jointly benefit both Hetch Hetchy Water and the Power Enterprise are allocated to the Power Enterprise. Operating and capital costs benefitting Hetch Hetchy Water and 45% of operating and capital costs jointly benefitting both Hetch Hetchy Water and the Power Enterprise are allocated to the Water Enterprise. Costs allocated to the Water Enterprise are paid through an inter-enterprise transfer from the Water Enterprise to Hetch Hetchy Water and Power. Such transfers constitute “Operation and Maintenance Costs of the Enterprise.” See “– Operating and Maintenance Expenses – Inter-Enterprise Transfers.”

Financial Management Policies. To support sound financial management practices during periods of instability and to ensure organizational accountability and disciplined decision making, and to maintain the highest practical credit ratings, the SFPUC conducted an extensive peer review study to compare the financial policies of other United States municipal utilities, analyze rating agency evaluations of financial policies and recommend changes to the SFPUC’s existing financial policies. Based on this study, the Commission adopted in February and March 2017 a Debt Service Coverage Policy, a Capital Financing Policy and a Fund Balance Reserve Policy. Such new policies replaced the SFPUC’s existing Fund Balance Reserve Policy. The SFPUC recently revised its Debt Management Policies & Procedures, which the Commission adopted on November 26, 2019. See “– Financial Management Policies.” In addition, the Commission adopted a Ratepayer Assurance Policy to address the prudent use of ratepayer funds and the establishment of rates and charges and to ensure process transparency.

Financial Reporting System. The City implemented a new financial and procurement system in July 2017. Trained City staff have been using the system to report accounting, procurement and financial information, starting with the information for Fiscal Year 2017-18.

Wholesale Water Sales Revenue

Wholesale Rate-Setting Process. Wholesale Customer rates are determined annually based upon the Wholesale Customers’ collective share of the Water Enterprise’s total revenue requirements, known as the “**Wholesale Revenue Requirement**” in the WSA. The Wholesale Revenue Requirement under the WSA consists of the sum of the Wholesale Customers’ allocated shares of the following costs of the Water Enterprise in providing water to the Wholesale Customers: operating and maintenance expenses, administrative and general expenses, property taxes, and the “Suburban Hetch Hetchy Assessment,” the costs of operating the Hetch Hetchy Project allocated exclusively to the Water Enterprise or jointly to the Water Enterprise and the Power Enterprise.

The cost of service for Wholesale Customers includes a pro-rata share of Operation and Maintenance Costs of the Enterprise. Capital costs are recovered under the cash method as needed to cover revenue-funded capital improvements of the Regional Water System and debt service associated with bond-funded capital projects. The operating costs and plant investment for Hetch Hetchy Water and Power are first classified as power-specific, water-specific or joint. The water related costs and water’s share of joint costs are reflected in the Wholesale Revenue Requirement.

In addition to a pro-rata share of Operation and Maintenance Costs of the Enterprise, debt service and revenue funded capital, the Wholesale Customers agreed to pay a fixed annual charge to reimburse the Water Enterprise for a pro rata share of undepreciated investment in facilities capitalized prior to July 1, 2009. The WSA allowed the Wholesale Customers to repay the undepreciated value of existing assets as well as construction work in progress as of June 30, 2009, in equal annual payments over the 25 years of the WSA at an annual interest rate of 5.13%. On January 1, 2013, State legislation authorizing BAWSCA to prepay the remaining value on existing

regional assets to achieve cost savings became effective. On February 27, 2013, the Wholesale Customers through BAWSCA made an early repayment of \$356 million to the outstanding balance owed to the Water Enterprise. See “FINANCIAL OPERATIONS – Wholesale Water Sales Revenue – Capital Cost Recovery Prepayment.”

The WSA allowed the Wholesale Customers to reimburse the Water Enterprise for any revenue funded project expenditures made in Fiscal Year 2009-10 through Fiscal Year 2011-12 using funds appropriated, but unspent, prior to July 1, 2009 over 10 years with repayment beginning in Fiscal Year 2014-15 and ending in Fiscal Year 2023-24 at an annual interest rate of 4.00%. The annual payment of \$1.2 million has been incorporated into wholesale rates.

Finally, the WSA contains a rate device known as the balancing account. Any difference between the revenues received and the actual earned revenues associated with the allocated cost of wholesale service is placed in the balancing account and used to adjust the following year’s rate recovery up or down depending on whether there is a shortfall or surplus in the balancing account. The projected year-end amount in the balancing account for Fiscal Year 2018-19 is approximately \$64.8 million owed by the SFPUC to the Wholesale Customers. See “APPENDIX B – SUMMARY OF CERTAIN PROVISIONS OF THE WATER SUPPLY AGREEMENT – Balancing Account.”

Statutory and Contractual Limits on Wholesale Water Rates. The sale and delivery of water to the Wholesale Customers under the WSA are subject to the “Rules and Regulations Governing Water Service to Customers” of the Water Enterprise adopted by the Commission, and as they may from time to time be amended, that are (1) applicable to the sale and delivery of water by the SFPUC to the Wholesale Customers, (2) reasonable, and (3) not inconsistent with either the WSA or with an individual contract.

Wholesale Water Rate Adjustments. Under the WSA, adjustments to the Wholesale Customers’ rate schedules, other than emergency rate adjustments and drought pricing, discussed below, are coordinated with the budget development process. If the SFPUC desires to increase Wholesale Customer rates, it is required to provide certain yearly budget information to the Wholesale Customers prior to adoption of any such rate increases. Failure to do so will not prohibit the SFPUC from adoption of such rates, but, in the event of such failure, the Wholesale Customers may either invoke arbitration, or seek injunctive relief to compel the SFPUC to remedy the failure as soon as reasonably practical.

The SFPUC may increase the water rates applicable to the Wholesale Customers without compliance with the above described procedures in the event a drought, earthquake, other act of God, malfunctioning of the Regional Water System or other emergency which requires an increase in rates. Rates may be increased on an emergency basis to cover operating expenses and capital costs. Any such emergency rate increase must be accompanied by a rate increase for Retail Customers of an equal percentage.

Any emergency rate surcharge adopted by the SFPUC could go into effect within 30 days of such adoption (subject to any action by the Board of Supervisors) and would remain in effect only until the next budget coordinated rate-setting cycle, at which time it can be reviewed for continuance and modification.

Drought pricing for Wholesale Customers, if required, could also be changed under similar terms and conditions set forth for emergency rate increases. Any drought-related pricing or surcharge adopted by the Commission would also remain in effect only until the next budget coordinated rate-setting cycle.

Historical Wholesale Water Rate Adjustments. The following table lists wholesale water rate adjustments since Fiscal Year 2010-2011 for the Wholesale Customers.

TABLE 18
HISTORICAL PERCENTAGE INCREASES (DECREASES)
IN WHOLESALE WATER RATES

Date	Change in Wholesale Rates ⁽¹⁾
July 2010	15.2%
July 2011	38.4
July 2012	11.4
July 2013	(16.4)
July 2014	19.6
July 2015	28.0
July 2016	9.3
July 2017	0.0
July 2018	0.0
July 2019	0.0

⁽¹⁾ Wholesale rates are set prospectively based on an estimate of the Wholesale Revenue Requirement and reflect annual true ups. As such, rates may increase or decrease significantly from year to year.
Source: SFPUC, Audited Financial Statements, and SFPUC Financial Services.

Arbitration for Disputes. The Prior Master Water Sales Contract had a binding arbitration provision for disputes related to wholesale rate setting by the SFPUC. The SFPUC and its Wholesale Customers arbitrated one dispute over the 25-year term of the Prior Master Water Sales Contract. The WSA continues the practice of binding arbitration and the SFPUC and its Wholesale Customers have settled other disputes, without invoking arbitration, as part of the true up process for determining the actual Wholesale Revenue Requirement following the close of each fiscal year.

Capital Cost Recovery Prepayment. Under the WSA, the Wholesale Customers had been making total annual capital cost recovery payments to the SFPUC of approximately \$28.2 million, with such annual payments due through the expiration of the WSA in 2034. In February 2013, the Wholesale Customers, acting through BAWSCA, exercised a right to prepay the outstanding balance of the capital cost recovery obligation, in the amount of \$356,139,000, to the SFPUC, thereby discharging the obligation in its entirety. Since the Wholesale Customers' obligation was to the Retail Customers of the SFPUC for funding the existing capital assets of the Hetch Hetchy Regional Water System, the SFPUC developed a plan to use the proceeds to pay costs of certain regional and local capital projects allocated to Retail Customers, to refund certain then outstanding Water Revenue Bonds and to fund unrestricted available fund balance reserves. The SFPUC realized the proceeds as Revenues of the Water Enterprise from the Wholesale Customers in Fiscal Year 2012-13. As a result, water sales for Wholesale Customers in Fiscal Year 2012-13 and debt service coverage in Fiscal Year 2012-13 and Fiscal Year 2013-14 increased significantly.

Retail Water Sales Revenue

Retail Rate Structure. Retail Customers pay a flat monthly service charge based on the size of the meter plus a volumetric charge for all water delivered based on one-month meter readings. Volumetric charges for single- and multi-family residential customers are based on a two-tiered rate structure, where the first tier is applicable to the first 4 CCF (400 cubic feet) of use per month (single-family) or 3 CCF (300 cubic feet) of use per month (multi-family), and the second tier is applicable to all additional use. Volumetric charges for non-residential customers are based on a uniform rate. The table below details retail water rates for Fiscal Year 2019-20.

**TABLE 19
RATES FOR RETAIL WATER SERVICE IN SAN FRANCISCO
AS OF JULY 1, 2019**

	Single-Family Residential (\$/CCF)⁽¹⁾	Multi-Family Residential (\$/CCF)	Non-Residential (\$/CCF)
Tier 1 ⁽²⁾ (0-4 or 0-3 CCF)	7.85	7.94	-
Tier 2 (All other usage)	9.61	9.73	-
Uniform ⁽³⁾	-	-	9.14

⁽¹⁾ One “CCF” equals 100 cubic feet of water (equal to 748 gallons).

⁽²⁾ Tier 1 for single-family residential is from 0-4 CCF; tier 1 for multi-family residential is from 0-3 CCF.

⁽³⁾ Different rates applying to builders and contractors, fire service, interruptible irrigation and docks and ships apply to a small percentage of Non-Residential use.

Source: SFPUC, Financial Services.

The following table shows a comparison of typical monthly charges for representative Retail Customer classes based on average use.

**TABLE 20
TYPICAL MONTHLY CHARGES FOR RETAIL WATER SERVICE IN SAN FRANCISCO
FISCAL YEAR 2019-20**

Customer Type	Average Use (CCF)	Meter Size	Fixed Charge	Volume Charge	Total Monthly Charges (Volume + Fixed)
Average Single Family Residence	5.3	5/8”	\$ 13.28	\$ 43.89	\$ 57.17
Larger Single Family Residence	12.0	5/8”	13.28	108.28	121.56
Large Apartment Building	101.0	3”	125.18	746.45	871.63
Large Office	351.0	3”	125.18	3,208.14	3,333.32
Department Store	340.0	4”	192.32	3,107.60	3,299.92
Hotel	3,314.0	6”	378.82	30,289.96	30,668.78

Source: SFPUC, Financial Services

Retail Rate-Setting Process. The SFPUC is authorized and required under the Charter and Proposition E to set rates, fees and other charges in connection with providing the utility services under its jurisdiction, subject to rejection – within 30 days of submission – by resolution of the Board of Supervisors. If the Board of Supervisors fails to act within 30 days, the rates will become effective without further action.

Under the Charter, in setting retail rates, fees and charges (for water and for the wastewater and power utility services it provides) the SFPUC is required to take the following actions:

- (1) Establish rates, fees and charges at levels sufficient to improve or maintain financial condition and bond ratings at or above levels equivalent to highly rated utilities of each enterprise under its jurisdiction, meet requirements and covenants under all bond resolutions and indentures (including, without limitation, increases necessary to pay for the retail customers’ share of the debt service on bonds and operating expenses of any State financing authority), and provide sufficient resources for the continued financial health (including appropriate reserves), operation, maintenance and repair of each enterprise, consistent with good utility practice.
- (2) Retain an independent rate consultant to conduct rate and cost of service studies for each utility at least every five years.

- (3) Set retail rates, fees and charges based on the cost of service.
- (4) Conduct all studies mandated by applicable State and federal law to consider implementing connection fees for water and clean water facilities servicing new development.
- (5) Conduct studies of rate-based conservation incentives and/or lifeline rates and similar rate structures to provide assistance to low income users, and take the results of such studies into account when establishing rates, fees and charges, in accordance with applicable State and federal laws.
- (6) Adopt annually a rolling 5-year forecast of rates, fees and other charges.
- (7) Establish a Rate Fairness Board consisting of seven members: the City Administrator or his or her designee; the Controller or his or her designee; the Director of the Mayor's Office of Public Finance or his or her designee; two residential retail customers, consisting of one appointed by the Mayor and one by the Board of Supervisors; and two business retail customers, consisting of a large business customer appointed by the Mayor and a small business customer appointed by the Board of Supervisors. Specific duties for the Rate Fairness Board include:
 - (a) annual review of a five-year rate forecast;
 - (b) hold one or more public hearings on annual rate recommendations before the SFPUC adopts rates;
 - (c) provide a report and recommendations to the SFPUC on the rate proposal; and,
 - (d) in connection with periodic rate studies, submit to the SFPUC rate policy recommendations for the SFPUC's consideration, including recommendations to reallocate costs among various retail utility customer classifications, subject to any outstanding bond requirements.

Retail rates and the retail rate-setting process must also comply with the requirements of the State Constitution, including notice, protest and public hearing requirements. See "CONSTITUTIONAL, STATUTORY AND CHARTER LIMITATIONS – State Law Limitations."

Retail Water Rate Adjustments. The SFPUC's retail rates and charges for delivered water are set to equal the cost of operation, maintenance, replacement, debt service and other costs incurred in gathering, treating and delivering water for consumptive and other uses in the City and other areas receiving retail service from the Water Enterprise. The SFPUC has regularly reviewed and often increased its retail water rates to fund operating and capital costs. Pursuant to the Charter, the SFPUC retained an independent consultant to perform a cost of service study completed in 2018. In April 2018, the SFPUC approved retail water rates and charges for the four-year period effective July 1, 2018 through June 30, 2022. Significantly, in the rates adopted in April 2018, the SFPUC also approved a new drought surcharge. The drought surcharge would allow the SFPUC to implement a temporary drought surcharge which would apply to the volumetric portions of both water and wastewater rates and would only be triggered when the SFPUC imposes delivery reduction in accordance with the Retail Water Shortage Allocation Plan and calls for either voluntary or mandatory water reduction.

The following table lists retail water rate adjustments since Fiscal Year 2012-13 through Fiscal Year 2021-22.

TABLE 21
HISTORICAL PERCENTAGE INCREASES (DECREASES)
IN RETAIL WATER RATES

Date	Retail Rates
July 2012	12.5%
July 2013	6.5
July 2014	12.0
July 2015	12.0
July 2016	10.0
July 2017	7.0
July 2018	9.0
July 2019	8.0
July 2020	7.0
July 2021	7.0

Source: SFPUC, Financial Services.

The SFPUC may make adjustments from time to time in such rates, fees and charges and may make such classification of rates, fees and charges as it deems necessary, but will not reduce such rates, fees and charges below those then in effect unless the Revenues resulting after such reduced rates, fees and charges are put into effect will at all times be sufficient to meet the rate covenants set forth in the Indenture. See “SECURITY FOR THE BONDS – Rate Covenants.”

Billing and Collection Procedures. All Retail Customers are billed monthly on the basis of metered water use. In the event of non-payment, the SFPUC has authority and power to discontinue service and, in owner-occupied buildings and master metered apartment buildings, to record liens on property.

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Delinquencies. The table below shows the delinquency in collection of water charges from Retail Customers as of July 1, 2019. The SFPUC considers its rates of payment delinquency, service discontinuance for non-payment, and write-offs for uncollectible accounts to be low by water industry standards for urban areas.

**TABLE 22
ACCOUNTS RECEIVABLES AGING REPORT
AS OF JULY 1, 2019**

<u>Period</u>	<u>Amount</u>	<u>Percent of Total</u>
0 - 30 Days	\$25,118,017	91.13%
31 - 60 Days	1,535,588	5.57
61 - 90 Days	389,752	1.41
Over 90 Days	520,117	1.89
Total	<u>\$27,563,475</u>	<u>100.00%</u>
Credit Balances	(\$1,898,527)	
Total Aged Receivables	<u>\$25,664,948</u>	
Less Receivables from Municipal Customers	(\$944,653)	
Less Allowance For Doubtful Accounts	<u>(369,294)</u>	
Accounts Receivable, Net of Allowance	<u>\$24,351,001</u>	

Source: SFPUC, Financial Services.

The following table shows a five-year history of write-offs for uncollectible accounts.

**TABLE 23
WRITE-OFFS FOR UNCOLLECTIBLE ACCOUNTS**

<u>Fiscal Year (ended June 30)</u>	<u>Amount</u>
2015 ⁽¹⁾	\$ 617,734
2016	3,621
2017	73,315
2018	145,863
2019	3,873

⁽¹⁾ Write-offs for Fiscal Year 2014-15 include amounts from Fiscal Years 1999-2000 to 2012-13 initially reported to the SFPUC as uncollectible by the Bureau of Delinquent Revenues in Fiscal Year 2014-15. The SFPUC expects that the Bureau of Delinquent Revenues will report such uncollectible amounts to the SFPUC on an annual basis moving forward.

Source: SFPUC, Financial Services.

Comparative Retail Water Rates. The following table shows a comparison of monthly charges by selected local water purveyors for a typical residential account with a 5/8-inch meter consuming a volume of water that is typical for a single-family residential customer served by each water purveyor.

TABLE 24
COMPARATIVE TYPICAL MONTHLY RESIDENTIAL WATER CHARGES
AS OF JULY 1, 2019

Water Purveyor	Typical Monthly Charge ⁽¹⁾
City of Oakland	\$51.62
San Francisco Public Utilities Commission⁽²⁾	57.17
City of Concord	58.27
City of Antioch	58.92
City of Hayward	60.71
City of Palo Alto	66.56
City of San Jose	80.40

⁽¹⁾ Based on single-family residence at CCF typical for each agency in 2018.

⁽²⁾ Based on water charges as of July 1, 2019.

Source: SFPUC, Financial Services.

Impact of Weather on Revenues

Weather conditions cannot be forecasted with precision, and impact water sales. If retail water sales are less than forecasted, retail water sales revenues will be less than forecasted without increases in retail water rates. Actual water sales were, for example, less than water sales forecasted at the time water rates were adopted for Retail Customers for the four-year period from Fiscal Year 2014-15 through Fiscal Year 2017-18 and retail water sales revenues for such period were significantly less than forecasted water sales revenues. However, the SFPUC was able to offset lower revenues to some extent with reductions to expenditures and retail rates have thereafter been increased to reflect the likely long-term reduction in water usage.

The Commission adopted a four-year retail rate package on May 13, 2014 that took effect on July 1, 2014. The rate package was not altered during the recent drought. However, in response to regulations adopted by SWRCB, on August 26, 2014, the Commission imposed mandatory restrictions, consistent with the SWRCB's Emergency Regulations, on outdoor irrigation by reducing all outdoor irrigation of ornamental landscapes or turf with potable water by Retail Customers by at least 10%, for the period October 1, 2014 through June 30, 2015. In response to continued drought conditions, the Commission increased the mandatory outdoor irrigation reduction to 25%, effective July 1, 2015. To regulate mandatory restrictions, the Commission adopted Excess Water Use charges applicable to retail potable water irrigation accounts that did not meet the required reduction level. For each customer account, an excess use charge for water use above the 90% cumulative allocation for the entire restriction period was assessed at either two times the applicable water rate for that account or three times the applicable water rate for customers paying the lower interruptible irrigation rate.

On May 18, 2016, the SWRCB adopted new standards for drought emergency water conservation regulation that allow utilities to self-certify that they have sufficient available water to meet demand for another three years of drought. The SFPUC determined that it does meet this standard and lifted the mandatory 25% outdoor irrigation reduction, effective July 1, 2016. Following a wet 2016/2017 hydrologic year and a forecast of full reservoir storage levels, the SFPUC lifted all voluntary and mandatory restrictions and excess use charges, effective May 1, 2017.

Capacity Charges

The SFPUC imposes a capacity charge on any Retail Customer requesting a new connection to the water distribution system, or requiring additional capacity as a result of any addition, improvement, modification or change in use of an existing connection to the water distribution system. As of July 1, 2019, the capacity charge is \$1,876 per equivalent 5/8 inch meter. The capacity charge is adjusted on July 1 of each year by the annual change in the 20 City Average Construction Cost Index published by Engineering News Record (ENR) Magazine. The SFPUC takes a conservative approach to budgeting for revenues from capacity charges; new account growth is projected at 0.1% annual growth, despite greater than budget capacity charges revenue.

Operating and Maintenance Expenses

“**Operating and Maintenance Expenses**” cover the general operations expenses of the Water Enterprise. These expenses include labor and fringe benefits, contractual services, materials and supplies, depreciation, general and administrative, services from other departments and other miscellaneous costs. See “HISTORICAL OPERATING RESULTS.” Services from other departments include payment for services from other City departments, such as the City Attorney’s Office and the General Services Agency. Operating and Maintenance Expenses include payments to Hetch Hetchy Water and Power for services related to water storage and delivery. See “– Inter-Enterprise Transfers” and “SECURITY FOR THE BONDS – Rate Covenants.”

Allocation of Costs. The SFPUC allocates various common costs it incurs among the Water Enterprise, Hetch Hetchy Water and Power and the Wastewater Enterprise. Allocations are based on the SFPUC management’s best estimate and may change from year to year depending on activities undertaken by each enterprise and information available. The most recent cost allocation review was done in 2018. For Fiscal Years 2019-20 and 2018-19, the SFPUC has allocated \$49.3 million and \$46.8 million, respectively, in administrative costs to the Water Enterprise, which are included in the financial statements under various expense categories.

Inter-Enterprise Transfers. An annual transfer occurs from the Water Enterprise to Hetch Hetchy Water and Power to pay for services related to water storage and delivery. The budgeted transfer amount is \$34.6 million for Fiscal Year 2019-20 and was \$33.6 million for Fiscal Year 2018-19. An additional transfer related to power purchases is budgeted at \$10.2 million for Fiscal Year 2019-20 and was \$9.9 million in Fiscal Year 2018-19. Should Hetch Hetchy Water and Power incur higher capital costs or higher operating costs in the future, the amount of these transfers could increase.

Payments to/from the City.

Payments to City for Interdepartmental Services. A variety of City departments provide services such as engineering, purchasing, legal, data processing, telecommunications and human resources to the Water Enterprise and charge amounts designed to recover those costs. The budgeted charge amount is \$13.5 million for Fiscal Year 2019-20 and was \$12.7 million for Fiscal Year 2018-19.

Lease Certificate of Participation Financing. On October 7, 2009, the City issued \$167.67 million in fixed-rate Certificates of Participation, Series 2009 C and D, to fund the headquarters of the SFPUC at 525 Golden Gate Avenue. Pursuant to a Memorandum of Understanding between the City and the SFPUC, the SFPUC agreed to reimburse the City General Fund for all costs in connection with this City financing. This obligation is subordinate to debt service on the Bonds and payments related thereto are allocated among the three SFPUC Enterprises. See “OBLIGATIONS PAYABLE FROM REVENUES – Other Subordinate Obligations Payable from Revenues.”

Water Payments from Other Agencies. The SFPUC receives payments from other agencies of the City for their share of the proportionate cost of the service provided to them. Prior to Fiscal Year 2007-08, the Water Enterprise delivered water without charge to certain City departments. In Fiscal Year 2007-08, the Water Enterprise began charging all City departments for water (with the exception of itself and Fire Department for water dispensed from fire hydrants). The SFPUC budgeted to collect payments from other City agencies totaling approximately \$13.2 million in Fiscal Year 2019-20 and collected \$12.5 million in Fiscal Year 2018-19.

Financial Management Policies

Debt Management Policies & Procedures. The SFPUC has established “Debt Management Policies & Procedures” (the “**Debt Policies**”) for debt financing under its jurisdiction. The SFPUC has also established separate “SFPUC Bond Disclosure Policies & Procedures” (the “**Disclosure Policies**”) which are appended to the Debt Policies. The Debt Policies, including the appended Disclosure Policies, apply to all SFPUC enterprises, including the Water Enterprise, and are intended to enable the SFPUC to effectively manage its debt issuance and

administration practices and comply with all debt issuance and administration rules and regulations. The Debt Policies are reviewed bi-annually and revised, as necessary, with Commission approval.

Revisions to the Debt Policies were most recently adopted by the Commission on November 26, 2019. This included revisions to three key areas:

- (1) Disclosure – The Disclosure Policies now cover two amendments that were made to Rule 15c2-12, effective February 27, 2019 (the “**Rule 15c2-12 Amendments**”). See the Listed Events 15 and 16 in “APPENDIX E – FORM OF CONTINUING DISCLOSURE CERTIFICATE.” In addition, pursuant to the Disclosure Policies, the SFPUC will develop a Disclosure Practices Working Group (the “**DPWG**”). The DPWG will meet at least semiannually to better and more effectively administer the SFPUC’s continuing disclosure requirements, particularly to monitor the SFPUC’s financial obligations and financial difficulties, if any, in light of the Rule 15c2-12 Amendments. The DPWG is comprised of the Assistant General Manager, Business Services and Chief Financial Officer, two Deputy Chief Financial Officers and the Debt Manager of the SFPUC, with legal consultation from the City Attorney’s Office and the SFPUC’s outside disclosure counsel.
- (2) Variable Rate Obligations – The Debt Policies, which set forth and describe various types of debt obligations that the SFPUC may issue, now cover new amendments made to the Wastewater bond indenture that will allow the SFPUC to issue variable rate obligations of the Wastewater Enterprise with more market-standard provisions. Such amendments have not yet taken effect and will do so upon consent of 51% of Wastewater Enterprise senior lien bondholders. These amendments do not apply to any variable rate obligations issued by the Water Enterprise.
- (3) WIFIA Loans – In July 2018, the SFPUC executed a loan in an approximate amount of \$699 million with the United States Environmental Protection Agency pursuant to the federal Water Infrastructure Finance and Innovation Act (the “**WIFIA Loan**”). The WIFIA Loan provides partial funding of the Biosolids Digester Facility Project, a project of the Wastewater Enterprise’s Sewer System Improvement Program. This was the first WIFIA loan executed by the SFPUC. The Debt Policies were revised to add WIFIA loans as a permitted form of low-cost debt financing instrument, comparable to the low-cost State Revolving Fund loans that the SFPUC has, from time-to-time, executed with the SWRCB. No WIFIA loans have been executed for the Water Enterprise.

The SFPUC makes no representation that these policies will not be revised or amended and, except to the extent required for compliance with the terms of the Indenture, makes no representation that these policies will be followed by the SFPUC.

Debt Service Coverage Policy. The Commission adopted a debt service coverage policy (the “**Debt Service Coverage Policy**”) on March 28, 2017, which applies to all SFPUC enterprises, including the Water Enterprise. Pursuant to the Debt Service Coverage Policy, to ensure that the SFPUC maintains access to low-cost capital and retains financial flexibility for contingencies, the SFPUC will aim to adopt budgets, rates and financial plans that generate revenues such that debt service coverage on an Indenture basis will be at least 1.35 times and debt service coverage on a current basis will be at least 1.10 times.

The Indenture includes a rate covenant of 1.25 times coverage (including certain available fund balances). See “SECURITY FOR THE BONDS – Rate Covenants – Debt Service Coverage.”

The SFPUC makes no representation that this policy will not be revised or amended and, except to the extent required for compliance with the terms of the Indenture, makes no representation that this policy will be followed by the SFPUC.

Capital Financing Policy. The Commission adopted a capital financing policy (the “**Capital Financing Policy**”) on March 28, 2017, which applies to all SFPUC enterprises, including the Water Enterprise. The SFPUC relies mainly on current revenue and debt financing to pay for capital assets or improvements. According to the

Capital Financing Policy, the appropriate mix of current revenues versus debt financing depends, in part, on the capital investment lifecycle of the Water Enterprise. Accordingly, the SFPUC has determined that over the 10-year financial planning horizon, the SFPUC will aim to pay for a minimum ranging between 15% and 30% of the Water Enterprise's capital budget from current revenues.

The SFPUC makes no representation that this policy will not be revised or amended and, except to the extent required for compliance with the terms of the Indenture, makes no representation that this policy will be followed by the SFPUC.

Fund Balance Reserve Policy. The Commission adopted a fund balance reserve policy (the “**Fund Balance Reserve Policy**”) on February 28, 2017, which applies to all SFPUC enterprises, including the Water Enterprise. Pursuant to the Fund Balance Reserve Policy, for the time period covered in the 10-Year Financial Plan, the SFPUC will aim to propose operating and capital budgets and rates for adoption such that the Fund Balance Reserve totals a minimum of 90 days or 25% of operations and maintenance expenses (including programmatic projects and excluding debt service and revenue-funded capital) throughout the forecast period. Amounts in excess of such minimum will be considered for contingencies and rate stabilization.

The SFPUC makes no representation that this policy will not be revised or amended and, except to the extent required for compliance with the terms of the Indenture, makes no representation that this policy will be followed by the SFPUC.

Investment of SFPUC Funds

The SFPUC's pooled deposits and investments are invested pursuant to State law and the investment policy established from time to time by the City Treasurer and overseen by the Treasury Oversight Committee. The current policy seeks the preservation of capital, liquidity and yield, in that order of priority. Under the City Treasurer's current investment procedures, the SFPUC's pooled deposits and investments are invested in the City's larger pooled investment fund (the “**City Pool**”). Among other purposes, the City Pool serves in effect as a disbursement account for expenditures from the City's various segregated and pooled funds. Investments are generally made so that securities can be held to maturity. The City Treasurer calculated the weighted average maturity of these investments as of October 31, 2019, to be 347 days.

The following table sets forth the approximate book values of the investments held in the City Pool reported by the City Treasurer as of October 31, 2019. The Water Enterprise's pooled deposits and investments accounted for approximately \$445.6 million, or approximately 3.9%, of such amounts. The Wastewater Enterprise and the Power Enterprise each have their own pooled deposits and investments that are separate from the Water Enterprise.

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TABLE 25
CITY POOLED INVESTMENT FUND
(AS OF OCTOBER 31, 2019)

Investments	Book Value (millions)
U.S. Treasuries	\$ 905.2
Federal Agencies	4,969.4
State & Local Government Agency Obligations	80.3
Public Time Deposits	35.0
Negotiable CDs	2,685.0
Commercial Paper	717.7
Medium Term Notes	34.5
Money Market Funds	1,027.0
Supranationals	772.9
Total	\$11,227.1

Source: Office of the Treasurer & Tax Collector of the City and County of San Francisco.

The SFPUC’s non-pooled deposits and investments consist primarily of funds related to the SFPUC’s Outstanding Bonds, which are invested pursuant to policy established by the SFPUC, subject to the restrictions contained in the applicable bond documentation.

Risk Management and Insurance

The SFPUC’s risk management program encompasses both self-insured and insured coverage. Risk assessments and coverage are coordinated by the SFPUC Enterprise Risk Manager through the City Office of Risk Management. With certain exceptions, the City and SFPUC’s general approach is to first evaluate self-insurance for the risk of loss to which it is exposed. Based on this analysis, the SFPUC has determined that mitigating risk through a “self-retention” mechanism is more economical as it manages risks internally and administers, adjusts, settles, defends and pays claims from budgeted resources (i.e., pay-as-you-go). When economically more viable or when required by debt financing covenants, the SFPUC obtains commercial insurance.

At least annually, the City reviews and actuarially determines general liability and workers’ compensation liabilities, which are recorded as “Damages and Claims” and “Accrued Worker’s Compensation” in the financial statements.

The SFPUC does not maintain commercial earthquake coverage for the Water Enterprise, with certain minor exceptions, such as a sub-limit for fire-sprinkler leakage due to earthquake under the Property Insurance program. The SFPUC also does not presently maintain insurance covering cyber-losses.

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The following is a summary of the SFPUC’s coverage approach to risk:

Primary Risks	Typical Coverage Approach
General Liability	Self-Insured
Property	Purchased Insurance & Self-Insured
Electronic Data Processing	Purchased Insurance & Self-Insured
Workers’ Compensation	Self-Insured through City-Wide Pool
Other Risks	Typical Coverage Approach
Surety Bonds	Purchased and Contractually Transferred
Professional Liability	Combination of Self-Insured, Purchased Insurance and Contractual Risk Transfer
Errors & Omissions	Combination of Self-Insured, Purchased Insurance and Contractual Risk Transfer
Builders Risk	Purchased Insurance & Contractual Risk Transfer
Public Officials Liability	Purchased Insurance
Employment Practices Liability	Purchased Insurance
Crime	Purchased Insurance

The SFPUC’s property risk management approach varies depending on whether the facility is currently under construction, or if the property is part of revenue-generating operations. The majority of purchased insurance is for revenue-generating facilities, debt-financed facilities and mandated coverage to meet statutory or contractual requirements.

Additionally, the SFPUC acknowledges the importance of aligning strategic planning to the risk management process and has implemented an Enterprise Risk Management (“ERM”) program to meet this need. The framework provides a strategic approach to managing operational risks. The ERM program has been implemented thus far for the Power Enterprise and CleanPowerSF and plans are in place to continue implementation across the remainder of the SFPUC as needed.

Capital Project Risk Management. For capital construction projects, the SFPUC has utilized traditional contractual risk transfer, contractor-controlled insurance programs or other alternative insurance programs. Under the latter two approaches, the insurance program usually provides coverage for the entire construction project, along with multiple risk coverages, such as general liability and workers compensation. When a contractual risk transfer is used for capital construction risks, the SFPUC requires each contractor to provide its own insurance, while ensuring that the full scope of work be covered with satisfactory levels to limit the SFPUC’s risk exposure balanced by that which is commercially available.

Performance bonds are required, and Builder’s Risk insurance must be purchased, in most phases of the construction contracting process for such phases, as bid, performance, and payment or maintenance. Additionally, bonds may be required in other contracts where goods or services are provided to ensure compliance with applicable terms and conditions such as warranty.

Professional liability policies are either directly purchased insurance on behalf of the SFPUC, transferred through contract to the contracted professional, or retained through self-insurance on a case by case basis depending on the size, complexity or scope of construction or professional service contracts. Professional liability policies are typically purchased for services provided by engineers, architects, design professionals and other licensed or certified professional service providers.

Builder’s Risk policies of insurance are required to be provided either through an owner-controlled insurance program or the contractor on all construction projects for the full value of the construction.

HISTORICAL OPERATING RESULTS

The historical results of operations reflected in the following table are based on the tables contained in the Financial Statements entitled “Statements of Revenues, Expenses and Changes in Net Position” and “Statements of Cash Flows” for the Fiscal Years listed. This table excludes certain non-operating revenue and expenses included in the “Statements of Revenues, Expenses and Changes in Net Position” table. Consequently, “Operating and Investment Income” presented in this table differs from “Change in net position” in the “Statements of Revenues, Expenses and Changes in Net Position” table. The calculation of debt service coverage includes net operating income and funds not budgeted to be spent in the next twelve months and legally available to pay debt service, as permitted under the Indenture. The audited financial statements of the Water Enterprise for Fiscal Years 2018-19 and 2017-18, prepared by the SFPUC and audited by KPMG LLP, independent certified public accountants, are attached as APPENDIX C to this Official Statement. The following table should be read in conjunction with such financial statements. KPMG LLP has not reviewed the following table. See “APPENDIX C – SFPUC WATER ENTERPRISE FINANCIAL STATEMENTS.”

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TABLE 26
HISTORICAL REVENUES, OPERATING & MAINTENANCE EXPENSES
AND DEBT SERVICE COVERAGE
FOR FISCAL YEARS ENDED JUNE 30
(IN THOUSANDS)⁽¹⁾

	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>
OPERATING & INVESTMENT REVENUE					
Charges for Services ⁽²⁾					
Retail Water Sales	\$189,413	\$205,482	\$225,705	\$248,136	\$261,913
Wholesale Water Sales	210,610	188,100	212,502	247,002	247,790
Subtotal – Water Sales	<u>\$400,023</u>	<u>\$393,582</u>	<u>\$438,207</u>	<u>\$495,138</u>	<u>\$509,703</u>
Rental Income ⁽³⁾	12,284	12,081	8,813	12,906	13,010
Other Revenues	11,908	11,766	11,879	15,875	17,310
Capacity Fees ⁽⁴⁾	1,832	2,087	1,432	1,720	2,368
Investing Activities ⁽⁵⁾	5,789	3,595	4,331	6,448	15,650
Total Revenues	<u>\$431,836</u>	<u>\$423,111</u>	<u>\$464,662</u>	<u>\$532,087</u>	<u>\$558,041</u>
OPERATING & MAINTENANCE EXPENSE					
Personnel Services ⁽⁶⁾	\$99,192	\$103,027	\$182,034	\$128,295	\$111,594
Contractual Services	12,729	13,451	10,664	14,131	13,715
Materials and Supplies	12,667	12,896	12,564	15,936	13,421
Depreciation ⁽⁷⁾	95,384	106,666	118,826	118,751	120,815
Services of Other Departments ⁽⁸⁾	60,365	60,868	59,173	56,860	59,751
General/Administrative & Other ⁽⁹⁾	16,613	17,878	38,566	36,174	37,798
Total Operating Expenses	<u>\$296,950</u>	<u>\$314,786</u>	<u>\$421,827</u>	<u>\$370,147</u>	<u>\$357,094</u>
OPERATING AND INVESTMENT INCOME	\$134,886	\$108,325	\$42,835	\$161,940	\$200,947
COVERAGE CALCULATION					
Operating and Investment Income	\$134,886	\$108,325	\$42,835	\$161,940	\$200,947
+Adjustment to Investing Activities ⁽¹⁰⁾	732	635	111	(1,245)	(4,821)
+Depreciation & Non-Cash Expenses	98,192	107,268	121,375	119,624	122,248
+Changes in Working Capital ⁽¹¹⁾	(37,175)	(11,062)	63,520	31,060	(11,073)
+Appropriated Fund Balance ⁽¹²⁾	-	23,994	10,747	1,452	4,318
= “Net Revenue” ⁽¹³⁾⁽¹⁴⁾	<u>\$196,635</u>	<u>\$229,160</u>	<u>\$238,588</u>	<u>\$312,831</u>	<u>\$311,619</u>
+Other Available Funds ⁽¹⁵⁾	248,390	162,733	155,852	186,752	221,362
Funds Available for Debt Service	<u>\$445,025</u>	<u>\$391,893</u>	<u>\$394,440</u>	<u>\$499,583</u>	<u>\$532,981</u>
Bond Debt Service ⁽¹⁴⁾	\$192,312	\$219,195	\$207,812	\$233,959	\$261,638
Debt Service Coverage⁽¹⁶⁾					
Including “Other Available Funds” ⁽¹⁴⁾	2.31x	1.79x	1.90x	2.14x	2.04x
Current Basis ⁽¹⁴⁾⁽¹⁷⁾	1.02x	1.05x	1.15x	1.34x	1.19x

(1) Operating and Investment Income presented in this table differs from the Change in Net Assets presented in the Statement of Revenues, Expenses and Changes in Net Assets in the Audited Financial Statements. See “APPENDIX C – SFPUC WATER ENTERPRISE FINANCIAL STATEMENTS.” This table excludes certain elements of non-operating revenue and expenses included in the Statements of Revenues, Expenses and Changes in Net Position. Examples of excluded elements are Grant Revenue, Interest Expense and Gains from Sale of Assets.

(2) Increase in Fiscal Year 2017-18 resulting from rate increases of 7.0% for retail customers beginning July 1, 2017, and increased consumption of 11% by whole sale customers and 3% by retail customers. Increase in Fiscal Year 2018-19 resulting mainly from rate increases of 9.0% for retail customers beginning July 1, 2018 offset by 2.8% decrease in consumption.

(3) Decrease in Fiscal Year 2016-17 mainly due to write-offs of rental receivables from SFPUC properties.

- (4) Decrease in Fiscal Year 2016-17 due to write-offs coupled with a reduction in permits issued. Increase in Fiscal Year 2017-18 due to an increase in allowance for doubtful accounts. Increase in Fiscal Year 2018-19 due to average 41% rate increase for Capacity Fees.
- (5) Interest and investment income increase in Fiscal Year 2017-18 and Fiscal Year 2018-19 due to higher interest rates.
- (6) Increase in Fiscal Year 2016-17 mainly due to increase in pension costs. Decrease in Fiscal Year 2017-18 mainly due to actual investment earnings in the 2017 measurement year which decreased total pension liability. Decrease in Fiscal Year 2018-19 due to Pension and OPEB in 2018 measurement year based on actuarial reports.
- (7) Increase due to increase in building and structure depreciation.
- (8) Decrease in Fiscal Year 2017-18 attributable to a reduction in water assessment fees paid to Hetchy Water.
- (9) Increase in Fiscal Year 2016-17 primarily due to decrease in capitalization of expenses.
- (10) Represents adjustments to show investing activities on a cash basis.
- (11) Fiscal Year 2016-17, Fiscal Year 2017-18 and Fiscal Year 2018-19 adjustments primarily relating to pension obligations adjusted on a cash basis. See (6) above. See "APPENDIX C – SFPUC WATER ENTERPRISE FINANCIAL STATEMENTS – Statements of Cash Flows."
- (12) The SFPUC budgeted and appropriated \$10.7 million of available fund balances to be used as a source of funds in Fiscal Year 2016-17. Such amount offsets Operating and Maintenance Expenses in Current Basis calculations.
- (13) "Net Revenue" is presented on a cash basis.
- (14) Partial BABs Subsidy Payments actually received by the SFPUC are reflected as reductions in Bond Debt Service and are excluded from Net Revenue. Due to Federal sequestration, the Indenture requires that such partial payments not be reflected as reductions in Bond Debt Service but rather permits an adjustment to Net Revenue. See "SECURITY FOR THE BONDS – Rate Covenants – Debt Service Coverage".
- (15) Per Indenture, in addition to current year cash flow, coverage calculation includes certain "Other Available Funds," which are not budgeted to be spent in such twelve months and legally available to pay debt service. See "SECURITY FOR THE BONDS" and "APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE." See also "FINANCIAL OPERATIONS – Wholesale Water Sales Revenue – Capital Cost Recovery Prepayment."
- (16) Coverage does not include debt service on subordinate obligations, including the Water Enterprise's share of lease payments associated with the 2009 Golden Gate COPs and debt service on Commercial Paper Notes.
- (17) Unaudited. Calculated as ratio between Net Revenues over debt service on all senior lien obligations; excludes "Other Available Funds."

Source: SFPUC, Financial Services.

PROJECTED OPERATING RESULTS

The following table presents projected operating results for the Water Enterprise. These projections are based on an analysis of historic trends, adjusted where appropriate for known or anticipated changes in operations. The projections are also based on the assumption that all retail water rate increases necessary to finance the WSIP and the Water Enterprise's non-WSIP capital improvement program will be approved and implemented. The projections in the following Table 27 are budget based. Therefore, line items in Table 27 will not correspond to similar line items in Table 26, which is based upon the SFPUC's GAAP financial statements for the Water Enterprise.

THESE PROJECTIONS, ALL OR SOME OF WHICH MAY OR MAY NOT BE REALIZED, ARE BASED ON THE ISSUANCE OF ADDITIONAL SERIES OF BONDS FOR THE REMAINDER OF WSIP, AS WELL AS NON-WSIP CAPITAL PROJECTS AND HETCH HETCHY PROJECTS AS CURRENTLY PROPOSED. CHANGES IN THE CIRCUMSTANCES THAT FORM THE BASES FOR THE ASSUMPTIONS USED IN DEVELOPING THESE PROJECTIONS, AS WELL AS UNANTICIPATED EVENTS, MAY OCCUR SUBSEQUENT TO THE DATE OF THE OFFICIAL STATEMENT. THEREFORE, ACTUAL RESULTS MAY DIFFER MATERIALLY FROM THE PROJECTIONS SHOWN.

TABLE 27
PROJECTED REVENUES, OPERATING & MAINTENANCE EXPENSES
AND DEBT SERVICE COVERAGE
FOR FISCAL YEAR ENDING JUNE 30
(IN THOUSANDS)

	2020	2021	2022	2023	2024
CURRENT REVENUE					
Retail Revenues ⁽¹⁾	\$253,449	\$272,056	\$293,385	\$314,924	\$338,358
Retail Water Sales Rate Adjustments ⁽²⁾	19,769	22,581	22,884	24,879	16,918
Wholesale Revenues ⁽³⁾	258,568	257,369	255,416	254,160	249,715
Wholesale Water Sales Rate Adjustments ⁽⁴⁾	0	0	0	0	37,762
Other Miscellaneous Income ⁽⁵⁾	33,009	33,367	33,463	33,755	34,180
Total Current Revenues*	<u>\$564,794</u>	<u>\$585,374</u>	<u>\$605,148</u>	<u>\$627,718</u>	<u>\$676,933</u>
OPERATING AND MAINTENANCE EXPENSE⁽⁶⁾	\$ 258,749	\$ 265,968	\$ 273,831	\$ 281,217	\$ 286,749
less FUND BALANCES BUDGETED & APPROPRIATED⁽⁷⁾	<u>(4,318)</u>	<u>(11,107)</u>	<u>0</u>	<u>0</u>	<u>0</u>
NET OPERATING REVENUE⁽⁸⁾	<u>\$ 310,364</u>	<u>\$ 330,513</u>	<u>\$ 331,317</u>	<u>\$ 346,501</u>	<u>\$ 390,184</u>
plus AVAILABLE FUND BALANCE⁽⁹⁾	<u>238,629</u>	<u>205,788</u>	<u>195,749</u>	<u>179,381</u>	<u>163,720</u>
FUNDS AVAILABLE FOR DEBT SERVICE[†]	<u>\$ 548,993</u>	<u>\$ 536,301</u>	<u>\$ 527,066</u>	<u>\$ 525,883</u>	<u>\$ 553,904</u>
DEBT SERVICE⁽⁸⁾⁽¹⁰⁾	\$ 261,588	\$ 284,353	\$ 298,820	\$ 310,230	\$ 329,881
DEBT SERVICE COVERAGE⁽¹¹⁾					
Indenture Basis ⁽⁸⁾⁽¹²⁾	2.10x	1.89x	1.76x	1.70x	1.68x
Sufficiency of Revenues ⁽⁸⁾⁽¹³⁾	1.19x	1.16x	1.11x	1.12x	1.18x

* Totals may not add due to independent rounding.

(1) Assumes projected average daily billed consumption of 59.7 mgd for Fiscal Year 2019-20 and a projected decrease of 0.5% annually through Fiscal Year 2023-24. Fiscal Year 2018-19 actuals were 59.5 mgd. See “THE WATER ENTERPRISE – Historic Water Sales and Top Customers.”

(2) Includes average annual rate increases of 8.3% approved for Fiscal Year 2019-20, 7.8% approved for Fiscal Year 2020-21 and 7.9% approved for Fiscal Year 2021-22, and assumes a projected increase of 5.0% for Fiscal Years 2022-23 and 2023-24. See “FINANCIAL OPERATIONS – Retail Water Sales Revenue.”

(3) Assumes projected average daily billed consumption of 126.2 mgd for Fiscal Year 2019-20 and a projected decrease of 0.5% annually through Fiscal Year 2023-24. Fiscal Year 2018-19 actuals were 125.0 mgd. See “THE WATER ENTERPRISE – Historic Water Sales and Top Customers.”

(4) Assumes no rate increases in Fiscal Years 2019-20 through 2021-22 and projected rate increases of 15.1% in Fiscal Year 2022-23 and 8.3% in Fiscal Year 2023-24. See “FINANCIAL OPERATIONS – Wholesale Water Sales Revenue.”

(5) Includes, among other amounts, projected interest income, property rentals, fees, cost recoveries, and service installation charges.

(6) Represents Operating and Maintenance Expense net of depreciation and other non-cash items per Indenture. See “SECURITY FOR THE BONDS” and “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE.”

(7) The SFPUC budgeted and appropriated \$11.107 million of available fund balances to be used as a source of funds in Fiscal Year 2019-20. Such amount offsets Operating and Maintenance Expenses in sufficiency of Revenues calculations. See “– Management Discussion of Projections.”

(8) Assumes Amendment Effective Date is the date of issuance of the 2019 Series ABC Bonds. BABs Subsidy Payments are treated as a reduction in projected Debt Service and are not included in projected Net Revenues. BABs Subsidy Payments expected to be received assume the continuation of 6.2% sequestration rate effective October 1, 2019. Sequestration rates are subject to change and may be increased by federal legislation.

(9) Amounts are treated as Revenues under the Indenture. See “SECURITY FOR THE BONDS.”

(10) Debt Service on Outstanding Bonds, net of capitalized interest. Does not reflect the issuance of the 2019 Series ABC Bonds or the refunding of the Refunding Bonds. Assumes future issuance of Additional Series of Bonds of approximately \$200 million in Fiscal Year 2019-20.

(11) Coverage does not include debt service on subordinate obligations, including the Water Enterprise’s share of lease payments associated with the 2009 Golden Gate COPs and debt service on Commercial Paper Notes or Revolving Notes.

(12) Calculated as the sum of Net Operating Revenue and certain available fund balances of the Water Enterprise, divided by Annual Debt Service. The Indenture includes a rate covenant of 1.25 times coverage. See “SECURITY FOR THE BONDS – Rate Covenants – Debt Service Coverage.”

(13) Calculated as ratio between Net Operating Revenue over debt service on all senior lien obligations; excludes “Available Fund Balance.”

Note: Amounts set forth in the table are projections. Actual results may differ materially from these projections. See “FORWARD LOOKING STATEMENTS” above.

Source: SFPUC, Financial Services.

In the preparation of the projections set forth in the table above, the SFPUC has made certain assumptions with respect to conditions that may occur in the future. While the SFPUC believes these assumptions are reasonable for the purpose of the projections, they are dependent on future events, and actual conditions are likely to differ, perhaps materially, from those assumed. To the extent actual future conditions differ from those assumed by the SFPUC or provided to the SFPUC by others, actual results will vary from those projected. This projected information has not been compiled, reviewed or examined by the SFPUC’s independent accountants.

The assumptions used in the table above are as follows:

Projected Revenue Assumptions.

The projected revenues are based on projected water sales and the schedules of rates to be effective in each year. In April 2018, the SFPUC adopted schedules of water rates for Retail Customers to be effective in each of the Fiscal Years 2018-19 through 2021-22. The adopted schedules provided for a 7.0% rate increase in Fiscal Years 2020-21 and 2021-22. See “FINANCIAL OPERATIONS – Retail Water Sales Revenue.” The projections assume a further retail rate increase of 5.0% for Fiscal Years 2022-23 and 2023-24.

Projected retail rate increases are based on an interim version of the Water Enterprise’s Ten-Year Financial Plan. Consequently, actual retail rate increases for Fiscal Years 2022-23 and 2023-24 may be lower or higher.

Revenues from sales of water to the Wholesale Customers are calculated in accordance with the WSA. The adopted rate schedule includes no rate increase in Fiscal Year 2019-20. Projections assume no wholesale rate increases through Fiscal Year 2021-22, a 15.1% increase in Fiscal Year 2022-23 and a 8.3% increase in Fiscal Year 2023-24.

Water volume sales to the Wholesale Customers and Retail Customers are projected to decrease 0.5% annually from Fiscal Years 2019-20 through 2023-24.

Interest earnings assume average annual yields of 2.5% throughout the projected period.

“Available Fund Balance” is assumed to be available and treated as “Revenues” for purposes of “Debt Service Coverage – Indenture Basis.”

BABs Subsidy Payments are included in projected Net Operating Revenue and are not reflected as reductions in projected Debt Service. See also “SECURITY FOR THE BONDS – Rate Covenants – Debt Service Coverage.”

Projected Operating Expense Assumptions.

The SFPUC has adopted an operating budget through Fiscal Year 2019-20. Operating and Maintenance Expenses are projected to grow at approximately 3% per year thereafter through Fiscal Year 2023-24.

Projected Debt Service Assumptions.

Projected debt service reflects projected Annual Debt Service on Outstanding Bonds and anticipated Additional Series of Bonds (net of capitalized interest and debt service reserve fund earnings). Assumptions include no reserve account and up to three years of capitalized interest for all future issuances of Additional Series of Bonds. Projected debt service does not reflect an offset for Refundable Credits to reduce the amount of interest used in calculating Annual Debt Service. See “SECURITY FOR THE BONDS” and “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE.” Issuances of Additional Series of Bonds are at an assumed 5%

borrowing rate. Actual issuance dates, borrowing rates and capitalized interest periods for Additional Series of Bonds may vary. The SFPUC may issue additional refunding bonds from time to time in response to market conditions in order to achieve debt service savings. See “FINANCING OF CAPITAL IMPROVEMENTS.”

Management Discussion of Projections

The SFPUC’s financial plans and projections forecast a 0.5% decline in water sales from Fiscal Year 2019-20; in the event that water sales increase from the historic lows achieved since the drought, it will result in a positive revenue variance from projections. Any Wholesale Customer revenue variance is recaptured in future years through the Wholesale Revenue Requirement recovery mechanism set forth in the Water Supply Agreement. See “FINANCIAL OPERATIONS – Wholesale Water Sales Revenues.” Should another drought occur, resulting in lower than forecast demand and sales, the SFPUC will manage revenues and expenditures so as to comply with Indenture based rate covenants, as well as meet its Debt Service Coverage Policy and its Fund Balance Reserve Policy targets. In addition, the April 2018 approved retail water rates and charges for the four-year period effective July 1, 2018, include a new drought surcharge. See “FINANCIAL OPERATIONS – Retail Water Sales Revenue.”

See “SECURITY FOR THE BONDS – Rate Covenants” and “FINANCIAL OPERATIONS – Retail Water Sales Revenue” and “– Financial Management Policies.”

RISK FACTORS

This section provides a general overview of certain risk factors which should be considered, in addition to the other matters set forth in this Official Statement, in evaluating an investment in the 2019 Series ABC Bonds. This section is provided for convenience and is not meant to be a comprehensive or definitive discussion of all of the risks associated with an investment in the 2019 Series ABC Bonds. The order in which this information is presented does not necessarily reflect the relative importance of various risks or the probability of their occurrence.

Potential investors in the 2019 Series ABC Bonds are advised to consider the following factors, among others, and to review this entire Official Statement to obtain information essential to the making of an informed investment decision. Any one or more of the risk factors discussed below, among others, could lead to a decrease in the market price and/or in the marketability of the 2019 Series ABC Bonds or adversely affect the ability of the SFPUC to make timely payments of principal of or interest on the 2019 Series ABC Bonds. There can be no assurance that other risk factors not discussed herein will not become material and the SFPUC has not undertaken to update investors about the emergence of the risk factors in the future.

General

The ability of the SFPUC to comply with its covenants under the Indenture and to generate Revenues sufficient to pay principal of and interest on the Bonds may be adversely affected by actions and events outside of the control of the SFPUC and may be adversely affected by actions taken (or not taken) by voters, property owners, taxpayers or persons obligated to pay fees and charges. Among other matters, drought, general and local economic conditions and changes in law and government regulations could adversely affect the amount of Revenues realized by the SFPUC or significantly raise the cost of operating the Water Enterprise.

In addition, the realization of future Revenues is subject to, among other things, the capabilities of management of the SFPUC, the ability of the SFPUC to provide service to its Retail Customers and the Wholesale Customers, the ability of the SFPUC to establish, maintain and collect charges from its Retail Customers and the Wholesale Customers and the ability of the SFPUC to establish, maintain and collect rates and charges sufficient to pay for Operation and Maintenance Costs of the Enterprise, the Bonds and other obligations payable from Revenues. See “FINANCIAL OPERATIONS” and “OBLIGATIONS PAYABLE FROM REVENUES.”

Limited Obligation

If the SFPUC defaults on its obligations to make debt service payments on the Bonds, the Trustee has the right under the Indenture to accelerate the total unpaid principal amount of the Bonds. However, in the event of a

default and such acceleration, there can be no assurance that the SFPUC, and correspondingly the Trustee, will have sufficient moneys available for payment of the Bonds.

The SFPUC is not obligated to pay the principal of, or premium, if any, or interest on the 2019 Series ABC Bonds except from Revenues of the Water Enterprise. The SFPUC has no taxing power. The General Fund of the City is not liable for the payment of the principal of, or premium, if any, or interest on the 2019 Series ABC Bonds, and neither the credit nor the taxing power of the City is pledged to the payment of the principal of, or premium, if any, or interest on the 2019 Series ABC Bonds. The 2019 Series ABC Bonds are not secured by a legal or equitable pledge of, or charge, lien or encumbrance upon, any property of the City or of the SFPUC or any of its income or receipts, except Revenues.

No Bond Reserve Account

No Bond Reserve Account has been established for the 2019 Series ABC Bonds. The Bond Reserve Accounts established with respect to other Series of Bonds do not secure the 2019 Series ABC Bonds. Therefore, the only security pledged to the holders of the 2019 Series ABC Bonds are the Revenues pledged under the Indenture and the covenant of the SFPUC to impose rates and charges necessary to pay debt service on the 2019 Series ABC Bonds.

Risks Related to Water Enterprise Facilities and Operations

The operation of the Water Enterprise, and the physical condition of the Water Enterprise facilities, are subject to a number of risk factors that could adversely affect the reliability of the SFPUC's water supply, or increase the operating expenses of the Water Enterprise. Prolonged damage to the Water Enterprise facilities could interrupt the ability of the SFPUC to realize Revenues sufficient to pay principal of and interest on the Bonds, or require the SFPUC to increase expenditures for repairs significantly enough to adversely impact the SFPUC's ability to pay the principal of or interest on the Bonds. These factors could include, among others, the following.

Failure of Water Facilities. Many of the Water Enterprise's facilities have been in service for an extended period and may have reached the end of their useful lives. See "WATER FACILITIES – Physical Condition of Facilities" and "CAPITAL IMPROVEMENT PROGRAM."

Seismic Hazards. The Water Enterprise's distribution, treatment and transmission systems and some of the facilities of the Hetch Hetchy Project are located in seismically active regions of the State, and cross three major known active fault zones (the San Andreas Fault, the Hayward fault and the Calaveras Fault). See "WATER FACILITIES – Seismic Hazards."

Other Natural and Man-Made Disasters. Other natural disasters, including without limitation, wildfires, flooding, landslides, or man-made disasters or accidents, including without limitation water pipeline failures, natural gas pipeline failures or explosions, could interrupt operation of the Hetch Hetchy Project or the Regional Water System, result in liability claims against the Water Enterprise, or otherwise adversely impact the Water Enterprise's ability to provide services or collect Revenues. See "WATER FACILITIES – Wildfire Considerations."

Casualty Losses. The SFPUC's risk management program includes both self-insured and insured coverages; however, the program does not provide coverage for every conceivable risk of loss. Damage attributable to seismic events and environmental pollution are excluded. In situations where the SFPUC has not purchased commercial coverage, the Water Enterprise has a 'self-retention' program that it administers and retains budgeted resources internally to provide coverage for loss liabilities. See also "FINANCIAL OPERATIONS – Risk Management and Insurance." The SFPUC is not required to either insure against or self-insure against every potential risk of loss, and there is a risk that damage or destruction of property and equipment comprising the Water Enterprise could occur for which no insurance or self-insurance funds will be available. There can be no assurance that insurance providers will pay claims under any policies promptly, or at all, should a claim be made under such policies in connection with property loss or damage. It is possible that an insurance provider will refuse to pay a claim, especially if it is substantial, and force the SFPUC to sue to collect on or settle the insurance claim. Further,

there can be no assurances that any insurance proceeds will be sufficient to rebuild or replace any damaged property. The SFPUC is authorized under the WSA to adopt emergency rate increases which helps to mitigate this risk.

Drought. The State is located in a semi-arid region and is subject to periodic drought. An extended drought could adversely affect the ability of the SFPUC to deliver water sufficient to satisfy all of the demands of its customers. If the SFPUC were to deliver less water to its customers, the SFPUC would need to increase the rates payable by customers or Revenues would decline. The SFPUC may also seek to acquire, and would be obligated to pay the cost of, additional water to deliver to its customers. The SFPUC has adopted a drought planning sequence and associated operating procedures respecting the delivery of water during a drought. The SFPUC is authorized under the WSA to adopt drought surcharges if needed. In addition, retail water rates and charges for the four-year period effective July 1, 2018, include a new drought surcharge. See “FINANCIAL OPERATIONS – Retail Water Sales Revenue – Retail Water Rate Adjustments.” See also “THE WATER ENTERPRISE – Water Supply Reliability and Drought Planning.” For a discussion of the 2012-2015 California drought, see “THE WATER ENTERPRISE – Recent Drought; Current Water Conditions.”

Wet Years. Precipitation within the Water Enterprise service area varies from year to year. High levels of precipitation generally results in reduced water usage for irrigation, reducing the amount of water delivered by the SFPUC. If the SFPUC were to deliver less water to its customers, the SFPUC would need to increase the rates payable by customers or Revenues would decline. High levels of precipitation may also increase the supply of water available to Wholesale Customers, also reducing SFPUC water deliveries.

Safety and Security. The occurrence of military conflicts and terrorist activities could adversely impact the operations of the Water System or the finances of the SFPUC. The SFPUC continually plans and prepares for emergency situations. See “WATER FACILITIES – Safety and Security.” However, there can be no assurance that any existing or additional safety and security measures will prove adequate in the event that military conflicts or terrorist activities are directed against the assets of the Water Enterprise or that costs of security measures will not be greater than presently anticipated.

Statutory and Regulatory Compliance. The operation of the Water Enterprise is subject to a variety of federal and State statutory and regulatory requirements concerning matters such as water quality, dam safety, instream fishery flows and endangered species. The SFPUC’s failure to comply with applicable laws and regulations could result in significant fines and penalties. In addition to claims by private parties, changes in the scope and standards for public agency water systems such as the Water Enterprise may also lead to administrative orders issued by federal or State regulators. Future compliance with such orders could also impose substantial additional operating expenses on the Water Enterprise. See “REGULATORY MATTERS.”

Endangered Species. Various aquatic species (including native fish) present in the Tuolumne River and Bay Area streams (e.g., Alameda, San Mateo and Pilarcitos Creeks) are either listed or candidates for listing under the State or federal endangered species acts. New listings and future enforcement actions under the acts, or conditions placed in permits to undertake construction for certain projects, could potentially directly affect water flow and/or water supplies available to the Water Enterprise and/or increase costs due to mitigation requirements. See “REGULATORY MATTERS – Endangered Species.”

Labor Actions. The Charter prohibits SFPUC and other City employees from engaging in certain labor actions (e.g. strikes). Nonetheless, a labor action could limit the SFPUC’s ability to operate the Water Facilities and adversely impact Revenues.

Proposals to Dismantle Hetch Hetchy Reservoir. Various environmental advocates have from time to time proposed the dismantling of O’Shaughnessy Dam with the aim of draining Hetch Hetchy reservoir and restoring the Hetch Hetchy Valley, most recently through a lawsuit filed in April 2015 in Tuolumne County Superior Court. Any such litigation, if successful, could impose substantial additional operating and capital expenses on the Water Enterprise. See “THE WATER ENTERPRISE – Proposals to Restore Hetch Hetchy Valley.”

Cybersecurity

City Measures. The City, like many other large public and private entities, relies on a large and complex technology environment to conduct its operations, and faces multiple cybersecurity threats including, but not limited to, hacking, viruses, malware and other attacks on its computing and other digital networks and systems (collectively, “**Systems Technology**”). As a recipient and provider of personal, private, or sensitive information, the City has been the subject of cybersecurity incidents that have resulted in or could have resulted in adverse consequences to the City’s Systems Technology and that required a response action to mitigate the consequences.

Cybersecurity incidents could result from unintentional events, or from deliberate attacks by unauthorized entities or individuals attempting to gain access to the City’s Systems Technology for the purposes of misappropriating assets or information or causing operational disruption and damage. To mitigate the risk of business operations impact and/or damage from cybersecurity incidents or cyber-attacks, the City invests in multiple forms of cybersecurity and operational safeguards. In November 2016, the City adopted a City-wide Cyber Security Policy (the “**City Cyber Policy**”) to support, maintain, and secure critical infrastructure and data systems. The objectives of the City Cyber Policy include the protection of critical infrastructure and information, manage risk, improve cyber security event detection and remediation, and facilitate cyber awareness across all City departments. The City’s Department of Technology has established a cybersecurity team to work across all City departments, including the SFPUC, to implement the City Cyber Policy. The City Cyber Policy is reviewed periodically.

The City has also appointed a City Chief Information Security Officer (the “**CCISO**”), who is directly responsible for understanding the business and related cybersecurity needs of the City’s 54 departments, including the SFPUC. The CCISO is responsible for identifying, evaluating, responding, and reporting on information security risks in a manner that meets compliance and regulatory requirements, and aligns with and supports the risk posture of the City.

SFPUC Measures. The SFPUC also relies on a large and complex technology environment to conduct its operations. Although the SFPUC maintains its own business and control networks that are separate from the City’s network, the SFPUC faces similar cybersecurity threats as the City, including hacking, viruses, malware and other attacks on its computing and other digital networks and systems. To mitigate the risk of and damage from cybersecurity incidences or cyberattacks, the SFPUC abides by the City Cyber Policy and also maintains its own information security program (the “**SFPUC Information Security Program**”). The SFPUC Information Security Program is based on National Institute of Standards and Technology cybersecurity guidance and employs industry standard Center for Internet Security critical security controls. In addition, control networks for the Water Enterprise and the Wastewater Enterprise adhere to the American Water Works Association Cyber Security guidance and the control networks for the Power Enterprise adhere to the North American Electric Reliability Corporation critical infrastructure protection controls. The SFPUC Information Security Program includes state of the art information security systems and 14 cybersecurity policies. The information security systems are continuously tested with internal vulnerability assessments that include daily updates on malware threats. The SFPUC’s cybersecurity policies are prescriptive for hardening servers, network devices and databases, and for addressing system administrator controls, mobile device management, incident response, security patching, antivirus, email, passwords, remote access, secure asset disposal, end user controls, and timely removal of access to systems and facilities for staff that leave employment at the SFPUC. The SFPUC Information Security Program is periodically reviewed for effectiveness by independent consultants, most recently in July 2019. In addition, pursuant to the SFPUC’s policies, the City Services Auditor, independent cybersecurity auditors and the Department of Homeland Security perform extensive penetration and vulnerability testing on the SFPUC’s business and control networks every other year.

The SFPUC has also appointed a Chief Information Security Officer (the “**CISO**”). In addition to working with the CCISO on information security policy development and solution sharing, the CISO is responsible for annual updates to the SFPUC’s policies, is charged with identifying and monitoring threats which are typically addressed by the SFPUC’s information technology services team, educating staff concerning vulnerabilities and constantly improving the SFPUC Information Security Program.

While the SFPUC Information Security Program is periodically reviewed, no assurances can be given by the SFPUC that such measures will ensure against other cybersecurity threats and attacks. Cybersecurity breaches could damage the SFPUC’s information security systems and cause material disruption to the SFPUC’s operations

and the provision of SFPUC services. The costs of remedying any such damage or protecting against future attacks could be substantial. Further, cybersecurity breaches could expose the SFPUC to material litigation and other legal risks, which could cause the SFPUC to incur material costs related to such legal claims or proceedings. The SFPUC does not presently purchase liability insurance covering cyber-losses and does not require its vendors to purchase technology errors and omissions insurance coverage.

Construction Related Risks

Construction projects for the Water Enterprise are subject to ordinary construction risks and delays applicable to projects of their kind, including but not limited to (i) inclement weather affecting contractor performance and timeliness of completion, which could affect the costs and availability of, or delivery schedule for, equipment, components, materials, labor or subcontractors; (ii) contractor claims or nonperformance; (iii) failure of contractors to execute within contract price; (iv) work stoppages or slowdowns; (v) failure of contractors to meet schedule terms; (vi) errors or omissions in contract documents requiring change orders; (vii) the occurrence of a major seismic event; or (viii) unanticipated project site conditions, including the discovery of hazardous materials on the site or other issues regarding compliance with applicable environmental standards, and other natural hazards or seismic events encountered during construction. In addition, Water Enterprise construction projects may require scheduling system shutdowns to avoid impacting water deliveries and many shutdown windows are inflexible. Increased construction costs or delays could impact the Water Enterprise's financial condition in general and the implementation of its capital programs in particular. Construction bids may also be higher than anticipated for budgeting purposes.

Limitations on Rate-Setting

The generation of Revenues sufficient to satisfy the requirements of the Indenture and to pay the principal of and interest on the Bonds will require the SFPUC to raise the water rates payable by its customers. The increase or maintenance of retail water rates is subject to various substantive and procedural requirements and limitations. See "FINANCIAL OPERATIONS – Retail Water Sales Revenue" and "CONSTITUTIONAL, STATUTORY AND CHARTER LIMITATIONS."

Water rates payable by the Wholesale Customers are established under the WSA, which will help reduce the risk that Revenues will be insufficient for the purposes described in this section. Rates established pursuant to the WSA are subject to the substantive requirements and the procedures, including procedures for resolving disputes, of applicable law and as set forth in the WSA. The WSA also provides for rate adjustments for drought and non-drought emergencies if needed. See "FINANCIAL OPERATIONS – Wholesale Water Sales Revenue" and "APPENDIX B – SUMMARY OF CERTAIN PROVISIONS OF THE WATER SUPPLY AGREEMENT."

Initiative, Referendum, Charter Amendments and Future Legislation

Under the State Constitution, the voters of the State have the ability to initiate legislation and require a public vote on legislation passed by the State Legislature through the powers of initiative and referendum, respectively. The SFPUC is unable to predict whether any such initiatives might be submitted to or approved by the voters, the nature of such initiatives, or their potential impact on the SFPUC or the Water Enterprise. See "CONSTITUTIONAL, STATUTORY AND CHARTER LIMITATIONS."

Under the Charter, the voters of the City can restrict or revise the powers of the SFPUC through the approval of a Charter amendment or other initiative. For example, in June 1998, the electorate of the City approved Proposition H which, subject to certain exceptions, including a limited exception to raise rates to pay debt service on voter-approved debt, froze the SFPUC's water and sewer rates through July 1, 2006. The SFPUC can give no assurance that the electorate will not seek in the future to freeze or limit rate increases. See "CONSTITUTIONAL, STATUTORY AND CHARTER LIMITATIONS – Charter Limitations."

In addition, the SFPUC is subject to various laws, rules and regulations adopted by the local, State and federal governments and their agencies. The SFPUC is unable to predict the adoption or amendment of any such laws, rules or regulations, or their effect on the operations or financial condition of the SFPUC.

Increased Operating and Maintenance Expenses

There can be no assurance that the Operating and Maintenance expenses of the SFPUC, such as wages and salaries, pension and other benefits, and purchased power costs, will not increase, perhaps substantially. See “FINANCIAL OPERATIONS – Operating and Maintenance Expenses.”

Interim Funding Program Facilities

Commercial Paper Notes. The bank credit facilities supporting the Commercial Paper Notes are subject to early termination upon the occurrence of certain events, including the failure of the SFPUC to make certain payments, the occurrence of certain bankruptcy or insolvency-related events, the reduction below specified levels or the withdrawal or suspension of ratings on certain obligations of the SFPUC payable from Revenues or certain other specified events of default. Upon the occurrence of such termination, one or more of the following would likely occur: (a) the SFPUC would be prohibited from issuing additional notes supported by such credit facilities; (b) any outstanding reimbursement obligation of the SFPUC to the bank providing such facility for draws made for the payment of principal of or interest on Commercial Paper Notes could bear interest at rates higher than the rates borne by the Commercial Paper Notes; and (c) any such outstanding reimbursement obligation of the SFPUC could be accelerated and become immediately due and payable. The Commercial Paper Notes and any reimbursement obligations are payable from Revenues on a basis subordinate to the Bonds.

Revolving Notes. The commitment of the bank to make advances under the revolving credit agreement for interim funding (the repayment obligation of the SFPUC for which are evidenced by the Revolving Notes) may be terminated by the bank upon the occurrence of certain events, including the failure of the SFPUC to make certain payments, the occurrence of certain bankruptcy or insolvency-related events, the reduction below specified levels or the withdrawal or suspension of ratings on certain obligations of the SFPUC payable from Revenues or certain other specified events of defaults. Upon such an event of default, (a) the outstanding repayment obligation of the SFPUC evidenced by the Revolving Notes would bear interest at substantially increased interest rates and (b) the bank could declare all amounts outstanding under the Revolving Notes to be immediately due and payable.

See “OBLIGATIONS PAYABLE FROM REVENUES – Subordinate Debt and Interim Funding Program.”

Climate Change

Impact on San Francisco. Numerous scientific studies on global climate change show that, among other effects on the global ecosystem, sea levels will rise, extreme temperatures, and extreme weather events will become more frequent as a result of increasing global temperatures attributable to atmospheric pollution.

The Fourth National Climate Assessment, published by the U.S. Global Change Research Program in November 2018 (“NCA4”), finds that more frequent and intense extreme weather and climate-related events, as well as changes in average climate conditions, are expected to continue to damage infrastructure, ecosystems and social systems over the next 25 to 100 years. NCA4 states that rising temperatures, sea level rise, and changes in extreme events are expected to increasingly disrupt and damage critical infrastructure and property and regional economies and industries that depend on natural resources and favorable climate conditions. Disruptions could include more frequent and longer-lasting power outages, fuel shortages and service disruptions. NCA4 states that the continued increase in the frequency and extent of high-tide flooding due to sea level rise threatens coastal public infrastructure. NCA4 also states that expected increases in the severity and frequency of heavy precipitation events will affect inland infrastructure, including access to roads, the viability of bridges and the safety of pipelines.

Sea levels will continue to rise in the future due to the increasing temperature of the oceans causing thermal expansion and growing ocean volume from glaciers and ice caps melting into the ocean. Between 1854 and 2016, sea level rose about nine inches according to the tidal gauge at Fort Point, a location underneath the Golden Gate Bridge. Weather and tidal patterns, including 100-year or more storms and king tides, may exacerbate the effects of climate related sea level rise. Coastal areas like the City and the Bay Area are at risk of substantial flood damage over time, affecting private development and public infrastructure, including roads, utilities, emergency services, schools, and parks. As a result, the City could lose considerable tax revenues and many residents, businesses, and

governmental operations along the waterfront could be displaced, and the City could be required to mitigate these effects at a potentially material cost.

Adapting to sea level rise is a key component of the City's policies. The City and its enterprise departments have been preparing for future sea level rise for many years and have issued a number of public reports. For example, in March 2016, the City released a report entitled "Sea Level Rise Action Plan," identifying geographic zones at risk of sea level rise and providing a framework for adaptation strategies to confront these risks. That study shows an upper range of end-of-century projections for permanent sea level rise, including the effects of temporary flooding due to a 100-year storm, of up to 108 inches above the 2015 average high tide. To implement this Plan, the Mayor's Sea Level Rise Coordinating Committee, co-chaired by the Planning Department and the Port of San Francisco, joined a number of other public agencies to create "Adapt SF," which is now drafting a Citywide Sea Level Rise Vulnerability Assessment, a Citywide Sea Level Rise Risk Assessment, a Sea Level Rise Adaptation Plan, public maps and tools to communicate sea level rise impacts and implementation of near-term adaptation projects. The City's Sea Level Rise Action Plan states that one key missing piece of information is an understanding of the effects of climate change on precipitation. Certain City departments are engaging a consultant team to model future storm events, quantify how climate change impacts extreme storms, and prepare an action plan for addressing climate change for use by the City departments. The consultants' study is expected to be completed in 2019.

In April 2017, the Working Group of the California Ocean Protection Council Science Advisory Team (in collaboration with several state agencies, including the California Natural Resource Agency, the Governor's Office of Planning and Research, and the California Energy Commission) published a report, that was formally adopted in March 2018, entitled "Rising Seas in California: An Update on Sea Level Rise Science" (the "Sea Level Rise Report") to provide a new synthesis of the state of science regarding sea level rise. The Sea Level Rise Report provides the basis for State guidance to state and local agencies for incorporating sea level rise into design, planning, permitting, construction, investment and other decisions. Among many findings, the Sea Level Rise Report indicates that the effects of sea level rise are already being felt in coastal California with more extensive coastal flooding during storms, exacerbated tidal flooding, and increased coastal erosion. In addition, the report notes that the rate of ice sheet loss from Greenland and Antarctic ice sheets poses a particular risk of sea level rise for the California coastline.

The City has already incorporated site-specific adaptation plans in the conditions of approval for certain large waterfront development projects, such as the Candlestick/Hunters Point Shipyard, Treasure Island, Pier 70 and Mission Rock projects. Also, the City has started the process of planning to fortify the Port's seawall from sea level rise, including an initial investment of about \$8 million during fiscal year 2017-18 and consideration of financing options. The City expects short term upgrades to cost over \$500 million and long-term upgrades to cost more than \$5 billion.

Portions of the San Francisco Bay Area, including the City, are built on fill that was placed over saturated silty clay known as "Bay Mud." This Bay Mud is soft and compressible, and the consolidation of the Bay Mud under the weight of the existing fill is ongoing. A report issued in March 2018 by researchers at UC Berkeley and the University of Arizona suggests that flooding risk from climate change could be exacerbated in the San Francisco Bay Area due to the sinking or settling of the ground surface, known as subsidence. The study claims that the risk of subsidence is more significant for certain parts of the City built on fill.

Projections of the effects of global climate change on the City are complex and depend on many factors that are outside the City's control. The various scientific studies that forecast climate change and its adverse effects, including sea level rise and flooding risk, are based on assumptions contained in such studies, but actual events may vary materially. Also, the scientific understanding of climate change and its effects continues to evolve. Accordingly, the City is unable to forecast when sea level rise or other adverse effects of climate change (e.g., the occurrence and frequency of 100-year storm events and king tides) will occur. In particular, the City cannot predict the timing or precise magnitude of adverse economic effects, including, without limitation, material adverse effects on the business operations or financial condition of the City and the local economy during the term of the 2019 Series ABC Bonds. While the effects of climate change may be mitigated by the City's past and future investment in adaptation strategies, the City can give no assurance about the net effects of those strategies and whether the City will be required to take additional adaptive mitigation measures. If necessary, such additional measures could require significant capital resources.

In September 2017, the City filed a lawsuit against the five largest investor-owned oil companies seeking to have the companies pay into an equitable abatement fund to help fund investment in sea level rise adaptation infrastructure. In July 2018, the United States District Court, Northern District of California denied the plaintiffs' motion for remand to state court, and then dismissed the lawsuit. The City appealed these decisions to the United States Court of Appeals for the Ninth Circuit, which is pending. While the City believes that its claims are meritorious, the City can give no assurance regarding whether it will be successful and obtain the requested relief from the courts, or contributions to the abatement fund from the defendant oil companies.

Impact on SFPUC Water Enterprise. The issue of climate change has become an important factor in water resources planning in the State, and is being considered during planning for the Water Enterprise. There is evidence that increasing concentrations of greenhouse gases have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, there is evidence that a warming trend occurred during the latter part of the 20th century and will likely continue through the 21st century. These changes will have a direct effect on water resources in the State, and numerous studies on climate and water in the State have been conducted to determine the potential impacts. Based on these studies, climate change could result in the following types of water resources impacts in the State, including impacts on the Water Enterprise and associated watersheds:

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low- and medium-elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year;
- Changes in the timing, intensity and annual variability of precipitation, and an increased amount of precipitation falling as rain instead of as snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could degrade water quality;
- Sea level rise, which could cause inundation of Water Enterprise assets and/or an increase in saltwater intrusion into groundwater basins;
- Increased water temperatures with accompanying adverse effects on some fisheries and water quality; and
- Changes in urban water demand.

However, other than the general trends listed above, there is no clear scientific consensus on exactly how climate change will quantitatively affect SFPUC or State water supplies.

The SFPUC conducted a hydrologic modeling study to determine streamflow sensitivities to possible increases in temperature and changes in precipitation due to climate change in the Tuolumne watershed. For the hydrologic study, the likelihood of any particular climate future was not assessed, and the report did not seek to comprehensively frame all the changes climate scientists expect from global warming. The goal of that study was simply to assess the sensitivity of reservoir inflows to a range of changes in two climate variables, temperature and precipitation. For that reason, a physically-based conceptual hydrology simulation model was calibrated against past conditions and used to assess potential changes in the timing and volume of runoff that may occur for increase in temperature of up to 9.7 degrees Fahrenheit and change in precipitation ranging between -15% and +6% as compared to existing conditions. A review of the literature and consultation with climate science experts allowed selection of climate scenarios that encompassed a range of temperature and precipitation changes that may be experienced through 2100 so that potential changes in watershed runoff could be simulated and analyzed. With differing increases in temperature alone, the median annual runoff at Hetch Hetchy would decrease by 0.7% to 2.1% from present-day conditions with increases between about +1 and +3 degrees Fahrenheit and decrease by 2.6% to 10.2% from present-day with larger increases between about +3.5 and +9.7 degrees Fahrenheit. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Hetch Hetchy would decrease by 7.6% to 8.6% from present-day conditions with 5% decrease in precipitation and by 24.7% to 29.4% from

present-day conditions with 15% decrease in precipitation. Low runoff years are critical to evaluate water supply reliability. Climate change effects are exacerbated in low runoff years and aforementioned decreases in runoff will be larger in dry years by a factor between 1.5 and 3. The preliminary water supply analysis shows that the Regional Water System would be vulnerable to temperature increases above 6.3 degrees Fahrenheit without change in precipitation and for temperature increases above 3 degrees Fahrenheit when combined with decreases in precipitation greater than 5%.

SFPUC hydrologists are involved in ongoing monitoring and research regarding climate change trends and will continue to monitor the changes and predictions, particularly as these changes relate to water system operations and management of the Water Enterprise. The Water Enterprise is currently working on a long-term vulnerability assessment with researchers at University of Massachusetts, the National Center for Atmospheric Research, and Deltares, a research institute in Delft, Netherlands. There are many uncertain factors such as climate change, changing regulations, water quality, growth and economic cycles that may create vulnerabilities for the Regional Water System's ability to meet levels of service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system is difficult to predict, but nonetheless they need to be considered in SFPUC planning. To address this planning challenge, the proposed project will use a vulnerability-based planning approach to explore a range of future conditions to identify vulnerabilities, assess the risks associated with these vulnerabilities and develop an adaptation plan that is flexible and robust to a wide range of future outcomes. This plan will guide water supply decisions to reduce the risk of particular vulnerabilities of the Regional Water System over the next 50 years or longer. The project will aim to address (i) the conditions under which the Regional Water System will no longer be able to meet water supply performance criteria, (ii) whether climate change is the most important driver of vulnerability for the Regional Water System, and (iii) the SFPUC's ability to manage vulnerabilities.

Regarding sea level rise, the City has developed policies for considering the potential impact of sea level rise on City assets, "Guidance for Incorporating Sea Level Rise into Capital Planning" that requires all assets in the City's Ten-Year Capital Plan be evaluated for inundation under a variety of sea level rise scenarios plus a 1% storm. The SFPUC identified three facilities that are part of the Auxiliary Water Supply System ("AWSS"), the supplementary and emergency water supply for firefighting managed by the SFPUC. These assets have projected functional lifespans of between 90 and 100 years and were found to be in the potential inundation zone toward the end of the 21st century. The City, through its Sea Level Rise Action Plan, is currently evaluating the best approaches for protecting these assets, along with all other public and private assets potentially subject to inundation caused by sea level rise and large storms.

The SFPUC is a founding member of the Water Utility Climate Alliance (the "WUCA"), a group of 12 large water utilities delivering drinking water to over 50 million people in the United States that is focused on collaboratively advancing water utility climate change adaptation. WUCA meets monthly by phone, maintains active projects and committees exploring adaptation best practices on a variety of subjects and features active participation of SFPUC staff.

Green Bonds

The purpose of labeling the 2019 Sub-Series A Bonds as "Green Bonds" is to allow owners of such bonds to invest in bonds that have financed environmentally beneficial projects and the 2019 Sub-Series A Bonds have been certified by CBI as "Climate Bonds". The SFPUC does not make any representation, however, as to the suitability of the 2019 Sub-Series A Bonds to fulfill the environmental and sustainability criteria of particular investors. The 2019 Sub-Series A Bonds may not be a suitable investment for all investors seeking exposure to green or sustainable assets. There is currently no market consensus on what precise attributes are required for a particular project to be defined as "green" or "sustainable," and therefore no assurance can be provided to investors that the projects financed or refinanced by proceeds of the 2019 Sub-Series A Bonds will continue to meet investor expectations.

Inverse Condemnation

Under the doctrine of inverse condemnation (a legal concept that entitles property owners to just compensation if their private property is damaged by a public use), California courts have imposed liability on

public agencies in legal actions brought by private property holders for damages caused by such public agencies' infrastructure. In *City of Oroville v. Superior Court of Butte County*, 7 Cal. 5th 1091 (2019), however, the California Supreme Court held that damage to private property must be substantially caused by an inherent risk presented by the deliberate design, construction or maintenance of the public improvement. Thus, if the inherent risks associated with the SFPUC's facilities, including water storage or transportation facilities or electrical distribution and transmission lines, as deliberately designed, constructed or maintained, are determined to be the substantial cause of damage to private property from flooding, fire or otherwise, and the doctrine of inverse condemnation applies, the SFPUC could be liable for direct and indirect property damage to private parties and such liability, in the aggregate, could be substantial. In addition to such claims for property damage, the SFPUC could also be liable for punitive damages and other damages under other theories of liability, including if the SFPUC were found to have been negligent, which liability, in the aggregate, could be substantial. See "WATER FACILITIES – Wildfire Considerations."

Economic, Political, Social and Environmental Conditions

Changes in economic political, social, or environmental conditions on a local, State, federal, and/or international level may adversely affect investment risk generally. Such conditional changes may include (but are not limited to) fluctuations in business production, consumer prices, or financial markets, unemployment rates, availability of skilled labor, technological advancements, shortages or surpluses in natural resources or energy supplies, changes in law, social unrest, fluctuations in the crime rate, political conflict, acts of war or terrorism, environmental damage, and natural disasters.

Bankruptcy or Financial Failure of Wholesale Customers

The financial failure or bankruptcy of a Wholesale Customer could adversely affect the ability of such Wholesale Customer to honor its obligation under the WSA (including its obligation to pay the purchase price of water delivered by the SFPUC to such Wholesale Customer).

The SFPUC is not aware of the existing or impending financial failure or bankruptcy of any Wholesale Customer, but there can be no assurance that a financial failure or bankruptcy of a Wholesale Customer will not occur. If a Wholesale Customer were to become bankrupt, the SFPUC may be unable to enforce the terms of the WSA against such Wholesale Customer and the SFPUC's right to receive payment for water delivered prior to bankruptcy but not invoiced or invoiced but not paid may be limited to the rights of an unsecured creditor of the bankrupt entity. Further, there can be no assurance that the SFPUC will be physically able or legally permitted to cease or interrupt deliveries of water to a non-paying Wholesale Customer.

Although no assurance can be provided, the SFPUC believes that any reduction in Revenues as a result of the inability to collect payment for water delivered to a bankrupt Wholesale Customer or as a result of any temporary interruption or reduction of water deliveries will not be material. The SFPUC further believes that, following such bankruptcy, the amount of water delivered for the service area currently served by such Wholesale Customer will not be reduced and that the SFPUC will be able to obtain payment for such water on terms comparable to the terms of the WSA.

Bankruptcy of the City

The SFPUC, being an enterprise department of the City, likely cannot itself file for bankruptcy. While an involuntary bankruptcy petition cannot be filed against the City, the City is only authorized to file for bankruptcy under certain circumstances. Should the City file for bankruptcy, there could be adverse effects on the holders of the 2019 Series ABC Bonds.

To the extent that the Revenues are "special revenues" under the United States Bankruptcy Code (the "**Bankruptcy Code**"), then Revenues collected after the date of the bankruptcy filing should be subject to the lien of the Indenture. If any or all of the Revenues are determined not to be "special revenues," then any such amounts collected after the commencement of the bankruptcy case will likely not be subject to the lien of the Indenture. The holders of the 2019 Series ABC Bonds may not be able to assert a claim against any property of the City other than

the Revenues, and if any or all of the Revenues are no longer subject to the lien of the Indenture, then there may be limited, if any, funds from which the holders of the 2019 Series ABC Bonds are entitled to be paid.

The Bankruptcy Code provides that “special revenues” can be applied to necessary operating expenses of the project or system, before they are applied to other obligations. This rule applies regardless of the provisions of the transaction documents. It is not clear precisely which expenses would constitute necessary operating expenses and any definition in the transaction documents may not be applicable.

If the City is in bankruptcy, the parties (including the Trustee and the holders of the 2019 Series ABC Bonds) may be prohibited from taking any action to collect any amount from the City or to enforce any obligation of the City, unless the permission of the bankruptcy court is obtained. These restrictions may also prevent the Trustee from making payments to the holders of the 2019 Series ABC Bonds from funds in the Trustee’s possession. The rate covenants (see “SECURITY FOR THE BONDS – Rate Covenants”) may not be enforceable in bankruptcy by the Trustee or the holders of the 2019 Series ABC Bonds.

Revenues are deposited with and held by the Treasurer and may be commingled with other City funds. See “SECURITY FOR THE BONDS – Flow of Funds.” If the City goes into bankruptcy, the City may not be required to turn over to the Trustee any Revenues that are in its possession at the time of the bankruptcy filing. In addition, if the City has possession of Revenues (whether collected before or after commencement of the bankruptcy) and if the City does not voluntarily turn over such Revenues to the Trustee, it is not entirely clear what procedures the Trustee and the holders of the 2019 Series ABC Bonds would have to follow to attempt to obtain possession of such Revenues, how much time it would take for such procedures to be completed, or whether such procedures would ultimately be successful.

The City may be able to borrow additional money that is secured by a lien on any of its property (including the Revenues), which lien could have priority over the lien of the Indenture, or to cause some of the Revenues to be released to it, free and clear of the lien of the Indenture, in each case as long as the bankruptcy court determines that the rights of the Trustee and the holders of the 2019 Series ABC Bonds will be adequately protected.

If the City is in bankruptcy it may be able, without the consent and over the objection of the Trustee and the holders of the 2019 Series ABC Bonds, to alter the priority, interest rate, principal amount, payment terms, collateral, maturity dates, payment sources, covenants (including tax-related covenants), and other terms or provisions of the Indenture and the 2019 Series ABC Bonds, as long as the bankruptcy court determines that the alterations are fair and equitable.

There may be delays in payments on the 2019 Series ABC Bonds while the court considers any of these issues. There may be other possible effects of a bankruptcy of the City that could result in delays or reductions in payments on the 2019 Series ABC Bonds, or result in losses to the holders of the 2019 Series ABC Bonds. Regardless of any specific adverse determinations in a City bankruptcy proceeding, the fact of a City bankruptcy proceeding could have an adverse effect on the liquidity and value of the 2019 Series ABC Bonds.

The City may invest the Revenues in the City’s Pooled Investment Fund. See “FINANCIAL OPERATIONS – Investment of SFPUC Funds.” Should those investments suffer any losses, Revenues may be lower than expected, and there may be delays or reductions in payments on the 2019 Series ABC Bonds.

Limitations on Remedies

The remedies available to the Owners of the 2019 Series ABC Bonds upon the occurrence of an event of default under the Indenture in many respects depend upon judicial actions which are themselves often subject to discretion and delay and could prove both expensive and time consuming to obtain. In addition to the limitations on remedies contained in the Indenture, the rights and obligations under the 2019 Series ABC Bonds and the Indenture may be subject to bankruptcy, insolvency, reorganization, arrangement, fraudulent conveyance, moratorium and other laws relating to or affecting creditors’ rights, to the application of equitable principles, to the exercise of judicial discretion in appropriate cases and to limitations on legal remedies against charter cities and counties in the State.

The opinions to be delivered by Bond Counsel, concurrently with the issuance of the 2019 Series ABC Bonds, that the 2019 Series ABC Bonds constitute valid and binding limited obligations of the SFPUC and the Indenture constitutes a valid and binding obligation of the SFPUC will also be subject to such limitations and the various other legal opinions to be delivered concurrently with the issuance of the 2019 Series ABC Bonds will be similarly qualified. See “APPENDIX D – PROPOSED FORM OF OPINION OF BOND COUNSEL.”

If the SFPUC fails to comply with its covenants under the Indenture or to pay principal of or interest on the 2019 Series ABC Bonds, there can be no assurance that the available legal remedies will be adequate to protect the interests of the holders of the 2019 Series ABC Bonds.

Failure to Maintain Credit Ratings

Certain rating agencies have assigned ratings to the 2019 Series ABC Bonds. The ratings issued reflect only the views of such rating agencies. Any explanation of the significance of these ratings should be obtained from the respective rating agencies. See “RATINGS.” There is no assurance current ratings will continue for any given period or that such ratings will not be revised downward or withdrawn entirely by the rating agencies if, in the respective judgment of such rating agencies, circumstances so warrant. Any such downward revision or withdrawal of such ratings could be expected to have an adverse effect on the market price or the marketing of the 2019 Series ABC Bonds. The SFPUC undertakes no obligation to maintain its current credit ratings on the 2019 Series ABC Bonds or to oppose any such downward revision, suspension or withdrawal.

Secondary Market

There can be no guarantee that there will be a secondary market for the 2019 Series ABC Bonds or, if a secondary market exists, that the 2019 Series ABC Bonds can be sold for any particular price. Occasionally, because of general market conditions or because of adverse history or economic prospects connected with a particular issue, secondary marketing practices in connection with a particular issue are suspended or terminated. Additionally, prices of issues for which a market is being made will depend upon then prevailing circumstances. Such prices could be substantially different from the original purchase price.

Uncertainties of Projections, Forecasts and Assumptions

Certain information contained in this Official Statement is based upon assumptions and projections. Projections and assumptions are inherently subject to significant uncertainties. Inevitably, some assumptions will not be realized and unanticipated events and circumstances may occur and actual results are likely to differ, perhaps materially, from those projected. Accordingly, such projections are not necessarily indicative of future performance, and the SFPUC assumes no responsibility for the accuracy of such projections. See “FORWARD-LOOKING STATEMENTS.”

Other Risks

The discussion in this section, “RISK FACTORS”, is not meant to be a comprehensive or definitive list of the risks associated with an investment in the 2019 Series ABC Bonds. There may be other risks inherent in ownership of the 2019 Series ABC Bonds in addition to those described in this section. Investors are advised to read the entire Official Statement in order to obtain information necessary to make an investment in the 2019 Series ABC Bonds.

REGULATORY MATTERS

General

Public water supply systems in the State, such as the Regional Water System and In-City Distribution System operated by the Water Enterprise, are primarily regulated by the SWRCB Division of Drinking Water (“DDW”), formerly under the California Department of Public Health (“CDPH”) and, in some limited instances, by the EPA and California Regional Water Quality Control Boards (“RWQCBs”).

Drinking water delivered to customers must comply with statutory and regulatory water quality standards designed to protect public health and safety that are now administered by DDW. The CDPH reissued a drinking water supply permit in 2004 prescribing conditions and requirements for the Water Enterprise to operate the Regional Water System. The CDPH also issued drinking water supply permits to the In-City Distribution System, several small water systems owned and operated by the Water Enterprise, and the Wholesale Customer public water supply systems. The CDPH and the DDW issued several amendments to the Regional Water System and In-City Distribution System permits for various changes over the last 13 years. In accordance with the drinking water standards and permit requirements, the Water Enterprise operates and maintains water storage, treatment and conveyance facilities, implements watershed management and protection activities, performs inspections, monitors drinking water quality, conducts applied research, maintains and implements a comprehensive and effective cross-connection control program, and submits monthly and annual compliance reports. The Water Enterprise is currently operating in compliance with all State and federal drinking water regulations and permit requirements. The Regional Water System and the City of San Francisco drinking water supply permits will be updated around 2025 to reflect new facilities and operations.

In addition, public water system discharges to State and federal waters are regulated under general National Pollutant Discharge Elimination System (“NPDES”) permits. The SWRCB issued general permits, whereas the two RWQCBs (San Francisco Bay and Central Valley) issued individual region-specific NPDES permits to the SFPUC which contain numerical effluent limitations, monitoring, reporting, and notification requirements for water discharges from the facilities and pipelines of the Regional Water System. The SFPUC is generally operating and maintaining the water treatment and transmission facilities in compliance with the NPDES permit requirements.

A number of water resource management and regulatory initiatives may affect the availability of water to the Regional Water System in the future. Also, alternate water supplies currently used by Wholesale Customers of the Water Enterprise may be reduced in the future, increasing the customers’ reliance on the Regional Water System. In addition to those raised below, these initiatives include the Sacramento-San Joaquin Delta Reform Act of 2009, the federal or California Endangered Species Acts, the SWRCB Bay Delta Proceedings, the Federal Energy Regulatory Commission (“FERC”) proceeding to relicense the Irrigation Districts’ New Don Pedro Dam and Reservoir and others. The effects of any of these activities, or of these activities cumulatively, are unknown.

Drinking Water Requirements

Division of Drinking Water. The SFPUC currently operates its Water Enterprise systems in compliance with drinking water supply permits issued by the CDPH under the California Health and Safety Code. The SFPUC has received orders from the CDPH and DDW for noncompliance with some standards relating to the Water Enterprise. Requirements prescribed in these orders have been completed.

Surface Water Treatment. The EPA Surface Water Treatment Rule (“SWTR”) requires filtration of all surface water supplies unless the water supply can meet stringent requirements. As discussed under “WATER FACILITIES – Water Treatment,” the high quality of water provided from Hetch Hetchy Reservoir has been sufficient to meet SWTR drinking water requirements without installation and operation of filtration facilities. In 1998, the CDPH adopted its own version of the SWTR and determined that Hetch Hetchy Reservoir complies with all state drinking water criteria, without installation and operation of filtration facilities. New treatment (disinfection or filtration) facilities could be required in the future if SWTR criteria are not consistently met.

Local water from the Alameda and Peninsula watersheds and upcountry non-Hetch Hetchy sources requires filtration to meet applicable drinking water quality requirements. The filtered and treated water from these non-Hetch Hetchy sources may be blended with disinfected Hetch Hetchy water. Most customers receive water from blended sources. System water quality, including both raw water and treated water, is continuously monitored and tested to assure that water delivered to customers meets or exceeds federal and State drinking water/public health requirements.

Long Term 2 Enhanced Surface Water Treatment Rule. The EPA Long Term 2 Enhanced Surface Water Treatment Rule (“**LT2ESWTR**”) specifies *Cryptosporidium* reduction requirements for filtered and unfiltered water systems to improve public health protection through the control of this microbial contaminant. Published in January 2006, the EPA LT2ESWTR required large water systems such as the Regional Water System to provide *Cryptosporidium* inactivation treatment by April 1, 2012. The CDPH adopted its version of LT2ESWTR by reference to the EPA’s version of LT2ESWTR on April 15, 2013, effective July 1, 2013.

In response to this regulation and consistent with the overall goals of the WSIP, the SFPUC designed and constructed an advanced disinfection facility that uses ultraviolet light technology to inactivate target organisms in the Hetch Hetchy water supply. This facility began operation more than 9 months prior to the compliance date. See “**WATER FACILITIES – Water Treatment.**”

LT2ESWTR sets treatment levels based on the source water quality, with poorer source water quality requiring more treatment. Initial monitoring conducted several years ago placed SFPUC’s sources in the best water quality ‘bin’. The SFPUC completed the mandated second round of source water quality monitoring in 2017, and confirmed no changes in source water quality-bin classification and treatment requirements.

Stage 2 Disinfectants and Disinfection Byproduct Rule. The EPA promulgated the Stage 2 Disinfectants and Disinfection Byproducts Rule (“**Stage 2 DBPR**”) to reduce public health risk associated with disinfection byproducts (“**DBPs**”). Published in January 2006, the Stage 2 DBPR required water utilities including the Regional Water System and In City Distribution System to conduct a special study known as Initial Distribution System Evaluation (“**IDSE**”) to identify potentially high DBP locations in their distribution systems. The Stage 2 DBPR also specified DBP monitoring requirements based on the IDSE results. The SFPUC completed the IDSE studies and submitted the reports to the CDPH in June 2006 for the Regional Water System and in December 2008 for the In-City Distribution System. In June 2012, the CDPH adopted its version of the Stage 2 DBPR with similar regulatory requirements as the EPA’s version. The SFPUC has demonstrated compliance with the Stage 2 DBPR by the continued use of the chloramination treatment process.

Six-Year Review. Under the Safe Drinking Water Act (the “**SDWA**”), the EPA must review all existing regulations every six years and determine which regulations may need to be revised. In its third six-year review, the EPA determined that the SWTR, LT2ESWTR, Stage 1 and Stage 2 DBPRs and Interim Enhanced SWTR regulations are candidates for regulatory revisions. The review may result in new capital and operational expenditures to the Water Enterprise, but any regulatory revisions would not go into effect for several years.

Groundwater Rule. The EPA promulgated the Groundwater Rule (“**GWR**”) to address waterborne disease and microbial contamination related to groundwater. The CDPH adopted its own version of the GWR in August 2011 by reference to the EPA’s version. The GWR requires that a system putting new groundwater sources in service after November 30, 2009 should conduct assessment source water monitoring if directed by the State. The GWR also requires a groundwater system to conduct triggered source water monitoring if it does not provide 4 log virus treatment and the results of bacteriological monitoring are fecal coliform positive. This rule may affect the treatment and operation of the groundwater projects in the Regional Water System and the In-City Distribution System, depending on the operational management and water quality of these new alternate water sources. New treatment facilities may be required to meet the disinfection requirements and to reduce certain mineral content of the groundwater to comply with the corresponding drinking water standards, if water quality monitoring results indicated such a need and the proposed blending with the surface water sources does not allow the water quality goals to be met.

Total Coliform Rule. The EPA has revised the Total Coliform Rule (“**TCR**”), and may also consider the adoption of a new Distribution System Rule in the future to more closely regulate distribution system operations and

related facilities. The Revised Total Coliform Rule (“**RTCR**”) went into effect in April 2016, with minimal operational impact to the Water Enterprise. It is too early at this time to identify what new treatment facilities or operational changes will be required to meet the future distribution system rule.

The DDW has not adopted its own version of the RTCR. However, the DDW has stated that all public water systems, including the Regional Water System, In-City Distribution System, and small drinking water systems, must comply with both the federal RTCR and the State TCR until the State adopts its own version of the RTCR, which is expected to occur in 2018. The current draft State RTCR has several provisions different from the EPA’s version. Exact impacts on the Water Enterprise’s drinking water systems are not known until the final rule is adopted.

Lead and Copper Rule. The SFPUC has proactively addressed lead concerns for several decades, well before the EPA published the Lead and Copper Rule (“**LCR**”) in June 1991. In the 1980’s, the SFPUC removed all known lead service lines from the In-City Distribution System. In the late 1990’s, the SFPUC started distributing non-lead faucets to daycare centers and schools. The distribution program for non-lead faucets was then expanded to the general public served by the In-City Distribution System. In the 2000’s, the SFPUC initiated a program to replace service meters with a non-lead type in the In-City Distribution System and eliminated large, leaded, compound meters. As of July 2017, approximately 97% of the service meters have been replaced.

In 2006, the SFPUC submitted a report to the CDPH documenting that its existing corrosion control treatment using pH adjustment was optimized. The SFPUC also piloted use of other non-lead plumbing components and sponsored the lead-free law known as Assembly Bill 1953 (“**AB 1953**”) that was enacted by the California Legislature in 2006. AB 1953, which requires new lead free plumbing components containing no more than 0.25% lead, has been in effect since January 1, 2010. In January 2014, EPA began enforcing its lead-free mandate known as the Reduction of Lead in Drinking Water Act, which was enacted by Congress on January 4, 2011. The EPA’s definition of “lead free” is the same as AB 1953’s definition of “lead-free.”

In 2015, the SFPUC completed its latest triennial LCR monitoring. All samples collected were below the action level. These results demonstrate continued compliance with the existing LCR. Nevertheless, the SFPUC may have to conduct a new optimized corrosion control treatment study with the addition of new groundwater sources to the Regional Water System and the In-City Distribution System. The next round of triennial monitoring is expected to be completed in 2018.

In February 2016, in response to the event of lead problem associated with the drinking water supply in Flint, Michigan, as well as in some other parts of the United States, the EPA issued a memo clarifying the recommended LCR tap sampling procedures and, in March 2016, published new guidelines for the states and public water systems to assist in complying with the existing LCR monitoring, corrosion treatment optimization, and notification requirements.

In September 2016, Senate Bill 1398 was signed into law and codified in Section 116885 of the California Health and Safety Code. In September 2017, Senate Bill 427 was adopted and signed into law. Together these two bills require a community water system, such as those overseen by the SFPUC, to complete the following:

- Compile an inventory of known Lead User Service Lines (“**LUSLs**”) by 7/1/2018;
- Identify areas that may have LUSLs by 7/1/2018;
- Identify unknown user service line material by 7/1/2020; and
- Develop a replacement timeline for LUSLs and still unknown material user service lines by 7/1/2020.

The cost to replace a service line is estimated to range between \$5,000 and \$10,000. While the SFPUC does not have the exact number of LUSLs and unknown material user service lines, the SFPUC currently estimates the number to be 11,000-13,000 such lines. The potential replacement cost could be up to \$130 million. As a usual practice, the SFPUC will generally replace any identified LUSL as part of its ongoing main replacement and service

renewal program. However, the DDW could direct a water system to accelerate the program if a high number of LUSLs are identified during the inventory and unknown service line identification.

The EPA proposed LCR Long-Term Revisions (the “**LCR-LTR**”) in October 2019. The LCR-LTR focus areas include: strengthening drinking water treatment requirements, replacing lead service lines, increasing monitoring, and improving risk communication. Service line replacement and monitoring, especially mandatory school and day care facility monitoring, will be the most resource intensive requirements. The LCR-LTR will not go into effect for several years and specific costs cannot be quantified until the regulation is finalized.

Fluoridation. Assembly Bill 733, signed into law in October 1995, authorizes the DDW to require large water systems to fluoridate their public water supply. It also directs the DDW to seek funding for fluoridation.

The CDPH adopted its fluoridation regulations in April 1998. These regulations, as codified in Section 64433 through 64434 of Title 22, California Code of Regulations, apply to large water systems with at least 10,000 service connections. The regulations require that:

- Large systems with existing fluoridation practices continue fluoridating under more stringent regulatory requirements (i.e., concentration, control, monitoring, reporting and notification requirements)
- Large non-fluoridated systems start fluoridating when funding is made available.

The SFPUC has been fluoridating the Water Enterprise’s water supply since the early 1950s, and meets all the requirements of these regulations. The optimal levels and associated control ranges specified in the fluoridation regulations were historically based on the annual average of maximum daily air temperatures recorded during the previous five years. However, in April 2015, the United States Department of Health and Human Services Agency recommended that water systems practicing fluoridation adjust their fluoride content to 0.7 mg/L, as opposed to the previous temperature-dependent optimal levels ranging from 0.7 mg/L to 1.2 mg/L. The Center for Disease Control and Prevention (the “**CDC**”) also provided detailed information on the basis for this change. To reflect the CDC’s recommendation, DDW consulted with public water systems practicing fluoridation regarding amendments to their individual public water supply permits to reference the CDC’s recommended optimal level of 0.7 mg/L. The recommended optimal level of 0.7 mg/L currently corresponds with the existing California Water Fluoridation Standards control range of 0.6 mg/L to 1.2 mg/L. In May 2016, the DDW confirmed that the fluoride control range for the Regional Water System is 0.6 mg/L to 1.2 mg/L. The SFPUC is in compliance with the operational and monitoring requirements of the State fluoridation regulations.

Chloramination. Chloramine is a disinfectant added to water for public health protection. It is a combination of chlorine and ammonia that is currently considered the best technology for controlling the formation of certain regulated DBPs. Chloramine was used as a disinfectant in the entire Regional Water System for 10 years between 1935 and 1944 when the Hetch Hetchy water supply was first brought to the City from the Sierra Nevada. Many utilities used chloramination at that time, including 34 other drinking water supplies in the State. Chloramination was discontinued in 1944 by the SFPUC and many other utilities due to shortages of ammonia during World War II.

The SFPUC started using chloramine as a distribution system disinfectant again in February 2004 to better comply with the Stage 2 DBPR, which requires more stringent control of chlorination DBPs. There is a significant amount of ongoing research by many agencies worldwide regarding best disinfection practices for control of microorganisms in drinking water and simultaneous minimization of DBPs. The SFPUC continually monitors that research and the latest information on water disinfection practices.

Since 2004, chloramine has been very effective as a distribution system disinfectant in the Regional Water System and the In-City Distribution System. It has lowered microbial densities (including coliform bacteria, heterotrophic bacteria, *Legionella* bacteria), at the same time minimizing the formation of regulated DBPs. Adjustments (up or down) of the target chloramine level may occur when operational conditions warrant. A small group of individuals believe that various health problems have been caused by chloramine but the SFPUC believes

that no scientific proof exists to support these assertions. The SFPUC has worked with local health departments, regulatory agencies, research organizations, professional associations, water quality and health experts, other utilities, and elected officials to address these concerns.

New Drinking Water Standards. The SWRCB adopted a new maximum contaminant level (“**MCL**”) of 5 nanogram/liter (“**ng/L**”) for 1,2,3-Trichloropropane in July 2017. This MCL is set at a very low level that the SFPUC has to implement a dedicated, routine monitoring program to assess if its sources of water supply need treatment for compliance. Based on historical water quality data collected thus far, it appears that treatment for compliance may not be required, but will be confirmed with more updated data to be collected in the future.

The DDW vacated the recently adopted MCL for chromium-6 in response to an order issued by the Superior Court of Sacramento County on May 31, 2017. A new chromium-6 MCL is currently under development by the DDW. Impacts of the new MCL to the Water Enterprise’s water systems are yet to be known, and will be evaluated when the new standard is proposed. If treatment is required, blending with high quality surface water supplies will be the likely treatment alternative.

The State of California has increasingly legislated new regulatory requirements over the past few years. New requirements address: lead (SB 1398, 2016 and SB 427, 2017), cross connection control (AB 1671, 2017), microplastics (SB 1422, 2018) and perfluoroalkyl and polyfluoroalkyl substances (“**PFAS**”) (AB 756, 2019). Additional PFAS legislation and/or regulation is anticipated, but highly protected surface water supplies will minimize the SFPUC’s risk. In addition, the SWRCB is expected to finalize a new laboratory accreditation regulation in 2020 that will require new staffing to address.

Public Water System Discharges

As part of routine operations and maintenance activities, the SFPUC transfers treated water between storage facilities and discharges water to the environment. These transfers and discharges are regulated under the federal Clean Water Act through general National Pollutant Discharge Elimination System (“**NPDES**”) permits issued by the SWRCB or appropriate RWQCB.

The SFPUC currently has several NPDES permits that cover discharges from the Regional Water System and SFPUC drinking water facilities. These permits generally impose discharge limitations, monitoring, reporting, and notification requirements. These permits require the SFPUC to control various water quality parameters (such as pH, chlorine residual, turbidity, etc.) and implement best management practices to minimize any adverse environmental effects caused by the discharges from the Regional Water System. The SFPUC is implementing improvements, as well as operational controls, to more reliably meet permit requirements under Section 402 of the Clean Water Act. See “**CAPITAL IMPROVEMENT PLAN – Water System Improvement Program (WSIP).**”

Bay-Delta Water Quality Standards

The Water Enterprise obtains the majority of its water supply from Hetch Hetchy Reservoir, located on the main branch of the Tuolumne River, which is an upstream tributary to the San Joaquin River and the San Francisco Bay/Sacramento San Joaquin Delta Estuary (the “**Bay Delta**”). In 1995, the SWRCB, which oversees the allocation of water for consumptive and environmental needs, adopted a Water Quality Control Plan (the “**1995 WQCP**”) for the Bay Delta pursuant to State and federal obligations to protect water quality in the Bay Delta ecosystem. The 1995 WQCP called for certain flow objectives on the San Joaquin River where it enters the Delta and certain Delta outflows.

In 2000, the SWRCB issued an order implementing the 1995 WQCP. The order did not in any way condition the City’s rights to divert water from the Tuolumne River, nor did it require the City to release water to implement the 1995 WQCP. In 2006, the SWRCB amended the 1995 WQCP (the “**2006 WQCP**”) and identified San Joaquin River flows as an issue of emerging concern because various fish species in the Delta and San Joaquin River basin had not shown significant signs of recovery under the 1995 WQCP. In 2008, in light of continued decline in anadromous and pelagic (open water) fish species, the SWRCB adopted a Strategic Workplan for

Activities in the San Francisco Bay/Sacramento San Joaquin Delta Estuary calling for review and implementation of the 2006 WQCP's San Joaquin River flow objectives.

In February 2009, the SWRCB noticed its intent to update water quality objectives of the 2006 WQCP and the program of implementation, which could result in changes to water rights and water quality regulation consistent with the program of implementation. Following a several years-long process, on December 12, 2018, by Resolution No. 2018-0059, the SWRCB adopted the "Phase 1" Amendment to the WQCP ("**2018 Plan Amendment**") and the accompanying final Substitute Environmental Document. The adopted Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Plan Amendment requires the release of 40% of the "unimpaired flow" on the three tributaries from February through June in every year type, whether wet, normal, dry, or critically dry. If the Plan Amendment were to be implemented, it would result in significant water supply shortages for the Hetchy Hetchy Regional Water System during single dry and multiple dry years.

The SWRCB has two primary means of implementing the 40 percent unimpaired flow requirement: (1) in a separate water rights proceeding that would consider any necessary changes to upstream water rights; or, (2) through Clean Water Act section 401 certification actions in Federal Energy Regulatory Commission ("**FERC**") hydroelectric licensing processes, such as the FERC relicensing proceeding underway for the Don Pedro Project on the Tuolumne River (discussed below).

On January 10, 2019, the SFPUC joined in filing a lawsuit with the San Joaquin Tributaries Authority challenging the SWRCB's adoption of the Plan Amendment on multiple legal grounds including the California Environmental Quality Act and the Porter Cologne Act. Over a dozen other lawsuits have been filed in state and federal court challenging the Plan Amendment. To date, there have been no substantive motions or decisions in the litigation. The parties to the litigation are currently negotiating preparation of the administrative record.

In its Resolution No. 2018-0059 approving the 2018 Plan Amendment, the SWRCB directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." The SFPUC, in partnership with other key stakeholders, is currently negotiating with the State a voluntary agreement that could ultimately be adopted as an alternative or substitute for the Bay-Delta Plan Amendment. On March 1, 2019, in accordance with the SWRCB's instruction, SFPUC submitted to the State a proposed voluntary agreement ("**March 1st Proposed Voluntary Agreement**"). In a written progress report to the Voluntary Agreement Plenary Participants dated July 1, 2019, the California Secretary for Environmental Protection and the California Secretary for Natural Resources stated that the collective State agencies (i.e., State Team) should be able "to determine the adequacy" of the various proposed voluntary agreements, including the proposed Tuolumne Voluntary Agreement, by October 15, 2019. The report further states that if the State Team decides to recommend the Voluntary Agreements to the SWRCB, then (1) scientific peer review of the Voluntary Agreements would be completed by the spring of 2020, and (2) a draft CEQA document would be released for public comment in the summer of 2020, with a finalized CEQA document completed the following year.

If successful, this voluntary agreement process may allow the SFPUC to offset some or all the flow requirement of the 2018 Plan Amendments by agreeing to instead implement certain "non-flow" measures designed to improve the viability of targeted fish species. These negotiations are ongoing.

FERC Proceeding to Increase Flows in the Lower Tuolumne River

FERC licenses the New Don Pedro Project, owned and operated by the Irrigation Districts. The City helped fund the original construction of New Don Pedro Project in exchange for a water bank account allowing the SFPUC to receive water credits for advanced releases from the Hetch Hetchy Project to the New Don Pedro Reservoir.

The current FERC license for the New Don Pedro Project expired in 2016, and the Irrigation Districts are now operating under an annual license that incorporates the conditions of their prior license. The Irrigation Districts initiated the process to relicense the New Don Pedro Project using FERC's Integrated Licensing Process in 2010. Relicensing is a lengthy process, stretching over several years and open to public participation. It is estimated the

process may cost up to \$50 million to complete, which costs are split for certain studies between the Irrigation Districts and the SFPUC pursuant to an existing agreement.

The Irrigation Districts submitted an Amended Final License Application (“**AFLA**”) for the New Don Pedro Project on October 11, 2017. The Irrigation Districts are also working through a licensing proceeding for the La Grange Diversion Dam (the “**La Grange Project**”), which is located on the Tuolumne River, two miles downstream of the New Don Pedro Project. The Irrigation Districts also submitted their Final License Application (“**FLA**”) for La Grange on October 11, 2017.

NEPA and CEQA environmental review must be completed before a new license can be issued. On February 11, 2019, FERC released the Draft Environmental Impact Statement (“**DEIS**”) for the AFLA for the New Don Pedro Project and the FLA for the La Grange Project. The DEIS presents a “preferred alternative” that is mostly aligned with the Irrigation Districts’ AFLA. On April 12, 2019, SFPUC submitted comments to FERC on the DEIS. FERC is currently in the process of preparing a Final Environmental Impact Statement (“**FEIS**”), which may contain revisions to its proposed license articles and responses to comments submitted by the SFPUC, Irrigation Districts, and others. The release date of the FEIS is not known at this time.

As mentioned above, under section 401 of the federal Clean Water Act, FERC cannot issue a new license for a hydroelectric project until a state’s water quality agency issues a 401 certification stating that the new license will comply with the applicable water quality requirements. The ongoing WQCP voluntary agreement process is designed, in part, to draft the section 401 certification terms that would be included as part of the FERC license in lieu of the 40 percent unimpaired flow requirement set forth in the 2018 WQCP.

A 1995 Don Pedro Project Settlement Agreement (“**Settlement Agreement**”) and a 1996 Order by FERC (“**1996 Order**”) established increased water flows on the Tuolumne River to protect fisheries and riparian resources. A restoration plan (“**Restoration Plan**”) adopted in 2000 guides planning, funding and implementation efforts. The Restoration Plan calls for a series of projects with a combined estimated cost of \$25 million to improve river channel, riparian and fisheries conditions within a 27-mile stretch of the Tuolumne River corridor below La Grange Diversion Dam. Four of the 10 priority projects have been completed. However, no additional projects are in the planning or construction phases due to the limited availability of federal and State grant funds.

Pursuant to a then existing agreement between the City and the Irrigation Districts, the City might have been liable to provide a portion of the increased flows mandated under the 1995 Settlement Agreement. Instead, the City and the Irrigation Districts entered into a new agreement whereby the Irrigation Districts agreed to provide all flows ordered by FERC to implement the Settlement Agreement until FERC issues a new license for the New Don Pedro Project in exchange for which the City pays to the Irrigation Districts on a monthly basis an amount aggregating \$3.5 million per year, subject to an escalation clause applied to keep pace with inflation. Pursuant to the terms of its agreement with the Irrigation Districts, the City may withdraw from the agreement upon one year’s notice.

The term of the Settlement Agreement runs until FERC issues a new license for the New Don Pedro Project. License conditions, such as release requirements, could change under a new license. Changed release requirements could adversely affect the availability of Tuolumne River water to the SFPUC and incidental hydroelectric generation.

Dam Licensing and Safety Issues

In 1929, the California Legislature enacted legislation providing for supervision over non-federal dams in the State. The statutes place the supervision of the safety of non-federal dams and reservoirs under the jurisdiction of the DSOD. Dams under jurisdiction are artificial barriers, together with appurtenant work, including outlet towers, which are 25 feet or more in height or have an impounding capacity of 50 acre-feet or more. Any artificial barrier not in excess of six feet in height, regardless of storage, or that has a capacity not in excess of 15 acre-feet, regardless of height, is not considered jurisdictional.

The DSOD reviews plans and specifications for the construction of new dams or for the enlargement, alteration, repair or removal of existing dams, under applications, and must grant written approval before the owner can proceed with construction. The DSOD routinely inspects operating dams to assure that they are adequately maintained. The DSOD also conducts investigations of selected dams and directs the owners to additional investigations and detailed safety evaluations when necessary. In early 2017, Oroville Dam, which is owned and operated by the State, suffered significant spillway structural problems and a major downstream area was temporarily evacuated. As a result of the Oroville Dam experience, the State Legislature enacted legislation to enhance the DSOD's authority, and DSOD has requested additional evaluations of certain spillways, including four spillways at the following dams: Cherry Valley, O'Shaughnessy, Turner, and San Andreas.

The SFPUC has 18 dams under the jurisdiction of the DSOD. *The following highlights capital improvements to dams that have recently been made through WSIP under DSOD's jurisdiction.*

Crystal Springs Reservoir System. An order imposed by the DSOD prohibited use of stop logs in the reservoir spillway due to seismic concerns and resulted in a loss of historic storage capacity at Lower Crystal Springs Reservoir. As part of the WSIP, the SFPUC restored the historical maximum capacity of 69,400 acre feet through capital improvements. The DSOD then rescinded the storage restriction. However, the land that will be inundated by the restored capacity has been populated with fountain thistle, an endangered plant species. The recovered storage will be available to the Regional Water System over time as the impacts to fountain thistle are mitigated for under the terms of federal and State endangered species act permits.

Calaveras Dam. Due to seismic stability concerns regarding Calaveras Dam, the DSOD had restricted the amount of water stored in Calaveras Reservoir to a target maximum of 38,000 acre-feet, a reduction in storage capacity of approximately 60%. In 2011, under DSOD review, the SFPUC began improvements to Calaveras Dam to alleviate seismic safety concerns. Substantial completion of such improvements was reached in 2018 and final completion was reached in 2019, The replacement dam and reservoir now store up to 96,800 acre feet of water, the historical maximum capacity.

The following highlights known significant issues with the SFPUC's dams for which capital improvements are currently being implemented or planned under the Ten-Year Capital Plan.

Moccasin Dam. On March 22, 2018, the town of Moccasin experienced more than 5.0 inches of precipitation over a 24-hour period, of which 3.1 inches fell within a four-hour period. The torrent of rain caused Moccasin Creek to overtop the Moccasin Creek Diversion Dam. The overtopping creek water brought with it a large volume of debris including downed trees and logs. Flooding reached the Administration Building basement, Moccasin Powerhouse, the Line Shop, and Gardeners' Shop. Both Moccasin Dam Spillways (Main and Auxiliary Spillways) were inundated and the reservoir came within approximately 1 foot of overtopping the dam. Furthermore, seepage was observed exiting the downstream face of the dam. Following an evacuation order for areas downstream of the dam, the SFPUC issued emergency contracts to remove debris, perform damage assessments, and perform emergency interim repairs to the Moccasin Reservoir Dam, Main and Auxiliary Spillways, the Moccasin Creek Diversion Dam and appurtenant facilities. Based on substantial completion of the emergency repairs, DSOD allowed partial re-filling of the reservoir at the end of calendar year 2018, and the SFPUC returned the reservoir to service at a restricted reservoir level in June 2019. The SFPUC is planning for upgrades necessary to meet DSOD requirements for Moccasin Reservoir Dam, Spillways and Outlet Works. Potential work elements include the enlargement of the primary and auxiliary spillways, modification of the adit tower and outlet, enlargement of the existing dam, modification of the existing catwalk, modification of access roads, dam security and maintenance.

O'Shaughnessy Dam. O'Shaughnessy Dam was completed in 1923 and raised in 1938. A rehabilitation project is planned to address deficiencies of the existing outlet works system at O'Shaughnessy Dam, including the drum gates and release system through O'Shaughnessy Dam to Canyon Tunnel and the Tuolumne River. A recent condition assessment identified deficiencies in the O'Shaughnessy Dam release system. Improvement projects were identified and have been prioritized. Phase 1 will include three of these projects: drum gate rehabilitation (upgrading the hinges and rivets, recoating the gate and existing seals, and repairing the spillway concrete), installation of a new bulkhead system, and rehabilitation of slide gates and installation of a diversion pipe butterfly valve. Phase 2 will include large valves such as the 60" and 72" needle valves and their associated control system.

Cherry Valley Dam. Cherry Valley Dam was built in 1956. The spillway includes a 334-foot wide ogee-type concrete weir that discharges into an unlined adjacent channel. The original design documents indicate that the spillway is rated for 52,000 cubic feet per second (“cfs”). However, significant erosion damage has been experienced below the dam with spillway releases below 1,800 cfs. This has included large scale erosion outside the lower portion of the spillway channel, as well as flooding of the Cherry Power Tunnel Adit and a campground downstream, creating a potentially hazardous condition for the dam, personnel and the public. The SFPUC performed a recent condition assessment of the spillway, and a re-assessment of the Probable Maximum Flood (“PMF”) event shows a significant increase compared to the previous PMF estimate. The objective of the proposed capital project is to improve the capacity of the existing spillway to provide safe passage of the new PMF. The project may also involve structural/seismic stability analysis of the outlet tower and other possible safety improvements and appurtenant facilities.

Early Intake Dam. Early Intake Dam is a single-curvature concrete arch structure. It was constructed between 1923 and 1924 to divert Hatch Hetchy water from the Tuolumne River into the Mountain Tunnel. Within a few years of the dam’s completion, significant cracking was observed at several locations, most likely due to the absence of contraction joints in the structure. In addition, widely distributed and progressively worsening distributed cracking has been observed throughout the dam and spillway structure over the years. The dam is reaching the end of its design life. The SFPUC has identified an interim mitigation alternative to install a liner on the upstream face of the dam to reduce the rate of expansion and deterioration caused by the alkali aggregate reaction. This interim measure may extend the useful life of the dam by 20-25 years. Alternatively, the dam may need to be replaced.

Eleanor Dam. Eleanor Dam is a multiple arch reinforced concrete dam that was constructed in the 1920’s. The 2015-2016 Needs Assessment Report identified deterioration and aging of the structure, as well as performance concerns. Specifically, the SFPUC has identified structural/seismic concerns regarding the Eleanor Bridge, which is an integral part of the arch dam, including cracking and spalling of concrete, exposed rebar, multiple significant leakage through the arch barrels, and cracks and erosion of the spillway concrete. The SFPUC has prioritized projects to rehabilitate the dam by degree of risk. Rehabilitation may include some or all of the following: installation of a liner on the upstream face of the dam, pressure grouting, concrete repairs, valve replacement, and installation of concrete lining and riprap.

Priest Dam. Priest Dam is an earth and rock filled dam located just east of Moccasin located on Rattlesnake Creek in Tuolumne County. The dam was built between 1921 and 1923, and is approximately 168 feet tall and 1,000 feet wide with a crest width of 20 feet. Priest Dam has a long history of issues related to settlement and deflection, and needs a condition assessment and stability analysis using current standards and analysis techniques. The project will include installation of new instrumentation to monitor and document the movement of the dam under different storage conditions. The SFPUC will use the results to determine whether a future capital improvement project is required.

Pilarcitos Dam. Pilarcitos Dam has a capacity of approximately 3,100 acre-feet and was originally constructed in 1862 by the Spring Valley Water Company. In 2013, DSOD requested the SFPUC to perform a geotechnical characterization of the Pilarcitos Dam foundation and a seismic stability evaluation of the Pilarcitos Outlet Tower. Geotechnical investigations have found problematic materials that may affect seismic performance of the Pilarcitos Dam. The SFPUC is currently conducting a condition and needs assessment of the dam and forebay outlet structure, outlet tunnel, outlet pipeline and spillway as requested by DSOD. Hydrologic and hydraulic studies show that the current spillway does not have sufficient capacity to pass the probable maximum flood. A capital project is being planned to develop alternatives for consideration to mitigate the facilities seismic and hydraulic deficiencies.

San Andreas Dam. San Andreas Dam, built between 1870 and modified in 1875, is a 105-foot high earthfill dam which impounds a 19,000 acre-foot reservoir in San Mateo County. A project is being planned to assess and implement upgrades to the dam embankment, spillway and emergency drawdown outlet works. A recent spillway condition assessment mandated by DSOD revealed deficiencies that need to be addressed through upgrades or a spillway replacement if that should be required. The embankment dam needs to be assessed for potential liquefaction of alluvium underneath the embankment. Construction of the emergency drawdown outlets will precede any potential upgrades to the spillway and/or embankment.

Turner Dam. Turner Dam, a 195-foot high earthfill dam constructed in 1965, impounds the 50,500 acre-foot San Antonio Reservoir in Alameda County. A project is planned to address recommendations included in the Turner Dam Spillway Condition Assessment Report as directed by DSOD. The project also is budgeted for the spillway upgrades and other possible upgrades at the dam if that should be necessary.

Stanford Heights Reservoir. Stanford Heights reservoir, located within San Francisco, is impounded by a 31-foot high earthfill dam constructed in 1928. The SFPUC performed a stability analysis in 1993, and an updated seismic stability and deformation analysis check of the embankment in 1997. Based on the stability analysis investigation, further investigations, analysis, planning and design engineering for possible improvements may be necessary.

Sunset Reservoir South Basin. In a 1996 study, the SFPUC recommended seismic strengthening of the roof structure and other associated reservoir structural elements at the Sunset Reservoir South Basin which is formed with a 34-foot high earthfill dam within San Francisco. However, due to subsequent prioritization decisions made by the SFPUC under WSIP, the SFPUC deferred those recommendations. Since the study is now 22 years old, the recommendations need to be reviewed and updated prior to developing and implementing a structural improvement project. The project includes an analysis of the South Basin embankment based on up-to-date geotechnical and seismic inputs. Additional data must be obtained to better characterize the embankment fill, foundation materials, and piezometric conditions. Based upon previously performed studies, the reservoir roof structure and other structural elements require strengthening to bring the structural components to current standards.

University Mound South Basin. In a 1996 study, the SFPUC recommended seismic strengthening of the roof structure and other associated reservoir structural elements at the University Mound South Basin which is formed with a 17-foot high earthfill dam within San Francisco. However, the SFPUC deferred the work due to subsequent prioritization decisions during WSIP. Since the reservoir study is over 22 years old now, the recommendations need to be reviewed and updated as necessary to design work to bring the structural seismic condition up to current standards.

Hazardous Material Management

The handling of hazardous materials is subject to a variety of federal and State regulations. The SFPUC currently complies with regulations regarding hazardous material safety with respect to hazardous material disposal and employee safety. In 2015, however, the Alameda County Department of Environmental Health and the Alameda County District Attorney's Office filed an enforcement action against the SFPUC, alleging deficient record keeping and storage management. In August 2016, the Board of Supervisors approved settlement of the enforcement action, including payment of a \$250,000 fine. The SFPUC has revised related hazardous materials management systems and has since been spending an estimated annual increase of \$100,000 in operating costs to better ensure regulatory compliance in the hazardous materials program.

Endangered Species

Various aquatic species (including native fishes) present in the Tuolumne River and Bay Area streams (e.g., Alameda, San Mateo and Pilarcitos Creeks) are either listed or candidates for listing under the State or federal endangered species acts. New listings and future enforcement actions under the acts, or conditions placed in permits to undertake construction for certain capital projects, could potentially directly affect water supplies available to the Regional Water System. The SFPUC is working with the responsible State and federal agencies to obtain permits under the acts, which would avoid regulatory uncertainty and ensure water supply reliability for the Regional Water System. In addition, future enforcement actions involving the Bay Delta or Bay Delta tributaries could further affect the availability of supplies to the State Water Project and the Central Valley Project, reducing SFPUC customers' alternate water supplies and increasing their need for additional Regional Water System deliveries.

Required Instream Flow Schedules from Regional Water System Dams

In order to comply with federal and State permit requirements in connection with dam and reservoir improvements to be carried out as part of the WSIP, the SFPUC has implemented schedules of instream flow

releases from Lower Crystal Springs Reservoir to San Mateo Creek, from Calaveras Reservoir to Calaveras Creek/Alameda Creek, and is preparing to test bypass of flow from the Upper Alameda Creek Diversion Dam to Alameda Creek to enhance habitat for native species.

The SFPUC has proposed the Alameda Creek Recapture Project to recover a portion of the loss of water supply associated with Calaveras Dam releases and bypasses. The SFPUC has a water supply program underway to identify and implement water supply projects to make up the water supply loss associated with the Crystal Springs Dam releases, approximately 3.5 mgd.

The Alameda County Water District appealed the certification of the environmental impact report for the Alameda Creek Recapture Project (the “ACRP EIR”) by the San Francisco Planning Department. On September 5, 2017, the Board of Supervisors upheld the appeal as to one issue – the adequacy of the environmental analysis of project operations on threatened steelhead trout in lower Alameda Creek – and also directed the San Francisco Planning Department to consult with an independent third-party expert concerning the adequacy of the conceptual groundwater model of the Sunol Valley. The ACRP EIR will be recirculated on the fishery issue, and the document will be considered for certification under CEQA by the San Francisco Planning Department in the first half of 2020, following which the SFPUC expects that the Alameda Creek Recapture Project will be approved by the SFPUC and authorized for construction.

CONSTITUTIONAL, STATUTORY AND CHARTER LIMITATIONS

The activities of the SFPUC and the Water Enterprise, including, without limitation, the establishment of rates for water service and the issuance of Bonds, are subject to a number of limitations under both State and local law. Certain of such limitations are summarized below. Additionally, such limitations may be revised, enhanced, expanded, or otherwise altered as provided under State and local law, including in certain instances by legislation adopted by State, regional or local authorities, including the State Legislature or the Board of Supervisors, or by the voters of the State or the City themselves through the power of initiative or referendum, by voting in favor of amendments to the Charter, or in any other lawful manner.

State Law Limitations

Tax and Spending Limitations. The taxing powers of public agencies in the State are limited by Article XIII A of the California Constitution, added by an initiative amendment approved by the voters on June 6, 1978, and commonly known as Proposition 13.

Article XIII A limits the maximum ad valorem tax on real property to 1% of “full cash value,” which is defined as “the County Assessor’s valuation of real property as shown on the Fiscal Year 1975-76 tax bill under ‘full cash value’ or, thereafter, the appraised value of real property when purchased, newly constructed, or a change in ownership has occurred after the 1975 assessment.” The full cash value may be adjusted annually to reflect inflation at a rate not to exceed 2% per year, or reduction in the consumer price index or comparable local data, or declining property value caused by damage, destruction, or other factors.

The tax rate limitation referred to above does not apply to ad valorem taxes to pay the debt service on any indebtedness approved by the voters before July 1, 1978, or on any bonded indebtedness for the acquisition or improvement of real property approved by two-thirds of the votes cast by the voters voting on the proposition.

Under the terms of Article XIII A and pursuant to an allocation system created by implementing legislation, each county is required to levy the maximum ad valorem tax permitted by Article XIII A and to distribute the proceeds to local agencies.

Assessed valuation growth allowed under Article XIII A (new construction, change of ownership and up to 2% annual value growth) is allocated among the jurisdictions that serve the tax rate area within which the growth occurs. Local agencies and schools share the growth of base revenues from the tax rate area. Each year’s growth allocation becomes part of each agency’s allocation in the following year. The availability of revenues from tax bases to such entities may be affected by the existence of certain successor agencies to former redevelopment

agencies that, under certain circumstances, may be entitled to such revenues resulting from the upgrading of certain property values.

Under State law, any fee that exceeds the reasonable cost of providing the service for which the fee is charged may be considered a “special tax” that must be authorized by a two-thirds vote of the electorate. Accordingly, if a portion of the SFPUC’s water user rates or capacity charges were determined by a court to exceed the reasonable cost of providing service, the SFPUC might not be permitted to continue to collect that portion unless it were authorized to do so by a two-thirds majority of the votes cast in an election to authorize the collection of that portion of the rates or fees. If the SFPUC were unable to obtain such a two-thirds majority vote and were unable to reduce costs, such failure could adversely affect the SFPUC’s ability to pay the debt service on the 2019 Series ABC Bonds. However, the reasonable cost of providing water services has been determined by the State Controller to include depreciation and allowance for the cost of capital improvements. In addition, State courts have determined that fees such as capacity charges will not be special taxes if they approximate the reasonable cost of constructing the water system improvements contemplated by the local agency imposing the fee.

The United States Supreme Court has upheld Article XIII A against a challenge alleging violation of equal protection under the Fourteenth Amendment to the United States Constitution.

Proposition 218. Proposition 218, a State ballot initiative known as the “Right to Vote on Taxes Act,” was approved by the voters on November 5, 1996. The initiative added Articles XIII C and XIII D to the California Constitution, creating additional requirements for the imposition by most local governments of “general taxes,” “special taxes,” “assessments,” “fees,” and “charges.” Articles XIII C and XIII D became effective, pursuant to their terms, as of November 6, 1996, although compliance with some of the provisions was deferred until July 1, 1997, and certain of the provisions purport to apply to any tax imposed for general governmental purposes (i.e., “general taxes”) imposed, extended or increased on or after January 1, 1995 and prior to November 6, 1996.

Article XIII D imposes substantive and procedural requirements on the imposition, extension or increase of any “fee” or “charge” subject to its provisions. A “fee” or “charge” subject to Article XIII D includes any levy, other than an ad valorem tax, special tax or assessment, imposed by an agency upon a parcel or upon a person as an incident of property ownership. Article XIII D prohibits, among other things, the imposition of any proposed fee or charge, and, possibly, the increase of any existing fee or charge, in the event written protests against the proposed fee or charge are presented at a required public hearing on the fee or charge by a majority of owners of the parcels upon which the fee or charge is to be imposed. Except for fees and charges for water, sewer and refuse collection services, the approval of a majority of the property owners subject to the fee or charge, or at the option of the agency, by a two-thirds vote of the electorate residing in the affected area, is required not less than 45 days following the public hearing on any such proposed new or increased fee or charge. In the view of the SFPUC, rates for water usage charged by the SFPUC to the Wholesale Customers are not fees or charges under Article XIII D, although no assurance may be given by the SFPUC that a court would not determine otherwise.

The California Supreme Court decisions in *Richmond v. Shasta Community Services District*, 32 Cal. 4th 409 (2004) (“**Richmond**”), and *Bighorn-Desert View Water Agency v. Verjil*, 39 Cal. 4th 206 (2006) (“**Bighorn**”) have clarified uncertainty surrounding the applicability of Section 6 of Article XIII D to service fees and charges. In *Richmond*, the Shasta Community Services District charged a water connection fee, which included a capacity charge for capital improvements to the water system and a fire suppression charge. The Court held that both the capacity charge and the fire suppression charge were not subject to Article XIII D because a water connection fee is not a property-related fee or charge because it results from the property owner’s voluntary decision to apply for the connection. In both *Richmond* and *Bighorn*, however, the Court stated that a fee for ongoing water service through an existing connection is imposed “as an incident of property ownership” within the meaning of Article XIII D, rejecting, in *Bighorn*, the water agency’s argument that consumption-based water charges are not imposed “as an incident of property ownership” but as a result of the voluntary decisions of customers as to how much water to use.

The SFPUC provides public notice of proposed water rate increases in accordance with the requirements of Article XIII D through means that include, among others, holding informational presentations at community group meetings, mailings to residential and commercial customers of public hearings on rate increases, and press releases and media campaigns regarding rate increases, followed by public hearings conducted by the SFPUC’s Rate

Fairness Board and by the SFPUC itself. The SFPUC also develops and adopts retail utility user rates and fees in accordance with the requirements of Article XIID(6)(b) that limit property-related fees and charges.

Article XIIC extends the people's initiative power to reduce or repeal previously authorized local taxes, assessments, fees and charges. This extension of the initiative power is not limited by the terms of Article XIIC to fees, taxes, assessment fees and charges imposed after November 6, 1996 and absent other authority could result in retroactive reduction in any existing taxes, assessments, fees or charges. In Bighorn, the Court concluded that under Article XIIC local voters by initiative may reduce a public agency's water rates and delivery charges. The Court noted, however, that it was not holding that the authorized initiative power is free of all limitations, stating that it was not determining whether the electorate's initiative power is subject to the public agency's statutory obligation to set water service charges at a level that will "pay the operating expenses of the agency, ... provide for repairs and depreciation of works, provide a reasonable surplus for improvements, extensions, and enlargements, pay the interest on any bonded debt, and provide a sinking or other fund for the payment of the principal of such debt as it may become due."

The courts have not fully interpreted the provisions of Proposition 218. The SFPUC is unable to predict how courts will further interpret Article XIIC and Article XIID, and what, if any, further implementing legislation will be enacted. Under the Bighorn case, City voters could adopt an initiative measure that reduces or repeals the SFPUC's water rates and charges, though it is not clear whether (and courts have not decided whether) any such reduction or repeal by initiative would be enforceable in a situation in which such rates and charges are pledged to the repayment of bonded indebtedness. There can be no assurance that the courts will not further interpret, or the voters will not amend, Article XIIC and Article XIID to limit the ability of the SFPUC to impose, levy, charge and collect increased fees and charges for the Water Enterprise, or to call into question water rate increases previously adopted by the SFPUC. No assurance may be given that Articles XIIC and XIID will not have a material adverse impact on Revenues.

Proposition 26. Proposition 26, which amended Article XIII A and XIIC of the California Constitution, was approved by the electorate at the November 2, 2010 election. Proposition 26 imposes a two-thirds voter approval requirement for the imposition of fees and charges by the State. It also imposes a majority voter approval requirement on local governments with respect to fees and charges for general purposes, and a two-thirds voter approval requirement with respect to fees and charges for special purposes. According to its supporters, Proposition 26 was designed to prevent the circumvention of tax limitations imposed by the voters pursuant to Proposition 13, approved in 1978, Proposition 218, and other measures through the use of non-tax fees and charges.

Proposition 26 expressly excludes from its scope "a charge imposed for a specific government service or product provided directly to the payor that is not provided to those not charged, and which does not exceed the reasonable cost to the governmental entity of providing the service or product to the payor" and "assessments and property-related fees imposed in accordance with the provisions of Article XIID." The California Supreme Court has held that a fee for ongoing water service through an existing connection is imposed "as an incident of property ownership" within the meaning of Article XIID. See "– Proposition 218." The SFPUC believes that the initiative is not intended to, and would not, apply to fees for water deliveries and services charged by the SFPUC. The SFPUC, however, is unable to predict how Proposition 26 will be interpreted by the courts to apply to the provision of water services by local governments such as the SFPUC.

Initiative and Referendum

Article XIII A and Articles XIIC and XIID of the California Constitution were adopted pursuant to the State's constitutional initiative process. From time to time other initiative measures could be adopted by State voters, or by voters of the City, placing additional limitations on the ability of the SFPUC to increase revenues.

Charter Limitations

The Charter requires that bonds (such as the Bonds) secured by revenues, other than refunding bonds, may be issued only with the assent of a majority of voters. However, under the Charter amendments enacted by the voters in November 2002 (Proposition E), the SFPUC may issue revenue bonds, including notes, commercial paper or other forms of indebtedness, when authorized by ordinance approved by a two-thirds vote of the Board of

Supervisors, for the purpose of reconstructing, replacing, expanding, repairing or improving water facilities or wastewater facilities or combinations of water and wastewater facilities under the jurisdiction of the SFPUC (and subject to the further conditions contained in Proposition E). See “OBLIGATIONS PAYABLE FROM REVENUES – Authority for Issuance of Revenue Bonds and Other Obligations Payable from Revenues.”

In June 1998, the electorate of the City approved Proposition H which, subject to certain exceptions, including a limited exception to raise rates to pay debt service on voter-approved debt, froze the SFPUC’s water rates through July 1, 2006. The SFPUC can give no assurance that the electorate will not seek in the future to freeze or limit rate increases.

Future Charter Amendments

Voters in the City could adopt additional Charter amendments in the future which would limit the ability of the SFPUC to issue debt or to enact rate increases, affect the operation of the Water Enterprise or implement other changes affecting the SFPUC and the Water Enterprise. See “RISK FACTORS – Initiative, Referendum, Charter Amendments and Future Legislation.”

LITIGATION

The SFPUC is not aware of any litigation pending or threatened questioning the political existence of the City or the SFPUC or contesting the SFPUC’s power to fix Water Enterprise rates and charges, or in any way questioning or affecting:

- (i) the proceedings under which the 2019 Series ABC Bonds are to be issued,
- (ii) the validity of any provision of the 2019 Series ABC Bonds or the Indenture,
- (iii) the pledge of Revenues by the SFPUC under the Indenture, or
- (iv) the titles to office of the present members of the Board of Supervisors and the Commission.

There are a number of suits and claims pending against the City and the SFPUC impacting the Water Enterprise, which may include personal injury, wrongful death and other suits and claims against which the City may self-insure. The aggregate amount of the self-insured liabilities of the City and the SFPUC which may result from such suits and claims will not, in the opinion of the City Attorney, materially impair the ability of the SFPUC to pay principal of or interest on the 2019 Series ABC Bonds as they become due. There is no litigation pending, with service of process having been accomplished, against the City or the SFPUC which if determined adversely to the City or the SFPUC would, in the opinion of the City Attorney, materially impair the ability of the SFPUC to pay principal of and interest on the 2019 Series ABC Bonds as they become due.

TAX MATTERS

State Tax Exemption on 2019 Series ABC Bonds. In the opinion of Bond Counsel, under existing law interest on the 2019 Series ABC Bonds is exempt from personal income taxes of the State of California. A copy of the form of opinion of Bond Counsel relating to the 2019 Series ABC Bonds is included in Appendix D.

Federal Income Tax Considerations. Interest on the 2019 Series ABC Bonds will be includable in gross income of the owners thereof for federal income taxes.

The following is a general summary of certain United States federal income tax consequences of the purchase and ownership of the 2019 Series ABC Bonds. The discussion is based upon the Internal Revenue Code of 1986 (the “Code”), United States Treasury Regulations, rulings and decisions now in effect, all of which are subject to change (possibly, with retroactive effect) or possibly differing interpretations. No assurance can be given that future changes in the law will not alter the conclusions reached herein.

The discussion below does not purport to deal with United States federal income tax consequences applicable to all categories of investors and generally does not address consequences relating to the disposition of a 2019 Series ABC Bond by the owner thereof for federal income tax purposes. Further, the discussion below does not discuss all aspects of federal income taxation that may be relevant to a particular investor in the 2019 Series ABC Bonds in light of the investor's particular circumstances or to certain types of investors subject to special treatment under the federal income tax laws (including insurance companies, tax exempt organizations and other entities, financial institutions, broker-dealers, persons who have hedged the risk of owning the 2019 Series ABC Bonds, traders in securities that elect to use a mark to market method of accounting, thrifts, regulated investment companies, pension and other employee benefit plans, partnerships and other pass through entities, certain hybrid entities and owners of interests therein, persons who acquire 2019 Series ABC Bonds in connection with the performance of services, or persons deemed to sell 2019 Series ABC Bonds under the constructive sale provisions of the Code). The discussion below also does not discuss any aspect of state, local, or foreign law or United States federal tax laws other than United States federal income tax law. The discussion below is limited to certain issues relating to initial investors who will hold the 2019 Series ABC Bonds as "capital assets" within the meaning of section 1221 of the Code, and acquire such 2019 Series ABC Bonds for investment and not as a dealer or for resale. The discussion below addresses certain federal income tax consequences applicable to owners of the 2019 Series ABC Bonds who are United States persons within the meaning of section 7701(a)(30) of the Code ("**United States persons**") and, except as discussed below, does not address any consequence to persons other than United States persons.

Prospective investors should note that no rulings have been or will be sought from the Internal Revenue Service (the "**Service**") with respect to any of the United States federal income tax consequences discussed below, and no assurance can be given that the Service will not take contrary positions.

ALL PROSPECTIVE INVESTORS SHOULD CONSULT THEIR TAX ADVISORS IN DETERMINING THE FEDERAL, STATE, LOCAL, FOREIGN AND ANY OTHER TAX CONSEQUENCES TO THEM FROM THE PURCHASE, OWNERSHIP AND DISPOSITION OF THE 2019 SERIES ABC BONDS.

Stated Interest and Reporting of Interest Payments on the 2019 Series ABC Bonds. The stated interest on the 2019 Series ABC Bonds will be included in the gross income, as defined in section 61 of the Code, of the owners thereof as ordinary income for federal income tax purposes at the time it is paid or accrued, depending on the tax accounting method applicable to the owners thereof. Subject to certain exceptions, the stated interest on the 2019 Series ABC Bonds will be reported to the Service. Such information will be filed each year with the Service on Form 1099-INT (or other appropriate reporting form) which will reflect the name, address, and taxpayer identification number of the owner. A copy of such Form 1099-INT will be sent to each owner of a 2019 Series ABC Bond for federal income tax purposes.

Original Issue Discount on 2019 Series ABC Bonds. If the first price at which a substantial amount of a maturity of the 2019 Series ABC Bonds is sold (ignoring sales to bond houses, brokers or similar persons or organizations acting in the capacity of underwriters, placement agents, or wholesalers) (the "**Issue Price**") is less than the stated redemption price at maturity of such maturity of the 2019 Series ABC Bonds, the excess of the stated redemption price at maturity of such maturity of the 2019 Series ABC Bond over the Issue Price of that maturity is "original issue discount" and is taxed as interest as it is accrued by the owner of that Bond as described herein. If the original issue discount on a 2019 Series ABC Bond is de minimis (generally one quarter of one percent of its stated redemption price at maturity multiplied by the number of complete years to its maturity, the original issue discount on that 2019 Series ABC Bond will be treated as zero. The stated redemption price at maturity of a 2019 Series ABC Bond is the sum of all payments provided by such 2019 Series ABC Bond other than "qualified stated interest" payments. The term "qualified stated interest" generally means stated interest that is unconditionally payable in cash or property (other than debt instruments of the issuer) at least annually at a single fixed rate.

Original issue discount on a 2019 Series ABC Bond will be amortized over the life of the 2019 Series ABC Bond using the "constant yield method" provided in the Treasury Regulations. As original issue discount on a 2019 Series ABC Bond would accrue under the constant yield method, the owner of a 2019 Series ABC Bond issued with original issue discount generally will be required to include such accrued amount in its gross income as interest, regardless of its regular method of accounting. This can result in taxable income to the beneficial owner of such a

2019 Series ABC Bond that exceeds actual cash distributions to that owner in a taxable year. To the extent that a 2019 Series ABC Bond is purchased at a price that exceeds the sum of the Issue Price of that 2019 Series ABC Bond and all original issue discount on that 2019 Series ABC Bond previously includible by any holder in gross income (the “revised issue price” of that 2019 Series ABC Bond), the subsequent annual inclusion of original issue discount by that purchaser is adjusted downward to reflect that excess.

The amount of the original issue discount that accrues on the 2019 Series ABC Bonds each taxable year will be reported annually to the Service on Form 1099-OID (or other appropriate reporting form) and to the owners. The portion of the original issue discount included in each owner’s gross income while the owner holds the 2019 Series ABC Bonds will increase the adjusted tax basis of the 2019 Series ABC Bonds in the hands of such owner.

Amortizable Bond Premium for 2019 Series ABC Bonds. An owner that purchases a 2019 Series ABC Bond for an amount that is greater than its stated redemption price at maturity will be considered to have purchased the 2019 Series ABC Bond with “amortizable bond premium” equal in amount to such excess. The owner may elect to amortize such premium using a constant yield method over the remaining term of the 2019 Series ABC Bond and may offset interest otherwise required to be included in respect of the 2019 Series ABC Bond during any taxable year by the amortized amount of such excess for the taxable year. Amortizable bond premium on a 2019 Series ABC Bond held by an owner that does not make such an election will decrease the amount of gain or increase the amount of loss otherwise recognized on the sale, exchange, redemption or retirement of a 2019 Series ABC Bond. However, if the 2019 Series ABC Bond may be optionally redeemed after the beneficial owner acquires it at a price in excess of its stated redemption price at maturity, special rules would apply under the Treasury Regulations which could result in a deferral of the amortization of some bond premium until later in the term of the 2019 Series ABC Bond. Any election to amortize one’s amortizable bond premium would apply to all taxable debt instruments held by the beneficial owner on or after the first day of the first taxable year to which such election applies and may be revoked only with the consent of the Service.

Disposition of 2019 Series ABC Bonds, Inclusion of Acquisition Discount and Treatment of Market Discount. An owner of 2019 Series ABC Bonds will generally recognize gain or loss on the sale, exchange, redemption or retirement of the 2019 Series ABC Bonds equal to the difference between the amount realized on the sale, exchange, redemption or retirement (exclusive of the amount paid for accrued interest) and the owner’s adjusted tax basis in 2019 Series ABC Bonds. Generally, the owner’s adjusted tax basis in the 2019 Series ABC Bonds will be the owner’s initial cost, increased by original issue discount (if any) previously included in the owner’s income to the date of disposition, and decreased by the amount of any payments, other than qualified stated interest payments, received and amortizable bond premium taken with respect to such 2019 Series ABC Bond. Any gain or loss generally will be capital gain or loss and will be long-term or short-term, depending on the owner’s holding period for the 2019 Series ABC Bonds.

Under current law, a purchaser of a 2019 Series ABC Bond who did not purchase that 2019 Series ABC Bond in the initial public offering (a “subsequent purchaser”) generally will be required, on the disposition (or earlier partial principal payment) of such 2019 Series ABC Bond, to recognize as ordinary income a portion of the gain (or partial principal payment), if any, to the extent of the accrued “market discount.” In general, market discount is the amount by which the price paid for such 2019 Series ABC Bond by such a subsequent purchaser is less than the stated redemption price at maturity of that 2019 Series ABC Bond (or, in the case of a 2019 Series ABC Bond bearing original issue discount, is less than the “revised issue price” of that 2019 Series ABC Bond (as defined below) upon such purchase), except that market discount is considered to be zero if it is less than one quarter of one percent of the principal amount times the number of complete remaining years to maturity. The Code also limits the deductibility of interest incurred by a subsequent purchaser on funds borrowed to acquire 2019 Series ABC Bonds with market discount. As an alternative to the inclusion of market discount in income upon disposition, a subsequent purchaser may elect to include market discount in income currently as it accrues on all market discount instruments acquired by the subsequent purchaser in that taxable year or thereafter, in which case the interest deferral rule will not apply. The recharacterization of gain as ordinary income on a subsequent disposition of such 2019 Series ABC Bonds could have a material effect on the market value of such 2019 Series ABC Bonds.

Medicare Contribution Tax. Pursuant to Section 1411 of the Code, as enacted by the Health Care and Education Reconciliation Act of 2010, an additional tax is imposed on individuals at 3.8% of the lesser of (i) the taxpayer’s net investment income (which includes interest, original issue discount and net gains from a disposition

of a 2019 Series ABC Bond), or (ii) the excess of the taxpayer's "modified adjusted gross income" over \$200,000 for unmarried individuals (\$250,000 for married couples filing a joint return or for a surviving spouse). Any individual taxpayer owning 2019 Series ABC Bonds (whether directly or indirectly through pass-through entities) should consult with that taxpayer's tax advisor concerning this additional tax, as it may apply to interest earned on the 2019 Series ABC Bonds as well as to gain on the sale of a 2019 Series ABC Bond.

Defeasance of 2019 Series ABC Bonds. Persons considering the purchase of a 2019 Series ABC Bond should be aware that the bond documents permit the SFPUC under certain circumstances to deposit monies or securities with the Trustee in an amount sufficient to cause a release of the lien of the Indenture (a "defeasance"). A defeasance would likely be a taxable event resulting in the realization of gain or loss by the owner of a defeased 2019 Series ABC Bond for federal income tax purposes, without any corresponding receipt of monies by the owner. Such gain or loss generally would be subject to recognition for the tax year in which such realization occurs, as in the case of a sale or exchange. In addition, the defeased instrument may be treated as having been reissued with original issue discount or amortizable bond premium with the consequences described above. Owners of 2019 Series ABC Bonds are advised to consult their tax advisers with respect to the tax consequences resulting from such events.

Backup Withholding. Under section 3406 of the Code, an owner of a 2019 Series ABC Bond who is a United States person may, under certain circumstances, be subject to "backup withholding" (currently at a rate of 24%) of current or accrued interest on a 2019 Series ABC Bond or with respect to proceeds received from a disposition of the 2019 Series ABC Bond. This withholding applies if such owner of a 2019 Series ABC Bond: (i) fails to furnish to the payor such owner's social security number or other taxpayer identification number ("TIN"); (ii) furnishes the payor an incorrect TIN; (iii) fails to properly report interest, dividends, or other "reportable payments" as defined in the Code; or (iv) under certain circumstances, fails to provide the payor with a certified statement, signed under penalty of perjury, that the TIN provided to the payor is correct and that such owner is not subject to backup withholding.

Backup withholding will not apply, however, with respect to payments made to certain owners of the 2019 Series ABC Bonds. Owners of the 2019 Series ABC Bonds should consult their tax advisors regarding their qualification for exemption from backup withholding and the procedures for obtaining such exemption.

Withholding on Payments to Nonresident Alien Individuals and Foreign Corporations. Under sections 1441 and 1442 of the Code, nonresident alien individuals and foreign corporations are generally subject to withholding at the current rate of 30% (subject to change) on periodic income items arising from sources within the United States, provided such income is not effectively connected with the conduct of a United States trade or business.

Assuming the interest income of such an owner of the 2019 Series ABC Bonds is not treated as effectively connected income within the meaning of section 864 of the Code, such interest will be subject to 30% withholding, or any lower rate specified in an income tax treaty, unless such income is treated as portfolio interest. Interest will be treated as portfolio interest if: (i) the owner provides a statement to the payor certifying, under penalties of perjury, that such owner is not a United States person and providing the name and address of such owner; (ii) such interest is treated as not effectively connected with the owner's United States trade or business; (iii) interest payments are not made to a person within a foreign country that the Service has included on a list of countries having provisions inadequate to prevent United States tax evasion; (iv) interest payable with respect to the 2019 Series ABC Bonds is not deemed contingent interest within the meaning of the portfolio debt provision; (v) such owner is not a controlled foreign corporation, within the meaning of section 957 of the Code; and (vi) such owner is not a bank receiving interest on the 2019 Series ABC Bonds pursuant to a loan agreement entered into in the ordinary course of the bank's trade or business.

Assuming payments on the 2019 Series ABC Bonds are treated as portfolio interest within the meaning of sections 871 and 881 of the Code, then no withholding under section 1441 and 1442 of the Code and no backup withholding under section 3406 of the Code is required with respect to owners or intermediaries who have furnished Form W-8 BEN, Form W-8 EXP or Form W-8 IMY, as applicable, provided the payor does not have actual knowledge or reason to know that such person is a United States person.

Foreign Account Tax Compliance Act (“FATCA”) – U.S. Holders and Non-U.S. Holders. Sections 1471 through 1474 of the Code (commonly referred to as “FATCA”) impose a reporting regime and potentially a 30% withholding tax on certain payments made to or through (i) a “foreign financial institution” (as specifically defined in the Code) that does not enter into an agreement with the Service to provide the Service with certain information in respect of its account holders and investors or (ii) a “non-financial foreign entity” (as specifically defined in the Code) that does not provide sufficient information with respect to its substantial U.S. owners, if any. The United States has entered into, and continues to negotiate, intergovernmental agreements (each, an “IGA”) with a number of other jurisdictions to facilitate the implementation of FATCA. An IGA may significantly alter the application of FATCA and its information reporting and withholding requirements with respect to any particular investor.

Failure to comply with the additional certification, information reporting and other specified requirements imposed under FATCA could result in the 30% withholding tax being imposed on payments of interest and principal under the 2019 Series ABC Bonds and sales proceeds of 2019 Series ABC Bonds held by or through a foreign entity. In general, withholding under FATCA currently applies to payments of U.S. source interest (including original issue discount) and gross proceeds from the sale, exchange or retirement of debt obligations paid after December 31, 2018, and will apply to “foreign pass-thru payments” but no earlier than two years after the date of publication of final regulations defining the term “foreign pass thru payment.” Prospective investors should consult their own tax advisors regarding FATCA and its effect on them.

ERISA Considerations. The Employee Retirement Income Security Act of 1974, as amended (“ERISA”), and section 4975 of the Code generally prohibit certain transactions between employee benefit plans under ERISA or tax qualified retirement plans and individual retirement accounts under the Code (collectively, the “Plans”) and persons who, with respect to a Plan, are fiduciaries or other “parties in interest” within the meaning of ERISA or “disqualified persons” within the meaning of the Code. In addition, each fiduciary of a Plan (“Plan Fiduciary”) must give appropriate consideration to the facts and circumstances that are relevant to an investment in the 2019 Series ABC Bonds, including the role that such an investment in the 2019 Series ABC Bonds would play in the Plan’s overall investment portfolio. Each Plan Fiduciary, before deciding to invest in the 2019 Series ABC Bonds, must be satisfied that such investment in the 2019 Series ABC Bonds is a prudent investment for the Plan, that the investments of the Plan, including the investment in the 2019 Series ABC Bonds, are diversified so as to minimize the risk of large losses and that an investment in the 2019 Series ABC Bonds complies with the documents of the Plan and related trust, to the extent that such documents are consistent with ERISA. All Plan Fiduciaries, in consultation with their advisors, should carefully consider the impact of ERISA and the Code on an investment in any 2019 Series ABC Bond.

The preceding discussion of certain United States federal income tax consequences is for general information only and is not tax advice. Accordingly, each investor should consult its tax advisor as to particular tax consequences to it of purchasing, owning, and disposing of the 2019 Series ABC Bonds, including the applicability and effect of any state, local, or foreign tax laws, and of any proposed changes in applicable laws.

CERTAIN LEGAL MATTERS

Certain legal matters incident to the authorization, sale and delivery of the 2019 Series ABC Bonds are subject to the approval of Norton Rose Fulbright US LLP, San Francisco, California, Bond Counsel to the SFPUC. Certain legal matters are being passed upon for the SFPUC by the City Attorney and by Orrick, Herrington & Sutcliffe LLP, San Francisco, California, Disclosure Counsel. Certain legal matters are being passed upon for the Underwriters by Kutak Rock LLP, Irvine, California. Bond Counsel and Disclosure Counsel will receive compensation that is contingent upon the sale and delivery of the 2019 Series ABC Bonds.

The form of approving opinion of Bond Counsel is set forth in Appendix D, and will be available at the time of delivery of the 2019 Series ABC Bonds. Bond Counsel is not passing upon and undertakes no responsibility for the accuracy, completeness or fairness of the information contained in this Official Statement.

Orrick, Herrington & Sutcliffe LLP has served as Disclosure Counsel to the SFPUC and in such capacity has advised the SFPUC with respect to the requirements of applicable securities laws and participated with responsible SFPUC officials and staff in conferences and meetings where information contained in this Official Statement was reviewed for accuracy and completeness. Disclosure Counsel is not responsible for the accuracy or

completeness of the information presented in this Official Statement and has not undertaken to independently verify any of such information. Rather, the SFPUC is solely responsible for the accuracy and completeness of the information contained in this Official Statement. Upon the issuance of the 2019 Series ABC Bonds, Orrick, Herrington & Sutcliffe LLP will deliver a letter to the SFPUC concerning certain matters with respect to the Official Statement. No purchaser or holder of the 2019 Series ABC Bonds, or other person or party other than the SFPUC, will be entitled to rely on such letter or on the fact that Orrick, Herrington & Sutcliffe LLP has acted as Disclosure Counsel to the SFPUC.

RATINGS

Moody's Investors Service ("**Moody's**") has assigned its municipal bond rating of "Aa2" to the 2019 Series ABC Bonds, and S&P Global Ratings, a Standard & Poor's Financial Services LLC business ("**S&P**"), has assigned its municipal bond rating of "AA-" to the 2019 Series ABC Bonds.

The ratings assigned by Moody's and S&P express only the views of the respective rating agencies. The explanation of the significance of these ratings, and any outlook associated with these ratings, may be obtained from Moody's and S&P, respectively. Each rating agency generally bases its rating on its own investigations, studies, and assumptions. The SFPUC has provided certain additional information and materials to the rating agencies (some of which does not appear in this Official Statement).

A securities rating is not a recommendation to buy, sell or hold securities and may be subject to revision or withdrawal at any time. There is no assurance such ratings will continue for any given period of time or that such ratings will not be revised downward or withdrawn entirely by the rating agencies, if in the judgment of such rating agencies, circumstances so warrant. Any such downward revision or withdrawal of such ratings may have an adverse effect on the market price of the 2019 Series ABC Bonds. The SFPUC undertakes no responsibility to maintain its current ratings on the 2019 Series ABC Bonds or to oppose any such downward revision, suspension or withdrawal.

UNDERWRITING

The 2019 Series ABC Bonds are being purchased by Morgan Stanley & Co. LLC, Goldman Sachs & Co. LLC, BofA Securities, Inc., Citigroup Global Markets Inc. and J.P. Morgan Securities LLC (collectively, the "**Underwriters**").

The Underwriters have agreed to purchase the 2019 Sub-Series A Bonds from the SFPUC at a purchase price of \$621,608,975.95 (consisting of \$622,580,000.00 aggregate principal amount of the 2019 Sub-Series A Bonds, less an underwriter's discount of \$971,024.05). Under the bond purchase contract to be entered into in connection with the purchase of the 2019 Sub-Series A Bonds, the Underwriters will be obligated to purchase all of the 2019 Sub-Series A Bonds if any are purchased, the obligation to make such purchase being subject to certain terms and conditions to be satisfied by the SFPUC.

The Underwriters have agreed to purchase the 2019 Sub-Series B Bonds from the SFPUC at a purchase price of \$16,424,343.30 (consisting of \$16,450,000.00 aggregate principal amount of the 2019 Sub-Series B Bonds, less an underwriter's discount of \$25,656.70). Under the bond purchase contract to be entered into in connection with the purchase of the 2019 Sub-Series B Bonds, the Underwriters will be obligated to purchase all of the 2019 Sub-Series B Bonds if any are purchased, the obligation to make such purchase being subject to certain terms and conditions to be satisfied by the SFPUC.

The Underwriters have agreed to purchase the 2019 Sub-Series C Bonds from the SFPUC at a purchase price of \$17,897,042.78 (consisting of \$17,925,000.00 aggregate principal amount of the 2019 Sub-Series C Bonds, less an underwriter's discount of \$27,957.22). Under the bond purchase contract to be entered into in connection with the purchase of the 2019 Sub-Series C Bonds, the Underwriters will be obligated to purchase all of the 2019 Sub-Series C Bonds if any are purchased, the obligation to make such purchase being subject to certain terms and conditions to be satisfied by the SFPUC.

The Underwriters have certified the reoffering prices or yields set forth on the inside cover of this Official Statement. The SFPUC takes no responsibility for the accuracy of these prices or yields. The Underwriters may offer and sell the 2019 Sub-Series A Bonds, the 2019 Sub-Series B Bonds or the 2019 Sub-Series C Bonds to certain dealers and others at prices lower than the offering prices stated on the inside cover page. The offering prices may be changed from time to time by the Underwriters.

The Underwriters and their respective affiliates are full service financial institutions engaged in various activities, which may include securities trading, commercial and investment banking, financial advisory, investment management, principal investment, hedging, financing and brokerage activities. Certain of the Underwriters and their respective affiliates have, from time to time, performed, and may in the future perform, various investment banking services for the SFPUC for which they received or will receive customary fees.

In the ordinary course of their various business activities, the Underwriters and their respective affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (which may include bank loans and/or credit default swaps) for their own account and for the accounts of their customers and may at any time hold long and short positions in such securities and instruments. Such investment and securities activities may involve securities and instruments of the SFPUC.

Morgan Stanley & Co. LLC, an underwriter of the 2019 Series ABC Bonds, has entered into a retail distribution arrangement with its affiliate Morgan Stanley Smith Barney LLC. As part of this arrangement, Morgan Stanley & Co. LLC may distribute municipal securities to retail investors through the financial advisor network of Morgan Stanley Smith Barney LLC. As part of this arrangement, Morgan Stanley & Co. LLC may compensate Morgan Stanley Smith Barney LLC for its selling efforts with respect to the 2019 Series ABC Bonds.

BofA Securities, Inc., an underwriter of the 2019 Series ABC Bonds, has entered into a distribution agreement with its affiliate Merrill Lynch, Pierce, Fenner & Smith Incorporated (“**MLPF&S**”). As part of this arrangement, BofA Securities, Inc. may distribute securities to MLPF&S, which may in turn distribute such securities to investors through the financial advisor network of MLPF&S. As part of this arrangement, BofA Securities, Inc. may compensate MLPF&S as a dealer for their selling efforts with respect to the 2019 Series ABC Bonds.

Citigroup Global Markets Inc., an Underwriter of the 2019 Series ABC Bonds, has entered into a retail distribution agreement with Fidelity Capital Markets, a division of National Financial Services LLC (together with its affiliates, “**Fidelity**”). Under this distribution agreement, Citigroup Global Markets Inc. may distribute municipal securities to retail investors at the original issue price through Fidelity. As part of this arrangement, Citigroup Global Markets Inc. will compensate Fidelity for its selling efforts with respect to the 2019 Series ABC Bonds.

J.P. Morgan Securities LLC (“**JPMS**”), one of the Underwriters of the 2019 Series ABC Bonds, has entered into negotiated dealer agreements with each of Charles Schwab & Co., Inc. (“**CS&Co.**”) and LPL Financial LLC (“**LPL**”) for the retail distribution of certain securities offerings at the original issue prices. Pursuant to each dealer agreement (if applicable to this transaction), each of CS&Co. and LPL will purchase 2019 Series ABC Bonds from JPMS at the original issue price less a negotiated portion of the selling concession applicable to any 2019 Series ABC Bonds that such firm sells.

FINANCIAL STATEMENTS

Attached as Appendix C are the audited financial statements of the Water Enterprise (the “**Financial Statements**”) for Fiscal Years 2018-19 and 2017-18, prepared by the SFPUC and audited by KPMG LLP, independent certified public accountants, San Francisco, California (the “**Auditor**”). The financial statements are included for convenience.

The audited financial statements of the SFPUC are public documents and the SFPUC has not requested nor did the SFPUC obtain permission from the Auditor to include the audited financial statements as an Appendix to this Official Statement. Accordingly, the Auditor has made no representation in connection with inclusion of the audits herein that there has been no material change in the financial condition of the SFPUC since the most recent

audit was concluded. The Auditor has not been engaged to perform and has not performed, since the date of its report included herein, any procedures on the financial statements addressed in that report. The Auditor also has not performed any procedures relating to this Official Statement.

CONTINUING DISCLOSURE

The SFPUC has covenanted for the benefit of the Owners and Beneficial Owners of the 2019 Series ABC Bonds, under a Continuing Disclosure Certificate dated as of the Closing Date, to provide certain financial information and operating data (the “**Annual Report**”) not later than nine months following the end of its Fiscal Year (presently June 30), beginning on March 31, 2020, with the report for Fiscal Year 2018-19, and to promptly provide notices of the occurrence of certain enumerated events set forth in the Continuing Disclosure Certificate (“**Listed Events**”).

The SFPUC will file the Annual Report and any notice of Listed Events as described in the Continuing Disclosure Certificate. The specific nature of the information to be contained in the Annual Report or the notices of Listed Events is set forth in the Continuing Disclosure Certificate. These covenants have been made in order to assist the Underwriters in complying with the Rule. The form of the Continuing Disclosure Certificate is attached to this Official Statement as Appendix E. As of the date hereof, the SFPUC is in compliance in all material respects with its continuing disclosure undertakings.

On December 28, 2017, the SFPUC issued its Water Revenue Bonds, 2017 Series DEFG, which refunded and defeased portions of six series of its water revenue bonds. Pursuant to irrevocable instructions in the related escrow agreement, U.S. Bank National Association, as escrow agent (the “**2017 Escrow Agent**”), timely filed four notices of partial defeasance. However, the 2017 Escrow Agent inadvertently failed to timely file the remaining two notices of partial defeasance. The two remaining notices were filed on June 14, 2018.

CO-MUNICIPAL ADVISORS

Backstrom McCarley Berry & Co., LLC, San Francisco, California, and Montague DeRose and Associates, LLC, Walnut Creek, California (the “**Co-Municipal Advisors**”), have served as Co-Municipal Advisors to the SFPUC in connection with the structuring and delivery of the 2019 Series ABC Bonds. The Co-Municipal Advisors have participated with responsible SFPUC officials and staff in conferences and meetings where information contained in this Official Statement was reviewed for accuracy and completeness. The Co-Municipal Advisors are not, however, obligated to undertake, and have not undertaken to make, an independent verification or to assume responsibility for the accuracy, completeness or fairness of the information contained in this Official Statement. The Co-Municipal Advisors will receive compensation that is contingent upon the sale and delivery of the 2019 Series ABC Bonds.

VERIFICATION OF MATHEMATICAL ACCURACY

Upon delivery of the 2019 Series ABC Bonds, Causey Demgen & Moore P.C., Denver, Colorado, will deliver a report on the mathematical accuracy of certain computations, contained in schedules provided to them on behalf of the SFPUC, relating to (a) the sufficiency of the anticipated receipts from the cash deposited in the Escrow Fund to prepay the Refunded Bonds in full, and (b) the “yield” on the investments deposited in the Escrow Fund and on the Refunded Bonds considered by Bond Counsel in connection with the opinion rendered by such firm that the Refunded Bonds are not “arbitrage bonds” within the meaning of Section 148 of the Internal Revenue Code of 1986, as amended.

MISCELLANEOUS

References made in this Official Statement to certain documents and reports are brief summaries thereof that do not purport to be complete or definitive, and reference is made to such documents and reports for full and complete statements of the contents thereof.

The appendices to this Official Statement are integral parts of this Official Statement. Investors must read the entire Official Statement, including the appendices, to obtain information essential to making an informed investment decision.

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APPROVAL AND DELIVERY

This Official Statement has been duly approved, executed and delivered by the SFPUC.

PUBLIC UTILITIES COMMISSION OF THE
CITY AND COUNTY OF SAN FRANCISCO

By: _____ /s/ Harlan L. Kelly, Jr.
Harlan L. Kelly, Jr.
General Manager

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APPENDIX A

SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE

This Appendix contains summaries of certain provisions of the Indenture, which are in addition and complementary to the summaries found in the Official Statement under the captions "INTRODUCTION" "THE 2019 Series ABC BONDS" and "SECURITY FOR THE BONDS." The following summaries are qualified in their entirety by reference to the complete Indenture, a copy of which can be obtained from the Commission.

DEFINITIONS

Accreted Value

The term "Accreted Value" means, with respect to any Capital Appreciation Bond, the principal amount thereof plus the interest accrued thereon from its date, compounded at the approximate interest rate thereof on each May 1 and November 1. The Accreted Values at any date to which reference is made will be the amounts set forth in the Accreted Value Table.

Accreted Value Table

The term "Accreted Value Table" means, with respect to any Capital Appreciation Bonds, the corresponding table attached as an Exhibit to the Indenture or to a Supplemental Indenture pursuant to which Additional Bonds constituting Capital Appreciation Bonds are issued.

Additional Bonds

The term "Additional Bonds" means bonds, notes or other obligations of the Commission payable from Revenues and ranking on a parity with the Bonds and authorized to be issued under and pursuant to the Indenture.

Balloon Indebtedness

The term "Balloon Indebtedness" means a Series of Bonds 25% or more of the principal of which matures on the same date and which amount is not required by the documents governing such Bonds to be amortized by payment or redemption prior to such date. For purposes of this definition, an optional or mandatory tender of Bonds for purchase as described within the definition of Tender Indebtedness will not be treated as a maturity. If any Series of Bonds consists partially of Variable Rate Indebtedness and partially of indebtedness bearing interest at a fixed rate, the portion constituting Variable Rate Indebtedness and the portion bearing interest at a fixed rate will be treated as separate issues for purposes of determining whether any such indebtedness constitutes Balloon Indebtedness.

Board of Supervisors

The term "Board of Supervisors" means the Board of Supervisors of the City from time to time or any other governing board of the City hereafter provided for pursuant to law.

Bond Obligation

The term "Bond Obligation" means, as of any given date of calculation, (1) with respect to any Outstanding Current Interest Bond, the principal amount of such Bond, (2) with respect to any Outstanding Capital Appreciation Bond, the Accreted Value thereof as of the May 1 or November 1 next preceding such date of calculation (unless such date of calculation is a May 1 or November 1 in which case as of such date), and (3) with respect to any outstanding Parity State Loan, the unpaid principal amount of the Parity State Loan.

Bondowner, Owner

The term “Bondowner” or “Owner” means any person who is the registered owner of any Outstanding Bond, or, if such Outstanding Bond has a maturity of one year or less and is issued in bearer form, means the bearer of such Bond, or, with respect to any Parity State Loan, means the State of California (or any board, department or agency thereof).

Bond Reserve Fund

The term “Bond Reserve Fund” means the fund by that name established under the Indenture.

Bond Reserve Fund Policy

The term “Bond Reserve Fund Policy” means a policy of insurance or surety bond issued by a Municipal Bond Insurer, obligations insured by which have a rating by Moody’s and S&P which is the highest rating then issued by said rating agency, or a Letter of Credit issued by a Qualified Bank, to satisfy all or a portion of the Required Reserve.

Bonds, Capital Appreciation Bonds, Current Interest Bonds, Serial Bonds, Term Bonds

The term “Bonds” means the San Francisco Water Revenue Bonds authorized by, and at any time Outstanding pursuant to, the Indenture or any Supplemental Indenture, including any Additional Bonds authorized by, and at any time Outstanding pursuant to, the Indenture and any Supplemental Indenture, and includes bonds, notes or other evidences of indebtedness (other evidence of indebtedness includes Parity State Loans, but only for purposes of (i) the calculation of “Maximum Annual Debt Service”, “Annual Debt Service”, “Debt Service” and “Average Annual Debt Service” and (ii) the provisions of the Indenture described in “REVENUES AND FUNDS—Pledge and Assignment of Revenues; Revenue Fund,” “EVENTS OF DEFAULT AND REMEDIES OF BONDOWNERS—Events of Default; Acceleration,” “--Bondholder Suits” and “--Application of Funds Upon Acceleration,” and in the forepart as “SECURITY FOR THE BONDS—Rate Covenants”) payable from Revenues on a parity with the Outstanding Bonds.

The term “Current Interest Bonds” means all or any portion of a Series of Bonds designated as Current Interest Bonds and which pay interest at least semiannually to the Owners thereof excluding the first payment of interest thereon.

The term “Capital Appreciation Bonds” means all or any portion of a Series of Bonds designated as Capital Appreciation Bonds and on which interest is compounded and paid at maturity or on prior redemption.

The term “Serial Bonds” means all or any portion of a Series of Bonds designated as Serial Bonds and for which no Minimum Sinking Fund Account Payments are provided.

The term “Term Bonds” means all or any portion of a Series of Bonds designated as Term Bonds and which are payable at or before their specified maturity date or dates from Minimum Sinking Fund Account Payments established for that purpose and calculated to retire such Bonds on or before their specified maturity date or dates.

Build America Bonds

The term “Build America Bonds” means any bonds or other obligations issued as Build America Bonds under Section 54AA of the Code, or under any other provisions of the Code that creates, in the determination of the Commission, a substantially similar direct-pay subsidy program that provides comparable security for the Owners of the Bonds.

Business Day

The term “Business Day” means any day other than (1) a Saturday, Sunday or day upon which commercial banks in San Francisco, California, or New York, New York are authorized or required to be closed and (2) for purposes of payments and other actions relating to Bonds secured by a Letter of Credit, a day upon which commercial banks in the city in which is located the office of the Qualified Bank at which demands for payment under the Letter of Credit are to be presented are authorized to be closed.

Certificate of the Commission

The term “Certificate of the Commission” means an instrument in writing signed by the President or by the General Manager or by any other officer of the Commission or of the City duly authorized by the Commission for that purpose, and by the Secretary. Any such instrument and supporting opinions or representations, if any, may, but need not, be combined in a single instrument with any other instrument, opinion or representation, and the two or more so combined will be read and construed as a single instrument. If and to the extent required by the provisions of the Indenture, each Certificate of the Commission will include the statements provided for in the Indenture.

Charter

The term “Charter” means with respect to the Outstanding Bonds and any Additional Bonds, the Charter of the City as it now exists or as it may hereafter be amended, and any new or successor Charter.

City

The term “City” means the existing political subdivision known as the City and County of San Francisco, in the State of California, as the same is organized and existing under and by virtue of the Constitution and laws of the State of California and the Charter and any public body hereafter created which will be a successor thereto.

Code

The term “Code” means the Internal Revenue Code of 1986, as amended.

Commission

The term “Commission” means the Public Utilities Commission of the City duly constituted under the Charter, and all commissions, agencies or public bodies hereafter created which succeed to or take over the powers and duties of the Commission with respect to the Enterprise.

Consulting Engineers

The term “Consulting Engineers” means any engineer or firm of engineers retained by the Commission having a wide and favorable reputation for skill and experience in evaluating the construction and operation of public utilities, including public water supply, storage and distribution systems, or in other revenue producing publicly owned enterprises, to perform the acts and carry out the duties provided for such consulting engineers in the Indenture.

Controller

The term “Controller” means the Controller of the City from time to time and includes any deputy acting for the Controller.

Credit Provider

The term “Credit Provider” refers to a Municipal Bond Insurer that has issued an outstanding policy of municipal bond insurance or a Qualified Bank that is the issuer of an outstanding Letter of Credit which, in each

case, secures payment of principal of, and interest on, or tender price of, all or a portion of a Series of Bonds; provided that this term will not refer to a Reserve Provider.

Effective Date

The term “Effective Date” means each date on which one or more of the respective provisions of the Fifth Supplemental Indenture becomes effective, being such time as the written consents of the Owners of a majority in aggregate amount of the Bond Obligation of the Bonds then Outstanding and of each Credit Provider have been filed with the Trustee, and the other requirements contained in the Section entitled “Modification or Amendment of the Indenture” of the Indenture have been satisfied. The Effective Date of the provisions of the Fifth Supplemental Indenture occurred on or about April 16, 2015.

Enterprise or Water Enterprise

The term “Enterprise” or “Water Enterprise” means the whole and each and every part of the municipal water supply, storage and distribution system of the Commission, as located partially within and partially without the City, including all of said presently existing municipal water system of the City and all additions, betterments, and extensions to said water system or any part thereof thereafter made, but excluding any water supply, storage or distribution facilities under the jurisdiction of the Hetch Hetchy Project, a department of the City under the jurisdiction of the Commission.

Event of Default

The term “Event of Default” means an event of that name described in the Indenture.

Federal Securities

The term “Federal Securities” means United States treasury notes, bonds, bills or certificates of indebtedness, or obligations for which the faith and credit of the United States of America are pledged for the payment of principal and interest (including obligations issued or held in book-entry form and securities which represent an undivided interest in such direct obligations), and also any securities now or hereafter authorized, both the principal of and interest on which is guaranteed directly by the full faith and credit of the United States of America, and including interest strips held in book-entry form by the Federal Reserve Bank of New York of bonds issued by the Resolution Funding Corporation. For all Additional Bonds issued subsequent to the date of the amendment and restatement of the Indenture in 2002, the term “Federal Securities” also includes bonds, debentures, notes or other evidence of indebtedness issued or guaranteed by any of the following federal agencies and provided such obligations are backed by the full faith and credit of the United States of America (stripped securities are only permitted if they have been stripped by the agency itself): (i) direct obligations or fully guaranteed certificates of beneficial ownership of the U.S. Export-Import Bank; (ii) certificates of beneficial ownership of the Rural Economic Community Development Administration (formerly the Farmers Home Administration); (iii) obligations of the Federal Financing Bank; (iv) debentures of the Federal Housing Administration; (v) participation certificates of the General Services Administration; (vi) guaranteed Title XI financings of the U.S. Maritime Administration; and (vii) project notes, local authority bonds, new communities debentures and U.S. public housing notes and bonds of the U.S. Department of Housing and Urban Development.

Fifth Supplemental Indenture

The term “Fifth Supplemental Indenture” means the Fifth Supplemental Indenture, dated as of June 1, 2010, by and between the Commission and the Trustee.

Financial Newspaper or Journal

The term “Financial Newspaper or Journal” means *The Wall Street Journal* or *The Bond Buyer*, or any other newspaper or journal publishing financial news and selected by the Trustee, whose decision will be final and conclusive, printed in the English language, customarily published on each business day and circulated in San Francisco, California.

Fiscal Year

The term “Fiscal Year” means the period beginning on July 1 of each year and ending on the next succeeding June 30, or such other fiscal year as may be adopted by the Commission for its general accounting purposes or the then current accounting period of the City if the Commission has no separate accounting period.

General Manager

The term “General Manager” means the manager of utilities appointed by the Commission from time to time pursuant to the Charter or any other applicable provision of law.

Improvement Fund

The term “Improvement Fund” means the fund by that name established pursuant to the Indenture.

Indenture

The term “Indenture” means the Amended and Restated Indenture, dated as of August 1, 2002, by and between the Commission and the Trustee, as originally executed or as it may from time to time be supplemented or amended by any Supplemental Indenture delivered pursuant to the provisions of the Indenture.

Independent Certified Public Accountant

The term “Independent Certified Public Accountant” means any certified public accountant or firm of such accountants appointed and paid by the City or the Commission, and who, or each of whom –

- (i) is in fact independent and not under domination of the City or the Commission;
 - (ii) does not have any substantial interest, direct or indirect, with the City or the Commission;
- and
- (iii) is not connected with the City or the Commission as an officer or employee of the City or the Commission, but who may be regularly retained to make annual or other audits of the books of or reports to the City or the Commission.

Law

The term “Law” means the Charter, the San Francisco Administrative Code, and all laws of the State of California supplemental thereto, including the Revenue Bond Law of 1941 to the extent made applicable by the Charter or by the San Francisco Administrative Code. Whenever reference is made in the Indenture to the Law, reference is made to the Law as in force on the date of the Indenture or any Supplemental Indenture, unless the context otherwise requires.

Legal Investments

The term “Legal Investments” means bonds, notes, certificates of indebtedness, bills, acceptances or other securities in which funds of the Commission may now or hereafter be legally invested as provided by the law in effect at the time of such investment.

Letter of Credit

The term “Letter of Credit” means an irrevocable and unconditional letter of credit, a standby purchase agreement, a line of credit or other similar credit arrangement issued by a Qualified Bank to secure payment of Balloon Indebtedness, Variable Rate Indebtedness, Tender Indebtedness or a Series of Bonds or to satisfy all or a portion of the Required Reserve.

Letter of Credit Agreement

The term “Letter of Credit Agreement” means an agreement between the Commission and a Qualified Bank pursuant to which the Qualified Bank agrees to issue a Letter of Credit and which sets forth the repayment obligation of the Commission to the Qualified Bank on account of any payment under the Letter of Credit.

Letter of Representations

The term “Letter of Representations” means the letter or letters of representation of the Commission delivered to and accepted by The Depository Trust Company setting forth the basis on which The Depository Trust Company serves as depository for the Bonds, as originally executed or as it may be supplemented or revised or replaced by a letter to a substitute depository.

Maximum Annual Debt Service, Annual Debt Service, Debt Service, Average Annual Debt Service

The term “Maximum Annual Debt Service” means, at any point in time, with respect to Bonds then Outstanding, the maximum amount of principal and interest becoming due in the then current or any future Fiscal Year, calculated by the Commission as provided in this definition. For purposes of calculating Maximum Annual Debt Service, the following assumptions are to be used to calculate the principal and interest becoming due in any Fiscal Year:

(i) in determining the principal amount due in each year, payment will (unless a different subsection of this definition applies for purposes of determining principal maturities or amortization) be assumed to be made in accordance with any amortization schedule established for such debt, including any Minimum Sinking Fund Account Payments or any scheduled redemption or payment of Bonds on the basis of Accreted Value, and for such purpose, the redemption payment or payment of Accreted Value will be deemed a principal payment and interest that is compounded and paid as Accreted Value will be deemed due on the scheduled redemption or payment date of such Capital Appreciation Bond;

(ii) if any of the Outstanding Series of Bonds constitute Balloon Indebtedness or Balloon Indebtedness and Variable Rate Indebtedness or if Bonds then proposed to be issued would constitute Balloon Indebtedness or Balloon Indebtedness and Variable Rate Indebtedness, then, for purposes of determining Maximum Annual Debt Service, such amounts as constitute Balloon Indebtedness will be treated as if the principal amount of such Bonds were to be amortized from the date of their original issuance in substantially equal annual installments of principal and interest over a term of 25 years; the interest rate used for such computation will be the rate quoted in *The Bond Buyer –25 Revenue Bond Index* for the last week of the month preceding the date of calculation, as published in *The Bond Buyer*, or if that index is no longer published, another similar index selected by the Commission, or if the Commission fails to select a replacement index, an interest rate equal to 80% of the yield for outstanding United States Treasury bonds having an equivalent maturity as the Bonds on the date of issuance, or if there are no such Treasury bonds having equivalent maturities, 80% of the lowest prevailing prime rate of any of the five largest commercial banks in the United States ranked by assets;

(iii) if any Outstanding Bonds constitute Tender Indebtedness or if Bonds then proposed to be issued would constitute Tender Indebtedness, then for purposes of determining the amounts of principal and interest due in any Fiscal Year on such Bonds, the options or obligations of the owners of such Bonds to tender the same for purchase or payment prior to their stated maturity or maturities will be treated as a principal maturity occurring on the first date on which owners of such Bonds may or are required to tender such Bonds except that any such option or obligation to tender Bonds will be ignored and not treated as a principal maturity, if (1) such Bonds are rated in one of the two highest long-term rating categories (without reference to gradations such as “plus” or “minus”) by Moody’s and by S&P or such Bonds are rated in the highest short-term, note or commercial paper rating categories by Moody’s and by S&P and (2) the obligation, if any, the Commission may have under a Letter of Credit Agreement with respect to such Bonds, other than its obligations on such Bonds, will either be subordinated to the obligation of the Commission on the Bonds or be incurred under the conditions and meeting the tests for the issuance of Additional Bonds set forth in the Indenture;

(iv) if any Outstanding Bonds constitute Variable Rate Indebtedness, the interest rate on such Bonds will be assumed to be 110% of the greater of (a) the daily average interest rate on such Bonds during the 12 months ending with the month preceding the date of calculation, or such shorter period that such Bonds have been Outstanding, or (b) the rate of interest on such Bonds on the date of calculation;

(v) if Bonds proposed to be issued will be Variable Rate Indebtedness, then such Bonds will be assumed to bear interest at the rate quoted in *The Bond Buyer –25 Revenue Bond Index* for the last week of the month preceding the date of sale of such additional Bonds, as published in *The Bond Buyer*, or if that index is no longer published, another similar index selected by the Commission, or if the Commission fails to select a replacement index, an interest rate equal to 80% of the yield for outstanding United States Treasury bonds having an equivalent maturity as the additional Bonds proposed to be issued, or if there are no such Treasury bonds having equivalent maturities, 80% of the lowest prevailing prime rate of the five largest commercial banks in the United States ranked by assets:

(vi) if moneys or Federal Securities or general obligation bonds of the State of California have been deposited with and are held by the Trustee or another fiduciary to be used to pay principal and/or interest on specified Bonds, then the principal and/or interest to be paid from such moneys or Federal Securities or general obligation bonds of the State of California or from the earnings thereon will be disregarded and not included in calculating Maximum Annual Debt Service.

The term “Annual Debt Service” means the sum of such principal and interest as computed for the twelve-month period ending June 30 to which reference is made.

The term “Debt Service” means the sum of all such principal and interest.

The term “Average Annual Debt Service” means total Debt Service, divided by the number of twelve-month periods ending on June 30 (including any fractional periods) remaining until the last maturity date of any Outstanding Bond.

For the purpose of calculating Maximum Annual Debt Service, Annual Debt Service, Debt Service, and Average Annual Debt Service, in determining the amount of interest coming due during any twelve-month period ending June 30 on any Series of Bonds that were issued as Build America Bonds, such amount will be reduced by an amount equal to the Refundable Credits the Commission is scheduled to receive during each such twelve-month period ending June 30. If the amount of Refundable Credits received by the Commission for any Series of Bonds that were issued as Build America Bonds is reduced or not received during any twelve-month period ending June 30, the Commission will calculate the amount of interest coming due for the subsequent twelve-month period ending June 30 without deducting an amount equal to the Refundable Credits for the purpose of calculating Maximum Annual Debt Service, Annual Debt Service, Debt Service, and Average Annual Debt Service until the receipt of such Refundable Credits resumes and all prior deficiencies are cured.¹

Mayor

The term “Mayor” means the Mayor of the City from time to time.

¹ Pursuant to the Twenty-First Supplemental Indenture, this sentence is to be amended as follows, which amendment will become effective at such time as the written consents of the Owners of a majority in aggregate amount of the Bond Obligation of the Bonds then Outstanding and of each Credit Provider (if any) have been filed with the Trustee, and the other requirements contained in the Indenture have been satisfied:

If the amount of Refundable Credits scheduled to be received by the Commission for any Series of Bonds that were issued as Build America Bonds is reduced or otherwise not received during any twelve-month period ending June 30, the Commission will calculate the amount of interest due on such Series of Bonds for the subsequent twelve month period ending June 30 by offsetting against the gross amount of interest payable on such Series only the amount of the Refundable Credits scheduled to be received under Federal legislation (or other Federal regulation, pronouncement or action) authorizing the reduction of Refundable Credits.

Minimum Sinking Fund Account Payments

The term “Minimum Sinking Fund Account Payments” means the aggregate amounts required by the Indenture and any subsequent Supplemental Indenture or Supplemental Indentures to be deposited in Sinking Fund Accounts for the payment of Term Bonds.

Moody’s

The term “Moody’s” means Moody’s Investors Service, Inc., a corporation duly organized and existing under and by virtue of the laws of the State of Delaware, and its successors and assigns, except that if such corporation will be dissolved or liquidated or will no longer perform the functions of a securities rating agency, then the term “Moody’s” will be deemed to refer to any other nationally recognized securities rating agency selected by the Commission and approved by the Trustee.

Municipal Bond Insurer

The term “Municipal Bond Insurer” means any insurance company or companies which has or have issued a policy of municipal bond insurance insuring payment of the principal of and interest on any of the Bonds of any Series or a Bond Reserve Fund Policy and are so designated as such in the Indenture or a Supplemental Indenture.

Net Revenues

The term “Net Revenues” means all of the Revenues (but not including interest on investment of funds required to be deposited in said funds or investment earnings required to be deposited in the Improvement Fund) less all Operation and Maintenance Costs of the Enterprise (but not including such Operation and Maintenance Costs as are scheduled to be paid by the Commission from moneys other than Revenues, such moneys to be clearly available for such purpose).

Operation and Maintenance Costs of the Enterprise

The term “Operation and Maintenance Costs of the Enterprise” means the reasonable and necessary costs of operating and maintaining the Enterprise, calculated on sound accounting principles, including (among other things) salaries and wages, fees for services, costs of materials, supplies and fuel, reasonable expenses of management, legal fees, accounting fees, repairs and other expenses necessary to maintain and preserve the Enterprise in good repair and working order, and reasonable amounts for administration, overhead, insurance, taxes (if any), other similar costs, and the payment of pension charges and proportionate payments to such compensation and other insurance or outside reserve funds as the Commission may establish or the Board of Supervisors may require with respect to employees of the Commission, as provided in the Charter, but excluding in all cases (i) depreciation and obsolescence charges or reserves therefor, (ii) amortization of intangibles or other bookkeeping entries of a similar nature, (iii) costs of capital additions, replacements, betterments, extensions or improvements to the Enterprise, which under generally accepted accounting principles are chargeable to a capital account or to a reserve for depreciation, and (iv) charges for the payment of principal and interest on any general obligation bonds, revenue bonds or other indebtedness heretofore or hereafter issued for Enterprise purposes.

Opinion of Counsel

The term “Opinion of Counsel” means a written opinion of counsel (who may be counsel for the City or the Commission) retained by the Commission and who is acceptable to the Trustee. If and to the extent required by the provisions of the Indenture, each Opinion of Counsel will include the statements provided for in the Indenture.

Outstanding

The term “Outstanding,” when used as of any particular time with reference to Bonds, means (subject to the provisions of the Indenture) all Bonds theretofore executed, issued and delivered by the Commission under the Indenture except –

- (1) Bonds cancelled by the Trustee or surrendered to the Trustee for cancellation;
- (2) Bonds for the payment or redemption of which funds or securities in the necessary amount (as set forth in the Indenture) will have theretofore been deposited with a fiduciary (whether upon or prior to the maturity or redemption date of such Bonds), provided that, if such Bonds are to be redeemed prior to the maturity thereof, notice of such redemption will have been given as in the Indenture provided or provision satisfactory to the Trustee will have been made for the giving of such notice; and
- (3) Bonds in lieu of or in substitution for which other Bonds have been executed, issued and delivered by the Commission pursuant to the Indenture.

For purposes of this definition and within the meaning of the Indenture, Bonds the principal of or interest on which has been paid by a Municipal Bond Insurer will not be deemed paid by or on behalf of the Commission, will not be defeased and will remain Outstanding under the Indenture until paid by the Commission.

Parity State Loans

The term “Parity State Loans” means those loan agreements or installment sale agreements entered into between the Commission and the State of California (or any board, department or agency thereof) to finance additions, betterments, extensions, repairs, renewals or replacements to the Enterprise, which, by their terms, are payable from Revenues on a parity basis with debt service on the Bonds.

Payment Date

The term “Payment Date” means any interest, or interest and principal, payment date on which payment of the principal of or interest on the Bonds is due or on which any Term Bonds are required to be redeemed from any Minimum Sinking Fund Account Payments.

Permitted Investments

The term “Permitted Investments” means any of the following:

- (1) United States Treasury notes, bonds, bills, or certificates of indebtedness, or obligations for which the faith and credit of the United States of America are pledged for the payment of principal and interest (including obligations issued or held in book-entry form on the books of the Department of the Treasury of the United States of America and securities which represent an undivided interest in such direct obligations), and also any securities now or hereafter authorized, both the principal of and interest on which is guaranteed directly by the full faith and credit of the United States of America;
- (2) Bonds, consolidated bonds, collateral trust debentures, consolidated debentures or other obligations issued by federal land banks or federal intermediate credit banks established under the Federal Farm Loan Act, as amended; debentures and consolidated debentures issued by the Central Bank for Cooperatives and banks for cooperatives established under the Farm Credit Act of 1933, as amended; bonds or debentures of the Federal Home Loan Bank Board established under the Federal Home Loan Bank Act and bonds of any federal home loan bank established under said act; bonds, debentures, participation certificates or other obligations of the Government National Mortgage Association or the Federal National Mortgage Association established under the National Housing Act, as amended; and also any securities now or hereafter authorized, both the principal of and interest on which is guaranteed indirectly by the full faith and credit of the United States of America;
- (3) Time certificates of deposit or negotiable certificates of deposit issued by a state or nationally chartered bank or trust company, including the Trustee, or a state or federal savings and loan association, provided that such certificates of deposit will be (i) continuously and fully insured by the Federal Deposit Insurance Corporation or the Federal Savings and Loan Insurance Corporation or (ii) issued by any bank or trust company organized under the laws of any state of the United States, or any national banking association (including the Trustee), having a combined capital and surplus of at least \$100,000,000, and such certificates will have maturities of six months or less, or (iii) continuously and

fully secured by such securities as are described in clauses (1) or (2) above, which securities will have a market value (exclusive of accrued interest) at all times at least equal to the principal amount of such certificates of deposit;

(4) Bankers' acceptances which are issued by a bank or trust company organized under the laws of any state of the United States or any national banking association (including the Trustee) rated "A" or higher by Moody's and S&P; provided, that such banker's acceptances may not exceed 270 days' maturity;

(5) Any repurchase agreement with any bank or trust company organized under the laws of any state of the United States or any national banking association (including the Trustee) or government bond dealer reporting to, trading with and recognized as a primary dealer by, the Federal Reserve Bank of New York, which agreement is secured by any one or more of the securities described in clauses (1) or (2) above, provided the underlying securities are required by the repurchase agreement to be held by any such bank, trust company or primary dealer having a combined capital and surplus of at least \$100,000,000 and being independent of the issuer of such repurchase agreement, and provided the securities are continuously maintained at a market value of not less than the amount so invested;

(6) Commercial paper of "prime" quality of the highest ranking or of the highest letter and numerical rating as provided by Moody's and S&P, which commercial paper is limited to issuing corporations that are organized and operating within the United States of America and that have total assets in excess of five hundred million (\$500,000,000) and that have an "A" or higher rating for the issuer's debentures, other than commercial paper, as provided by Moody's and S&P; provided that purchases of eligible commercial paper may not exceed one hundred eighty (180) days' maturity nor represent more than ten percent (10%) of the outstanding commercial paper of an issuer corporation;

(7) Bonds, notes, warrants or other evidence of indebtedness of any of the states of the United States or of any political subdivision or public agency thereof which are rated in one of the two highest short-term or long-term rating categories by Moody's and S&P;

(8) Any investment agreement with (i) any bank or trust company organized under the laws of any state of the United States of America or any national banking association (including the Trustee) or government bond dealer reporting to, trading with and recognized as a primary dealer by, the Federal Reserve Bank of New York, having a combined capital and surplus of at least \$100,000,000, or (ii) any corporation, limited liability company or other entity that is organized and operating within the United States of America and that has total assets in excess of five hundred million dollars (\$500,000,000) and (A) at the time the investment agreement is entered into, has an "A" or higher rating for its debt, other than commercial paper, as provided by Moody's and S&P, or (B) at the time the investment agreement is entered into, the investment agreement or the provider's obligations under the investment agreement are guaranteed by any entity with an "A" or higher rating for its debt, other than commercial paper, or for its financial strength, as provided by Moody's and S&P; and

(9) Government money market portfolios or money market funds restricted to obligations issued or guaranteed as to payment of principal and interest by the full faith and credit of the United States of America, which portfolios, unless held by the Trustee for 5 business days or less, have a rating at least equal to the lowest then existing rating on the Bonds given by S&P and Moody's.

Policy Costs

The term "Policy Costs" means the amounts owing to a Reserve Provider, including the principal amount of any draw on a Bond Reserve Fund Policy, interest thereon and reasonable expenses incurred by the Reserve Provider in enforcing payment of Policy Costs, as more fully set forth in the agreement pursuant to which such Bond Reserve Fund Policy is issued.

President

The term "President" means the President of the Commission from time to time.

Project

The term “Project” means any additions, enlargements, betterments, extensions and other improvements to or benefiting, and the equipping of, the Enterprise, including, without limitation, the acquisition of land therefor.

Project Fund

The term “Project Fund” means each fund by the name established within the Improvement Fund.

Proportionate Basis

The term “Proportionate Basis” when used with respect to the redemption of Bonds, means that the amount of Bonds of each maturity to be redeemed will be determined as nearly as practicable by multiplying the total amount of funds available for redemption by the ratio which the amount of Bond Obligation of Bonds of such maturity bears to the amount of all Bond Obligation of Bonds to be redeemed, provided that if the amount available for redemption of Bonds of any maturity is insufficient to redeem a multiple of \$5,000 principal amount or Accreted Value payable at maturity, such amount will be applied to the redemption of the highest possible integral multiple (if any) of \$5,000 principal amount or Accreted Value payable at maturity. For purposes of the foregoing, Term Bonds will be deemed to mature in the years and in the amounts of the Minimum Sinking Fund Account Payments and Capital Appreciation Bonds and Current Interest Bonds maturing or subject to Minimum Sinking Fund Account Payments in the same year will be treated as separate maturities. When used with respect to the payment or purchase of Bonds, “Proportionate Basis” will have the same meaning set forth above except that “pay” or “purchase” will be substituted for “redeem” or “redemption” and “paid” or “purchased” will be substituted for “redeemed.”

Proposition A of 2002, Proposition A

The term “Proposition A of 2002” or “Proposition A” means a measure approved by a majority of voters voting thereon at a duly called and held revenue bond election on November 5, 2002, authorizing the issuance by the Commission of its revenue bonds or other forms of revenue financing in a principal amount not to exceed \$1,628,000,000 to finance the acquisition and construction of improvements to the Enterprise.

Proposition E of 2002, Proposition E

The term “Proposition E of 2002” or “Proposition E” means a measure approved by a majority of voters voting thereon at a duly called and held revenue bond election on November 5, 2002 authorizing the issuance by the Commission of its revenue bonds or other forms of revenue financing for the purpose of reconstructing, replacing, expanding, repairing or improving water facilities or clean water facilities or combinations of water and clean water facilities under the jurisdiction of the Commission

Qualified Bank

The term “Qualified Bank” means a state or national bank or trust company or savings and loan association or a foreign bank with a domestic branch or agency which is organized and in good standing under the laws of the United States or any state thereof or any foreign country, which has a capital and surplus of \$25,000,000 or more and which has a short term debt rating of the highest ranking or of the highest letter and numerical rating as provided by Moody’s or by S&P.

Qualified Independent Consultant

The term “Qualified Independent Consultant” means a person or a firm who or which engages in the business of advising the management of public agencies concerning the operation and financing of public utilities, including public water supply, storage and distribution systems, and also including advice and consultation generally concerning the use and operation of public utilities, including public water supply, storage and distribution systems, and which person or firm, by reason of his or its knowledge and experience, has acquired a reputation as a recognized consultant. Such Qualified Independent Consultant may include a person or firm rendering professional

engineering or accounting services in addition to his or its occupation as a public utility consultant and may include any person or firm regularly employed by the City or the Commission as a consultant to the City or the Commission.

Rebate Certificate

The term “Rebate Certificate” means the Rebate Certificate or similar tax certificate delivered or to be delivered by the Commission at the time of issuance and delivery of a Series of Bonds, as the same may be amended or supplemented in accordance with its terms.

Rebate Fund

The term “Rebate Fund” means the fund established and so designated for a Series of Bonds.

Refundable Credits

The term “Refundable Credits” means (a) with respect to a Series of Bonds issued as Build America Bonds under Section 54AA of the Code, the amounts which are payable by the Federal government under Section 6431 of the Code, which the Commission has elected to receive under Section 54AA(g)(1) of the Code, and (b) with respect to a Series of Bonds issued as Build America Bonds under any other provisions of the Code that creates, in the determination of the Commission, a substantially similar direct-pay subsidy program, the amounts which are payable by the Federal government under the applicable provisions of the Code, which the Commission has elected to receive under the applicable provisions of the Code.

Required Reserve

The term “Required Reserve” means,

(1) with respect to a Series of Bonds issued prior to the Effective Date, the aggregate amount which is equal to the sum of fifty percent (50%) of the Maximum Annual Debt Service on such Series of Bonds then Outstanding; provided, however, that such Required Reserve or a portion thereof may be provided by one or more Bond Reserve Fund Policies; provided further that in no event will the Commission, in connection with issuance of a Series of Additional Bonds, be obligated to deposit an amount in the Bond Reserve Fund which is in excess of the amount permitted by the applicable provisions of the Code to be so deposited from the proceeds of tax-exempt bonds without having to restrict the yield of any investment purchased with any portion of such deposit.

(2) with respect to a Series of Bonds issued on or after the Effective Date, as of any date of calculation, the amount, if any, required to be deposited into a Reserve Account for that Series of Bonds, as defined in and provided by the Supplemental Indenture pursuant to which such Series of Bonds is issued; provided, however, that in no event will the Commission, in connection with issuance of a Series of Additional Bonds, be obligated to deposit an amount in the Bond Reserve Fund which is in excess of the amount permitted by the applicable provisions of the Code to be so deposited from the proceeds of tax-exempt bonds without having to restrict the yield of any investment purchased with any portion of such deposit.

Reserve Account

The term “Reserve Account” means each account established in the Bond Reserve Fund with respect to each Series of Bonds issued under the Indenture.

Reserve Provider

The term “Reserve Provider” means the issuer of a Bond Reserve Fund Policy.

Revenue Fund

The term “Revenue Fund” means the fund by that name established pursuant to the Indenture.

Revenues

The term “Revenues” means all gross revenues of the Enterprise, including all charges received for and all other income and receipts derived by the Commission or the City from the operation of the Enterprise, or arising from the Enterprise, including connection and installation charges, but excluding –

- (1) any money received by or for the account of the City or the Commission from the levy or collection of taxes,
- (2) moneys received from the State of California and the United States of America and required to be deposited in restricted funds,
- (3) refundable deposits made to establish credit,
- (4) advances and contributions made to the Commission or the City to be applied to construction,
- (5) moneys required to be paid to the State of California and the United States of America pursuant to agreements with the City or the Commission,
- (6) moneys received from insurance proceeds or the sale of or upon the taking by or under the threat of eminent domain of all or any part of the Enterprise (which moneys will be received and disposed of pursuant to the Indenture),
- (7) proceeds from Bonds issued by the Commission or proceeds from loans obtained by the Commission,
- (8) moneys or securities received by the City or the Commission as gifts or grants, the use of which is restricted by the donor or grantor,
- (9) sewer service fees or charges, and
- (10) any surcharge imposed by or upon the direction of any joint powers agency or other governmental entity, other than the Commission, the City or any department or agency of the City, whether or not collected by the Commission, the City or any department or agency of the City, for the purpose of financing improvements to the facilities comprising the Enterprise.

The term “Revenues” also includes (i) all interest, profits or other income derived from the deposit or investment of any moneys in any fund or account established under the Indenture (excluding any Rebate Fund and any escrow fund pledged for the payment of defeased bonds) or in any fund or account of the Enterprise and legally available to pay Debt Service on the Bonds, and (ii) any other moneys, proceeds and other amounts that the Commission determines should be “Revenues” under the Indenture.

Secretary

The term “Secretary” means the Secretary of the Commission from time to time.

Series

The term “Series” means any series of Bonds executed, authenticated and delivered pursuant to the Indenture and identified as a separate Series of Bonds, including any Additional Bonds issued pursuant to a Supplemental Indenture and the Indenture.

Sinking Fund Accounts

The term “Sinking Fund Accounts” means any special account or accounts established by the Indenture or any Supplemental Indenture or Indentures in the Principal Fund for the payment of Term Bonds.

S&P

The term “S&P” means Standard & Poor’s Ratings Services, a corporation duly organized and existing under and by virtue of the laws of the State of New York, and its successors and assigns, except that if such corporation is dissolved or liquidated or will no longer performs the functions of a securities rating agency, then the term “S&P” will be deemed to refer to any other nationally recognized securities rating agency selected by the Commission and approved by the Trustee.

Supplemental Indenture

The term “Supplemental Indenture” means any indenture or resolution amendatory of or supplemental to the Indenture; but only if and to the extent that such Supplemental Indenture is specifically authorized under the Indenture.

Tender Indebtedness

The term “Tender Indebtedness” means any Bonds or portions of Bonds a feature of which is an option, on the part of the Bondowners, or an obligation, under the terms of such Bonds, to tender all or a portion of such Bonds to the Commission, the Trustee or other fiduciary or agent for payment or purchase and requiring that such Bonds or portions of Bonds be purchased if properly presented.

Thirty-Second Supplemental Indenture

The term “Thirty-Second Supplemental Indenture” means the Thirty-Second Supplemental Indenture, dated as of December 1, 2019, by and between the Commission and the Trustee.

Thirty-Third Supplemental Indenture

The term “Thirty-Third Supplemental Indenture” means the Thirty-Third Supplemental Indenture, dated as of December 1, 2019, by and between the Commission and the Trustee.

Thirty-Fourth Supplemental Indenture

The term “Thirty-Fourth Supplemental Indenture” means the Thirty-Fourth Supplemental Indenture, dated as of December 1, 2019, by and between the Commission and the Trustee.

Treasurer

The term “Treasurer” means the Treasurer of the City and includes any deputy acting for the Treasurer.

Trustee

The term “Trustee” means U.S. Bank National Association, acting as an independent trustee with the duties and powers provided in the Indenture, its successors and assigns, and any other corporation or association which may at any time be substituted in its place, as provided in the Indenture.

Twenty-First Supplemental Indenture

The term “Twenty-First Supplemental Indenture” means the Twenty-First Supplemental Indenture, dated as of October 1, 2016, by and between the Commission and the Trustee.

Twenty-Fourth Supplemental Indenture

The term “Twenty-Fourth Supplemental Indenture” means the Twenty- Fourth Supplemental Indenture, dated as of September 14, 2017, by and between the Commission and the Trustee.

2019 Series ABC Bonds

The term “2019 Series ABC Bonds” means the Commission’s San Francisco Water Revenue Bonds, 2019 Series ABC issued pursuant to the Thirty-Second, Thirty-Third and Thirty-Fourth Supplemental Indentures amending and supplementing the Indenture.

Variable Rate Indebtedness

The term “Variable Rate Indebtedness” means any portion of indebtedness the interest rate on which is not fixed at the time of incurrence of such indebtedness, and has not at some subsequent date been fixed, at a single numerical rate for the entire term of the indebtedness.

Written Request of the Commission, Written Requisition of the Commission, Written Statement of the Commission

The terms “Written Request of the Commission,” “Written Requisition of the Commission” and “Written Statement of the Commission” mean, respectively, a written request, requisition or statement signed by or on behalf of the Commission by the President or the General Manager or the Secretary or by any person (whether or not an officer of the Commission) who is specifically authorized by resolution of the Commission (which resolution will be provided to the Trustee) to sign or execute such a document on its behalf.

USE OF DEPOSITORY

(a) The 2019 Series ABC Bonds will be initially registered in the name of “Cede & Co.,” as nominee of The Depository Trust Company, New York, New York (the “Depository Trust Company”). Registered ownership of the 2019 Series ABC Bonds, or any portions thereof, may not thereafter be transferred except:

(i) to any successor of The Depository Trust Company or its nominee, or of any substitute depository designated pursuant to clause (ii) of this subsection (a) (a “Substitute Depository”); provided that any successor of The Depository Trust Company or Substitute Depository will be qualified under any applicable laws to provide the service proposed to be provided by it;

(ii) to any Substitute Depository not objected to by the Trustee, upon (1) the resignation of The Depository Trust Company or its successor (or any Substitute Depository or its successor) from its functions as depository, or (2) a determination by the Commission that The Depository Trust Company (or its successor) is no longer able to carry out its functions as depository; provided that any such Substitute Depository will be qualified under any applicable laws to provide the services proposed to be provided by it; or

(iii) to any person as provided below, upon (1) the resignation of The Depository Trust Company or its successor (or any Substitute Depository or its successor) from its functions as depository, or (2) a determination by the Commission to remove The Depository Trust Company or its successor (or Substitute Depository or its successor) from its functions as depository.

(b) In the case of any transfer pursuant to clause (i) or clause (ii) of subsection (a) above, upon receipt of all Outstanding 2019 Series ABC Bonds by the Trustee, together with a Written Request of the Commission to the Trustee designating the Substitute Depository, one new bond for each 2019 Series ABC Bond (as the case may be), which the Commission will prepare or cause to be prepared, will be executed and delivered for each maturity of 2019 Series ABC Bonds then Outstanding, registered in the name of such successor or such Substitute Depository, or their nominees, as the case may be, all as specified in such Written Request of the Commission. In the case of any transfer pursuant to clause (iii) of subsection (a) above, upon receipt of all Outstanding 2019 Series ABC Bonds by the Trustee, together with a Written Request of the Commission to the Trustee, new bonds for 2019 Series ABC Bonds, which the Commission will prepare or cause to be prepared in definitive form, will be executed and delivered in such denominations and registered in the names of such persons as are requested in such Written Request of the Commission, subject to the limitations of the Indenture, provided that the Trustee will not be required to deliver such new bonds for 2019 Series ABC Bonds within a period less than 60 days from the date of receipt of such Written Request from the Commission.

(c) In the case of a partial redemption or an advance refunding of any 2019 Series ABC Bonds evidencing a portion of the principal maturing in a particular year, The Depository Trust Company or its successor (or any Substitute Depository or its successor) will make an appropriate notation on such 2019 Series ABC Bonds indicating the date and amounts of such reduction in principal, in form acceptable to the Trustee. The Trustee will not be liable for such depository's failure to make such notations or errors in making such notations.

(d) The Commission and the Trustee will be entitled to treat the person in whose name any 2019 Series ABC Bonds is registered as the Owner thereof for all purposes of the Indenture and any applicable laws, notwithstanding any notice to the contrary received by the Trustee or the Commission; and the Commission and the Trustee will not have responsibility for transmitting payments to, communicating with, notifying, or otherwise dealing with any beneficial owners of the 2019 Series ABC Bonds. Neither the Commission nor the Trustee will have any responsibility or obligation, legal or otherwise, to any such beneficial owners or to any other party, including The Depository Trust Company or its successor (or Substitute Depository or its successor), except to the Owner of any 2019 Series ABC Bonds, and the Trustee may rely conclusively on its records as to the identity of the Owners of the 2019 Series ABC Bonds.

(e) Notwithstanding any other provisions of the Indenture and so long as all Outstanding 2019 Series ABC Bonds are registered in the name of Cede & Co. or its registered assigns, the Commission and the Trustee will cooperate with Cede & Co., as sole registered Bondowner, and its registered assigns in effecting payment of the principal of and redemption premium, if any, and interest on the 2019 Series ABC Bonds by arranging for payment in such manner that funds for such payments are properly identified and are made available on the date they are due all in accordance with the Letter of Representations delivered by the Commission and the Trustee to The Depository Trust Company with respect to the 2019 Series ABC Bonds, the provisions of which the Trustee may rely upon to implement the foregoing procedures notwithstanding any inconsistent provisions set out in the Indenture.

BOND PROCEEDS FUNDS; ADDITIONAL SERIES OF BONDS

Improvement Fund. The Commission has covenanted and agreed to maintain under the Indenture the separate fund known as the Improvement Fund. The Treasurer holds the amounts on deposit in the Improvement Fund. The Improvement Fund will be maintained and accounted for by the Controller so long as any moneys are on deposit in such Improvement Fund. The Commission may direct the Trustee to establish, within the Improvement Fund, separate Project Funds relating to separate Series of Bonds. Upon completion of the acquisition and construction of the Project, the Commission may direct the transfer of any remaining balance in the Improvement Fund to any other fund or account of the Commission.

The moneys in the Improvement Fund will be held by the Treasurer in trust and applied to the costs of acquisition, construction, expansion, improvement, financing and refinancing of the Project and the expenses incident thereto or connected therewith including, if necessary, interest to the extent permitted by law, reimbursement to the Commission for expenses incurred in connection with the Enterprise, architectural, engineering and inspection fees and expenses, apparatus, equipment and furnishings for the Enterprise, testing and inspection, surveys, insurance premiums, losses during construction not insured against because of deductible amounts, the fees and expenses of the Trustee, expenses in connection with the preparation, issuance, sale and delivery of the Bonds, legal, accounting and consultant fees and expenses, and similar expenses.

The Treasurer will pay out moneys from the Improvement Fund only upon warrants drawn by the Controller in the manner provided by law. No withdrawals will be made from the Improvement Fund for any purpose not authorized by law.

2019 Series ABC Costs of Issuance Fund. The Trustee will deposit a portion of the proceeds of the 2019 Series ABC Bonds in a separate fund to be known as the "2019 Series ABC Costs of Issuance Fund" which the Trustee agrees to establish and maintain. The money in the 2019 Series ABC Costs of Issuance Fund will be used and disbursed in the manner provided in the Indenture for the purpose of paying all costs of issuance incidental to or connected with the issuance of the 2019 Series ABC Bonds (or for making reimbursements to the Commission or any other person, firm or corporation for such costs theretofore paid by such person or it). Any balance of money remaining in the 2019 Series ABC Costs of Issuance Fund after the payment of all costs incidental to or connected with the issuance of the 2019 Series ABC Bonds or on the date six months after the date of issuance of the 2019

Series ABC Bonds, whichever is earlier, will be transferred by the Trustee to the Commission, and the 2019 Series ABC Costs of Issuance Fund will be closed.

Issuance of Additional Series of Bonds; General. In addition to the Outstanding Bonds, the Commission may, subject to the requirements of the Law, by Supplemental Indenture establish one or more other Series of Bonds payable from Revenues on a parity with the Bonds and secured by a lien upon and pledge of Revenues equal to the lien and pledge securing the Bonds, and the Commission may issue and the Trustee may authenticate and deliver Bonds of any Series so established, in such principal amount and for such lawful purpose or purposes (including refunding of any Bonds issued under the Indenture and then Outstanding) as will be determined by the Commission in said Supplemental Indenture, but only upon compliance by the Commission with the provisions of the Indenture and subject to the following specific conditions, which are made conditions precedent to the issuance of any such additional Series of Bonds:

(a) The Commission will not be in default under the Indenture or any Supplemental Indenture.

(b) The Supplemental Indenture providing for the issuance of such additional Series of Bonds will require that the Bond Reserve Fund to be established pursuant to the Indenture be increased, if and to the extent necessary, forthwith upon the receipt of the proceeds of the sale of such additional Series of Bonds to an amount at least equal to the Required Reserve. Said deposit may be made from such proceeds or any other source, as provided in the Supplemental Indenture.

(c) The Bonds of such additional Series will be payable as to principal either semiannually on May 1 and November 1 of each year in which principal falls due or annually on November 1 of each year in which principal falls due, provided that Term Bonds of any Series will have a principal maturity date of November 1. The Bonds of such additional Series that are Current Interest Bonds will be payable as to interest semiannually on May 1 and November 1 of each year excepting the first year, provided that the first installment of interest may be payable on either May 1 or November 1 and will be for a period of not longer than twelve months and that the interest will be payable thereafter semiannually on May 1 and November 1, and further provided that interest on any Bonds constituting Parity State Loans, Variable Rate Indebtedness or Tender Indebtedness may be payable on such Payment Dates as will be specified in the loan agreement, installment sale agreement or Supplemental Indenture providing for the issuance of such Bonds.

(d) Fixed serial maturities or mandatory Minimum Sinking Fund Account Payments, or any combination thereof, will be established in amounts sufficient to provide for the retirement of all of the Bonds of such additional Series on or before their respective maturity dates, unless such Bonds are Balloon Indebtedness.

(e) The aggregate principal amount of Bonds issued under the Indenture will not exceed any limitation imposed by law or by any Supplemental Indenture.

(f) The representations and estimates set forth in the certificates and written reports required by the Indenture can be made by the parties required to give such certificates and written reports.

(g) If then required by law, the issuance of such additional Series of Bonds must be approved by the qualified voters voting on a proposition to authorize the issuance of said Series of Bonds.

Issuance of Additional Series of Bonds for Refunding. In addition to the Outstanding Bonds, the Commission may, subject to the requirements of the Law (including the provisions of any resolution or ordinance of the Board of Supervisors), by Supplemental Indenture establish one or more other Series of Bonds payable from Revenues on a parity with the Outstanding Bonds and secured by a lien upon and pledge of Revenues equal to the lien and pledge securing the Outstanding Bonds, and the Commission may issue, and the Trustee may authenticate and deliver Bonds of any Series so established, for the purpose of refunding any Bonds issued under the Indenture and then Outstanding, but only upon compliance by the Commission with the provisions of the Indenture, and subject to the following specific conditions, which are made conditions precedent to the issuance of any such additional Series of Bonds:

(a) The Supplemental Indenture providing for the issuance of such additional Series of Bonds will require that the Bond Reserve Fund to be established pursuant to the Indenture be increased, if necessary, forthwith upon the receipt of the proceeds of the sale of such additional Series of Bonds to an amount at least equal to the Required Reserve. Said deposit may be made from such proceeds or any other source, as provided in said Supplemental Indenture.

(b) The Bonds of such additional Series will be payable as to principal either semiannually on May 1 and November 1 of each year in which principal falls due or annually on November 1 of each year in which principal falls due, provided that Term Bonds of any Series will have a principal maturity date of November 1. The Bonds of such additional Series that are Current Interest Bonds will be payable as to interest semiannually on May 1 and November 1 of each year excepting the first year, provided that the first installment of interest may be payable on either May 1 or November 1 and will be for a period of not longer than twelve months and that the interest will be payable thereafter semiannually on May 1 and November 1, and further provided that interest on any Bonds constituting Variable Rate Indebtedness or Tender Indebtedness may be payable on such Payment Dates as will be specified in the Supplemental Indenture providing for the issuance of such Bonds.

(c) Fixed serial maturities or mandatory Minimum Sinking Fund Account Payments, or any combination thereof, will be established in amounts sufficient to provide for the retirement of all of the Bonds of such additional Series on or before their respective maturity dates, unless such Bonds are Balloon Indebtedness.

(d) The aggregate principal amount of Bonds issued under the Indenture will not exceed any limitation imposed by law or by any Supplemental Indenture.

(e) The proceeds of the Bonds of such additional Series will be used, together with any other available moneys, to refund (by defeasance, current refunding or crossover refunding) all or a portion of the Bonds then Outstanding, and the Average Annual Debt Service for the Bonds of such additional Series (during the period from their issuance to their last maturity date) will be equal to or less than the Average Annual Debt Service on the Bonds to be refunded (during the period from the issuance of the additional Series to the last maturity date of the Bonds to be refunded.)

(f) The statements set forth in the certificate required by the Indenture can be made by the party required to give such certificate.

(g) If then required by law, the issuance of such additional Series of Bonds will have been approved by the qualified voters voting on a proposition to authorize the issuance of said Series of Bonds.

Proceedings for the Issuance of Additional Series of Bonds. Whenever the Commission will determine to issue an additional Series of Bonds pursuant to the Indenture, the Commission will execute or adopt a Supplemental Indenture providing for the issuance of such additional Series of Bonds, specifying the maximum principal amount of Bonds of such Series and prescribing the terms and conditions of such additional Series of Bonds, including the terms and conditions of any Letter of Credit Agreement with respect to the Letter of Credit securing such additional Series of Bonds, if any.

Such Supplemental Indenture will prescribe the form or forms of Bonds of such additional Series and, subject to the provisions of the Indenture, will provide for the distinctive designation, denominations, methods of execution and numbering, dating, maturity dates, interest rates, interest payment dates, provisions for redemption prior to maturity and methods and places of payment of principal and interest.

The Commission may by such Supplemental Indenture prescribe any other provisions respecting the Bonds of such Series not inconsistent with the terms of the Indenture, including registration, transfer and exchange provisions, provisions for the payment of principal and interest and sinking fund provisions.

Before such additional Series of Bonds will be issued and delivered, the Commission will file the following documents with the Trustee:

(a) An Opinion of Counsel setting forth (1) that such counsel has examined the Supplemental Indenture and found it to be in compliance with the requirements of the Indenture; (2) that the execution and delivery of the additional Series of Bonds have been sufficiently and duly authorized by the Commission; and (3) that said additional Series of Bonds, when duly executed by the Commission and, if required, authenticated and delivered by the Trustee, will be valid and binding special obligations of the Commission, payable from Revenues as provided in the Indenture.

(b) If such additional Series of Bonds are being issued pursuant to the Indenture, a Certificate of the Commission that the requirement of (a) under “Issuance of Additional Series of Bonds; General” has been met.

(c) The required certificates and reports under subparagraph (1) or (2) below:

(1) If the additional Series of Bonds are being issued pursuant to the requirements set forth under “Issuance of Additional Series of Bonds; General” (see above), the following certificates:

(A) A Certificate of the Commission setting forth (i) for any period of 12 consecutive calendar months out of the 18 calendar months next preceding the authentication and delivery of such Series of Bonds, the Net Revenues for such 12-month period, and (ii) the Debt Service for such 12-month period, and demonstrating that for such 12-month period Net Revenues equaled at least 1.25 times Debt Service;

(B) If any portion of the proceeds of such Series of Bonds is to be used to finance construction, a certificate of the Consulting Engineers setting forth (i) the estimated date of completion for the portion of the Project for which such Series of Bonds is being issued and for any other uncompleted portion of the Project, and (ii) an estimate of the cost of construction of such portion of the Project and of any other uncompleted portion of the Project;

(C) A written report of a Qualified Independent Consultant setting forth for each of the next three Fiscal Years, or if any portion of the proceeds of such Series of Bonds is to be used to finance construction, the three Fiscal Years following the Fiscal Year in which the Consulting Engineers estimate such portion of the Project will be completed, estimates of (i) Revenues, (ii) Operation and Maintenance Costs of the Enterprise and (iii) Net Revenues; and

(D) A Certificate of the Commission setting forth (i) the estimates of Net Revenues, as set forth in the written report of the Qualified Independent Consultant pursuant to paragraph (C) above, for each of such three Fiscal Years, (ii) the Annual Debt Service for each of such three Fiscal Years, including Annual Debt Service as estimated in such Certificate of the Commission with respect to future Series of Bonds, if any, which such Certificate of the Commission will estimate (based on the estimate of the Consulting Engineers of the cost of construction of such portion of the Project and other uncompleted portions of the Project) will be required to complete payment of the cost of construction of such portion of the Project and any other uncompleted portion of the Project, and demonstrating that the estimated Net Revenues in each of the Fiscal Years set forth in (i) above is at least equal to 1.25 times the Annual Debt Service for the corresponding Fiscal Year as set forth in (ii) above.

Said certificate or certificates or written report will be filed after the sale of the additional Series of Bonds proposed to be issued (but prior to the delivery thereof and receipt of payment therefor), and will, respect to such additional Series of Bonds, be based upon the actual interest rate or rates determined at the time of sale thereof.

(2) If the additional Series of Bonds are being issued pursuant to the requirements set forth under “Issuance of Additional Series of Bonds for Refunding” (see above), a certificate of

an Independent Certified Public Accountant that the requirements stated under (e) under such caption have been met. Said certificate will be filed after the sale of the additional Series of Bonds proposed to be issued (but prior to the delivery thereof and receipt of payment therefor), and will, with respect to such additional Series of Bonds, be based upon the actual interest rate or rates determined at the time of sale thereof.

(d) The Supplemental Indenture, duly executed or certified and approved by the Trustee.

Upon the delivery to the Trustee of the foregoing instruments, the Trustee will authenticate and deliver the additional Series of Bonds, in the aggregate principal amount specified in such Supplemental Indenture, to, or upon the Written Request of the Commission, when such additional Series of Bonds will have been presented to it for that purpose.

None of the limitations or restrictions on the issuance of additional Series of Bonds described under this caption "Proceedings for the Issuance of Additional Series of Bonds" will be applicable to any additional Series of Bonds which are to be issued solely for the purpose of refunding and retiring all of the Bonds issued pursuant to the Indenture and then Outstanding, and nothing contained in the Indenture will limit the issuance of any additional Series of Bonds if, after the issuance and delivery of such additional Series of Bonds, none of the Bonds theretofore authorized pursuant to the Indenture will be Outstanding or the Commission will have discharged the entire indebtedness on all Bonds Outstanding pursuant to the defeasance provisions of the Indenture.

Consent Required for Other Issuances of Additional Bonds. So long as any of the Bonds remain Outstanding, the Commission will not issue any Additional Bonds or obligations payable from Revenues on a parity with the Bonds except pursuant to the provisions of the Indenture described above under the captions "Issuance of Additional Series of Bonds; General," "Issuance of Additional Series of Bonds for Refunding," or "Proceedings for the Issuance of Additional Series of Bonds," *except* under any of the following conditions, in which case none of the limitations or restrictions on the issuance of additional Series of Bonds described under the foregoing captions shall be applicable, except as set forth below:

(a) if the Owners of a majority in aggregate amount of the Bond Obligation and any Credit Provider consent in writing to the issuance of such Additional Bonds or obligations; or

(b) the obligation constitutes debt of the Commission (including without limitation loan agreements and installment sale agreements entered into between the Commission and the State of California (or any board, department or agency thereof) to finance or refinance additions, betterments, extensions, repairs, renewals or replacements to the Enterprise) payable by its terms from Revenues on a subordinate basis to the payment of Debt Service on the Bonds.

In addition, the Commission may enter into Parity State Loans if (i) no Event of Default has occurred and is continuing under the Indenture or any Supplemental Indenture (and no event has occurred which, but for the passage of time or the giving of notice, would constitute an Event of Default under the Indenture or any Supplemental Indenture); (ii) the payment of Parity State Loan principal and interest shall meet the requirements of the provisions of the Indenture described in paragraph (c) under the heading "BOND PROCEEDS FUNDS; ADDITIONAL SERIES OF BONDS--Issuance of Additional Series of Bonds; General"; and (iii) in connection with the execution and delivery of such Parity State Loans, the Commission delivers the certificates set forth in the provisions of the Indenture described in paragraph (c)(1) under the heading "BOND PROCEEDS FUNDS; ADDITIONAL SERIES OF BONDS--Issuance of Additional Series of Bonds; General," taking into account that for purposes of such provisions the reference to "Series of Bonds" includes Parity State Loans.

REVENUES AND FUNDS

Pledge and Assignment of Revenues; Revenue Fund. (a) In accordance with the Charter, but subject to the budget and fiscal provisions of the Charter, whenever revenue bonds issued by the Commission pursuant to the Charter or refunding bonds of such revenue bonds are Outstanding, the entire gross revenue of the Enterprise will be set aside and deposited into a fund in the City treasury heretofore established and known as the "Enterprise Revenue

Fund” (the “Revenue Fund”). All amounts paid into such fund will be maintained by the Treasurer separate and apart from all other City funds and will be secured by the Treasurer’s official bond or bonds.

(b) Moneys in the Revenue Fund, including earnings thereon, will be appropriated, transferred, expended or used for the following purposes pertaining to the financing, maintenance and operation of the Enterprise and related facilities owned, operated or controlled by the Commission and only in accordance with the following priority:

- (1) the payment of operation and maintenance expenses for such utility and related facilities;
- (2) the payment of pension charges and proportionate payments to such compensation and other insurance or outside reserve funds as the Commission may establish or the Board of Supervisors may require with respect to employees of the Commission;
- (3) the payment of principal, interest, reserve, sinking fund, and other mandatory funds created to secure revenue bonds or other evidences of indebtedness (including, Parity State Loans), hereafter issued by the Commission for the acquisition, construction or extension of the Enterprise or related facilities owned, operated or controlled by the Commission as provided in the Indenture;
- (4) the payment of principal and interest on general obligation bonds issued by the City for Enterprise purposes;
- (5) reconstruction and replacement as determined by the Commission or as required by any Enterprise revenue bond ordinance duly adopted and approved;
- (6) the acquisition of land, real property or interest in real property for, and the acquisition, construction, enlargement and improvement of, new and existing buildings, structures, facilities, equipment, appliances and other property necessary or convenient to the development or improvement of such utility owned, controlled or operated by the Commission; and for any other lawful purpose of the Commission including the transfer of surplus funds pursuant to the Charter.

(c) Subject to the provisions of subsection (a) and (b) above, all of the Revenues (except amounts on deposit in the Rebate Fund) are irrevocably pledged to the punctual payment of the principal of and interest and redemption premium, if any, on the Bonds and the Policy Costs, and the Revenues will not be used for any other purpose while any of the Bonds remain Outstanding or Policy Costs remain unpaid; except that the Revenues may be used for such purposes as are expressly permitted in the Charter and in the Indenture. Pursuant to Section 5451 of the California Government Code, such pledge will constitute a lien on and security interest in the Revenues for the payment of the Bonds and the Policy Costs in accordance with the terms thereof and of the Indenture, and will immediately attach to the collateral and be effective, binding, and enforceable against the Commission, its successors, purchasers of the Revenues, creditors and all others asserting any rights thereto, irrespective of whether such parties have notice of such pledge and without the need for any physical delivery, recordation, filing or further act.

(d) The Commission covenants and confirms that the Revenues in the Revenue Fund shall be appropriated, transferred, expended and used as set forth above in paragraph (b) under this caption “Pledge and Assignment of Revenues; Revenue Fund” and in the order of priority set forth subparagraphs (1), (2), and (3) of such paragraph, notwithstanding any amendment to the Charter. The Commission further confirms that all Revenues (except amounts on deposit in the various Rebate Funds) are irrevocably pledged to the punctual payment of the principal of and interest and redemption premium, if any, on the Bonds and the Policy Costs, and the Revenues shall not be used for any other purpose while any of the Bonds remain outstanding or Policy Costs remain unpaid; except that the Revenues may be used for such purposes as are expressly set forth above in paragraph (b) under this caption “Pledge and Assignment of Revenues; Revenue Fund” and, as long as the Commission is in compliance with its rate covenant under the Indenture and the deposits required as described below under the caption “Establishment and Maintenance of Funds for Revenues; Use and Withdrawal of Revenues,” as otherwise set forth in the Charter and in the Indenture. Amendments to the Charter shall not alter the pledge of Revenues or the order of priority of payment of the Revenues used for the payment of principal of and interest on the Bonds.

Establishment and Maintenance of Funds for Revenues; Use and Withdrawal of Revenues. All moneys in the Revenue Fund, after the making of the payments described in subsections (b)(1) and (2) in “Pledge and Assignment of Revenues; Revenue Fund” above, shall, on a parity basis be (i) paid over to the Trustee to the extent necessary and deposited in one or more of the following respective special funds at the times therein specified, and (ii) used as needed for the payment of Parity State Loans. The Trustee shall establish and maintain, in trust, for the benefit of and so long as any Bonds, other than Parity State Loans, are Outstanding the Interest Fund, Principal Fund, and Bond Reserve Fund.

All Revenues in each of said funds shall be held in trust by the Trustee and shall be applied, used and withdrawn only for the purposes authorized in the Indenture. Such amounts shall be so transferred to and deposited in the following respective funds in the following order of priority, the requirements of each such fund at the time of deposit to be satisfied before any transfer is made to any fund subsequent in priority:

(a) Interest Fund, Refundable Credits. On or before the fifth Business Day prior to each Interest Payment Date, the Treasurer will pay to the Trustee for deposit in the Interest Fund in an amount equal to the sum of the following: (i) the amount of interest becoming due and payable on the Outstanding Bonds of such Series that are Current Interest Bonds (except for Bonds constituting Variable Rate Indebtedness) on such Interest Payment Date (less any amounts on deposit in such Fund, including, but not limited to, Refundable Credits available to pay such interest, but excluding amounts on deposit which are reserved as capitalized interest to pay interest during any subsequent period), and (ii) one hundred ten percent (110%) of the estimated aggregate amount of interest due on such Interest Payment Date on the Outstanding Bonds of such Series that are Variable Rate Indebtedness (provided, however, that (A) the amount of such deposit into the Interest Fund for any period may be reduced by the amount by which the deposit in the prior period for interest estimated to accrue on Outstanding Variable Rate Indebtedness exceeded the actual amount of interest accrued during that period on said Outstanding Variable Rate Indebtedness, (B) the amount of such deposit into the Interest Fund for any period will be increased by the amount by which the deposit in the prior period for interest estimated to accrue on Outstanding Variable Rate Indebtedness was less than the actual amount of interest accruing during that period on said Outstanding Variable Rate Indebtedness, and (C) the amount of such deposit will be reduced by any Refundable Credits on deposit in the Interest Fund and available to pay interest for such period). No deposit need be made into the Interest Fund if the amount contained therein is at least equal to the interest to become due and payable on the next Interest Payment Date upon all of the Bonds issued under the Indenture and then Outstanding (but excluding any moneys on deposit in the Interest Fund from the proceeds of any Series of Bonds or other source and reserved as capitalized interest to pay interest on any future Interest Payment Dates following said next Interest Payment Date). Moneys in the Interest Fund will be used and withdrawn by the Trustee solely for the purpose of paying the interest on the Bonds as it will become due and payable (including accrued interest on any Bonds purchased or redeemed prior to maturity pursuant to the Indenture).

All of the Refundable Credits received by the Commission will be deposited promptly upon receipt in the Interest Fund, and such Refundable Credits are irrevocably pledged to the punctual payment of principal of, interest and redemption premium, if any, on the related Series of Bonds, and, unless an Event of Default shall occur under the Indenture and the provisions of the Indenture relating to the application of funds upon acceleration shall apply, the Refundable Credits will not be used for any other purpose while any of such Series of Bonds issued as Build America Bonds remain Outstanding. Pursuant to Section 5451 of the California Government Code, the pledge of the Indenture constitutes a lien on and security interest in the Refundable Credits for the payment of interest on the related Series of Bonds in accordance with the terms thereof and the terms of the Indenture, and will immediately attach and be effective, binding, and enforceable against the Commission, its successors, purchasers of the Refundable Credits, creditors and all others asserting any rights thereto, irrespective of whether such parties have notice of such pledge and without the need for any physical delivery, recordation, filing or further act. Notwithstanding the foregoing deposit and pledge, (a) the Refundable Credits shall not be included in the calculation of Revenues if the Refundable Credits have been used in any calculation as a reduction (or credit) against the interest payable under the Indenture (or in any other calculation that would double-count a Refundable Credit), and (b) if the Federal Government is paying less than the amount scheduled to be paid by the Federal Government pursuant to Section 6431 of the Code or pursuant to any similar direct-pay subsidy program (due to sequestration or otherwise), then Refundable Credits may be included in the calculation of Revenues but only to the extent such Refundable Credits are required or permitted to be made pursuant to Federal law. Additionally, in calculating the amount that the Treasurer pays to the Trustee for deposit in the Interest Fund, the Treasurer may reduce the payment by the amount of any Refundable Credits on deposit with the Trustee as provided in the paragraph above.

(b) Principal Fund; Sinking Fund Accounts. On or before the fifth Business Day prior to each Principal Payment Date, the Treasurer will pay to the Trustee for deposit in the Principal Fund in an amount equal to the sum of the following: (i) the aggregate amount of Bond Obligation of such Series (less any amounts on deposit in such Fund) becoming due and payable on such Principal Payment Date, plus (ii) the Minimum Sinking Fund Account Payments required to be made with respect to any Term Bonds of such Series on such Principal Payment Date, plus (iii) if any Letter of Credit Agreement has been entered into on a parity with the Bonds, sufficient amounts to pay the obligations of the Commission under such Letter of Credit Agreement due on such Principal Payment Date. If the amounts on deposit in the Principal Fund will be insufficient to make all deposits which are required to be made with respect to any Principal Payment Date, such amounts shall be applied on a Proportionate Basis and in such proportion as said Serial Bonds, said Minimum Sinking Fund Payments for Term Bonds, and said Letter of Credit Agreement obligations shall bear to each other.

(c) Bond Reserve Fund; Reserve Accounts.

(1) In the event of a withdrawal from any Reserve Account, the Treasurer will pay to the Trustee for deposit in such Reserve Account, on a *pari passu* basis with transfers to any other Reserve Account, on or before the fifth Business Day prior to each Interest Payment Date following such withdrawal, (i) if such Reserve Account is established with respect to fixed rate Bonds only, an amount which if made in two semi-annual installments, and (ii) if such Reserve Account is established with respect to any Variable Rate Bonds, an amount which if made in equal installments over a 12-month period, is sufficient to replenish any prior withdrawal from such Reserve Account so that the balance in such Reserve Account is equal to the Required Reserve with respect to the applicable Series of Bonds (or such larger balance as may be required by any Supplemental Indenture) at the end of such 12-month period.

(2) No deposit need be made into any Reserve Account so long as there will be in such Reserve Account an amount equal to the Required Reserve with respect to such Series of Bonds, or when and if the sum of the amounts contained (excluding all Bond Reserve Fund Policies) therein and in the Interest Fund and in the Principal Fund is at least equal to the sum of the aggregate principal amount of all of the Bonds then Outstanding and all of the interest then due or thereafter to become due on all such Bonds.

(3) Except as otherwise provided as described below, the Trustee will establish and hold within the Bond Reserve Fund a Reserve Account for each Series of Bonds issued under the Indenture. With respect to the Series of Bonds (the "Prior Series of Bonds") issued prior to the Effective Date of the Fifth Supplemental Indenture, each Reserve Account will be funded in an amount equal to fifty percent (50%) of the Maximum Annual Debt Service on the Outstanding Bonds of the Series to which it relates. With respect to the Series of Bonds issued on or after the Effective Date of the Fifth Supplemental Indenture, the Trustee will establish and hold a Reserve Account for each Series of Additional Bonds issued under the Indenture, if and to the extent required by the Supplemental Indenture pursuant to which that Series of Bonds is issued. Upon the issuance of a Series of Additional Bonds, there will be deposited into the Reserve Account for that Series an amount equal to the Required Reserve, if any, established for that Series of Bonds under the Supplemental Indenture pursuant to which that Series of Bonds is issued. Upon the issuance of a Series of Additional Bonds, the Commission will advise the Trustee of the Required Reserve to be maintained in the Reserve Account for that Series. Unless otherwise provided in the Supplemental Indenture pursuant to which a Series of Bonds is issued, the Reserve Account established with respect to a Series of Bonds will be available only to pay Debt Service on such Series of Bonds, and will not be available to pay Debt Service on any other Series of Bonds.

(4) Subject to paragraph (12) below, moneys in the respective Reserve Accounts within the Bond Reserve Fund will be used and withdrawn by the Trustee solely for the purpose of paying the principal of, Minimum Sinking Fund Account Payments with respect to, and interest on the corresponding Series of Bonds to which such Reserve Account relates (unless otherwise provided in the Supplemental Indenture pursuant to which a Series of Bonds was issued) in the event that no other moneys are available therefor, or for payment or redemption of all of the Bonds of such Series then Outstanding.

(5) Following application of all other funds held in any Reserve Account relating to a Series of Bonds, the Trustee will draw under any Bond Reserve Fund Policy issued with respect to such Series of

Bonds, in a timely manner and pursuant to the terms of such Bond Reserve Fund Policy, to the extent necessary in order to obtain sufficient funds on or prior to the date such funds are needed to pay the Bond Obligation of, Minimum Sinking Fund Account Payments with respect to, and interest on such Series of Bonds when due.

(6) If a Bond Reserve Fund Policy satisfies all or a portion of the Required Reserve for any Series of Bonds and a drawing is made on the Bond Reserve Fund Policy, on or before the fifth Business Day prior to each Interest Payment Date following such drawing, the Treasurer will pay to the Trustee or to the Reserve Provider, with notice to the Trustee, (i) if such Bond Reserve Fund Policy is established with respect to fixed rate Bonds only, an amount which if made in two semi-annual installments, and (ii) if such Bond Reserve Fund Policy is established with respect to any Variable Rate Bonds, an amount which if made in equal installments over a 12-month period, is sufficient to repay the aggregate amount of Policy Costs owing with respect to such drawing by the end of such 12-month period. If the Trustee receives such payment, it shall immediately remit the same to the Reserve Provider.

(7) In the event that the Trustee has notice that any payment of principal of or interest on a Bond has been recovered from its Bondowner pursuant to the United States Bankruptcy Code by a trustee in bankruptcy in accordance with the final, nonappealable order of a court having competent jurisdiction, the Trustee, pursuant to the terms of the Bond Reserve Fund Policy, if any, securing the Series of Bonds of which such Bond is a part, will so notify the Reserve Provider and draw on such policy to the lesser of the extent required or the maximum amount of such policy in order to pay to such Bondowners the principal of and interest so recovered.

(8) If and to the extent that more than one Bond Reserve Fund Policy satisfies the portion of the Required Reserve relating to a Series of Bonds, drawings under such Bond Reserve Fund Policies and payment of Policy Costs with respect to such Bond Reserve Fund Policies shall be made on a pro rata basis (calculated by reference to the maximum amounts of such Bond Reserve Fund Policies).

(9) If a Bond Reserve Fund Policy is deposited in a Reserve Account in which cash has been previously deposited in satisfaction of the Required Reserve for the applicable Series of Bonds, the trustee shall release cash from that Reserve Account in an amount equal to the Bond Reserve Fund Policy being deposited, and shall transfer the cash so released to the Commission to be used for any lawful purpose, provided, however, that the Commission shall ensure that the use of any cash so released will not adversely affect the exclusion from gross income of the interest on the Bonds under Section 103 of the Code (if applicable).

(10) If deposits are insufficient to fully satisfy the requirements of subparagraph (5) above, deposits to the Bond Reserve Fund shall be applied on a pro rata basis to the respective Reserve Accounts, calculated by reference to the amounts required to be maintained in each Reserve Account, and within any Reserve Account first to the pro rata payment of Policy Costs and upon satisfaction of such Policy Costs to satisfying any portion of the Required Reserve to be maintained within such Reserve Account not covered by a Bond Reserve Fund Policy.

(11) So long as the Commission is not in default under the Indenture, and in each Reserve Account there is a balance equal to the Required Reserve for the Series of Bonds for which such Reserve Account was established, any amount in the Bond Reserve Fund in excess of the Required Reserve will be withdrawn semiannually, on May 1 and November 1 of each year, by the Trustee from the Bond Reserve Fund and transferred to the Treasurer for deposit in the Revenue Fund or, during the period of construction of the Project or any portion thereof, the Improvement Fund. Notwithstanding the foregoing, the Commission will have the right to withdraw excess amounts on deposit in the Bond Reserve Fund at any time upon request to the Trustee.

(12) On and after the Effective Date, any Reserve Requirement established with respect to any Series of Bonds which are issued as Build America Bonds prior to such date may, at the option of the Commission, be recalculated in accordance with the provisions of the Fifth Supplemental Indenture.

(13) Nothing under the Indenture shall preclude the creation of a Reserve Account to secure one or more Series of Bonds issued subsequent to the Effective Date.

All moneys remaining in the Revenue Fund on the tenth day of each month (or on such earlier day of each month as the transfers required to the Interest Fund, Principal Fund, Sinking Fund Accounts and the Bond Reserve Fund will have been completed) and attributable to the preceding calendar month, after the setting aside and transferring of all of the amounts required to be set aside or transferred by the Treasurer by the provisions in the Indenture as required to the Interest Fund, Principal Fund, Sinking Fund Accounts and the Bond Reserve Fund, will be deposited by the Treasurer in accordance with the Charter. The inability of the Treasurer to make any deposit for any of the purposes described above in subparagraphs (4), (5), or (6) of paragraph (b) under the caption "Pledge and Assignment of Revenues; Revenue Fund" by reason of a lack of Revenues available therefor will not constitute an Event of Default under the Indenture. If at any time any moneys so deposited are needed to pay the interest on or principal of the Bonds, or to pay Operation and Maintenance Costs of the Enterprise for the then current Fiscal Year for which no adequate budgeted amount was provided by the Commission, the Treasurer may transfer such moneys for such purpose. Any such transfer will be replenished from Revenues when moneys are available for deposit in the particular fund from which the transfer was made, after all required transfers to funds having a higher priority have been made.

The Treasurer shall not expend any moneys for any of the purposes specified in subparagraphs (4), (5), or (6) of paragraph (b) under the caption "Pledge and Assignment of Revenues; Revenue Fund" if and when the Commission is in default in making any payment or deposit under the Indenture.

Deposit and Investment of Moneys in Funds; Interest Rate Swaps. All moneys held by the Treasurer in the Revenue Fund or the Improvement Fund, or for the purposes described above in subparagraphs (4), (5), or (6) of paragraph (b) under the caption "Pledge and Assignment of Revenues; Revenue Fund" may be invested in Legal Investments maturing not later than the date on which such moneys are required for payment by the Treasurer. All moneys held by the Trustee and allocated to any of the funds held by it, subject to the restrictions set forth in the Rebate Certificate, will be held in time or demand deposits (including certificates of deposit) in any bank or trust company (including the Trustee) authorized to accept deposits of public funds, and will be secured at all times by such obligations, and to the fullest extent, as is required by law, and may be invested in Permitted Investments, maturing not later than the date on which such moneys are required for payment by the Trustee, except that moneys in the Bond Reserve Fund may be deposited or invested in deposits or Permitted Investments which mature not more than seven years from the date of investment or the final date of maturity of the Outstanding Bonds, whichever is earlier. If at any time any of the investments stated to be Permitted Investments under the Indenture cease to be a legal investment for funds held under the Indenture, the Commission will so advise the Trustee by a Written Statement of the Commission. The Trustee will not be responsible for making any investment which is not a legal investment if the Commission will not have previously delivered a Written Request or Written Statement of the Commission correctly advising the Trustee that such investment was no longer a legal investment. For the purpose of determining the amount of money in the Bond Reserve Fund, all investments of moneys therein will be valued annually on October 31 at the market value of such investments. All interest received on any moneys so invested by the Treasurer or the Trustee will be deposited in and for the purpose of the Revenue Fund, except that all interest received on any moneys so invested in the Principal Fund or Interest Fund will remain in such fund, and further except that prior to receipt by the Trustee of notice of completion of construction of the Project or any portion thereof all interest received on any moneys so invested in the Improvement Fund or in the Bond Reserve Fund will remain in, or be transferred to and deposited in, the Improvement Fund held by the Treasurer. Upon completion of construction of the Project or any such portion thereof, the Commission will file with the Trustee a Certificate or Written Statement of the Commission stating the fact and date of such completion of construction.

The Trustee may sell or present for redemption any obligations so purchased by it whenever it is necessary in order to provide moneys to meet any payment, and the Trustee will not be liable or responsible for any loss resulting from such investment.

The Trustee may act as principal or agent in the acquisition or disposition of any investment.

The Trustee may commingle any of the moneys held by it pursuant to the Indenture for investment purposes only; provided, however, that the Trustee will account separately for the moneys belonging to each fund or account established pursuant to the Indenture and held by it.

The Commission may and the Trustee will, upon the Written Request or Written Statement of the Commission, and provided that the Trustee is supplied with an Opinion of Counsel to the effect that such action is permitted under the laws of the State of California, enter into an interest rate swap agreement corresponding to the interest rate or rates payable on a Series of Bonds or any portion thereof and the amounts received by the Commission or the Trustee, if any, pursuant to such a swap agreement may be applied to the deposits required under the Indenture. The entity with which the Commission or the Trustee may contract for an interest rate swap is limited to entities that are rated in one of the two highest short-term or long-term debt rating categories by Moody's and S&P. If the Commission so designates, amounts payable under the interest rate swap agreement will be made on a parity basis with payments on the Bonds and, in such event, the Commission will pay to the Trustee for deposit in the Interest Fund, at the times and in the manner provided in the Indenture, the amounts to be paid under such interest rate swap agreement, as if such amounts were additional interest due on the Bonds to which such interest rate swap relates.

SELECTED COVENANTS OF THE COMMISSION

Payment of Principal and Interest. The Commission will punctually pay or cause to be paid the principal and interest (and premium, if any) to become due in respect of every Bond issued under the Indenture at the times and places and in the manner provided in the Indenture and in the Bonds, in strict conformity with the terms of the Bonds and of the Indenture, but solely from Revenues as provided in the Indenture.

Against Encumbrances. Subject to any rights of the United States of America or the State of California, the Commission will not mortgage or otherwise encumber, pledge or place any charge upon the Enterprise or any part thereof, or upon any of the Revenues, prior to or on a parity with the Bonds, provided that Letter of Credit Agreements entered into in connection with Balloon Indebtedness, Variable Rate Indebtedness or Tender Indebtedness may be payable on a parity with the Bonds.

So long as any Bonds are Outstanding, the Commission will not issue any bonds or obligations payable from Revenues or secured by a pledge, lien or charge upon Revenues prior to or on a parity with the Bonds, other than the Bonds, provided that Letter of Credit Agreements entered into in connection with Balloon Indebtedness, Variable Rate Indebtedness or Tender Indebtedness may be payable on a parity with the Bonds.

Nothing in the Indenture, and particularly nothing in the preceding two paragraphs, will prevent the Commission from authorizing and issuing bonds, notes, warrants, certificates or other obligations or evidences of indebtedness which as to principal or interest, or both, (1) are payable from Revenues after and subordinate to the payment from Revenues of the principal of and interest on the Bonds, or (2) are payable from moneys which are not Revenues as such term is defined in the Indenture.

Sale or Other Disposition of Property. The Commission will not sell or otherwise dispose of the Enterprise or any part thereof essential to the proper operation of the Enterprise or to the maintenance of the Revenues except as expressly permitted in the Indenture. The Commission will not enter into any lease or agreement which impairs the operation of the Enterprise or impedes the rights of the Owners of the Bonds with respect to the Revenues or the operation of the Enterprise, but the Commission may enter into any lease or agreement concerning all or any part of the Enterprise if such lease or agreement will not impair the operation of the Enterprise or impede the rights of the Owners of the Bonds with respect to the Revenues or the operation of the Enterprise.

Any real or personal property which has become nonoperative or which is not needed for the efficient and proper operation of the Enterprise, or any material or equipment which has worn out, may be sold if all of the net proceeds of such sale (less any amounts payable to the United States of America or the State of California or required by the United States of America or the State of California to be deposited in a restricted fund) are deposited in the Revenue Fund.

The Commission reserves the right to sell all or a portion of the Enterprise, and to enter into and execute agreements for and to complete such sale, but subject to the following specific conditions, which are made conditions precedent to such sale:

(1) The Commission will be in compliance with all covenants set forth in the Indenture, and in all Supplemental Indentures theretofore adopted by the Commission, and a Certificate of the Commission to that effect will have been filed with the Trustee.

(2) The Commission will have determined by resolution whether the net proceeds of the sale (less any amounts payable to the United States of America or the State of California or required to be deposited in a restricted fund) are to be used for the redemption of Bonds or for the making of additions or improvements to or extensions of the Enterprise.

(3) If the Commission will have determined that the net proceeds of the sale (less any amounts payable to the United States of America or the State of California or required to be deposited in a restricted fund) are to be used for the redemption of Bonds, such proceeds of the sale will be deposited with the Trustee, and the following conditions will have been satisfied:

(i) The Commission will have adopted a resolution providing for the redemption of the maximum principal amount of Bonds which can be redeemed from such proceeds of such sale, or, in the event that no Bonds are subject to redemption on the next succeeding interest payment date, directing the Trustee (A) to hold such proceeds in trust, (B) to invest such proceeds in the investments permitted by the Indenture until any Bonds become redeemable, subject to any restrictions imposed by the Indenture, (C) to deposit the interest and income on such proceeds in the Revenue Fund as such interest and income is received, and (D) to use such proceeds to redeem Bonds in the amount and manner specified in the Indenture and any Supplemental Indenture on the first interest payment date on which the Bonds can be redeemed; and a certified copy of such resolution will have been filed with the Trustee, along with a Written Request or Certificate of the Commission containing such direction.

(ii) If such proceeds are not to be immediately used for the redemption of Bonds but instead are to be held by the Trustee until Bonds become redeemable, the Commission will have filed with the Trustee a written report of an Independent Certified Public Accountant stating (A) the amount of proceeds to be deposited with the Trustee from such sale, (B) an estimate of the total amount of Bond Obligation and the amount of Bonds of each maturity which could be redeemed from such proceeds on the first interest payment date on which Bonds are redeemable, and (C) the estimated annual interest and income to be earned on such proceeds while held and invested by the Trustee. Such interest and income on such proceeds upon receipt by the Trustee will be deposited in the Revenue Fund and will be treated as Revenues for all purposes of the Indenture, including determining whether the Commission is in compliance with the rate covenant contained in the Indenture.

(iii) If such proceeds of such sale are to be immediately used to redeem Bonds, the Net Revenues for the last Fiscal Year or last recorded twelve-month period preceding the date of the adoption by the Commission of the resolution authorizing such sale, less a deduction for the portion of such Net Revenues attributable to the portion of the Enterprise to be sold, all as shown by a certificate or opinion of an Independent Certified Public Accountant or a written report of a Qualified Independent Consultant, will have produced a sum equal to at least 1.25 times Maximum Annual Debt Service on the Bonds to be Outstanding following the redemption of Bonds from the proceeds of such sale.

(iv) If such proceeds are not to be immediately used for the redemption of Bonds but instead are to be held by the Trustee until Bonds become redeemable, the Net Revenues for the last Fiscal Year or last recorded twelve-month period preceding the date of adoption by the Commission of the resolution authorizing such sale, less a deduction for the portion of such Net Revenues attributable to the portion of the Enterprise to be sold, plus an allowance for the estimated annual interest or income to be earned on the invested proceeds of such sale while held

and invested by the Trustee, all as shown by a certificate or opinion of an Independent Certified Public Accountant or a written report of a Qualified Independent Consultant, will have produced a sum equal to at least 1.25 times Maximum Annual Debt Service.

(4) If the Commission, will have determined that the net proceeds of the sale (less any amounts payable to the United States of America or the State of California or required to be deposited in a restricted fund) are to be used for the making of additions or improvements to or extensions of the Enterprise, such proceeds of the sale will be deposited by the Treasurer in a special fund in trust to be held by the Treasurer to be used for the making of additions or improvements to or extensions of the Enterprise, and the condition set forth in the following sentence will have been satisfied. The Net Revenues for the last Fiscal Year or last recorded twelve-month period preceding the date of the adoption by the Commission of the resolution authorizing such sale, less a deduction for the portion of such Net Revenues attributable to the portion of the Enterprise to be sold, all as shown by a written report of an Independent Certified Public Accountant, plus

(i) An allowance for Net Revenues from any additions or improvements to or extensions of the Enterprise to be made with the proceeds of such sale or with the proceeds of Bonds previously issued, and also for Net Revenues from any such additions, improvements or extensions which have been made from moneys from any source but which, during all or any part of such Fiscal Year or recorded twelve-month period, were not in service, all in an amount equal to one hundred percent (100%) of the estimated additional average annual Net Revenues to be derived from such additions, improvements and extensions for the first twenty-four months in which each addition, improvement or extension is respectively to be in operation, all as shown by the certificate or opinion of a Qualified Independent Consultant; and

(ii) An allowance for earnings arising from any increase in the charges made for the use of the Enterprise which has become effective prior to such sale, but which, during all or any part of such Fiscal Year or recorded twelve-month period, was not in effect, in an amount equal to one hundred percent (100%) of the amount by which the Net Revenues would have been increased if such increase in charges had been in effect during the whole of such Fiscal Year or recorded twelve-month period, as shown by the certificate or opinion of a Qualified Independent Consultant;

will have produced a sum equal to at least 1.25 times the Maximum Annual Debt Service on the Bonds then Outstanding. Any balance of such proceeds from any such sale not required by the Commission for the purposes aforesaid will be deposited in the Revenue Fund established pursuant to the Indenture and applied as provided in the Indenture.

Operation and Maintenance of Enterprise. The Commission will maintain and preserve the Enterprise in good repair and working order at all times from the Revenues available for such purposes, in conformity with standards customarily followed for municipal water supply, storage and distribution systems of like size and character. The Commission will from time to time make all necessary and proper repairs, renewals, replacements and substitutions to the properties of the Enterprise, so that at all times business carried on in connection with the Enterprise will and can be properly and advantageously conducted in an efficient manner and at reasonable cost, and will operate the Enterprise in an efficient and economical manner, consistent with the protection of the Owners of the Bonds, and will not commit or allow any waste with respect to the Enterprise.

Liens and Claims. Subject to any rights of the United States of America or the State of California, the Commission will keep the Enterprise and all parts thereof free from judgments, from mechanics' and materialmen's liens and from all liens and claims of whatsoever nature or character, to the end that the security provided pursuant to the Indenture may at all times be maintained and preserved, and the Commission will keep the Enterprise and the Revenues free from any liability which might hamper the Commission in conducting its business or operating the Enterprise. Subject to the provisions of the Indenture, the Trustee at its option (after first giving the Commission thirty days' written notice to comply therewith and failure of the Commission to so comply within said thirty-day period) may defend against any and all actions or proceedings in which the validity of the Indenture is or might be questioned, or may pay or compromise any claim or demand asserted in any such actions or proceedings; provided, however, that, in defending against such actions or proceedings or in paying or compromising such claims or

demands, the Trustee will not in any event be deemed to have waived or released the Commission from liability for or on account of any of its covenants and warranties contained in the Indenture, or from its liability under the Indenture to defend the validity of the Indenture and the pledge made in the Indenture and to perform such covenants and warranties.

Insurance. The Commission will procure, and maintain at all times while any of the Bonds will be Outstanding, adequate fidelity insurance or bonds on all officers and employees handling or responsible for any Revenues or funds of the Enterprise, such insurance or bonds to be in an aggregate amount at least equal to the maximum amount of such Revenues or funds at any one time in the custody of all such officers and employees or in the amount of one million dollars (\$1,000,000), whichever is less.

The insurance described above may be provided as a part of any comprehensive fidelity and other insurance and not separately for the Enterprise.

The Commission may purchase, on all or any of the Bonds of any Series, insurance assuring the Bondowners that the principal of and interest on the insured Bonds will be paid when due and payable. The purchase of any such insurance will not constitute a preference or priority of the insured Bonds over any Bonds not so insured, and all Bonds Outstanding, irrespective of the providing of such insurance on some of the Bonds, will be equally and proportionately secured.

Books and Accounts; Financial Statements. The Commission will keep proper books of record and accounts of the Enterprise, separate from all other records and accounts of the Commission, in which complete and correct entries will be made of all transactions relating to the Enterprise. Such books of record and accounts will at all times during business hours be subject to the inspection of the Trustee or of any Owner of Bonds then Outstanding or their representatives authorized in writing, at reasonable hours and under reasonable conditions.

The Commission further will prepare and file with the Trustee annually, within five months after the close of each Fiscal Year so long as any of the Bonds are Outstanding, financial statements of the Enterprise for the preceding Fiscal Year, prepared in accordance with generally accepted accounting principles applied on a consistent basis from year to year (which financial statements will include a statement showing the balances in each fund required to be established under the provisions of the Indenture), including a balance sheet, statement of income, statement of retained earnings and contributed capital, and statement of changes in financial position, which financial statements will be examined by and include the certificate or opinion of an Independent Certified Public Accountant. Such financial statements will be accompanied by a Certificate of the Commission stating that no Event of Default has occurred or is continuing as of the end of each Fiscal Year, or specifying the nature of the Events of Default, if any, which have occurred and are continuing.

The Commission will furnish a copy of these financial statements to any Bondowner upon request, and will furnish to the Trustee such reasonable number of copies thereof (not exceeding 100 copies) as may be required by the Trustee for distribution to investment bankers, security dealers and others interested in the Bonds and to the Owners of Bonds requesting copies thereof. The Trustee will not be required to incur any nonreimbursable expenses in making such distribution.

The Commission will cause to be published a summary statement showing the amount of Revenues and the amount of all other funds collected which are required to be pledged or otherwise made available as security for payment of the principal of and interest on the Bonds, the disbursements from such Revenues and other funds in reasonable detail, and a general statement of the financial and physical condition of the Enterprise. The statement will be published annually, not more than 120 days after the close of each Fiscal Year. The Commission will furnish a copy of the statement to any Bondowner upon request.

Enterprise Budgets. The Commission will prepare and submit to the Mayor for review and submission to the Board of Supervisors for approval an annual budget for the Enterprise for each Fiscal Year. Such budget will set forth in reasonable detail the Revenues anticipated to be derived in such Fiscal Year and the expenditures anticipated to be paid or provided for therefrom in such Fiscal Year including, without limitation, the amounts required to provide for the payment of the principal of and interest and redemption premium, if any, on the Bonds during such Fiscal Year, to pay or provide for Operation and Maintenance Costs of the Enterprise for such Fiscal Year, to make up any deficiencies in any fund or account anticipated for the then current Fiscal Year, and to pay or provide for the

payment of all other claims or obligations required to be paid from Revenues in such Fiscal Year, and will show that Net Revenues will be at least adequate to satisfy the provisions of the rate covenant under the Indenture. Such budget will comply with any conditions or restrictions set forth in any agreements between the Commission and users of the Enterprise. The Commission will take all action available and necessary to obtain approval or acceptance of the budget by the Mayor and the Board of Supervisors. The Commission will supply to the Trustee and to any Bondowner who will so request in writing a copy of the annual budget for the Fiscal Year covered by such budget. Such budget will be open for inspection by any Owner at the principal corporate trust office of the Trustee during normal business hours. If at any time a revised annual budget for the Enterprise will be adopted which will involve an increase or decrease in the Revenues or in said expenditures of ten percent (10%) or more, the Commission will supply a copy to the Trustee and to any Bondowner who will so requests in writing.

Maintenance of Revenues; Merger with Hetch Hetchy Project. The City will not acquire, construct, operate or maintain, and will not within the scope of its powers permit any other public or private corporation, political subdivision, district or agency or any person whatsoever to acquire, construct, operate or maintain, within the City or any part thereof, any system or utility competitive with the Enterprise. The Commission will have in effect, or cause to have in effect, at all times an ordinance or resolution requiring all customers of the Enterprise to pay the fees, rates and charges applicable to the water, services and facilities furnished by the Enterprise. The Commission will not provide any water service of the Enterprise free of charge to any person, firm or corporation, or to any public agency (including the United States of America, the State of California, and any public corporation, political subdivision, city, county, district or agency of any thereof), except (i) for free use by the City and its agencies, (ii) to the extent that any such free use is required by the terms of any existing contract or agreement and (iii) for incidental insignificant free use so long as such free use does not prevent the Commission from satisfying the other covenants of the Indenture, including, without limitation, the rate covenant under the Indenture.

The Commission will not take any action pursuant to the Charter to accomplish a merger of the Enterprise with the Hetch Hetchy Project, a department of the City under the jurisdiction of the Commission, unless and until the Commission will have provided a method for segregating the Revenues from the revenues of the Hetch Hetchy Project so as to preserve the lien of the Indenture upon the Revenues, and will have obtained an opinion of counsel from a firm nationally recognized in the practice of tax-exempt financing that such merger will not, in and of itself, affect the exclusion from gross income of the interest on the Bonds under Section 103 of the Code (if applicable).

Eminent Domain Proceeds. If all or any part of the Enterprise will be taken by or under threat of eminent domain proceedings, the net proceeds realized by the Commission or the City therefrom (excluding any portion thereof payable to the United States of America or the State of California or required by the United States of America or the State of California to be deposited in a restricted fund) will be deposited by the Treasurer in a special fund in trust and applied and disbursed by the Treasurer subject to the following conditions:

(a) If such eminent domain proceedings have had a material adverse effect upon the Revenues and the security of the Bonds, the Commission will by resolution determine to apply such proceeds for one of the following purposes:

(1) The Commission may determine to apply such proceeds to the purchase, defeasance or redemption of Bonds then Outstanding. In that event, the Treasurer will transfer such proceeds to the Trustee who will apply such proceeds on a Proportionate Basis to the redemption, defeasance or purchase of Bonds of each Series then Outstanding in the proportion which the Bond Obligation amount of each Series bears to the aggregate Bond Obligation amount of all Bonds then Outstanding.

(2) The Commission may determine to apply such proceeds to the cost of additions or improvements to or extensions of the Enterprise if (A) the Commission first secures and files with the Trustee a written report of a Qualified Independent Consultant showing (i) the loss in annual Revenues, if any, suffered, or to be suffered, by the Commission by reason of such eminent domain proceedings, (ii) a general description of the additions, improvements or extensions then proposed to be acquired by the Commission from such proceeds, and (iii) an estimate of the additional Revenues to be derived from such additions, improvements or extensions; and (B) such written report states that such additional Revenues will sufficiently offset the loss of Revenues resulting from such eminent domain proceedings so that the ability of the Commission to meet its

obligations under the Indenture will not be substantially impaired. The Commission will then promptly proceed with the construction of the additions, improvements or extensions substantially in accordance with such written report. Payments for such construction will be made by the Commission from such proceeds. Any balance of such proceeds not required by the Commission for the purposes aforesaid will be deposited in the Revenue Fund and applied as provided in the Indenture.

(b) If such eminent domain proceedings have had no effect, or at the most a relatively immaterial effect, upon the Revenues and the security of the Bonds, and a Qualified Independent Consultant so concludes in a written report filed with the Trustee, the Commission may determine to apply such proceeds to the costs of additions or improvements to or extensions of the Enterprise or may deposit such proceeds in the Revenue Fund, to be applied as provided in the Indenture.

Tax Covenants. With respect to any Series of Bonds the interest on which is to be excluded from gross income of the owners thereof for federal income tax purposes, the Commission covenants that it will not take any action, or fail to take any action, if any such action or failure to take action would adversely affect the exclusion from gross income of the interest on such Bonds under Section 103 of the Code. The Commission will not directly or indirectly use or permit the use of any proceeds of any such Bonds or any other funds of the Commission, or take or omit to take any action that would cause such Bonds to be “arbitrage bonds” within the meaning of Section 148(a) of the Code. To that end, the Commission will comply with all requirements of Section 148 of the Code to the extent applicable to a Series of Bonds. If at any time the Commission is of the opinion that for purposes of the provisions of the Indenture summarized under the caption “Tax Covenants” herein it is necessary to restrict or limit the yield on the investment of any moneys held by the Trustee under the Indenture or otherwise, the Commission will so instruct the Trustee in writing, and the Trustee will take such action as required by such instructions.

Without limiting the generality of the foregoing, the Commission agrees that there will be paid from time to time all amounts required to be rebated to the United States of America pursuant to Section 148(f) of the Code and any temporary, proposed or final Treasury Regulations as may be applied to a Series of Bonds the interest on which is to be excluded from gross income of the owners thereof for federal income tax purposes. This covenant will survive payment in full or defeasance of any such Bonds. The Commission specifically covenants to pay or cause to be paid to the United States of America at the times and in the amounts determined under the Indenture the Rebate Requirement. The Trustee agrees to comply with all written instructions of the Commission given in accordance with the applicable Rebate Certificate.

Notwithstanding any provision of the Indenture summarized under this caption, if the Commission provides to the Trustee an opinion of nationally recognized bond counsel to the effect that any action required under the Indenture or under a tax certificate relating to a Series of Bonds is no longer required, or to the effect that some further action is required, to maintain the exclusion from gross income of the interest on such Series of Bonds under Section 103 of the Code, the Commission and the Trustee may rely conclusively on such opinion in complying with such provisions of the Indenture, and the covenants under the Indenture will be deemed to be modified to that extent.

The Commission will assure that the proceeds of any Series of Bonds the interest on which is to be excluded from gross income of the owners thereof for federal income tax purposes are not so used as to cause such Bonds to satisfy the private business tests of section 141(b) of the Code or the private loan financing test of section 141(c) of the Code. The Commission will not take any action or permit or suffer any action to be taken if the result of the same would be to cause any of such Bonds to be “federally guaranteed” within the meaning of section 149(b) of the Code.

Continuing Disclosure. The Commission covenants and agrees that it will comply with and carry out all of the provisions of the Continuing Disclosure Certificate, dated as of the date of issuance of the 2019 Series ABC Bonds (the “Continuing Disclosure Certificate”), executed and delivered by the Commission in connection with the issuance of the 2019 Series ABC Bonds, as it may be supplemented and amended in accordance with its terms. Notwithstanding any other provision of the Indenture, failure of the Commission to comply with the 2019 Series ABC Continuing Disclosure Certificate will not be considered an Event of Default; however, any Participating Underwriter (as such term is defined in the 2019 Series ABC Continuing Disclosure Certificate) or any Bondowner or beneficial owner may take such actions as may be necessary and appropriate, including seeking specific

performance by court order, to cause the Commission to comply with its obligations under this Section, and the sole remedy in the event of any failure of the Commission to comply with the 2019 Series ABC Continuing Disclosure Certificate will be an action to compel performance.

EVENTS OF DEFAULT AND REMEDIES OF BONDOWNERS

Events of Default; Acceleration. If one or more of the following events (“Events of Default”) shall happen:

(1) if default shall be made in the due and punctual payment of the principal of, or the premium (if any) on, any Bond when and as the same shall become due and payable, whether at maturity as therein expressed, by proceedings for redemption, by declaration or otherwise, or if default shall be made in the redemption from any Sinking Fund Account of any Term Bonds in the amounts and at the times provided therefor;

(2) if default shall be made in the due and punctual payment of any installment of the interest on any Bond when and as such interest installment shall become due and payable;

(3) if default shall be made by the Commission in the observance of any of the other covenants, agreements or conditions on its part in the Indenture or in the Bonds contained, and such default continues for a period of sixty days after written notice of such failure, specifying such default and requiring the same to be remedied, shall have been given to the Commission by the Trustee or by a Credit Provider, or to the Commission and the Trustee by the Owners of not less than twenty-five percent (25%) of the Bond Obligation; or

(4) if the Commission or the City shall file a petition or answer seeking reorganization or arrangement under the federal bankruptcy laws or any other applicable law of the United States of America, or if a court of competent jurisdiction shall approve a petition, filed with or without the consent of the Commission or the City, as the case may be, seeking reorganization under the federal bankruptcy laws or any other applicable law of the United States of America, or if, under the provisions of any other law for the relief or aid of debtors, any court of competent jurisdiction shall assume custody or control of the Commission or the City or of the whole or any substantial part of the property of the Commission or the City;

then and in each and every such case during the continuance of such Event of Default, the Trustee may, and upon the written request of the Owners of not less than a majority in aggregate amount of the Bond Obligation or of a Credit Provider shall, upon notice in writing to the Commission, declare the principal of all of the Current Interest Bonds then Outstanding, and the interest accrued thereon, the Capital Appreciation Bonds then Outstanding, in the amount of the Accreted Value thereof, and the Parity State Loans then outstanding, in the amount of the obligations due thereunder, to be due and payable immediately, and upon any such declaration the same shall become and shall be immediately due and payable, anything in the Indenture or in the Bonds contained to the contrary notwithstanding.

This provision, however, is subject to the condition that if, at any time after the principal of the Bonds shall have been so declared due and payable, and before any judgment or decree for the payment of the moneys due shall have been obtained or entered as provided in the Indenture, the Commission shall deposit with the Trustee a sum sufficient to pay all principal and Accreted Value of the Bonds maturing prior to such declaration and all matured installments of interest (if any) upon all the Current Interest Bonds, with interest on such overdue payments of principal and Accreted Value and interest installments at the rate or rates of interest borne by the respective Bonds, and the reasonable expenses of the Trustee, and any and all other defaults known to the Trustee (other than in the payment of principal and Accreted Value of and interest on the Bonds due and payable solely by reason of such declaration) shall have been made good or cured to the satisfaction of the Trustee, or provision deemed by the Trustee to be adequate shall have been made therefor, then, and in every such case, (i) if such declaration shall have been made by the Trustee, the Trustee, or (ii) if such declaration shall have been made upon the written request of Bondowners, the Owners of not less than a majority in aggregate amount of the Bond Obligation of the Bonds then Outstanding, or (iii) if such declaration shall have been made upon the written request of a Credit Provider, such Credit Provider, may, by written notice to the Commission and, in cases (ii) and (iii) above, to the Trustee, on behalf

of the Owners of all of the Bonds, rescind and annul such declaration and its consequences; but no such rescission and annulment shall extend to or shall affect any subsequent default, or shall impair or exhaust any right or power consequent thereon.

Bondholder Suits. In case one or more of the Events of Default shall happen, then and in every such case the Owner of any Bond at the time Outstanding shall be entitled to proceed to protect and enforce the rights vested in such Owner by the Indenture by such appropriate judicial proceeding as such Owner shall deem most effectual to protect and enforce any such right, either by suit in equity or by action at law, whether for the specific performance of any covenant or agreement contained in the Indenture, or in aid of the exercise of any power granted in the Indenture, or to enforce any other legal or equitable right vested in the Owners of Bonds by the Indenture or by law; provided, however, that no such Bondowner shall have the right to institute any such judicial proceeding pursuant to this Section unless (a) such Owner shall have previously given to the Trustee written notice of the occurrence of an Event of Default under the Indenture; (b) the Owners of at least ten percent (10%) in aggregate amount of the Bond Obligation of the Bonds then Outstanding shall have made written request to the Trustee to exercise the powers granted in the Indenture or to institute such action, suit or proceeding in its own name; (c) such Owner or said Owners shall have tendered to the Trustee reasonable indemnity against the costs, expenses and liabilities to be incurred in compliance with such request; (d) the Trustee shall have refused or omitted to comply with such request for a period of sixty (60) days after such written request shall have been received by, and said tender of indemnity shall have been made to, the Trustee; and (e) the Trustee shall not have received contrary directions from the Owners of a majority in aggregate amount of Bond Obligation of the Bonds Outstanding. The provisions of the Indenture shall constitute a contract with the Owners of the Bonds, and such contract and duties of the Commission and of the Commission members and of the officers and employees of the Commission and of the City shall be enforceable by any Bondowner by mandamus or other appropriate suit, action or proceeding in any court of competent jurisdiction.

Application of Funds Upon Acceleration. All of the Revenues, including all sums in all of the funds provided for in the Indenture upon the date of declaration of acceleration as provided for in the Section above entitled "Events of Default; Acceleration" and all sums thereafter received by the Commission or the Trustee under the Indenture, shall, if received by the Commission, be transmitted to the Trustee and be applied by the Trustee in the following order, upon presentation of the several Bonds--

First, to the payment of the costs and expenses of the Bondowners in declaring such Event of Default, including reasonable compensation to their agents, attorneys and counsel; and to the payment of the costs and expenses of the Trustee, including but not limited to reasonable compensation to its agents, attorneys and counsel;

Second, to the payment of the whole amount of Bond Obligation then owing and unpaid upon the Bonds, with interest on, with respect to the Current Interest Bonds, the overdue principal and installments of interest, with respect to the Capital Appreciation Bonds, the Accreted Value thereof, and with respect to the Parity State Loans, the obligations due thereunder, at the rate or rates of interest borne by the respective Bonds, and in case such moneys shall be insufficient to pay in full the whole amount so owing and unpaid upon the Bonds, then to the payment of such principal and interest, Accreted Value and obligations (under Parity State Loans) without preference or priority of principal over interest, or of interest over principal, or of any installment of interest over any other installment of interest, ratably to the aggregate of such principal and interest, Accreted Value and obligations (under Parity State Loans); and

Third, to the payment of all Policy Costs, and in case such moneys shall be insufficient to pay in full all Policy Costs owing and unpaid, then to the payment of such Policy Costs pro rata (calculated by reference to the maximum amounts available under the respective Bond Reserve Fund Policies).

Remedies of Reserve Provider. If the Commission fails to pay Policy Costs to a Reserve Provider to the extent and at the times required by the provisions of the Indenture and such failure continues for 30 days after written notice of such default is received by the Commission and the Trustee from such Reserve Provider or if an Event of Default concerning bankruptcy of the Commission or the City (as described in subsection (4) under the caption "Events of Default; Acceleration" above) shall occur and be continuing, then the Reserve Provider may exercise any remedy provided under the Indenture to the Trustee or available at law or in equity to protect and enforce its right to receive payment of Policy Costs; *provided, that*, in no event, will the Reserve Provider be able to declare the principal and Accreted Value of the Bonds and the interest accrued thereon to be due and payable

immediately or to exercise any remedy that the Trustee, in its sole discretion, determines would adversely affect the Bondowners.

Rights of Credit Provider. Each Credit Provider, during any period in which an Event of Default has occurred and is continuing, will be recognized as the Owner of each Bond which it guarantees or insures for the purposes of exercising all rights and privileges available to Bondowners. Any acceleration of principal payments with respect to Bonds guaranteed or insured by a Credit Provider are subject to such Credit Provider's prior written consent (but only if such Credit Provider is not in default under its guaranty or insurance policy).

MODIFICATION OR AMENDMENT OF THE INDENTURE

Modification with Consent of Bondowners and Credit Providers. The Indenture may be modified or amended at any time by a Supplemental Indenture which will become binding when the written consents of the Owners of a majority in the aggregate amount of the Bond Obligation of the Bonds (or, if such Supplemental Indenture is only applicable to a Series of Bonds, such Series of Bonds) then Outstanding (exclusive of Bonds owned or held by or for the account of the City or the Commission (but excluding Bonds held in any pension or retirement fund) as provided in the Indenture)) and of each Credit Provider (so long as such Credit Provider is not in default under the policy of municipal bond insurance or Letter of Credit issued by it in connection with any Series of Bonds) will have been filed with the Trustee, provided such Credit Provider's consent will not be unreasonably withheld. The Indenture may also be amended or supplemented by a Supplemental Indenture upon written consent of each Credit Provider, provided that at the time of the amendment or supplement the payment of the principal and interest on all Outstanding Bonds is insured by a policy or policies of municipal bond insurance or payable under a Letter of Credit issued by a Credit Provider.

No such modification or amendment may:

- (1) extend the fixed maturities of the Bonds, or extend the time for making any Minimum Sinking Fund Account Payments, or reduce the rate of interest thereon, or extend the time of payment of interest, or reduce the amount of principal thereof, or reduce any premium payable on the redemption thereof, without the consent of the Owner of each Bond so affected, or
- (2) reduce the aforesaid percentage of the Bond Obligation the consent of the Owners of which is required for the execution of any amendment or modification of the Indenture, or
- (3) modify any of the rights or obligations of the Trustee without its written consent thereto.

Modification without Consent of Bondowners or Credit Providers. The Indenture and the rights and obligations of the Commission and of the Owners of the Bonds may also be modified or amended at any time by a Supplemental Indenture which will become binding upon adoption, without the consent of any Bondowners or any Credit Provider (but with notice to each Credit Provider), but only to the extent permitted by law and only if the Trustee determines, which determination may be based upon a good faith reliance upon an Opinion of Counsel, that the provisions of such Supplemental Indenture will not materially adversely affect the interests of the Owners, including, without limitation, for any one or more of the following purposes-

- (1) to add to the covenants and agreements of the Commission in the Indenture other covenants and agreements thereafter to be observed or to surrender any right or power reserved to or conferred upon the Commission by the Indenture;
- (2) to cure, correct or supplement any ambiguous or defective provision or omission or mistake contained in the Indenture, or in regard to questions arising under the Indenture, as the Commission may deem necessary or desirable;
- (3) to provide for the issuance of additional Series of Bonds, and to provide the terms and conditions under which such additional Series of Bonds may be issued, subject to and in accordance with the provisions of the Indenture; and

(4) to amend the provisions in the Indenture specifying the purposes, in order of priority, for which expenditures can be made from the Revenue Fund for purposes lower in priority than expenditures on the Bonds.

DEFEASANCE

Discharge of Indenture. If the Commission shall pay and discharge the entire indebtedness on all Bonds Outstanding in any one or more of the following ways-

(a) by well and truly paying or causing to be paid the principal of (including redemption premiums, if any) and interest on all Bonds Outstanding, as and when the same become due and payable (but this clause shall not include Bonds the principal of or interest on which has been paid by a Municipal Bond Insurer until said principal and interest shall have been paid by the Commission); or

(b) by depositing with the Trustee, an escrow agent or other fiduciary, in trust, at or before maturity, money which, together with the amounts then on deposit in the Principal Fund, the Interest Fund and the Bond Reserve Fund, is fully sufficient to pay or redeem all Bonds Outstanding, including all principal, interest and redemption premiums, if any; or

(c) by delivering to the Trustee, for cancellation by it, all Bonds Outstanding; or

(d) by depositing with the Trustee, an escrow agent or other fiduciary, in trust, Federal Securities or general obligation bonds of the State of California in such amount which, in the determination of an Independent Certified Public Accountant, who will certify such determination to the Trustee, shall, together with the income or increment to accrue thereon and any other moneys of the Commission made available for such purpose, be fully sufficient to pay and discharge the indebtedness on all Bonds (including all principal, interest and redemption premiums, if any) at or before their respective maturity dates;

and if the Commission shall also pay or causes to be paid all other sums payable under the Indenture by the Commission, including all Policy Costs, then and in that case, at the election of the Commission (evidenced by a Certificate of the Commission signifying its intention to pay and discharge all such indebtedness, which shall be filed with the Trustee), and notwithstanding that any Bonds shall not have been surrendered for payment, the pledge of the Revenues and other funds provided for in the Indenture and all other obligations of the Commission under the Indenture shall cease, terminate and be completely discharged, except only as described below under "Discharge of Liability on Bonds," and the Owners of the Bonds not so surrendered and paid shall thereafter be entitled to payment only out of the money or Federal Securities or general obligation bonds of the State of California deposited with the Trustee, escrow agent or other fiduciary as aforesaid for their payment, subject, however, to the provisions of the Indenture described below under "Payment of Bonds after Discharge of Indenture." The discharge of the obligations of the Commission under the Indenture shall be without prejudice to the rights of the Trustee to charge for and be reimbursed by the Commission for any expenditures which it may thereafter incur in connection therewith.

Discharge of Liability on Bonds. Upon the deposit with the Trustee, an escrow agent or other fiduciary, in trust, at or before maturity, of money or Federal Securities or general obligation bonds of the State of California in the necessary amount to pay or redeem Outstanding Bonds (whether upon or prior to their maturity or the redemption date of such Bonds), provided that if such Bonds are to be redeemed prior to the maturity thereof, notice of such redemption shall have been given as in the Indenture provided or provision satisfactory to the Trustee shall have been made for the giving of such notice, then all liability of the Commission in respect of such Bonds shall cease, determine and be completely discharged, except only that thereafter the Owners thereof shall be entitled to payment of the principal of and interest on such Bonds by the Commission, and the Commission shall remain liable for such payment, but only out of the money or Federal Securities or general obligation bonds of the State of California deposited in an escrow fund established for this purpose and held by the Trustee, an escrow agent, or other fiduciary, as aforesaid for their payment, subject, however, to the provisions of the Indenture described below under "Payment of Bonds after Discharge of Indenture."

Payment of Bonds after Discharge of Indenture. Notwithstanding any provisions of the Indenture, any moneys deposited in trust for the payment of the principal of, or interest or premium on, any Bonds and remaining unclaimed for two years after the principal of all the Outstanding Bonds has become due and payable (whether at maturity or upon call for redemption or by declaration as provided in the Indenture) shall then be repaid to the Commission upon its Written Request, and the Owners of such Bonds shall thereafter be entitled to look only to the Commission for payment thereof, and all liability of the Trustee or any other fiduciary with respect to such moneys will thereupon cease; provided, however, that before the repayment of such moneys to the Commission, as aforesaid, the Trustee may (at the cost of the Commission) first publish at least once in a Financial Newspaper or Journal a notice, in such form as may be deemed appropriate by the Trustee, with respect to the Bonds so payable and not presented and with respect to the provisions relating to the repayment to the Commission of the moneys held for the payment thereof. In the event of the repayment of any such moneys to the Commission, as aforesaid, the Owners of the Bonds in respect of which such moneys were deposited shall thereafter be deemed to be general creditors of the Commission for amounts equivalent to the respective amounts deposited for the payment of such Bonds and so repaid to the Commission (without interest thereon).

TRUSTEE PROVISIONS

The Trustee will, prior to an Event of Default, and after the curing of all Events of Default which may have occurred, perform such duties and only such duties as are specifically set forth in the Indenture. The Trustee will, during the existence of any Event of Default (which has not been cured), exercise such of the rights and powers vested in it by the Indenture, and use the same degree of care and skill in their exercise, as a prudent man would exercise or use under the circumstances in the conduct of his own affairs.

So long as there is no Event of Default under the Indenture, the Commission may remove the Trustee, by giving written notice to such Trustee and by giving Bondowners notice by mail, first class postage prepaid, of such removal, and any successor thereto, and may appoint a successor or successors thereto; provided that any such successor will be a bank or trust company doing business and having an office in San Francisco, California, having a combined capital and surplus of at least \$100,000,000, and subject to supervision or examination by federal or state authority. If such bank or trust company publishes a report of condition at least annually, pursuant to law or to the requirements of any supervising or examining authority above referred to, then for the purpose of this Section the combined capital and surplus of such bank or trust company will be deemed to be its combined capital and surplus as set forth in its most recent report of condition so published.

The Trustee may at any time resign by giving written notice to the Commission and by giving the Bondowners notice by mail, first class postage prepaid, of such resignation. Upon receiving such notice of resignation, the Commission will promptly appoint a successor Trustee by an instrument in writing. Any resignation or removal of the Trustee and appointment of a successor Trustee will become effective upon acceptance of appointment by the successor Trustee. If no successor Trustee is appointed and accepts appointment within 45 days of giving notice of removal or notice of resignation, the resigning Trustee or any Bondowner (on behalf of himself and all other Bondowners) may petition any court of competent jurisdiction for the appointment of a successor Trustee, and such court may thereupon, after such notice (if any) as it may deem proper, appoint such successor Trustee.

APPENDIX B

SUMMARY OF CERTAIN PROVISIONS OF THE WATER SUPPLY AGREEMENT

The following brief summary of certain provisions of the Water Supply Agreement is subject in all respects to all of the provisions of such document. This brief summary does not purport to be a complete statement of said provisions and prospective purchasers of the 2019 Series ABC Bonds are referred to the complete text of said document.

Definitions

“**1984 Agreement**” refers to the 1984 Settlement Agreement and Master Water Sales Contract between the City and County of San Francisco and certain Suburban Purchasers in San Mateo County, Santa Clara County and Alameda County, which expired on June 30, 2009.

“**Act**” refers to the Raker Act, 38 Stat. 242, the Act of Congress, enacted in 1913, that authorized the construction of the Hetch Hetchy system on federal lands.

“**Adjusted Proportional Annual Use**” means the respective percentages of annual water use, as adjusted to reflect deliveries of water by the Hetch Hetchy Water & Power Project to outside City Retail Customers.

“**Agreement**” refers to the Water Supply Agreement, by and among San Francisco and the Wholesale Customers who approve the Agreement.

“**BAWSCA**” refers to the Bay Area Water Supply and Conservation Agency established pursuant to Division 31 of the California Water Code (Water Code §§81300-81461) or its successor and permitted assigns.

“**CEQA**” refers to the California Environmental Quality Act found at §§21000 et seq. of the Public Resources Code and the Guidelines for the California Environmental Quality Act found at §§15000 et seq. of Title 14 of the California Code of Regulations, as amended from time to time.

“**Commission**” means the governing board of the SFPUC.

“**Debt Service**” means principal and interest paid during a fiscal year on Indebtedness incurred by the SFPUC for the 2006 Revenue Bonds, Series A, and subsequently issued Indebtedness (exclusive of 2006 Revenue Bonds, Series B and C), the proceeds of which are used or are scheduled to be used for the acquisition or construction of New Regional Assets or to refund such Indebtedness.

“**Direct Retail**” refers to Regional Water System capital or operating expenditures that are incurred to provide water service solely to Retail Customers.

“**Direct Wholesale**” refers to Regional Water System capital or operating expenditures that are incurred to provide water service solely to one or more Wholesale Customers.

“**Drought**” means a water shortage caused by lack of precipitation, as reflected in resolutions of the Commission calling for voluntary or mandatory water rationing based on evaluation of water stored or otherwise available to the Regional Water System, whether or not the Commission declares a water shortage emergency pursuant to Water Code §§ 350 et seq., as amended from time to time.

“**Emergency**” means a sudden, non-drought event, such as an earthquake, failure of Regional Water System infrastructure or other catastrophic event or natural disaster that results in an insufficient supply of water available to the Retail or Wholesale Service Areas for basic human consumption, firefighting, sanitation, and fire protection.

“Encumbrance” or **“Encumber”** refers to the process by which the City Controller certifies the availability of amounts previously appropriated by the Commission for specifically identified SFPUC capital projects performed either by third parties or through work orders to other San Francisco departments.

“Environmental Enhancement Surcharge” means the surcharge to be imposed by the SFPUC on individual parties to the Agreement whose use exceeds their Interim Supply Allocation when the collective use of water by all parties to the Agreement is in excess of the Interim Supply Limitation.

“Excess Use Charges” are monthly charges set by the SFPUC, in the form of multipliers, that are applied to the Wholesale Customer water rates during times of mandatory rationing if a Wholesale Customer’s water usage is greater than its shortage allocation.

“Fundamental Rights” of Wholesale Customers are their status as parties to the Agreement, their allocation of water recognized in the Agreement, their protection against arbitrary, unreasonable, or unjustly discriminatory rates and any other specific rights described in the Agreement.

“Hetch Hetchy Enterprise” refers to Hetch Hetchy Water and Power Enterprise, a SFPUC operating department.

“Indebtedness” includes revenue bonds, bond anticipation notes, certificates of participation (excluding certificates of participation towards which SFPUC contributes debt service as an operating expense), and commercial paper.

“Individual Water Sales Contract” refers to the contracts between each Wholesale Customer and San Francisco that details customer-specific matters such as location of service connections, service area maps and other matters specific to that customer.

“Individual Supply Guarantee” refers to each Wholesale Customer’s share of the Supply Assurance.

“Interim Supply Allocation” refers to each Wholesale Customer’s share, to be established by the SFPUC of the Interim Supply Limitation.

“Interim Supply Limitation” refers to the 265 MGD annual average limitation on water deliveries until December 31, 2018 from Regional Water System watersheds imposed by the SFPUC in its approval of the WSIP in Resolution Number 08-0200 dated October 30, 2008.

“Joint,” when used in connection with Hetch Hetchy Enterprise assets or expenses, refers to assets used or expenses incurred in providing both water supply (“Water-Related”) and in the generation and transmission of electrical energy (“Power-Related”).

“Local System Water” refers to Regional Water System water supplies developed in San Mateo, Alameda and Santa Clara Counties or otherwise not produced by the Hetch Hetchy Enterprise under rights of way granted by the Act.

“MGD” refers to an average flow rate of one million gallons per day over a specific time period, often a year. For example, one MGD is equal to 365 million gallons per year or 1,120 acre feet per year.

“Net Annual Debt Service” refers to debt service less payments made from proceeds of Indebtedness (e.g., capitalized interest), earnings on bond proceeds (e.g., reserve fund earnings) used to pay Debt Service, and interest paid from renewed commercial paper, or from reserve fund liquidation.

“New Assets” refers to Regional and Hetch Hetchy Water-Only and Water-Related capital assets added to Regional Water System plant in service after June 30, 2009.

“**New Regional Assets**” refers to New Assets placed in service on or after July 1, 2009 that are used and useful in delivering water to Wholesale Customers. The following four categories comprise New Regional Assets:

1. Water Enterprise Regional Assets
2. Water Enterprise Direct Wholesale Assets
3. Hetch Hetchy Water Only Assets
4. Water-Related portion (45 percent) of Hetch Hetchy Joint Assets

“**Power-Only**,” when used with reference to Hetch Hetchy Enterprise capital costs and operating and maintenance expenses, means capital costs and expenses that are incurred solely for the construction and operation of assets used to generate and transmit electrical energy.

“**Power-Related**” refers to the power related portion (55%) of Joint Hetch Hetchy Enterprise assets or expenses.

“**Proportional Annual Use**” means the shares of deliveries from the Regional Water System used by City Retail Customers and by the Wholesale Customers in a fiscal year, expressed as a percentage.

“**Proportional Water Use**” refers the general principle of allocating Regional Water System costs based on the relative purchases of water by Retail and Wholesale Customers.

“**Regional**,” when used with reference to Water Enterprise capital assets and operating expenses, refers to assets and expenses that benefit Wholesale and Regional Customers.

“**Regional Water System**” means the water storage, transmission and treatment system operated by the SFPUC in Tuolumne, Stanislaus, San Joaquin, Alameda, Santa Clara, San Mateo and San Francisco counties, including projects constructed under the WSIP, but excluding Direct Retail and Direct Wholesale assets.

“**Retail Customers**” means any customer that purchases water from San Francisco that is not a Wholesale Customer, whether located inside or outside of San Francisco.

“**Retail Service Area**” means the areas where SFPUC sells water to Retail Customers.

“**Retail Water**” means water sold by the SFPUC to its Retail Customers within and outside San Francisco.

“**San Francisco**” refers to the City and County of San Francisco.

“**SFPUC**” refers to the San Francisco Public Utilities Commission as an operating department of San Francisco, the General Manager of which reports to the Commission.

“**Substantially Expended**,” when used with respect to a specific bond issue, means 98% of the proceeds from that bond issue and investment earnings contributed to the project fund have been expended.

“**Supply Assurance**” means the 184 MGD maximum annual average metered supply of water dedicated by San Francisco to public use in the Wholesale Service Area (not including San Jose and Santa Clara).

“**Term**” means the 25-year term of the Agreement commencing July 1, 2009, including one or both 5-year extensions authorized by the Agreement.

“**Tier 1 Shortage Plan**” refers to the Water Shortage Allocation Plan, adopted by the SFPUC and the Wholesale Customers in conjunction with the Agreement describing the method for allocating water between the

SFPUC and the Wholesale Customers collectively for shortages of up to 20% of deliveries from the Regional Water System, as amended from time-to-time.

“**Water Enterprise**” refers to the San Francisco Water Department (SFWD), an SFPUC Operating Department.

“**Water Management Charge**” refers to the charge collected by San Francisco on behalf of BAWSCA for local water resource development in the Wholesale Service Area.

“**Water-Only**,” when used with reference to Hetch Hetchy Enterprise capital costs and operating and maintenance expenses, means capital costs and expenses that are incurred solely for the construction and operation of assets used to protect water quality or to provide for the delivery of water for consumptive purposes.

“**Water-Related**” refers to the water related portion (45%) of Joint Hetch Hetchy Enterprise assets or expenses.

“**Wheeling Statute**” refers to Article 4 of Chapter 11 of the California Water Code, as amended from time to time.

“**Wholesale Capital Fund**” is the account established by the SFPUC for deposit of Wholesale Customer revenue that is used to fund the wholesale share of revenue-funded New Regional Assets.

“**Wholesale Customer**” or “**Customers**” means one or more of the 27 water customers that are contracting for purchase of water from San Francisco pursuant to the Agreement.

“**Wholesale Revenue Coverage**” refers to the additional dollar amount included in wholesale rates each fiscal year that is charged to Wholesale Customers by the SFPUC for their proportionate share of Debt Service coverage.

“**Wholesale Revenue Coverage Reserve**” refers to the account established by the SFPUC for deposit of Wholesale Revenue Coverage.

“**Wholesale Revenue Requirement**” means the calculated Wholesale Customer portion of SFPUC Regional Water System capital and operating costs.

“**Wholesale Service Area**” means the combined service areas of the Wholesale Customers, as delineated on the service area maps attached to each Individual Water Sales Contract.

“**WSIP**” refers to the Water System Improvement Program approved by the Commission in Resolution No. 08-0200 on October 30, 2008, as amended from time to time.

Term

The Term of the Agreement is twenty-five (25) years. The Term began on July 1, 2009 and ends on June 30, 2034.

In December 2031, the SFPUC may provide written notice to the Wholesale Customers that it is willing to extend the Term of the Agreement. Between January 1, 2032 and June 30, 2032, any Wholesale Customer may accept the SFPUC’s offer to extend the Term by providing a written notice of extension to the SFPUC. If such notices of extension are received from Wholesale Customers representing at least two-thirds in number as of June 30, 2032 and seventy five percent (75%) of the quantity of water delivered by the SFPUC to all Wholesale Customers during fiscal year 2030-31, the Term shall be extended for another five (5) years (“First Extension Term”), through June 30, 2039. No party to the Agreement which does not wish to remain a party during the Extension Term shall be compelled to do so by the actions of other parties.

In December 2036, the SFPUC may provide written notice to the Wholesale Customers that it is willing to extend the Term of the Agreement. Between January 1, 2037 and June 30, 2037, any Wholesale Customer may accept the SFPUC's offer to extend the Term by providing a written notice of extension to the SFPUC. If such notices of extension are received from Wholesale Customers representing at least two-thirds in number as of June 30, 2037 and seventy five percent (75%) of the quantity of water delivered by the SFPUC to all Wholesale Customers during fiscal year 2035-36, the Term shall be extended for another five (5) years ("Second Extension Term"), through June 30, 2044. No party to the Agreement which does not wish to remain a party during the Extension Term shall be compelled to do so by the actions of other parties.

Amendments to Agreement

The Agreement may be amended with the written consent of San Francisco and of Wholesale Customers representing at least two-thirds in number and seventy five percent (75%) of the quantity of water delivered by San Francisco to all Wholesale Customers during the fiscal year immediately preceding the amendment.

No amendment which adversely affects a Fundamental Right of a Wholesale Customer may be made without the written consent of that customer.

Supply Assurance

San Francisco agrees to deliver water to the Wholesale Customers up to the amount of the Supply Assurance. Water delivered by San Francisco to Retail Customers shall not be included in the Supply Assurance. Until December 31, 2018, such commitment is subject to the Interim Supply Limitation provisions in the Agreement.

Both the Supply Assurance and the Individual Supply Guarantees identified are expressed in terms of daily deliveries on an annual average basis and do not themselves constitute a guarantee by San Francisco to meet peak daily or hourly demands of the Wholesale Customers, irrespective of what those peak demands may be. The parties acknowledge, however, that the Regional Water System has been designed and constructed to meet peak daily and hourly demands and that its capacity to do so has not yet been reached. San Francisco agrees to operate the Regional Water System to meet peak requirements of the Wholesale Customers to the extent possible without adversely affecting its ability to meet peak demands of Retail Customers. The Agreement shall not preclude San Francisco from undertaking to meet specific peak demand requirements of individual Wholesale Customers in their Individual Water Sales Contracts.

The Supply Assurance is perpetual and shall survive the expiration or earlier termination of the Agreement. Similarly, the Individual Supply Guarantees and/or the Individual Water Sales Contracts are perpetual and shall survive the expiration or earlier termination of the Agreement or the Individual Water Sales Contracts.

The amount of water made available by San Francisco to the Wholesale Customers is subject to reduction, to the extent and for the period made necessary by reason of water shortage, Drought, Emergencies, or by malfunctioning or rehabilitation of facilities in the Regional Water System. The amount of water made available to the Wholesale Customers may not be reduced, however, merely because the water recycling and groundwater projects which WSIP envisions to be constructed within San Francisco, or the conservation programs intended to reduce water use by Retail Customers that are included in the WSIP, do not generate the yield or savings (10 MGD combined) anticipated by San Francisco.

Allocation of Supply Assurance

A portion of the Supply Assurance has been allocated among 24 of the 27 Wholesale Customers. Three Wholesale Customers do not have Individual Supply Guarantees. The cities of San Jose and Santa Clara do not have an Individual Supply Guarantee because San Francisco has provided water to them on a temporary and interruptible basis. The City of Hayward does not have an Individual Supply Guarantee because of the terms of the 1962 contract between it and San Francisco.

If the total amount of water delivered by San Francisco to Hayward and to the Wholesale Customers with Individual Supply Guarantees exceeds 184 MGD over a period of three consecutive fiscal years (i.e., July 1 through June 30), then the Individual Supply Guarantees of those Wholesale Customers shall be reduced pro rata so that their combined entitlement and the sustained use by Hayward does not exceed 184 MGD.

It is the responsibility of each Wholesale Customer to limit its purchases of water from San Francisco so as to remain within its Individual Supply Guarantee. San Francisco is not liable to any Wholesale Customer or obligated to supply more water to any Wholesale Customer individually or to the Wholesale Customers collectively than the amount to which it or they are otherwise entitled under the Agreement due to the use by any Wholesale Customer of more water than the amount to which it is entitled under the Agreement.

San Francisco installs such new connections between the Regional Water System and the distribution system of any Wholesale Customer that are necessary to deliver the quantities of water to which the Wholesale Customer is entitled under the Agreement. San Francisco has the right to determine the location of such connections, in light of the need to maintain the structural integrity of the Regional Water System and, where applicable, the need to limit peaking directly off of Regional Water System pipelines by a Wholesale Customer's individual retail customers, the need to ensure that a Wholesale Customer's individual retail customers have access to alternative sources of water in the event of a reduction in San Francisco's ability to provide them with water, and other factors which may affect the desirability or undesirability of a particular location.

Wholesale Customer Service Areas

A Wholesale Customer may not deliver water furnished to it by San Francisco outside the boundary of its service area without the prior written consent of San Francisco, except for deliveries to another Wholesale Customer on an emergency and temporary basis. San Francisco may refuse a Wholesale Customer's request to expand its service area on any reasonable basis.

If two or more Wholesale Customers agree to adjust the boundaries of their respective service areas so that one assumes an obligation to serve customers in an area that was previously within the service area of another Wholesale Customer, they may also correspondingly adjust their respective Individual Supply Guarantees.

San Francisco acknowledges that it has heretofore consented in writing to deliveries of water by individual Wholesale Customers outside their service area boundaries and agrees that nothing in the Agreement is intended to affect such prior authorizations, which remain in full force and effect according to their terms.

Permanent Transfers of Individual Supply Guarantees

A Wholesale Customer that has an Individual Supply Guarantee may transfer a portion of it to one or more other Wholesale Customers; transfers of a portion of an Individual Supply Guarantee must be permanent; and transfers of portions of Individual Supply Guarantees are subject to approval by the SFPUC. SFPUC review is limited to (1) whether a proposed transfer complies with the Act, and (2) whether the affected facilities in the Regional Water System have sufficient capacity to accommodate delivery of the increased amount of water to the proposed transferee.

Restrictions on Resale

Each Wholesale Customer agrees that it will not sell any water purchased from San Francisco to a private party for resale by such private party to others in violation of the Act.

Each Wholesale Customer also agrees that it will not sell water purchased from San Francisco to another Wholesale Customer without prior written approval of the SFPUC, except on a temporary and emergency basis. The SFPUC agrees that it will not unreasonably withhold its consent to a request by a Wholesale Customer to deliver water to another Wholesale Customer for resale.

Conservation; Use of Local Sources

Each Wholesale Customer shall take all actions within its legal authority related to water conservation that are necessary to insure that the SFPUC (a) remains eligible for (i) state and federal grants and (ii) access to the Drought Water Bank operated by the California Department of Water Resources, as well as other Drought-related water purchase or transfer programs, and (b) complies with future legal requirements imposed on the Regional Water System by the federal government, the State, or any other third party as conditions for receiving funding or water supply.

San Francisco and each Wholesale Customer agree that they will diligently apply their best efforts to use both surface water and groundwater sources located within their respective service areas and available recycled water to the maximum feasible extent, taking into account the environmental impacts, the public health effects and the effects on supply reliability of such use, as well as the cost of developing such sources.

Restrictions on Purchases of Water from Others; Minimum Annual Purchases

Each Wholesale Customer (except for Alameda County Water District and the cities of Milpitas, Mountain View and Sunnyvale) agrees that it will not contract for, purchase or receive, with or without compensation, directly or indirectly, from any person, corporation, governmental agency or other entity, any water for delivery or use within its service area without the prior written consent of San Francisco.

The prohibition in the preceding sentence does not apply to:

1. recycled water;
2. water necessary on an emergency and temporary basis, provided that the Wholesale Customer promptly gives San Francisco notice of the nature of the emergency, the amount of water that has been or is to be purchased, and the expected duration of the emergency; or
3. water in excess of a Wholesale Customer's Individual Supply Guarantee.

Alameda County Water District and the cities of Milpitas, Mountain View and Sunnyvale may purchase water from sources other than San Francisco, provided that San Francisco shall require that each purchase a minimum annual quantity of water from San Francisco. Due to continued dry years in the last four years, and the call for voluntary rationing from the wholesale and retail customers, the SFPUC waived the minimum purchase requirements from these agencies from Fiscal Year 2013-14 through Fiscal Year 2016-17.

Water Quality

San Francisco shall deliver treated water to Wholesale Customers (except Coastside County Water District, which receives untreated water from Crystal Springs and Pilarcitos Reservoirs) that complies with primary maximum contaminant level and treatment technique standards at the regulatory entry points designated in the San Francisco Regional Water System Domestic Water Supply Permit (currently Permit No. 02-04-04P3810001) issued by the California Department of Public Health.

Completion of WSIP

San Francisco will complete construction of the physical facilities in the WSIP by December 2021. The SFPUC agrees to provide for full public review and comment by local and state interests of any proposed changes that delay previously adopted project completion dates or that delete projects. The SFPUC shall meet and consult with BAWSCA before proposing to the Commission any changes in the scope of WSIP projects which reduce their capacity or ability to achieve adopted levels of service goals. The SFPUC retains discretion to determine whether to approve the physical facilities in the WSIP until after it completes the CEQA process.

Regional Water System Repair, Maintenance and Operation

San Francisco will keep the Regional Water System in good working order and repair consistent with prudent utility practice.

San Francisco will continue to operate its reservoirs in a manner that assigns higher priority to the delivery of water to the Bay Area and the environment than to the generation of electric power. The SFPUC, as the Regional Water System operator, is solely responsible for making day-to-day operational decisions.

Shortages

Notwithstanding San Francisco's obligations to deliver the Supply Assurance to the Wholesale Customers collectively and the Individual Supply Guarantees to Wholesale Customers individually, San Francisco may reduce the amount of water available or interrupt water deliveries to specific geographical areas within the Regional Water System service area to the extent that such reductions are necessary due to Emergencies, or in order to install, repair, rehabilitate, replace, investigate or inspect equipment in, or perform other maintenance work on, the Regional Water System. Such reductions or interruptions may be imposed by San Francisco without corresponding reductions or interruptions in the amount of water available to SFPUC water users outside the specific geographical area where reductions or interruptions are necessary, if the system's ability to supply water outside the specific geographical area has not been impaired. In the event of such a reduction or interruption, San Francisco will restore the supply of water to the specific geographical area as soon as is possible.

Following a major system emergency event, the SFPUC will work closely with its Wholesale Customers to monitor customer demand, including the demand source. In the event that any individual Wholesale Service Area or Retail Service Area customer's uncontrolled distribution system leaks could result in major water waste and endanger the supply provided by the Regional Water System as a whole, flow through some customer connections may need to be temporarily reduced or terminated. SFPUC will work closely with customers to assess the nature of the demand (e.g. fire-fighting versus leakage), so that public health and safety protection can be given top priority.

1. All emergencies that require use of non-potable source water will require use of chlorine, or other suitable disinfectant, if feasible.

2. San Francisco will use its best efforts to meet the seismic reliability and delivery reliability level of service goals adopted by the Commission in conjunction with the WSIP. San Francisco will distribute water on an equitable basis throughout the Regional Water System service area following a regional Emergency, subject to physical limitations caused by damage to the Regional Water System.

Notwithstanding San Francisco's obligations to deliver the Supply Assurance to the Wholesale Customers collectively and the Individual Supply Guarantees to Wholesale Customers individually, San Francisco may reduce the amount of water available to the Wholesale Customers in response to Drought.

1. The Tier 1 Shortage Plan set forth in the Agreement will continue to be used to allocate water from the Regional Water System between Retail and Wholesale Customers during system-wide shortages of 20% or less.

2. San Francisco and the Wholesale Customers may negotiate in good faith revisions to the Tier 1 Shortage Plan to adjust for and accommodate anticipated changes due to demand hardening in the SFPUC's Wholesale and Retail Service Areas. Until agreement is reached, the current Tier 1 Shortage Plan will remain in effect.

3. The SFPUC will honor allocations of water among the Wholesale Customers ("Tier 2 Allocations") provided by BAWSCA or if unanimously agreed to by all Wholesale Customers. If BAWSCA or all Wholesale Customers do not provide the SFPUC with Tier 2 Allocations, then the SFPUC may make a final allocation decision after first meeting and discussing allocations with BAWSCA and the Wholesale Customers. For Regional Water System shortages in excess of 20%, San Francisco shall (a) follow the Tier 1 Shortage Plan

allocations up to the 20% reduction, (b) meet and discuss how to implement incremental reductions above 20% with the Wholesale Customers, and (c) make a final determination of allocations above the 20% reduction. After the SFPUC has made the final allocation decision, the Wholesale Customers shall be free to challenge the allocation on any applicable legal or equitable basis.

4. San Francisco will use its best efforts to identify potential sources of dry year water supplies and establish the contractual and other means to access and deliver those supplies in sufficient quantity to meet a goal of not more than 20% system-wide shortage in any year of the design drought.

Wheeling of Water from Outside SFPUC System

Subject to the Wheeling Statute, the SFPUC will not deny use of Regional Water System unused capacity for wheeling when such capacity is available for wheeling purposes during periods when the SFPUC has declared a water shortage emergency under Water Code Section 350 if the following conditions are met:

A. The transferor pays reasonable charges incurred by the SFPUC as a result of the wheeling, including capital, operation, maintenance, administrative and replacement costs (as such are defined in the Wheeling Statute).

B. Wheeled water that is stored in the Regional Water System spills first.

C. Wheeled water will not unreasonably: (1) impact fish and wildlife resources in Regional Water System reservoirs; (2) diminish the quality of water delivered for consumptive uses; or (3) increase the risk of exotic species impairing Regional Water System operations. The transferor may at its own expense provide for treatment to mitigate these effects.

D. Priority will be given to wheeling by Wholesale Customers or BAWSCA over arrangements for third-party public entities.

Limits on New Customers

Until December 31, 2018, San Francisco will not enter into contracts to supply water to any entity other than a Wholesale Customer (whether permanent or temporary, firm or interruptible) unless:

1. It completes any necessary environmental review under CEQA of the proposed new wholesale water service obligations;

2. It concurrently completes any necessary environmental review under CEQA and commits to make both San Jose and Santa Clara permanent customers with Individual Supply Guarantees equal to at least 9 MGD; and

3. The Agreement is amended to incorporate any commitments to proposed new wholesale customers and to San Jose and Santa Clara, and to address the effects, if any, of the new customer(s) on water supply reliability, water quality and cost to existing customers of the Regional Water System.

As of January 1, 2019, San Francisco will not enter into contracts to supply water to any entity other than a Wholesale Customer (whether permanent or temporary, firm or interruptible) unless:

1. It completes any necessary environmental review under CEQA of the proposed new wholesale water service obligations;

2. It concurrently completes any necessary environmental review under CEQA and commits to make both San Jose and Santa Clara permanent customers with Individual Supply Guarantees equal to at least 9 MGD;

3. Doing so increases the reliability of the Regional Water System; and

4. The Agreement is concurrently amended (a) to reflect that increased reliability by means of an increased commitment by San Francisco to deliver water during Droughts and (b) to address the effects, if any, of the new customer(s) on water supply, water quality and cost to existing customers of the Regional Water System.

San Francisco may enter into new retail water service obligations outside of the City and County of San Francisco:

1. Only in Alameda, San Mateo, Santa Clara, San Joaquin and Tuolumne Counties;
2. That are within or immediately adjacent to areas in which it currently serves other Retail Customers; and
3. Until the aggregate additional demand represented by the new retail customers reaches 0.5 MGD.

The limitations on serving new Retail Customers described in this subsection do not apply to historical obligations to supply water that may be contained in prior agreements between the SFPUC or its predecessor the Spring Valley Water Company, and individual users or property owners located adjacent to Regional Water System transmission pipelines.

Subject to completion of necessary environmental review under CEQA, San Francisco may at any time enter into water exchanges or cost sharing agreements with other water suppliers to enhance dry year or normal year water deliveries, provided that San Francisco cannot incur new water service obligations to such other water suppliers unless the requirements for taking on new wholesale customers are met.

New Sources of Water Supply to Maintain Supply Assurance

Sudden and unanticipated events may require San Francisco to act promptly to protect the health, safety and economic well-being of its Retail and Wholesale Customers. Such sudden events include, but are not limited to drought, earthquakes, terrorist acts, catastrophic failures of facilities owned and operated by San Francisco, and other natural or man-made events. If such events diminish San Francisco's ability to maintain the Supply Assurance, San Francisco may increase the Wholesale Revenue Requirement to pay for planning, evaluation and implementation of replacement sources of supply when such needs arise and without the prior approval of the Wholesale Customers.

Climate change, regulatory actions and other events may impact San Francisco's ability to maintain the Supply Assurance from its existing surface water supplies, but on timescales long enough to permit San Francisco to collaborate with its Wholesale Customers on how best to address possible impacts to water supply. If such events diminish San Francisco's ability to maintain the Supply Assurance, San Francisco may increase the Wholesale Revenue Requirement to pay for planning, evaluation and implementation of replacement sources of supply when such needs arise and without the prior approval of the Wholesale Customers.

New Sources of Water Supply to Increase Supply Assurance

The Commission action in SFPUC Resolution Number 08-0200, adopted October 30, 2008 requires certain decisions by San Francisco regarding whether to supply more than 265 MGD from its watersheds following 2018. Such decisions are to be made by December 31, 2018, subject to the exercise of San Francisco's retained CEQA discretion. San Francisco's future decisions may include an offer to increase the Supply Assurance at the request of some or all of its Wholesale Customers. Costs associated with providing additional water from its existing water supplies in San Mateo, Santa Clara, Alameda, Tuolumne, and Stanislaus Counties shall be allocated to Wholesale and Retail Customers as described in the Agreement.

If San Francisco seeks to develop additional water supplies from new sources to increase the Supply Assurance available to Wholesale Customers, studies and resulting water supply projects will be conducted jointly with BAWSCA under separate agreement(s) specifying the purpose of the projects, the anticipated regional benefits and how costs of studies and implementation will be allocated and charged. Nothing in the Agreement shall serve as

precedent for the allocation of such new supply capital costs between Retail and Wholesale Customers or associated operational expenses, which shall only occur following approval of both parties and amendment of the Agreement, if necessary.

Interim Supply Limitation Imposed by SFPUC

In adopting the WSIP in Res. No. 08-0200, the Commission included full implementation of all proposed WSIP capital improvement projects to achieve level of service goals relating to public health, seismic safety, and delivery reliability, but decided to adopt a water supply element that includes the Interim Supply Limitation. Between the effective date of the Agreement and December 31, 2018, the Interim Supply Limitation is allocated as follows between Retail and Wholesale Customers:

Retail Customers' allocation: 81 MGD
Wholesale Customers' allocation: 184 MGD

The Wholesale Customers' collective allocation of 184 MGD under the Interim Supply Limitation includes the demand of the cities of San Jose and Santa Clara, whose demand is not included in the Supply Assurance.

Transfers of Interim Supply Allocations

Any Wholesale Customer, including Hayward, may transfer a portion of its Interim Supply Allocation to one or more other Wholesale Customers. All Wholesale Customers are also eligible transferees, including California Water Service Company up to its Individual Supply Guarantee. Transfers of a portion of an Interim Supply Allocation must be prospective. The duration of a transfer cannot be less than the balance of the fiscal year. Transfers of portions of Interim Supply Allocations are subject to approval by the SFPUC. SFPUC review is limited to determining (1) whether a proposed transfer complies with the Act, and (2) whether the affected facilities in the Regional Water System have sufficient capacity to accommodate delivery of the increased amount of water to the proposed transferee. The SFPUC will not unreasonably withhold or delay its approval. Transfers of Interim Supply Allocations shall continue in effect until the earlier of (1) delivery of written notice to the SFPUC by the transfer participants that the transfer has been rescinded or (2) December 31, 2018.

Environmental Enhancement Surcharge

Beginning with wholesale water rates for fiscal year 2011-12, and continuing for the duration of the Interim Supply Limitation, the Commission will establish the Environmental Enhancement Surcharge concurrently with the budget-coordinated rate process set forth in the Agreement. The monetary amount of the Environmental Enhancement Surcharge per volume of water, such as dollars per acre-foot, will be equivalent for Retail Customer use in excess of 81 MGD and Wholesale Customer use in excess of 184 MGD.

Beginning in fiscal year 2011-12, the Environmental Enhancement Surcharge will be levied only if and when combined Retail Customer and Wholesale Customer purchases exceed the Interim Supply Limitation of 265 MGD and if the fund described below has been established by the San Francisco Board of Supervisors. In that event, the Environmental Enhancement Surcharge will apply to Retail Customers for use in excess of 81 MGD and to individual Wholesale Customers for use in excess of their Interim Supply Allocations established by the Commission.

1. Environmental Enhancement Surcharges related to the Retail Customers' use in excess of their 81 MGD Retail Customer Allocation will be paid by the SFPUC, and no portion of such surcharges may be allocated to Wholesale Customers. The method of recovering the Environmental Enhancement Surcharges imposed upon Retail Customers shall be within the sole discretion of the SFPUC.
2. Environmental Enhancement Surcharges related to the individual Wholesale Customers' use in excess of their respective Interim Supply Allocations will be paid to the SFPUC by individual Wholesale Customers.

Environmental Enhancement Surcharges paid by the SFPUC and by Wholesale Customers will be placed into a restricted reserve fund. The SFPUC will request the San Francisco Board of Supervisors to establish this fund by ordinance and, if adopted, the fund will be subject to the following restrictions:

1. Interest earnings will stay in the reserve fund.
2. The reserve fund shall (a) be subject to automatic appropriation; (b) require unexpended and unencumbered fund balances to be carried forward from year to year; and (c) not be transferred to the San Francisco General Fund.
3. The reserve fund may be used only for specific environmental restoration and enhancement measures for the Sierra and local watersheds, such as those included in the Watershed Environmental Improvement Program.
4. Environmental Enhancement Surcharge proceeds shall be expended in an expeditious manner. Any Environmental Enhancement Surcharge proceeds that remain in the reserve fund as of December 31, 2018 shall be used to complete projects previously approved. Upon completion of the identified projects, the balance of any unexpended sums in the reserve fund shall be distributed to BAWSCA and the SFPUC in proportion to the total amount of surcharges assessed to the Wholesale and Retail Customers, respectively.

Specific uses of Environmental Enhancement Surcharges will be decided by the SFPUC and BAWSCA General Managers following input from environmental stakeholders and other interested members of the public. If parties are unable to agree, then they will jointly select a third person to participate in making the decision.

San Jose/Santa Clara Interim Supply Allocation and Process for Reduction/ Termination.

San Francisco will supply a combined annual average of 9 MGD to the cities of San Jose and Santa Clara through 2028. Water supplied by San Francisco may only be used in the existing defined service areas in the northern portions of San Jose and Santa Clara. San Francisco may reduce the quantity of water specified in this section when it establishes the Interim Supply Allocations for Wholesale Customers. The establishment of Interim Supply Allocations for San Jose and Santa Clara shall not be considered a reduction of supply, provided that the Interim Supply Allocations assigned to San Jose and Santa Clara do not effect a reduction greater than the aggregate average reduction in Individual Supply Guarantees for Wholesale Customers that have such guarantees.

San Francisco Decisions in 2028 Regarding Future Water Supply

By December 31, 2028, San Francisco will have completed any necessary CEQA review that is relevant to making San Jose and Santa Clara permanent customers of the Regional Water System and will decide whether or not to make San Jose and Santa Clara permanent customers of the Regional Water System. San Francisco will make San Jose and Santa Clara permanent customers only if, and to the extent that, San Francisco determines that Regional Water System long term water supplies are available. In the event that San Francisco decides to afford permanent status to San Jose and Santa Clara, the Agreement will be amended.

By December 31, 2028, San Francisco will have completed any necessary CEQA review and will decide how much water if any, in excess of the Supply Assurance it will supply to Wholesale Customers from the Regional Water System to meet their projected future water demands until the year 2030, and whether to offer a corresponding increase in the Supply Assurance as a result of its determination.

Retained Discretion of SFPUC and Wholesale Customers

The Agreement contemplates discretionary actions that the SFPUC and the Wholesale Customers may choose to take in the future that could result in physical changes to the environment (“Discretionary Actions”). The Discretionary Actions include decisions to:

1. Develop additional or alternate water resources by the SFPUC or one or more Wholesale Customers;
2. Implement the physical facilities comprising the WSIP by December 31, 2015;
3. Approve wheeling proposals by Wholesale Customers;
4. Approve new wholesale customers and water exchange or cost sharing agreements with other water suppliers;
5. Provide additional water to San Jose and/or Santa Clara;
6. Offer permanent status to San Jose and/or Santa Clara;
7. Reduce or terminate supply to San Jose and/or Santa Clara;
8. Provide additional water to Wholesale Customers in excess of the Supply Assurance to meet their projected future water demands; and
9. Offer a corresponding volumetric increase in the Supply Assurance.

Wholesale Revenue Requirement

The Agreement shall be applicable only to the water rates charged by San Francisco to the Wholesale Customers. Nothing contained in the Agreement shall limit, constrain, or in any way affect the rates which San Francisco may charge for water sold to Retail Customers or the methodology by which such rates are determined.

The Agreement sets forth the method by which the Wholesale Customers’ collective share of expenses incurred by the SFPUC in delivering water to them will be determined.

The Agreement implements two general principles as follows: (1) the Wholesale Customers should not pay for expenses of SFPUC operations from which they receive no benefit and (2) the Wholesale Customers should pay their share of expenses incurred by the SFPUC in delivering water to them on the basis of Proportional Annual Use unless otherwise explicitly provided in the Agreement.

To implement these general principles, the Wholesale Revenue Requirement will consist of, and be limited to the Wholesale Customers’ shares of the following categories of expense:

1. Contribution to the capital cost of Water Enterprise New Regional Assets.
2. Water Enterprise operation and maintenance expenses, including power purchased from the Hetch Hetchy Enterprise that is used in the operation of the Water Enterprise.
3. Water Enterprise administrative and general expenses.
4. Water Enterprise property taxes.
5. The Water Enterprise’s share of the Hetch Hetchy Enterprise’s operation and maintenance, administrative and general, and property tax expenses.

6. The Water Enterprise's share of the Hetch Hetchy Enterprise's capital cost of New Assets classified as Water-Only and the Water-Related portion of Joint Assets.

In each of these cost categories, Direct Retail Expenses will be allocated entirely to Retail Customers. Direct Wholesale Expenses will be allocated entirely to the Wholesale Customers. Regional Expenses will be allocated between Retail Customers and Wholesale Customers.

For purposes of establishing the rates to be charged Wholesale Customers, expenses will be based on the budget for, and estimates of water purchases in, the following fiscal year. For purposes of accounting, the Wholesale Revenue Requirement will be determined on the basis of actual expenses incurred and actual water use.

In addition, rates charged to Wholesale Customers may include the Wholesale Customers' contribution to a Wholesale Revenue Coverage Reserve, which is not included in the Wholesale Revenue Requirement itself.

Capital Cost Contribution – New Regional Assets

The Wholesale Customers shall pay the wholesale share of Net Annual Debt Service for new Regional Assets.

1. The amount of Net Annual Debt Service for New Regional Assets will be determined for each series of Indebtedness issued. Until the proceeds of a particular series are Substantially Expended, the amount attributable to specific projects will be based on the expected use of proceeds shown in the "Certificate Regarding Use of Proceeds" executed by the SFPUC General Manager on behalf of the Commission in connection with the sale of the Indebtedness.
2. After the proceeds of a series are Substantially Expended, the SFPUC General Manager will prepare and execute a certificate showing the actual expenditure of proceeds at an allocation of Net Debt Service to New Regional Assets for a series of bonds will be used in the fiscal year in which the proceeds have been Substantially Expended and thereafter.
3. The Wholesale Customers' share of Net Annual Debt Service for the New Regional Assets that are categorized as Direct Wholesale will be 100 percent. (None of the projects in the WSIP are categorized as Direct Wholesale.) The Wholesale Customers' share of Net Annual Debt Service for all other New Regional Assets will be determined each year and will be equal to the Wholesale Customers' Proportional Annual Use.
4. If Indebtedness is issued by the SFPUC to refund the 2006 Revenue Bonds, Series A or to refund any other long-term Indebtedness issued after July 1, 2009, the Net Annual Debt Service attributable to proceeds used for refunding will be allocated on the same basis as the Indebtedness being refunded.
5. In addition to Net Debt Service, Wholesale Customers will pay a proportionate share of annual administrative costs associated with Indebtedness, such as bond trustee fees, credit rating agency fees, letter of credit issuer fees, San Francisco Revenue Bond Oversight Committee fees, etc., but only to the extent such fees are neither paid from proceeds of Indebtedness nor included in SFPUC operation and maintenance or administrative and general expenses.

The Wholesale Customers shall pay the wholesale share of the appropriation contained in the SFPUC annual budget for each year to be used to acquire or construct New Regional Assets.

The Wholesale Customers' share of the annual appropriation for revenue-funded New Regional Assets that are categorized as Direct Wholesale will be 100 percent. The Wholesale Customers' share of the annual appropriation for all other revenue-funded New Regional Assets will be determined each year and will be equal to the Wholesale Customers' Proportional Annual Use in each fiscal year. The amount appropriated in each fiscal year for the wholesale share of New Regional Assets shall be contributed to the Wholesale Capital Fund.

Hetch Hetchy Enterprise Expenses

There are two steps involved in determining the amount of the Wholesale Customers' share of Hetch Hetchy Enterprise expenses.

1. The first step is to determine the Water Enterprise's share of Hetch Hetchy Enterprise operation expenses, maintenance expenses, administrative and general expenses, and property taxes.
2. The second step is to determine the Wholesale Customers' share of expenses allocable to the Water Enterprise.

The Water Enterprise's share of Hetch Hetchy Enterprise expenses consist of 100 percent of Water-Only expenses and the Water-Related portion (45%) of Joint expenses.

The Wholesale Customers' share of the sum of the Water Enterprise's share of Hetch Hetchy Enterprise expenses shall be calculated by multiplying that dollar amount by Adjusted Proportional Annual Use.

Wholesale Customers are also allocated a share of Hetch Hetchy Enterprise capital costs. The components of Hetch Hetchy Enterprise capital costs are as follows:

1. The Water Enterprise will be assigned 100 percent of Net Annual Debt Service attributable to acquisition and construction of New Hetch Hetchy Enterprise assets that are Water-Only and the Water-Related portion (45 percent) of Net Annual Debt Service on New Hetch Hetchy Enterprise Joint assets.
2. The Water Enterprise will be assigned 100 percent of capital expenditures from revenues for New Hetch Hetchy Enterprise assets that are Water-Only and the Water-Related portion (45 percent) of such expenditures for new Hetch Hetchy Enterprise Joint assets.

The Wholesale Customers' share of the Net Annual Debt Service and revenue funded capital expenditures shall be calculated by multiplying that dollar amount by Adjusted Proportional Annual Use.

Additional Agreements Related to Financial Issues

The Wholesale Customers have no entitlement to any of the following sources of revenue to the SFPUC.

1. Revenues from leases or sales of SFPUC real property.
2. Revenues from other utility services such as the sale of electric power, natural gas and steam.
3. Revenues from the sale of water to customers and entities other than the Wholesale Customers.
4. Revenues earned from the investment of SFPUC funds other than funds contributed by the Wholesale Customers to the Wholesale Revenue Coverage Reserve or the Wholesale Capital Fund. Wholesale Customers are also entitled to the benefit of earnings on proceeds of Indebtedness (through expenditure on New Regional Assets and /or application to Debt Service) and to interest on the Balancing Account.
5. Revenues not related to the sale of water.

The Wholesale Customers will not be charged with any of the following expenses:

1. Capital costs for assets constructed or acquired prior to July 1, 1984.

2. Expenses incurred by the SFPUC for generation and distribution of electric power, including Hetch Hetchy Enterprise Power-Only expenses and the Power-Related share of Hetch Hetchy Enterprise Joint expenses. An exception to this is Regional energy costs incurred by the Water Enterprise, for which Wholesale Customers are charged on the basis of Proportional Annual Use.
3. Expenses incurred by SFPUC in providing water to Retail Customers.
4. Expenses associated with the SFPUC's accruals or allocations for uncollectible Retail Water accounts.
5. Attorneys' fees and costs incurred by the Wholesale Customers that a court of competent jurisdiction orders San Francisco to pay as part of a final, binding judgment against San Francisco.
6. Any expenses associated with funding any reserves (other than the required Wholesale Revenue Coverage Reserve) accrued and not anticipated to be paid within one year unless such reserve is established by mutual agreement of the SFPUC and BAWSCA.
7. Any expenses accrued in respect to pending or threatened litigation, damage or personal injury claims or other loss contingencies unless projected to be paid within one year. Otherwise, such expenses will be charged to the Wholesale Customers when actually paid.
8. Any expenses associated with installing, relocating, enlarging, removing or modifying meters and service connections at the request of an individual Wholesale Customer.
9. The Retail Customers' portion of any Environmental Enhancement Surcharges imposed to enforce the Interim Supply Limitation.

The following payments by Wholesale Customers, individually or collectively, are not credited as Wholesale revenues.

1. Payments by individual Wholesale Customers of the Environmental Enhancement Surcharge imposed to enforce the Interim Supply Limitation.
2. Payments of attorneys' fees and costs incurred by San Francisco that a court of competent jurisdiction orders the Wholesale Customers to pay as part of a final, binding judgment against the Wholesale Customers.
3. Payments by individual Wholesale Customers for installation, relocation, enlargement, removal or modification of meters and service connections requested by, and charged to, a Wholesale Customer.
4. Payments applied to the amortization of the ending balance in the balancing account under the 1984 Agreement.
5. Payments of the Water Management Charge which are delivered to BAWSCA.
6. Payments directed to the Wholesale Revenue Coverage Reserve.
7. Prepayments of certain capital and revenues payment.

The Wholesale Customers will receive a proportional benefit from funds received by the SFPUC from (a) governmental grants, rebates, reimbursements or other subventions, (b) private-sector grants for Regional capital or operating purposes of the Water Enterprise and the Water-Only and Water-related portion of Joint Hetch Hetchy Water Enterprise expenses, or (c) a SFPUC use of taxable bonds.

The Wholesale Customers will receive a proportionate benefit from recovery of damages, including liquidated damages, by SFPUC from judgments against or settlements with contractors, suppliers, sureties, etc., related to Regional Water System projects and the Water-Only and Water-Related portion of Joint Hetch Hetchy Enterprise projects.

The SFPUC will continue to charge Wholesale Customers for assets acquired or constructed with proceeds of Indebtedness on which Wholesale Customers paid Debt Service during the Term of the Agreement on the “cash” basis (as opposed to the “utility” basis) after the expiration or earlier termination of the Agreement.

Rate Adjustments

Adjustments to the rates applicable to the Wholesale Customers, other than emergency rate increases and drought rate increases, shall be coordinated with the budget development process described in the Agreement.

The Commission may adjust the Wholesale Customers’ rates in response to an Emergency that damages the Regional Water System and disrupts San Francisco’s ability to maintain normal deliveries of water to Retail and Wholesale Customers. In such an Emergency, the Commission may adopt an emergency rate surcharge applicable to Wholesale Customers without following the budgeting procedures set forth in the Agreement, provided that any such rates surcharge imposed by the Commission shall be applicable to both Retail and Wholesale Customers and incorporate the same percentage increase for all customers. Any emergency rate surcharge adopted by the Commission shall remain in effect only until the next-budget coordinated rate-setting cycle.

If the Commission declares a water shortage emergency under Water Code Section 350, implements the Tier 1 Shortage Plan and imposes drought rates on Retail Customers, it may concurrently adjust wholesale rates independently of coordination with the annual budget process. Those adjustments may be designed to encourage water conservation and may constitute changes to the structure of the rates. Drought Rate payments and payments of excess use charges levied in accordance with the Tier 1 Shortage Plan constitute Wholesale Customer Revenue and count towards the Wholesale Revenue Requirement. The SFPUC may use these revenues to purchase additional water for the Wholesale Customers from the State Drought Water Bank or other willing seller.

Rate Structure

The Agreement is not intended and shall not be construed to limit the Commission’s right (a) to adjust the structure of the rate schedule applicable to the Wholesale Customers (i.e., the relationship among the several charges set out therein) or (b) to add, delete, or change the various charges which make up the rate schedule, provided that neither such charges nor the structure of the rate schedule(s) applicable to the Wholesale Customers shall be arbitrary, unreasonable, or unjustly discriminatory as among said customers. The SFPUC will give careful consideration to proposals for changes in the rate schedule made jointly by the Wholesale Customers but, subject to the limitations set out above, shall retain the sole and exclusive right to determine the structure of the rate schedule.

The SFPUC may recommend, and the Commission may adopt, changes in the structure of wholesale rates at any time. However, the new rate schedule implementing these changes will become effective at the beginning of the following fiscal year.

Balancing Account

After the close of each fiscal year, the SFPUC will compute the costs allocable to the Wholesale Customers for that fiscal year based on actual costs incurred by the SFPUC and actual amounts of water used by the Wholesale Customers and the Retail Customers. That amount will be compared to the amounts billed to the Wholesale Customers for that fiscal year (including any Excess Use Charges, but excluding revenues not credited to the Wholesale Revenue Requirement). The difference will be posted to a “balancing account” as a credit to, or charge against, the Wholesale Customers. Interest shall also be posted to the balancing account calculated by multiplying the amount of the opening balance by the average net interest rate, certified by the Controller as earned in the San Francisco Treasury for the previous fiscal year on the San Francisco County Pooled Investment Account. Interest, when posted, will carry the same mathematical sign (whether positive or negative) as carried by the opening

balance. The amount posted to the balancing account in each year shall be added to, or subtracted from, the balance in the account from previous years.

If the amount in the balancing account is owed to the Wholesale Customers (a positive balance), the SFPUC shall take it into consideration in establishing wholesale rates. However, the SFPUC need not apply the entire amount to reduce wholesale rates for the immediately ensuing year. Instead, the SFPUC may prorate a positive ending balance over a period of up to three successive years in order to avoid fluctuating decreases and increases in wholesale rates.

If the amount in the balancing account is owed to the SFPUC (a negative balance), the SFPUC shall not be obligated to apply all or any part of the negative balance in establishing wholesale rates for the immediately ensuing year. Instead, the SFPUC may prorate the negative balance in whole or in part over multiple years in order to avoid fluctuating increases and decreases in wholesale rates. As of June 30, 2016, the amount of the credit due to the Wholesale Customers for the balancing account was estimated to be \$21,538,827.

Wholesale Revenue Coverage Reserve

The SFPUC may include in wholesale rates for any fiscal year an additional dollar amount (“Wholesale Revenue Coverage”), which for any fiscal year shall equal the following:

1. The lesser of (i) 25% of the Wholesale Customers’ share of Net Annual Debt Service for that fiscal year, or (ii) the amount necessary to meet the Wholesale Customers’ proportionate share of Debt Service coverage required by then-current Indebtedness for that fiscal year, minus
2. A credit for (i) the actual amount previously deposited in the “Wholesale Revenue Coverage Reserve,” (ii) accrued interest on the amounts on deposit in the Wholesale Revenue Coverage Reserve, and (iii) an amount equal to any additional interest that would have accrued on the actual amounts previously deposited in the Wholesale Revenue Coverage Reserve assuming no withdrawals had been made therefrom.

During each fiscal year, the SFPUC will set aside and deposit that portion of revenue equal to Wholesale Revenue Coverage into a separate account that the SFPUC will establish and maintain, to be known as the “Wholesale Revenue Coverage Reserve.” Deposits into the Wholesale Revenue Coverage Reserve shall be made no less frequently than monthly. The Wholesale Revenue Coverage Reserve shall be credited with interest. The SFPUC may use amounts in the Wholesale Revenue Coverage Reserve for any lawful purpose. Any balance in the Wholesale Revenue Coverage Reserve in excess of the Wholesale Revenue Coverage amount as of the end of any fiscal year shall be applied as a credit against wholesale rates in the immediately following fiscal year unless otherwise directed by BAWSCA.

Conditions in the municipal bond market may change from those prevailing in 2009. If, prior to expiration of the Term, the SFPUC determines that it would be in the best financial interest of both Retail Customers and Wholesale Customers of the Regional Water System for the Debt Service coverage requirement to be increased in one or more series of proposed new Indebtedness above 1.25%, or for the coverage covenant to be strengthened in other ways, it will provide a written report to BAWSCA. The report will contain (1) a description of proposed covenant(s) in the bond indenture; (2) an explanation of how savings are expected to be achieved (e.g., increase in the SFPUC’s credit rating over the then-current level; ability to obtain credit enhancement, etc.); (3) the estimated all-in true interest cost savings; (4) a comparison of the Wholesale Revenue Requirements using the Debt Service coverage limitation and under the proposed methodology; and (5) a comparison of the respective monetary benefits expected to be received by both Retail and Wholesale Customers. The SFPUC and BAWSCA agree to meet and confer in good faith about the proposed changes.

Any increase in Debt Service coverage proposed by the SFPUC shall be commensurate with Proportional Water Use by Retail and Wholesale Customers. If the SFPUC demonstrates that an increase in Debt Service coverage will result in equivalent percentage reductions in total Wholesale and Retail Debt Service payments over the life of the proposed new Indebtedness, based on Proportional Water Use, BAWSCA may agree to a modification

of the Wholesale Revenue Coverage requirement. If BAWSCA does not agree to a proposed modification in coverage requirements in the covenants for new Indebtedness, SFPUC may nevertheless proceed with the modification and the issuance of new Indebtedness. Any Wholesale Customer, or BAWSCA, may challenge an increase in the Wholesale Revenue Requirement resulting from the modification in Debt Service coverage through arbitration. If the arbitrator finds that the increase in Debt Service coverage (1) did not and will not result in equivalent percentage reductions in total Wholesale and Retail Debt Service payments over the life of the proposed new Indebtedness, based on Proportional Water Use, or (2) was not commensurate with Proportional Water Use, the arbitrator may order the Wholesale Revenue Requirement to be recalculated both retrospectively and prospectively to eliminate the differential impact to Wholesale or Retail Customers.

Working Capital Requirement

The SFPUC maintains working capital in the form of unappropriated reserves for the purpose of bridging the gap between when the SFPUC incurs operating expenses required to provide service and when it receives revenues from its Retail and Wholesale Customers. The Wholesale Customers shall fund their share of working capital as part of the annual Wholesale Revenue Requirement calculation. The amount of wholesale working capital for which the Wholesale Customers will be responsible will be determined using the 60-day standard formula approach.

Applying this approach, annual wholesale working capital equals one-sixth of the wholesale allocation of operation and maintenance, administrative and general, and property tax expenses for the Water and Hetch Hetchy Enterprises. Wholesale working capital shall be calculated separately for the Water and Hetch Hetchy Enterprises.

Wholesale Capital Fund

The SFPUC shall establish a comparable Wholesale Revenue-Funded Capital Fund (Wholesale Capital Fund) to enable the Wholesale Customers to fund the wholesale share of revenue-funded New Regional Assets. The SFPUC may include in wholesale rates for any fiscal year an amount equal to the wholesale share of the SFPUC's appropriation for revenue funded New Regional Assets for that year, which sum will be credited to the Wholesale Capital Fund. The wholesale share of other sources of funding, where legally permitted and appropriately accounted for under GAAP, will also be credited to the Wholesale Capital Fund, together with interest earnings on the Wholesale Capital Fund balance.

The SFPUC will expend revenues appropriated and transferred to the Wholesale Capital Fund only on New Regional Assets.

In order to prevent the accumulation of an excessive unexpended and unencumbered surplus in the Wholesale Capital Fund, any excess fund balance (i.e., an accumulated unexpended, unencumbered amount in excess of 10% of the wholesale share of total capital appropriations for New Regional Assets during the five preceding years) will be transferred for the credit of the Wholesale Customers to the Balancing Account.

Arbitration and Judicial Review

All questions or disputes arising under the following subject areas shall be subject to mandatory, binding arbitration and shall not be subject to judicial determination:

1. the determination of the Wholesale Revenue Requirement, which shall include both the calculations used in the determination and the variables used in those calculations;
2. the SFPUC's adherence to accounting practices and conduct of the compliance audit; and
3. the SFPUC's classification of new assets for purposes of determining the Wholesale Revenue Requirement.

All other questions or disputes arising under this Agreement shall be subject to judicial determination. Disputes about the scope of arbitrability shall be resolved by the courts.

Preservation of Water Rights; Notice of Water Rights Proceedings

It is the intention of San Francisco to preserve all of its water rights, irrespective of whether the water held under such water rights is allocated under the Agreement. Nothing in the Agreement shall be construed as an abandonment, or evidence of an intent to abandon, any of the water rights that San Francisco presently possesses.

Reservations of, and Limitations on, Claims

The 1984 Agreement resolved a civil action brought against San Francisco by certain of the Wholesale Customers. Plaintiffs in that action contended that they, and other Wholesale Customers that are municipalities or special districts, were “co-grantees” within the meaning of Section 8 of the Act and were entitled to certain rights, benefits and privileges by virtue of that status. San Francisco disputed those claims.

Nothing in the Agreement, or in the Individual Water Sales Contracts, shall be construed or interpreted in any way to affect the ultimate resolution of the controversy between the Parties concerning whether any of the Wholesale Customers are “co-grantees” under the Act and, if so, what rights, benefits and privileges accrue to them by reason of that claimed status.

The following claims, which San Francisco disputes, are reserved but may not be asserted during the Term (or portions thereof, as indicated):

1. The Wholesale Customers’ claim that the Act entitles them to water at cost.
2. The Wholesale Customers’ claim that San Francisco is obligated under the Act or state law to supply them with additional water in excess of the Supply Assurance. This claim may not be asserted unless and until San Francisco decides not to meet projected water demands of Wholesale Customers in excess of the Supply Assurance.
3. The claim by San Jose and Santa Clara that they are entitled under the Act, or any other federal or state law, to permanent, non-interruptible status and to be charged rates identical to those charged other Wholesale Customers. This claim may not be asserted unless and until San Francisco notifies San Jose or Santa Clara that it intends to interrupt or terminate water deliveries.
4. The Wholesale Customers’ claim that the SFPUC is not entitled to impose a surcharge for lost power generation revenues attributable to furnishing water in excess of the Supply Assurance. This claim may not be asserted unless and until SFPUC furnishes water in excess of the Supply Assurance during the Term and also includes such a surcharge in the price of such water.
5. Claims by Wholesale Customers (other than San Jose and Santa Clara, whose service areas are fixed) that SFPUC is obligated under the Act or state law to furnish water, within their Individual Supply Guarantee, for delivery to customers outside their existing service area and that Wholesale Customers are entitled to enlarge their service areas to supply those customers. Such claims may be asserted only after SFPUC’s denial of, or failure for six months to act on, a written request by a Wholesale Customer to expand its service area.

The Wholesale Customers (and the SFPUC, where specified) will refrain from the following activities during the Term (or portions thereof, as specified):

1. The Wholesale Customers and the SFPUC will not contend before any court, administrative agency or legislative body or committee that the methodology for determining the Wholesale Revenue Requirement (or the requirements for (a) amortization of the ending balance under the 1984 Agreement, or (b) contribution to the Wholesale Revenue Coverage) determined in

accordance with the Agreement violates the Act or any other provision of federal law, state law, or San Francisco's City Charter, or is unfair, unreasonable or unlawful.

2. The Wholesale Customers will not challenge the transfer of funds by the SFPUC to any other San Francisco City department or fund, provided such transfer complies with the San Francisco City Charter. The transfer of its funds, whether or not permitted by the City Charter, will not excuse the SFPUC from its failure to perform any obligation imposed by the Agreement.
3. The Wholesale Customers and the SFPUC will not assert monetary claims against one another based on the 1984 Agreement other than otherwise arbitral claims arising from the three fiscal years immediately preceding the start of the Term (i.e., Fiscal Years 2006-07, 2007-08 and 2008-09).

The Wholesale Customers do not, by executing the Agreement, concede the legality of the SFPUC's establishing Interim Supply Allocations or imposing Environmental Enhancement Surcharges on water use in excess of such allocations. Any Wholesale Customer may challenge such allocation when imposed and/or such surcharges if and when levied, in any court of competent jurisdiction.

The furnishing of water in excess of the Supply Assurance by San Francisco to the Wholesale Customers shall not be deemed or construed to be a waiver by San Francisco of its claim that it has no obligation under any provision of law to supply such water to the Wholesale Customers, nor shall it constitute a dedication by San Francisco to the Wholesale Customers of such water.

Prohibition of Assignment

The Agreement shall be binding on, and shall inure to the benefit of, the Wholesale Customers and San Francisco, and their respective successors and permitted assigns. Each Wholesale Customer agrees that it will not transfer or assign any rights or privileges under the Agreement, either in whole or in part, or make any transfer of all or any part of its water system or allow the use thereof in any manner whereby any provision of the Agreement will not continue to be binding on it, its assignee or transferee, or such use of the system. Any assignment or transfer in violation of this covenant, and any assignment or transfer that would result in the supply of water in violation of the Act, shall be void.

Nothing shall prevent any Wholesale Customer (except the California Water Service Company and Stanford) from entering into a joint powers agreement or a municipal or multi-party water district with any other Wholesale Customer (except the two listed above) to exercise the rights and obligations granted to and imposed upon the Wholesale Customers hereunder, nor shall this section prevent any Wholesale Customer (except the two listed above) from succeeding to the rights and obligations of another Wholesale Customer hereunder as long as the Wholesale Service Area served by the Wholesale Customers involved in the succession is not thereby enlarged.

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APPENDIX C

SFPUC WATER ENTERPRISE FINANCIAL STATEMENTS

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Delivering high-quality
water every day.

Water Enterprise

Financial Statements June 30, 2019 and 2018
(With Independent Auditors' Report Thereon)



San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

SAN FRANCISCO WATER ENTERPRISE

Table of Contents

	Page
Independent Auditors' Report	1
Management's Discussion and Analysis (Unaudited)	3
Financial Statements:	
Statements of Net Position	16
Statements of Revenues, Expenses, and Changes in Net Position	17
Statements of Cash Flows	18
Notes to Financial Statements	20
Independent Auditors' Report on Internal Control over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with <i>Government Auditing Standards</i>	71



KPMG LLP
Suite 1400
55 Second Street
San Francisco, CA 94105

Independent Auditors' Report

The Honorable Mayor and Board of Supervisors
City and County of San Francisco:

Report on the Financial Statements

We have audited the accompanying financial statements of the San Francisco Water Enterprise (the Enterprise), an enterprise fund of the City and County of San Francisco, California (the City) as of and for the years ended June 30, 2019 and 2018, and the related notes to the financial statements, which collectively comprise the Enterprise's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with U.S. generally accepted accounting principles; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Governmental Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the Enterprise as of June 30, 2019 and 2018 and the respective changes in its financial position and, where applicable, cash flows thereof for the years then ended in accordance with U.S. generally accepted accounting principles.



Emphasis of Matter

As discussed in Note 1, the financial statements of the Enterprise are intended to present the financial position, the changes in financial position and, where applicable, cash flows of only that portion of the City that is attributable to the transactions of the Enterprise. They do not purport to, and do not, present fairly the financial position of the City as of June 30, 2019 and 2018, the changes in its financial position, or, where applicable, its cash flows for the years then ended in accordance with U.S. generally accepted accounting principles. Our opinion is not modified with respect to this matter.

Other Matters

Required Supplementary Information

U.S. generally accepted accounting principles require that the management's discussion and analysis on pages 3 through 15 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audits of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated December 9, 2019 on our consideration of the Enterprise's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the Enterprise's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Enterprise's internal control over financial reporting and compliance.

KPMG LLP

San Francisco, California
December 9, 2019

SAN FRANCISCO WATER ENTERPRISE
Management's Discussion and Analysis (Unaudited)
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

This section presents management's analysis of the San Francisco Water Enterprise's (the Enterprise) financial condition and activities as of and for the fiscal years ended June 30, 2019 and 2018. Management's Discussion and Analysis (MDA) is intended to serve as an introduction to the Enterprise's financial statements. This information should be read in conjunction with the audited financial statements that follow this section. All dollar amounts, unless otherwise noted, are expressed in thousands of dollars.

The information in this MDA is presented under the following headings:

- Organization and Business
- Overview of the Financial Statements
- Financial Analysis
- Capital Assets
- Debt Administration
- Rates and Charges
- Request for Information

Organization and Business

The San Francisco Public Utilities Commission (SFPUC or the Commission) is a department of the City and County of San Francisco (the City) that is responsible for the maintenance, operation, and development of three utility enterprises: Water (the Enterprise), Hetch Hetchy Water and Power and CleanPowerSF, and Wastewater. The Enterprise collects, transmits, treats, and distributes high-quality drinking water to a total population of approximately 2.7 million people, including retail customers in the City and wholesale customers located in San Mateo, Santa Clara, and Alameda Counties. The Enterprise sold approximately 185 million gallons of water per day in the year ended June 30, 2019. Approximately two-thirds of the water delivered by the Enterprise is to wholesale customers. Retail customers use the remaining one-third and are primarily San Francisco consumers, including residential, commercial, industrial, and governmental users. Wholesale customers include cities, water districts, one private utility, and one non-profit university. Service to these customers is provided pursuant to the 25-year Amended and Restated Water Supply Agreement (WSA), commenced on July 1, 2009, which established the basis for determining the costs of wholesale service.

Overview of the Financial Statements

The Enterprise's financial statements include the following:

Statements of Net Position present information on the Enterprise's assets, deferred outflows, liabilities, and deferred inflows as of year-end, with the difference reported as net position. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position of the Enterprise is improving or worsening.

While the *Statements of Net Position* provide information about the nature and amount of resources and obligations as of year-end, the *Statements of Revenues, Expenses, and Changes in Net Position* present the results of the Enterprise's operations over the course of the fiscal year and information as to how the net position changed during the year. These statements can be used as an indicator of the extent to which the Enterprise has successfully recovered its costs through user fees and other charges. All changes in net position are reported during the period in which the underlying event giving rise to the change occurs, regardless of the timing of the related cash flows. Thus, revenues and expenses are reported in these statements from some items that will result in cash flows in future fiscal periods, such as delayed collection of operating revenues and the expenses of employee earned but unused vacation leave.

SAN FRANCISCO WATER ENTERPRISE
Management's Discussion and Analysis (Unaudited)
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

The *Statements of Cash Flows* present changes in cash and cash equivalents resulting from operational, capital, non-capital, and investing activities. These statements summarize the annual flow of cash receipts and cash payments, without consideration of the timing of the event giving rise to the obligation or receipt and exclude non-cash accounting measures of depreciation or amortization of assets.

The *Notes to Financial Statements* provide information that is essential to a full understanding of the financial statements that is not displayed on the face of the financial statements.

Financial Analysis

Financial Highlights for Fiscal Year 2019

- Total assets exceeded total liabilities by \$381,783.
- Net position increased by \$52,614 or 10.7% during the fiscal year.
- Capital assets, net of accumulated depreciation and amortization increased by \$125,425 or 2.4% to \$5,388,658.
- Current and other assets decreased by \$71,821 or 10.6% mainly due to debt principal and interest repayments and Water System Improvement Program (WSIP) related capital projects spending.
- Operating revenues increased by \$16,752 or 3.2% to \$542,391.
- Operating expenses decreased by \$13,053 or 3.5% to \$357,094.

Financial Highlights for Fiscal Year 2018

- Total assets exceeded total liabilities by \$283,416.
- Net position decreased by \$11,743 or 2.3% during the fiscal year.
- Capital assets, net of accumulated depreciation and amortization increased by \$209,769 or 4.2% to \$5,263,233.
- Current and other assets increased by \$76,484 or 12.8% mainly due to debt issuance of the 2017 Series ABC and 2017 Series DEFG revenue bonds, offset by debt principal and interest repayments and Water System Improvement Program (WSIP) related capital projects spending.
- Operating revenues increased by \$65,308 or 14.2% to \$525,639.
- Operating expenses decreased by \$51,680 or 12.3% to \$370,147.

SAN FRANCISCO WATER ENTERPRISE
Management's Discussion and Analysis (Unaudited)
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

Financial Position

The following table summarizes the Enterprise's changes in net position.

Table 1
Comparative Condensed Net Position
June 30, 2019, 2018, and 2017

	2019	2018	2017	2019-2018 Change	2018-2017 Change
Total assets:					
Current and other assets	\$ 604,463	676,284	599,800	(71,821)	76,484
Capital assets, net of accumulated depreciation and amortization	5,388,658	5,263,233	5,053,464	125,425	209,769
Total assets	<u>5,993,121</u>	<u>5,939,517</u>	<u>5,653,264</u>	<u>53,604</u>	<u>286,253</u>
Deferred outflows of resources:					
Unamortized loss on refunding of debt	139,061	150,255	126,805	(11,194)	23,450
Pensions	55,465	62,062	105,357	(6,597)	(43,295)
Other post-employment benefits	13,142	9,122	—	4,020	9,122
Total deferred outflows of resources	<u>207,668</u>	<u>221,439</u>	<u>232,162</u>	<u>(13,771)</u>	<u>(10,723)</u>
Liabilities:					
Current liabilities:					
Revenue and capital appreciation bonds	100,899	76,665	48,875	24,234	27,790
Certificates of participation	2,688	2,556	2,431	132	125
Commercial paper	161,336	40,312	145,000	121,024	(104,688)
Other liabilities	132,251	137,576	118,602	(5,325)	18,974
Subtotal current liabilities	<u>397,174</u>	<u>257,109</u>	<u>314,908</u>	<u>140,065</u>	<u>(57,799)</u>
Long-term liabilities:					
Revenue and capital appreciation bonds	4,709,678	4,839,101	4,512,370	(129,423)	326,731
Certificates of participation	101,704	104,550	107,291	(2,846)	(2,741)
Other liabilities	402,782	455,341	438,455	(52,559)	16,886
Subtotal long-term liabilities	<u>5,214,164</u>	<u>5,398,992</u>	<u>5,058,116</u>	<u>(184,828)</u>	<u>340,876</u>
Total liabilities:					
Revenue and capital appreciation bonds	4,810,577	4,915,766	4,561,245	(105,189)	354,521
Certificates of participation	104,392	107,106	109,722	(2,714)	(2,616)
Commercial paper	161,336	40,312	145,000	121,024	(104,688)
Other liabilities	535,033	592,917	557,057	(57,884)	35,860
Total liabilities	<u>5,611,338</u>	<u>5,656,101</u>	<u>5,373,024</u>	<u>(44,763)</u>	<u>283,077</u>
Deferred inflows of resources:					
Related to pensions	33,330	15,063	11,135	18,267	3,928
Other post-employment benefits	13,983	268	—	13,715	268
Total deferred inflows of resources	<u>47,313</u>	<u>15,331</u>	<u>11,135</u>	<u>31,982</u>	<u>4,196</u>
Net position:					
Net investment in capital assets	563,457	504,476	495,868	58,981	8,608
Restricted for debt service	16,193	22,933	10,989	(6,740)	11,944
Restricted for capital projects	—	32,978	37,904	(32,978)	(4,926)
Unrestricted	(37,512)	(70,863)	(43,494)	33,351	(27,369)
Total net position	<u>\$ 542,138</u>	<u>489,524</u>	<u>501,267</u>	<u>52,614</u>	<u>(11,743)</u>

Net Position, Fiscal Year 2019

For the year ended June 30, 2019, the Enterprise's assets and deferred outflows of resources exceeded liabilities and deferred inflows of resources by \$542,138. Total net position increased from prior year by \$52,614 or 10.7% (see Table 1). The increase in net position was the result of an increase of \$39,833 in assets and deferred outflows of resources, coupled with a decrease of \$12,781 in liabilities and deferred inflows of resources.

Current and other assets primarily is comprised of restricted and unrestricted balances of cash, receivables for water deliveries and services, interfund receivables due from other governmental agencies, and

SAN FRANCISCO WATER ENTERPRISE
Management's Discussion and Analysis (Unaudited)
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

inventory. This also includes receivables, which represent cumulative amounts due from the wholesale customers to match revenues with the Enterprise's costs of providing service (the Balancing Account), in accordance with the provisions set forth in the WSA effective July 1, 2009. Balances are applied to future year rates. As of June 30, 2019, the Enterprise owed the wholesale customers \$64,829, which was mainly due to lower water demand by the wholesale customers. This amount was recorded as a liability in accordance with the 2009 agreement. See Note 9(a), Water Supply Agreement, for additional details.

During the fiscal year 2019, current and other assets decreased by \$71,821 or 10.6%. The decreases included \$74,244 in restricted and unrestricted cash and investments mainly due to debt principal and interest repayments and capital projects spending, \$693 in restricted interest receivables mainly due to lower cash balances in capital projects funds, \$214 in state grants collections relating to high efficiency toilet installation projects, \$135 in inventory from more issuances than purchases during the fiscal year. These decreases were offset by increases of \$1,355 in interest receivable from higher interest rates, \$1,050 in prepaid charges, advances and other receivables mainly due to increases in prepaid charges for rents, software licenses and other costs, \$714 in charges for services receivable due to an increase in billing rates, and \$346 mainly due from the Department of Public Works for Mission Bay South, Hunters View and Transbay Folsom custom work projects.

Capital assets, net of accumulated depreciation and amortization, increased by \$125,425 or 2.4% from construction and capital improvement activities. The largest portion of the Enterprise's net position of \$563,457 or 105.4% represents net investment in capital assets (see Capital Assets section of the MDA for more information), which increased by \$58,981 or 11.7% from prior year's \$504,476; as explained by a \$125,425 increase in capital assets in buildings, structures, and improvements and construction in progress, offset by a \$66,444 increase in liabilities related to capital assets mainly due to issuance of commercial paper. Deferred outflows of resources decreased by \$13,771 due to an \$11,194 decrease from amortization of bond refunding loss, and \$6,597 decrease from pensions based on actuarial report, offset by a \$4,020 increase in other post-employment benefits obligations (OPEB) based on actuarial report.

Total liabilities decreased by \$44,763 or 0.8% which is explained by decreases of \$107,903 in principal of revenue bonds, capital appreciation bonds and certificates of participation mainly due to principal repayments, \$33,574 in net pension liability based on actuarial report, \$16,897 in restricted and unrestricted payables mainly from lower WSIP project activities, \$15,565 in other post-employment benefits obligations from actuarial assumptions, \$1,893 in general liability based on actuarial report, \$621 in workers' compensation based on actuarial estimates, \$481 in interest payable, \$303 in accrued payroll, vacation and sick leave, \$117 in pollution remediation liability mainly for the Lake Merced and 17th and Folsom sites (see Note 13(d) for details), and \$96 payment to the Department of Public Works for road structure support projects. These decreases were offset by increases of \$121,024 in commercial paper from additional issuances, \$8,963 in the Wholesale Balancing Account (see Note 9(a) for details), and \$2,700 in unearned revenues mainly from BAWSCA bond surcharge.

Deferred inflows of resources increased by \$31,982 due to a \$18,267 increase relating to pension, and a \$13,715 increase in OPEB obligations based on actuarial report.

Net Position, Fiscal Year 2018

For the year ended June 30, 2018, the Enterprise's assets and deferred outflows of resources exceeded liabilities and deferred inflows of resources by \$489,524. Total net position decreased from prior year by \$11,743 or 2.3% (see Table 1). The decrease in net position was the result of an increase of \$287,273 in

SAN FRANCISCO WATER ENTERPRISE
Management's Discussion and Analysis (Unaudited)
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

liabilities and deferred inflows of resources, offset by an increase of \$275,530 in assets and deferred outflows of resources.

Current and other assets primarily is comprised of restricted and unrestricted balances of cash, receivables for water deliveries and services, interfund receivables due from other governmental agencies, and inventory. This also includes receivables, which represent cumulative amounts due from the wholesale customers to match revenues with the Enterprise's costs of providing service (the Balancing Account), in accordance with the provisions set forth in the WSA effective July 1, 2009. Balances are applied to future year rates. As of June 30, 2018, the Enterprise owed the wholesale customers \$55,866, which was mainly due to increased water demand by the wholesale customers that generated additional billed revenue. This amount was recorded as a liability in accordance with the 2009 agreement. See Note 9(a), Water Supply Agreement, for additional details.

During the fiscal year 2018, current and other assets increased by \$76,484 or 12.8%. The increases included \$77,707 or 14.7% in restricted and unrestricted cash and investments mainly due to debt issuance of the 2017 Series ABC bonds offset by debt principal and interest repayments and WSIP related capital projects spending, \$1,205 in interest receivable due to higher cash balance from revenue bond funds and higher annualized interest rates, \$248 in advances and other receivables mainly due to increases in custom work and property rental receivables, and \$175 in state grants receivable relating to high efficiency toilet installation projects. These increases were offset by decreases of \$1,875 in inventory due to obsolete inventory write-offs at the City Distribution Division and more issuances than purchases during the fiscal year, \$638 in charges for services receivable mainly due to a decrease in unbilled revenue accrual for wholesale customers, and \$338 due from the Office of Community Investment and Infrastructure for the Candlestick/Hunter's Point custom work projects.

Capital assets, net of accumulated depreciation and amortization, increased by \$209,769 or 4.2% from construction and capital improvement activities. The largest portion of the Enterprise's net position of \$504,476 or 103.1% represents net investment in capital assets (see Capital Assets section of the MDA for more information), which increased by \$8,608 or 1.7% from prior year's \$495,868 to \$504,476 as explained by a \$209,769 increase in capital assets in buildings, structures, and improvements and construction in progress, offset by a \$201,161 increase in liabilities related to capital assets mainly due to the issuance of the 2017 Series ABC bonds. Deferred outflows of resources decreased by \$10,723 due to a \$43,295 decrease in pensions based on actuarial report, offset by a \$23,450 increase in unamortized loss on refunding of debt from the issuance of 2017 Series DEFG bonds and \$9,122 from other post-employment benefits obligations per the implementation of GASB Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other than Pensions*.

Total liabilities increased by \$283,077 or 5.3% which is explained by increases of \$351,905 in principal of revenue bonds and certificates of participation mainly due to the issuance of 2017 Series ABC bonds, \$45,006 in other post-employment benefits obligations as a result of implementation of GASB Statement No. 75, \$22,588 in restricted and unrestricted payables due to prior year activities to close out the legacy system payables, \$12,395 in the Wholesale Balancing Account (see Note 9(a) for details), \$2,664 in general liability based on actuarial report, \$2,154 in interest payable due to higher outstanding debt principal, \$1,868 in workers' compensation based on actuarial estimates, \$354 in unearned revenues mainly from additional deposits for custom work, and \$89 due to the Department of Public Works for road structure support projects. These increases were offset by decreases of \$104,688 in commercial paper due to refunding from the 2017 Series ABC and 2017 Series DEFG bonds, \$50,953 in net pension liability based on actuarial report, \$157 in pollution remediation liability mainly for the Lake Merced and 17th and Folsom sites (see Note 13(d) for details), and \$148 in accrued payroll, vacation and sick leave.

SAN FRANCISCO WATER ENTERPRISE
Management's Discussion and Analysis (Unaudited)
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

Deferred inflows of resources increased by \$4,196 due to increases of \$3,928 relating to pension obligations and \$268 relating to other post-employment benefits obligations per the implementation of GASB Statement No. 75.

Results of Operations

The following table summarizes the Enterprise's revenues, expenses, and changes in net position.

Table 2
Comparative Condensed Revenues, Expenses, and Changes in Net Position
Years ended June 30, 2019, 2018, and 2017

	2019	2018	2017	2019-2018 Change	2018-2017 Change
Revenues:					
Charges for services	\$ 509,703	495,138	438,207	14,565	56,931
Rents and concessions	13,010	12,906	8,813	104	4,093
Other operating revenues	19,678	17,595	13,311	2,083	4,284
Interest and investment income	15,650	6,448	4,331	9,202	2,117
Other non-operating revenues	32,399	39,064	37,405	(6,665)	1,659
Total revenues	<u>590,440</u>	<u>571,151</u>	<u>502,067</u>	<u>19,289</u>	<u>69,084</u>
Expenses:					
Operating expenses	357,094	370,147	421,827	(13,053)	(51,680)
Interest expenses	177,998	164,001	148,075	13,997	15,926
Amortization of premium, discount, refunding loss, and issuance costs	(17,788)	(13,540)	(9,029)	(4,248)	(4,511)
Non-operating expenses	1,388	1,920	2,607	(532)	(687)
Total expenses	<u>518,692</u>	<u>522,528</u>	<u>563,480</u>	<u>(3,836)</u>	<u>(40,952)</u>
Change in net position before transfers	<u>71,748</u>	<u>48,623</u>	<u>(61,413)</u>	<u>23,125</u>	<u>110,036</u>
Transfers from the City and County of San Francisco	1,200	382	128	818	254
Transfers to the City and County of San Francisco	(20,334)	(31,368)	(60,116)	11,034	28,748
Net transfers	<u>(19,134)</u>	<u>(30,986)</u>	<u>(59,988)</u>	<u>11,852</u>	<u>29,002</u>
Change in net position	<u>52,614</u>	<u>17,637</u>	<u>(121,401)</u>	<u>34,977</u>	<u>139,038</u>
Net position at beginning of year					
Beginning of year, as previously reported	489,524	501,267	622,668	(11,743)	(121,401)
Cumulative effect of accounting change	—	(29,380) *	—	29,380	(29,380)
Net position at beginning of year as restated	<u>489,524</u>	<u>471,887</u>	<u>622,668</u>	<u>17,637</u>	<u>(150,781)</u>
Net position at end of year	<u>\$ 542,138</u>	<u>489,524</u>	<u>501,267</u>	<u>52,614</u>	<u>(11,743)</u>

* Cumulative effect of accounting change per GASB Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other than Pensions*.

Results of Operations, Fiscal Year 2019

The Enterprise's total revenues of \$590,440 for the year represented an increase of \$19,289 or 3.4% from prior year (see Table 2). Increases included \$14,565 from charges for services, \$9,202 for interest and investment income, \$2,083 from other operating revenues, and \$104 from rents and concessions. These increases were offset by a decrease of \$6,665 from other non-operating revenues.

Charges for services were \$509,703, an increase of \$14,565 or 2.9% mainly due to an adopted rate increase of 9.0% for retail customers beginning July 1, 2018, offset by a decrease of 2.8% in consumption. Rents and concessions were \$13,010, an increase of \$104 or 0.8% mainly from Consumer Price Index increases. Other operating revenues were \$19,678, an increase of \$2,083 or 11.8% mainly due to a 9.0% adopted rate increase. Interest and investment income was \$15,650, an increase of \$9,202 or 142.7% mainly due to higher interest rates for pooled cash with the City Treasury and unrealized gains on investments. Other non-operating revenues were \$32,399, a decrease of \$6,665 or 17.1% mainly from a prior year settlement received of \$8,250 for the Pacific Rod and Gun Club offset by \$1,500 proceeds received in the current year for sale of land on Burnett Avenue in San Francisco.

SAN FRANCISCO WATER ENTERPRISE
Management's Discussion and Analysis (Unaudited)
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

The Enterprise's total expenses were \$518,692, a decrease of \$3,836 or 0.7%. Operating expenses were \$357,094, a decrease of \$13,053 or 3.5% due to decreases of \$16,701 in personnel services primarily due to pension and OPEB obligations based on actuarial reports, \$2,515 in materials and supplies mainly from prior year obsolete inventory write-offs, and \$416 in contractual services mainly from decreased construction contracts. These decreases were offset by increases of \$2,891 in services provided by other departments mainly due to increased water assessment fees paid to Hetch Hetchy Water and City Attorney legal services, \$2,064 in depreciation due to additional capital assets placed into service, and \$1,624 in general and administrative and other mainly due to lower capitalization of capital projects. Interest expenses increased by \$13,997 due to prior year issuance of 2017 Series ABC and DEFG bonds, and reduced interest capitalization for capital projects. Amortization of bond premium, discount, refunding loss, and issuance costs increased by \$4,248 mainly due to the issuance of bonds in prior year. Non-operating expenses decreased by \$532 from reduced community based organization programs.

Transfers in of \$1,200 were from the General Fund for low income assistance programs. Transfers out of \$20,334 included \$20,000 to Hetch Hetchy Water to fund various upcountry capital projects, \$302 to the Arts Commission for arts enrichment, and \$32 to the Office of the City Administrator for the Surety Bond Program.

Results of Operations, Fiscal Year 2018

The Enterprise's total revenues of \$571,151 for the year represented an increase of \$69,084 or 13.8% from prior year (see Table 2). Increases included \$56,931 from charges for services, \$4,284 for other operating revenues, \$4,093 for rents and concessions, \$2,117 from interest and investment income, and \$1,659 for other non-operating revenues.

Charges for services were \$495,138, an increase of \$56,931 or 13.0% is primarily due to an adopted rate increase of 7.0% for retail customers beginning July 1, 2017, and increased consumption of 11% by wholesale customers and 3% by retail customers. Rents and concessions were \$12,906, an increase of \$4,093 or 46.4% mainly due to write-off of Sunol Valley Golf lease receivable in prior year. Other operating revenues were \$17,595, an increase of \$4,284 or 32.2% due to a 7% planned rate increase and increased consumption from other City departments on water sales. Interest and investment income was \$6,448, an increase of \$2,117 or 48.9% due to higher average cash balances and higher annualized interest rates with the City Treasury. Other non-operating revenues were \$39,064, an increase of \$1,659 or 4.4% mainly due to a \$8,250 pollution remediation settlement received for the Pacific Rod and Gun Club site, offset by a \$6,591 decrease in sale of property primarily due to a one-time gain from property sold in prior year.

The Enterprise's total expenses were \$522,528, a decrease of \$40,952 or 7.3% from prior year. Operating expenses were \$370,147, a decrease of \$51,680 or 12.3% due to a \$53,739 decrease in personnel services mainly from pensions, \$2,392 in general and administrative and other expenses mainly due to increased capitalization of capital projects, \$2,313 in services by other departments mainly for lower water assessment fees paid to Hetch Hetchy Water, and \$75 in depreciation. These decreases were offset by increases of \$3,467 for contractual services mainly due to increased construction contracts, and \$3,372 in materials and supplies mainly resulting from obsolete inventory write-offs, water treatment supplies and other materials and supplies. Interest expenses increased by \$15,926, and amortization of bond premium, discount, refunding loss and issuance costs increased by \$4,511 mainly due to the issuance of the 2017 Series ABC and 2017 Series DEFG bonds. Non-operating expenses decreased by \$687 due to lower rebates for high efficiency toilets installed.

Transfers in of \$382 included \$282 from the City for Earthquake Safety and Emergency Response projects, and \$100 from the General Fund for the San Francisco War Memorial Veterans Building project. Transfers out of \$31,368 included \$30,000 to Hetch Hetchy Water to fund various upcountry capital projects, \$1,244

SAN FRANCISCO WATER ENTERPRISE
Management's Discussion and Analysis (Unaudited)
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

to San Francisco Recreation and Park Department for Alta Plaza Park and Moscone Recreation Center projects, \$92 to San Francisco Municipal Transportation Agency for the Forest Hill Station project, and \$32 to the Office of the City Administrator for the Surety Bond Program.

Capital Assets

The following table summarizes changes in the Enterprise's capital assets.

Table 3
Capital Assets, Net of Accumulated Depreciation and Amortization
As of June 30, 2019, 2018, and 2017

	2019	2018	2017	2019-2018	2018-2017
				Change	Change
Facilities, improvements, machinery, and equipment	\$ 4,890,207	3,825,832	3,826,176	1,064,375	(344)
Intangible assets	5,816	7,321	4,671	(1,505)	2,650
Land	30,029	30,029	26,777	—	3,252
Construction work in progress	462,606	1,400,051	1,195,840	(937,445)	204,211
Total	<u>\$ 5,388,658</u>	<u>5,263,233</u>	<u>5,053,464</u>	<u>125,425</u>	<u>209,769</u>

Capital Assets, Fiscal Year 2019

The Enterprise has net capital assets of \$5,388,658 invested in a broad range of utility capital assets as of June 30, 2019 (see Table 3). The investment in capital assets includes land, facilities, improvements, water treatment plants, aqueducts, water transmission, distribution mains, water storage facilities, pump stations, water reclamation facilities, machinery, and equipment. The Enterprise's net revenue and long-term debt are used to finance capital investments. Capital assets, net of accumulated depreciation and amortization, increased by \$125,425 from the prior year. Construction work in progress decreased by \$937,445 primarily due to capital assets placed into service. Intangible assets decreased by \$1,505 due to amortization of \$2,171 primarily relating to the SFPUC On-Line Invoicing System, Automated Water Meter Program upgrades and SFBid online contracting system, offset by increases of \$666 mainly from Water Quality Sampling and Maximo asset management software. Land was unchanged from prior year. Facilities, improvements, machinery, and equipment increased by \$1,064,375 mainly attributable to capital assets placed into service such as Calaveras Dam, WSIP Security Upgrades, and West Sunset Well Station.

Major additions to construction work in progress during the year ended June 30, 2019 include the following:

Calaveras Dam Replacement	\$ 68,453
Recycled Water Project	25,913
Sunol Long Term Improvements	18,325
Regional Groundwater Storage & Recovery	14,677
Water Main Replacement - Van Ness Avenue/Market/Lombard Streets	9,826
Various New Water Utility Services	7,116
San Francisco Groundwater Supply	6,204
Sunol Valley Water Treatment Plant - Powdered Activated Carbon System	5,710
Various Water Utility Services Renewals	5,245
Water Main Replacement - Putnam Street/Peralta/Cortland Avenues	5,041
Other project additions individually below \$5,000	77,097
Total	<u>\$ 243,607</u>

SAN FRANCISCO WATER ENTERPRISE
Management's Discussion and Analysis (Unaudited)
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

Major depreciable facilities, improvements, intangible assets, machinery and equipment placed in service, including transfers of completed projects from construction work in progress, during the year ended June 30, 2019 include the following:

Calaveras Dam Construction	\$ 496,165
Calaveras Dam Spillway & Basin	369,551
Calaveras Dam Outlet System	126,044
Calaveras Dam Fish Passage	62,228
WSIP Security Systems Upgrades	17,852
West Sunset Well Station	14,098
Golden Gate Park Central Well Station	13,000
South Sunset Well Station	9,505
Sunol Valley Water Treatment Plant - Powdered Activated Carbon System	7,613
Various New Water Utility Services	7,116
Water Main Replacement - Putnam Street/Peralta/Cortland Avenues	6,914
Auxiliary Water Supply System - Columbus Avenue Pipeline	5,956
Sunset Reservoir Chemical Building	5,890
Various Water Utility Service Renewals	5,245
Water Main Replacement - Pacheco Street/10th/Castaneda Avenues	5,046
Other items individually below \$5,000	31,465
Total	<u>\$ 1,183,688</u>

See Note 4 for additional information about Capital Assets.

Water System Improvement Program

The WSIP delivers capital improvements that enhance the Enterprise's ability to provide reliable, affordable, high-quality drinking water to its 27 wholesale customers and regional retail customers in Alameda, Santa Clara, and San Mateo Counties, as well as approximately 800,000 residential customers in San Francisco, in an environmentally sustainable manner. The program is structured to cost-effectively meet water quality requirements and long-term water supply objectives, as well as improve seismic and delivery reliability.

Overall, the \$4.8 billion WSIP to upgrade the City of San Francisco's regional and local drinking water systems is 97% completed with \$4.5 billion of project appropriations expended through fiscal year ended June 30, 2019. The program consists of 35 local projects located within San Francisco and 52 regional projects spread over seven different counties from the Sierra Foothills to San Francisco. As of June 30, 2019, 34 local projects are completed, and the target completion date is December 2019. For regional projects, 42 are completed and the expected completion date is December 2021. Additional details regarding the WSIP are available at <https://www.sfwater.org/index.aspx?page=115>.

Capital Assets, Fiscal Year 2018

The Enterprise has net capital assets of \$5,263,233 invested in a broad range of utility capital assets as of June 30, 2018 (see Table 3). The investment in capital assets includes land, facilities, improvements, water treatment plants, aqueducts, water transmission, distribution mains, water storage facilities, pump stations, water reclamation facilities, machinery, and equipment. The Enterprise's net revenue and long-term debt are used to finance capital investments. Capital assets, net of accumulated depreciation and amortization, increased by \$209,769 from the prior year. Construction work in progress increased by \$204,211 primarily due to additions from the Calaveras Dam Replacement, Recycled Water, Sunol Long Term Improvements, and Regional Groundwater Storage & Recovery projects. Land increased by \$3,252 mainly from the

SAN FRANCISCO WATER ENTERPRISE
Management's Discussion and Analysis (Unaudited)
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

purchase of property at Rollins Road in Burlingame, California. Intangible assets increased by \$2,650 due to additions of \$3,988 mainly for software updates for the Automated Meter Reading System, offset by decreases of \$1,338 amortization mainly relating to the SFPUC On-Line Invoicing System, and the SFBid online contracting system. Facilities, improvements, machinery, and equipment decreased by \$344 mainly attributable to depreciation.

Major additions to construction work in progress during the year ended June 30, 2018 include the following:

Calaveras Dam Replacement	\$ 143,323
Recycled Water Project	29,326
Sunol Long Term Improvements	25,355
Regional Groundwater Storage & Recovery	16,172
Rollins Road Purchase	9,241
Habitat Reserve Program	8,617
San Francisco Groundwater Supply	8,471
Irving Street Infrastructure Improvements Phase 2	7,781
Various New Water Utility Services	6,267
Other project additions individually below \$5,000	73,882
Total	<u>\$ 328,435</u>

Major depreciable facilities, improvements, intangible assets, machinery and equipment placed in service, including transfers of completed projects from construction work in progress, during the year ended June 30, 2018 include the following:

Lake Merced Well Station	\$ 17,232
Auxiliary Water Supply System - Pumping Station No. 1	15,524
Water Main Replacement - Haight/Buchanan/Ashbury Streets	8,139
Water Main Replacement - Potrero Avenue/21st to 25th Streets	7,382
Water Main Replacement - 6th/Market/Howard/Taylor Streets	7,276
Water Main Replacement - Masonic Avenue/O'Farrell/Fell Streets	6,428
Various New Water Utility Services	6,266
Auxiliary Water Supply System - Cisterns F (4 Cisterns)	5,946
Other items individually below \$5,000	46,864
Total	<u>\$ 121,057</u>

See Note 4 for additional information about Capital Assets.

Water System Improvement Program

The WSIP delivers capital improvements that enhance the Enterprise's ability to provide reliable, affordable, high-quality drinking water to its 27 wholesale customers and regional retail customers in Alameda, Santa Clara, and San Mateo Counties, as well as 800,000 retail customers in San Francisco, in an environmentally sustainable manner. The program is structured to cost effectively meet water quality requirements and long-term water supply objectives, as well as improve seismic and delivery reliability.

Overall, the \$4.8 billion WSIP to upgrade the City of San Francisco's regional and local drinking water systems is 96% completed with \$4.4 billion of project appropriations expended through fiscal year ended June 30, 2018. The program consists of 35 local projects located within San Francisco and 52 regional projects spread over seven different counties from the Sierra Foothills to San Francisco. As of June 30, 2018, 34 local projects are completed, and the target completion date is December 2018. For regional

SAN FRANCISCO WATER ENTERPRISE
Management's Discussion and Analysis (Unaudited)
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

projects, 40 are completed and the expected completion date is December 2021. Additional details regarding the WSIP are available at <https://www.sfwater.org/index.aspx?page=115>.

Debt Administration

As of June 30, 2019, the Enterprise had \$5,076,305 total debt outstanding, an increase of \$13,121 over the prior year, as shown below in Table 4. More detailed information about the Enterprise's debt activity is presented in Notes 6, 7, and 8 to the financial statements.

Table 4
Outstanding Debt, Net of Unamortized Costs
As of June 30, 2019, 2018, and 2017

	<u>2019</u>	<u>2018</u>	<u>2017</u>	<u>2019-2018</u> <u>Change</u>	<u>2018-2017</u> <u>Change</u>
Revenue bonds	\$ 4,808,548	4,909,041	4,554,967	(100,493)	354,074
Capital appreciation bonds	2,029	6,725	6,278	(4,696)	447
Commercial paper	161,336	40,312	145,000	121,024	(104,688)
Certificates of participation	104,392	107,106	109,722	(2,714)	(2,616)
Total	<u>\$ 5,076,305</u>	<u>5,063,184</u>	<u>4,815,967</u>	<u>13,121</u>	<u>247,217</u>

The decrease of \$100,493 in revenue bonds was due to \$71,665 from bond repayment, \$28,840 from amortization of premium, and offset by \$12 from amortization of discount. The decrease of \$4,696 in capital appreciation bonds was due to \$5,000 from repayment, offset by \$304 from accretions. The decrease of \$2,714 in certificates of participation was due to \$2,556 from repayment and \$158 from amortization of premium. The Enterprise had \$135,308 in tax-exempt and \$26,028 in taxable commercial paper as of June 30, 2019, and \$25,312 in taxable and \$15,000 in tax-exempt commercial paper outstanding as of June 30, 2018.

Credit Ratings and Bond Insurance – The Enterprise carried underlying ratings of “Aa3” and “AA-” from Moody’s and Standard & Poor’s (S&P) at June 30, 2019 and 2018, respectively.

Debt Service Coverage – Pursuant to the Amended and Restated Indenture, the Enterprise is required to collect sufficient net revenues each fiscal year, together with any Enterprise funds (except Bond Reserve Funds), which are available for payment of debt service and are not budgeted to be expended, at least equal to 1.25 times annual debt service for said fiscal year. During fiscal years 2019 and 2018, the Enterprise’s net revenues, together with fund balances available to pay debt service and not budgeted to be expended, were sufficient to meet the rate covenant requirements under the Enterprise’s Amended and Restated Indenture (see Note 8).

Debt Authorization – Pursuant to the Charter Section 8B.124, the Enterprise can incur indebtedness upon two-thirds vote of the Board of Supervisors, as approved by voters in Proposition E in November 2002. As of June 30, 2019, the Board of Supervisors has authorized the issuance of \$4,234,873 in revenue bonds under Proposition E, with \$3,278,440 issued against this authorization. The Enterprise can also incur indebtedness of up to \$1,628,000 for improvements to the water system pursuant to Proposition A that was approved by the voters in November 2002. As of June 30, 2019, \$1,348,335 of the \$1,628,000 Proposition A authorized bonds were issued. The Enterprise is also authorized to issue up to \$500,000 in commercial paper.

SAN FRANCISCO WATER ENTERPRISE
Management's Discussion and Analysis (Unaudited)
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

Cost of Debt Capital – The Enterprise's outstanding long-term debt has coupon interest rates ranging from 1.8% to 7.0% as of June 30, 2019 and 2018. The Enterprise's short-term debt has interest rates ranging from 0.9% to 7.0% during fiscal years 2019 and 2018.

Rates and Charges

Rate Setting Process

Retail Customers

Proposition E, as approved by the voters in November 2002, amended the City Charter by adding the new Article VIII B, entitled "Public Utilities," which changed the Commission's ability to issue new revenue bonds and set retail water rates. For the retail water rate setting, the Commission is required to:

- Establish rates, fees, and charges based on cost of service;
- Retain an independent rate consultant to conduct cost of service studies at least every five years;
- Consider establishing new connection fees;
- Consider conservation incentives and lifeline rates;
- Adopt a rolling five-year forecast annually; and
- Establish a Rate Fairness Board.

Pursuant to the City and County of San Francisco Charter Section 8B.125, an independent rate study is performed at least once every five years. In compliance with City Charter section 8B.125, a rate study was completed in April 2018 and resulted in an approved four-year retail rate increase. The Commission adopted retail rates effective for four fiscal years from July 1, 2018 through June 30, 2022. The SFPUC Rates Schedules and Fees is available at

<https://sfwater.org/modules/showdocument.aspx?documentid=7743>.

Wholesale Customers

The WSA prescribes the rate setting process for the wholesale water rates. The WSA has a 25-year term, beginning on July 1, 2009, with two 5-year extension options. The WSA was amended and restated on December 11, 2018 by the SFPUC. The contract changed the rate basis by which the capital cost recovery is determined from a "utility basis" to a "cash basis," resulting in the repayment of the cost of capital over the life of the debt funding of those assets rather than the life of the asset. The WSA requires the rate be calculated and set annually and include a reconciliation between prior year revenues and expenses. Refer to Note 9 of the notes to financial statements for further discussion on the balancing account of the wholesale customers.

SAN FRANCISCO WATER ENTERPRISE
Management's Discussion and Analysis (Unaudited)
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

The following table is the Enterprise's ten-year average rate adjustments:

Ten-year Average Rate Adjustments		
Effective Date:	Retail	Wholesale ³
July 1, 2012	12.5 ¹	11.4
July 1, 2013	6.5 ¹	(16.4)
July 1, 2014	12.0 ²	19.6
July 1, 2015	12.0 ²	28.0
July 1, 2016	10.0 ²	9.3
July 1, 2017	7.0 ²	-
July 1, 2018	9.0 ⁴	-
July 1, 2019	8.0 ⁴	-
July 1, 2020	7.0 ⁴	-
July 1, 2021	7.0 ⁴	-

¹ Five-year retail rate increases adopted and effective July 1, 2009.

² Four-year retail rate increases adopted and effective July 1, 2014.

³ Wholesale rates adopted annually; no increase for wholesale rates effective July 1, 2017; no increase projected through June 30, 2022 from 10 Year Financial Plan.

⁴ Four-year retail rate increases adopted and effective July 1, 2018.

Request for Information

This report is designed to provide our citizens, customers, investors, and creditors with an overview of the Enterprise's finances and to demonstrate the Enterprise's accountability for the money it receives. Questions regarding any of the information provided in this report or requests for additional financial information should be addressed to San Francisco Public Utilities Commission, Chief Financial Officer, 525 Golden Gate Avenue, 13th Floor, San Francisco, CA 94102. This report is available at <https://www.sfwater.org/index.aspx?page=347>.

SAN FRANCISCO WATER ENTERPRISE
Statements of Net Position
June 30, 2019 and 2018
(In thousands)

	2019	2018
Assets		
Current assets:		
Cash and investments with City Treasury	\$ 405,558	358,768
Cash and investments outside City Treasury	254	274
Receivables:		
Charges for services (net of allowance for doubtful accounts of \$1,733 as of June 30, 2019 and \$2,211 as of June 30, 2018)	55,151	53,835
Due from other City departments	640	294
Due from other governments	111	325
Interest	2,644	1,289
Restricted interest and other receivable (net of allowance for doubtful accounts of \$5 as of June 30, 2019 and \$51 as of June 30, 2018)	3,795	4,491
Total current receivables	62,341	60,234
Prepaid charges, advances, and other receivables, current portion	2,309	1,435
Inventory	5,426	5,561
Restricted cash and investments outside City Treasury	122,512	143,739
Total current assets	598,400	570,011
Non-current assets:		
Restricted cash and investments with City Treasury	2,224	102,011
Restricted interest and other receivable (net of allowance for doubtful accounts of \$9 as of June 30, 2019 and \$0 as of June 30, 2018)	3	—
Charges for services, less current portion (net of allowance for doubtful accounts of \$662 as of June 30, 2019 and \$0 as of June 30, 2018)	189	791
Capital assets, not being depreciated and amortized	493,314	1,430,759
Capital assets, net of accumulated depreciation and amortization	4,895,344	3,832,474
Prepaid charges, advances, and other receivables, less current portion	3,647	3,471
Total non-current assets	5,394,721	5,369,506
Total assets	5,993,121	5,939,517
Deferred outflows of resources		
Unamortized loss on refunding of debt	139,061	150,255
Pensions	55,465	62,062
Other post-employment benefits	13,142	9,122
Total deferred outflows of resources	207,668	221,439
Liabilities		
Current liabilities:		
Accounts payable	12,624	15,554
Accrued payroll	6,943	6,660
Accrued vacation and sick leave, current portion	5,706	6,125
Accrued workers' compensation, current portion	1,949	2,024
Due to other City departments	—	96
Damage claims liability, current portion	3,872	4,656
Unearned revenues, refunds, and other	20,095	17,395
Bond and loan interest payable	38,288	38,769
Revenue bonds, current portion	98,870	71,665
Capital appreciation bonds, current portion	2,029	5,000
Certificates of participation, current portion	2,688	2,556
Commercial paper	161,336	40,312
Wholesale balancing account, current portion	10,859	415
Current liabilities payable from restricted assets	31,915	45,882
Total current liabilities	397,174	257,109
Long-term liabilities:		
Other post-employment benefits obligations	150,771	166,336
Net pension liability	175,429	209,003
Accrued vacation and sick leave, less current portion	4,394	4,561
Accrued workers' compensation, less current portion	8,387	8,933
Damage claims liability, less current portion	7,637	8,746
Revenue bonds, less current portion	4,709,678	4,837,376
Capital appreciation bonds, less current portion	—	1,725
Certificates of participation, less current portion	101,704	104,550
Wholesale balancing account, less current portion	53,970	55,451
Pollution remediation obligation	2,194	2,311
Total long-term liabilities	5,214,164	5,398,992
Total liabilities	5,611,338	5,656,101
Deferred inflows of resources		
Related to pensions	33,330	15,063
Other post-employment benefits	13,983	268
Total deferred inflows of resources	47,313	15,331
Net position		
Net investment in capital assets	563,457	504,476
Restricted for debt service	16,193	22,933
Restricted for capital projects	—	32,978
Unrestricted	(37,512)	(70,863)
Total net position	\$ 542,138	489,524

See accompanying notes to financial statements.

SAN FRANCISCO WATER ENTERPRISE
Statements of Revenues, Expenses, and Changes in Net Position
Years ended June 30, 2019 and 2018
(In thousands)

	<u>2019</u>	<u>2018</u>
Operating revenues:		
Charges for services	\$ 509,703	495,138
Rents and concessions	13,010	12,906
Capacity fees	2,368	1,720
Other revenues	17,310	15,875
Total operating revenues	<u>542,391</u>	<u>525,639</u>
Operating expenses:		
Personnel services	111,594	128,295
Contractual services	13,715	14,131
Materials and supplies	13,421	15,936
Depreciation and amortization	120,815	118,751
Services provided by other departments	59,751	56,860
General and administrative and other	37,798	36,174
Total operating expenses	<u>357,094</u>	<u>370,147</u>
Operating income	<u>185,297</u>	<u>155,492</u>
Non-operating revenues (expenses):		
Federal and state grants	200	597
Interest and investment income	15,650	6,448
Interest expenses	(177,998)	(164,001)
Amortization of premium, discount, refunding loss, and issuance costs	17,788	13,540
Net gain from sale of assets	2,277	727
Other non-operating revenues	29,922	37,740
Other non-operating expenses	(1,388)	(1,920)
Net non-operating expenses	<u>(113,549)</u>	<u>(106,869)</u>
Change in net position before transfers	<u>71,748</u>	<u>48,623</u>
Transfers from the City and County of San Francisco	1,200	382
Transfers to the City and County of San Francisco	(20,334)	(31,368)
Net transfers	<u>(19,134)</u>	<u>(30,986)</u>
Change in net position	52,614	17,637
Net position at beginning of year	489,524	501,267
Cumulative effect of accounting change	—	(29,380)
Beginning of year as restated	<u>489,524</u>	<u>471,887</u>
Net position at end of year	<u>\$ 542,138</u>	<u>489,524</u>

See accompanying notes to financial statements.

SAN FRANCISCO WATER ENTERPRISE
Statements of Cash Flows
Years ended June 30, 2019 and 2018
(In thousands)

	<u>2019</u>	<u>2018</u>
Cash flows from operating activities:		
Cash received from customers, including cash deposits	\$ 540,479	525,886
Cash received from tenants for rent	12,837	12,783
Cash paid to employees for services	(124,905)	(121,352)
Cash paid to suppliers for goods and services	(126,412)	(108,216)
Cash paid for judgments and claims	(5,527)	(2,925)
Net cash provided by operating activities	<u>296,472</u>	<u>306,176</u>
Cash flows from non-capital financing activities:		
Cash received from grants	456	422
Cash received from settlements	—	8,308
Cash received from miscellaneous revenues	5,955	5,401
Cash paid for rebates and program incentives	(1,388)	(1,920)
Transfers from the City and County of San Francisco	1,200	382
Transfers to the City and County of San Francisco	(20,334)	(31,368)
Net cash (used in) non-capital financing activities	<u>(14,111)</u>	<u>(18,775)</u>
Cash flows from capital and related financing activities:		
Proceeds from sale of capital assets	2,277	3,231
Proceeds from bond issuance, net of premium, discount, refunding loss, and issuance costs	—	928,694
Proceeds from commercial paper borrowings	121,024	15,664
Principal paid on commercial paper	—	(120,352)
Principal paid on long-term debt	(79,221)	(527,881)
Interest paid on long-term debt	(230,587)	(278,284)
Interest paid on commercial paper	(1,018)	(830)
Issuance cost paid on long-term debt	(4)	(1,405)
Acquisition and construction of capital assets	(208,064)	(257,777)
Federal interest income subsidy from Build America Bonds	23,977	24,042
Net cash (used in) capital and related financing activities	<u>(371,616)</u>	<u>(214,898)</u>
Cash flows from investing activities:		
Interest income received	10,829	5,204
Proceeds from sale of investments outside City Treasury	484,965	485,074
Purchase of investments outside City Treasury	(514,907)	(436,878)
Net cash (used in) provided by investing activities	<u>(19,113)</u>	<u>53,400</u>
(Decrease) increase in cash and cash equivalents	(108,368)	125,903
Cash and cash equivalents:		
Beginning of year	<u>587,604</u>	<u>461,701</u>
End of year	<u>479,236</u>	<u>587,604</u>
Reconciliation of cash and cash equivalents to the statement of net position:		
Cash and investments with City Treasury:		
Unrestricted	405,558	358,768
Restricted	2,224	102,011
Cash and investments outside City Treasury:		
Unrestricted	254	274
Restricted	122,512	143,739
Less: Restricted (with maturity more than 90 days - see table in Note 3)	(49,728)	(19,786)
Less: Unrealized (gain) loss on investments	(1,584)	2,598
Cash and cash equivalents at end of year on statements of cash flows	<u>\$ 479,236</u>	<u>587,604</u>

SAN FRANCISCO WATER ENTERPRISE
Statements of Cash Flows
Years ended June 30, 2019 and 2018
(In thousands)

	<u>2019</u>	<u>2018</u>
Reconciliation of operating income to net cash provided by operating activities:		
Operating income	\$ 185,297	155,492
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation and amortization	120,815	118,751
Provision for uncollectible accounts	147	(37)
Write-off of capital assets and other non-cash items	1,286	910
Changes in operating assets and liabilities:		
Receivables:		
Charges for services	(898)	678
Prepaid charges, advances, and other	(1,021)	(224)
Due from other City departments	(370)	338
Inventory	135	1,875
Accounts payable	(2,930)	8,286
Accrued payroll	283	177
Other post-employment benefits obligations	(5,870)	6,772
Pension obligations	(8,710)	(3,730)
Accrued vacation and sick leave	(586)	(325)
Accrued workers' compensation	(621)	1,868
Due to other City departments	(96)	89
Wholesale balancing account	8,963	12,395
Pollution remediation obligation	(117)	(157)
Damage claims liability	(1,893)	2,664
Unearned revenues, refunds, and other liabilities	2,658	354
Total adjustments	<u>111,175</u>	<u>150,684</u>
Net cash provided by operating activities	<u>\$ 296,472</u>	<u>306,176</u>
Noncash transactions:		
Accrued capital asset costs	\$ 31,915	45,882
Interfund payable	—	96
Unrealized (gain) loss on investments	(1,584)	2,598

See accompanying notes to financial statements.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

(1) Description of Reporting Entity

The San Francisco Water Enterprise (the Enterprise) was established in 1930 under the provisions of the Charter of the City and County of San Francisco (the City). The Enterprise acquired the fully developed, mature water works for San Francisco on March 3, 1930. Since then, the City has operated and maintained the water works as the San Francisco Water Enterprise. The Board of Supervisors of the City has adopted resolutions (the Water Resolutions) providing for the issuance of various water revenue and refunding bond series. The Water Resolutions require the City to keep separate books of records and accounts of the Enterprise. The Enterprise, which consists of a system of reservoirs, storage tanks, water treatment plants, pump stations, and pipelines, is engaged in the distribution of water to San Francisco and certain suburban areas. In fiscal year 2019, the Enterprise sold approximately 67,319 million gallons, i.e., about 185 million gallons per day of water, to approximately 2.7 million people within San Francisco and certain suburban areas.

The San Francisco Public Utilities Commission (the Commission), established in 1932, is responsible for providing operational oversight of the public utility enterprises of the City, which include the Enterprise along with the City's power and sewer utilities (i.e., Hetch Hetchy Water and Power and CleanPowerSF, of which the Power Enterprise is a component, and the San Francisco Wastewater Enterprise). The Commission is responsible for determining such matters as the rates and charges for services, approval of contracts, and organizational policy.

Until August 1, 2008, the Commission consisted of five members, all appointed by the Mayor. Proposition E, a City Charter amendment approved by the voters in the June 3, 2008 election, terminated the terms of all five existing members of the Commission, changed the process for appointing new members, and set qualifications for all members. Under the amended Charter, the Mayor continues to nominate candidates to the Commission, but nominees do not take office until the Board of Supervisors votes to approve their appointments by a majority (at least six members). The amended Charter provides for staggered four-year terms for the Commission members and requires them to meet the following qualifications:

- Seat 1 must have experience in environmental policy and an understanding of environmental justice issues.
- Seat 2 must have experience in ratepayer or consumer advocacy.
- Seat 3 must have experience in project finance.
- Seat 4 must have expertise in water systems, power systems, or public utility management.
- Seat 5 is an at-large member.

The SFPUC is a department of the City, and as such, the financial operations of the Enterprise, Hetch Hetchy Water and Power and CleanPowerSF, and the Wastewater Enterprises are included in the Comprehensive Annual Financial Report of the City as enterprise funds. These financial statements are intended to present only the financial position, and the changes in financial position and cash flows of only that portion of the City that is attributable to the transactions of the Enterprise. They do not purport to, and do not, present fairly the financial position of the City as of June 30, 2019 and 2018, the changes in its financial position, or, where applicable, the cash flows for the years then ended, in conformity with U.S. generally accepted accounting principles (GAAP).

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

(2) Significant Accounting Policies

(a) Basis of Accounting and Measurement Focus

The accounts of the Enterprise are organized on the basis of a proprietary fund type and are included as an enterprise fund of the City. The activities of this Enterprise are accounted for with a separate set of self-balancing accounts that comprise the Enterprise's assets, deferred outflows, liabilities, deferred inflows, net position, revenues, and expenses. Enterprise funds account for activities (i) that are financed with debt that is secured solely by a pledge of the net revenues from fees and charges of the activity; or (ii) that are required by laws or regulations that the activity's costs of providing services, including capital costs (such as depreciation or debt service), be recovered with fees and charges, rather than with taxes or similar revenues; or (iii) that the pricing policies of the activity establish fees and charges designed to recover its costs, including capital costs (such as depreciation or debt service).

The financial activities of the Enterprise are accounted for on a flow of economic resources measurement focus, using the accrual basis of accounting in accordance with U.S. GAAP. Under this method, all assets and liabilities associated with its operations are included on the statement of net position; revenues are recognized when earned, and expenses are recognized when liabilities are incurred. Operating revenues are defined as charges to customers, rental income, and capacity fees.

The Enterprise applies all applicable Governmental Accounting Standards Board (GASB) pronouncements.

(b) Cash and Cash Equivalents

The Enterprise considers its pooled cash and investments held with the City Treasury to be demand deposits and, therefore, cash and cash equivalents for financial reporting. The City Treasury also holds non-pooled cash and investments for the Enterprise. Non-pooled restricted deposits and investments held outside the City Treasury with original maturities of three months or less are also considered to be cash equivalents.

(c) Investments

Money market funds are carried at cost, which approximates fair value. All other investments are stated at fair value based on quoted market prices. Changes in fair value are recognized as investment gains or losses and are recorded as a component of non-operating revenues.

(d) Inventory

Inventory consists primarily of construction materials and maintenance supplies and is valued at average cost. Inventory is expensed as it is consumed.

(e) Capital Assets

Capital assets are defined as assets with an initial individual cost of more than \$5 and an estimated useful life in excess of one year. Capital assets with an original acquisition date prior to July 1, 1977 are recorded in the financial statements at estimated cost, as determined by an independent professional appraisal, or at cost, if known. All subsequent acquisitions have been recorded at cost. All donated capital assets are valued at acquisition value at the time of donation. Depreciation and amortization are computed using the straight-line method over the

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

estimated useful lives of the related assets, which range from 1 to 100 years for equipment and 1 to 200 years for buildings, structures, and improvements. No depreciation or amortization is recorded in the year of acquisition, and depreciation or amortization is recorded in the year of disposal.

(f) Intangible Assets

Under GASB Statement No. 51, *Accounting and Financial Reporting for Intangible Assets*, intangible assets are defined as identifiable, non-financial assets capable of being separated, sold, transferred, or licensed, and include contractual or legal rights. Examples of intangible assets include rights-of-way easements, land use rights, water rights, licenses, and permits. The accounting pronouncement also provides guidance on the capitalization of internally generated intangible assets, such as the development and installation of computer software by or on behalf of the reporting entity.

According to the standard, the Enterprise is required to capitalize intangible assets with a useful life extending beyond one reporting period. The Enterprise has established a capitalization threshold of \$100. GASB Statement No. 51 also requires amortization of intangible assets over the benefit period, except for certain assets having an indefinite useful life. Assets with an indefinite useful life generally provide a benefit that is not constrained by legal or contractual limitations or any other external factor and, therefore, are not amortized (see Note 4).

(g) Construction Work in Progress

The cost of acquisition and construction of major plant and equipment is recorded as construction work in progress. Costs of discontinued construction projects are recorded as an expense in the year in which the decision is made to discontinue such projects.

(h) Capitalization of Interest

A portion of the interest cost incurred on capital projects is capitalized for assets that require a period of time to construct or to otherwise prepare them for their intended use. Such amounts are amortized over the useful lives of the assets (see Note 4).

(i) Bond Discount, Premium, and Issuance Costs

Bond issuance costs related to prepaid insurance costs are capitalized and amortized using the effective interest method. Other bond issuance costs are expensed when incurred. Original issue bond discount or premium is offset against the related debt and is also amortized using the effective interest method.

(j) Accrued Vacation and Sick Leave

Accrued vacation pay, which may be accumulated up to 10 weeks per employee, is charged to expense as earned. Sick leave earned subsequent to December 6, 1978 is non-vesting and may be accumulated up to six months per employee.

(k) Workers' Compensation

The Enterprise is self-insured for workers' compensation claims and accrues the estimated cost of those claims, including the estimated cost of incurred but not reported claims (see Note 12(c)).

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

(l) General Liability

The Enterprise is self-insured for general liability and uninsurable property damage claims. Commercially uninsurable property includes assets that are underground or provide transmission and distribution. Maintained commercial coverage does not cover claims attributed to loss from earthquake, contamination, pollution remediation efforts, and other specific naturally occurring contaminants such as mold. The liability represents an estimate of the cost of all outstanding claims, including adverse loss development and estimated incurred but not reported claims (see Note 12(a)).

(m) Arbitrage Rebate Payable

Certain bonds are subject to arbitrage rebate requirements in accordance with regulations issued by the U.S. Treasury Department. The requirements generally stipulate that earnings from the investment of the tax-exempt bond proceeds that exceed related interest costs on the bonds must be remitted to the federal government on every fifth anniversary of each bond issue. The arbitrage rebate liability was \$0 at June 30, 2019 and 2018.

(n) Refunding of Debt

Gains or losses occurring from refunding of debt prior to maturity are reported as deferred outflows and deferred inflows of resources from refunding of debt. Deferred outflows and deferred inflows of resources are recognized as a component of interest expense using the effective interest method over the remaining life of the old debt or the life of the new debt, whichever is shorter.

(o) Income Taxes

As a department of a government agency, the Enterprise is exempt from both federal income taxes and California state franchise taxes.

(p) Revenue Recognition

Water service charges are based on water usage as determined by the Enterprise. Effective July 2013, the majority of residential and non-residential customers are billed on a monthly basis except for building and contractor customers, which are billed on a bi-monthly basis. Revenues earned but unbilled are accrued as charges for services and reflected as a receivable on the statements of net position. The unbilled amounts for the fiscal years ending June 30, 2019 and 2018 were \$29,032 and \$26,441, respectively.

(q) Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

(r) Accounting and Financial Reporting for Pollution Remediation Obligations

According to GASB Statement No. 49, *Accounting and Financial Reporting for Pollution Remediation Obligations*, a government would have to estimate its expected outlays for

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

pollution remediation if it knows a site is polluted, and any of the following recognition triggers occur:

- Pollution poses an imminent danger to the public or environment and a government has little or no discretion to avoid fixing the problem;
- A government has violated a pollution prevention-related permit or license;
- A regulator has identified (or evidence indicates it will identify) a government as responsible (or potentially responsible) for cleaning up pollution, or for paying all or some of the cost of the cleanup;
- A government is named (or evidence indicates that it will be named) in a lawsuit to compel it to address the pollution; or
- A government begins or legally obligates itself to begin cleanup or post-cleanup activities (limited to amounts the government is legally required to complete).

As a part of ongoing operations, situations may occur requiring the removal of pollution or other hazardous material. These situations typically arise in the process of acquiring an asset, preparing an asset for its intended use, or during the design phase of projects under review by the project managers. Other times, pollution may arise during the implementation and construction of a major or minor capital project. Examples of pollution may include, but are not limited to: asbestos or lead paint removal, leaking of sewage in underground pipes or neighboring areas, chemical spills, removal and disposal of known toxic waste, harmful biological and chemical pollution of water, or contamination of surrounding soils by underground storage tanks (see Note 13(d)).

(s) **Other Post-Employment Benefits**

As prescribed under GASB 75, Accounting and Financial Reporting for Postemployment Benefits Other than Pensions, net OPEB liability, deferred outflows/inflows of resources related to OPEB, and OPEB expense are actuarially determined on a citywide basis. Net OPEB liability is measured as the portion of the present value of projected benefit payments to be provided to current active and inactive employees attributed to those employees' past service, less the amount of the Retiree Healthcare Trust Fund investments measured at fair value.

The provisions of GASB Statement No. 75 are effective for the Enterprise's year ended June 30, 2019 and 2018. While restatement of all prior periods was not practical because the actuarial information was not available, the cumulative effect of applying this Statement is reported as a restatement of beginning net position as of July 1, 2017 as follows:

Record Beginning Net OPEB Liability	\$ (158,939)
Record Beginning Deferred Outflows of Resources - OPEB Items	8,229
Remove Net OPEB Obligation (Change from GASB 45)	121,330
Total Cumulative Effect of Change in Accounting Principle	<u>\$ (29,380)</u>

(t) **New Accounting Standards Adopted in Fiscal Year 2019**

- 1) In November 2016, the GASB issued Statement No. 83, *Certain Asset Retirement Obligations*. GASB Statement No. 83 establishes accounting and financial reporting standards for certain asset retirement obligations (AROs). The new standard is effective for periods beginning after June 15, 2018. The Enterprise adopted the provisions of this Statement, which did not have a significant impact on its financial statements.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

- 2) In March 2018, the GASB issued Statement No. 88, *Certain Disclosures Related to Debt, Including Direct Borrowings and Direct Placements*. GASB Statement No. 88 establishes additional financial statement note disclosure requirements related to debt obligations of governments, including direct borrowings and direct placements. The new standard is effective for periods beginning after June 15, 2018. The Enterprise adopted the provisions of this Statement. Refer to Notes 6 and 7 for details.

(u) GASB Statements Implemented in Fiscal Year 2018

- 1) In June 2015, the GASB issued Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefit Other Than Pension Plans*. GASB Statement No. 75 revises and establishes new accounting and financial reporting requirements for governments that provides their employees with other postemployment benefits other than pensions (OPEB). The new standard is effective for periods beginning after June 15, 2017. The Enterprise adopted the provisions of this Statement. Refer to Note 10(b) for details.
- 2) In March 2016, the GASB issued Statement No. 81, *Irrevocable Split Interest Agreements*. GASB Statement No. 81 establishes accounting and financial reporting standards for irrevocable split interest agreement created through trusts in which a donor irrevocably transfers resources to an intermediary. The new standard is effective for periods beginning after December 15, 2016. The Enterprise adopted the provisions of this Statement, which did not have a significant impact on its financial statements.
- 3) In March 2017, the GASB issued Statement No. 85, *Omnibus 2017*. GASB Statement No. 85 addresses practice issues identified during the implementation and application of certain GASB Statements. The new standard is effective for periods beginning after June 15, 2017. The Enterprise adopted the provisions of this Statement, which did not have a significant impact on its financial statements.
- 4) In May 2017, the GASB issued Statement No. 86, *Certain Debt Extinguishment Issues*. GASB Statement No. 86 improves accounting and financial reporting for in-substance defeasance of debt using existing resources other than proceeds of refunding debt. The new standard is effective for periods beginning after June 15, 2017. The Enterprise adopted the provisions of this Statement, which did not have a significant impact on its financial statements.

(v) Future Implementation of New Accounting Standards

- 1) In January 2017, the GASB issued Statement No. 84, *Fiduciary Activities*. GASB Statement No. 84 establishes criteria for state and local governments to identify fiduciary activities and how those activities should be reported. The new standard is effective for periods beginning after December 15, 2018. The Enterprise will implement the provisions of Statement No. 84 in fiscal year 2020.
- 2) In June 2017, the GASB issued Statement No. 87, *Leases*. GASB Statement No. 87 establishes a single model for lease accounting and requires reporting of certain lease liabilities that currently are not reported. The new standard is effective for periods beginning after December 15, 2019. The Enterprise will implement the provisions of Statement No. 87 in fiscal year 2021.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

- 3) In June 2018, the GASB issued Statement No. 89, *Accounting for Interest Cost Incurred before the End of a Construction Period*. GASB Statement No. 89 establishes accounting requirements for interest cost incurred before the end of a construction period. The new standard is effective for periods beginning after December 15, 2019. The Enterprise will implement the provisions of Statement No. 89 in fiscal year 2021.
- 4) In August 2018, the GASB issued Statement No. 90, *Accounting and Financial Reporting for Majority Equity Interests*. GASB Statement No. 90 provides clarification when a government should report a majority equity interest in a legally separate organization as either a component unit or an investment. The new standard is effective for periods beginning after December 15, 2018. The Enterprise will implement the provisions of Statement No. 90 in fiscal year 2020.
- 5) In May 2019, the GASB issued Statement No. 91, *Conduit Debt Obligations*. GASB Statement No. 91 enhances the compatibility and consistency of conduit debt obligation reporting and reporting of related transactions by State and local government issuers. The new standard is effective for periods beginning after December 15, 2020. The Enterprise will implement the provisions of Statement No. 91 in fiscal year 2022.

(3) Cash, Cash Equivalents, and Investments

The Enterprise's cash, cash equivalents, and investments with the City Treasury are invested in an unrated City pool pursuant to investment policy guidelines established by the City Treasurer. The objectives of the policy guidelines are, in order of priority, preservation of capital, liquidity, and yield. The policy addresses soundness of financial institutions in which the City will deposit funds, types of investment instruments as permitted by the California Government Code, and the percentage of the portfolio that may be invested in certain instruments with longer terms to maturity. The City Treasurer allocates income from the investment of pooled cash at month-end in proportion to the Enterprise's average daily cash balances. The primary objectives of the Enterprise's investment policy are consistent with the City's policy.

Restricted assets are held by an independent trustee outside the City's investment pool. The assets are held for the purpose of paying future interest and principal on the bonds and for eligible capital project expenditures. The current balances as of June 30, 2019 and 2018 were \$122,512 and \$143,739, respectively. The Enterprise held all investments in guaranteed investment contracts, treasury and government obligations, commercial paper, corporate bonds, and notes, as well as money market mutual funds consisting of Treasury and Government Obligations.

Funds held by the trustee established under the 2002 Amended and Restated Indentures agreements are invested in "Permitted Investments," as defined in the agreement, which includes money market funds and investment agreements. The agreement permits investment in money market funds registered under the Federal Investment Company Act of 1940 whose shares are registered under the Federal Securities Act of 1933 and have a rating by S&P of "AAAm-G," "AAAm," or "AAm," and a rating by Moody's of "Aaa," "Aa1," or "Aa2". The credit ratings of the money market funds invested in as of June 30, 2019 were "Aaa-mf" and "P-1" by Moody's, and "AAAm" and "A-1+" by S&P. The credit ratings of the money market funds invested in as of June 30, 2018 were "Aaa-mf" and "P-1" by Moody's, and "AAAm" and "A-1+" by S&P. Investment agreements must be with a U.S. bank or trust company that have a rating by Moody's and S&P of "A" or higher, or are guaranteed by any entity with a rating of "A" or higher, at the time the agreement is entered.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

The Enterprise categorizes its fair value measurements within the fair value hierarchy established by GAAP. The hierarchy is based on the valuation inputs used to measure fair value of the assets. Level 1 inputs are quoted prices in active markets for identical assets; Level 2 inputs are significant other observable inputs; and Level 3 inputs are significant unobservable inputs. The inputs and techniques used for valuing securities are not necessarily an indication of risk associated with investing in those securities.

The following tables present the restricted and unrestricted cash and investments outside City Treasury as of June 30, 2019 and 2018:

Cash and Investments outside City Treasury								
Investments	Credit Ratings (S&P/Moody's)	June 30, 2019		Investments exempt from fair value	Fair Value Measurements Using			
		Maturities	Fair Value		Quoted prices in active markets for identical assets		Significant other observable inputs	Unobservable Inputs
					(Level 1)	(Level 2)		
Commercial Paper	A-1/P-1	October 31, 2019	\$ 49,728	49,728	—	—	—	
Commercial Paper	A-1+/P-1	September 10, 2019	352	352	—	—	—	
Commercial Paper	A-1/P-1	July 1, 2019	12,332	12,332	—	—	—	
U.S. Treasury Money Market Funds	AAAm/Aaa-mf	< 90 days	60,061	60,061	—	—	—	
Money Market Funds	A-1+/P-1	< 90 days	38	38	—	—	—	
Cash and Cash Equivalents	N/A		1	1	—	—	—	
Total Restricted Cash and Investments outside City Treasury			\$ 122,512	122,512	—	—	—	
Cash and Cash Equivalents	N/A		254	254	—	—	—	
Total Cash and Investments outside City Treasury			\$ 254	254	—	—	—	

Cash and Investments outside City Treasury								
Investments	Credit Ratings (S&P/Moody's)	June 30, 2018		Investments exempt from fair value	Fair Value Measurements Using			
		Maturities	Fair Value		Quoted prices in active markets for identical assets		Significant other observable inputs	Unobservable Inputs
					(Level 1)	(Level 2)		
U.S. Agencies	AA+/Aaa	March 20, 2020	\$ 7,626	—	—	7,626	—	
Commercial Paper	A-1/P-1	March 8, 2019	12,160	12,160	—	—	—	
Commercial Paper	A-1+/P-1	September 26, 2018	270	270	—	—	—	
Commercial Paper	A-1+/P-1	< 90 days	48,633	48,633	—	—	—	
U.S. Treasury Money Market Funds	AAAm/Aaa-mf	< 90 days	75,019	75,019	—	—	—	
Money Market Funds	A-1+/P-1	< 90 days	31	31	—	—	—	
Total Restricted Cash and Investments outside City Treasury			\$ 143,739	136,113	—	7,626	—	
Cash and Cash Equivalents	N/A		274	274	—	—	—	
Total Cash and Investments outside City Treasury			\$ 274	274	—	—	—	

Commercial paper is valued using a variety of techniques such as matrix pricing; market corroborated pricing inputs such as yield curve, indices, and other market related data. Commercial paper, money market investments, and cash and cash equivalents are exempt from fair value treatment under GASB Statement No. 72.

The restricted cash and investments outside City Treasury as of June 30, 2019 and 2018 included an unrealized gain due to changes in fair value on commercial paper of \$123 and \$418, respectively.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

Additional cash outside of the investment pool included revolving fund and cash in transit. The revolving fund has a balance of \$28 and \$33 at June 30, 2019 and 2018, respectively, which is held in a commercial bank in non-interest bearing checking accounts covered by Federal Deposit Insurance Corporation depository insurance. These accounts were established as provided by the City's Administrative Code for revolving fund needs. The cash in transit was \$226 and \$241 at June 30, 2019 and 2018, respectively.

The Enterprise's cash, cash equivalents, and investments are shown on the accompanying statements of net position as follows:

	2019	2018
Current assets:		
Cash and investments with City Treasury	\$ 405,558	358,768
Cash and investments outside City Treasury	254	274
Restricted cash and investments outside City Treasury	122,512	143,739
Non-current assets:		
Restricted cash and investments with City Treasury	2,224	102,011
Total cash, cash equivalents, and investments	\$ 530,548	604,792

The following table shows the percentage distribution of the City's pooled investments by maturity:

Fiscal years ended June 30	Investment maturities (in months)			
	Under 1	1 to less than 6	6 to less than 12	12 to 60
2019	17.4%	22.2%	16.3%	44.1%
2018	14.3%	22.1%	18.5%	45.1%

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

(4) Capital Assets

Capital assets with a useful life of 50 years or greater include buildings and structures, reservoirs, dams, treatment plants, pump stations, certain water mains and pipelines, sewer systems, tunnels, and bridges.

Capital assets as of June 30, 2019 and 2018 consist of the following:

	<u>2018</u>	<u>Increases</u>	<u>Decreases</u>	<u>2019</u>
Capital assets not being depreciated and amortized:				
Land	\$ 30,029	—	—	30,029
Intangible assets	679	—	—	679
Construction work in progress	1,400,051	243,607	(1,181,052) *	462,606
Total capital assets not being depreciated and amortized	<u>1,430,759</u>	<u>243,607</u>	<u>(1,181,052)</u>	<u>493,314</u>
Capital assets being depreciated and amortized:				
Facilities and improvements	4,929,069	1,159,465	—	6,088,534
Intangible assets	22,457	666	—	23,123
Machinery and equipment	288,037	23,557	(440)	311,154
Total capital assets being depreciated and amortized	<u>5,239,563</u>	<u>1,183,688</u>	<u>(440)</u>	<u>6,422,811</u>
Less accumulated depreciation and amortization for:				
Facilities and improvements	(1,190,341)	(106,715)	—	(1,297,056)
Intangible assets	(15,815)	(2,171)	—	(17,986)
Machinery and equipment	(200,933)	(11,929)	437	(212,425)
Total accumulated depreciation and amortization	<u>(1,407,089)</u>	<u>(120,815)</u>	<u>437</u>	<u>(1,527,467)</u>
Total capital assets being depreciated and amortized, net	<u>3,832,474</u>	<u>1,062,873</u>	<u>(3)</u>	<u>4,895,344</u>
Total capital assets, net	<u>\$ 5,263,233</u>	<u>1,306,480</u>	<u>(1,181,055)</u>	<u>5,388,658</u>

* Decrease in construction work in progress includes \$1,286 in capital project write-offs, mainly related to Bay Division Pipeline Upgrade, and Local Water Conveyance/Distribution projects.

	<u>2017</u>	<u>Increases</u>	<u>Decreases</u>	<u>2018</u>
Capital assets not being depreciated and amortized:				
Land	\$ 26,777	5,756 *	(2,504)	30,029
Intangible assets	679	—	—	679
Construction work in progress	1,195,840	328,435	(124,224) *	1,400,051
Total capital assets not being depreciated and amortized	<u>1,223,296</u>	<u>334,191</u>	<u>(126,728)</u>	<u>1,430,759</u>
Capital assets being depreciated and amortized:				
Facilities and improvements	4,819,814	109,255	—	4,929,069
Intangible assets	18,469	3,988	—	22,457
Machinery and equipment	280,866	7,814	(643)	288,037
Total capital assets being depreciated and amortized	<u>5,119,149</u>	<u>121,057</u> *	<u>(643)</u>	<u>5,239,563</u>
Less accumulated depreciation and amortization for:				
Facilities and improvements	(1,085,497)	(104,844)	—	(1,190,341)
Intangible assets	(14,477)	(1,338)	—	(15,815)
Machinery and equipment	(189,007)	(12,569)	643	(200,933)
Total accumulated depreciation and amortization	<u>(1,288,981)</u>	<u>(118,751)</u>	<u>643</u>	<u>(1,407,089)</u>
Total capital assets being depreciated and amortized, net	<u>3,830,168</u>	<u>2,306</u>	<u>—</u>	<u>3,832,474</u>
Total capital assets, net	<u>\$ 5,053,464</u>	<u>336,497</u>	<u>(126,728)</u>	<u>5,263,233</u>

* Decrease in construction work in progress includes \$910 in capital project write-offs, mainly related to San Francisco Groundwater, San Joaquin Water System Improvement, and Sunol Valley Water System Improvement projects.

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

GASB Statement No. 62, *Codification of Accounting and Financial Reporting Guidance Contained in Pre-November 30, 1989 Financial Accounting Standards Board (FASB) and American Institute of Certified Public Accountants (AICPA) Pronouncements*, requires that interest expense incurred during construction of assets be capitalized. Interest included in the construction work in progress and total interest expense incurred during the years ended June 30, 2019 and 2018 are as follows:

	<u>2019</u>	<u>2018</u>
Interest expensed	\$ 177,998	164,001
Interest included in construction work in progress	53,431	59,855
Total interest incurred	<u>\$ 231,429</u>	<u>223,856</u>

(5) Restricted Assets

Pursuant to the Indentures, all revenues of the Enterprise (except amounts on deposit in the rebate fund) are irrevocably pledged to the punctual payment of debt service on the Water Revenue and Refunding Bonds. Accordingly, the revenues of the Enterprise shall not be used for any other purpose while any of its Water Revenue and Refunding Bonds are outstanding, except as expressly permitted by the Indentures. Further, all revenues shall be deposited by the City Treasurer, by instruction of the Enterprise, in special funds designated as the Water Enterprise Revenue Fund (the Water Revenue Fund), which must be maintained in the City Treasury. These funds, held at the City Treasury, are recorded in the statement of net position of the Enterprise as cash and investments. Deposits in the Water Revenue Fund, including earnings thereon, shall be appropriated, transferred, expended, or used for the following purposes pertaining to the financing, maintenance, and operation of the Enterprise in accordance with the following priority:

1. The payment of operation and maintenance expenses for such utility and related facilities;
2. The payment of pension charges and proportionate payments to such compensation and other insurance or outside reserve funds as the Enterprise may establish or the Board of Supervisors may require with respect to employees of the Enterprise;
3. The payment of principal, interest, reserve, sinking fund, and other mandatory funds created to secure Revenue Bonds issued by the Enterprise for the acquisition, construction, or extension of facilities owned, operated, or controlled by the Enterprise;
4. The payment of principal and interest on General Obligation Bonds issued by the City for the Enterprise's purposes;
5. Reconstruction and replacement as determined by the Enterprise or as required by any of the Enterprise's Revenue Bond ordinances duly adopted and approved; and
6. The acquisition of land, real property, or interest in real property for, and the acquisition, construction, enlargement, and improvement of, new and existing buildings, structures, facilities, equipment, appliances, and other property necessary or convenient to the development or improvement of such utility owned, controlled, or operated by the Enterprise; and for any other lawful purpose of the Enterprise, including the transfer of surplus funds pursuant to the Charter.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

In accordance with the Indenture, the bond financing program maintains that certain restricted cash and investment balances be held in trust. Restricted assets held in trust consisted of the following as of June 30, 2019 and 2018:

	<u>2019</u>	<u>2018</u>
Cash and investments with City Treasury:		
Water revenue bond construction fund	\$ 2,224	102,011
Cash and investments outside City Treasury:		
1991A Capital Appreciation Bond	2,576	2,534
2010B Water revenue bond fund	21,464	22,722
2010D Water revenue bond fund	2,900	3,711
2010E Water revenue bond fund	16,684	20,267
2010F Water revenue bond fund	—	1
2010G Water revenue bond fund	22,652	22,216
2011A Water revenue bond fund	1	2
2011B Water revenue bond fund	1,022	1,004
2011C Water revenue bond fund	1,185	1,164
2011D Water revenue bond fund	1,957	1,922
2012A Water revenue bond fund	2,927	2,960
2012B Water revenue bond fund	798	787
2012C1 Water revenue refunding bond fund	1,167	1,152
2012C2 Water revenue refunding bond fund	3,359	3,314
2012D Water revenue refunding bond fund	2,462	2,422
2015A Water revenue refunding bond fund	1	2
2016A Water revenue refunding bond fund	1	3
2016C Water revenue bond fund	—	1
2017A Water revenue bond fund	6,357	12,302
2017B Water revenue bond fund	11,503	18,687
2017C Water revenue bond fund	1,891	5,393
2017D Water revenue refunding bond fund	1	40
2017E Water revenue refunding bond fund	—	10
2017F Water revenue refunding bond fund	—	7
2017G Water revenue refunding bond fund	—	6
2009C Certificates of participation - 525 Golden Gate	1,796	1,745
2009D Certificates of participation - 525 Golden Gate	7,084	6,904
Commercial Paper - Tax Exempt	11	8
Commercial Paper - Taxable	27	23
Habitat reserve endowment fund	12,686	12,430
Total cash and investments outside City Treasury	<u>122,512</u>	<u>143,739</u>
Interest and other receivables:		
Water bond construction fund including capacity fee receivables	<u>3,798</u>	<u>4,491</u>
Total restricted assets	<u>\$ 128,534</u>	<u>250,241</u>

Restricted assets listed above as cash and investments with City Treasury are held in subfund accounts within the Water Revenue Fund of the City Treasury.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

(6) Short-Term Debt

The Commission and the Board of Supervisors have authorized the issuance of up to \$500,000 in commercial paper pursuant to the voter-approved 2002 Proposition E. As of June 30, 2019 and 2018, amounts outstanding under Proposition E were \$161,336 and \$40,312, respectively. Commercial paper interest rates ranged from 0.8% to 2.8%.

With maturities up to 270 days, the Enterprise intends to maintain the program by remarketing the commercial paper upon maturity over the near-to-medium term, at which time outstanding commercial paper will likely be refunded with revenue bonds. This is being done to take advantage of the continued low interest rate environment. If the commercial paper interest rates rise to a level that exceeds these benefits, the Enterprise will refinance the commercial paper with the long-term, fixed-rate debt.

In accordance with GASB Statement No. 88, *Certain Disclosures Related to Debt, Including Direct Borrowing and Direct Placements*, the Enterprise had \$338,664 and \$459,688 in unused authorization as of June 30, 2019 and 2018, respectively. Significant Events of default as specified in the Reimbursement Agreements, or Revolving Credit Agreement include 1) payment defaults 2) material breach of warranty, representation, or other non-remedied breach of covenants as specified in the respective agreements (not cured within applicable grace periods) and 3) bankruptcy and insolvency events, which may result in all outstanding obligations to be immediately due and payable (unless waived by the respective Bank, if applicable); or issuance of a No-Issuance Notice, reduction in credit to outstanding amount plus interest coverage, and/or termination of the respective agreement. As of June 30, 2019, there were no such events describe herein.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

(7) Changes in Long-Term Liabilities

Long-term liability activities for the years ended June 30, 2019 and 2018 are as follows:

	Interest rate	Maturity (Calendar Year)	2018	Additions	Reductions	2019	Due within one year
Revenue Bonds:							
2009A revenue bonds	4.00 % - 5.25 %	2019	\$ 16,885	—	(7,250)	9,635	9,635
2009B revenue bonds	4.00 - 5.00	2019	14,910	—	(5,275)	9,635	9,635
2010A revenue bonds	2.00 - 5.00	2019	3,035	—	(505)	2,530	2,530
2010B revenue bonds (Build America)	4.00 - 6.00	2040	396,190	—	(11,215)	384,975	11,555
2010D revenue refunding bonds	3.00 - 5.00	2021	63,735	—	(15,965)	47,770	16,780
2010E revenue bonds (Build America)	4.90 - 6.00	2040	344,200	—	—	344,200	—
2010F revenue bonds	3.00 - 5.50	2021	27,100	—	(3,125)	23,975	5,175
2010G revenue bonds (Build America)	6.95	2050	351,470	—	—	351,470	—
2011A revenue bonds	4.25 - 5.00	2041	322,480	—	—	322,480	—
2011B revenue bonds	3.50 - 5.00	2041	18,315	—	(445)	17,870	700
2011C revenue bonds	3.00 - 5.00	2041	19,475	—	—	19,475	760
2011D revenue refunding bonds	4.00 - 5.00	2028	19,135	—	—	19,135	—
2012A revenue bonds	4.00 - 5.00	2043	459,455	—	—	459,455	—
2012B revenue bonds	4.00 - 5.00	2043	16,520	—	—	16,520	—
2012C1 revenue refunding bonds	4.00	2031	8,465	—	—	8,465	—
2012C2 revenue refunding bonds	4.00 - 5.00	2032	69,570	—	—	69,570	—
2012D revenue refunding bonds	1.75 - 5.00	2019	24,040	—	(11,825)	12,215	12,215
2015A revenue refunding bonds	2.00 - 5.00	2036	429,600	—	(3,220)	426,380	14,000
2016A revenue refunding bonds	4.00 - 5.00	2039	763,005	—	—	763,005	—
2016B revenue refunding bonds	1.50 - 5.00	2030	110,880	—	(5,980)	104,900	8,920
2016C revenue bonds	0.87 - 4.19	2046	253,885	—	(5,525)	248,360	5,605
2017A revenue bonds	5.00	2047	121,140	—	—	121,140	—
2017B revenue bonds	5.00	2047	147,725	—	—	147,725	—
2017C revenue bonds	5.00	2047	70,675	—	—	70,675	—
2017D revenue refunding bonds	2.00 - 5.00	2035	350,305	—	(835)	349,470	860
2017E revenue refunding bonds	4.00 - 5.00	2031	48,890	—	—	48,890	—
2017F revenue refunding bonds	5.00	2031	8,705	—	—	8,705	—
2017G revenue refunding bonds	2.03 - 2.91	2024	34,280	—	(500)	33,780	500
Less issuance discount			(166)	—	12	(154)	—
Add issuance premiums			395,137	—	(28,840)	366,297	—
Total revenue bonds payable			4,909,041	—	(100,493)	4,808,548	98,870
1991 capital appreciation bonds	0.00	2019	6,725	304	(5,000)	2,029	2,029
2009C certificates of participation (COPs)	2.00 - 5.00	2022	14,162	—	(2,556)	11,606	2,688
2009C COPs issuance premiums			445	—	(158)	287	—
2009D COPs (Build America)	6.36 - 6.49	2041	92,499	—	—	92,499	—
Other post-employment benefits obligations			166,336	9,125	(24,690)	150,771	—
Net pension liability			209,003	25,430	(59,004)	175,429	—
Accrued vacation and sick leave			10,686	10,372	(10,958)	10,100	5,706
Accrued workers' compensation			10,957	2,707	(3,328)	10,336	1,949
Damage claims liability			13,402	4,768	(6,661)	11,509	3,872
Wholesale balancing account			55,866	8,963	—	64,829	10,859
Pollution remediation obligation			2,311	—	(117)	2,194	—
Total			\$ 5,491,433	61,669	(212,965)	5,340,137	125,973

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

	Interest rate	Maturity (Calendar Year)	2017	Additions	Reductions	2018	Due within one year
Revenue Bonds:							
2009A revenue bonds	4.00 % - 5.25 %	2019	\$ 20,210	—	(3,325)	16,885	7,250
2009B revenue bonds	4.00 - 5.00	2019	19,930	—	(5,020)	14,910	5,275
2010A revenue bonds	2.00 - 5.00	2019	3,515	—	(480)	3,035	505
2010B revenue bonds (Build America)	4.00 - 6.00	2040	407,095	—	(10,905)	396,190	11,215
2010D revenue refunding bonds	3.00 - 5.00	2021	75,200	—	(11,465)	63,735	15,965
2010E revenue bonds (Build America)	4.90 - 6.00	2040	344,200	—	—	344,200	—
2010F revenue bonds	3.00 - 5.50	2021	30,335	—	(3,235)	27,100	3,125
2010G revenue bonds (Build America)	6.95	2050	351,470	—	—	351,470	—
2011A revenue bonds	4.25 - 5.00	2041	602,715	—	(280,235)	322,480	—
2011B revenue bonds	3.50 - 5.00	2041	28,525	—	(10,210)	18,315	445
2011C revenue bonds	3.00 - 5.00	2041	30,140	—	(10,665)	19,475	—
2011D revenue refunding bonds	4.00 - 5.00	2028	47,165	—	(28,030)	19,135	—
2012A revenue bonds	4.00 - 5.00	2043	591,610	—	(132,155)	459,455	—
2012B revenue bonds	4.00 - 5.00	2043	16,520	—	—	16,520	—
2012C1 revenue refunding bonds	4.00	2031	24,180	—	(15,715)	8,465	—
2012C2 revenue refunding bonds	4.00 - 5.00	2032	69,570	—	—	69,570	—
2012D revenue refunding bonds	1.75 - 5.00	2019	24,040	—	—	24,040	11,825
2015A revenue refunding bonds	2.00 - 5.00	2036	429,600	—	—	429,600	3,220
2016A revenue refunding bonds	4.00 - 5.00	2039	763,005	—	—	763,005	—
2016B revenue refunding bonds	1.50 - 5.00	2030	119,425	—	(8,545)	110,880	5,980
2016C revenue bonds	0.87 - 4.19	2046	259,350	—	(5,465)	253,885	5,525
2017A revenue bonds	5.00	2047	—	121,140	—	121,140	—
2017B revenue bonds	5.00	2047	—	147,725	—	147,725	—
2017C revenue bonds	5.00	2047	—	70,675	—	70,675	—
2017D revenue refunding bonds	2.00 - 5.00	2035	—	350,305	—	350,305	835
2017E revenue refunding bonds	4.00 - 5.00	2031	—	48,890	—	48,890	—
2017F revenue refunding bonds	5.00	2031	—	8,705	—	8,705	—
2017G revenue refunding bonds	2.03 - 2.91	2024	—	34,280	—	34,280	500
Less issuance discount			(181)	—	15	(166)	—
Add issuance premiums			297,348	146,975	(49,186)	395,137	—
Total revenue bonds payable			4,554,967	928,695	(574,621)	4,909,041	71,665
1991 capital appreciation bonds	0.00	2019	6,278	447	—	6,725	5,000
2009C certificates of participation (COPs)	2.00 - 5.00	2022	16,593	—	(2,431)	14,162	2,556
2009C COPs issuance premiums			630	—	(185)	445	—
2009D COPs (Build America)	6.36 - 6.49	2041	92,499	—	—	92,499	—
Other post-employment benefits obligations			121,330	51,778	(6,772)	166,336	—
Net pension liability			259,956	29,430	(80,383)	209,003	—
Accrued vacation and sick leave			11,011	10,202	(10,527)	10,686	6,125
Accrued workers' compensation			9,089	4,382	(2,514)	10,957	2,024
Damage claims liability			10,738	4,151	(1,487)	13,402	4,656
Wholesale balancing account			43,471	12,395	—	55,866	415
Pollution remediation obligation			2,468	—	(157)	2,311	—
Total			\$ 5,129,030	1,041,480	(679,077)	5,491,433	92,441

The payments of principal and interest amounts on various bonds are secured by net revenues of the Enterprise.

(a) Capital Appreciation Bonds

The capital appreciation bonds mature from November 1, 2018 and November 1, 2019. The bonds were insured by Municipal Bond Insurance Association (MBIA) and carried "Aaa" and "AAA" ratings from Moody's and S&P, respectively. In February 2009, the bonds were further reinsured by National Public Finance Guarantees Corp. (NPFGC) and carried "Baa1" and "A"

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

ratings from Moody's and S&P, respectively. On May 29, 2013, the SFPUC transferred \$2,500 to U.S. Bank, trustee of the 1991 Series A San Francisco Water Revenue Bonds (the Bonds), for the purpose of replacing the debt service reserve surety policy that had been satisfying the reserve requirement of the bonds. The surety policy had been provided by NPFGC. With this transfer, the surety policy is effectively terminated. The amount deposited with the U.S. Bank will continue to satisfy the reserve requirement on the bonds. Interest on the capital appreciation bonds is due upon maturity and is recognized as annual interest expense over the life of the bonds using the interest method. The Enterprise has recognized \$2,029 and \$6,725 of unpaid principal and interest on the capital appreciation bonds as of June 30, 2019 and 2018, respectively, and has reported it as capital appreciation bonds in the accompanying statements of net position.

(b) Water Revenue Bonds 2009 Series A

On April 16, 2015, the Enterprise issued \$429,600 of the 2015 Series A revenue bonds for the purpose of refunding \$431,860 of the then outstanding 2006 Series A revenue bonds and \$39,030 of the 2009 Series A revenue bonds. The 2015 bonds bear coupon rates of 2.0% and 5.0% and mature serially from 2018 to 2036. The refunded 2009 Series A bonds carried coupon rates of 5.0% and matured serially between 2023 and 2026. Although the refunding resulted in the recognition of a deferred accounting loss of \$6,168, the economic gain was \$2,559 or 6.6% of the refunded principal. The remaining 2009 Series A bonds not refunded included serial and term bonds with interest rates ranging from 4.0% to 5.3%. The Bonds mature through November 1, 2039.

A portion of the proceeds of the 2015 Series A revenue refunding bonds was deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated April 1, 2015, to refund and legally defease a portion of the outstanding 2009 Series A bonds. This deposit, together with certain other available monies was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities consisting of United States Treasury Securities - SLGS. The principal and interest on monies held by the escrow agent will be sufficient to refund and legally defease the 2009 Series A bonds maturing on November 1, 2023 to and including November 1, 2026.

A portion of the proceeds of the 2016 Series A refunding bonds was deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated October 1, 2016, to refund and legally defease a portion of the outstanding 2009 Series A bonds. This deposit, together with certain other available monies was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities. The principal and interest on monies held by the escrow agent will be sufficient to refund and legally defease bonds maturing November 1, 2020 through and including November 1, 2022 and November 1, 2026 to and including November 1, 2039. As of June 30, 2019 and 2018, the principal amount of 2009 Series A bonds outstanding was \$9,635 and \$16,855, respectively.

(c) Water Revenue Bonds 2009 Series B

During fiscal year 2010, the Enterprise issued revenue bonds, 2009 Series B in the amount of \$412,000. The purpose of the bonds is to provide \$377,778 in new money for WSIP capital projects, with the balance applied to financing costs and a cash-funded debt service reserve. The bonds were rated "AA-" and "A1" from S&P and Moody's, respectively. The bonds include serial and term bonds with interest rates varying from 4.0% to 5.0%. The bonds mature through November 1, 2039. The 2009 Series B bonds have a true interest cost of 4.5%.

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

On February 27, 2013, the Wholesale Water Customers BAWSCA made an early repayment of \$356,139 to the Enterprise. Prepayment proceeds in the amount of \$24,014 were deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated February 27, 2013, to refund and legally defease a portion of the outstanding 2009 Series B bonds. This deposit, together with certain other available monies, was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities consisting of United States Treasury Securities - SLGS. The principal and interest on monies held by the escrow agent will be sufficient to partially defease a portion of the 2009 Series B bonds maturing November 1, 2013 through 2018.

A portion of the proceeds of the 2016 Series A refunding bonds was deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated October 1, 2016, to refund and legally defease a portion of the outstanding 2009 Series B bonds. This deposit, together with certain other available monies was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities. The principal and interest on monies held by the escrow agent will be sufficient to refund and legally defease all of the maturities of the 2009 Series B bonds starting on November 1, 2020 and thereafter. As of June 30, 2019 and 2018, the principal amount of 2009 Series B bonds outstanding was \$9,635 and \$14,910, respectively.

(d) Water Revenue Bonds 2010 Series AB

In fiscal year 2010, the Enterprise issued revenue bonds, 2010 Series ABC in the combined principal amount of \$488,705. The purpose of the bonds is to refund \$14,400 of outstanding 2001 Series A revenue bonds, to provide \$58,748 in proceeds for the Advanced Meter Infrastructure System (AMI) Project and to provide \$364,757 in new money for WSIP capital projects, with the balance applied to financing costs and a cash-funded debt service reserve fund. The bonds were rated "AA-" and "Aa2" from S&P and Moody's, respectively. The bonds included serial and term bonds with interest rates ranging from 2.0% to 6.0%.

The 2010 Series A Bonds in the par amount of \$56,945 were issued as tax-exempt bonds to provide funds for the SFPUC's AMI Project and pay financing costs. The 2010 Series A bonds were issued as serial bonds with coupons ranging from 2.0% to 5.0% and have a final maturity of 2030. The Series A bonds have a true interest cost of 3.8%.

On February 27, 2013, the Wholesale Water Customers BAWSCA made an early repayment of \$356,139 to the Enterprise. Prepayment proceeds in the amount of \$11,681 were deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated February 27, 2013, to refund and legally defease a portion of the outstanding 2010 Series A bonds. This deposit, together with certain other available monies, was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities consisting of United States Treasury Securities - SLGS. The principal and interest on monies held by the escrow agent will be sufficient to partially defease a portion of the 2010 Series A bonds maturing November 1, 2013 through 2018.

A portion of the proceeds of the 2016 Series B refunding bonds was deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated October 1, 2016, to refund and legally defease a portion of the outstanding 2010 Series A bonds. This deposit, together with certain other available monies was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities. The principal and interest on monies held by the escrow agent will be sufficient to redeem all of the maturities of the 2010 Series A

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

bonds starting on November 1, 2020 and thereafter. As of June 30, 2019 and 2018, the principal amount of 2010 Series A bonds outstanding was \$2,530 and \$3,035, respectively.

The 2010 Series B Bonds in the par amount of \$417,720 were issued as taxable Build America Bonds (with Direct Pay Subsidy) to provide \$364,757 in new money for WSIP capital projects and pay financing costs. The 2010 Series B bonds were issued as serial and term bonds with coupons ranging from 4.0% to 6.0% and have a final maturity of 2040. The Series B bonds have a true interest cost (net of federal subsidy) of 3.9%. As of June 30, 2019 and 2018, the principal amount outstanding was \$384,975 and \$396,190, respectively.

(e) Water Revenue Bonds 2010 Series DE

In July 2010, the Enterprise issued revenue bonds 2010 Series DE in the combined principal amount of \$446,925. The purpose of the bonds is to advance refund \$31,570 of outstanding 2002 Series A revenue bonds and to provide \$372,689 in new money for WSIP capital projects, with the balance applied to financing costs and a cash-funded debt service reserve fund. The bonds were rated “AA-” and “Aa2” from S&P and Moody’s, respectively. The bonds included serial and term bonds with interest rates ranging from 3.0% to 6.0%.

The 2010 Series D Bonds in the par amount of \$102,725 were issued as tax-exempt bonds to provide \$72,243 in new money for WSIP capital projects and \$35,080 to advance refund a portion of outstanding 2002 Series A revenue bonds. The Series D bonds were issued as serial bonds with coupons ranging from 3.0% to 5.0% and have a final maturity of 2021. The Series D bonds have a true interest cost of 2.5%.

On February 27, 2013, the Wholesale Water Customers BAWSCA made an early repayment of \$356,139 to the Enterprise. \$12,360 of the repayment proceeds were deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated February 27, 2013, to refund and legally defease a portion of the outstanding 2010 Series D bonds. BAWSCA repayment funds were combined with \$165 from the 2010 Series D Capitalized Interest Account. This deposit, together with certain other available monies, was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities consisting of United States Treasury Securities - SLGS. The principal and interest on monies held by the escrow agent will be sufficient to partially defease a portion of the 2010 Series D bonds maturing November 1, 2015 through 2017. As of June 30, 2019 and 2018, the principal amount of 2010 Series D bonds outstanding was \$47,770 and \$63,735, respectively.

The 2010 Series E Bonds in the par amount of \$344,200 were issued as taxable Build America Bonds (with Direct Pay Subsidy) to provide \$300,446 in new money proceeds for WSIP capital projects. The Series E bonds were issued as serial and term bonds with coupons ranging from 4.9% to 6.0% and have a final maturity of 2040. The Series E bonds have a true interest cost (net of federal subsidy) of 3.8%. As of June 30, 2019 and 2018, the principal amount of 2010 Series E bonds outstanding was \$344,200.

(f) Water Revenue Bonds 2010 Series FG

In December 2010, the Enterprise issued revenue bonds 2010 Series FG in the combined principal amount of \$532,430. The purpose of the bonds is to provide \$437,980 in new money for WSIP capital projects, with the balance applied to financing costs and a cash-funded debt service reserve. The bonds were rated “AA-” and “Aa2” from S&P and Moody’s, respectively. The bonds included serial and term bonds with interest rates ranging from 3.0% to 7.0%.

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

The \$180,960 Series F bonds were issued as tax-exempt bonds to provide \$149,728 in new money for WSIP capital projects. The Series F bonds were issued as serial and term bonds with coupons ranging from 3.0% to 5.5% and have a final maturity of 2030. The Series F bonds have a true interest cost of 4.8%.

On February 27, 2013, the Wholesale Water Customers BAWSCA made an early repayment of \$356,139 to the Enterprise. \$3,646 of the repayment proceeds were deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated February 27, 2013, to refund and legally defease a portion of the outstanding 2010 Series F bonds. BAWSCA repayment funds were combined with \$131 from the 2010 Series F Capitalized Interest Account. This deposit, together with certain other available monies, was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities consisting of United States Treasury Securities - SLGS. The principal and interest on monies held by the escrow agent will be sufficient to partially defease a portion of the 2010 Series F bonds maturing November 1, 2017 and 2018.

A portion of the proceeds of the 2016 Series A refunding bonds was deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated October 1, 2016, to refund and legally defease a portion of the outstanding 2010 Series F bonds. This deposit, together with certain other available monies was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities. The principal and interest on monies held by the escrow agent will be sufficient to refund and legally defease all of the maturities of the 2010 Series F bonds starting on November 1, 2021 and thereafter. As of June 30, 2019 and 2018, the principal amount of 2010 Series F bonds outstanding was \$23,975 and \$27,100 respectively.

The \$351,470 Series G bonds were issued as taxable Build America Bonds (with Direct Pay Subsidy) to provide \$288,252 in new money for WSIP capital projects. The Series G bonds were issued as term bonds with a coupon of 7.0% and have a final maturity of 2050. The Series G bonds have a true interest cost (net of federal subsidy) of 4.5%. As of June 30, 2019 and 2018, the principal amount of 2010 Series G bonds outstanding was \$351,470.

(g) Water Revenue Bonds 2011 Series ABCD

In August 2011, the Enterprise issued revenue bonds, 2011 Series ABCD in the combined principal amount of \$720,750. The purpose of the bonds is to provide new money for WSIP capital projects, to finance Hetch Hetchy Water Improvements, and to finance the Local Water Main Replacement Projects, as well as refund \$56,670 of outstanding 2001 Series A and 2002 Series A revenue bonds, with the balance applied to financing costs and a cash-funded debt service reserve. The bonds were rated "AA-" and "Aa3" from S&P and Moody's, respectively. The bonds included serial and term bonds with interest rates varying from 3.0% to 5.0%.

The \$602,715 Series A bonds were issued as tax-exempt bonds to provide \$525,000 in new money for WSIP capital projects. The Series A bonds were issued as serial and term bonds with coupons ranging from 4.3% to 5.0% and have a final maturity of 2041. The Series A bonds have a true interest cost of 4.6%.

A portion of the proceeds of the 2017 Series D and 2017 Series G refunding bonds was deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated December 1, 2017, to refund and legally defease a portion of the outstanding 2011 Series A bonds. This deposit, together with certain other available monies was held by the

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

escrow agent under the Escrow Agreement and invested in non-callable Federal Securities. The principal and interest on monies held by the escrow agent will be sufficient to redeem the maturities of the 2011 Series A bonds starting on November 1, 2022 and thereafter. As of June 30, 2019 and 2018, the principal amount of 2011 Series A bonds outstanding was \$322,480.

The \$28,975 Series B bonds were issued as tax-exempt bonds to provide \$27,710 to finance improvements to certain up-country water storage and transmission facilities under the jurisdiction of Hetch Hetchy Water and Power and CleanPowerSF. The Series B bonds were issued as serial and term bonds with coupons ranging from 3.5% to 5.0% and have a final maturity of 2041. The Series B bonds have a true interest cost of 4.5%.

On February 27, 2013, the Wholesale Water Customers BAWSCA made an early repayment of \$356,139 to the Enterprise. \$515 of the repayment proceeds were deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated February 27, 2013, to refund and legally defease a portion of the outstanding 2011 Series B bonds. This deposit, together with certain other available monies, was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities consisting of United States Treasury Securities - SLGS. The principal and interest on monies held by the escrow agent will be sufficient to partially defease a portion of the 2011 Series B bonds maturing November 1, 2017 through 2018.

A portion of the proceeds from the 2017 Series F refunding bonds was deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated December 1, 2017, to refund and legally defease a portion of the outstanding 2011 Series B bonds. This deposit, together with certain other available monies was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities. The principal and interest on monies held by the escrow agent will be sufficient to redeem the maturities of the 2011 Series B bonds starting on November 1, 2022 and thereafter. As of June 30, 2019 and 2018, the principal amount of 2011 Series B bonds outstanding was \$17,870 and \$18,315, respectively.

The \$33,595 Series C bonds were issued as tax-exempt bonds to provide \$33,772 to finance certain water main replacement projects within the City. The Series C bonds were issued as serial and term bonds with coupons ranging from 3.0% to 5.0% and have a final maturity of 2041. The Series C bonds have a true interest cost of 4.4%.

On February 27, 2013, the Wholesale Water Customers BAWSCA made an early repayment of \$356,139 to the Enterprise. \$3,824 of the repayment proceeds were deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated February 27, 2013, to refund and legally defease a portion of the outstanding 2011 Series C bonds. This deposit, together with certain other available monies, was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities consisting of United States Treasury Securities - SLGS. The principal and interest on monies held by the escrow agent will be sufficient to partially defease a portion of the 2011 Series C bonds maturing November 1, 2014 through 2018.

A portion of the proceeds of the 2017 Series E refunding bonds was deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated December 1, 2017, to refund and legally defease a portion of the outstanding 2011 Series C bonds. This deposit, together with certain other available monies was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities. The principal and interest on monies held by the escrow agent will be sufficient to redeem the maturities of the 2011 Series C bonds

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

starting on November 1, 2022 and thereafter. As of June 30, 2019 and 2018, the principal amount of 2011 Series C bonds outstanding was \$19,475.

The \$55,465 Series D bonds were issued as tax-exempt bonds to provide \$59,381 to refund, on a current basis, a portion of the 2001 Series A bonds as well as refund, on an advance basis, a portion of the 2002 Series A bonds. The Series D bonds were issued as serial bonds with coupons ranging from 4.0% to 5.0% and have a final maturity of 2028. The Series D bonds have a true interest cost of 3.8%.

A portion of the proceeds of the 2017 Series E refunding bonds was deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated December 1, 2017, to refund and legally defease a portion of the outstanding 2011 Series D bonds. This deposit, together with certain other available monies was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities. The principal and interest on monies held by the escrow agent will be sufficient to redeem the maturities of the 2011 Series D bonds starting on November 1, 2022 and thereafter. As of June 30, 2019 and 2018, the principal amount of 2011 Series D bonds outstanding was \$19,135.

(h) Water Revenue Bonds 2012 Series AB and C (C1 and C2)

In June 2012, the Enterprise issued revenue bonds, 2012 Series ABC in the combined principal amount of \$701,880. The purpose of the bonds was to provide \$530,000 of new money for WSIP capital projects, \$15,750 to reimburse the Enterprise for costs to settle litigation arising out of certain capital projects of benefit to the Enterprise, and to refund \$99,180 of outstanding 2001 Series A and 2002 Series A revenue bonds, with the balance applied to financing costs and a cash-funded debt service reserve. The bonds were rated "AA-" and "Aa3" from S&P and Moody's, respectively. The bonds included serial and term bonds with interest rates varying from 4.0% to 5.0%.

The \$591,610 Series A bonds were issued as tax-exempt bonds to provide \$530,000 in new money for WSIP capital projects. The Series A bonds were issued as serial and term bonds with coupons ranging from 4.0% to 5.0% and have a final maturity of 2043. The Series A bonds have a true interest cost of 4.3%. A portion of the proceeds of the 2017 Series D refunding bonds was deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated December 1, 2017, to refund and legally defease a portion of the outstanding 2012 Series A bonds. This deposit, together with certain other available monies was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities. The principal and interest on monies held by the escrow agent will be sufficient to redeem the maturities of the 2012 Series A bonds starting on November 1, 2031 and thereafter. As of June 30, 2019 and 2018, the principal amount of 2012 Series A bonds outstanding was \$459,455.

The \$16,520 Series B bonds were issued as tax-exempt bonds to reimburse the Enterprise \$15,750 for costs to settle litigation arising out of certain capital projects of benefit to the Enterprise. The Series B bonds were issued as serial and term bonds with coupons ranging from 4.0% to 5.0% and have a final maturity of 2043. The Series B bonds have a true interest cost of 4.1%. As of June 30, 2019 and 2018, the principal amount of 2012 Series B bonds outstanding was \$16,520.

The \$93,750 Series C bonds were issued as tax-exempt bonds to provide \$101,147 to refund, on a current basis, a portion of the 2001 Series A bonds as well as refund, on an advance basis, a portion of the 2002 Series A bonds. The Series C bonds were issued as serial bonds with

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

coupons ranging from 4.0% to 5.0% and have a final maturity of 2032. The Series C bonds have a true interest cost of 3.7%. A portion of the proceeds of the 2017 Series E refunding bonds was deposited with the trustee, acting as escrow agent under the irrevocable Escrow Agreement, dated December 1, 2017, to refund and legally defease a portion of the outstanding 2012 Series C bonds. This deposit, together with certain other available monies was held by the escrow agent under the Escrow Agreement and invested in non-callable Federal Securities. The principal and interest on monies held by the escrow agent will be sufficient to redeem the maturities of the 2012 Series C bonds starting on November 1, 2029 and thereafter. As of June 30, 2019 and 2018, the principal amount of 2012 Series C bonds outstanding was \$78,035.

(i) Water Revenue Refunding Bonds 2012 Series D

In August 2012, the Enterprise issued tax-exempt revenue bonds, 2012 Series D in the amount of \$24,040 for the purpose of refunding the remaining portion of the outstanding 2002 Series B bonds maturing on and after November 1, 2013. The bonds carried “Aa3” and “AA-” ratings from Moody’s and S&P, respectively. The 2012 Series D refunding bonds include serial bonds with interest rates ranging from 1.8% to 5.0% and have a final maturity in 2019. The Series D bonds have a true interest cost of 1.34%. Unamortized 2002 Series B bond issuance costs were \$258 at the date of the refunding. The refunding resulted in the recognition of a deferred accounting loss of \$582, \$108 gross debt service savings over the next seven-year terms, and an economic gain of \$1,397 or 5.8% of the refunded principal. As of June 30, 2019 and 2018, the principal amount of 2012 Series D bonds outstanding was \$12,215 and \$24,040, respectively.

(j) Water Revenue Refunding Bonds 2015 Series A

In April 2015, the Enterprise issued tax-exempt revenue bonds, 2015 Series A in the amount of \$429,600 for the purpose of refunding all the outstanding 2006 Series A bonds maturing on and after November 1, 2015 and portion of the outstanding 2009 Series A bonds maturing on and after November 1, 2023. The bonds carried “Aa3” and “AA-” ratings from Moody’s and S&P, respectively. The 2015 Series A bonds include serial bonds with interest rates varying from 2.0% to 5.0% and have a final maturity in 2036. The Series A bonds have a true interest cost of 3.3%. Unamortized 2006 Series A bond issuance costs were \$1,392, and there were no unamortized bond issuance costs for 2009 Series A bonds at the date of the refunding. The refunding resulted in the recognition of a deferred accounting loss of \$25,365, gross debt service savings of \$28,148 over the next 20 two-year terms, and an economic gain of \$48,561 or 10.3% of refunded principal. As of June 30, 2019 and 2018, the principal amount of 2015 Series A bonds outstanding was \$426,380 and \$429,600.

(k) Water Revenue Refunding Bonds 2016 Series AB

In October 2016, the Enterprise issued tax-exempt revenue bonds, 2016 Series AB in the aggregate amount of \$893,820. The 2016 Series A bonds were issued for the purpose of refunding a portion of the outstanding 2009 Series A bonds maturing on and after November 1, 2020, a portion of the outstanding 2009 Series B bonds maturing on and after November 1, 2020, and a portion of the outstanding 2010 Series F bonds maturing on and after November 1, 2021. The 2016 Series B bonds were issued for the purpose of refunding, on a current basis, all the outstanding 2006 Series B and Series C bonds, and a portion of the outstanding 2010 Series A bonds maturing on and after November 1, 2020, the bonds carried “Aa3” and “AA-” ratings from Moody’s and S&P, respectively. The 2016 Series AB bonds include serial bonds with interest rates varying from 1.5% to 5.0% and have a final maturity in 2039. The Series AB

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

bonds have a true interest cost of 2.9%. Unamortized bond issuance costs at the date of refunding were \$145 for 2006 Series B bonds and \$54 for 2006 Series C bonds. The refunding resulted in the recognition of a deferred accounting loss of \$106,205, gross debt service savings of \$135,966, and an economic gain of \$107,152 or 11.5% of refunded principal. As of June 30, 2019 and 2018, the principal amount of 2016 Series AB bonds outstanding was \$867,905 and \$873,885, respectively.

(l) Water Revenue Bonds 2016 Series C

In December 2016, the Enterprise issued taxable bonds, 2016 Series C in the amount of \$259,350. The bonds were issued as Green Bonds. The purpose of the bonds was to refund all of the outstanding taxable commercial paper notes in the approximate amount of \$237,000, and to provide \$19,975 of new money for WSIP capital projects. The bonds carried "Aa3" and "AA-" ratings from Moody's and S&P, respectively. The 2016 Series C bonds include serial bonds with interest rates varying from 0.9% to 4.0% and have a final maturity in 2046, and two term bonds with 4.0% and 4.2% interest rates and final maturities of 2041 and 2046. The Series C bonds have a true interest cost of 3.9%. As of June 30, 2019 and 2018, the principal amount of 2016 Series C bonds outstanding was \$248,360 and \$253,885, respectively.

(m) Water Revenue Bonds 2017 Series ABC

In December 2017, the Enterprise issued tax-exempt revenue bonds, 2017 ABC in the aggregate amount of \$339,540. The purpose of the 2017 Series ABC Bonds was to refund approximately \$120,500 aggregate principal amount of commercial paper notes and to provide \$230,500 new money for WSIP capital projects, other various capital projects of the Water Enterprise, and capital projects of Hetch Hetchy Water. The bonds carried "Aa3" and "AA-" ratings from Moody's and S&P, respectively. The 2017 Series ABC bonds include serial bonds with coupon rates of 5.0% and have final maturity in 2045, and four term bonds with coupons of 5.0% and final maturities from 2045 to 2047.

The \$121,140 2017 Series A bonds were issued as tax-exempt Green Bonds to refund approximately \$60,265 of commercial paper notes and to provide \$65,500 in new money for WSIP capital projects. The Series A bonds were issued as serial and term bonds with coupons of 5.0% and a final maturity of 2047. The Series A bonds have a true interest cost of 3.8%. As of June 30, 2019 and 2018, the principal amount of 2017 Series A bonds outstanding was \$121,140.

The \$147,725 2017 Series B bonds were issued as tax-exempt bonds to provide \$150,000 in new money for Water Enterprise capital projects (non-WSIP). The Series B bonds were issued as serial and term bonds with coupons of 5.0% and have a final maturity of 2047. The Series B bonds have a true interest cost of 3.8%. As of June 30, 2019 and 2018, the principal amount of 2017 Series B bonds outstanding was \$147,725.

The \$70,675 2017 Series C bonds were issued as tax-exempt bonds to refund approximately \$60,266 of commercial paper notes and to provide \$15,000 in new money for Hetch Hetchy Water capital projects. The Series C bonds were issued as serial bonds and a term bond with coupons of 5.0% and have a final maturity of 2047. The Series C bonds have a true interest cost of 3.8%. As of June 30, 2019 and 2018, the principal amount of 2017 Series C bonds outstanding was \$70,675.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

(n) Water Revenue Refunding Bonds 2017 Series DEFG

In December 2017, the Enterprise issued tax-exempt revenue bonds, 2017 Series DEF, and taxable 2017 Series G refunding bonds in the aggregate amount of \$442,180. The 2017 Series D (WSIP, Green) bonds were issued for the purpose of refunding a portion of the outstanding 2011 Series A (WSIP) bonds maturing on and after November 1, 2022, a portion of the outstanding 2012 Series A bonds maturing on and after November 1, 2031.

The 2017 Series E bonds were issued for the purpose of refunding a portion of the outstanding 2011 Series C bonds maturing on or after November 1, 2022, a portion of the outstanding 2011 Series D bonds maturing on and after November 1, 2022, a portion of 2012 Series C1 bonds maturing on or after November 1, 2029.

The 2017 Series F bonds were issued for the purpose of refunding a portion of the outstanding 2011 Series B bonds maturing on or after November 1, 2022.

The taxable 2017 Series G (WSIP, Green) bonds were issued to refund a portion of the outstanding 2011 Series A bonds maturing on and after November 1, 2022.

The bonds carried "Aa3" and "AA-" ratings from Moody's and S&P, respectively. The 2017 Series DEFG bonds include serial bonds with interest rates varying from 2.0% to 5.0% and have a final maturity in 2035. The Series DEFG bonds have a true interest cost of 2.9%. The refunding resulted in the recognition of a deferred accounting loss of \$34,275, gross debt service savings of \$68,942, and an economic gain of \$51,698 or 10.7% of refunded principal. As of June 30, 2019 and 2018, the principal amount of 2017 Series DEFG bonds outstanding was \$440,845 and \$442,180, respectively.

(o) Clean Water State Revolving Fund (CWSRF) Loan and Grant

In September 2017, the SFPUC entered into an Installment Sale Agreement with the State Water Resources Control Board for a Clean Water State Revolving Fund (CWSRF) Loan and Grant to fund the Enterprise's SF Westside Recycled Water Project. The CWSRF loan is in the amount of \$186,220, which includes \$15,000 of principal forgiveness, or a grant. It will bear an interest rate of 1% for a 30-year term, with loan repayment beginning one year after substantial completion of project construction. The CWSRF loan is secured on a parity lien basis with the Enterprise's outstanding revenue bonds. The principal outstanding as of June 30, 2019 and 2018 was \$0.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

(p) Future Annual Debt Service of Revenue Bonds

The following table presents the future annual debt service relating to the revenue and refunding bonds outstanding as of June 30, 2019. The federal interest subsidy amounts represent 35.0%, excluding sequestration, of the interest for the revenue bond 2010 Series B, E, and G.

	<u>Principal</u>	<u>Interest before subsidy</u>	<u>Federal interest subsidy*</u>	<u>Interest net of subsidy</u>
Fiscal years ending June 30:				
2020	\$ 98,870	220,490	(21,967)	198,523
2021	108,390	215,835	(21,782)	194,053
2022	113,425	210,701	(21,575)	189,126
2023	121,410	205,321	(21,245)	184,076
2024	127,045	199,560	(20,797)	178,763
2025-2029	741,450	895,838	(96,322)	799,516
2030-2034	924,770	686,973	(79,359)	607,614
2035-2039	1,111,740	427,123	(53,263)	373,860
2040-2044	809,430	171,220	(25,476)	145,744
2045-2049	234,830	48,739	(12,313)	36,426
2050-2051	51,045	3,588	(1,182)	2,406
	<u>4,442,405</u>	<u>3,285,388</u>	<u>(375,281)</u>	<u>2,910,107</u>
Less: Current portion	(98,870)			
Less: Unamortized bond discount	(154)			
Add: Unamortized bond premiums	366,297			
Long-term portion as of June 30, 2019	<u>\$ 4,709,678</u>			

* The SFPUC received IRS notice dated July 26, 2019 that the federal interest subsidies on the 2010 Series B bonds, 2010 Series E bonds, and 2010 Series G bonds are reduced by 5.9%, or a total reduction of \$23,530, due to sequestration over the remaining life of the bonds assuming the sequestration rate will remain the same.

As defined in the Indentures, the principal and interest of the Enterprise's revenue and refunding bonds are payable from its revenues, as well as monies deposited in certain funds and accounts pledged thereto (See Note 5).

(q) Proposition A

On November 5, 2002, the San Francisco voters passed Proposition A, which provides for the issuance of revenue bonds and/or other forms of indebtedness by the Commission in a principal amount not to exceed \$1,628,000 to finance the acquisition and construction of improvements to the City's Water System. As of June 30, 2019, there was no commercial paper outstanding pursuant to this authorization and \$1,348,335 of bonds had been issued in fiscal years 2006, 2010, and 2012; and in September 2017, the SFPUC entered into an Installment Sale Agreement with the State Water Resources Control Board for a Clean Water State Revolving Fund (CWSRF) Loan and Grant to fund the Enterprise's SF Westside Recycled Water Project in the amount of \$186,220 (which includes a \$15,000 grant) against Prop A. The total authorization against Prop A was \$1,348,335 as of June 30, 2019.

(r) Proposition E

On November 5, 2002, the San Francisco voters passed Proposition E, which authorizes the Board of Supervisors' approval of the issuance of revenue bonds and/or other forms of indebtedness by the Commission to finance costs for the Commission's capital programs, including WSIP. As of June 30, 2019, the Board of Supervisors has authorized the issuance of

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

\$4,234,873 in revenue bonds with \$3,278,440 issued against this authorization. Additionally, \$161,336 and \$40,312 in commercial paper was outstanding pursuant to this authorization as of June 30, 2019 and 2018, respectively.

(s) Certificates of Participation Issued for the 525 Golden Gate Avenue Headquarters Building

In October 2009, the City issued \$167,670 in certificates of participation to fund the headquarters building of the SFPUC at 525 Golden Gate Avenue. The 2009 Series C were issued for \$38,120 and 2009 Series D for \$129,550 as “Build America Bonds” on a taxable basis under the 2009 American Recovery and Reinvestment Act. The 2009 Series C certificates carry interest rates ranging from 2.0% to 5.0% and mature on November 1, 2022. The 2009 Series D certificates carry interest rates ranging from 6.4% to 6.5% and mature on November 1, 2041, after adjusting for the federal interest subsidy, the true interest cost averages 3.4% and 4.3% for Series C and Series D, respectively.

Under the terms of a memorandum of understanding (MOU) between the City and the SFPUC dated October 1, 2009, the City conveyed the real property to the Trustee, the Bank of New York Mellon Trust Company, N.A., which was replaced by U.S. Bank in March 2014 under a property lease in exchange for the proceeds of the sale of the certificates. The Trustee has leased the property back to the City for the City’s use under a project lease. The City is obligated under the project lease to pay base rental payments and other payments to the Trustee each year during the 32-year term of the project lease. The Commission makes annual base rental payments to the City for the building equal to annual debt service on the certificates. It is anticipated these lease costs will be offset with reductions in costs associated with current office rental expense. There are no events of default stated in the MOU.

Each of the three Enterprises has an ownership interest in the building equal to their projected usage of space as follows: Water (73%), Wastewater (15%), and Power (12%). Similarly, each Enterprise is responsible for a portion of the annual base rental payment based on their ownership percentages less contributed equity. The percentage share of base rental payments for the Enterprises is as follows: Water (71.4%), Wastewater (18.9%), and Power (9.7%).

The future annual debt services relating to the certificates of participation 2009 Series C and D outstanding as of June 30, 2019 are as follows:

<u>Certificates of Participation 2009 Series C (Tax-Exempt)</u>	<u>Principal</u>	<u>Interest</u>	<u>Total</u>
Fiscal years ending June 30:			
2020	\$ 2,688	513	3,201
2021	2,824	375	3,199
2022	2,970	230	3,200
2023	3,124	78	3,202
	<u>11,606</u>	<u>1,196</u>	<u>12,802</u>
Less: Current portion	(2,688)		
Add: Unamortized bond premiums	287		
Longterm portion as of June 30, 2019	<u>\$ 9,205</u>		

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

<u>Certificates of Participation 2009 Series D (Taxable)</u>	<u>Principal</u>	<u>Interest before subsidy</u>	<u>Federal interest subsidy *</u>	<u>Interest net of subsidy</u>
Fiscal years ending June 30:				
2020	\$ —	5,968	(1,966)	4,002
2021	—	5,968	(1,966)	4,002
2022	—	5,968	(1,966)	4,002
2023	—	5,968	(1,966)	4,002
2024	3,267	5,864	(1,931)	3,933
2025-2029	18,507	25,954	(8,548)	17,406
2030-2034	22,762	19,369	(6,379)	12,990
2035-2039	28,071	11,157	(3,674)	7,483
2040-2042	19,892	1,972	(649)	1,323
Total		<u>88,188</u>	<u>(29,045)</u>	<u>59,143</u>
Long-term portion as of June 30, 2019	\$ <u>92,499</u>			

* The SFPUC received IRS notice dated July 26, 2019 that the federal interest subsidy on the 2009 Series D bonds is reduced by 5.9%, or a total reduction of \$1,821, due to sequestration over the remaining life of the bonds assuming the sequestration rate will remain the same.

(t) Events of Default and Remedies

In accordance with GASB Statement No. 88, *Certain Disclosures Related to Debt, Including Direct Borrowing and Direct Placements*. Significant Events of default as specified in the Water Enterprise Indenture (applicable to Water Revenue Bonds, Capital Appreciation Bonds and SRF Loan) include 1) Non-payment 2) material breach of warranty, representation or indenture covenants (not cured within applicable grace periods) and 3) bankruptcy and insolvency events, which may result in the Trustee (upon written request by the majority of the owners (by aggregate amount of the bond obligations or of a credit provider), declaring the principal and the interest accrued thereon, and of all Capital Appreciation bonds then outstanding, in the amount of the Accreted Value thereof, to be due and payable immediately. As of June 30, 2019, there were no such events describe herein.

(8) Revenue Pledge

The Enterprise has pledged future revenues to repay various revenue bonds. Proceeds from the revenue bonds provided financing for various capital construction projects, and to refund previously issued bonds. The bonds are payable solely from revenues of the Enterprise through the fiscal year ending 2051.

The original amount of revenue bonds issued, total principal and interest remaining, principal and interest paid during fiscal years 2019 and 2018, applicable net revenues and funds available for debt service are as follows:

	<u>2019</u>	<u>2018</u>
Bonds issued with revenue pledge	\$ 4,746,890	4,760,930
Principal and interest remaining due at the end of the year	7,727,793	8,023,429
Principal and interest paid during the year	261,638	233,959
Net revenues for the year ended June 30	311,619	312,831
Funds available for debt service	532,981	499,583

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

(9) Wholesale Balancing Account

Water Supply Agreement

From 1984-2009, the Enterprise provided water service pursuant to the terms of the 1984 Water Settlement Agreement and Master Water Sales Contract, which established the basis for water rates to be charged to those customers (Wholesale Customers). The Master Water Sales Contract expired on June 30, 2009. The Commission and the Wholesale Customers approved a Water Supply Agreement (WSA) effective July 1, 2009 (the contract was restated and amended by the SFPUC on December 11, 2018). The WSA has a 25-year term from July 1, 2009 with two options for five-year extensions. The existing 184 million gallons per day (mgd) Supply Assurance continues under the WSA and no increase in the Supply Assurance will be considered before December 31, 2028. During the period from 2009 to 2028, the WSA limits the quantity of water delivered to Retail Customers and Wholesale Customers from the watersheds to 265 mgd. Under the WSA, annual operating expenses, including debt service on bonds sold to finance regional system improvements and regional capital projects funded from revenues, will be allocated between Retail Customers and Wholesale Customers on the basis of proportionate annual water use. The original WSA stated the Wholesale Customers' share of net book value of existing regional assets as of June 30, 2009 would be recovered on level annual payment over the 25-year term of the WSA at an interest rate of 5.13%. The 25-year term repayment obligation was settled in February 2013. The Wholesale Customers made an early repayment to the Enterprise of the outstanding balance of \$356,139 as discussed further in the "BAWSCA Early Repayment" Section Note 9(b), of this report. The WSA continues much of the rate setting, accounting, and dispute resolution provisions contained in the expired contract, and has emergency and drought-pricing adjustment provisions.

Pursuant to the terms of the WSA, the Enterprise is required to establish water rates applicable to the Wholesale Customers annually. The wholesale water rates are based on an estimate of the level of revenues necessary to recoup the cost of distributing water to the Wholesale Customers in accordance with the methodology outlined in Article V of the WSA (the Wholesale Revenue Requirement (WRR), previously known as the Suburban Revenue Requirement). During fiscal years ending in 2019 and 2018, the WRR, net of adjustments, charged to such wholesale customers was \$253,235 and \$248,085, respectively. Such amounts are subject to final review by the Wholesale Customers, along with a trailing wholesale balancing account compliance audit of the WRR calculation.

Pursuant to Article VII, Section 7.02 of the WSA, the Enterprise is required to re-compute the WRR after the close of each fiscal year based on the actual costs incurred in the delivery of water to the Wholesale Customers. The difference between the wholesale revenues earned during the year and the "actual" WRR is recorded in a separate account (the Balancing Account) and represents the cumulative amount that is either owed to the Wholesale Customers (if the wholesale revenues exceed the WRR) or owed to the City (if the WRR exceeds the wholesale revenues paid). In accordance with Article VI of the WSA, the amount recorded in the Balancing Account shall earn interest at a rate equal to the average rate received by the City during the year on the invested pooled funds of the City Treasury, and shall be taken into consideration in the determination of subsequent wholesale water rates. The Enterprise owed the Wholesale Customers \$64,829 and \$55,866 for the years ended June 30, 2019 and 2018, respectively, an increase of \$8,963. Refer to the compliance audit report for the final balancing account available at <https://www.sfwater.org/index.aspx?page=345>.

In addition to advancing funds to acquire the pre-2009 assets as discussed previously, the Enterprise has also previously appropriated funds, advanced through rates charged to Retail Customers, for construction of capital projects that were not yet placed into service as of June 30, 2009. Wholesale

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

Customers' share of these construction work in progress costs is calculated in accordance with the provisions in the WSA, including a 10-year repayment term and payment of annual principal and interest rate calculated at 4.0% annually. The total obligation of the Wholesale Customers to the Enterprise is estimated at \$9,542, and the level annual payment including principal and interest is approximately \$1,159. The Wholesale Customers made the first annual payment as of June 30, 2015, and will end on June 30, 2024.

(10) Employee Benefits

(a) Pension Plan

The Enterprise participates in a cost-sharing multiple-employer defined benefit pension Plan (the Plan). The Plan is administered by the San Francisco City and County Employees' Retirement System (SFERS). For purposes of measuring the net pension liability, deferred outflows/inflows of resources related to pensions, pension expense, information about the fiduciary net position of the SFERS plans, and additions to/deductions from the Plan's fiduciary net position have been determined on the same basis as they are reported by Cheiron, the consulting actuary for the Plan. Benefit payments (including refunds of employee contributions) are recognized when currently due and payable in accordance with the benefit terms. Investments are reported at fair value.

GASB Statement No. 68 requires that the reported results must pertain to liability and asset information within certain defined timeframes. For this report, the following timeframes are used:

San Francisco Employees' Retirement System - Cost Sharing

Fiscal year 2019	
Valuation Date (VD)	June 30, 2017 updated to June 30, 2018
Measurement Date (MD)	June 30, 2018
Measurement Period (MP)	July 1, 2017 to June 30, 2018
Fiscal year 2018	
Valuation Date (VD)	June 30, 2016 updated to June 30, 2017
Measurement Date (MD)	June 30, 2017
Measurement Period (MP)	July 1, 2016 to June 30, 2017

The City is an employer of the Plan with a proportionate share of 94.10% as of June 30, 2018 (measurement date), and 94.07% as of June 30, 2017 (measurement date). The Enterprise's allocation percentage was determined based on the Enterprise's employer contributions divided by the City's total employer contributions for fiscal years 2018 and 2017. The Enterprise's net pension liability, deferred outflows/inflows of resources related to pensions, amortization of deferred outflows/inflows, and pension expense is based on its allocated percentage. The Enterprise's allocation of the City's proportionate share was 4.35% as of June 30, 2018, and 4.45% as of June 30, 2017 (measurement dates).

Plan Description – The Plan provides basic service retirement, disability, and death benefits based on specified percentages of defined final average monthly salary and provides annual cost of living adjustments (COLAs) after retirement. The Plan also provides pension continuation benefits to qualified survivors. The San Francisco City and County Charter and the Administrative Code are the authorities which establish and amend the benefit provisions and employer obligations of the Plan. The Retirement System issues a publicly available financial

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

report that includes financial statements and required supplementary information for the Plan. That report may be obtained by writing to the San Francisco City and County Employees' Retirement System, 1145 Market Street, 5th Floor, San Francisco, CA 94103 or by calling (415) 487-7000.

Benefits – The Retirement System provides service retirement, disability and death benefits based on specified percentages of defined final average monthly salary and annual COLAs after retirement. Benefits and refunds are recognized when due and payable in accordance with the terms of the Plan. The Retirement System pays benefits according to the category of employment and the type of benefit coverage provided by the City and County. The four main categories of Plan members are:

- a) Miscellaneous Non-Safety Members – staff, operational, supervisory, and all other eligible employees who are not in special membership categories.
- b) Sheriff's Department and Miscellaneous Safety Members – sheriffs assuming office on and after January 7, 2012, and undersheriffs, deputized personnel of the Sheriff's department, and miscellaneous safety employees hired on and after January 7, 2012.
- c) Firefighter Members – firefighters and other employees whose principal duties are in fire prevention and suppression work or who occupy positions designated by law as firefighter member positions.
- d) Police Members – police officers and other employees whose principal duties are in active law enforcement or who occupy positions designated by law as police member positions.

The membership groups and the related service retirement benefits are included in the Notes to the Basic Financial Statements of San Francisco Employees' Retirement System.

All members are eligible to apply for a disability retirement benefit, regardless of age, when they have 10 or more years of credited service and they sustain an injury or illness that prevents them from performing their duties. Safety members are eligible to apply for an industrial disability retirement benefit from their first day on the job if their disability is caused by an illness or injury that they receive while performing their duties.

All retired members receive a benefit adjustment each July 1, which is the Basic COLA. The majority of adjustments are determined by changes in Consumer Price Index with increases capped at 2%. The Plan provides for a Supplemental COLA in years when there are sufficient "excess" investment earnings in the Plan. The maximum benefit adjustment each July 1 is 3.5% including the Basic COLA. Effective July 1, 2012, voters approved changes in the criteria for payment of the Supplemental COLA benefit, so that Supplemental COLAs would only be paid when the Plan is also fully funded on a market value of assets basis. Certain provisions of this voter-approved proposition were challenged in the Courts. A decision by the California Courts modified the interpretation of the proposition. Effective July 1, 2012, members who retired before November 6, 1996 will receive a Supplemental COLA only when the Plan is also fully funded on a market value of assets basis. However, the "full funding" requirement does not apply to members who retired on or after November 6, 1996 and were hired before January 7, 2012. For all members hired before January 7, 2012, all Supplemental COLAs paid to them in retirement benefits will continue into the future even where an additional Supplemental COLA is not payable in any given year. For members hired on and after January 7, 2012, a Supplemental COLA will only be paid to retirees when the Plan is fully funded on a market value of asset basis and in addition for these members, Supplemental COLAs will not be permanent adjustments to retirement benefits. That is, in years when a Supplemental COLA is not paid, all previously paid Supplemental COLAs will expire.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

Funding and Contribution Policy – Contributions are made to the basic plan by both the City and the participating employees. Employee contributions are mandatory as required by the Charter. Employee contribution rates varied from 7.5% to 13.0% as a percentage of gross covered salary in fiscal years 2019 and 2018. Most employee groups agreed through collective bargaining for employees to contribute the full amount of the employee contributions on a pretax basis. The City is required to contribute at an actuarially determined rate. Based on the July 1, 2017 actuarial report, the required employer contribution rate for fiscal year 2019 was 18.81% to 23.31%. Based on the July 1, 2016 actuarial report, the required employer contribution rate for fiscal year 2018 was 18.96% to 23.46%.

Employer contributions and employee contributions made by the employer to the Plan are recognized when due and the employer has made a formal commitment to provide the contributions. The City's proportionate share of employer contributions recognized by the Retirement System in fiscal year ended June 30, 2018 and 2017 (measurement period) were \$582,568 and \$519,073, respectively. The Enterprise's allocation of employer contributions for fiscal year 2018 and 2017 (measurement period) were \$25,922, and \$24,638, respectively.

Pension Liabilities, Pension Expenses, and Deferred Outflows and Inflows of Resources Related to Pensions

Fiscal Year 2019

The City reported net pension liabilities for its proportionate share of the pension liability of the Plan of \$4,030,207 as of June 30, 2019. The City's net pension liability for the Plan is measured as the proportionate share of the net pension liability. The net pension liability of the Plan is measured as of June 30, 2018 (measurement date), and the total pension liability for the Plan used to calculate the net pension liability was determined by an actuarial valuation as of June 30, 2017 rolled forward to June 30, 2018 using standard update procedures. The City's proportion of the net pension liability was based on a projection of the City's long-term share of contributions to the pension plan relative to the projected contributions of all participating employers, actuarially determined. The Enterprise's allocation of the City's proportionate share of the net pension liability for the Plan as of June 30, 2019 was \$175,429.

For the year ended June 30, 2019, the City's recognized pension expense was \$488,255 including amortization of deferred outflow/inflow related pension items. The Enterprise's allocation of pension expense including amortization of deferred outflow/inflow related pension items was \$17,730. Pension expense decreased from the prior year, largely due to the impact of actual investment earnings.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

As of June 30, 2019, the Enterprise's reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

Fiscal Year 2019 Schedule of Deferred Outflows and Inflows of Resources		
	Deferred Outflows of Resources	Deferred Inflows of Resources
Pension contribution subsequent to measurement date	\$ 26,440	–
Differences between expected and actual experience	1,423	4,965
Changes in assumptions	27,353	–
Net difference between projected and actual earnings on pension plan investments	–	28,198
Change in employer's proportion	249	167
Total	\$ 55,465	33,330

Amounts reported as deferred outflows, exclusive of contributions made after the measurement date, and deferred inflows of resources will be amortized annually and recognized in pension expense as follows:

Fiscal years	Deferred Outflows/(Inflows) of Resources
2020	\$ 11,196
2021	4,923
2022	(14,428)
2023	(5,996)
Total	\$ (4,305)

Fiscal Year 2018

The City reported net pension liabilities for its proportionate share of the pension liability of the Plan of \$4,697,129 as of June 30, 2018. The City's net pension liability for the Plan is measured as the proportionate share of the net pension liability. The net pension liability of the Plan is measured as of June 30, 2017 (measurement date), and the total pension liability for the Plan used to calculate the net pension liability was determined by an actuarial valuation as of June 30, 2016 rolled forward to June 30, 2017 using standard update procedures. The City's proportion of the net pension liability was based on a projection of the City's long-term share of contributions to the pension plan relative to the projected contributions of all participating employers, actuarially determined. The Enterprise's allocation of the City's proportionate share of the net pension liability for the Plan as of June 30, 2018 was \$209,003.

For the year ended June 30, 2018, the City's recognized pension expense was \$732,895, including amortization of deferred outflow/inflow related pension items. The Enterprise's allocation of pension expense including amortization of deferred outflow/inflow related pension items was \$22,240. Pension expense decreased from the prior year, largely due to the impact of actual investment earnings.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

As of June 30, 2018, the Enterprise's reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

Fiscal Year 2018 Schedule of Deferred Outflows and Inflows of Resources		
	Deferred Outflows of Resources	Deferred Inflows of Resources
Pension contribution subsequent to measurement date	\$ 25,922	—
Differences between expected and actual experience	1,939	6,310
Changes in assumptions	33,889	614
Net difference between projected and actual earnings on pension plan investments	—	7,797
Change in employer's proportion	312	342
Total	\$ 62,062	15,063

Amounts reported as deferred outflows, exclusive of contributions made after the measurement date, and deferred inflows of resources will be amortized annually and recognized in pension expense as follows:

Fiscal years	Deferred Outflows/(Inflows) of Resources
2019	\$ 969
2020	17,568
2021	11,157
2022	(8,617)
Total	\$ 21,077

Actuarial Assumptions

Fiscal Year 2019

A summary of the actuarial assumptions and methods used to calculate the Total Pension Liability as of June 30, 2018 (measurement period) is provided below, including any assumptions that differ from those used in the July 1, 2017 actuarial valuation. Refer to the July 1, 2017 actuarial valuation report for a complete description of all other assumptions, which can be found on the Retirement System's website <http://mysfers.org>.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

Key Actuarial Assumptions

Valuation Date	June 30, 2017 updated to June 30, 2018
Measurement Date	June 30, 2018
Actuarial Cost Method	Entry - Age Normal Cost Method
Expected Rate of Return	7.50%
Municipal Bond Yield	3.58% as of June 30, 2017 3.87% as of June 30, 2018 Bond Buyer 20 - Bond GO Index, June 29, 2017 and June 28, 2018
Inflation	3.00%
Salary Increases	3.50% plus merit component based on employee classification and years of service
Discount Rate	7.50% as of June 30, 2017 7.50% as of June 30, 2018
Administrative Expenses	0.60% of payroll as of June 30, 2017 0.60% of payroll as of June 30, 2018

	Old Miscellaneous and All New Plans	Old Police & Fire, pre 7/1/75	Old Police & Fire, Charters A8.595 and A8.596	Old Police & Fire, Charters A8.559 and A8.585
Basic COLA				
June 30, 2017	2.00%	2.70%	3.30%	4.40%
June 30, 2018	2.00%	2.50%	3.10%	4.20%

Mortality rates for active members and healthy annuitants were based upon adjusted Employee and Healthy Annuitant CalPERS mortality tables projected generationally from the 2009 base year using a modified version of the MP-2015 projection scale.

Fiscal Year 2018

A summary of the actuarial assumptions and methods used to calculate the Total Pension Liability as of June 30, 2017 (measurement period) is provided below, including any assumptions that differ from those used in the July 1, 2016 actuarial valuation. Refer to the July 1, 2016 actuarial valuation report for a complete description of all other assumptions, which can be found on the Retirement System's website <http://mysfers.org>.

Key Actuarial Assumptions

Valuation Date	June 30, 2016 updated to June 30, 2017
Measurement Date	June 30, 2017
Actuarial Cost Method	Entry - Age Normal Cost Method
Expected Rate of Return	7.50%
Municipal Bond Yield	2.85% as of June 30, 2016 3.58% as of June 30, 2017 Bond Buyer 20 - Bond GO Index, June 30, 2016 and June 29, 2017
Inflation	3.25%
Salary Increases	3.75% plus merit component based on employee classification and years of service
Discount Rate	7.50% as of June 30, 2016 7.50% as of June 30, 2017
Administrative Expenses	0.60% of payroll as of June 30, 2016 0.60% of payroll as of June 30, 2017

	Old Miscellaneous and All New Plans	Old Police & Fire, pre 7/1/75	Old Police & Fire, Charters A8.595 and A8.596	Old Police & Fire, Charters A8.559 and A8.585
Basic COLA				
June 30, 2016	2.00%	2.70%	3.30%	4.40%
June 30, 2017	2.00%	2.70%	3.30%	4.40%

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

Mortality rates for active members and healthy annuitants were based upon adjusted Employee and Healthy Annuitant CalPERS mortality tables projected generationally from the 2009 base year using a modified version of the MP-2015 projection scale.

Discount Rate

Fiscal Year 2019

The beginning and end of year measurements are based on different assumptions and contribution methods that may result in different discount rates. The discount rate was 7.50% as of June 30, 2018 (measurement date) and 7.50% as of June 30, 2017 (measurement date).

The discount rate used to measure the Total Pension Liability as of June 30, 2018 was 7.50%. The projection of cash flows used to determine the discount rate assumed that plan member contributions will continue to be made at the rates specified in the Charter. Employer contributions were assumed to be made in accordance with the contribution policy in effect for July 1, 2017 actuarial valuation. That policy includes contributions equal to the employer portion of the Entry Age normal costs for members as of the valuation date, a payment for the expected administrative expenses, and an amortization payment on the unfunded actuarial liability.

The amortization payment is based on closed periods that vary in length depending on the source. Charter amendments prior to July 1, 2014 are amortized over 20 years. After July 1, 2014, any Charter changes to active member benefits are amortized over 15 years and changes to inactive member benefits, including Supplemental COLAs, are amortized over 5 years. The remaining unfunded actuarial liability not attributable to Charter amendments as of July 1, 2013 is amortized over a 19-year period commencing July 1, 2014. Experience gains and losses and assumption or method changes on or after July 1, 2014 are amortized over 20 years. For the July 1, 2016 valuation, the increase in the unfunded actuarial liability attributable to the Supplemental COLAs granted on July 1, 2013 and July 1, 2014 are amortized over 17-years and 5-years respectively. All amortization schedules are established as a level percentage of payroll so payments increase 3.50% each year. The unfunded actuarial liability is based on an Actuarial Value of Assets that smooths investment gains and losses over five years and a measurement of the actuarial liability that excludes the value of any future Supplemental COLAs.

While the contributions and measure of Actuarial Liability in the valuation do not anticipate any future Supplemental COLAs, the projected contributions for the determination of the discount rate include the anticipated future amortization payments on future Supplemental COLAs for current members when they are expected to be granted. For members who worked after November 6, 1996 and before Proposition C passed, a Supplemental COLA is granted if the actual investment earnings during the year exceed the expected investment earnings on the Actuarial Value of Assets. For members who did not work after November 6, 1996 and before Proposition C passed, the market value of assets must also exceed the actuarial liability at the beginning of the year for a Supplemental COLA to be granted. When a Supplemental COLA is granted, the amount depends on the amount of excess earnings and the basic COLA amount for each membership group. The large majority of members receive a 1.50% Supplemental COLA when granted.

Because the probability of a Supplemental COLA depends on the current funded level of the System for certain members, Cheiron developed an assumption as of June 30, 2018 for the probability and amount of Supplemental COLA for each future year. We have assumed that a full Supplemental COLA will be paid to all Post 97 Retirees effective July 1, 2018. The table below

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

shows the net assumed Supplemental COLA for members with a 2.00% Basic COLA for sample years.

Assumed Supplemental COLA for Members with a 2.00% Basic COLA

<u>Fiscal years</u>	<u>96 - Prop C</u>	<u>Before 11/6/96 or After Prop C</u>
2019	0.750 %	0.000 %
2022	0.750	0.290
2025	0.750	0.350
2028	0.750	0.360
2031+	0.750	0.380

The projection of benefit payments to current members for determining the discount rate includes the payment of anticipated future Supplemental COLAs.

Based on these assumptions, the System's fiduciary net position was projected to be available to make projected future benefit payments for current members until fiscal year end 2097 when only a portion of the projected benefit payments can be made from the projected fiduciary net position. Projected benefit payments are discounted at the long-term expected return on assets of 7.50% to the extent the fiduciary net position is available to make the payments and at the municipal bond rate of 3.87% to the extent they are not available. The single equivalent rate used to determine the Total Pension Liability as of June 30, 2018 was 7.50%.

The long-term expected rate of return on pension plan investments was 7.50%. It was set by the Retirement Board after consideration of both expected future returns and historical returns experienced by the Retirement System. Expected future returns were determined by using a building-block method in which best-estimate ranges of expected future real rates of return were developed for each major asset class. These ranges were combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Target allocation and best estimates of geometric long-term expected real rates of return (net of pension plan investment expense and inflation) for each major asset class are summarized in the following table.

Long-Term Expected Real Rates of Return		
<u>Asset Class</u>	<u>Target Allocation</u>	<u>Long-Term Expected Real Rate of Return</u>
Global Equity	31.0 %	5.4 %
Private Equity	18.0	6.6
Real Assets	17.0	4.5
Hedge Funds/Absolute Returns	15.0	3.7
Private Credit	10.0	4.6
Treasuries	6.0	0.5
Liquid Credit	3.0	3.3
Total	<u>100.0</u>	

Fiscal Year 2018

The beginning and end of year measurements are based on different assumptions and contribution methods that may result in different discount rates. The discount rate was 7.50% as of June 30, 2017 (measurement date) and 7.50% as of June 30, 2016 (measurement date).

The discount rate used to measure the total pension liability as of June 30, 2017 measurement date was 7.50%. The projection of cash flows used to determine the discount rate assumed that

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

plan member contributions will continue to be made at the rates specified in the Charter. Employer contributions were assumed to be made in accordance with the contribution policy in effect for July 1, 2016 actuarial valuation. That policy includes contributions equal to the employer portion of the Entry Age normal costs for members as of the valuation date, a payment for the expected administrative expenses, and an amortization payment on the unfunded actuarial liability.

The amortization payment is based on closed periods that vary in length depending on the source. Charter amendments prior to July 1, 2014 are amortized over 20 years. After July 1, 2014, any Charter changes to active member benefits are amortized over 15 years and changes to inactive member benefits, including Supplemental COLAs, are amortized over 5 years. The remaining unfunded actuarial liability not attributable to Charter amendments as of July 1, 2013 is amortized over a 19-year period commencing July 1, 2014. Experience gains and losses and assumption or method changes on or after July 1, 2014 are amortized over 20 years. For the July 1, 2016 valuation, the increase in the unfunded actuarial liability attributable to the Supplemental COLAs granted on July 1, 2013 and July 1, 2014 are amortized over 17-years and 5-years respectively. All amortization schedules are established as a level percentage of payroll so payments increase 3.75% each year. The unfunded actuarial liability is based on an actuarial value of assets that smooths investment gains and losses over five years and a measurement of the Actuarial Liability that excludes the value of any future Supplemental COLAs.

While the contributions and measure of Actuarial Liability in the valuation do not anticipate any future Supplemental COLAs, the projected contributions for the determination of the discount rate include the anticipated future amortization payments on future Supplemental COLAs for current members when they are expected to be granted. For members who worked after November 6, 1996 and before Proposition C passed, a Supplemental COLA is granted if the actual investment earnings during the year exceed the expected investment earnings on the Actuarial Value of Assets. For members who did not work after November 6, 1996 and before Proposition C passed, the market value of assets must also exceed the actuarial liability at the beginning of the year for a Supplemental COLA to be granted. When a Supplemental COLA is granted, the amount depends on the amount of excess earnings and the basic COLA amount for each membership group. The large majority of members receive a 1.50% Supplemental COLA when granted.

Because the probability of a Supplemental COLA depends on the current funded level of the System for certain members, Cheiron developed an assumption as of June 30, 2017 measurement date for the probability and amount of Supplemental COLA for each future year. The table below shows the net assumed Supplemental COLA for members with a 2.00% Basic COLA for sample years.

Assumed Supplemental COLA for Members with a 2.00% Basic COLA

<u>Fiscal years</u>	<u>96 - Prop C</u>	<u>Before 11/6/96 or After Prop C</u>
2018	0.750 %	0.000 %
2023	0.750	0.290
2028	0.750	0.350
2033	0.750	0.380
2038+	0.750	0.380

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

The projection of benefit payments to current members for determining the discount rate includes the payment of anticipated future Supplemental COLAs.

Based on these assumptions, the System's fiduciary net position was projected to be available to make projected future benefit payments for current members until fiscal year end 2096 when only a portion of the projected benefit payments can be made from the projected fiduciary net position. Projected benefit payments are discounted at the long-term expected return on assets of 7.50% to the extent the fiduciary net position is available to make the payments and at the municipal bond rate of 3.58% to the extent they are not available. The single equivalent rate used to determine the Total Pension Liability as of the June 30, 2017 measurement date was 7.50%.

The long-term expected rate of return on pension plan investments was 7.50%. It was set by the Retirement Board after consideration of both expected future returns and historical returns experienced by the Retirement System. Expected future returns were determined by using a building-block method in which best-estimate ranges of expected future real rates of return were developed for each major asset class. These ranges were combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Target allocation and best estimates of geometric long-term expected real rates of return (net of pension plan investment expense and inflation) for each major asset class are summarized in the following table.

Long-Term Expected Real Rates of Return			
<u>Asset Class</u>	<u>Target Allocation</u>	<u>Long-Term Expected Real Rate of Return</u>	
Global Equity	40.0 %	5.3 %	
Fixed Income	20.0	1.6	
Private Equity	18.0	6.5	
Real Assets	17.0	4.6	
Hedge Funds/Absolute Returns	5.0	3.6	
Total	<u>100.0</u>		

Sensitivity of Proportionate Share of the Net Pension Liability to Changes in the Discount Rate – The following presents the Enterprise's allocation of the employer's proportionate share of the net pension liability for the Plan, calculated using the discount rate, as well as what the Enterprise's allocation of the employer's proportionate share of the net pension liability would be if it were calculated using a discount rate that is 1% lower or 1% higher than the current rate.

Fiscal Year 2019

<u>Employer</u>	<u>1% Decrease Share of NPL @ 6.50%</u>	<u>Share of NPL @ 7.50%</u>	<u>1% Increase Share of NPL @ 8.50%</u>
Water	\$ 328,561	175,429	48,802

Fiscal Year 2018

<u>Employer</u>	<u>1% Decrease Share of NPL @ 6.50%</u>	<u>Share of NPL @ 7.50%</u>	<u>1% Increase Share of NPL @ 8.50%</u>
Water	\$ 358,055	209,003	85,673

(b) Other Post-Employment Benefits

The Enterprise participates in the City's single employer defined benefit plan (the Plan). The Plan is maintained by the City and is administered through the City's Health Service System. It

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

provides postemployment medical, dental and vision insurance benefits to eligible employees, retired employees, surviving spouses, and domestic partners. Health benefit provisions are established and may be amended through negotiations between the City and the respective bargaining units. The City does not issue a separate report on its other postemployment benefit plan.

GASB Statement No. 75 requires that reported results must pertain to liability and asset information within certain defined timeframes. For this report, the following timeframes are used.

San Francisco Health Service System Retiree Plan

Fiscal year 2019	
Valuation Date (VD)	June 30, 2018
Measurement Date (MD)	June 30, 2018
Measurement Period (MP)	July 1, 2017 to June 30, 2018
Fiscal year 2018	
Valuation Date (VD)	June 30, 2016 updated to June 30, 2017
Measurement Date (MD)	June 30, 2017
Measurement Period (MP)	July 1, 2016 to June 30, 2017

The Enterprise's proportionate share percentage of the Plan was determined based on its percentage of citywide "pay-as-you-go" contributions for the years ended June 30, 2018 and 2017. The Enterprise's net OPEB liability, deferred outflows/inflows of resources related to OPEB, amortization of deferred outflows/inflows and OPEB expense to each department is based on the Enterprise's allocated percentage. The Enterprise's proportionate share of the City's OPEB elements as of June 30, 2018 and 2017 measurement dates were 4.19% and 4.47%, respectively.

Benefits

Permanent full-time and elected employees are eligible to retire and receive postretirement health insurance benefits when they are eligible for retirement benefits from the City and County of San Francisco's Retirement System. The eligibility requirements are as follows:

Normal Retirement	Miscellaneous	Age 50 with 20 years of credited service ¹ Age 60 with 10 years of credited service
	Safety	Age 50 with 5 years of credited service
	Disabled Retirement ²	Any age with 10 years of credited service
Terminated Vested ³		5 years of credited service at separation

¹ Age 53 with 20 years of credited service, age 60 with 10 years of credited service, or age 65 for Miscellaneous members hired on or after January 7, 2012.

² No service requirement for Safety members retiring under the industrial disability benefit or for surviving spouses / domestic partners of those killed in the line of duty.

³ Effective with Proposition B, passed June 3, 2008, participants hired on or after January 10, 2009 must retire within 180 days of separation in order to be eligible for retiree healthcare benefits.

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

Retiree healthcare benefits are administered by the San Francisco Health Service System and include the following :

Medical:	PPO – City Health Plan (self-insured) and UHC Medicare Advantage (fully-insured)
	HMO – Kaiser (fully-insured) and Blue Shield (flex-funded)
Dental:	Delta Dental, DeltaCare USA and UnitedHealthcare Dental
Vision:	Vision benefits are provided under the medical insurance plans and are administered by Vision Service Plan.

Projections of the sharing of benefit related costs are based on an established pattern of practice.

Contributions

Benefits provided under the Plan are currently paid through “pay as you go” funding. Additionally, under the City Charter, active officers and employees of the City who commenced employment on or after January 10, 2009, shall contribute to the Retiree Health Care Trust Fund (Trust Fund) a percentage of compensation not to exceed 2% of pre-tax compensation. The City shall contribute 1% of compensation for officers and employees who commenced employment on or after January 10, 2009 until the City’s GASB Actuary has determined that the City’s portion of the Trust Fund is fully funded. At that time, the City’s 1% contribution shall cease, and officers and employees will each contribute 50% of the maximum 2% of pre-tax compensation.

Starting July 1, 2016, active officers and employees of the City who commenced employment on or before January 9, 2009, shall contribute 0.25% of pre-tax compensation into the Trust Fund. Beginning on July 1st of each subsequent year, the active officers and employees of the City who commenced employment on or before January 9, 2009, shall contribute an additional 0.25% of pre-tax compensation up to a maximum of 1%. Starting July 1, 2016, the City shall contribute 0.25% of compensation into the Trust Fund for each officer and employee who commenced employment on or before January 9, 2009. Beginning on July 1st of each subsequent year, the City shall contribute an additional 0.25% of compensation, up to a maximum of 1% for each officer and employee who commenced employment on or before January 9, 2009. When the City’s GASB Actuary has determined that the City’s portion of the Trust Fund is fully funded, the City’s 1% contribution shall cease, and officers and employees will each contribute 50% of the maximum 1% of pre-tax compensation.

Additional or existing contribution requirements may be established or modified by amendment to the City’s Charter.

For the fiscal years ending June 30, 2019 and 2018, funding was based on “pay-as-you-go” plus a contribution of \$32,786 and \$25,839 to the Retiree Healthcare Trust Fund, respectively. The “pay-as-you-go” portion paid by the City was \$185,839 for a total contribution of \$218,625 for the fiscal year ending June 30, 2019, and \$178,019 for a total contribution of \$203,858 for the fiscal year ending June 30, 2018. The Enterprise’s proportionate share of the City’s contributions for fiscal year 2019 was \$9,154, and for fiscal year 2018 was \$9,122.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

OPEB liabilities, OPEB Expenses and Deferred Outflows/Inflows of Resources Related to OPEB

Fiscal Year 2019

As of June 30, 2019, the City reported net OPEB liabilities related to the Plan of \$3,600,967. The Enterprise's proportionate share of the City's net OPEB liability as of June 30, 2019 was \$150,771.

For the year ended June 30, 2019, the City's recognized OPEB expense was \$320,332. Amortization of the City's deferred inflow is included as a component of pension expense. The Enterprise's proportionate share of the City's OPEB expense was \$3,284.

As of June 30, 2019, the Enterprise reported its proportionate share of the City's deferred outflows/inflows of resources related to OPEB from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Contributions subsequent to measurement date	\$ 9,154	\$ -
Differences between expected and actual experience	-	13,843
Changes in assumptions	3,988	-
Net difference between projected and actual earnings on plan investments	-	140
Total	\$ 13,142	\$ 13,983

Amounts reported as deferred outflows, exclusive of contributions made after the measurement date, and deferred inflows of resources will be amortized annually and recognized in OPEB expense as follow:

Year ended June 30:

2020	\$ (1,693)
2021	(1,693)
2022	(1,693)
2023	(1,629)
2024	(1,643)
Thereafter	(1,644)
Total	\$ (9,995)

Fiscal Year 2018

As of June 30, 2018, the City reported net OPEB liabilities related to the Plan of \$3.7 billion. The Enterprise's proportionate share of the City's net OPEB liability as of June 30, 2018 was \$166,336.

For the year ended June 30, 2018, the City's recognized OPEB expense was \$355,186. Amortization of the City's deferred inflow is included as a component of pension expense. The Enterprise's proportionate share of the City's OPEB expense was \$15,894.

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

As of June 30, 2018, the Enterprise reported its proportionate share of the City's deferred outflows/inflows of resources related to OPEB from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Contributions subsequent to measurement date	\$ 9,122	\$ -
Net difference between projected and actual earnings on plan investments	-	268
Total	\$ 9,122	\$ 268

Amounts reported as deferred outflows, exclusive of contributions made after the measurement date, and deferred inflows of resources will be amortized annually and recognized in OPEB expense as follows:

Year ended June 30:

2019	\$ (67)
2020	(67)
2021	(67)
2022	<u>(67)</u>
Total	\$ (268)

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

Actuarial Assumptions

Fiscal Year 2019

A summary of the actuarial assumptions and methods used to calculate the Total OPEB Liability as of June 30, 2018 (measurement date) is provided below :

Key Actuarial Assumptions

Valuation Date	June 30, 2018
Measurement Date	June 30, 2018
Actuarial Cost Method	The Entry Age Actuarial Cost Method is used to measure the Plan's Total OPEB Liability
Healthcare Cost Trend Rates	Pre-Medicare trend starts at 6.50% and trends down to ultimate rate of 3.93% in 2076 Medicare trend starts at 7.50% and trends down to ultimate rate of 3.93% in 2076 10-County average trend starts at 5.90% and trends down to ultimate rate of 3.93% in 2076 Vision and expenses trend remains flat 3.5% for all years
Expected Rate of Return on Plan Assets	7.40%
Discount Rate	7.40%
Salary Increase Rate	Wage Inflation Component: 3.50% Additional Merit Component (dependent on years of service): Police: 1.50% - 8.00% Fire: 1.50% - 15.00% Muni Drivers: 0.00% - 15.00% Craft: 0.00% - 3.50% Misc: 0.00% - 5.25%
Inflation Rate	Wage Inflation: 3.50% compounded annually Consumer Price Inflation: 2.75% compounded annually
Mortality Tables	Base mortality tables are developed by multiplying a published table by an adjustment factor developed in SFERS experience study for the period ending June 30, 2014.

Non-Annuitant - CalPERS employee mortality tables without scale BB projection

Gender	Adjustment	
	Factor	Base Year
Female	0.918	2009
Male	0.948	2009

Healthy Annuitants - CalPERS healthy annuitant mortality table without scale BB projection

Gender	Adjustment	
	Factor	Base Year
Female	1.014	2009
Male	0.909	2009

Miscellaneous Disable Annuitants - RP-2014 Disabled Retiree Tables without MP-2014 projection

Gender	Adjustment	
	Factor	Base Year
Female	1.066	2006
Male	0.942	2006

Safety Disables Annuitants - CalPERS industrial disability mortality table without scale BB projection

Gender	Adjustment	
	Factor	Base Year
Female	0.983	2009
Male	0.909	2009

The mortality rates in the base tables are projected generationally from the base year using the modified version of the MP-2015 projection scale. The scale was modified using the Society of Actuaries' model implementation tool with rates converging to the ultimate rate in 2017 (instead of 2029) and an ultimate rate of improvement of 0.85% (instead of 1.00%) up to age 85 decreasing to 0.70% (instead of 0.85%) at age 95.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

Fiscal Year 2018

A summary of the actuarial assumptions and methods used to calculate the Total OPEB Liability as of June 30, 2017 (measurement year) is provided below:

Key Actuarial Assumptions

Valuation Date	June 30, 2016 updated to June 30, 2017
Measurement Date	June 30, 2017
Actuarial Cost Method	The Entry Age Actuarial Cost Method is used to measure the Plan's Total OPEB Liability
Healthcare Cost Trend Rates	Pre-Medicare trend starts at 7.25% and trends down to ultimate rate of 4.5% Medicare trend starts at 7.0% and trends down to ultimate rate of 4.5% 10-County average trend starts at 6.0% and trends down to ultimate rate of 4.5%
Expected Rate of Return on Plan Assets	7.50%
Discount Rate	7.50%
Salary Increase Rate	Wage Inflation Component: 3.50% Additional Merit Component (dependent on years of service): Police: 0.00% - 8.00% Fire: 0.00% - 15.00% Muni Drivers: 0.00% - 15.00% Craft: 0.00% - 3.50% Misc: 0.00% - 5.25%
Inflation Rate	Wage Inflation: 3.50% compounded annually Consumer Price Inflation: 3.00% compounded annually
Mortality Tables	Base mortality tables are developed by multiplying a published table by an adjustment factor developed in SFERS experience study for the period ending June 30, 2014.

Non-Annuitant - CalPERS employee mortality tables without scale BB projection

Gender	Adjustment	
	Factor	Base Year
Female	0.918	2009
Male	0.948	2009

Healthy Annuitants - CalPERS healthy annuitant mortality table without scale BB projection

Gender	Adjustment	
	Factor	Base Year
Female	1.014	2009
Male	0.909	2009

Miscellaneous Disable Annuitants - RP-2014 Disabled Retiree Tables without MP-2014 projection

Gender	Adjustment	
	Factor	Base Year
Female	1.066	2006
Male	0.942	2006

Safety Disables Annuitants - CalPERS industrial disability mortality table without scale BB projection

Gender	Adjustment	
	Factor	Base Year
Female	0.983	2009
Male	0.909	2009

Sensitivity of Liabilities to Changes in the Healthcare Cost Trend Rate and Discount Rate

The following presents the Enterprise's proportionate share of the City's net OPEB liability calculated using the healthcare cost trend rate, as well as what the Enterprise's allocation of the

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

City's net OPEB liability would be if it were calculated using a healthcare cost trend rate that is 1% lower or 1% higher than the current rate:

Fiscal Year 2019

Employer	-1.00%	Healthcare Trend	1.00%
Water	\$ 131,045	\$ 150,771	\$ 175,236

Fiscal Year 2018

Employer	-1.00%	Healthcare Trend	1.00%
Water	\$ 145,162	\$ 166,336	\$ 192,510

Discount Rate

Fiscal Year 2019

The discount rate used to measure the Total OPEB Liability as of June 30, 2018 was 7.4%. Based on the assumption that plan member contributions will continue to be made at the rates specified in the Charter, it was determined that the Plan's projected fiduciary net position will be greater than or equal to the benefit payments projected for each future period. As such, the long-term expected rate of return on plan investments was applied to all periods of projected benefit payments to determine the total OPEB liability

The long-term expected rate of return on OPEB plan investments was 7.4% based on expected future returns and historical returns experienced by the Trust Fund. Expected future returns were determined based on 10-year and 20-year capital market assumptions for the Trust Fund's asset allocation. Target allocation for each major asset class are summarized in the following table:

Asset Class	Target Allocation	Long-term Expected Real Rate of Return
Equities		
U.S. Equities	41.0%	7.3%
Developed Market Equity (non-U.S.)	20.0%	7.1%
Emerging Market Equity	16.0%	9.4%
Credit		
High Yield Bonds	3.0%	5.4%
Bank Loans	3.0%	5.0%
Emerging Market Bonds	3.0%	4.9%
Rate Securities		
Treasury Inflation Protected Securities	5.0%	3.3%
Investment Grade Bonds	9.0%	3.6%
Total	<u>100.0%</u>	

The asset allocation targets summarized above have a 20-year return estimate of 7.5%, which was weighted against a 10-year model estimating a 6.3% return, resulting in the ultimate long-term expected rate of return of 7.4%

The following presents the Enterprise's proportionate share of the City's net OPEB liability calculated using the discount rate, as well as what the Enterprise's proportionate share of the

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

City's net OPEB liability would be if it were calculated using a discount rate that is 1% lower or 1% higher than the current rate:

1% Decrease	Discount Rate	1% Increase
6.40%	7.40%	8.40%
\$ 173,339	\$ 150,771	\$ 132,306

Fiscal Year 2018

The discount rate used to measure the Total OPEB Liability as of June 30, 2017 was 7.5%. Based on the assumption that plan member contributions will continue to be made at the rates specified in the Charter, it was determined that the Plan's projected fiduciary net position will be greater than or equal to the benefit payments projected for each future period. As such, the long-term expected rate of return on plan investments was applied to all periods of projected benefit payments to determine the total OPEB liability.

The long-term expected rate of return on OPEB plan investments was 7.5% based on expected future returns and historical returns experienced by the Trust Fund. Expected future returns were determined based on 10-year and 20-year capital market assumptions for the Trust Fund's asset allocation. Target allocation for each major asset class are summarized in the following table:

Asset Class	Target Allocation	20-year Expected Return
U.S. Equities	41.0%	7.3%
Developed Market Equity (non-U.S.)	20.0%	7.1%
Emerging Market Equity	16.0%	9.4%
High Yield Bonds	3.0%	5.4%
Bank Loans	3.0%	5.0%
Emerging Market Bonds	3.0%	5.4%
Treasury Inflation Protected Securities	5.0%	3.3%
Investment Grade Bonds	9.0%	3.6%
Total	100.0%	

The asset allocation targets summarized above have a 20-year return estimate of 7.75%, which was weighted against a 10-year model estimating a 6.59% return, resulting in the ultimate long-term expected rate of return of 7.5%.

The following presents the Enterprise's proportionate share of the City's net OPEB liability calculated using the discount rate, as well as what the Enterprise's proportionate share of the City's net OPEB liability would be if it were calculated using a discount rate that is 1% lower or 1% higher than the current rate:

1% Decrease Share	Share of NOL @	1% Increase Share
of NOL @ 6.50%	7.50%	of NOL @ 8.50%
\$ 190,549	\$ 166,336	\$ 146,479

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

(11) Related Parties

Various common costs incurred by the Commission are allocated among the Enterprise, Hetch Hetchy Water and Power and CleanPowerSF Enterprise, and the Wastewater Enterprise. The allocations are based on the Commission management's best estimate and may change from year to year depending on the activities incurred by each Enterprise and the information available. The administrative costs of \$42,407 or 49.6% and \$42,392 or 50.7% were allocated to the Enterprise for the years ended June 30, 2019 and 2018, respectively.

The City performs certain administrative services such as maintenance of accounting records and investment of cash for all fund groups within the City. The various funds are charged for these services based on the City's indirect cost allocation plan.

The Enterprise purchases water from Hetch Hetchy Water. The amounts, totaling \$33,578 and \$32,600 for the years ended June 30, 2019 and 2018, respectively, have been included in the services provided by other departments in the accompanying financial statements.

The Enterprise purchases electricity from Hetch Hetchy Power at market rates. The amounts, totaling \$9,480 and \$9,047 for the years ended June 30, 2019 and 2018, respectively, have been included in services provided by other departments in the accompanying financial statements.

The Enterprise sold water to the Wastewater Enterprise at retail rates. This amount, totaling \$1,266 and \$1,073 for the years ended June 30, 2019 and 2018, respectively, has been included in charges for services in the accompanying financial statements.

Since fiscal year 2008, the Enterprise has charged City departments for water usage except for fire hydrants, which are used for general public safety. In fiscal years 2019 and 2018, the Enterprise delivered water for fire hydrant purposes totaling \$7 and \$13, respectively, based on metered usage and applicable water rates, and the amount has been excluded from operating revenues in the accompanying financial statements.

A variety of City departments provide services such as engineering, purchasing, legal, data processing, telecommunications, and human resources to the Enterprise and charge amounts designed to recover those departments' costs. These charges, totaling \$16,577 and \$15,213 for the years ended June 30, 2019 and 2018, respectively, have been included in services provided by other departments in the accompanying financial statements.

During the fiscal year ended June 30, 2019, the Enterprise transferred \$20,000 to Hetch Hetchy Water to fund various upcountry capital projects, \$302 to the Arts Commission for arts enrichment funding for the SF Groundwater Supply project, and \$32 to the Office of the City Administrator for the Surety Bond Program. The Enterprise received \$1,200 from the City for low income assistance programs for water rates.

As of June 30, 2019 and 2018, the Enterprise has payables in the amount of \$0 and \$96 to the Department of Public Works for Road Structure Support projects, respectively.

SFPUC's 75-year lease agreement with the San Francisco Recreation and Park Department, for the use of parking spaces for its fleet of vehicles at the Civic Center Garage, commenced on February 1, 2011. The total payment under this agreement is \$6,274, which was fully made as of fiscal year 2015. The expenses and prepayments among the three SFPUC Enterprises are based on 525 Golden Gate occupancy. As of June 30, 2019, the Enterprise's allocable shares of expenses and prepayment were \$46 and \$3,399, respectively; and at June 30, 2018 were \$45 and \$3,445, respectively.

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

(12) Risk Management

The Enterprise's Risk Management program includes both self-insured (i.e., self-retention) and insured exposures at risk. Risk assessments and purchasing of insurance coverage are collaboratively coordinated by SFPUC Risk Management and the City's Office of Risk Management. With certain exceptions, the City and the Enterprise's general approach is to first evaluate the exposure at risk for self-insurance. Based on this analysis, internal mitigation strategies and financing through a self-retention mechanism is generally more economical as the SFPUC in coordination with the City Attorney's Office administers, adjusts, settles, defends, and pays claims from budgeted resources (i.e., pay-as-you-go fund). When economically more viable or when required by debt financing covenants, the Enterprise obtains commercial insurance. At least annually, the City actuarially determines general liability and workers' compensation risk exposures. The Enterprise does not maintain commercial earthquake coverage, with certain minor exceptions, such as a sub-limit for fire-sprinkler leakage due to earthquake under the SFPUC Property Insurance program.

<u>Primary Risks</u>	<u>Typical Coverage Approach</u>
General liability	Self-Insured
Property	Purchased Insurance and Self-Insured
Electronic data processing	Purchased Insurance and Self-Insured
Workers' compensation	Self-Insured through Citywide Pool
<u>Other Risks</u>	<u>Typical Coverage Approach</u>
Surety bonds	Purchased and Contractually Transferred
Errors and omissions	Combination of Self-Insured and Contractual Risk Transfer
Professional liability	Combination of Self-Insured and Contractual Risk Transfer
Public officials liability	Purchased Insurance
Employment practices liability	Purchased Insurance
Builders' risk	Contractually Transferred
Crime	Purchased Insurance

(a) General Liability

Through coordination with the Controller and the City Attorney's Office, the general liability risk exposure is actuarially determined and is addressed through pay-as-you-go funding as part of the budgetary process. Associated costs and estimates are booked as expenses as required under GAAP for financial statement purposes for both the Enterprise and the City and County of San Francisco's Comprehensive Annual Financial Report. The claim expense allocations are determined based on actuarially determined anticipated claim payments and the projected timing of disbursement.

The changes for the general liability (damage claims) for the years ended June 30, 2019 and 2018 are as follows:

<u>Fiscal years</u>	<u>Beginning of year</u>	<u>Claims and changes in estimates</u>	<u>Claims paid</u>	<u>End of year</u>
2019	\$ 13,402	4,768	(6,661)	11,509
2018	10,738	4,151	(1,487)	13,402

(b) Property and Electronic Data Processing

The Enterprise's property risk management approach varies depending on whether the facility is currently under construction, the property is part of revenue-generating operations, the property

SAN FRANCISCO WATER ENTERPRISE

Notes to Financial Statements

June 30, 2019 and 2018

(Dollars in thousands, unless otherwise stated)

is of high value, or is mission-critical in nature. During the course of construction, the Enterprise requires each contractor to provide its own insurance, while ensuring the full scope of work be covered with satisfactory levels to limit the Enterprise's risk exposure. Once construction is complete, the Enterprise performs an assessment to determine whether liability/loss coverage will be obtained through the commercial property policy or self-insurance. The majority of property scheduled in the insurance program is for either: (1) revenue generating facilities, (2) debt financed facilities, (3) mandated coverage to meet statutory requirements for bonding of various public officials, or (4) high-value, mission-critical property or equipment. The Electronic Data Processing policy protects selected high-value electronic property in case of damage or loss.

(c) Workers' Compensation

The City actuarially determines and allocates workers' compensation costs to the Enterprise according to a formula based on the following: (i) the dollar amount of claims; (ii) yearly projections of payments based on historical experience; and (iii) the size of the Enterprise's payroll. The administration of workers' compensation claims and payouts are handled by the Workers' Compensation Division of the City's Department of Human Resources. Statewide workers' compensation reforms have resulted in budgetary savings in recent years. The City continues to develop and implement improved programs, such as return-to-work programs, to lower or mitigate the growth of workers' compensation costs. Programs include accident prevention, investigation, and duty modification for injured employees with medical restrictions so return to work can occur as soon as possible.

The changes in the liabilities for workers' compensation for the years ended June 30, 2019 and 2018 are as follows:

<u>Fiscal years</u>	<u>Beginning of year</u>	<u>Claims and changes in estimates</u>	<u>Claims paid</u>	<u>End of year</u>
2019	\$ 10,957	2,707	(3,328)	10,336
2018	9,089	4,382	(2,514)	10,957

(d) Surety Bonds

Bonds are required in most phases of the public utilities construction contracting process for such phases as bid, performance, and payment or maintenance. Additionally, bonds may be required in other contracts where goods or services are provided to ensure compliance with applicable terms and conditions such as warranty.

(e) Errors and Omissions, Professional Liability

Errors and omissions and professional liability are commonly transferred through contract to the contracted professional, or retained through self-insurance on a case-by-case basis depending on the size, complexity, or scope of construction or professional service contracts. Examples of such contracts are inclusive of services provided by engineers, architects, design professionals, and other licensed or certified professional service providers.

(f) Public Officials Liability, Employment Practices Liability

All Enterprise public officials with financial oversight responsibilities are provided coverage through a commercial Public Officials Liability Policy. An Employment Practices Liability Policy is retained to protect against employment-related claims and liabilities.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

(g) Builders' Risk

Builders' risk policies of insurance are required to be provided by the contractor on all construction projects for the full value of construction.

(h) Crime

The Enterprise also retains a Commercial Crime Policy, in lieu of bonding its employees, to provide coverage against liabilities or losses due to third-party crime or employee fraud.

(13) Commitments and Litigation

(a) Commitments

As of June 30, 2019 and 2018, the Enterprise has outstanding commitments with third parties of \$237,663 and \$290,923, respectively, for various capital projects and other purchase agreements for materials and services.

(b) Grants

Grants that the Enterprise receives are subject to audit and final acceptance by the granting agency. Current and prior year costs of such grants are subject to adjustment upon audit.

(c) Litigation

The Enterprise is a defendant in various legal actions and claims that arise during the normal course of business. The final disposition of those legal actions and claims is not determinable. However, in the opinion of management, the outcome of any litigation of these matters will not have a material effect on the financial position or changes in net position of the Enterprise.

(d) Environmental Issue

As of June 30, 2019 and 2018, the Enterprise recorded \$2,194 and \$2,311 in pollution remediation liability, respectively. This decrease of \$117 in pollution remediation liability in fiscal year 2019 is for expenses relating to the excavation of contaminated soil that contained polycyclic aromatic hydrocarbons from the Pacific Rod & Gun Club site in the Lake Merced area, and remediation activities for the 17th and Folsom site. As of June 30, 2019, the pollution remediation liability of \$2,194 consisted of \$1,291 for the Pacific Rod & Gun Club site, and \$903 for the 17th and Folsom site. As of June 30, 2018, the pollution remediation liability of \$2,311 consisted of \$1,375 for the Pacific Rod & Gun Club site, and \$936 for the 17th and Folsom site.

(14) Subsequent Events

(a) Purchase of Watershed Property in Alameda County

On July 23, 2019, the Commission approved the purchase of 787 acres of agricultural land commonly known as the Wool Ranch in the unincorporated Town of Sunol, Alameda County for \$9,650. Acquisition of watershed lands upstream and downstream of SFPUC reservoirs will protect source water quality and native species and their habitats.

SAN FRANCISCO WATER ENTERPRISE
Notes to Financial Statements
June 30, 2019 and 2018
(Dollars in thousands, unless otherwise stated)

(b) *Water Revenue Bonds Rating Change*

On November 25, 2019, Moody's Investors Services Inc. (Moody's) raised its long-term rating on the Water Revenue Bonds from "Aa3" to "Aa2" with a "stable" outlook.



KPMG LLP
Suite 1400
55 Second Street
San Francisco, CA 94105

Independent Auditors' Report on Internal Control Over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance With *Government Auditing Standards*

The Honorable Mayor and Board of Supervisors
City and County of San Francisco:

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States, the financial statements of San Francisco Water Enterprise (the Enterprise), an enterprise fund of the City and County of San Francisco, California (the City), which comprise the statement of net position as of June 30, 2019, and the related statements of revenues, expenses, and changes in net position, and cash flows for the year then ended, and the related notes to the financial statements, and have issued our report thereon dated December 9, 2019.

Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered the Enterprise's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the Enterprise's internal control. Accordingly, we do not express an opinion on the effectiveness of the Enterprise's internal control.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A material weakness is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A significant deficiency is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether the Enterprise's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.



Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the Enterprise's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Enterprise's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

KPMG LLP

San Francisco, California
December 9, 2019



San Francisco Public Utilities Commission
A Department of the City and County of
San Francisco, California

Our Mission

To provide our customers with high-quality, efficient and reliable water, power and sewer services in a manner that values environmental and community interests and sustains the resources entrusted to our care.

Eleanor Dam

Watershed Keepers testing the outlet valves for Eleanor Dam.

Photo by: Robin Scheswohl

如果您需要中文翻譯, 請致電: (415) 554-3289.

Si necesita una traducción o asistencia en español llame al: (415) 554-3289.

Communications Division
Date of Publication: December 2019

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APPENDIX D

PROPOSED FORM OF OPINION OF BOND COUNSEL

On the delivery date of the 2019 Series ABC Bonds, Norton Rose Fulbright US LLP, San Francisco, California, Bond Counsel, propose to render their final approving opinion in substantially the following form:

[Closing Date]

Public Utilities Commission of the
City and County of San Francisco
San Francisco, California

Board of Supervisors of the
City and County of San Francisco
San Francisco, California

\$656,955,000
Public Utilities Commission
of the City and County of San Francisco
San Francisco Water Revenue Bonds,
2019 Series ABC

\$622,580,000
2019 Sub-Series A Bonds
(Refunding – Federally Taxable) (WSIP)
(Green Bonds)

\$16,450,000
2019 Sub-Series B Bonds
(Refunding – Federally Taxable)
(Hetch Hetchy)

\$17,925,000
2019 Sub-Series C Bonds
(Refunding – Federally Taxable)
(Local Water Main)

Ladies and Gentlemen:

We have acted as bond counsel to the Public Utilities Commission of the City and County of San Francisco (the “Commission”), a commission duly constituted under the Charter (the “Charter”) of the City and County of San Francisco (the “City”), in connection with the issuance of the Commission’s San Francisco Water Revenue Bonds, 2019 Series ABC, in the aggregate principal amount of \$656,955,000, consisting of \$622,580,000 of 2019 Sub-Series A Bonds (Refunding – Federally Taxable) (WSIP) (Green Bonds) (the “2019 Sub-Series A Bonds”), \$16,450,000 of 2019 Sub-Series B Bonds (Refunding – Federally Taxable) (Hetch Hetchy) (the “2019 Sub-Series B Bonds”) and \$17,925,000 of 2019 Sub-Series C Bonds (Refunding – Federally Taxable) (Local Water Main) (the “2019 Sub-Series C Bonds” and together with the 2019 Sub-Series A Bonds and the 2019 Sub-Series B Bonds, the “Bonds”). The 2019 Sub-Series A Bonds are being issued pursuant to authority granted by the Charter of the City, Ordinance No. 143-18, passed by the Board of Supervisors of the City on June 12, 2018, as amended by Ordinance No. 153-19, passed by the Board of Supervisors on June 25, 2019 (collectively, the “Ordinance”), Resolution No. 19-0225, adopted by the Commission on November 26, 2019 (the “Resolution”), and an Amended and Restated Indenture, dated as of August 1, 2002, by and between the Commission and U.S. Bank National Association, as trustee (the “Trustee”), as previously amended and supplemented (the “Original Indenture”), and as further supplemented by a Thirty-Second Supplemental Indenture, dated as of December 1, 2019 (the “Thirty-Second Supplemental Indenture”), by and between the Commission and the Trustee. The 2019 Sub-Series B Bonds are being issued pursuant to authority granted by the Charter of the City, the Ordinance, the Resolution and the Original Indenture, as further supplemented by a Thirty-Third Supplemental Indenture, dated as of December 1, 2019 (the “Thirty-Third Supplemental Indenture”), by and between the Commission and the Trustee. The 2019 Sub-Series C Bonds are being issued pursuant to authority granted by the Charter of the City, the Ordinance, the Resolution and the Original Indenture, as further supplemented by a Thirty-Fourth Supplemental Indenture, dated as of December 1, 2019 (the “Thirty-Fourth Supplemental Indenture” and together with the Original Indenture, the Thirty-Second Supplemental Indenture and the Thirty-Third Supplemental Indenture, the “Indenture”), by and between the Commission and the Trustee.

Capitalized terms not otherwise defined herein shall have the respective meanings ascribed thereto in the Indenture.

In our capacity as bond counsel, we have reviewed the Indenture, certifications of the Commission, the Trustee and others, opinions of counsel to the Commission and the Trustee, and such other documents, opinions and instruments as we have deemed necessary to render the opinions set forth herein. We have assumed, but have not verified, that the signatures on all documents, certificates and opinions that we have reviewed are genuine. In our examination, we have assumed, but have not verified, the legal capacity of all natural persons, the authenticity of all documents submitted to us as originals, the conformity to original documents of all documents submitted to us as certified or photostatic copies or by facsimile or other means of electronic transmission or which we obtained from sites on the internet, and the authenticity of the originals of such latter documents. As to facts and certain other matters and the consequences thereof relevant to the opinions expressed herein and the other statements made herein, we have relied without investigation or verification upon, and have assumed the accuracy and completeness of, certificates and letters (including opinion letters), and oral and written statements and representations of public officials, officers and other representatives of the Commission and the City, counsel for the City and others.

Our services as bond counsel were limited to such examination and to rendering the opinions set forth below. With respect to the opinions expressed herein, we call attention to the fact that the enforceability of the rights and obligations under the Bonds and the Indenture are subject to bankruptcy, insolvency, reorganization, arrangement, moratorium and other similar laws affecting creditors' rights, to the application of equitable principles, to the exercise of judicial discretion in appropriate cases and to the limitations on legal remedies against cities and counties in the State of California. In addition, the imposition of certain fees and charges by the Commission relating to the Enterprise is subject to the provisions of Articles XIII C and XIII D of the California Constitution.

Based upon the foregoing and subject to the limitations and qualifications herein specified, as of the date hereof, we are of the opinion, under existing law, that:

(1) The Bonds have been duly authorized, executed and delivered by, and constitute the valid and binding special limited obligations of, the Commission.

(2) The Indenture has been duly authorized, executed and delivered by, and constitutes the valid and binding obligation of, the Commission. The Indenture creates a valid pledge of the Revenues of the Enterprise and certain other amounts held by the Trustee under the Indenture to secure the payment of the principal of and interest on the Bonds, as and to the extent set forth in the Indenture and subject to the provisions of the Indenture permitting the application thereof for the purposes and on the terms and conditions set forth therein.

(3) The Bonds are special limited obligations of the Commission and are payable exclusively from and are secured by a pledge of the Revenues of the Enterprise and certain amounts held under the Indenture. The general fund of the City is not liable, and the credit or taxing power of the City is not pledged, for the payment of the Bonds or the interest thereon. The Commission has no taxing power. The Bonds are not secured by a legal or equitable pledge of, or charge, lien or encumbrance upon, any of the property of the City or of the Commission or any of its income or receipts, except the Revenues.

(4) Bonds and other parity debt of the Commission have been, and from time to time hereafter may be, issued under the Indenture which are payable from Revenues of the Enterprise on a parity basis with the Bonds.

(5) Interest on the Bonds is exempt from personal income tax imposed by the State of California.

Other than as described herein, we have not addressed, and are not opining on, the tax consequences to any person of the investment in, or of the receipt or accrual of interest on, the Bonds.

The opinions expressed and the statements made herein are based on an analysis of existing laws, regulations, rulings and court decisions. Such opinions and statements may be adversely affected by actions taken or events occurring, including a change in law, regulation or ruling (or in the application or official interpretation of any law, regulation or ruling) after the date hereof. We have not undertaken to determine, or to inform any person,

whether such actions are taken or such events occur, and we have no obligation to update this letter in light of such actions or events or for any other reason.

No opinion is expressed herein on the accuracy, completeness or sufficiency of the Official Statement or other offering material relating to the Bonds.

This opinion is limited to the laws of the State of California and the federal laws of the United States. The opinions in this letter are expressed solely as of the date hereof for your benefit and may not be relied upon in any manner for any purposes by any other person.

Respectfully submitted,

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APPENDIX E

FORM OF CONTINUING DISCLOSURE CERTIFICATE

\$656,955,000

**Public Utilities Commission
of the City and County of San Francisco
San Francisco Water Revenue Bonds,
2019 Series ABC**

\$622,580,000
2019 Sub-Series A Bonds
(Refunding – Federally Taxable)
(WSIP)
(Green Bonds)

\$16,450,000
2019 Sub-Series B Bonds
(Refunding – Federally Taxable)
(Hetch Hetchy)

\$17,925,000
2019 Sub-Series C Bonds
(Refunding – Federally Taxable)
(Local Water Main)

[Closing Date]

This Continuing Disclosure Certificate (the “**Disclosure Certificate**”) is executed and delivered by the Public Utilities Commission of the City and County of San Francisco (the “**SFPUC**”) in connection with the issuance of the water revenue bonds captioned above (the “**2019 Series ABC Bonds**”). The 2019 Series ABC Bonds are being issued pursuant to an Amended and Restated Indenture, dated as of August 1, 2002, between the SFPUC and U.S. Bank National Association, as trustee (the “**Trustee**”), as amended and supplemented, including as amended and supplemented by a Thirty-Second Supplemental Indenture, dated as of December 1, 2019, by and between the SFPUC and the Trustee, a Thirty-Third Supplemental Indenture, dated as of December 1, 2019, by and between the SFPUC and the Trustee, and a Thirty-Fourth Supplemental Indenture, dated as of December 1, 2019, by and between the SFPUC and the Trustee (collectively, the “**Indenture**”).

The SFPUC covenants and agrees as follows:

SECTION 1. Purpose of the Disclosure Certificate. This Disclosure Certificate is being executed and delivered by the SFPUC for the benefit of the Holders and Beneficial Owners of the 2019 Series ABC Bonds and in order to assist the Participating Underwriters in complying with Securities and Exchange Commission (the “**S.E.C.**”) Rule 15c2-12(b)(5).

SECTION 2. Definitions. In addition to the definitions set forth in the Indenture, which apply to any capitalized term used in this Disclosure Certificate unless otherwise defined in this Section 2, the following capitalized terms shall have the following meanings:

“**Annual Report**” shall mean any Annual Report provided by the SFPUC pursuant to, and as described in, Sections 3 and 4 of this Disclosure Certificate.

“**Beneficial Owner**” shall mean any person that: (a) has or shares the power, directly or indirectly, to make investment decisions concerning ownership of any 2019 Series ABC Bonds (including persons holding 2019 Series ABC Bonds through nominees, depositories or other intermediaries) including, but not limited to, the power to vote or consent with respect to any 2019 Series ABC Bonds or to dispose of ownership of any 2019 Series ABC Bonds; or (b) is treated as the owner of any 2019 Series ABC Bonds for federal income tax purposes.

“**Dissemination Agent**” shall mean the SFPUC, acting in its capacity as Dissemination Agent under this Disclosure Certificate, or any successor Dissemination Agent designated in writing by the SFPUC and which has filed with the SFPUC a written acceptance of such designation.

“**Financial Obligation**” means, for purposes of the Listed Events set out in Section 5(a)(10) and Section (5)(b)(8), a (i) debt obligation; (ii) derivative instrument entered into in connection with, or pledged as security or a source of payment for, an existing or planned debt obligation; or (iii) guarantee of (i) or (ii). The term “Financial Obligation” shall not include municipal securities (as defined in the Securities Exchange Act of 1934, as amended)

as to which a final official statement (as defined in the Rule) has been provided to the MSRB consistent with the Rule.

“**Holder**” shall mean either the registered owners of the 2019 Series ABC Bonds, or, if the 2019 Series ABC Bonds are registered in the name of The Depository Trust Company or another recognized depository, any applicable participant in such depository system.

“**Listed Events**” shall mean any of the events listed in Section 5(a) of this Disclosure Certificate.

“**MSRB**” shall mean the Municipal Securities Rulemaking Board or any other entity designated or authorized by the Securities and Exchange Commission to receive continuing disclosure filings pursuant to the Rule. Until otherwise designated by the MSRB or the Securities and Exchange Commission, filings with the MSRB are to be made through the Electronic Municipal Market Access (EMMA) website of the MSRB currently located at <http://emma.msrb.org>.

“**Official Statement**” shall mean the final Official Statement, dated December 12, 2019, prepared in connection with the sale and offering of the 2019 Series ABC Bonds.

“**Participating Underwriters**” shall mean any of the original underwriters or purchasers of the 2019 Series ABC Bonds required to comply with the Rule in connection with the offering of the 2019 Series ABC Bonds.

“**Rule**” shall mean Rule 15c2-12(b)(5) adopted by the S.E.C. under the Securities Exchange Act of 1934, as the same may be amended from time to time.

SECTION 3. Provision of Annual Reports.

(a) The SFPUC shall, or shall cause the Dissemination Agent to, not later than nine months after the end of the SFPUC’s fiscal year (which currently ends June 30), commencing March 31, 2020, with the report for Fiscal Year 2018-19, provide to the MSRB an Annual Report which is consistent with the requirements of Section 4 of this Disclosure Certificate. If the Dissemination Agent is not the SFPUC, the SFPUC shall provide the Annual Report to the Dissemination Agent not later than 15 days prior to said date. The Annual Report must be submitted in electronic format and accompanied by such identifying information as is prescribed by the MSRB, and may cross-reference other information as provided in Section 4 of this Disclosure Certificate. However, if the audited financial statements of the SFPUC are not available by the date required above for the filing of the Annual Report, the SFPUC shall submit unaudited financial statements and submit the audited financial statements as soon as they are available. If the SFPUC’s Fiscal Year changes, it shall give notice of such change in the same manner as for a Listed Event under Section 5(b).

(b) If the SFPUC is unable to provide to the MSRB an Annual Report by the date required in subsection (a), the SFPUC shall send a notice to the MSRB in substantially the form attached as Exhibit A.

(c) The Dissemination Agent shall (if the Dissemination Agent is other than the SFPUC), file a report with the SFPUC certifying the date that the Annual Report was provided to the MSRB pursuant to this Disclosure Certificate.

SECTION 4. Content of Annual Reports. The SFPUC’s Annual Report shall contain or incorporate by reference the following information:

(a) Audited Financial Statements of the municipal water supply, storage and distribution system of the SFPUC for the prior fiscal year, prepared in accordance with generally accepted accounting principles applicable to the SFPUC from time to time. If the SFPUC’s audited financial statements are not available by the date the Annual Report is required to be filed, the Annual Report shall contain unaudited financial statements in a format similar to the financial statements contained in the final Official

Statements, and the audited financial statements shall be filed in the same manner as the Annual Report when they become available;

(b) An update for the prior fiscal year of the table in the Official Statement entitled “TABLE 11, HISTORIC WHOLESALE AND RETAIL WATER SALES”;

(c) An update for the prior fiscal year of the table in the Official Statement entitled “TABLE 18, HISTORICAL PERCENTAGE INCREASES (DECREASES) IN WHOLESALE WATER RATES,” provided that such update need include rate increases (decreases) through the end of the prior fiscal year;

(d) An update for the prior fiscal year of the table in the Official Statement entitled “TABLE 21, HISTORICAL PERCENTAGE INCREASES (DECREASES) IN RETAIL WATER RATES,” provided that such update need include rate increases (decreases) through the end of the prior fiscal year;

(e) An update for the prior fiscal year of the table in the Official Statement in the section entitled “OBLIGATIONS PAYABLE FROM REVENUES – Outstanding Parity Revenue Bonds” showing all bonds of the SFPUC secured by Revenues; and

(f) An update for the prior fiscal year of the table in the Official Statement entitled “TABLE 26, HISTORICAL REVENUES, OPERATING & MAINTENANCE EXPENSES AND DEBT SERVICE COVERAGE.”

Any or all of the items listed above may be set forth in a document or set of documents, or may be included by specific reference to other documents, including official statements of debt issues of the SFPUC or related public entities, which are available to the public on the MSRB website. If the document included by reference is a final official statement, it must be available from the MSRB. The SFPUC shall clearly identify each such other document so included by reference.

SECTION 5. Reporting of Significant Events.

(a) The SFPUC shall give, or cause to be given, notice of the occurrence of any of the following Listed Events with respect to the 2019 Series ABC Bonds:

1. Principal and interest payment delinquencies;
2. Non-payment related defaults, if material;
3. Unscheduled draws on debt service reserves reflecting financial difficulties;
4. Unscheduled draws on credit enhancements reflecting financial difficulties;
5. Substitution of credit or liquidity providers, or their failure to perform;
6. Adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices or determinations with respect to the tax status of the 2019 Series ABC Bonds, or other material events affecting the tax status of the 2019 Series ABC Bonds;
7. Modifications to rights of Holders, if material;
8. Bond calls, if material, and tender offers;
9. Defeasances;

10. Release, substitution, or sale of property securing repayment of the 2019 Series ABC Bonds, if material;
11. Rating changes;
12. Bankruptcy, insolvency, receivership or similar event of the SFPUC;
13. The consummation of a merger, consolidation, or acquisition involving the SFPUC or the sale of all or substantially all of the assets of the SFPUC, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material;
14. Appointment of a successor or additional trustee or the change of name of a trustee, if material;
15. Incurrence of a Financial Obligation of the SFPUC, if material, or agreement to covenants, events of default, remedies, priority rights, or other similar terms of a Financial Obligation of the SFPUC, any of which affect Holders; and
16. Default, event of acceleration, termination event, modification of terms, or other similar events under the terms of a Financial Obligation of the obligated person, any of which reflect financial difficulties.

(b) Whenever the SFPUC obtains knowledge of the occurrence of a Listed Event, and, if the Listed Event is described in subsections (a)(2), (a)(6) (other than an adverse tax opinion, the issuance by the IRS of a proposed or final determination of taxability, or a Notice of Proposed Issue (IRS Form 5701-TEB)), (a)(7), (a)(8) (if the event is a bond call), (a)(10), (a)(13) or (a)(14) above, the SFPUC determines that knowledge of the occurrence of that Listed Event would be material under applicable federal securities law, the SFPUC shall, or shall cause the Dissemination Agent (if not the SFPUC) to, file a notice of such occurrence with the MSRB, in an electronic format as prescribed by the MSRB, in a timely manner not in excess of 10 business days after the occurrence of the Listed Event. Notwithstanding the foregoing, notice of Listed Events described in subsections (a)(8) and (9) above need not be given under this subsection any earlier than the notice (if any) of the underlying event is given to holders of affected 2019 Series ABC Bonds under the Indenture.

(c) For purposes of this Disclosure Certificate, any event described in paragraph (a)(12) above is considered to occur when any of the following occur: the appointment of a receiver, fiscal agent, or similar officer for the SFPUC in a proceeding under the United States Bankruptcy Code or in any other proceeding under state or federal law in which a court or governmental authority has assumed jurisdiction over substantially all of the assets or business of the SFPUC, or if such jurisdiction has been assumed by leaving the existing governing body and officials or officers in possession but subject to the supervision and orders of a court or governmental authority, or the entry of an order confirming a plan of reorganization, arrangement, or liquidation by a court or governmental authority having supervision or jurisdiction over substantially all of the assets or business of said party.

(d) The SFPUC shall give, or cause to be given, notice of the occurrence of the receipt by the SFPUC of a written statement by the Climate Standards Board to the effect that the Public Utilities Commission of the City and County of San Francisco San Francisco Water Revenue Bonds, 2019 Series ABC, 2019 Sub-Series A Bonds (Refunding – Federally Taxable) (Green Bonds) are no longer “Climate Bond Certified.” The SFPUC shall, or shall cause the Dissemination Agent (if not the SFPUC) to, file a notice of such occurrence with the MSRB, in electronic format as prescribed by the MSRB, in a timely manner not in excess of 30 days after the receipt by the SFPUC of such written statement.

(e) The SFPUC intends to comply with the Listed Events described in Section 5(a)(15) and Section 5(a)(16), and the definition of “Financial Obligation” in Section 2, with reference to the Rule, any other applicable federal securities laws and the guidance provided by the S.E.C. in Release No. 34-83885 dated August 20, 2018 (the “2018 Release”), and any further amendments or written guidance provided by the S.E.C. or its staff with respect to the amendments to the Rule effected by the 2018 Release.

SECTION 6. Termination of Reporting Obligation. The SFPUC’s obligations under this Disclosure Certificate shall terminate upon the legal defeasance, prior redemption or payment in full of all of the 2019 Series ABC Bonds. If such termination occurs prior to the final maturity of the 2019 Series ABC Bonds, the SFPUC shall give notice of such termination in the same manner as for a Listed Event under Section 5(b).

SECTION 7. Dissemination Agent. The SFPUC may, from time to time, appoint or engage a Dissemination Agent to assist it in carrying out its obligations under this Disclosure Certificate, and may discharge any such Dissemination Agent, with or without appointing a successor Dissemination Agent. The Dissemination Agent shall have only such duties as are specifically set forth in this Disclosure Certificate.

SECTION 8. Amendment; Waiver. Notwithstanding any other provision of this Disclosure Certificate, the SFPUC may amend or waive this Disclosure Certificate or any provision of this Disclosure Certificate, provided that the following conditions are satisfied:

(a) If the amendment or waiver relates to the provisions of Sections 3(a), 3(b), 4 or 5(a), it may only be made in connection with a change in circumstances that arises from a change in legal requirements, change in law, or change in the identity, nature or status of an obligated person with respect to the 2019 Series ABC Bonds or the type of business conducted;

(b) The undertaking, as amended or taking into account such waiver, would, in the opinion of the City Attorney or nationally recognized bond counsel, have complied with the requirements of the Rule at the time of the original issuance of the 2019 Series ABC Bonds, after taking into account any amendments or interpretations of the Rule, as well as any change in circumstances; and

(c) The amendment or waiver either (i) is approved by the owners of a majority in aggregate principal amount of the 2019 Series ABC Bonds or (ii) does not, in the opinion of the City Attorney or nationally recognized bond counsel, materially impair the interests of the Holders.

In the event of any amendment or waiver of a provision of this Disclosure Certificate, the SFPUC shall describe such amendment in the next Annual Report, and shall include, as applicable, a narrative explanation of the reason for the amendment or waiver and its impact on the type (or in the case of a change of accounting principles, on the presentation) of financial information or operating data being presented by the SFPUC. In addition, if the amendment relates to the accounting principles to be followed in preparing financial statements: (i) notice of such change shall be given in the same manner as for a Listed Event under Section 5; and (ii) the Annual Report for the year in which the change is made should present a comparison (in narrative form and also, if feasible, in quantitative form) between the financial statements as prepared on the basis of the new accounting principles and those prepared on the basis of the former accounting principles.

SECTION 9. Additional Information. Nothing in this Disclosure Certificate shall be deemed to prevent the SFPUC from disseminating any other information, using the means of dissemination set forth in this Disclosure Certificate or any other means of communication, or including any other information in any Annual Report or notice of occurrence of a Listed Event, in addition to that which is required by this Disclosure Certificate. If the SFPUC chooses to include any information in any Annual Report or notice of occurrence of a Listed Event in addition to that which is specifically required by this Disclosure Certificate, the SFPUC shall have no obligation under this Disclosure Certificate to update such information or include it in any future Annual Report or notice of occurrence of a Listed Event.

SECTION 10. Default. In the event of a failure of the SFPUC to comply with any provision of this Disclosure Certificate, any Participating Underwriters, Holder or Beneficial Owner of the 2019 Series ABC Bonds

may take such actions as may be necessary and appropriate, including seeking mandate or specific performance by court order, to cause the SFPUC to comply with its obligations under this Disclosure Certificate; provided that any such action may be instituted only in a federal or State court located in the City and County of San Francisco, State of California. Failure by the SFPUC to comply with any provision of this Disclosure Certificate shall not be deemed an Event of Default under the Indenture and the sole remedy under this Disclosure Certificate in the event of any failure of the SFPUC to comply with this Disclosure Certificate shall be an action to compel performance.

SECTION 11. Beneficiaries. This Disclosure Certificate shall inure solely to the benefit of the SFPUC, the Dissemination Agent, the Participating Underwriters and Holders and Beneficial Owners from time to time of the 2019 Series ABC Bonds, and shall create no rights in any other person or entity.

PUBLIC UTILITIES COMMISSION OF THE
CITY AND COUNTY OF SAN FRANCISCO

By: _____
Harlan Kelly, Jr.
General Manager

Approved as to Form:

DENNIS J. HERRERA
CITY ATTORNEY

By: _____
Deputy City Attorney

CONTINUING DISCLOSURE CERTIFICATE EXHIBIT A

**FORM OF NOTICE TO THE
MUNICIPAL SECURITIES RULEMAKING BOARD
OF FAILURE TO FILE ANNUAL REPORT**

Name of Issuer: Public Utilities Commission of the City and County of San Francisco

Name of Issue: San Francisco Water Revenue Bonds,
2019 Sub-Series A (Refunding – Federally Taxable) (WSIP) (Green Bonds),
2019 Sub-Series B (Refunding – Federally Taxable) (Hetch Hetchy) and
2019 Sub-Series C (Refunding – Federally Taxable) (Local Water Main)

Date of Issuance: January 9, 2020

NOTICE IS HEREBY GIVEN that the SFPUC has not provided an Annual Report with respect to the above-named Bonds as required by Section 3 of the Continuing Disclosure Certificate of the Public Utilities Commission of the City and County of San Francisco, dated January 9, 2020. The SFPUC anticipates that the Annual Report will be filed by _____.

Dated: _____

PUBLIC UTILITIES COMMISSION OF THE CITY AND
COUNTY OF SAN FRANCISCO

By: _____ [to be signed only if filed]
Title: _____

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APPENDIX F

INFORMATION REGARDING BOOK-ENTRY ONLY SYSTEM AND GLOBAL CLEARANCE PROCEDURES

The information in this Appendix has been provided by DTC for use in securities offering documents, and the SFPUC takes no responsibility for the accuracy or completeness thereof. The SFPUC cannot and does not give any assurances that DTC, DTC Participants or Indirect Participants will distribute to the beneficial owners either (a) payments of interest, principal or premium, if any, with respect to the Bonds or (b) certificates representing ownership interest in or other confirmation of ownership interest in the Bonds, or that they will so do on a timely basis or that DTC, DTC Participants or DTC Indirect Participants will act in the manner described in this Official Statement. The current "Rules" applicable to DTC are on file with the Securities and Exchange Commission and the current "Procedures" of DTC to be followed in dealing with DTC Participants are on file with DTC.

As used in this Appendix, "Securities" means the 2019 Series ABC Bonds, "Issuer" means the SFPUC, and "Agent" means the Trustee.

The information set out below is subject to any change in or reinterpretation of the rules, regulations and procedures of The Depository Trust Company ("DTC") New York, New York, Euroclear Bank S.A./N.V. as operator of the Euroclear System ("Euroclear") or Clearstream Banking, S.A. ("Clearstream") (DTC, Euroclear and Clearstream together, the "Clearing Systems") currently in effect. The information in this section concerning the Clearing Systems has been obtained from sources that the Issuer believes to be reliable, but none of the Issuer, the Trustee or the Underwriters take any responsibility for the accuracy, completeness or adequacy of the information in this section. Investors wishing to use the facilities of any of the Clearing Systems are advised to confirm the continued applicability of the rules, regulations and procedures of the relevant Clearing System. The Issuer will not have any responsibility or liability for any aspect of the records relating to, or payments made on account of, beneficial ownership interests in the 2019 Series ABC Bonds held through the facilities of any Clearing System or for maintaining, supervising or reviewing any records relating to such beneficial ownership interests.

The Issuer cannot and does not give any assurance that (1) DTC will distribute payments of debt service on the 2019 Series ABC Bonds, or redemption or other notices, to DTC Participants, (2) DTC Participants or others will distribute debt service payments paid to DTC or its nominee (as the registered owner of the 2019 Series ABC Bonds), or redemption or other notices, to the Beneficial Owners, or that they will do so on a timely basis, or (3) DTC will serve and act in the manner described in this Official Statement. The current rules applicable to DTC are on file with the Securities and Exchange Commission, and the current procedures of DTC to be followed in dealing with DTC Participants are on file with DTC.

Clearing Systems

DTC Book-Entry-Only System. DTC, New York, New York, will act as securities depository for the 2019 Series ABC Bonds. The 2019 Series ABC Bonds will be issued as fully registered securities registered in the name of Cede & Co., DTC's partnership nominee. One fully registered 2019 Series ABC Bond certificate will be issued in the aggregate principal amount of the 2019 Series ABC Bonds, and will be deposited with DTC.

DTC, the world's largest securities depository, is a limited-purpose trust company organized under the New York Banking Law, a "banking organization" within the meaning of the New York Banking Law, a member of the Federal Reserve System, a "clearing corporation" within the meaning of the New York Uniform Commercial Code and a "clearing agency" registered pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934, as amended. DTC holds and provides asset servicing for over 3.6 million issues of U.S. and non-U.S. equity issues, corporate and municipal debt issues and money market instruments (from over 100 countries) that DTC's participants ("Direct Participants") deposit with DTC. DTC also facilitates the post-trade settlement among Direct Participants of sales and other securities transactions in deposited securities through electronic computerized book-entry transfers and pledges between Direct Participants' accounts. This eliminates the need for physical movement of securities certificates. Direct Participants include both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, clearing corporations and certain other organizations. DTC is a wholly-owned subsidiary of The Depository Trust & Clearing Corporation ("DTCC"). DTCC is the holding company for DTC,

National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others such as both U.S. and non-U.S. securities brokers and dealers, banks, trust companies and clearing corporations that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly (“Indirect Participants”). DTC has a Standard & Poor’s rating of “AA+.” The DTC rules applicable to its Participants are on file with the Securities and Exchange Commission. More information about DTC can be found at www.dtcc.com.

Purchases of 2019 Series ABC Bonds under the DTC system must be made by or through Direct Participants, which will receive a credit for the 2019 Series ABC Bonds on DTC’s records. The ownership interest of each actual owner of a 2019 Series ABC Bond (a “beneficial owner”) is in turn to be recorded on the Direct and Indirect Participants’ records. Beneficial owners will not receive written confirmation from DTC of their purchase. Beneficial owners are, however, expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct or Indirect Participant through which the beneficial owner entered into the transaction. Transfers of beneficial ownership interests in the 2019 Series ABC Bonds are to be accomplished by entries made on the books of Direct and Indirect Participants acting on behalf of beneficial owners. Beneficial owners will not receive certificates representing their ownership interests in the 2019 Series ABC Bonds, except in the event that use of the book entry only system for the 2019 Series ABC Bonds is discontinued.

To facilitate subsequent transfers, all 2019 Series ABC Bonds deposited by Direct Participants with DTC are registered in the name of DTC’s partnership nominee, Cede & Co. or such other nominee as requested by an authorized representative of DTC. The deposit of 2019 Series ABC Bonds with DTC and their registration in the name of Cede & Co. or such other nominee as requested by an authorized representative of DTC effect no change in beneficial ownership. DTC has no knowledge of the actual beneficial owners of the 2019 Series ABC Bonds. DTC’s records reflect only the identity of the Direct Participants to whose accounts such 2019 Series ABC Bonds are credited, which may or may not be the Beneficial Owners. The Direct and Indirect Participants will remain responsible for keeping account of their holdings on behalf of their customers.

Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants and by Direct Participants and Indirect Participants to beneficial owners will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time. Beneficial owners of 2019 Series ABC Bonds may wish to take certain steps to augment transmission to them of notices of significant events with respect to the 2019 Series ABC Bonds, such as redemptions, defaults and proposed amendments to the bond documents.

Redemption notices will be sent to DTC. If less than all of the 2019 Series ABC Bonds are being redeemed, DTC’s practice is to determine by lot the amount of the interest of each Direct Participant to be redeemed.

Neither DTC nor Cede & Co. (nor any other DTC nominee) will consent or vote with respect to 2019 Series ABC Bonds unless authorized by a Direct Participant in accordance with DTC’s procedures. Under its usual procedures, DTC mails an “Omnibus Proxy” to the Issuer as soon as possible after the record date. The “Omnibus Proxy” assigns Cede & Co.’s consenting or voting rights to those Direct Participants to whose accounts the 2019 Series ABC Bonds are credited on the record date identified in a listing attached to the “Omnibus Proxy.”

Payment of the principal and redemption price of, and interest on, the 2019 Series ABC Bonds will be made to Cede & Co. or such other nominee as requested by an authorized representative of DTC. DTC’s practice is to credit Direct Participants’ accounts upon DTC’s receipt of funds and corresponding detail information from the Trustee or the Issuer on each payment date in accordance with their respective holdings shown on DTC’s records. Payments by Direct and Indirect Participants to beneficial owners will be governed by standing instructions and customary practices, as is the case with securities held for the accounts of customers in bearer form or registered in “street name,” and will be the responsibility of such Direct and Indirect Participant and not of DTC, the Issuer or the Trustee, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of the principal and redemption price of, and interest on, the 2019 Series ABC Bonds to Cede & Co. (or such other nominee as requested by an authorized representative of DTC) is the responsibility of the Trustee. Disbursement of such payments to Direct Participants will be the responsibility of DTC and disbursement of such payments to the beneficial owners will be the responsibility of the Direct Participants and Indirect Participants.

DTC may discontinue providing its services as depository with respect to the 2019 Series ABC Bonds at any time by giving reasonable notice to the Trustee and the Issuer. Under such circumstances, in the event that a successor depository is not obtained, 2019 Series ABC Bond certificates are required to be printed and delivered. The Issuer may decide to discontinue use of the system of book-entry-only transfers through DTC (or a successor securities depository). In that event, 2019 Series ABC Bond certificates will be printed and delivered to DTC.

Euroclear and Clearstream. Euroclear and Clearstream have advised the Issuer as follows:

Euroclear and Clearstream each hold securities for their customers and facilitate the clearance and settlement of securities transactions by electronic book-entry transfer between their respective account holders. Euroclear and Clearstream provide various services including safekeeping, administration, clearance and settlement of internationally traded securities and securities lending and borrowing. Euroclear and Clearstream also deal with domestic securities markets in several countries through established depository and custodial relationships. Euroclear and Clearstream have established an electronic bridge between their two systems across which their respective participants may settle trades with each other.

Euroclear and Clearstream customers are worldwide financial institutions, including underwriters, securities brokers and dealers, banks, trust companies and clearing corporations. Indirect access to Euroclear and Clearstream is available to other institutions that clear through or maintain a custodial relationship with an account holder of either system, either directly or indirectly.

Clearing and Settlement Procedures

General. The 2019 Series ABC Bonds sold in offshore transactions will be initially issued to investors through the book-entry facilities of DTC, or Clearstream and Euroclear in Europe if the investors are participants in those systems, or indirectly through organizations that are participants in the systems. For any of such 2019 Series ABC Bonds, the record holder will be DTC's nominee. Clearstream and Euroclear will hold omnibus positions on behalf of their participants through customers' securities accounts in Clearstream's and Euroclear's names on the books of their respective depositories.

The depositories, in turn, will hold positions in customers' securities accounts in the depositories' names on the books of DTC. Because of time zone differences, the securities account of a Clearstream or Euroclear participant as a result of a transaction with a participant, other than a depository holding on behalf of Clearstream or Euroclear, will be credited during the securities settlement processing day, which must be a business day for Clearstream or Euroclear, as the case may be, immediately following the DTC settlement date. These credits or any transactions in the securities settled during the processing will be reported to the relevant Euroclear participant or Clearstream participant on that business day. Cash received in Clearstream or Euroclear as a result of sales of securities by or through a Clearstream participant or Euroclear participant to a DTC Participant, other than the depository for Clearstream or Euroclear, will be received with value on the DTC settlement date but will be available in the relevant Clearstream or Euroclear cash account only as of the business day following settlement in DTC.

Transfers between participants will occur in accordance with DTC rules. Transfers between Clearstream participants or Euroclear participants will occur in accordance with their respective rules and operating procedures. Cross-market transfers between persons holding directly or indirectly through DTC, on the one hand, and directly or indirectly through Clearstream participants or Euroclear participants, on the other, will be effected in DTC in accordance with DTC rules on behalf of the relevant European international clearing system by the relevant depositories; however, cross-market transactions will require delivery of instructions to the relevant European international clearing system by the counterparty in the system in accordance with its rules and procedures and within its established deadlines in European time. The relevant European international clearing system will, if the transaction meets its settlement requirements, deliver instructions to its depository to take action to effect final settlement on its behalf by delivering or receiving securities in DTC, and making or receiving payment in accordance with normal procedures for same day funds settlement applicable to DTC. Clearstream participants or Euroclear participants may not deliver instructions directly to the depositories.

The Issuer will not impose any fees in respect of holding the 2019 Series ABC Bonds; however, holders of book-entry interests in the 2019 Series ABC Bonds may incur fees normally payable in respect of the maintenance and operation of accounts in the Clearing Systems.

Initial Settlement. Interests in the 2019 Series ABC Bonds will be in uncertified book-entry form. Purchasers electing to hold book-entry interests in the 2019 Series ABC Bonds through Euroclear and Clearstream accounts will follow the settlement procedures applicable to conventional Eurobonds. Book-entry interests in the 2019 Series ABC Bonds will be credited to Euroclear and Clearstream participants' securities clearance accounts on the business day following the date of delivery of the 2019 Series ABC Bonds against payment (value as on the date of delivery of the 2019 Series ABC Bonds). DTC participants acting on behalf of purchasers electing to hold book-entry interests in the 2019 Series ABC Bonds through DTC will follow the delivery practices applicable to securities eligible for DTC's Same Day Funds Settlement system. DTC participants' securities accounts will be credited with book-entry interests in the 2019 Series ABC Bonds following confirmation of receipt of payment to the Issuer on the date of delivery of the 2019 Series ABC Bonds.

Secondary Market Trading. Secondary market trades in the 2019 Series ABC Bonds will be settled by transfer of title to book-entry interests in the Clearing Systems. Title to such book-entry interests will pass by registration of the transfer within the records of Euroclear, Clearstream or DTC, as the case may be, in accordance with their respective procedures. Book-entry interests in the 2019 Series ABC Bonds may be transferred within Euroclear and within Clearstream and between Euroclear and Clearstream in accordance with procedures established for these purposes by Euroclear and Clearstream. Book-entry interests in the 2019 Series ABC Bonds may be transferred within DTC in accordance with procedures established for this purpose by DTC. Transfer of book-entry interests in the 2019 Series ABC Bonds between Euroclear or Clearstream and DTC may be effected in accordance with procedures established for this purpose by Euroclear, Clearstream and DTC.

Special Timing Considerations. Investors should be aware that investors will only be able to make and receive deliveries, payments and other communications involving the 2019 Series ABC Bonds through Euroclear or Clearstream on days when those systems are open for business. In addition, because of time-zone differences, there may be complications with completing transactions involving Clearstream and/or Euroclear on the same business day as in the United States. U.S. investors who wish to transfer their interests in the 2019 Series ABC Bonds, or to receive or make a payment or delivery of 2019 Series ABC Bonds, on a particular day, may find that the transactions will not be performed until the next business day in Luxembourg if Clearstream is used, or Brussels if Euroclear is used.

Clearing Information. The Issuer expects that the 2019 Series ABC Bonds will be accepted for clearance through the facilities of Euroclear and Clearstream. The international securities identification number, common code and CUSIP number for the 2019 Series ABC Bond set out on the cover page of this Official Statement.

None of Euroclear, Clearstream or DTC is under any obligation to perform or continue to perform the procedures referred to above, and such procedures may be discontinued at any time.

Neither the Issuer nor any of its agents will have any responsibility for the performance by Euroclear, Clearstream or DTC or their respective direct or indirect participants or account holders of their respective obligations under the rules and procedures governing their operations or the arrangements referred to above.

The information in this Official Statement concerning the Clearing Systems has been obtained from sources that the Underwriters believe to be reliable, but the Underwriters take no responsibility for the accuracy thereof.

Limitations

For so long as the 2019 Series ABC Bonds are registered in the name of DTC or its nominee, Cede & Co., the Issuer and the Trustee will recognize only DTC or its nominee, Cede & Co., as the registered owner of the 2019 Series ABC Bonds for all purposes, including payments, notices and voting. So long as Cede & Co. is the registered owner of the 2019 Series ABC Bonds, references in this Official Statement to registered owners of the 2019 Series ABC Bonds shall mean Cede & Co. and shall not mean the beneficial owners of the 2019 Series ABC Bonds.

Because DTC is treated as the owner of the 2019 Series ABC Bonds for substantially all purposes under the Indenture, beneficial owners may have a restricted ability to influence in a timely fashion remedial action or the giving or withholding of requested consents or other directions. In addition, because the identity of beneficial owners is unknown to the Issuer, the Trustee or DTC, it may be difficult to transmit information of potential interest to beneficial owners in an effective and timely manner. Beneficial owners should make appropriate arrangements with their broker or dealer regarding distribution of information regarding the 2019 Series ABC Bonds that may be transmitted by or through DTC.

Neither the Issuer nor the Trustee have any responsibility or obligation with respect to:

- the accuracy of the records of DTC, its nominee or any Direct Participant or Indirect Participant with respect to any beneficial ownership interest in any 2019 Series ABC Bonds;
- the delivery to any Direct Participant or Indirect Participant or any other person, other than a registered owner as shown in the bond register kept by the Trustee, of any notice with respect to any 2019 Series ABC Bond including, without limitation, any notice of redemption with respect to any 2019 Series ABC Bond;
- the payment to any Direct Participant or Indirect Participant or any other person, other than a registered owner as shown in the bond register kept by the Trustee, of any amount with respect to the principal or redemption price of, or interest on, any 2019 Series ABC Bond; or
- any consent given by DTC or its nominee as registered owner.

Prior to any discontinuation of the book-entry-only system hereinabove described, the Issuer and the Trustee may treat Cede & Co. (or such other nominee of DTC) as, and deem Cede & Co. (or such other nominee) to be, the absolute registered owner of the 2019 Series ABC Bonds for all purposes whatsoever, including, without limitation:

- the payment of the principal or redemption price of, and the interest on, the 2019 Series ABC Bonds;
- giving notices of redemption and other matters with respect to the 2019 Series ABC Bonds;
- registering transfers with respect to the 2019 Series ABC Bonds; and
- the selection of 2019 Series ABC Bonds for redemption.

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