

Diablo Water District

2022 Facility Reserve Charge & MERA Update

This technical memorandum describes the 2022 update of the existing funding mechanisms used by Diablo Water District (DWD) to finance required capital improvements to serve new development. These mechanisms are DWD's Facility Reserve Charge (FRC) and Main Extension Reimbursement Assessment (MERA). This memorandum documents the updated FRC schedule based on year 2021 and 2022 values, using the methodologies, potable water use history, projections and related facilities presented in DWD's 2020 Facilities Plan. The program serves to ensure that development is responsible for its share of the capital improvements needed within DWD's service area. With each FRC update, the District's goal is to properly prepare for the funding of future growth-related capital improvements; as such, the District will add new projects, modify previously identified projects, and even remove planned facilities that are no longer necessary and as appropriate the District's Master Plan will be supplemented or amended.

The technical analysis supporting the update is provided in the appendix tables attached to this memorandum, which describes the assumptions, findings and recommended update of charges. A list of acronyms used in the study is also included in the memorandum appendix.

Summary

The historical and updated FRC schedule is presented in Table 1 below:

Table 1 - Historical and Proposed FRC

History of Facilities Reserve Charge (FRC)								
Year	West of Jersey Is. Rd.		East of Jersey Is. Rd.		Bethel Island (b)		Delta Coves	
	5/8" Meter (a)	Reduction from Pre-2011	5/8" Meter (a)	Reduction from Pre-2011	5/8" Meter (a)	Reduction from Pre-2011	5/8" Meter (a)	Reduction from Pre-2011
Pre-2011	\$9,251	--	\$13,456	--	\$6,607	--	\$6,607	--
2011	\$5,366	42%	\$9,296	31%	\$5,366	19%	\$5,366	19%
2013	\$5,113	45%	\$8,929	34%	\$5,113	23%	\$5,113	23%
2015	\$6,548	29%	\$8,918	34%	\$4,816	27%	\$4,816	27%
2016	\$6,865	26%	\$9,316	31%	\$5,072	23%	\$5,072	23%
2018	\$8,248	11%	\$10,864	19%	\$5,920	10%	\$5,920	10%
2020	\$7,880	15%	\$12,911	4%	\$8,034	-22%	\$8,034	-22%
2022	\$11,457	-24%	\$17,271	-28%	\$12,297	-86%	\$12,297	-86%

These FRCs are based on the July 2022 ENR CCI for San Francisco (CCI = 15,640.1) and should be escalated annually.

^a An Equivalent Meter (EM) represents a Single Family Dwelling (SFD) 5/8" meter service demand.

^b For Bethel Island, specific requirements and funding arrangements are not included and will be determined on a case-by-case basis depending on requests for service. The FRC for Delta Coves subdivision is calculated and shown separately

Key elements of the 2020 Facilities Plan utilized in the analysis to arrive at the current rates of the FRC and MERA fees are presented in Table 2.

Table 2 - Summary of 2020 Facilities Plan-Based Data Used for FRC and MERA Development

FRC and MERA Entry Data (Table)	2020 Facilities Plan Reference
Capital Improvement Projects (A-1)	Table 9-4
Treated Water Storage Requirements (A-1)	Table 6-2
Average Day Unit Demand Factors (A-3)	Table 5-5
Maximum Day Demand/Average Day Demand (MDD/ADD) Ratio (A-3)	Page 5-5
Ultimate Average Day and Maximum Day Demands by Area (A-3) ¹	Table 5-9
Supply Capacity Requirements (A-4)	Page 9-4
Future MERA Funded Pipelines (A-13)	Table 8-1

1: DWD no longer anticipates providing potable water for irrigation on Bethel Island, as shown in the 2020 Facilities Plan, Table 5-9. The future irrigation values on Bethel Island have therefore been significantly reduced in the 2022 calculations.

The FRC values for all service areas have increased significantly, primarily as a result of the estimated costs for future projects in the Capital Improvement Projects (CIP) increasing from \$67.7 million in 2020 to \$104.7 million in the 2022 CIP. In addition to the evolving nature of any capital improvement plan from year-to-year, the 2022 capital costs also reflect a 22-percent increase in construction costs in the San Francisco region from May of 2020 to July of 2022, as measured by the Engineering News-Record's Construction Cost Index, and an even greater increase in the cost of specialty materials and goods that are unique to potable water distribution¹. The changes in the FRC funded capital costs from 2020 to 2022 are summarized in Table 3. These project costs are presented in 2022 dollars; future project costs may be more than what is being used for the current FRC fee calculation.

Table 3 - Summary of FRC Funded Capital Improvement Costs 2020 – 2022

FRC Funded CIP Expansion Projects	2020 Values	2022 Values	Difference	
Systemwide Projects (Including Delta Coves)	\$67,701,000	\$104,724,500	\$37,023,500	55%
West of JIR	\$0	\$0	\$0	
East of JIR (Not Including Bethel Island & Delta Coves)	\$13,905,000	\$18,035,700	\$4,130,700	30%
Bethel Island (b) & Delta Coves	<u>\$1,020,000</u>	<u>\$1,800,000</u>	<u>\$780,000</u>	76%
Totals	\$82,626,000	\$124,560,200	\$41,934,200	51%
Engineering News Record Construction Cost Index for San Francisco	12,819	15,640		22%

¹ Local pricing of potable water distribution goods and materials was obtained from Core & Main of Oakley, CA in July 2022.

Calculation of the FRCs is based on DWD’s future costs associated with funding for system capacity that is or will be available for new services. These costs also include remaining annual debt service payments made by the District for FRC-funded historical growth-related capital improvement projects. The unit FRC value is based on the number of anticipated future developer connections (Equivalent Meters) that will support the expansion-related future costs. An Equivalent Meter (EM) represents a Single Family Dwelling (SFD) 5/8" meter service demand (or 1" meter for home with fire sprinkler system). The updated FRCs are based on cost values, existing DWD customer demand as of the year 2021, and reduced overall build out water demands as a result of water conservation (as compared to FRCs developed prior to 2020). The values should be annually escalated for equity under inflationary impact using the Engineering News Report (ENR) Construction Cost Index (CCI) for the San Francisco region, at a minimum, unless project-specific estimated costs are available. Note that Bethel Island FRCs must be determined on a case-by-case basis depending on requests for service, even though the FRC value shown for that DWD service area now reflects both the system wide (Base) FRC and a dedicated project serving both Bethel Island and Delta Coves.

Purpose of Charge

The FRC is a funding mechanism for capital improvements constructed by DWD to meet the service demands of new development. The funds collected from the program are used to finance new construction and retirement of bonded debt for capital facilities required to serve growth. This program ensures that growth is responsible for its fair share of the capital improvements needed within DWD’s service area.

DWD’s policy is that existing customers should not have to pay higher water rates attributable to the increased water supply, treatment and distribution facility costs required to serve growth. Through the FRC, DWD collects revenue from new water connections to finance the contractually related debt service on existing but unused water facilities’ capacity, and the financing of construction costs for new water facilities required to serve the new development within the DWD service area. The FRC uses a meter capacity-based schedule of charges to equitably share in the costs of new capacity.

All FRC proceeds, as well as interest earned on the balance of funds, are accounted for in a Facility Reserve Fund, which is used solely for growth-related capital project and financing costs as authorized by state law. DWD’s Regulation No. 3 specifies that these uses include “...planning, designing, and construction of facilities that increase the District’s water supply or the capacity of its water treatment, storage and distribution system; for payment of principal and interest on indebtedness incurred for said facilities; and for payment of expenses of enlarging or relocating facilities to accommodate growth...”.

DWD Service Areas

The FRC schedule is based on the division of the DWD sphere of influence into the following four service areas as highlighted on Figure 1: West of Jersey Island Road, East of Jersey Island Road, Bethel Island (not including Delta Coves), and Delta Coves.

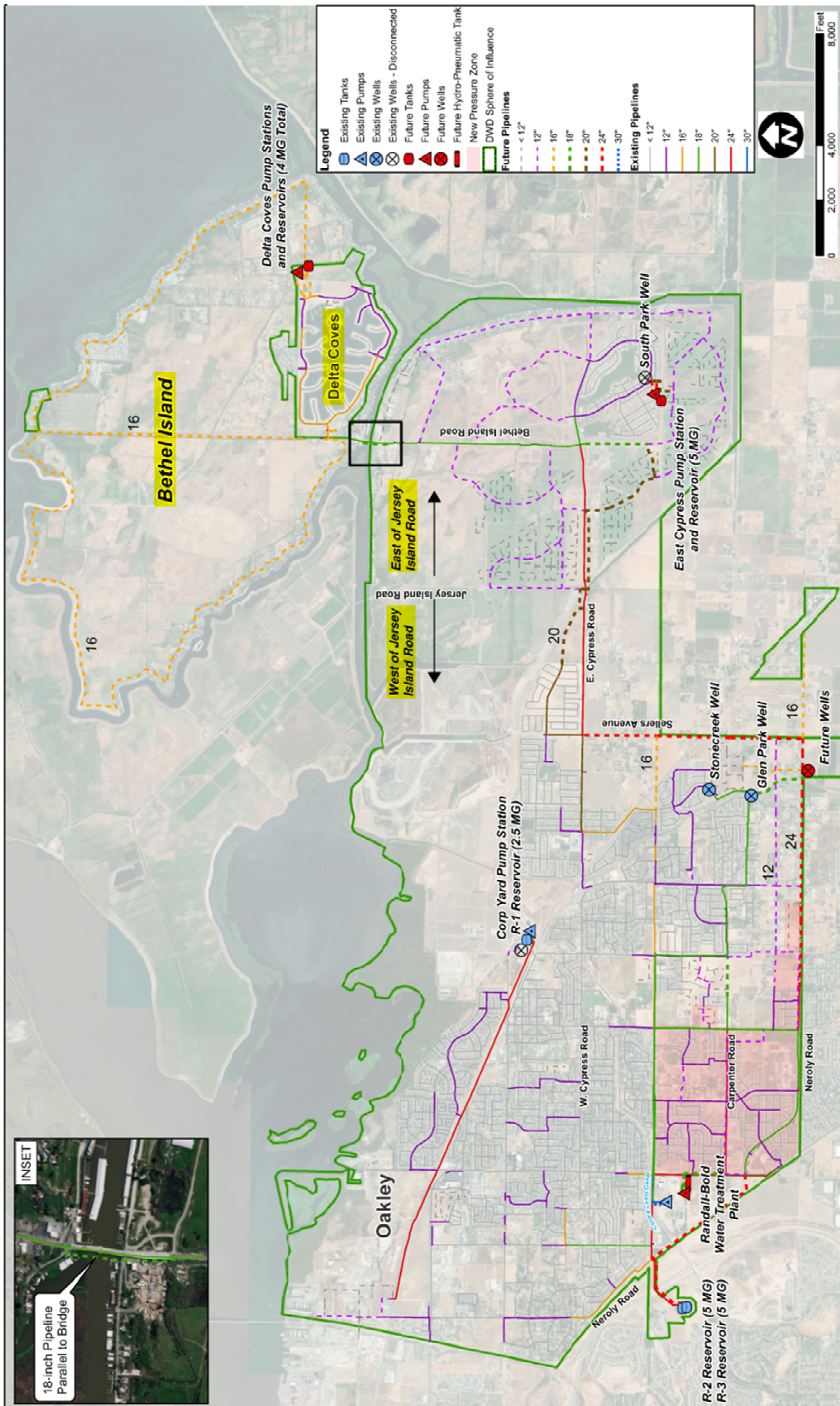


Figure 1
Diablo Water District
Ultimate Water Distribution System for
DWD Sphere of Influence and Bethel Island

The four service areas have been historically identified as independent growth areas in DWD's planning documents. Although the four service areas all currently exist within the same pressure zone, the distances separating each area create potentially different hydraulic (pressure) and water quality conditions which must be managed locally (per area). The 2022 current and ultimate maximum water demands, and facilities required to serve each of the four areas are explained in the detailed FRC calculations tables provided in Appendix A.

Each service area will pay a Base FRC for system-wide projects benefiting the entire system of water supply, transmission and storage capacities. In addition to the Base FRC, each area will pay a supplemental FRC for the specific distribution storage and pumping facilities to serve that particular area. However, all of the potential facilities and financing requirements of future Bethel Island water services are not known or identified in the FRC for that area and will be determined on a case-by-case basis depending on the specific service requested.

Basis for the Facilities Reserve Charge

The FRC is based on the general methodology provided in state law as applicable to county water districts and the expansion-related capital improvement costs for projects developed by DWD. The expansion-related project costs, the annual payments for unused water facilities' capacity, and the projected future development requirements establish the link between the FRC and the DWD facility costs. The following presents this calculation if expressed as an equation:

$$\text{Facilities Reserve Charge (FRC)} = \frac{\text{Future growth-related costs (\$)} + \text{Remaining growth-related debt service (\$)}}{\text{Future connections (as Equivalent Meters [EMs])}}$$

Table A-1 (in Appendix A) of this memorandum shows the tabulation of the capital improvement projects' (CIP) expansion-related water supply costs and projects required for DWD's ultimate service area using the costs developed in the 2020 Facilities Plan, updated to present value costs, plus additional projects identified by DWD since 2020. These new facilities and capacity-related projects include: major transmission pipeline projects that provide system wide transmission capacity; reservoirs for meeting system storage, fire protection, and peak demand requirements; Supervisory Control and Data Acquisition (SCADA) system expansion; updating of facilities plan, data and distribution maps; and management of growth-related projects. Table A-1 also includes additional details regarding the primary elements of each project and how the total capital cost is related to growth.

With each FRC update, DWD actively adds new projects, modifies and 'right-sizes' previously identified projects, and removes planned facilities that are no longer necessary. DWD also considers the remaining existing system capacity in these calculations, for those capital improvements that benefit both existing customers and future connections. Based on 2021 water use data, approximately 55% of the District's existing system is available for future growth considering its available water supply sources, and 41.2% is available for future growth considering its existing water storage capacity; the average of these values, 48.1%, was used in the calculations to reflect the system capacity available for future growth where these conditions apply.

The total 2022 CIP growth-related project costs of \$124.6 million are comprised of projects that either benefit growth within DWD's entire service area (i.e., system-wide projects), or projects that are required to supplement the system-wide projects to meet the needs of a specific area. The 2022 CIP includes \$104.7 million of system-wide projects that are distributed to new connections in each of the four sub-areas. In addition, projects identified as benefitting the East of Jersey Island Road Area total \$18.0 million, and the projects benefitting Bethel Island and Delta Coves total \$1.8 million. There are no projects specifically benefitting the West of Jersey Island Road Area apart from the system-wide projects. As noted above, specific plans for the future development of Bethel Island and Delta Coves are not yet developed, therefore, the nature of the supporting DWD facilities and their financing requirements will be evaluated on a case-by-case basis.

The FRC calculations do not include the District's current list of CIP projects that are paid for by existing customers through water use fees via DWD's General Fund. The General Fund-projects to be implemented over the next 10 years are presented in Table 4. Most of the projects listed in Table 4 are dedicated to maintaining service to DWD's existing customers; where there is overlap with FRC-funded projects, the total project cost is proportionally divided between existing (General Fund-funded) and future (FRC-funded) customers.

Table 4: Cost of Current DWD General Fund CIP Projects

General Fund CIP Projects	Cost
Water Meter Replacements	\$125,000
Randall Bold Water Treatment Maintenance Projects	\$18,546,442
Randall Bold Water Treatment CIP Projects	\$10,479,889
City CIP Related Improvements	\$850,000
Field Equipment	\$707,000
Valve Replacements	\$253,978
Vehicle Replacements	\$1,287,500
Seismic Upgrade of R2	\$988,000
Office Equipment	\$41,500
Hydrants, Pumps, Wells, Fire Service Lines	\$1,415,936
Water Service and Main Line R&R	\$9,000,000
Reservoirs Recoating	\$1,975,000
Solar	\$1,500,000
New Corporation Yard	\$4,500,000
TOTAL	\$51,670,245

The FRC-funded CIP projects in Appendix Table A-1 are based on facility capacities required to serve growth-related customer demands at buildout in each of the DWD service areas. The calculations of these capacity requirements are described below:

- **Current DWD service customers.** The number of future growth-related capacity requests by developers is estimated from the difference between the numbers of water customers at buildout versus the number of current customers. The water use conditions of DWD service customers in 2021 (base year for this analysis) is assumed to be representative of the water use conditions of customers in 2022. Appendix Table A-2 tabulates that as of December 31, 2021, there were 12,979 active service connections with a maximum daily demand (MDD) of 8.4 million gallons per day (MGD) of system wide services. The current estimated maximum daily water use of a single-family dwelling is 732 gallons per day (gpd) as shown on Appendix Table A-3, which represents one equivalent meter's (EMs) of DWD capacity demand. As such, DWD's current 2022 water demand is assumed to be 15,403 EMs, with 93 percent of active service connections attributed to the West of Jersey Island Road service area.
- **DWD buildout (ultimate) water supply requirements.** DWD's buildout water supply requirements are based on the ultimate number of customers multiplied by their projected unit water demand. Per the 2020 Facilities Plan, the projected buildout land uses within the District's service areas are based on the City General Plan for the Oakley planning area west of Jersey Island Road (2016), the proposed Cypress Preserve development plans (from December 2019) in eastern Oakley, the East Cypress Corridor Specific Plan for the rest of the Oakley planning area east of Jersey Island Road, and the County General Plan for Knightsen, Bethel Island, and small areas between the DWD service area and SOI. There will be significant future development in the eastern portion of the study area, as well as infill development in the northwestern portion.

As discussed in Section 3.5 of the 2020 Facilities Plan, the City and County General Plans define a range of allowable densities for new development for the various land use categories. These densities can then be equated to an ultimate number of dwellings and projected water use for the District. The 2022 FRC model is closely matching the ultimate buildout density for the District's service area under a high-density condition (assuming one multi-family residential unit = 0.45 EM). The total buildout EMs for single family residential plus multi-family residential connections in the FRC model is 24,159 EMs per Table A-3; this value would be 23,960 EMs per Table 3-2 in the 2020 Facilities Plan, a difference of less than 1%.

DWD no longer anticipates providing potable water for irrigation on Bethel Island, as shown in the 2020 Facilities Plan, Table 5-9. The future irrigation values on Bethel Island have therefore been significantly reduced in the 2022 calculations.

Per the 2020 Facilities Plan, the projected ultimate ADD is 12.6 million gallons per day (MGD). When multiplied by 2.0, DWD's system wide future maximum to average day water demand ratio, the DWD buildout maximum day demand (MDD) is 25.1 MGD (source numbers are in Table A-3). This ratio of 2.0, historically used by DWD in its planning documents, is also used by several water districts in the East Bay Area and is consistent

with DWD's primarily residential customer base and the warm, dry climate of this area. DWD no longer anticipates providing potable water for irrigation on Bethel Island, as shown in the 2020 Facilities Plan, Table 5-3. The future irrigation values on Bethel Island have therefore been significantly reduced in the 2022 calculations.

The maximum day to average day peaking factors and corresponding level of service were developed based on an aggregated random sample of existing customer accounts within each customer class; this highly accurate and granular level of data is available to DWD due to its annual upgrade of older, manual-read flowmeters to FlexNet-equipped flowmeters, which can collect and transmit hourly water use data electronically to the District. Future maximum day to average day peaking factors were extrapolated from the current values using District and engineering judgement of future water patterns and are consistent with the projected water use identified in the 2020 Facilities Plan.

The District recognizes that 2021 water use patterns (i.e., average day demand) are lower than the District's historical use patterns and reflect customer response to the current multi-year drought. The District anticipates that less conservative water use patterns may reappear in non-drought years as has occurred in the past during wetter years, even considering continued regional conservation messaging. Conservation is anticipated to have a greater impact on average day demands within the District as compared to maximum day to average day peaking factors. As presented in Table 5-6 and Table 5-7 of the 2020 Facilities Plan, although average day demands have been steadily decreasing over the past 15 years, the historical maximum day peaking factor has experienced little change over this timeframe.

- **Future development requirements.** The effect of DWD's ongoing and future conservation practices is anticipated to result in a maximum daily water use of 732 gpd per EM, with the number of DWD customers at buildout projected to be 32,443 EMs. As provided in Appendix Table A-3, the difference between current and buildout customers is approximately 17,040 EMs, with most of the water use growth to occur in the West of Jersey Island Road Area, which is one of the service areas identified in Table 3.

Appendix Table A-4 identifies the DWD capacity requirements at system buildout. These capacity requirements will first be served by existing but unused system capacities, as associated with each service area, and second by new capacity built from the projects identified in the CIP listed in Appendix Table A-1. As shown, the total buildout capacity with standby and blending reserves is 26.6 MGD while the total requirement from DWD centralized sources of supply and District-wide distribution facilities is 23.7 MGD, which provides for some standby water supply in the event of disruption during high demand periods at build out. As provided in Appendix Table A-4, this total buildout capacity will serve 32,443 EMs, including 17,040 future EMs to be connected.

- **Future water supplies.** DWD's historical maximum day demand (from 2021) of the Randall-Bold Water Treatment Plant (RBWTP) is 8.4 MGD MDD of the current net capacity of 14.6 MGD (57.5 percent). In addition, DWD currently uses up to 1.7 MGD from

groundwater production wells capable of supplying up to 4 MGD.² Therefore, DWD has determined that its additional water supply requirements for buildout are 5 MGD of RBWTP capacity and 3 MGD of groundwater supply well capacity. The costs of the 8 MGD of future capacity, plus the contractual payments on the debt service for the existing but unused capacity at the RBWTP, will be funded from future FRC proceeds.

- **Costs of financing capacity for future development.** To provide DWD with the ability to implement projects as required for and prior to development, the FRC is based on the financing of expansion-related capital projects provided in Appendix Table A-1. This practice is common within the industry, and is described in distribution system financial planning and management guidance documents such as the America Water Works Association’s Manual M1 (AWWA M1), Principles of Water Rates, Fees and Charges. This is in contrast to a pay-as-you-go approach, where it would be necessary to wait until all required funds were accumulated to construct development projects, which would inhibit DWD’s ability to serve new development.

Future annual debt service payments for FRC funded CIP expansion projects are summarized on Table 5.

Table 5 - Projected Incremental Debt Service Generated from FRC Funded Expansion Projects

	Systemwide Projects (Including Delta Coves)	West of Jersey Island Road	East of Jersey Island Rd. (Not Including Bethel Island & Delta Coves)	Bethel Island & Delta Coves	Grand Total
	Principal Amounts from Appendix Table A-5				
Principal Amount	\$104,724,535	\$0	\$18,035,682	\$1,800,000	\$124,560,218
Annual Debt Service^a	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
Total DWD Debt Service for 2023 - 2046^b	\$183,681,048	\$0	\$31,633,590	\$3,157,101	\$218,471,739

a. DWD Debt Service for 2022 CIP Projects is based on 25 year Certificate of Participation instruments with level annual payments, an annual interest rate of 5.0% and 3.0% issuance costs.

b. Assumes that CIP capital costs for 2022 will be funded through 2022 Certificate of Participation.

Table 6 details these cash flows based on a projected 25 year financing term for the future CIP projects with a 5 percent level payment bond at a 3 percent cost of issuance; the cumulative total debt service is \$183.7 million for the system-wide projects, \$31.6 million for the East of Jersey

² Maximum day well utilization in 2021 was 0.592 MGD on February 8. Well utilization decreased to relative insignificance later in the year.

Island Road Area projects, and \$3.2 million for the Bethel Island and Delta Coves Area-related project. These costs, net of interest earnings, are recovered from FRC proceeds based on the calculations of unit FRC rates.

Table 6 - Summary Derivation of Recommended 2022 FRC by Service Area

Service Area	Future Equivalent Meters		System-Wide FRC			Less Facilities Reserve Fund Fee Reduction	Net System-Wide Costs
			Future FRC Financing	Remaining Debt Service	Subtotal System-Wide		
	Quantity	%	\$183,681,048	\$19,068,546		(\$7,530,350)	
West of JIR	7,845	46.04%	\$10,779	\$1,119	\$11,899	(\$442)	\$11,457
East of JIR	5,440	31.93%	\$10,779	\$1,119	\$11,899	(\$442)	\$11,457
Bethel Island	3,178	18.65%	\$10,779	\$1,119	\$11,899	(\$442)	\$11,457
Delta Coves	576	3.38%	\$10,779	\$1,119	\$11,899	(\$442)	\$11,457
Total	17,040	100.00%	\$10,779	\$1,119	\$11,899	(\$442)	\$11,457
Service Area	Plus Incremental Area Specific Costs				Total Cost per Future Equivalent Meters		
	West of Jersey Island Road	East of Jersey Island Road	Bethel Island	Delta Coves			
	\$0	\$31,633,590	\$2,672,384	\$484,717			
West of JIR	\$0				\$11,457		
East of JIR		\$5,815			\$17,271		
Bethel Island			\$841		\$12,297		
Delta Coves				\$841	\$12,297		

The allocation of remaining outstanding debt to FRC funded CIP capacity expansion projects is shown on Appendix Table A-6. The outstanding debts shown on Appendix Table A-6 reflect the District’s recent refinancing of older debt and projected 2022 borrowing through Certificates of Participation. As also shown on Appendix Table A-6, approximately 70% of the District’s outstanding and projected 2022 debt is reimbursable, i.e., subject to recovery through the FRC.

Update of Charges

The derivation of the recommended 2022 FRC charges shown in Table 1 is summarized on Table 6 and presented in more detail in Appendix Table A-7. The net value of the base (i.e., system-wide) and supplemental FRCs for each service area, as described above, is calculated by dividing the financing costs of DWD system capacity for future customers by the number of future customers expressed as equivalent meters. Offsetting the unit cost of the Base FRC are the unspent proceeds of past FRC payments in the Facilities Reserve Fund, which totals \$7.53 million as of June 30, 2022.

Appendix Tables A-8 through A-11 summarize the 2011, 2013, 2015, 2016, 2018, 2020 and updated 2022 FRC schedules by service area, as specified in DWD’s Regulation No. 3. The tables also provide the FRCs for all water connections with meter sizes from 5/8-inch to 8-inches, based on meter capacity ratio factors defined by the American Water Works Association (AWWA) Manual M1 “Water Rates”.

CDM Smith recommends that on an annual basis, DWD increase the FRC charges to reflect inflation, based on the increase in the ENR CCI for San Francisco as well as to reflect changes in the annual Capital Improvements Program and other system changes that would materially affect the Facilities Reserve Charge.

MERA Update

DWD uses the Main Extension Reimbursement Assessment (MERA) funding mechanism to reimburse the original developer for the costs of water main extensions constructed by developers that are oversized beyond that required to serve the corresponding development. MERA allows a first user, who must construct a new pipeline extension for connecting to the DWD system, to be reimbursed for an equitable portion of the pipeline main extension if the pipeline must be oversized beyond that required to serve the user's own needs. Almost all new subdivisions would normally require 8" water mains throughout the subdivision for their daily and fire water service needs. As development occurs, new users pay the MERA fees, which are then used by DWD to reimburse previous projects.

Example:

- Development A requires 8" water mains throughout for its daily/fire water service needs.
- DWD's Facilities Plan requires that two of the water mains in Development A are installed as 18".
- Developer A installs the 18" pipelines required by DWD.
- DWD reimburses Developer A for the cost difference between the 18" and 8" pipelines from the MERA fund.

Table 7 summarizes the historical and updated MERA.

Table 7 - Historical and Proposed MERA

Current vs Updated MERA^a Charge	
Year	MERA Incremental Unit Payments, \$/EM (Based on 5/8" Meter on SFD)
Pre-2011	\$488
2011	\$488
2015	\$488
2016	\$488
2018	\$562
2020	\$615
2022	\$1,212

The increased MERA fee for 2022 is directly related to the increase in the cost of construction services, and potable water distribution specialty materials and goods, between May 2020 and July 2022.

The derivation of the 2022 MERA is summarized in Table 8.

Table 8 - Derivation of 2022 MERA

Description	Value
Outstanding MERA Reimbursement Obligations	\$581,500
Future MERA Project Reimbursements	\$20,067,158
Total MERA Obligations	\$20,648,658
Future Development Customers Paying FRC (EM)	17,040
Calculated 2022 MERA Incremental Unit Payments (\$/EM or 5/8" Meter on SFD) (a)	\$1,212
Calculated 2020 MERA Payment (5/8" Meter) (a)	\$615
Pre-2011 MERA Payment (5/8" Meter)	\$488

Appendices Tables A-12 and A-13 detail the outstanding DWD obligation at the end of 2021, the MERA projects, and the calculation of the updated 2022 MERA. DWD has \$581,500 in currently outstanding MERA related obligations.

Appendix A – Acronyms and Detailed Calculation Worksheets

List of Acronyms

20x2020: Refers to the conservation goal in DWD's 2015 Urban Water Management Plan

ADD: Average Day Demand

AWWA: American Water Works Association

BSNF: Burlington Northern Santa Fe

CCI: Construction Cost Index

CCWD: Contra Costa Water District

CIP: Capital Improvement Plan

COI: Bond Cost of Issuance (%)

COM: Commercial, Business & Light Industrial

COP: Certificate of Participation

CY: Calendar Year

DU: dwelling unit

DWD: Diablo Water District

DWR: Department of Water Resources

EDU: Equivalent Dwelling Unit

EM: Equivalent Meter ($\frac{5}{8}$ Inch connected to SFD)

ENR: Engineering News Report

FRC: Facility Reserve Charge

FY: Fiscal Year

gpcd: gallons per capita per day

gpd: gallons per day

ID: inside diameter

IND: industrial accounts

INS: institutional accounts: schools, public service

IRR: irrigation accounts

JIR: Jersey Island Road

LF: linear foot

MDD: Maximum Day Demand

MERA: Main Extension Reimbursement Assessment

MFD: Multiple-Family Dwelling

MG: million gallon

MGD: million gallons per day

RBWTP: Randall-Bold Water Treatment Plant
SCADA: Supervisory Control and Data Acquisition
SF: San Francisco
SFD: Single Family Dwelling
SOI: Sphere of Influence
TIC: True Interest Cost
WTP: Water Treatment Plant

Detailed Worksheets

Appendix Table A-1	Summary of Recommended Capital Improvement Projects for Ultimate DWD System
Appendix Table A-2	Current Water Use
Appendix Table A-3	Buildout Water Demands & Equivalent Meters
Appendix Table A-4	Future Development
Appendix Table A-5	CIP Expansion Project Financing
Appendix Table A-6	Current DWD Debt Amortization Schedule
Appendix Table A-7	2022 FRC Update
Appendix Table A-8	West of Jersey Island Rd 2022 FRC
Appendix Table A-9	East of Jersey Island Rd 2022 FRC
Appendix Table A-10	Bethel Island 2022 FRC
Appendix Table A-11	Delta Coves 2022 FRC
Appendix Table A-12	Main Extension Reimbursement Assessment-Related DWD Obligations
Appendix Table A-13	Pipeline Projects Funded by Developers

Table A-1
Summary of Recommended Capital Improvement Projects for Ultimate DWD System

Type of Project and Area Served	Project	Estimated Cost (July 2022 \$) (1)						
		Base Construction Cost	Total Construction Cost (2)	Project Implementation Allowance (3)	Land Cost	Total Capital Cost (Jul 2022 dollars) (1)	% Related to Growth (16)	Applied Amount
Systemwide Projects (Including Delta Coves)								
Treated Water Supply (4,10,11)	Future expansion of Randall-Bold WTP for additional 5 mgd capacity. WTP expansion cost includes replacement of Randall-Bold high lift pumps for additional pumping capacity, additional clearwell capacity, and treatment upgrades and associated documentation.	\$27,451,251	\$37,100,000	\$13,000,000	\$0	\$50,100,000	85%	\$42,585,000
Treated Water Supply (4,11)	Projects between 2021-2032 at Randall-Bold WTP associated with maintaining existing 15 mgd capacity available for near-term development. Costs obtained from CCWD's draft 2020 Water Treatment Plant Master Plan Report. Ultimate applied costs shown herein of \$2,445,903 provided by DWD from its Fund 02 Special Projects.	NA	NA	NA	\$0	\$7,411,827	33%	\$2,445,903
Groundwater Supply (5,12,13)	Groundwater Well #3: New well at 1.5 mgd average capacity. Well and pump station costs based on Stonecreek Well and Pump Station. Includes treatment system at \$854k and generator at \$240k . Assumes Land cost for 1 acre per site at up to \$400,000 per acre for developable land.	\$2,900,000	\$3,900,000	\$980,000	\$400,000	\$5,280,000	100%	\$5,280,000
	Pipeline to connect new High School well to Blending Facility pipeline. Pipeline anticipated to consist of installation of 18-inch DI pipe w/ 2,000 ft unpaved construction, and 3,500 ft paved construction. Pipe unit cost of \$327 per LF in unpaved roads, and \$430 per LF along Sellers Rd.	\$2,200,000	\$3,000,000	\$750,000	\$0	\$3,750,000	100%	\$3,750,000
	Groundwater Well #4: New well at 1.5 mgd average capacity. Assumes 2,000 ft of 18-inch DI pipe in paved alignment to connect to Well #3. Includes treatment system at \$854k and generator at \$240k . Assumes 50% increase from Base to Total Construction Cost due to additional planning required. Assumes land cost for 1 acre per site at up to \$400,000 per acre for developable land.	\$3,800,000	\$5,700,000	\$1,430,000	\$400,000	\$7,530,000	100%	\$7,530,000
Transmission Capacity (6,13)	Transmission pipeline in Neroly/Delta Roads, Sellers Avenue to Cypress Road (21,700 linear feet [LF] of 24-inch pipe at \$523 per LF assuming paved unit costs; plus 400 LF total for two cased crossings at Marsh Creek and Railroad at \$1,395 per LF). Does not include 1,566 LF installed under MERA for Riata project.	\$11,900,000	\$16,100,000	\$4,000,000	\$0	\$20,100,000	100%	\$20,100,000
Transmission Capacity (6,13)	Transmission pipeline from Reservoirs R-2 and R-3 to Neroly Road (2,700 LF of 24-inch steel pipe at \$522 per LF assuming paved unit costs). Transmission pipeline coming out of Randall-Bold WTP (500 LF of 30-inch steel pipe at \$483 per LF assuming paved unit cost).	\$1,700,000	\$2,300,000	\$580,000	\$0	\$2,880,000	48.1%	\$1,385,280

Type of Project and Area Served	Project	Estimated Cost (July 2022 \$) (1)						
		Base Construction Cost	Total Construction Cost (2)	Project Implementation Allowance (3)	Land Cost	Total Capital Cost (Jul 2022 dollars) (1)	% Related to Growth (16)	Applied Amount
Permanent Generators at Existing Wells (14)	New permanent generators placed at South Park Well Pump	\$630,000	\$900,000	\$230,000	\$0	\$1,130,000	48.1%	\$543,530
	New permanent generators placed at Stonecreek Well Pump Station: 200kW/250kVA	\$300,000	\$400,000	\$100,000	\$0	\$500,000	100%	\$500,000
Stonecreek Well Iron and Manganese Removal System (14)	Package treatment system to be installed at Stonecreek Well Pump Station. Treatment system quote of \$350k received; assume additional improvements required will result in 2x construction price; inflation also added.	\$854,039	\$1,200,000	\$300,000	\$0	\$1,500,000	100%	\$1,500,000
SCADA System Expansion (7,14)	Upgrade main SCADA control system (PLC's and HMI workstations) for future expansion to serve ultimate system facilities. Assumes system upgrade completed by 2025, and additional replacement of all equipment prior to buildout.	\$488,500	\$700,000	\$180,000	NA	\$880,000	48.1%	\$423,280
Facilities Plan Updates; Distribution System Map Updates (15)	Periodic updates of DWD's facilities plan and FRC/MERA to reflect actual growth and adjust facilities requirements for future growth; and periodic updates of the distribution system maps and facilities database to add new facilities as growth occurs.	NA	NA	NA	NA	\$1,187,047	100%	\$1,187,047
Growth Related Project Management (15)	Pre-planning, planning and related staff labor for growth projects. Assumed to be constant for ten years. Budgeted based on FY 22-23 Facilities Reserves and MERA staff support costs of \$887,494. (10 x \$887,494 = \$8,874,940)	NA	NA	NA	NA	\$8,874,940	100%	\$8,874,940
Solar (15)	Based on cost information provided by DWD from its Fund 02 Special Projects.	NA	NA	NA	NA	\$2,500,000	48.1%	\$1,202,500
Corporation Yard - New Building (Debt) (15)	Based on cost information provided by DWD from its Fund 02 Special Projects.	NA	NA	NA	NA	\$9,000,000	48.1%	\$4,329,000
Seismic Upgrades R1 and R2 (15)	Based on cost information provided in 2022 Seismic Evaluation Study and R2 improvements design.	\$2,770,000	\$3,700,000	\$930,000	NA	\$4,630,000	48.1%	\$2,227,030
Vehicles (15)	Based on cost information provided by DWD from its Fund 02 Special Projects.	NA	NA	NA	NA	\$432,500	50%	\$216,250
Asset Management System/GIS/Mapping Update (15)	Based on cost information provided by DWD from its Fund 02 Special Projects. Also added CM software with Y1 @ \$9,100 and \$6,600 every year after for a total of ten years.	NA	NA	NA	NA	\$644,775	100%	\$644,775
Subtotal for Systemwide Projects (Including Delta Coves)						\$128,331,090		\$104,724,535

Type of Project and Area Served	Project	Estimated Cost (July 2022 \$) (1)						
		Base Construction Cost	Total Construction Cost (2)	Project Implementation Allowance (3)	Land Cost	Total Capital Cost (Jul 2022 dollars) (1)	% Related to Growth (16)	Applied Amount
East of Jersey Island Road - Expansion Facilities (Not Including Bethel Island & Delta Coves)								
Storage and Pumping Facilities (8,9,15)	Cypress Reservoir & Pump Station: First phase including all site work, 2.5 MG tank, and pump station building with capacity for 5 x 60 HP pumps (4 duty + 1 standby pumps, each at 1,200 gpm and 150 total dynamic head design point). Also assumes chemical storage @ \$253k, tank mixer @ \$80k, and generator @ \$295k. Land cost for 3.7 acres at \$400k per acre.	\$5,124,233	\$6,900,000	\$1,700,000	\$1,805,682	\$10,405,682	100%	\$10,405,682
	Cypress Reservoir & Pump Station: Second phase with second 2.5 MG tank, add additional pump at pump station as needed, up to 5 duty pumps at build out.	\$3,050,139	\$4,100,000	\$1,030,000	\$0	\$5,130,000	100%	\$5,130,000
Transmission Capacity (6,13)	Transmission pipeline parallel to Cypress Road (3,100 LF of 20-inch pipe at \$484 per LF assuming paved unit costs).	\$1,500,000	\$2,000,000	\$500,000	\$0	\$2,500,000	100%	\$2,500,000
<i>Subtotal for East of Jersey Island Road - Expansion Facilities (Not Including Bethel Island & Delta Coves)</i>						\$18,035,682		\$18,035,682
Bethel Island and Delta Coves								
Transmission Capacity (6,13)	Transmission pipeline in Bethel Island Road (500 LF of 18-inch pipe at \$451 per LF assuming paved unit costs and 650 LF of 18-inch pipe assuming trenchless unit cost of \$1036 per LF). Assumes 50% implementation allowance.	\$900,000	\$1,200,000	\$600,000	\$0	\$1,800,000	100%	\$1,800,000
<i>Subtotal for Bethel Island & Delta Coves</i>						\$1,800,000		\$1,800,000
GRAND TOTAL FOR ALL RECOMMENDED PROJECTS						\$148,166,772		\$124,560,218

(1) All costs in these columns as marked are in July 2022 dollars, ENR CCI for San Francisco of 15640.10.

(2) Unless noted otherwise, Total Construction Cost equals the base construction cost plus a 35% construction contingency to cover required work not yet identified at the planning level, unforeseen conditions, bid climate, and change orders during construction.

(3) Project implementation allowance equals 25% of total construction cost for all projects except the Randall-Bold WTP expansion to cover engineering design, construction services, environmental, permitting, and legal. The implementation allowance for the Randall-Bold WTP expansion project is 35% of total construction cost to include an additional 10% for CCWD project administration.

(4) Due to existing and planned DWD groundwater wells, current financial plan anticipates DWD owned capacity of Randall-Bold WTP will be 20 mgd, requiring expansion of the Randall-Bold WTP by 5 mgd.

(5) Groundwater well costs include standby power capability for use as emergency storage. Costs are based on the Stonecreek Well and Pump Station construction.

(6) Pipeline unit construction costs include valves and appurtenances, pavement removal and replacement, traffic control, and an average allowance for correction of utility interferences.

(7) Costs of projects for supply and distribution storage and pumping include the costs of SCADA equipment for those facilities. Work associated with this item assumed to include: new Monitoring panel PLC at the Corp Yard; new PLC at the DWD/Randall-Bold WTP control panel; new PLC at the Blending Facility, new Ethernet switch at the Corp Yard, radio system upgrades/replacement, Local Operating Panel replacements at South Park PS, Glen Park PS, and Blending Facility. Capital cost reflects rough estimate for all work to be performed.

(8) Reservoir costs assume above-ground concrete tanks, and include site work, valve vault, telemetry, piping and appurtenances. Costs for reservoirs east of Jersey Island Road include a soil/foundation allowance due to the poor soils in those areas.

(9) Distribution pump station costs assume an above-ground building, and include standby pump, standby power, and telemetry.

(10) Existing customers receive benefit from pump replacement and treatment upgrades. Estimated 85% for growth.

(11) Costs based on parametric project costs, as substantiated by CCWD.

(12) Costs based on vendor-provided values or recent costs of similar projects.

(13) Costs based on AACE-licensed estimator's construction cost estimate of primary elements of future project, based on July 2022 local material and goods pricing.

(14) Costs based on ENR CCI-based updated of historic vendor pricing obtained by DWD.

(15) DWD estimate based on projected or historic costs.

(16) Based on 2021 water use data, approximately 55% of the District's existing system is available for future growth considering its available water supply sources, and 41.2% is available for future growth considering its existing water storage capacity; the average of these values, 48.1%, was used to reflect the system capacity available for future growth where these conditions apply.

**Table A-2
Current Water Use**

Description	Customer Classifications					Total	
	Single Family Dwelling	Multi-Family Dwelling ^a	Commercial / Other ^b	Irrigation	Industrial		
Ratio of Maximum to Average Water Demand in Million Gallons / Day (MGD) (a)							
Average Day Demands (MGD)	4.02	0.14	0.20	0.49	0.00	4.85	
Max. Month (MGD)	5.47	0.16	0.27	0.82	0.00	6.72	
Ratio of Max. Month to Average Day Demand	1.36	1.10	1.34	1.69		1.39	
Maximum Day Demands (MGD, MDD) ^c						8.38	
Active Service Connections^d							
West of JIR	11,883	20	157	161	0	12,221	94%
East of JIR (excludes 215 accounts on local wells)	626	0	9	19	0	654	5%
Bethel Island (excludes unmetered local wells) ^e	98	0	1	5	0	104	1%
Total Active Service Connections (excluding fire)	12,607	20	167	185	0	12,979	100%
Estimated Average Daily Demand by Service Area							
West of JIR (MGD)	3.79	0.14	0.19	0.42		4.54	
East of JIR (MGD)	0.20	0.00	0.01	0.05		0.26	
Bethel Island (MGD)	0.00	0.00	0.00	0.01		0.01	
Total Average Day Demands (MGD)	4.02	0.14	0.20	0.49	0.00	4.85	
Estimated Total Current Maximum Day Demand (MGD, MDD)							
RBWTP						8.31	
Wells						0.06	
Estimated Total						8.38	
Current Sources of Supply							
	Capacity in Use	Existing System Net Capacity (MGD)	Max Day Demand MGD ^e	Average Day Demand			
					(MGD)	(MG/yr)	
RBWTP Surface Water	57%	14.6	8.31		5.48	1,999	
Groundwater	2%	4.0	0.06		0.04	15.6	
Total	59%	18.6	8.38		5.52	2,014	
Unaccounted for Water				12.2%	0.67		
Total Metered Water Use					4.85		

^a Includes apartments, condominiums and mobile home courts

^b Includes business, churches, clubs, and public.

^c Demand values used for FRC and MERA are Maximum Day Demands (MDD) which for this study occurred June 17, 2021. Discreet peak day demands by customer classification are not available.

^d As of December 31, 2021

^e Bethel Island data on this tab includes Delta Coves current uses.

Table A-3
Buildout Water Demands & Equivalent Meters

Description	Customer Classes					Total
	Single Family Dwelling	Multi-Family Dwelling	Commercial / Other	Irrigation	Industrial	
Customer Average Day Demands at Buildout (a)	Values from 2020 Facilities Plan (c)					
West of Jersey Island Road (MGD) (b)	5.29	0.90	1.45	0.52	0.08	8.24
East of Jersey Island Road (MGD)	1.52	0.51	0.11	0.25	0.00	2.39
Bethel Island (MGD) (includes Delta Coves)	1.00	0.23	0.25	0.03	0.00	1.51
Total Diablo Water District (MGD)	7.81	1.64	1.81	0.80	0.08	12.14
						23.7
Single Family Average Day Unit Demand, gpd/du (a)	360	<-Fixed planning value from 2020 Facilities Plan.				
Future Ratio of Max Day to Avg Daily Demand Peaking Factor	2.0	1.1	2.0	3.0	1.1	2.0
Maximum Day Demands (MGD) [= avg day x peaking factor]	15.9	1.804	3.6	2.4	0.1	23.7
System Demand at Buildout (EM)	21,694	2,465	4,946	3,217	120	32,443
Estimated average gallons per day use per dwelling unit (DU) at maximum day demand (MDD). This equals gallons per day per Equivalent Meter (EM) as the Maximum Daily Demand	732					
Maximum Day Demands at Buildout (MGD)						
West of JIR	10.8	1.0	2.9	1.5	0.1	16.3
East of JIR	3.1	0.6	0.2	0.7	0.0	4.6
Bethel Island (includes Delta Coves)	2.0	0.3	0.5	0.1	0.0	2.9
Total System	15.9	1.8	3.6	2.4	0.1	23.7
Current System Demand						8.4
New System Demand (MGD @ MDD)	15.9	1.8	3.6	2.4	0.1	15.4
Maximum Day Demands at Buildout (Equivalent Meters (EM))						
West of JIR	14,694	1,353	3,962	2,103	120	22,233
East of JIR	4,222	767	301	1,011	0	6,300
Bethel Island	2,284	302	634	98	0	3,318
Delta Coves (d)	494	44	49	5	0	592
Total System EM at Buildout	21,694	2,465	4,946	3,217	120	32,443
Current System EM	12,607	257	548	1,991	0	15,403
New (Future) Demands	9,087	2,208	4,398	1,227	120	17,040
New (Future) Equivalent Meters by Area (EM) (a)						
West of JIR	2,811	1,096	3,447	371	120	7,845
East of JIR	3,596	767	271	807	0	5,440
Bethel Island	2,196	302	631	50	0	3,178
Delta Coves	484	44	49	(0)	0	576
Total	9,087	2,208	4,398	1,227	120	17,040

a. Future (new) demand in DWD service areas at buildout (2040) per Table 5-9 of the June 2020 Facilities Plan assumptions and current usage.

b. Build out Industrial demand is presumed to equal the anticipated demand at Oakley, page 5-4 of 2020 Facilities Plan.

c. DWD no longer anticipates providing potable water for irrigation on Bethel Island, as shown in the 2020 Facilities Plan, Table 5-9. Future irrigation values on Bethel Island have been significantly reduced.

d. Delta Coves EM values are based on the following information provided by Yousra Tilden (BKF) on October 18, 2013:

Single family residential = 494 units

Condominiums = 96 units,

Commercial establishments = 6 units over 7 acres, plus 5.8 acres for the Yacht Club, totals 13 acres.

To convert the number of condominium units to equivalent meters (EMs), we have presumed that MFD customers have an average of 8 dwelling units (DU) per account at buildout. Buildout MFD accounts total 600 (2020 Facilities Plan, Table 5-3), or 4,800 DU. Estimate one MFD DU equals 0.45 EDUs based on the 2019 and 2020 water use and EMs data. Therefore, 96 MFD equates to 44 EM.

To convert the commercial acres to EMs, we used the 2020 Facilities Plan, Table 5-5, unit demand factors for SFD and Commercial to estimate the number of DUs per acre of Commercial land (1360 gpd/acre / 360 gpd/du = 3.8 du/acre). Presume one EM equals one single family DU. Therefore, 13 acres of Commercial land equates to 49 EMs.

DWD indicated that five irrigation customers already exist in Delta Coves. June 2020. No additional irrigation services in Delta Coves are anticipated.

Table A-4
Future Development

Description	Planned Buildout Capacity	FY 2021 Used System Capacity	Existing System Capacity (2021)	Future Development (New EM Customers)
Total System Water Sources of Supply	Per 2020 Facilities Plan			
Current RBWTP Capacity (MGD) (a)	15.0		15.0	
Future RBWTP Capacity (MGD) (a)	5.0			
Total RBWTP Capacity (MGD) (a)	20.0			
Less current in-plant water uses of 3% (a)	(0.45)		(0.45)	
Net Capacity (MGD)	19.6			
WTP at Maximum Day (MGD) (b)	19.6	6.6	14.6	13.0
Groundwater Supply at Max Day (MGD) (c)	7.0	1.7	4.0	5.3
Total Capacity (MGD with standby and blending reserves)	26.6	8.38	18.6	18.2
Customer Buildout Demands (EM)	Planned Buildout Demands	Existing Active Demands (EM)		
West of JIR (b)	22,233	14,388		
East of JIR	6,300	860		
Bethel Island	3,318	140		
Delta Coves	592	16		
Total Equivalent Meters (EM)	32,443	15,403		
Peak Water Use per EM (gpd/EM, MDD)	732			
Total Demand (MDD, MGD)	23.7			

Equivalent Meter (EM) provides water service to one single-family dwelling.

a. Current net DWD capacity at Randall-Bold WTP less in-plant water uses of 3%. Table assumes future 5 MGD increase will be as net capacity. Both per 2020 Facilities Plan Section 9.3.1.

b. Includes 1.1 MGD in reserved industrial capacity, in West of JIR area, assigned to RBWTP.

c. Total groundwater supply as of 2020 includes 2 MGD from the Stonecreek Well, 2 MGD for the Glen Park Well, and presumes the Bethel Island residential wells will be retired before buildout.

Table A-5
CIP Expansion Project Financing

	Systemwide Projects (Including Delta Coves)	West of Jersey Island Road	East of Jersey Island Rd. (Not Including Bethel Island & Delta Coves)	Bethel Island & Delta Coves	Grand Total
	<i>Principal Amounts from Table 1</i>				
Principal Amount	\$104,724,535	\$0	\$18,035,682	\$1,800,000	\$124,560,218
First Year of Debt Service	2022	2022	2022	2022	
Last Year of Debt Service	2046	2046	2046	2046	
Annual Debt Service^a	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2022	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2023	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2024	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2025	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2026	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2027	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2028	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2029	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2030	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2031	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2032	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2033	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2034	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2035	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2036	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2037	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2038	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2039	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2040	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2041	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2042	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2043	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2044	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
2045	\$7,653,377	\$0	\$1,318,066	\$131,546	\$9,102,989
Total DWD Debt Service for 2023 - 2046^b	\$183,681,048	\$0	\$31,633,590	\$3,157,101	\$218,471,739

a. DWD Debt Service for 2022 CIP Projects is based on 25 year Bonds, Level Payments at 5% TIC and 3% COI.

b. Assumes that CIP capital costs for 2022 will be funded through 2022 Certificate of Participation.

Table A-6
Current DWD Debt Amortization Schedule

Year	2019 COP New Corporation Yard			2019 Refinance - 2010 Stony Creek			2019 Restructure - 2014 Admin Building			2013 Refinance - Glenn Park / Blending			2022 COP -			Roll-Up All Debt		
	Total Annual	General	Reimbursable	Total Annual	General	Reimbursable	Total Annual	General	Reimbursable	Total Annual	General	Reimbursable	Total Annual	General	Reimbursable	Total Annual	General	Reimbursable
		0%	100%		0%	100%		58%	43%		24%	76%		50%	50%		29.9%	70.1%
2022	\$215,200	\$0	\$215,200	\$234,200	\$0	\$234,200	\$262,400	\$150,880	\$111,520		\$0	\$0		\$0	\$0	\$711,800	\$150,880	\$560,920
2023	\$212,400	\$0	\$212,400	\$233,800	\$0	\$233,800	\$260,000	\$149,500	\$110,500	\$438,333	\$105,200	\$333,133	\$257,700	\$128,850	\$128,850	\$1,402,233	\$383,550	\$1,018,683
2024	\$214,600	\$0	\$214,600	\$238,200	\$0	\$238,200	\$262,400	\$150,880	\$111,520	\$435,000	\$104,400	\$330,600	\$484,800	\$242,400	\$242,400	\$1,635,000	\$497,680	\$1,137,320
2025	\$211,600	\$0	\$211,600	\$237,200	\$0	\$237,200	\$259,400	\$149,155	\$110,245	\$436,800	\$104,832	\$331,968	\$482,200	\$241,100	\$241,100	\$1,627,200	\$495,087	\$1,132,113
2026	\$213,600	\$0	\$213,600	\$231,000	\$0	\$231,000	\$261,200	\$150,190	\$111,010	\$438,000	\$105,120	\$332,880	\$484,400	\$242,200	\$242,200	\$1,628,200	\$497,510	\$1,130,690
2027	\$215,400	\$0	\$215,400	\$234,800	\$0	\$234,800	\$257,600	\$148,120	\$109,480	\$438,600	\$105,264	\$333,336	\$481,200	\$240,600	\$240,600	\$1,627,600	\$493,984	\$1,133,616
2028	\$212,000	\$0	\$212,000	\$238,200	\$0	\$238,200	\$258,800	\$148,810	\$109,990	\$438,600	\$105,264	\$333,336	\$482,800	\$241,400	\$241,400	\$1,630,400	\$495,474	\$1,134,926
2029	\$213,600	\$0	\$213,600	\$231,200	\$0	\$231,200	\$259,600	\$149,270	\$110,330	\$438,000	\$105,120	\$332,880	\$484,000	\$242,000	\$242,000	\$1,626,400	\$496,390	\$1,130,010
2030	\$215,000	\$0	\$215,000	\$234,200	\$0	\$234,200	\$260,000	\$149,500	\$110,500	\$436,800	\$104,832	\$331,968	\$484,800	\$242,400	\$242,400	\$1,630,800	\$496,732	\$1,134,068
2031	\$211,200	\$0	\$211,200	\$231,800	\$0	\$231,800							\$485,200	\$242,600	\$242,600	\$928,200	\$242,600	\$685,600
2032	\$212,400	\$0	\$212,400	\$234,200	\$0	\$234,200							\$485,200	\$242,600	\$242,600	\$931,800	\$242,600	\$689,200
2033	\$213,400	\$0	\$213,400	\$236,200	\$0	\$236,200							\$484,800	\$242,400	\$242,400	\$934,400	\$242,400	\$692,000
2034	\$214,200	\$0	\$214,200	\$232,800	\$0	\$232,800							\$484,000	\$242,000	\$242,000	\$931,000	\$242,000	\$689,000
2035	\$214,800	\$0	\$214,800	\$239,200	\$0	\$239,200							\$482,800	\$241,400	\$241,400	\$936,800	\$241,400	\$695,400
2036	\$215,200	\$0	\$215,200										\$481,200	\$240,600	\$240,600	\$696,400	\$240,600	\$455,800
2037	\$215,400	\$0	\$215,400										\$484,200	\$242,100	\$242,100	\$699,600	\$242,100	\$457,500
2038	\$215,400	\$0	\$215,400										\$481,600	\$240,800	\$240,800	\$697,000	\$240,800	\$456,200
2039	\$215,200	\$0	\$215,200										\$483,600	\$241,800	\$241,800	\$698,800	\$241,800	\$457,000
2040	\$214,800	\$0	\$214,800										\$485,000	\$242,500	\$242,500	\$699,800	\$242,500	\$457,300
2041	\$214,200	\$0	\$214,200										\$480,800	\$240,400	\$240,400	\$695,000	\$240,400	\$454,600
2042	\$213,400	\$0	\$213,400										\$481,200	\$240,600	\$240,600	\$694,600	\$240,600	\$454,000
2043	\$212,400	\$0	\$212,400										\$481,000	\$240,500	\$240,500	\$693,400	\$240,500	\$452,900
2044	\$211,200	\$0	\$211,200										\$485,200	\$242,600	\$242,600	\$696,400	\$242,600	\$453,800
2045	\$214,800	\$0	\$214,800										\$483,600	\$241,800	\$241,800	\$698,400	\$241,800	\$456,600
2046	\$213,000	\$0	\$213,000										\$481,400	\$240,700	\$240,700	\$694,400	\$240,700	\$453,700
2047	\$216,000	\$0	\$216,000										\$483,600	\$241,800	\$241,800	\$699,600	\$241,800	\$457,800
2048	\$213,600	\$0	\$213,600													\$213,600	\$0	\$213,600
2049	\$211,000	\$0	\$211,000													\$211,000	\$0	\$211,000
2050	\$213,200	\$0	\$213,200													\$213,200	\$0	\$213,200
Totals 2022 through 2050	\$6,198,200	\$0	\$6,198,200	\$3,287,000	\$0	\$3,287,000	\$2,341,400	\$1,346,305	\$995,095	\$3,500,133	\$840,032	\$2,660,101	\$11,856,300	\$5,928,150	\$5,928,150	\$27,183,033	\$8,114,487	\$19,068,546

**Table A-7
2022 FRC Update**

Description	Facilities Reserve Fund for Fee Reduction (c)	FRC Financing of Expansion Projects (From CIP)	Remaining Debt Service for Expansion-Related Systemwide Facilities					Totals		
			2019 COP New Corporation Yard	2019 Refinance - 2010 Stony Creek	2019 Restructure - 2014 Admin Building	2013 Refinance - Glenn Park / Blending	2022 COP -			
			% Reimbursable	% Reimbursable	% Reimbursable	% Reimbursable	% Reimbursable			
			100%	100%	43%	76%	50%			
DWD Assets, Costs & Contractual Obligations										
Base Systemwide	(\$7,530,350)	\$183,681,048	\$6,198,200	\$3,287,000	\$995,095	\$2,660,101	\$5,928,150	\$202,749,595		
West of JIR		\$0						\$0		
East of JIR		\$31,633,590						\$31,633,590		
Bethel Island ^a		\$2,672,384						\$2,672,384		
Delta Coves ^a		\$484,717						\$484,717		
Total		\$218,471,739	\$6,198,200	\$3,287,000	\$995,095	\$2,660,101	\$5,928,150	\$237,540,285		
Future Development Customers Paying FRCs (EM)	Future Equivalent Meters									
West of JIR	7,845									
East of JIR	5,440									
Bethel Island	3,178									
Delta Coves	576									
Incremental Unit Payments (\$/EM, Future Customers)		FRC Projects (\$ per EM)	FRC Debt Service Payments (\$ per EM)					Total FRC Cost per Equivalent Meter^d	Less Facilities Reserve Fund for Fee Reduction^e	Net FRC Cost per Equivalent Meter
Systemwide Base FRC		\$10,779	\$364	\$193	\$58	\$156	\$348	\$11,899	(\$442)	\$11,457
Supplemental FRCs										
West of JIR		\$0						\$11,899	(\$442)	\$11,457
East of JIR		\$5,815						\$17,713	(\$442)	\$17,271
Bethel Island ^b		\$841						\$12,739	(\$442)	\$12,297
Delta Coves		\$841						\$12,739	(\$442)	\$12,297

The 2022 FRC Update is based on Future Cashflows Associated with Facility Expansion.

- a. Allocated the Bethel Island/ Delta Coves project based on buildout equivalent meters.
- b. The Bethel Island Supplemental FRC for Distribution Storage & Pumping Facilities will be determined on a case-by-case basis depending on requests for service.
The Total FRC for Bethel Island will be the Base Fee plus the Supplemental Fee identified on a case-by-case basis.
- c. Facilities Reserve Fund balance of \$7,530,350, as of June 30, 2022. Source: DWD Monthly Financial Report for Period June 1, 2022 to June 30, 2022 pg. 1
- d. System-wide base FRC + the supplemental FRC amounts for the respective service areas.
- e. Reserve fund reduction is calculated by dividing the amount in the facilities reserve fund of \$7.53 million by the base system-wide future equivalent meters [14,762]

Table A-8

West of Jersey Island Rd 2022 FRC

Meter Size (inches) ^a	Capacity Ratio Factors (a)	2011 FRC Charges	2013 FRC Charges	2015 FRC Charges	2016 FRC Charges	2018 FRC Charges	2020 FRC Charges	2022 FRC Charges
5/8" (EM)	1.0	\$5,366	\$5,113	\$6,548	\$6,865	\$8,248	\$7,880	\$11,457
1"	1.4	\$7,512	\$7,158	\$9,167	\$9,611	\$11,547	\$11,032	\$16,039
1.5"	1.8	\$9,658	\$9,203	\$11,786	\$12,357	\$14,847	\$14,184	\$20,622
2"	2.9	\$15,560	\$14,828	\$18,989	\$19,909	\$23,920	\$22,852	\$33,224
3"	11.0	\$59,021	\$56,243	\$72,025	\$75,516	\$90,730	\$86,680	\$126,023
4"	14.0	\$75,118	\$71,582	\$91,669	\$96,112	\$115,475	\$110,320	\$160,393
6"	21.0	\$112,677	\$107,373	\$137,503	\$144,168	\$173,212	\$165,480	\$240,589
8"	29.0	\$155,602	\$148,277	\$189,885	\$199,088	\$239,197	\$228,520	\$332,242

a. All meter capacity ratio factors are from AWWA Manual M1. Charges for meters greater than 8" to be determined by DWD on a case-by-case basis.

The charge for a 1" meter for residential services, which is made necessary for the installation of a fire sprinkler system, is the same as the charge for a 5/8" meter for one- and two-family residential systems.

Table A-9

East of Jersey Island Rd 2022 FRC

Meter Size (inches)	Capacity Ratio Factors (a)	2011 FRC Charges	2013 FRC Charges	2015 FRC Charges	2016 FRC Charges	2018 FRC Charges	2020 FRC Charges	2022 FRC Charges
5/8" (EM)	1.0	\$9,296	\$8,929	\$8,918	\$9,316	\$10,864	\$12,911	\$17,271
1"	1.4	\$7,512	\$12,501	\$12,485	\$13,043	\$15,210	\$18,075	\$24,180
1.5"	1.8	\$9,658	\$16,072	\$16,052	\$16,769	\$19,556	\$23,240	\$31,088
2"	2.9	\$15,560	\$25,894	\$25,861	\$27,017	\$31,507	\$37,442	\$50,086
3"	11.0	\$59,021	\$98,219	\$98,095	\$102,478	\$119,507	\$142,021	\$189,983
4"	14.0	\$75,118	\$125,006	\$124,848	\$130,427	\$152,100	\$180,754	\$241,796
6"	21.0	\$112,677	\$187,509	\$187,273	\$195,640	\$228,151	\$271,131	\$362,694
8"	29.0	\$155,602	\$258,941	\$258,614	\$270,170	\$315,065	\$374,419	\$500,864

a. All meter capacity ratio factors are from AWWA Manual M1. Charges for meters greater than 8" to be determined by DWD on a case-by-case basis.

The charge for a 1" meter for residential services, which is made necessary for the installation of a fire sprinkler system, is the same as the charge for a 5/8" meter for one- and two-family residential systems.

Table A-10

Bethel Island 2022 FRC

Meter Size (inches)	Capacity Ratio Factors (a)	2011 FRC Charges	2013 FRC Charges	2015 FRC Charges	2016 FRC Charges	2018 FRC Charges	2020 FRC Charges	2022 FRC Charges
5/8" (EM)	1.0	\$5,366	\$5,113	\$4,816	\$5,072	\$5,920	\$8,034	\$12,297
1"	1.4	\$7,512	\$7,158	\$6,742	\$7,100	\$8,288	\$11,248	\$17,216
1.5"	1.8	\$9,658	\$9,203	\$8,669	\$9,129	\$10,656	\$14,461	\$22,135
2"	2.9	\$15,560	\$14,828	\$13,966	\$14,708	\$17,169	\$23,299	\$35,663
3"	11.0	\$59,021	\$56,243	\$52,975	\$55,789	\$65,122	\$88,374	\$135,272
4"	14.0	\$75,118	\$71,582	\$67,422	\$71,004	\$82,883	\$112,476	\$172,165
6"	21.0	\$112,677	\$107,373	\$101,133	\$106,506	\$124,324	\$168,714	\$258,247
8"	29.0	\$155,602	\$148,277	\$139,660	\$147,080	\$171,685	\$232,986	\$356,627

a. All meter capacity ratio factors are from AWWA Manual M1. Charges for meters greater than 8" to be determined by DWD on a case-by-case basis.

The charge for a 1" meter for residential services, which is made necessary for the installation of a fire sprinkler system, is the same as the charge for a 5/8" meter for one- and two-family residential systems.

Table A-11
Delta Coves 2022 FRC

Meter Size (inches)	Capacity Ratio Factors (a)	2011 FRC Charges	2013 FRC Charges	2015 FRC Charges	2016 FRC Charges	2018 FRC Charges	2020 FRC Charges	2022 FRC Charges
$\frac{5}{8}$ " (EM)	1.0	\$5,366	\$5,113	\$4,816	\$5,072	\$5,920	\$8,034	\$12,297
1"	1.4	\$7,512	\$7,158	\$6,742	\$7,100	\$8,288	\$11,248	\$17,216
1.5"	1.8	\$9,658	\$9,203	\$8,669	\$9,129	\$10,656	\$14,461	\$22,135
2"	2.9	\$15,560	\$14,828	\$13,966	\$14,708	\$17,169	\$23,299	\$35,663
3"	11.0	\$59,021	\$56,243	\$52,975	\$55,789	\$65,122	\$88,374	\$135,272
4"	14.0	\$75,118	\$71,582	\$67,422	\$71,004	\$82,883	\$112,476	\$172,165
6"	21.0	\$112,677	\$107,373	\$101,133	\$106,506	\$124,324	\$168,714	\$258,247
8"	29.0	\$155,602	\$148,277	\$139,660	\$147,080	\$171,685	\$232,986	\$356,627

a. All meter capacity ratio factors are from AWWA Manual M1. Charges for meters greater than 8" to be determined by DWD on a case-by-case basis.

The charge for a 1" meter for residential services, which is made necessary for the installation of a fire sprinkler system, is the same as the charge for a 5/8" meter for one- and two-family residential systems.

Table A-12

Main Extension Reimbursement Assessment-Related DWD Obligations

Developer	Development	Date Accepted	MERA Total		Jul-22	Jul-23
Centex Homes	8530 /8790 Riata	8/31/2008 Payments started in 2012	\$158,870	Year End Balance	\$0	\$0
				Payments	\$0	\$0
Pulte Homes	8731 - Magnolia Park	8/15/2011 Payments started in 2012	\$220,405	Year End Balance	\$0	\$0
				Payments	\$0	\$0
Discovery Homes	8736 - Pheasant Meadows	Pending/On Hold	\$7,612	Year End Balance	\$7,612	\$7,612
				Payments	\$0	\$0
City of Oakley	CIP 92	7/1/2016	\$35,360	Year End Balance	\$0	\$0
				Payments	\$5,360	\$0
SDC Delta Coves LLC	6013 - Delta Coves - 18" Offsite	4/24/2019	\$810,606	Year End Balance	\$486,366	\$405,306
				Payments	\$81,060	\$81,060
Brookfield Emerson Land, LLC	9032, 9349, 9350, & 9351 Emerson Ranch	2/26/2020	\$30,250	Year End Balance	\$15,250	\$10,250
				Payments	\$5,000	\$5,000
AD Seeno Construction	8760/9027 - Carpenter Road Improvements - 18" Waterline	Pending Acceptance	\$90,340	Year End Balance	\$72,272	\$63,238
				Payments	\$9,034	\$9,034
Totals:			\$1,353,443	Year End Balance	\$581,500	\$486,406
				Payments	\$100,454	\$95,094

**Table A-13
Pipeline Projects Funded by Developers**

General Location	Pipe Capacity Req'd for Build out (Inch ID)	Fully Burdened Unit Cost (2022 per LF)	Pipe Length Req'd for Buildout (LF)	Construction Contingency	Est Pipe Distribution Cost	Pipe Capacity Req'd for Current Developers (Inch ID)	Current Developer Reimbursement Unit Cost (\$ per LF)	DWD Payments to Developer for Oversizing Reimbursement (10 yr payment)
West of Jersey Island Road Area								
12" pipelines (initially unpaved conditions)	12	\$231	24,000	25%	\$6,930,000	8	\$179	\$2,634,000
16" pipelines (initially unpaved conditions)	16	\$301	9,150	25%	\$3,440,000	8	\$179	\$1,802,150
18" pipelines (initially unpaved conditions)	18	\$327	3,850	25%	\$1,570,000	8	\$179	\$880,850
Subtotal West of Jersey Island Road Area			37,000		\$11,940,000			\$5,317,000
East of Jersey Island Road Area								
12" pipelines (initially unpaved conditions)	12	\$243	56,200	25%	\$17,070,000	8	\$192	\$6,285,782
18" pipelines (initially unpaved conditions)	18	\$349	2,250	25%	\$980,000	8	\$192	\$548,248
20" pipelines (initially unpaved conditions)	20	\$379	8,800	25%	\$4,170,000	8	\$192	\$2,481,368
24" pipelines (initially unpaved conditions)	24	\$440	1,400	25%	\$770,000	8	\$192	\$501,354
Contra Costa Canal Crossing just northwest of Jersey Island Road & East Cypress Rd. (pipe and casing) (initially unpaved conditions)	20	\$1,375	200	25%	\$340,000	8	\$802	\$179,506
Subtotal East of Jersey Island Road Area			68,850		\$23,330,000			\$9,996,258
Bethel Island								
16" pipelines on Bethel Island (DIP) (initially paved conditions)	16	\$425	24,500	25%	\$13,030,000	12	\$338	\$4,753,900
Subtotal Bethel Island			24,500		\$13,030,000			\$4,753,900
Summary								
Subtotal West of Jersey Island Road Area			37,000		\$11,940,000			\$5,317,000
Subtotal East of Jersey Island Road Area			68,850		\$23,330,000			\$9,996,258
Subtotal Bethel Island			24,500		\$13,030,000			\$4,753,900
Total DWD Sphere of Influence			130,350		\$48,300,000			\$20,067,158

These projects represent the remaining facilities required to buildout. Distribution pipes already constructed are listed in the fixed assets.

Note: The MERA calculation is for DWD's Sphere of Influence, including service to Delta Coves on Bethel Island. Specific requirements for service to other parts of Bethel Island will be determined on a case-by-case basis.

All costs in this table are in July 2022 dollars. Unit costs for pipes include pipes, fittings, valves and corrosion protection. The unit costs are average values including both simple and difficult projects. Unit costs do not include any construction contingency. Pave unit costs are used for major transmission projects. The estimated construction cost includes a 25 percent contingency.

Applicable costs for potential reimbursement are calculated as: 1) For SOI except Delta Coves, the estimated construction cost minus the cost for an 8-inch pipeline using unit costs of 8-inch pipeline (unpaved) and for 8-inch pipe in casing; and 2) For Bethel Island as the estimated construction cost of 16-inch DIP minus the cost for a 12-inch DIP pipeline using unit costs specifically developed by CDM Smith in July 2022 dollars. Unit costs by CDM Smith do not include mobilization, restoration, patching, or other ancillary items/activities. Specific reimbursement amounts are determined on a case-by-case basis for each development based on DWD's MERA policy. New development is reimbursed for the difference between the cost of the required waterline and the cost of either an 8-inch or 12-inch pipeline depending on what is required to provide adequate service, including fire flows, for the development.