DES MOINES WATER WORKS
Board of Water Works Trustees

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MEMORANDUM

DATE: June 1, 2022

TO: Ted Corrigan, P.E., CEO and General Manager

FROM: Amy Kahler, Chief Financial Officer
Michael J. McCurnin, Director of Engineering Services

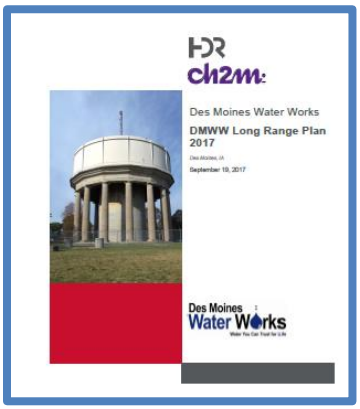
SUBJECT: 2023-2027 Five-Year Capital Improvement Plan

Background

Capital improvement planning was first introduced to our budgeting process in 2015 with the development of a 3-year Capital Improvement Plan (CIP). Over the course of the last several years, the planning has been expanded to a five-year window. Previous CIPs have included the current approved capital budget as the beginning year. After the 2018-2022 effort, a conscious decision was made to not include an approved budget year in subsequent five-year CIP efforts. The 2023-2027 Five-Year CIP is presented via this memorandum and identifies nearly $362 million in viable overall capital spending which is approximately $100 million more than the previous five-year CIP. Refined cost estimates for plant expansion efforts and the inclusion of a filter plant rehabilitation account for this difference. This CIP continues to advocate for the key themes and projects present in previous CIP efforts including treatment plant expansion, water quality projects, and other reinvestments in the broad system. It is projected to use water rates to fund $125 million of the total while using a combination of regional participation, debt, and funding by others for the remaining $237 million.

The CIP is typically presented to the Board in the first quarter of each year, but this year staff has elected to present in June to allow regionalization discussions to develop in advance of finalizing a proposed plan. A comprehensive list of projects (mostly from long-range planning efforts and special studies or investigations) is initially identified. Staff then trims this initial list and positions project costs across the five-year window. The annual budgeting process is closely linked to this effort and follows in the latter half of the year.

Throughout its history, Des Moines Water Works (DMWW) has completed a variety of long-range planning documents to provide guidance for treatment, distribution, and other utility needs. Most recently, DMWW consulted with consultants CH2M and HDR to complete the DMWW Long Range Plan 2017. The DMWW Long Range Plan 2017 stands to serve as a guidepost for the next several years.



The work for this planning document was broad and intensive. It included:

- Population and water demand until 2040 for the metro area (wholesale customers participated in this effort)
- Standards of service for the entire system
- Hydraulic modeling of both Des Moines and regional distribution systems
- More than $625 million in project costs (2016 dollars) for source, treatment, pumping, storage, and transmission improvements until 2040
- A water main replacement model with main break targets (breaks per 100 miles of pipe) through 2040 for the Des Moines water distribution systems

All departments participate in the CIP process by identifying the capital needs within their respective areas. The components of the CIP completed by the Engineering Services Department is more comprehensive because projects range from the "unsafe to consume" source water all the way through the process of delivering "safe to consume" finished water at customers' taps.

Key 2021 and 2022 Efforts Impacting 2023-2027 Five-Year CIP

DMWW again consulted with HDR in the first quarter of 2021 to complete a DMWW Long Range Plan Update and Progress Report. A key element of this effort was to determine if the timing of key projects included in the original plan could be delayed by evaluating recent average-day and peak-day customer demands. HDR collected five more years of operational data from metro area water producers and included new water demands that were unknown at the time of the original long-range plan. Based upon the data and related analysis, the report concluded that key projects should not be delayed, and in fact, consideration should be given to expediting or altering the order of key "expansion" projects.

As a result of the 2021-Q1 effort by HDR, staff has been coordinating over the past nine months with an HDR and Black & Veatch consulting team to complete a preliminary engineering report for both a 10 million gallon per day (MGD) expansion and a 25 MGD expansion at the Saylorville Water Treatment Plant (SWTP). Staff has been very pleased with the report effort. The report is in the final review stages, but the work has been mature enough to allow proper sharing with both the DMWW Board and regional parties over the past several weeks. The report process included necessary interactions and iterations with DMWW operating personnel to help discern critical design parameters. Each expansion option in the report assumes raw water hardness as high as 400 mg/l and raw water temperature as low as 40°F. These parameters better reflect conditions observed during the initial decade of operation of the SWTP and allows for increased production throughout the entire calendar year. Such increased production is important as additional aquifer storage and recovery (ASR) sites are also being contemplated regionally. The opinion of probable construction cost for the source, treatment, and transmission elements for each of these expansions has been also updated in the 2023-2027 CIP. Costs are substantially higher (approximately $90 million more for the 10 MGD expansion) for these project elements relative to costs shown in previous CIP documents. The revised design basis and current bidding environment are leading influencers in this difference. The report recommends advancing initially with the 10 MGD expansion and this recommendation is currently supported by both DMWW staff and regional stakeholders.

Work continues with the United States Geological Service (USGS) to complete hydrogeologic investigations along the Des Moines River between Saylorville Reservoir and Prospect Park. This broader investigation sets the table for projects that will allow greater water withdrawal from the Des Moines River alluvium, improve water quality at the Fleur Drive Water Treatment

Plant (FDWTP) and provide additional raw water for the 10 MGD expansion of the SWTP. A hydrogeologic model for the far southern region of this corridor has been provided. A hydrogeologic model for the entire corridor has been delayed until summer of 2022. Additional pump testing by DMWW and USGS to allow a further refinement of the model has unfortunately been delayed.

2023-2027 Five-Year CIP

The 2023-2027 Five-Year CIP continues to embrace many of the themes presented in the most recent five-year CIP, but there are also a few adjustments. A summary of this CIP is as follows:

- A number of previously-identified projects (storage tank aeration, etc.) to counter disinfection byproduct (DBP) concerns continue to be left off the plan.
- A number of previously-identified projects (park wetland, ion exchange system expansion, etc.) to counter nitrate concentration issues continue to be left off the plan.
- In place of the DBP and nitrate projects, staff continues to feel strongly that garnering more source water from the Des Moines River alluvium is most beneficial. Water from this source is not only beneficial for nitrate and DBP issues, but also provides benefits regarding ammonia, cyanobacteria, and cyanotoxin issues which have created significant operational challenges in recent years. Blending of source waters remains one of the most powerful pre-treatment options at our disposal.
- The window of this CIP continues to recommend completing all elements of a 10 MGD expansion of the SWTP (with the above-discussed design basis changes). This involves source, treatment, and transmission projects totaling near $159 million.
- With a clearer focus on both the Des Moines River alluvium and the expansion at the SWTP, this CIP will continue to defer water quality and capacity projects at the McMullen Water Treatment Plant (MWTP).
- The integration of an additional DMWW ASR site remains included to assist with addressing peak-day demands; however, staff has learned that both Ankeny and Waukee are actively pursuing new ASR sites and West Des Moines is also considering adding a site as well. Regional coordination of both plant expansion facilities and ASR facilities will play a key role in providing production volumes to aid in meeting peak-day demands in the next several years.
- This CIP continues to recommend aggressive reinvestment in water main replacement. Long-range planning documents from 2017 communicated that DMWW needed to nearly triple its historical reinvestment levels to maintain or slightly improve main break statistics. Escalations beyond that level were also recommended to allow for a target annual break rate of 20 main breaks per 100 miles of piping by 2040. DMWW, within the past few years, has begun to invest more in main replacement to move toward the report recommendations. This CIP continues to reaffirm the importance of remaining vigilant with our distribution system reinvestment by calling for approximately $15 million in additional spending across the five-year window.
- A study completed in 2022 by CDM Smith recommends rehabilitation of the filter plant at the FDWTP. Nearly $12 million has been included in this CIP to address several of the recommendations from that study.

A comprehensive listing of all the projects included in the 2023-2027 Five-Year CIP has been included in an attachment to this memorandum.

Managing the design, construction, and commissioning of these projects is clearly a tall order. Success will clearly not be possible without outside assistance and likely the creative use of outside assistance. Acquiring more services for both design and construction efforts is an easily identifiable option, but other creative measures will also be necessary to reach success within the five-year window.

Capital Improvement Plan Funding

DMWW has several funding options for the utility's projected CIP commitments totaling approximately $362 million. For purposes of projecting financial viability of the 2023-2027 Five-Year CIP, staff has developed a funding plan consisting of a combination of regional participation, water rate revenues, and debt. These funding sources are discussed in more detail below.

Regional Participation

The 10 MGD expansion of the SWTP, along with its related source and transmission projects, is included in the five-year CIP. Total project costs for this expansion are approximately $159 million. These costs are anticipated to be recovered through regional participation. If regionalization discussions are finalized and Central Iowa Water Works (CIWW) is formed, these expansion-related costs would be allocated as outlined in the draft 28E agreement, or 9% allocated to all participants based on each community's proportionate capacity in CIWW and 91% allocated based on each community's proportionate and incremental growth needs. Under a regional scenario as currently outlined in the draft 28E agreement, DMWW would be responsible for approximately $18 million of the expansion costs, and other regional participants would pay the remainder. The annual debt service on DMWW's share of the expansion costs, assuming a 20-year State Revolving Fund (SRF) loan at a 2% borrowing rate, would be about $1.1 million.

If CIWW does not come to fruition, staff recommends that purchased capacity be sold for the 10 MGD of additional capacity constructed. In either case, with or without formal regionalization, the funding model for the 2023-2027 CIP assumes expansion costs are primarily borne by regional participants, which helps ensure Des Moines customers are not later saddled with the burdensome costs of a stranded treatment expansion.

Additionally, there is $13.6 million in funding from other communities over the five-year period for joint capital projects, such as the construction or improvement of various booster stations.

Water Rate Revenues

The utility's primary source for funding capital improvements is water rate revenues. In the 2023- 2027 Five-Year CIP, staff has programmed $25 million in capital expenditures to be recovered through water rates, for a total of $125 million over the five-year period. This level of annual capital spending is comparable to budgeted capital costs recovered through rates in recent years.

Debt

The remaining funding lever is debt. Any capital needs remaining after regional participation (i.e., expansion-related projects) and a reasonable level of water rate recovery (assumed to be $25 million annually in our scenarios), are proposed to be financed through the SRF loan program. This results in an average of about $13.7 million of debt issued per year, or a cumulative projected debt load of $84.7 million by 2027. At this highest level of debt projected,

the annual debt service would be approximately $5.3 million. As DMWW is effectively debt-free currently, this amount of projected debt is within DMWW's debt capacity.

Historically, DMWW has been conservative in issuing debt. For the most part, DMWW has set water rates at a level that enables us to fund capital expenditures on a "pay as you go" basis. That works well for smaller projects and single-year projects, but not necessarily for large-scale projects that require a large amount of cash available up front. Assuming favorable interest rates, which do, in fact, exist with the SRF program, borrowing is the best way to accommodate the necessary cash flow for large-scale projects. While annual debt service must be recovered through water rates, the benefit of debt is that expenditures can be recovered over a longer period of time, lessening the impact on rates in a single year. Additionally, to the extent that borrowed funds are invested in significant infrastructure projects that improve the long-term productivity of the water system, future generations benefit from those improvements; therefore, debt can create intergenerational equity by better matching the cost of improvements to the customers who benefit from the improvement.

Although DMWW has favored water revenue bonds over SRF borrowings in the past, SRF is preferred to water revenue bonds in this five-year period (2023-2027) due to the flexibility and potential for refinancing if and when production-related assets transfer to CIWW.

Projects eligible for SRF funding include construction of new facilities, improvements or rehabilitations to existing and/or aging water facilities, water storage facilities, and wells. Specific qualifying projects most appropriate for funding through the SRF program will be identified and prioritized for financing during each annual budget process during the five-year CIP period.

A summary of the cumulative effect of debt financing is shown below (including 2022 budgeted debt in the cumulative amount financed):

FINANCING	2023	2024	2025	2026	2027
Amount Financed By Year	$ 14,024,629	$ 16,524,635	$ 18,054,536	$ 18,855,509	$ 1,258,125
Cumulative Financed *	30,003,408	46,528,043	64,582,580	83,438,088	84,696,213
Interest	586,915	892,448	1,214,478	1,536,884	1,490,729
Principal	699,579	1,327,594	2,077,623	2,909,635	3,793,356
Total Debt Pmt	$ 1,286,495	$ 2,220,042	$ 3,292,101	$ 4,446,520	$ 5,284,084

* Includes 2022 Budgeted Debt

Impact to Rates

Finance staff has taken the recommended CIP funding program discussed above and modeled the rate increases necessary to sustain this level of capital spending. At the recommended spending levels and funding sources outlined, water rates are projected to increase 5 – 10% year-over-year during the CIP five-year period. While the utility can choose to raise rates above these levels to cash-fund more projects and lessen reliance on debt, we must remain mindful of the need to balance water rate increases with increasingly relevant affordability considerations.

The tables below summarize the capital spending by year and category, along with the projected funding sources:

	CAPITAL DOLLARS					
	2023	2024	2025	2026	2027	5-YEAR
Customer Service - Meters, MTUs	$ 1,596,981	$ 1,578,014	$ 1,653,239	$ 1,735,901	$ 1,822,696	$ 8,386,831
Information Technology						
Normal Replacement	528,000	728,000	528,000	563,000	428,000	$ 2,775,000
PeopleSoft Replacement	1,085,000	-	-	-	-	$ 1,085,000
Water Distribution	1,546,919	1,387,341	1,428,968	1,471,837	1,515,160	$ 7,350,226
Water Production						
Vehicle & Equipment Replacement	930,000	960,000	990,000	550,000	570,000	$ 4,000,000
Normal WP Replacement	1,000,000	1,030,000	1,070,000	1,110,000	1,150,000	$ 5,360,000
DEPARTMENTS w/o Engineering	**$ 6,686,900**	**$ 5,683,355**	**$ 5,670,207**	**$ 5,430,739**	**$ 5,485,857**	**$ 28,957,057**
Engineering						
Plant/Raw Water Capacity	23,320,157	28,015,319	29,375,350	30,676,742	31,750,428	143,137,996
Transmission Capacity	9,836,537	4,515,749	-	-	-	14,352,285
Water Quality	3,979,034	12,077,420	11,583,936	11,989,374	-	39,629,765
Water Main Replacement	14,888,831	15,244,544	15,778,103	16,330,336	16,901,898	79,143,712
Core Network	5,897,946	5,115,126	9,182,454	9,253,029	3,319,470	32,768,025
DMWW Capital	3,609,912	2,009,753	839,836	852,031	1,049,925	8,361,457
Work for Other Entities	5,857,748	10,013,196	-	-	-	15,870,943
TOTAL ENGINEERING	**67,390,164**	**76,991,106**	**66,759,680**	**69,101,511**	**53,021,720**	**$ 333,264,182**
TOTAL UTILITY CIP	**$ 74,077,064**	**$ 82,674,461**	**$ 72,429,887**	**$ 74,532,250**	**$ 58,507,577**	**$ 362,221,239**

	TOTAL UTILITY CIP BY FUNDING SOURCE					
	2023	2024	2025	2026	2027	5-YEAR
Funded by Rates	$ 25,000,000	$ 25,000,000	$ 25,000,000	$ 25,000,000	$ 25,000,000	$ 125,000,000
Funded by Other Entities (Cash)	4,510,466	8,618,759	-	-	499,024	13,628,248
DMWW Debt	14,024,629	16,524,634	18,054,537	18,855,508	1,258,126	68,717,433
Regional Participation	30,541,970	32,531,068	29,375,350	30,676,742	31,750,428	154,875,558
TOTAL by FUNDING SOURCE	**$ 74,077,064**	**$ 82,674,461**	**$ 72,429,887**	**$ 74,532,250**	**$ 58,507,577**	**$ 362,221,239**

Impact of Regionalization

The region is in a transitory period between status quo and the potential formation of CIWW, which creates some complexities in preparing a five-year CIP and recommending a funding plan. As a CIWW 28E has not yet been executed, the capital funding program as presented above does not consider certain regionalization considerations that may, in fact, occur. This includes an estimated payment of approximately $50 million DMWW could receive in an asset true-up transaction. If regionalization were to occur, this anticipated $50 million would be an additional funding stream available for capital projects benefiting Des Moines customers, such as replacing aged water mains. These additional funds would lessen the rate impact to inside city customers or allow more capital spending on additional priorities.

Another change to funding assumptions under a regional CIWW model is that DMWW would not be solely responsible for financing production-related capital improvements; rather, the funding for these improvements would become the responsibility of CIWW and DMWW would pay only a proportionate share of the costs in cash or assume a proportionate share of the debt. Rather than being responsible for financing 100% of the costs and recovering costs through rates over time, DMWW's financial obligation would be reduced to about 40%.

Conclusion

The five-year CIP as outlined above is a projection of needs and resources to assist the utility in its capital planning efforts. Staff believes the 2023 – 2027 Five-Year CIP, as presented, is an aggressive and necessary plan that allows the utility to continue to provide a high level of service to customers and enables the utility to meet growing water demands in the region.

ENGINEERING CIP **6/1/2022**
2023-2027

TOTAL PROJECT COST

Category	Work Plan	Project	Total 2023	Total 2024	Total 2025	Total 2026	Total 2027	2023 - 2027
Plant/Raw Water Capacity	**ASR WELLS**	DMWW #4 (Joint Eastside Booster)	2,614,723	-	-	-	-	2,614,723
	SWTP	Expansion of Raw Water - 10 MGD Expansion	6,949,119	11,507,742	11,910,513	12,327,381	12,758,839	55,453,593
		Plant Expansion - 10 MGD Expansion	13,756,314	16,507,577	17,085,342	17,683,329	18,302,246	83,334,809
		SWTP 25 MGD Conventional Expansion	-	-	379,495	392,778	406,525	1,178,798
		SWTP Raw Water Supply for 25 MGD Expansion	-	-	-	273,254	282,818	556,072
Plant/Raw Water Capacity Total			**23,320,157**	**28,015,319**	**29,375,350**	**30,676,742**	**31,750,428**	**143,137,996**
Transmission Capacity	**Core Network**	SWTP - West Feeder Main Ph 3 Const	9,472,734	1,126,929	-	-	-	10,599,663
		Tenny to LP Moon Feeder Connection	363,803	3,388,820	-	-	-	3,752,623
Transmission Capacity Total			**9,836,537**	**4,515,749**	**-**	**-**	**-**	**14,352,285**
Water Quality	**FDTP**	Bulk PAC System	1,710,553	885,211	-	-	-	2,595,765
		CO2 Feed	2,268,481	-	-	-	-	2,268,481
		DM River Well Field	-	11,192,209	11,583,936	11,989,374	-	34,765,519
Water Quality Total			**3,979,034**	**12,077,420**	**11,583,936**	**11,989,374**	**-**	**39,629,765**
Water Main Replacement	**WMR - DM**	Air Valves - DM	276,530	286,208	296,226	306,594	317,324	1,482,882
		PVC to DI Replacement	159,803	-	-	-	-	159,803
		WMR - Des Moines	11,641,538	12,048,992	12,470,706	12,907,181	13,358,932	62,427,349
	WMR - Pleasant Hill	WMR - Pleasant Hill	266,092	275,406	285,045	295,021	305,347	1,426,911
	WMR - Polk County	WMR - Polk County	2,091,596	2,164,802	2,240,570	2,318,990	2,400,155	11,216,114
	WMR - Windsor Heights	WMR - Windsor Heights	453,272	469,136	485,556	502,550	520,140	2,430,653
Water Main Replacement Total			**14,888,831**	**15,244,544**	**15,778,103**	**16,330,336**	**16,901,898**	**79,143,712**
Core Network	**Facility Mgmt**	DM River Isolation Valve/Parco System	-	365,877	-	-	-	365,877
		Wilchinski Comm Bldg	-	-	74,110	-	-	74,110
	FDTP	Backwash Return	260,728	-	-	-	-	260,728
		Diesel Pump Fuel Containment	307,977	-	-	-	-	307,977
		FDTP Sanitary Sewer List Stn Replacement	297,045	-	-	-	-	297,045
		Filter Media Replacement (4)	-	1,312,251	6,111,807	6,325,721	-	13,749,778
		Lime Slaker Replacement	-	-	659,392	-	-	659,392
		Lime Sludge Filter Press	1,069,931	1,107,379	-	-	-	2,177,310
		SCADA Network Improve	1,086,417	1,124,442	-	-	-	2,210,859
		Treatment Basin Rechain (ongoing)	618,665	640,318	662,729	685,924	709,932	3,317,568
		WHL Pumps Rebuild #1 & #3	331,200	342,792	-	-	-	673,992
	MWTP	Rehab Collector Wells	800,494	-	857,510	-	918,586	2,576,589
		Well Isolation Valves	107,560	-	-	-	-	107,560
	SWTP	Floor and Drain Improvements	92,393	-	-	-	-	92,393
		Rehab Collector Wells	710,977	-	-	788,273	815,862	2,315,111
		RO Membrane Replacement (ongoing)	214,558	222,068	229,840	237,884	246,210	1,150,561
		UF Membrane Replacement	-	-	587,066	1,215,227	628,880	2,431,173
Core Network Total			**5,897,946**	**5,115,126**	**9,182,454**	**9,253,029**	**3,319,470**	**32,768,025**
DMWW Capital	**Facility Mgmt**	FDT - HVAC	-	532,831	-	-	-	532,831
		FDTP - Building Improvements	339,678	-	363,872	-	-	703,550
		FDTP - Distribution Building Modifications	203,119	630,684	-	-	-	833,802
		FDTP - North Parking Lot Repl	131,530	-	-	-	-	131,530
		FDTP Safety Showers & Tempering	150,612	155,884	-	-	-	306,496
		Fleur Drive Access Gates	-	65,151	-	-	-	65,151
		Fluoride Room Improvements	56,573	-	-	-	-	56,573
		Hazen Int/Ext Paint	967,923	-	-	-	-	967,923

Category	Work Plan	Project	Total 2023	Total 2024	Total 2025	Total 2026	Total 2027	2023 - 2027
DMWW Capital	**Facility Mgmt**	Lab Waterproofing	64,376	-	-	-	-	64,376
		Main Office Building Improvements	275,567	-	-	-	-	275,567
		MWTP - Trucking Scale	652,050	-	-	-	-	652,050
		MWTP Safety Showers & Tempering	-	155,884	161,340	-	-	317,224
		Roof Replace & Repairs	354,079	-	-	392,573	-	746,652
		Safety Compliance	227,183	235,134	243,364	251,881	260,697	1,218,258
		Security Cameras	81,131	-	-	89,951	-	171,082
		SEP/Bondurant PS Corrosion System	-	-	-	-	104,384	104,384
		SEP/Bondurant PS Hypo& Ammonia Storage	-	-	-	-	608,506	608,506
		Standpipe Foundation (2)	-	165,335	-	-	-	165,335
		Trimble GPS Equipment	39,568	-	-	43,869	-	83,437
	WMR - Pleasant Hill	TBD Capital Projects - Pleasant Hill	66,523	68,851	71,261	73,755	76,337	356,728
DMWW Capital Total			**3,609,912**	**2,009,753**	**839,836**	**852,031**	**1,049,925**	**8,361,457**
Work for Other Entities	**Remote Sites**	Bondurant Feeder and Pump Station	5,857,748	6,062,769	-	-	-	11,920,516
		Xenia Booster Station Upgrade	-	3,950,427	-	-	-	3,950,427
Work for Other Entities Total			**5,857,748**	**10,013,196**	**-**	**-**	**-**	**15,870,943**
Grand Total			**67,390,164**	**76,991,106**	**66,759,680**	**69,101,511**	**53,021,720**	**333,264,182**