



## CENTRAL COAST WATER AUTHORITY

### MEMORANDUM

October 26, 2022

**TO:** CCWA Board of Directors

**FROM:** John Brady  
Deputy Director, Operations and Engineering

**SUBJECT:** 2022 Water Quality Challenges and Plans to Mitigate Future Water Quality Issues.

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#### BACKGROUND

Based on the most current delivery projections from CCWA Participants, the flow rates through the Water Treatment Plant and Pipeline are projected to be far below what these systems were designed to accommodate. This low flow regime is projected to last well over 5 months and has actually already started, which is much earlier than the delivery projections indicated.

The consequence of the low flow rates through the Water Treatment Plant and Pipeline is excessively long travel times for the treated water to participants' respective Turnouts. For example, water will age up to 30 days at the Santa Maria Turnout and 71 days at the Santa Ynez Pumping Plant, which is located at the end of the Pipeline. This low flow regime started in mid-October and is projected to last until April 2023. However, it is important to note that if one supplemental water supply transaction for the South Coast is not completed as planned, then the low flows will continue through the entirety of 2023.

Drinking water standards require that detectable levels of secondary disinfectant must be maintained at all times in distribution systems that receive water produced from surface water treatment plants, such as CCWA's plant. The main issue with increasing water age in the Pipeline is the potential of losing chloramine residual, since this could lead to a  $Q_e | m | y q \$$   $G s r x e q m e r x P i z i p$  (MCL) violation.

CCWA utilizes chloramine as a secondary disinfectant in the Pipeline. This disinfectant was selected for use because it lasts longer than free chlorine and it essentially stops the formation of disinfection byproducts that arises from chlorine disinfection at the Water Treatment Plant. As with all secondary disinfectants, chloramine concentration will decrease with time. However, the decline in chloramine concentration is accelerated when a process known as nitrification occurs. This process will start as water age increases and can also start when water passes through zones of the pipeline where nitrification is known to occur due to the presence of biofilm.

With the onset of unprecedented low flows and the presence of zones within the Pipeline known to produce nitrites, it is vitally important to increase the capacity for treatment along the Pipeline to ensure the water remains potable. CCWA staff researched the appropriate response actions to this unfolding situation, which included meeting with Dr. Issam Njam (Water Quality Expert) as well as several consultations with the Division of Drinking Water.

The proposed plan is to design and construct one new pipeline treatment facilities that will increase chloramine concentrations and to oxidize nitrite if present. From our research and operational practice, we found that increasing chloramine residual, coupled with oxidizing any

nitrite that may form from the nitrification process, is an effective method to maintain potable water in the pipeline. The proposed treatment system is strategically located to maximize effect.

## **DISCUSSION**

### Early Action Due to Early Flow Reduction

In response to observing early reduction of flow rate in the pipeline in October 2022, CCWA staff moved forward with escalating efforts in developing a response plan. It was found that the original pipeline design included provisions for a chemical dosing location in the community of Nipomo. Chemical injection quills were installed during original construction, along with some provisions for chemicals to be delivered from a roadside location. Consequently, work was initiated to develop this site.

As outlined in Resolution 19-01, the Executive Director may proceed with the purchase of goods and services, with the approval from the Chair or Vice Chair, in an emergency situation. In such cases, the Executive Director has the authority to authorize CCWA staff to proceed on emergency basis and will need to provide a report to the Board describing the emergency circumstances. One purpose of this Board Report is to seek ratification of the Board Chair's decision to initiate this emergency project before the full Board Meeting.

Subsequent to the Executive Director securing approval from the CCWA Board Chair to proceed with the project on an emergency basis, CCWA staff procured the services of a local engineering consultant, engaged the CCWA environmental consultant, initiated a request for new power service from PG&E and initiated work on securing an encroachment permit from the County of San Luis Obispo Public Works. CCWA staff also conducted its own engineering analysis to size the dosing pumps, chemical storage tanks and analyzed methods of communications to the site. CCWA also notified property owners of CCWA's intention to construct the new chloramine booster station within the pipeline easement.

Costs committed to date for this project are minor. However, the results of bid solicitation are expected shortly and materials orders will be made soon.

### Operational Goal

Based on comments from the CCWA Operating Committee, the specific delivery patterns described in the schedules submitted are intentional and time sensitive. This means that potable water needs to be available in the pipeline at the time requested.

Since it is not currently known with certainty if there will be a sufficient volume of water available to purge the Pipeline of non-potable water prior to the need for potable water, the operational goal will be to try to maintain potable water for the entire year. This is why the new pipeline treatment facility is needed.

The pipeline contains approximately 191 acre-feet of water. If the pipeline is rendered non-potable, it will need to be disinfected by the AWWA free chlorine slug method. This would require slightly more than 191 AF and several days to disinfect the entire pipeline. As noted earlier, if one supplemental water supply transaction for a South Coast Participant is not completed as planned, low flows will continue throughout 2023 and there will be insufficient volume available to disinfect and purge the pipeline of non-potable water.

## FINANCIAL CONSIDERATIONS

### Cost Estimate

Although work has started on the design and procurement of materials, the design is still under preparation and the results of materials bid solicitations are not yet in. However, an order of magnitude cost estimate for the project has been prepared by CCWA staff and the engineering consultant using the best information available.

CCWA staff recommends installation of the Nipomo Chloramine Booster Station first and then observe performance. This system is designed to help maintain potable water to Turnouts in the Santa Maria Valley and it may or may not be sufficient to maintain potable water downstream of the Santa Maria Valley.

If we are unable to maintain chloramine residual after it is conveyed out of the Santa Maria Valley as it travels to Tank 5, CCWA staff does have a plan for a second Chloramine Booster Station at the Golden State Water Company Turnout. However, CCWA staff is not recommending this project at this time.

The cost estimate for the Nipomo Chloramine Booster Station is as follows:

### **Nipomo Chemical Dosing Facility Order of Magnitude Cost Estimate**

<b>Item</b>	<b>Cost</b>
<b>Engineering</b>	<b>30,000</b>
<b>Chemical Delivery Access</b>	
Encroachment Permit	5,500
Public Right-of-Way Improvement:	<u>111,600</u>
<b>subtotal</b>	<b>117,100</b>
<b>Chemical Dosing</b>	
Concrete Pad	10,000
Dosing Skids (2)	60,000
Precast Concrete Shelter	40,000
Double wall Tanks (2)	30,000
Fencing	15,000
PG&E New Service	5,000
Misc	<u>10,000</u>
<b>subtotal</b>	<b>170,000</b>
<b>Project Total</b>	<b>317,100</b>

A significant cost component for this system is the Right-of-Way improvements along Thompson Avenue in Nipomo, adjacent to the treatment facility location. These improvements are necessary to allow a chemical tanker truck access to pull off of Thompson Avenue and park adjacent to the Nipomo Chloramine Booster Station. CCWA's chemical vender has been consulted on these improvements as well as San Luis Obispo County Public Works and it was concluded that the improvements are necessary to facilitate safe delivery of chemical to the site.

### Cost Allocation Issue

CCWA staff provided a presentation to the CCWA Operating Committee at their October 12, 2022 meeting. The presentation detailed the numerous drought related water quality issues that have been encountered during the prior quarter and also described the delivery projections from CCWA Participants. As presented at the Operating Committee Meeting, CCWA staff's analysis of the aggregated delivery projections suggested that historic low flows would start in December 2022. CCWA made the recommendation to move forward with the design and construction of two new pipeline Chloramine Booster Stations. CCWA staff also recommended that the CCWA Operations and Maintenance Reserve Fund be utilized to fund the projects.

There was general concurrence about increasing treatment capacity on the pipeline to address the water quality challenges that were described. The Operating Committee also discussed issues related to how to allocate the costs for the new Pipeline treatment facilities. The main consideration of the discussion was how the South Coast Participants would benefit from the new treatment facilities as compared to how the north county Participants would benefit from the new treatment facilities.

The main conclusions of subsequent Participant discussion on the allocation issue included (1) North County Participants would directly benefit from the new facilities because they would help maintain potable water on a reach-by-reach basis and (2) South Coast Participants would benefit from the new facilities because the pipeline provides potable water directly to North County Participants and consequently the conveyance capacity of the pipeline is limited by the capacity of the treatment methods employed along the pipeline.

A compromise allocation scheme was developed and is described below:

- 50% of the costs for the new Pipeline Treatment Facility would be charged to Reach 35.
- 50% of the costs for the new Pipeline Treatment Facility would be charged to the Water Treatment Plant Reach and subject to the Regional Water Treatment Plant and Santa Ynez Exchange Adjustment Allocation.

In consideration of the current Fiscal Year Tank 5 Chloramine Booster Station, CCWA recommends that the above noted cost allocation protocol be applied to this project as well, since this treatment facility serves the same purpose as the Nipomo Project. The cost allocation for the Nipomo Chloramine Booster Station and the current Fiscal Year Tank 5 Chloramine Booster Station are presented in the attached table.

## Recommendations

That the Board:

- Ratify the CCWA Board Chair's authorization that allowed the Executive Director to proceed with work on the Nipomo Chloramine Booster Station Project on an emergency basis.
- Authorize the Executive Director to proceed with work to the design and construction of the new pipeline Nipomo Chloramine Booster Station.
- Authorize the Executive Director to utilize the CCWA Operations and Maintenance Reserve Fund to fund the new pipeline Nipomo Chloramine Booster Stations and direct the Executive Director to replenish the CCWA Operations and Maintenance Reserve Fund in Fiscal Year 2023/2024.
- Direct the Executive Director to allocate costs for the new pipeline Nipomo Chloramine Booster Stations and Tank 5 Chloramine Booster Station as follows:
  - 50% of the costs for the new Pipeline Treatment Facility would be charged to Reach 35.
  - 50% of the costs for the new Pipeline Treatment Facility would be charged to the Water Treatment Plant Reach and subject to the Regional Water Treatment Plant and Santa Ynez Exchange Adjustment Allocation.

Attachment

Central Coast Water Authority  
**Proposed new chemical dosing facilities cost allocation and Tank 5 Inlet chemical dosing facility cost reallocation**  
 October 27 2022

Regional Water Treatment Plant Allocation and Credit										Financial Reaches			
Project Participant	Allocated Table A				Unadjusted Fixed WTP Fixed Operating Costs <sup>(2)</sup>	Fixed Retreatment Charge	Fixed Retreatment Credit	Exchange Adjustments	WTP TOTAL	Reach 35 TOTAL	MHII TOTAL	PROJECT TOTAL	
	Table A Amount	Exchange Deliveries	Allocated Table A	Allocated Table A Percentage									
Guadalupe	550	-	550	1.25%	\$ 4,131	\$ 1,287	-	\$ 5,418	\$ 2,231	-	\$ 7,650		
Santa Maria	16,200	-	16,200	36.90%	121,681	37,910	-	159,592	65,728	-	225,319		
Golden State Water	500	-	500	1.14%	3,756	1,170	-	4,926	2,029	-	6,954		
Vandenberg SFB	5,500	-	5,500	12.53%	41,311	12,871	-	54,182	22,315	\$ 43,150	119,647		
Buellton	578	-	578	1.32%	4,341	1,353	-	5,694	2,345	4,535	12,574		
Santa Ynez (Solvang)	1,500	-	1,500	3.42%	11,267	3,510	-	14,777	6,086	11,768	32,631		
Santa Ynez	500	1,575	2,075	4.73%	15,586	4,856	-	\$ 11,830	32,272	2,029	38,223		
Goleta	4,500	(567)	3,933	8.96%	29,541	9,204	\$ (29,541)	(4,259)	4,945	18,258	35,304		
Morehart Land Co	200	-	200	0.46%	1,502	468	(1,502)	-	468	811	1,569		
LaCumbre	1,000	-	1,000	2.28%	7,511	2,340	(7,511)	-	2,340	4,057	7,845		
Raytheon (SBRC)	50	-	50	0.11%	376	117	(376)	-	117	203	392		
Santa Barbara	3,000	(378)	2,622	5.97%	19,694	6,136	(19,694)	(2,839)	3,297	12,172	23,536		
Montecito	3,000	(378)	2,622	5.97%	19,694	6,136	(19,694)	(2,839)	3,297	12,172	23,536		
Carpinteria	2,000	(252)	1,748	3.98%	13,130	4,091	(13,130)	(1,893)	2,198	8,115	15,691		
SB County Subtotal:	39,078	-	39,078	89.00%	293,521	91,448	(91,448)	-	293,522	158,550	171,250		
SLO County	4,830	-	4,830	11.00%	36,279	-	-	-	36,279	-	36,279		
<b>TOTAL:</b>	<b>43,908</b>		<b>43,908</b>	<b>100.00%</b>	<b>\$ 329,800</b>	<b>\$ 91,448</b>	<b>\$ (91,448)</b>	<b>-</b>	<b>\$ 329,800</b>	<b>\$ 158,550</b>	<b>\$ 171,250</b>	<b>\$ 659,600</b>	

Project Name	Project Cost	Financial reaches				Funding source
		WTP	Reach 35	Reach 37	MHII	
Tank 5	\$ 342,500	\$ 171,250			\$ 171,250	\$262K Collected in FY 2022/23 budget;\$80K in FY 21/22 carryover funds
Nipomo Dosing facility	\$ 317,100	\$ 158,550	\$ 158,550			O&M Reserve Fund
Golden State Turn-Out Facility		\$ -		\$ -		O&M Reserve Fund
Total estimated cost	\$ 659,600	\$ 329,800	\$ 158,550	\$ -	\$ 171,250	