State Water Resources Control Board
Division of Drinking Water

January 12, 2026

PWS No. CA4810008

Justen Cole
Utility Director
PO Box 220
Elmira, CA 95625-0220

**HEXAVALENT CHROMIUM COMPLIANCE PLAN APPROVAL LETTER**
**CITY OF VACAVILLE – CA4810008**

Dear Mr. Cole,

On October 1, 2024, the hexavalent chromium regulations came into effect. The regulation required all community and non-transient, non-community water systems to sample for hexavalent chromium. If the initial sample was above the maximum contaminant level (MCL) (10 ug/L), the system was required to start quarterly sampling. If a source exceeds the hexavalent chromium MCL by a running annual average (RAA) the water system is required to submit a compliance plan within 90 days.

In August and September 2025, the City of Vacaville (the City) was notified of the results which caused Wells 14, Primary Station (PS) Code CA481008_012_012), Well 16, PS Code CA4810008_030_030 and Well 15 (PC Code 4810008_024_024), respectively, to exceed the hexavalent chromium MCL. The City is required to submit a compliance plan within 90 days of that notification date. On October 23, 2025, the City submitted a draft hexavalent chromium compliance plan to the Division for review. Per subsequent meetings and discussions with the Division of Drinking Water (Division), the Compliance Plan was revised by the City to address the Division's comments.

The final version of the enclosed Compliance Plan dated January 6, 2026, is hereby approved by the Division. This review and approval is solely for the purpose of ensuring compliance with title 22, California Code of Regulations, section 64432(q). This does not constitute the State Water Resources Control Board's approval or permitting of a proposed project. The District Office reserves its full discretion when deciding whether to issue a permit or an amended permit after you complete your permit amendment application.

The City's hexavalent chromium compliance plan includes the following proposed drinking water infrastructure modifications and improvements, and specifies the following dates when milestones will be completed. Should any of the dates below need to be modified, the City shall propose the new dates and receive approval from the Division prior to exceeding the approved dates below. The City shall continue to update the Division of any updates or changes to the compliance plan on a quarterly frequency, including when the milestones in the summary below have been completed.

**PROJECT MILESTONES & APPROVED DATES**

Construction of Well 17 – The City is currently equipping Well 17 and the current construction schedule has completion slated for the spring of 2026.

Construction of Well 22 - The anticipated date for commencing construction: Drilling Complete, 01/05/2026 (equipping). The anticipated date for completing 100 percent of construction: 10/22/2026.

Well 15 (existing) and Well 21 (new construction) Blending Facility -
The anticipated date for commencing construction: 1/9/2026 (drilling), 8/10/2026 (equipping). Estimated date of submission of final plans and specifications to the State Board: 7/9/2026. The anticipated date for completing 100 percent construction: 4/7/2027. Anticipated date a Hexavalent Chromium Operations Plan will be completed and submitted to DDW: 6/16/2027.

Construction of Wells 18, 19, 20 - Estimated date of submission of final plans and specifications to the State Board: 1/15/2026 (equipping, drilling already submitted). The anticipated date for commencing construction: 12/22/2025 (drilling), 3/25/2026 (equipping). The anticipated date for completing 100 percent of construction: 4/21/2027.

Well 3 – Existing well. The City is re-evaluating its options for Well 3 if it will be economically beneficial to put the well back online at the reduced flow rate of 300 GPM to achieve compliance with the Hexavalent Chromium MCL.

Well 9 is taken out of service.

Well 14 & 16 Treatment - The City has selected MKN Associates to assist with the design and construction of RCF facilities at Well 14 and 16 based on the results of the pilot study. Once the City has completed construction of Wells 18, 19, and 20 to replace the capacity of Wells 14 and 16, and no immediate treatment is readily provided and permitted for Wells 14 and 16, then the City will immediately place Wells 14 and 16 on "Standby" status in accordance with Title 22, Section 64414, CA Code of Regulations.

North Bay Regional Water Treatment Plant Expansion Project – The City, in conjunction with the City of Fairfield, is working with West Yost Consulting Engineers on a complete engineering evaluation on the expansion of the North Bay Regional (NBR) Water Treatment Plant. Estimated date of submission of final plans and specifications to the State Board: 04/26/2028 (expected to utilize design build project method). The anticipated date for commencing construction: 04/26/2028. The anticipated date for completing 100 percent of construction: 12/03/2030.

If you have any questions regarding this matter, please contact Alla Lilichenko of my staff at alla.lilichenko@waterboards.ca.gov or me at marco.pacheco@waterboards.ca.gov.

Sincerely,

Digitally signed by Marco Pacheco
Date: 2026.01.12 09:45:43 -08'00'

Marco Pacheco, P.E.
Sr. Water Resource Control Engineer
San Francisco District

Enclosure: City of Vacaville Hexavalent Chromium Compliance Plan, dated Jan. 6, 2026

cc: Solano County Environmental Health Department (w/o encl.)

# Compliance Plan

## for

## City of Vacaville Groundwater Wells

## per

## Compliance Order No. (SWRCB_DDW_21-003)

**October 23, 2025**
**Revised December 2, 2025**
**Revised December 11, 2025**

## BACKGROUND

Water Supply

The City of Vacaville water system provides domestic water service to approximately 99,650 residents through approximately 28,840 residential connections. The City also provides water service to approximately 2,080 commercial, industrial, and institutional customers. The water system consists of water treatment plants, groundwater wells, booster pump stations, and reservoirs, via a network of water transmission and distribution mains. The City's water supply comes from several sources, including Solano Project surface water from Lake Berryessa, State Water Project (SWP) surface water and Settlement Water from the North Bay Aqueduct (NBA), and groundwater currently being provided from nine of the City's twelve wells. Surface water from Lake Berryessa is provided through contract between the US Bureau of Reclamation and the Solano County Water Agency (SCWA) and is delivered by Solano Irrigation District (SID). This water is treated at either the North Bay Regional Water Treatment Plant (NBR Plant) or at the City Diatomaceous Earth Filter Water Treatment Plant (DE Plant). Groundwater is treated at the wellhead with chlorine to disinfect for pathogens and is then laced directly into the distribution system. All water is treated to meet Federal and State drinking water standards prior to customer use. The City's distribution system consists of one main pressure zone, which primarily serves development with building pad elevations between 93 and 226 feet, and several upper pressure zones, which serve development above 226 feet. The system includes approximately 340 miles of distribution and transmission system mains that range in size from 2 to 30 inches in diameter. Approximately 31 miles of that length consists of pipelines 18 inches in diameter or larger. In addition, water is stored by the City in various elevated storage reservoirs, including five reservoirs in the main zone and six reservoirs in the upper pressure zones.

Management of Water Supply

The City prioritizes the Solano Project water supply because it has a larger allocation, higher water quality, and greater reliability compared to the SWP source. The SWP water source is less dependable, with allocations varying between 0 and 100%, making it a more uncertain supply option. To ensure a stable water supply, the agency has also utilized groundwater from nine wells, which contribute approximately one-third of the total supply in an average year. Surface water sources tend to contain organic constituents that can lead to the formation of disinfection byproducts, such as trihalomethanes (THMs). To mitigate this, the agency maintains a blend of treated surface water and groundwater in the system at all times, helping to control THM levels and uphold water quality. The City effectively maximizes the potential of its three water sources through strategic diversification, as demonstrated by balancing its carryover storage in Lake Berryessa and the San Luis reservoir while complying with the Solano Subbasin groundwater sustainability plan.

Hexavalent Chromium MCL (SWRCB DDW 21-003)

Effective October 1, 2024, the State of California adopted revisions to Title 22 of the California Code of Regulations, creating a new Maximum Contaminant Limit (MCL) for Hexavalent Chromium. The new MCL for Hexavalent Chromium is 10 micro-grams per liter (10 µg/L) or 10 parts per billion (10 ppb). Previously, the State of California did not have an MCL for Hexavalent Chromium, but regulated Total Chromium, with an MCL of 50 ppb. The federal Environmental Protection Agency (EPA) currently does not have an MCL for Hexavalent Chromium. However, EPA does have an established MCL for Total Chromium at 100 ppb.

Hexavalent Chromium, often referred to as Chromium +6 (Cr+6), is a naturally occurring ionic form of the element Chromium. It is found in the geological soils throughout California and is mined as an ore to be used in industrial processes. Cr+6 is used in making stainless steel, textile dyes, wood preservatives, leather tanning, paints, inks, plastics, and various coatings. It also happens to be a known carcinogen that primarily enters the body through the lungs, inhaled as dust, or in a vapor form due to high-heat industrial processes.

Four of Vacaville's current nine drinking water wells have regularly exceeded 10 ppb for Cr+6 over the years, but all wells have been consistently below the previous State MCL. The City's preliminary evaluations indicate that three wells, Wells 14, 15, and 16, will likely require some form of treatment to meet the Cr+6 MCL. Table 1 shows Cr+6 monitoring results in our production wells since the adoption of the new MCL for Cr+6, as well a historical data for those currently out of service.

**Table 1: Hexavalent Chromium Monitoring Results (µg/L)**

| Well No. | Last Sample Result prior to Regulation | 3/13/25 Result | 6/18/25 Result | 7/31/25 Result | 9/17/25 Result |
|---|---|---|---|---|---|
| Well 1 | 1.8 | Permanently Out of Service | | | |
| Well 5 | 3 | 2.8 | | | |
| Well 6 | 9.6 | 8.7 | | | |
| Well 8 | 10 | 9.9 | | | |
| Well 9 | **18** | 16 | 17 | Taken Out of Service | |
| Well 13 | 7.6 | 7.3 | | | |
| Well 14 | **23** | 19 | 20 | 21 | Temporarily Out of Service |
| Well 15 | **11** | 10 | 11 | | 11 |
| Well 16 | **23** | | | 23 | |

## COMPLIANCE PLAN AND SCHEDULE

### General

In response to the State's new 10 ppb Cr+6 MCL, the City of Vacaville resumed its 2014–2016 efforts to evaluate treatment options for wells exceeding the MCL. The company previously engaged for treatment technology is no longer operational, requiring the City to restart the evaluation process.

In October 2023, the City contracted with HDR to conduct a Cr+6 removal alternatives analysis for its well sites. In February 2024, HDR presented an initial evaluation of five treatment options, followed by a detailed analysis of Reduction-Coagulation-Filtration (RCF) and ion exchange treatments. Both technologies were found to be technically feasible but costly. The City is awaiting HDR's final technical memorandum to guide further decisions on treatment implementation.

Additionally, the City is working with LSCE Consulting Engineers on a Groundwater Characterization Study to assess Cr+6 levels in existing wells and identify potential new well sites. LSCE is currently progressing on Task 3 (Characterization of Groundwater for Cr+6) and Task 4 (Recommendations for Existing and New Wells), pending additional data from ongoing and upcoming well exploration and production well-drilling projects.

Under a separate contract with LSCE, the City is conducting monitoring well exploration at the DE Plant site and the future Green Tree development (on Leisure Town Road). This work includes hydrogeologic investigations, test hole drilling, monitoring well installation, water quality analysis, and well design recommendations. Monitoring wells at both sites have been completed. Decisions on production well drilling at these locations, as well as potential redrilling at Well 9 or Well 14, will be based on water quality and design data from these investigations.

**Current and Future Actions**

Well 17 – The City is currently equipping Well 17 and the current construction schedule has completion slated for the spring of 2026. This additional production will allow the City to discontinue use of wells that do not meet the MCL after completion. Water quality testing indicates Well 17 has a Chromium 6 level to be <50% of the MCL.

Well 22 Project - Well 2, drilled in 1979, produced around 1,400 GPM when first constructed when the City relied more on its groundwater supply. This well was abandoned and Well 22 was drilled on site. Production well drilling was completed in September of 2023 indicating a capacity of 800 GPM. Equipping design is ongoing, with an expected construction completion date of Fall 2026. This additional production will allow the City to discontinue use of wells that do not meet the MCL after completion.

- Submission of final plans and specifications to the State Board: 10/09/2025 (DDW approval to proceed on 10/14/2025)
- The anticipated date for commencing construction: Drilling Complete, 01/05/2026 (equipping)
- The anticipated date for completing 100 percent of construction: 10/22/2026

Well 15/Well 21 - The City, in collaboration with Wood Rodgers Engineering, has identified treatment alternatives for Well 15 which include reducing flow with the installation of a Variable Frequency Drive (VFD) to reduce $Cr^{+6}$ levels under the MCL. In November of 2024, the City installed a VFD for this purpose. In January of 2025, the City began a flow reduction study to determine the different $Cr^{+6}$ levels at various flow rates. Because this yielded inadequate results, the City is currently working with LSCE to drill a smaller well (Well 21) in an upper aquifer at the Well 15 site for on-site blending.

Flow meters for both wells will have real-time ratio control and a ±5% deviation alarm, verified via mass balance calculations. The larger well will not run without the smaller well running first. Controls, interlocks, and instrumentation improvements that require shutting down the system if flow rates are out of the necessary range will ensure this site maintains compliance. The VFD installed for the larger well will ramp down as necessary to limit the flow rate, if needed. Sample locations will be at each well source and post-mixing or entry into the distribution system, analyzed per EPA Method 218.6 (MDL ≤1 ppb). The City will submit a sampling plan for approval prior to start up.
This additional production will allow the City to discontinue use of wells that do not meet the MCL after completion and bring the total hexavalent chromium levels at this site below the MCL.

- Estimated date of submission of preliminary design plans and specifications to the State Board: 12/5/2025

- <u>The anticipated date for commencing construction</u>: 1/9/2026 (drilling), 8/10/2026 (equipping)
- <u>Estimated date of submission of final plans and specifications to the State Board</u>: 7/9/2026
- <u>The anticipated date for completing 100 percent of construction</u>: 4/7/2027
- <u>Anticipated date a Hexavalent Chromium Operations Plan will be completed and submitted to DDW</u>: 6/16/2027

<u>Wells 18, 19, 20 - </u>After HDR's initial evaluation indicated that treatment would be cost prohibitive, the City began looking into alternatives. Currently, City plans to drill new production wells to replace the capacity of the non-compliant wells as the City estimates project cost of drilling and equipping new wells to be cheaper than adding treatment at current well facilities. Three well sites that have existing monitoring wells were selected and an RFP for design and construction support services was released in January of 2025. The City is currently under contract and working with Verdantas for the design and construction of these 3 new wells. The project has an aggressive anticipated completion date of May 2027, although there is significant uncertainty with meeting this deadline.

- <u>Estimated date of submission of final plans and specifications to the State Board</u>: 1/15/2026 (equipping, drilling already submitted)
- <u>The anticipated date for commencing construction</u>: 12/22/2025 (drilling), 3/25/2026 (equipping)
- <u>The anticipated date for completing 100 percent of construction</u>: 4/21/2027

<u>Well 3</u> – Based on a Wood Rodgers assessment of Well 3 in 2016, in 2017 the City had a contractor install sand from 920 feet to a depth of 660 feet then placed a neat 15-foot cement seal from 660 to 645 feet. The contractor then installed the temporary test pump to a depth of 400 feet and conducted a well pumping test at approximately 300 GPM. Water samples were collected at the 45-minute and 340-minute time interval for Cr+6 analysis. Water samples collected indicated concentrations of Cr+6 were 3.5 µg/L after 45 minutes of pumping and 3.2 µg/L after 430 minutes of pumping, indicating the shallow aquifer has concentrations of Cr+6 acceptable for municipal water supply. Unfortunately, at the time, the reduced flow rate of the well did not justify the operational and maintenance costs to keep the well functional, and the well was removed from service. The City is now re-evaluating our options for this well and has yet to determine if it will be economically beneficial to put the well back online at the reduced flow rate of 300 GPM. The installation of a new pump and replacing aging electrical components would be maintenance-related items that do not require plans to be submitted and approved.

<u>Well 14 & 16 Treatment </u>- The City completed a pilot study with ATEC Water Systems, LLC on September 5, 2025. The City previously completed a pilot study for ion exchange by Ionex SG USA, LLC (which went bankrupt) in 2014. The City has selected MKN Associates to assist with the design and construction of RCF facilities at Well 14 and 16 based on the results of the pilot study from ATEC. Once the City has completed construction of Wells 18, 19, and 20 to replace the capacity of Wells 14 and 16, and no immediate treatment is readily provided and permitted for Wells 14 and 16, then the City will immediately place Wells 14 and 16 on "Standby" status in accordance with Title 22, Section 64414, CA Code of Regulations.

<u>North Bay Regional Water Treatment Plant Expansion Project</u> – The City, in conjunction with the City of Fairfield, is working with West Yost Consulting Engineers on a complete engineering evaluation on the expansion of the North Bay Regional (NBR) Water Treatment Plant. The City believes this will not only address groundwater in exceedance of 10 ppb of Cr+6, but emerging

contaminates. This is viewed as the City's best option to meet the Cr+6 MCL. This is scheduled to be completed by 2031.

- Estimated date of submission of final plans and specifications to the State Board: 04/26/2028 (expected to utilize design build project method)
- The anticipated date for commencing construction: 04/26/2028
- The anticipated date for completing 100 percent of construction: 12/03/2030

**FUNDING**

The City has submitted a general application to DDW for funding related to compliance projects. After reviewing and consulting with others who are similarly situated, and reviewing state requirements, it was determined that the City does not qualify for state financing and grants due to the accelerated timeline and the fact that any necessary financial reviews could not be completed in time. It is the City's understanding that the state is unlikely to provide financing or grants after the improvements are already completed. Funding is possible for other projects (such as the NBR expansion) because of the longer timeline past 2026.

In May 2025, the Vacaville City Council approved a Water & Sewer Rate Study (Rate Study) that included funding approximately $36.8 million over the next two years to address Cr+6 in the City's municipal drinking water wells. Following completion of the Proposition 218 public notification process, Council adopted the rate adjustments, which went into effect with the first full billing cycle after July 1, 2025.

The adopted Rate Study established a dedicated funding mechanism to support design and construction of Cr+6 compliance projects, demonstrating the City's financial commitment to meeting the State's compliance deadline. At the same time, Council adopted a deferred maintenance option that did not fully fund all recommended capital improvement program (CIP) projects, reflecting the need to balance compliance requirements with overall system affordability. While these funds were itemized out, the City is being forced to defer other critical water infrastructure projects and has no other viable funding options based on the tight deadline.

**CONCLUSION**

In an effort to meet the State's Cr+6 MCL of 10 ppb, the City will defer important infrastructure projects and focus on surface and groundwater projects to eliminate sources of water that are in exceedance of Cr+6 levels. The City's primary and most reliable long-term solution is the expansion of the North Bay Regional Water Treatment Plant to replace and expand capacity.

Other projects currently in progress are constructing new Wells 17, 18, 19, 20, 22, Well 15/21 Blending/Treatment, design of Well 14 RCF Cr+6 Treatment, Well 16 RCF Cr+6 Treatment, and the rehabilitation of Well 3. The City will strive to complete these projects within a reasonable timeframe to meet compliance, but the long-term plan relies on the North Bay Regional Water Treatment Plant Expansion. As new information is gathered over time, this compliance plan will change.

The City will continue quarterly public notification until we are in full compliance with the regulation.

Until the North Bay Regional Water Treatment Plant expansion is complete, wells that exceed the Cr+6 MCL will be maintained and used only if demand requires it, ensuring water supply reliability while minimizing public exposure to elevated Cr+6 levels.