# HEXAVALENT CHROMIUM COMPLIANCE PLAN

SEPTEMBER 26, 2025

## BACKGROUND:

The City of Los Banos (City) drinking water system is currently supplied by thirteen groundwater wells. All thirteen of the City's wells exceed the new California State Water Resources Control Board (SWRCB) drinking water maximum contaminant level (MCL) for hexavalent chromium. This plan is intended to satisfy the hexavalent chromium rule requirement for the City to submit a Compliance Plan to the SWRCB Division of Drinking Water (DDW) in response to any MCL exceedance prior to the City's compliance date of October 1, 2026 (CCR Title 22 §64432(q)).

## ACTIONS ALREADY TAKEN BY THE CITY:

The City has already taken several steps to address hexavalent chromium contamination of its water supply. The City investigated the source of the hexavalent chromium and concluded that the hexavalent chromium in the region is naturally occurring (Provost & Pritchard, 2018). The City has also begun screening alternatives to achieve compliance with the MCL. Alternatives considered include:

- Consolidation
- Replacement of wells
- Blending
- Replacing contaminated groundwater with surface water
- Wellhead treatment using the following processes
    - Strong base anion exchange (SBA)
    - Zero valent iron
    - Weak base anion exchange (WBA)
    - Reduction coagulation filtration (RCF)

Consolidation was eliminated from consideration because the closest water system of comparable size to Los Banos, the City of Merced, is approximately 25 miles away. Blending was eliminated because there are no nearby sources of water with low concentrations of hexavalent chromium with which to blend the contaminated wells with. A hydrogeological study (Provost & Pritchard, 2016) concluded that it is likely that any shallow wells (i.e. wells terminated above the Corcoran Clay) constructed within or near the City limits will also be contaminated with hexavalent chromium. Drilling deeper wells below the Corcoran Clay is precluded due to land subsidence concerns in the region. The study identified only one geographic area near the City where hexavalent chromium levels in existing wells were below the MCL. That area was approximately 2.5 miles outside of the City limits near the Delta Mendota Canal and Los Banos Creek. It is possible that localized seepage from the canal and from the creek are significant contributors to the lower hexavalent chromium levels observed in those wells.

The City would like to add treated surface water to its sources of supply. In addition to reducing dependence on the contaminated groundwater wells, this alternative would offer additional benefits to the City related to Sustainable Groundwater Management Act (SGMA) compliance. However, the City currently possesses no rights to surface water. Given the scarcity of surface water in the Central Valley

and the complexities of water rights agreements, it is likely that obtaining surface water rights or a long-term purchase agreement will be challenging, if it is possible at all. Furthermore, a surface water supply project would require extensive improvements to the City's backbone water distribution system which was designed for multiple sources of supply. It would also be roughly five times the cost of treating the wells, and would take several years longer to complete.

With regard to wellhead treatment, the City has completed pilot studies of the SBA and zero valent iron treatment processes. The City has also conducted preliminary pilot testing of the RCF process utilizing stannous reagent generated on-site (i.e. AMS). SBA performance during the pilot study was poor and the study indicated that the waste brine produced by the process was likely to be classified as a low level radioactive mixed waste due to incidental removal of uranium. The WBA process, while not pilot tested, can reasonably be assumed to be infeasible due to the high acid and caustic chemical doses required and the generation of a mixed radioactive waste. The zero valent iron pilot study was successful, however, the sole company marketing that product is no longer in business. Preliminary pilot studies of the RCF process indicate that it is likely the most economical treatment process for the City's wells. Further testing is needed to verify the effectiveness of the process and to determine the appropriate operating parameters.

## COMPLIANCE PLAN:

In the light of the work that has already been completed, the City is currently proceeding with a project to treat all thirteen of the contaminated wells.

## PHASE 1 – ENGINEERING REPORT AND FUNDING:

### Engineering Report

Based on the water quality and the pilot testing the City has already completed, RCF treatment appears to be the most economical treatment process for the City's wells. To confirm this, the City will need to complete pilot testing of the RCF process at one or more of its wells and incorporate the results of the pilot testing into an Engineering Report. The City issued a Request for Proposals for completion of a preliminary pilot study intended to prove that application of RCF treatment to the City's wells is feasible and has awarded the contract to ATEC Systems. A longer-duration follow-up study is being considered to optimize the treatment process.

The RCF Pilot Study will be designed to evaluate:

1. The use of ferrous as a reductant.
2. Required pre-filtration chemical contact times.
3. Filter hydraulic loading rate, head loss, and filter run lengths.
4. Characterization of the filter backwash waste.

The scope of the Engineering Report will include:

1. Documenting all pilot study results.
2. Establishing well design flow rates and treatment plant sizing.
3. Establishing a residuals management approach and permitting requirements.
4. Evaluating the feasibility of centralized treatment for multiple wells.
5. Evaluating treatment plant siting and developing preliminary site plans.
6. Estimating capital and operation and maintenance costs.

Funding of Planning Tasks

It is anticipated that a project to equip all thirteen of the contaminated wells with treatment plants will cost as much as $60 million dollars. To reduce the financial impact of increased rates on the city's disadvantaged residents, the City will be applying for both Planning and Construction funding assistance via the State's Financial Assistance Application Submittal Tool (FAAST).

The City anticipates that it will be able to fund Phases 1 and 2, including design of the treatment plants, using budget reserves. However, increased water rates will likely need to be in place to fund Phase 3 – Construction.

## PHASE 2 – DESIGN:

The second phase of the program will consist of CEQA permitting, design of the necessary improvements, and securing funding for construction and operation of the treatment plants. Design activities will include topographic surveys of the treatment sites and pipeline alignments, geotechnical studies, and preparation of construction bid documents (plans and specifications). It may also be necessary for the City to acquire additional property during this phase of the project.

Funding of Construction and Operation

It has been assumed that DDW will require that CEQA be complete and that the design plans be approximately 90% complete before a construction funding assistance application can be submitted in FAAST. The City will apply as soon as possible once these criteria are met.

Irrespective of the City receiving construction funding assistance, water rates will need to be increased substantially to pay for ongoing operation of the treatment plants. Once the Engineering Report is complete and project capital and operating costs are better defined, the City will initiate a rate study followed by the Proposition 218 process to raise water rates.

## PHASE 3 - CONSTRUCTION:

The third phase of the City's plan will consist of bidding, construction, and start-up of the treatment plants. There is significant uncertainty in the timeline for construction. However, the City currently needs almost all its wells in service to meet peak demands. This will limit the number of wells that can be out of service at any one-time during construction.

## SCHEDULE:

Attachment 1 to this Compliance Plan is a preliminary overall program schedule outlining the steps necessary for all water served by the City to comply with the hexavalent chromium standard. The project is planned for completion by December 9, 2030, with a contingency period included through August 2031 to account for potential construction-related complications. Official compliance will not occur until four consecutive quarters of treated water sample results have been reported. Under no feasible scenario will the City be able to meet the October 1, 2026 compliance deadline.