EXECUTIVE OFFICER'S REPORT
June 1, 2024 – June 30, 2024

Contents

1. Personnel Report – *Sandra Lopez*

Vacancies

- Environmental Scientist, Planning & Assessment Unit. This position will assess water quality data to help develop the 303(d) Impaired Waters List, work to restore impaired waters, and work on Basin Planning priorities. The position requires work based in science, policy, and public process.

- Environmental Scientist, Forestry/Dredge & Fill Unit. Responsibilities will include drafting permits, providing technical expertise, evaluating and assisting in the drafting of environmental documents, making policy recommendations, and performing sensitive assignments related to water quality issues and protection throughout the Lahontan Region. Evaluate and regulate the impacts of logging operations and other forest practices on the quality and beneficial uses of water. Prepare CWA Section 401 Water Quality Certifications and/or Waste Discharge Requirements (WDRs) for project compliance with regulatory requirements.

- Staff Services Analyst, South Lake Tahoe. This position will provide support to technical and administrative staff, ensure documents comply with accessibility standards, assist with process improvements, prepare agenda items and staff documents for distribution, and provide administrative support at regional board meetings held throughout the region.

- Scientific Aid, Regulatory and Enforcement Unit. This position will be reviewing Self-Monitoring Reports submitted from facilities under permit. The reports will be associated with discharges to land, and surface water. The facilities vary from construction sites to wastewater treatment plants.

- Water Resource Control Engineer, Forestry-Dredge & Fill Unit. This position will coordinate with the federal land management agencies and the California Department of Forestry and Fire Protection in reviewing timber harvest plans (THPs), Working Forest Management Plans (WFMPs), Non-industrial Timber Management Plans (NTMPs), utility corridor vegetation management plans, and timber harvest exemptions to evaluate the impact of logging operations and other forest practices on the quality and beneficial uses of water. Review projects that may affect waters of the US and state to ensure compliance with the requirements of the Water Quality Control Plan for the Lahontan Region (Basin Plan). Prepare Clean Water Action Section 401 water quality certifications and/or waste discharge requirements (WDRs) for project compliance with all regulatory requirements. Due to budgetary constraints, this vacancy will not be posted at this time.

- Environmental Scientist, Cannabis Unit. This position provides regulatory oversight of cannabis cultivation projects under the statewide Cannabis General order. Due to budgetary constraints, this vacancy will not be posted at this time.

Departures

- Cynthia Harris, Staff Services Analyst, South Lake Tahoe

2. Standing Item: Annual City of Barstow Nitrate Update, July 2024 – *Aileen Chea*

This standing item describes the compliance status for the City of Barstow (City) with its waste discharge requirements (WDRs) and various compliance orders issued by the Water Board regarding historical disposal practices from its wastewater treatment plant.

Waste Discharge Requirements

Discharge from the Barstow Wastewater Treatment Plant is currently regulated by waste discharge requirements, Board Order No. R6V-2019-0252 (Board Order). This Board Order requires monitoring and reporting of nitrate effluent and groundwater monitoring well sampling results. Submitted monitoring reports must include maps and graphs to show nitrate trends in groundwater. Additionally, the Board Order established an effluent limit for total nitrogen of 10 milligrams per liter (mg/L) and a receiving water limitation for nitrate as nitrogen of 10 mg/L.

According to self-monitoring reports submitted by the City (2023 fourth quarter report), the monthly total nitrogen concentrations in effluent samples averaged 6.08 mg/L and concentrations of nitrate as nitrogen averaged 4.0 mg/L for the year 2023. Groundwater sample data results, in conjunction with groundwater flow patterns, indicate the nitrate

concentrations predominantly increase from upgradient to downgradient in the Soapmine area north of the Mojave River as the mass of nitrate in groundwater diffuses and migrates eastward, as illustrated in Figure 2.1.

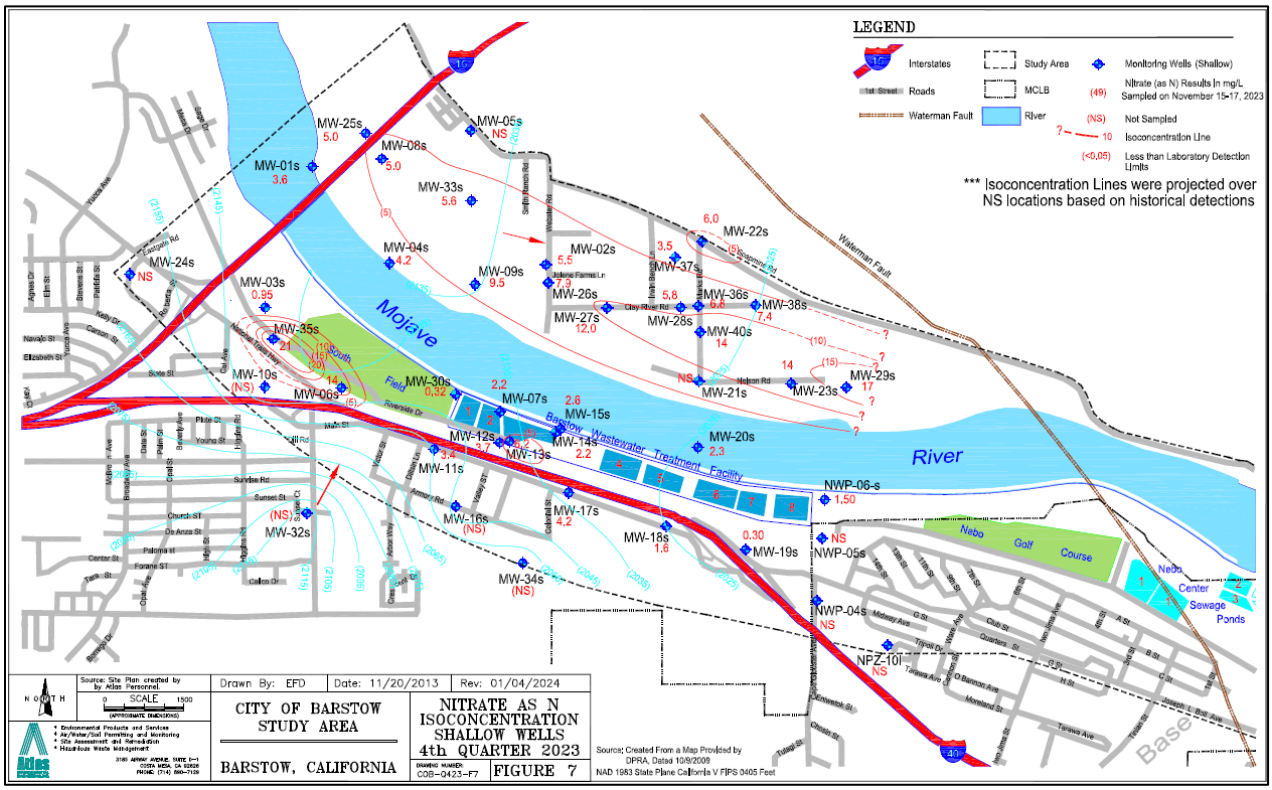

Figure 2.1: Map illustrating groundwater gradient and sampled nitrate concentrations based on shallow groundwater monitoring wells from the City's 4th Quarter 2023 Groundwater Monitoring Report.

Nitrate Pollution Groundwater Cleanup

The Water Board adopted Cleanup and Abatement Order (CAO) No. R6V-2013-0045 requiring the City to address nitrate polluted groundwater on the north side of the Mojave River. The cleanup status remains on hold until a comingled perchlorate plume, not the City's responsibility, is addressed.

Residential Well Sampling and Replacement Water in the Soapmine Road Area

The City continues to conduct quarterly sampling of residential drinking water wells to measure nitrate concentrations in groundwater, as required by CAO No. R6V-2007-0017. If a residential well sample contains a nitrate as nitrogen concentration equal to or greater than 5 mg/L, then the City must provide that residence with uninterrupted replacement water in the Soapmine Road area. For the fourth quarter of 2023, the City sampled 35 out of 42 residential wells (results shown in Figure 2.2). This count can vary based on the number of occupied residences in the Soapmine Road study area at the time of sampling.

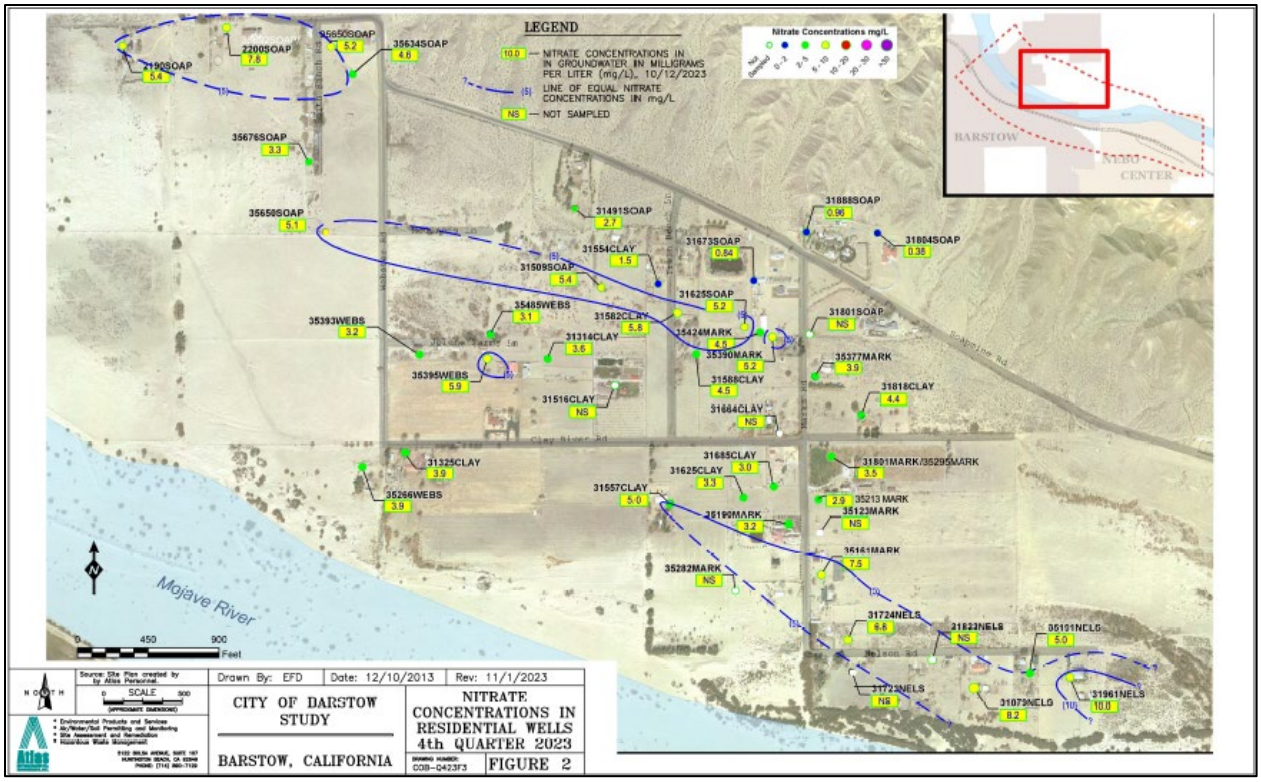

Figure 2.2: Map illustrating residential well locations and concentrations of sampled nitrate as nitrogen as reported in the City's fourth quarter 2023 report.

In aggregate, the nitrate concentration trends have become relatively stable, with a decreasing trend in residential wells sampled since quarterly monitoring began (illustrated in Figure 2.3). According to the City's submitted 2023 fourth quarter report, 13 wells sampled contained nitrate as nitrogen concentrations exceeding the replacement water threshold concentration of 5 mg/L. However, the City is providing 16 residences within the required study area with uninterrupted replacement water service (bottled water) based on nitrate levels reported in previous quarters.

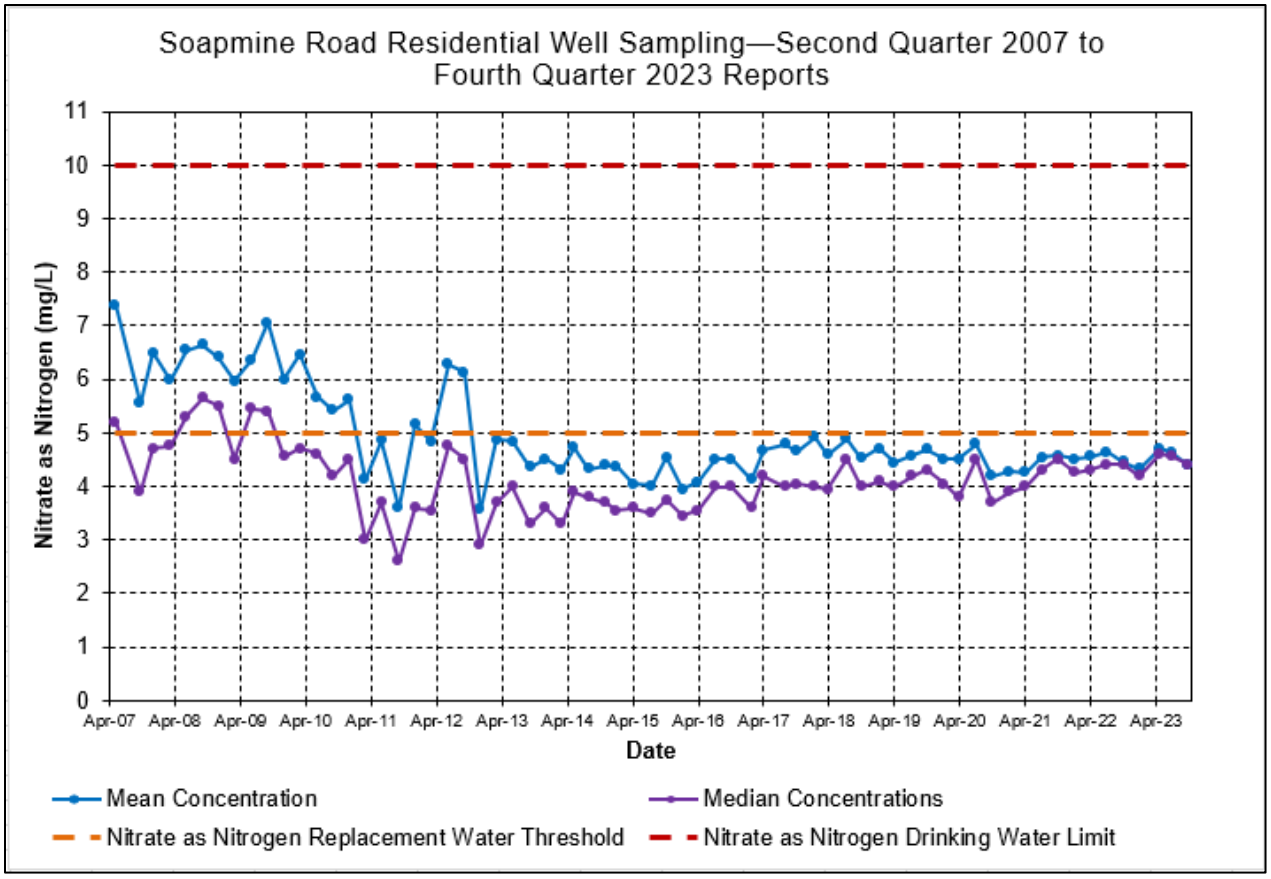

Figure 2.3: Chart illustrating sampled nitrate as nitrogen concentrations from residential wells reported on a quarterly basis compared to the replacement water threshold concentration contained in the CAO and the drinking water limit.

Based on the difference between the historical groundwater impact and current sampling data, the City has requested that the Water Board modify residential well sampling and replacement water requirements in CAO No. R6V-2007-0017, as follows.

1. Reduce sampling frequency for some residences from quarterly to either semi-annually or annually based on nitrate as nitrogen sample concentrations consistently measuring less than 5 mg/L.

2. Permanently cease well monitoring and bottle supply delivery to upgradient private wells (2190 Soapmine Road and 2200 Soapmine Road) affected by contamination from an unknown source, unrelated to the current cleanup.

3. Increase nitrate as nitrogen trigger threshold concentration from 5 mg/L to 10 mg/L for drinking water supply.

4. Cease supplying uninterrupted water service if 2 years of testing report nitrate and nitrogen concentrations below 10 mg/L.

Water Board staff plan to address the City's request to revise CAO No. R6V-2007-0017 during this fiscal year. This effort was delayed due to a staff resources shortage from October 2023 until April 2024.

3. **Standing Item: Annual City of Barstow Orphan Perchlorate Update, July 2024** – *Molina Hauv*

Background
In May 2021, APTIM, Inc. (APTIM) finalized a Focused Feasibility Study, Remedy Conceptual Design, and Full-Scale Work Plan for the Barstow Perchlorate remediation project funded through Senate Bill 445 (SB445). Remedial work outlined in that work plan has been in progress since March 2023.

Remedial Injections and Confirmation Soil Sampling
APTIM conducted in-situ remediation at the source area between March to June 2023 injecting emulsified vegetable oil (EVO) into the subsurface to treat perchlorate in soil. As planned, confirmation soil samples were taken 2 days, 30 days, 90 days, and 180 days after injection completion on each of the points. After the 90-day mark, confirmation sampling results showed reductions in perchlorate concentrations from baseline, however, concentrations remained elevated above the initial cleanup goal. Because of the elevated concentrations, additional injections were conducted in October 2023 at all 49 of the deep injection locations.

Post October 2023 injection confirmation soil samples were collected in December 2023. The results of those soil samples were that, on average, perchlorate concentrations decreased, but the average 3.9 milligram per kilogram (mg/kg) value exceeds the 0.4 mg/kg cleanup goal. Based on the results, APTIM decided to allow additional time to lapse and conducted additional confirmation soil samples in March 2024. The results of the March soil samples were an average of 3.6 mg/kg, which indicates that the decrease in perchlorate concentration has stalled six months after the initial injections. Additional injections were conducted in May 2024. Confirmation soil sampling is currently scheduled for June 2024 and September 2024, with exact field work dates to be determined.

The Figure 3.1 (below) depicts the average perchlorate concentrations in soil over time which generally is decreasing. Overall, the remediation approach is functioning as expected as shown from the reduction of average perchlorate concentrations from the baseline 55 mg/kg to the most recent samples indicating a 3.6 mg/kg average concentration. Remediation is taking longer than expected compared to the initial results of the pilot scale testing which estimated perchlorate remediation to be complete in approximately 30 days.

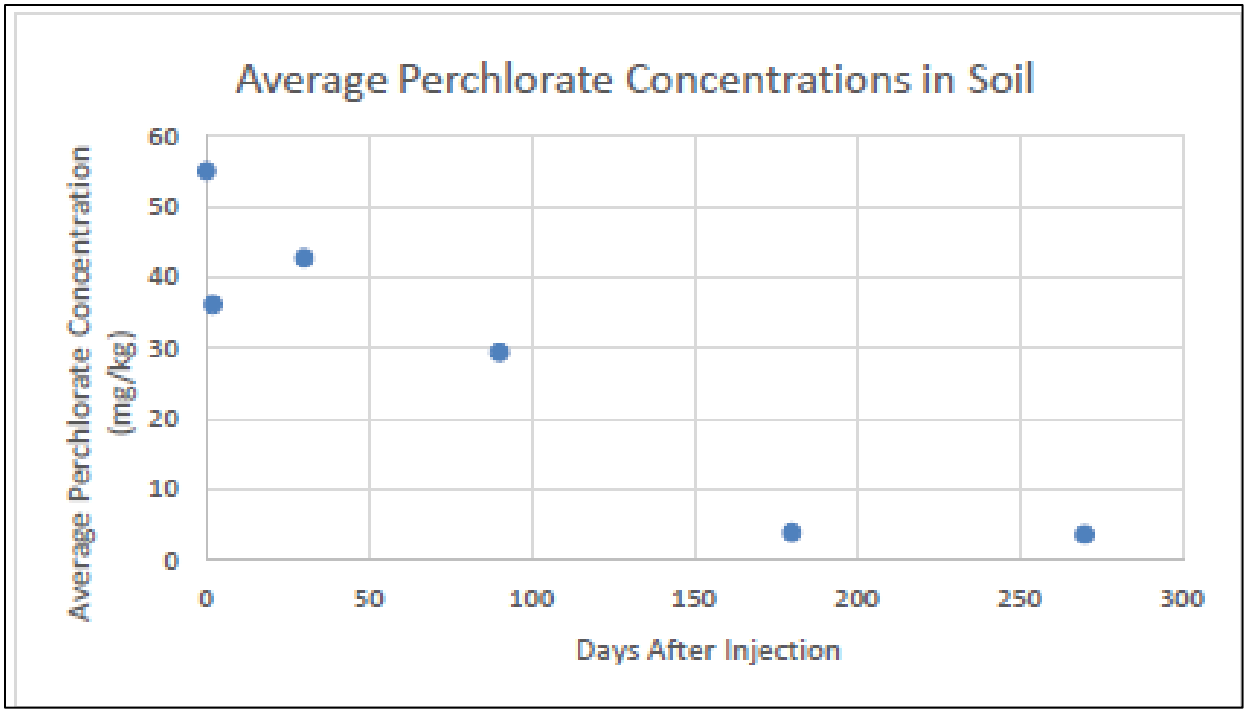

Figure 3.1: Average Perchlorate Concentrations in Soil, graph illustrating downward trend of perchlorate concentrations

Discrete Groundwater Sampling and Direct-Push using hydropunch sampling

In July 2023, APTIM completed the direct-push drilling and discrete groundwater sampling to characterize the vertical extent of the plume. Figures 3.2 and 3.3 illustrate the groundwater sampling locations using direct-push methods. These 16 sampling locations are found on two transects along Crooks Avenue and Webster Road.

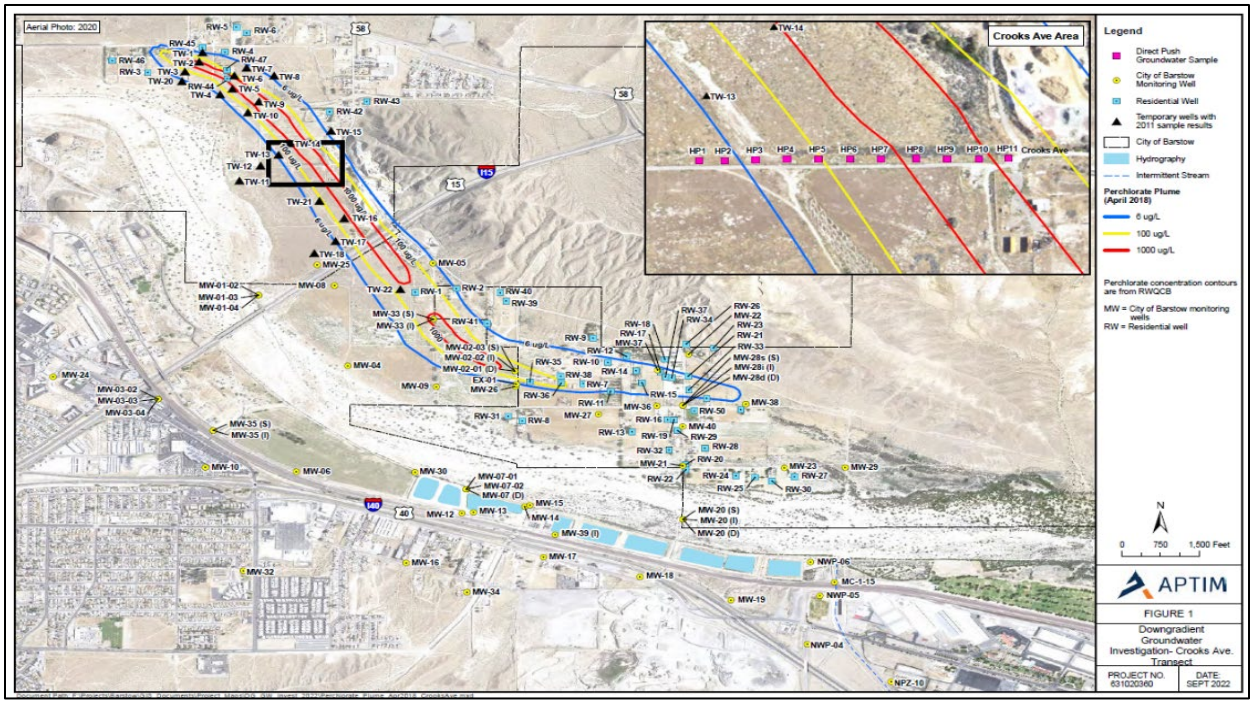

Figure 3.2 Direct Push Groundwater Sample Locations on Crooks Avenue, September 2022

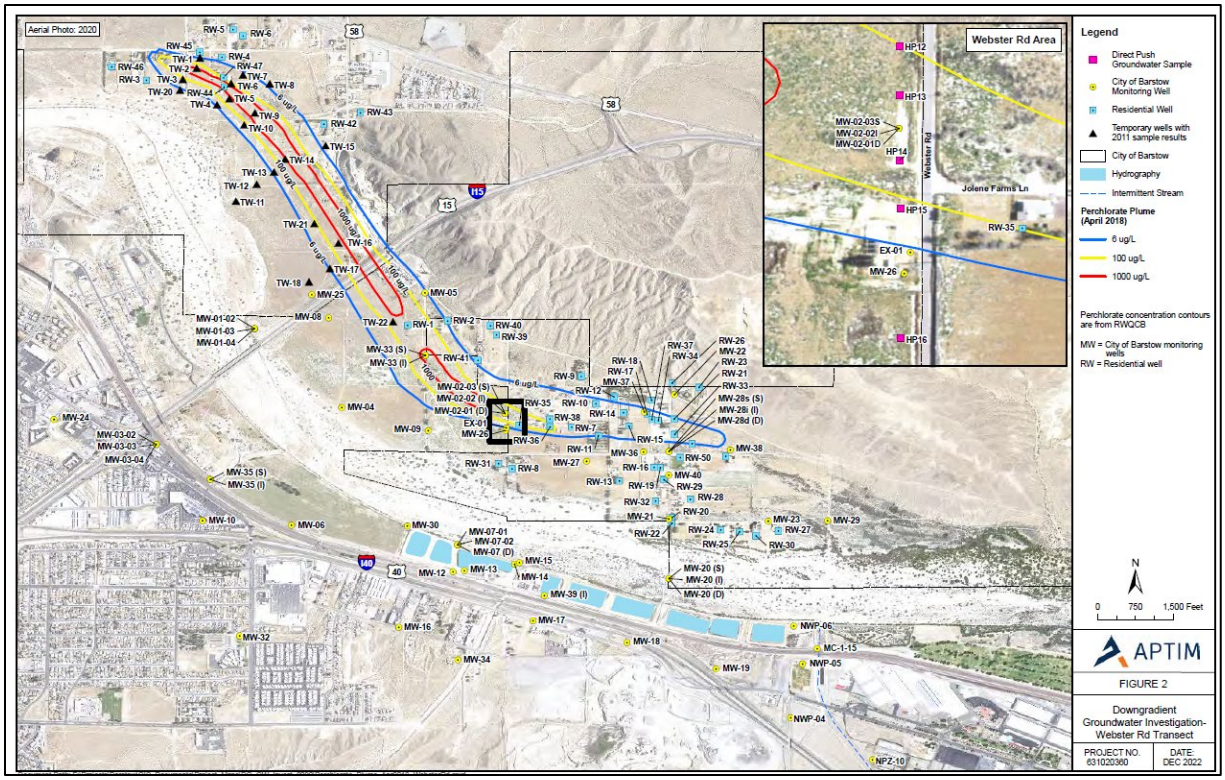

Figure 3.3 Direct Push Groundwater Sample Locations on Webster Road, December 2022

Along Crooks Avenue (Figure 3.2), hydropunch groundwater samples were collected every 10 feet from 50 feet below ground surface (bgs) to 110 feet bgs. The locations of the samples were north of Crooks Avenue, along the entire width of the perchlorate plume in 2018. Results from those samples indicated that the vertical plume extent was deeper than 110 feet bgs.

Along Webster Road (Figure 3.3), direct push groundwater samples were collected every 10 feet from 35 feet bgs to 105 feet bgs. The locations of the samples were west of Webster Road, along what was designated as the centerline of the plume between the source area and the leading edge of the plume.

The results of the hydropunch groundwater sampling investigation were used to determine the permanent groundwater monitoring well locations.

Groundwater Monitoring Well Installation and Tracer Test Study

As part of the Mojave River Pyrotechnics Investigation Work Plan, dated March 2019, a tracer test study was planned as part of site condition evaluation. The goal of the tracer tests is to estimate groundwater properties in the area, based on data from six wells: two existing wells located on the source area property and four newly installed groundwater monitoring wells downgradient of the source area property. Figure 3.4 illustrates the locations of the newly installed monitoring wells.

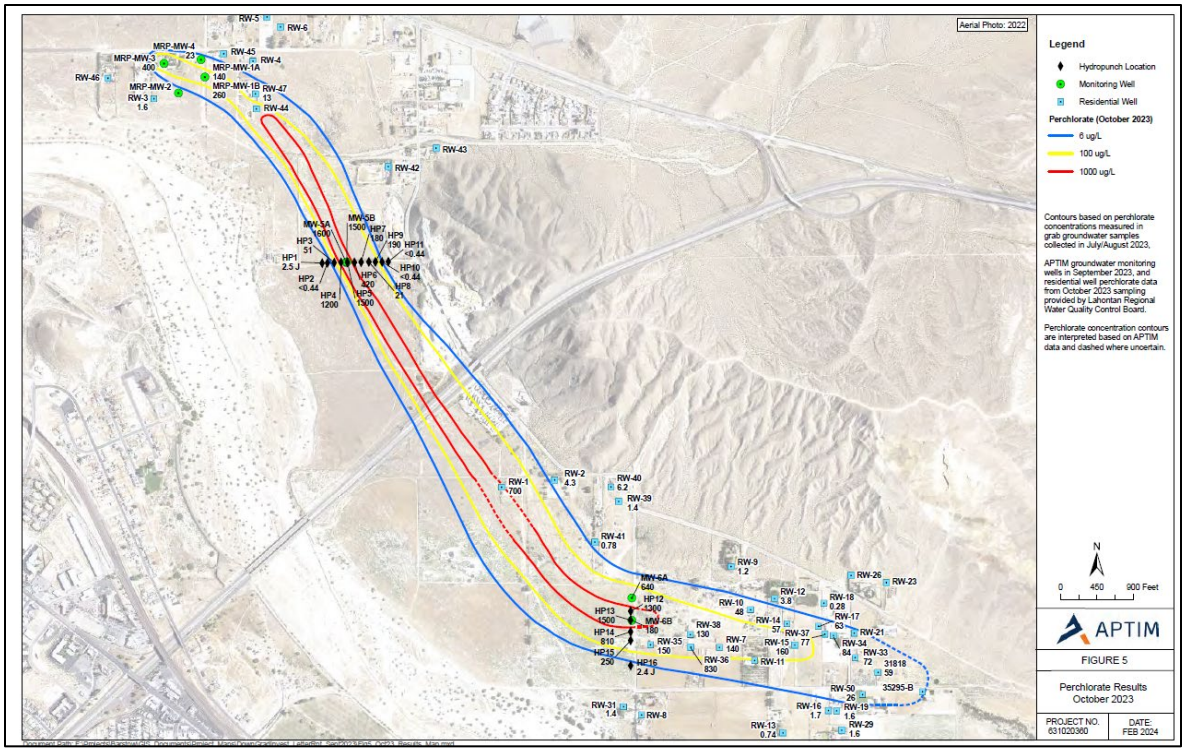

Figure 3.4: Groundwater Monitoring Well Locations and Perchlorate Results, February 2024

Based on the discreet groundwater samples collected permanent groundwater monitoring well locations were selected to target the highest concentration to track long-term trends in perchlorate migration and aide in selection of a groundwater remediation techniques for the groundwater plume. Sonic drilling was the methodology used for well installation between August and September 2023 (Figure 3.5). Monitoring well installation of four wells was completed in August 2023, with subsequent groundwater monitoring well sampling. Completed wells were protected with four yellow bollards and locked (Figure 3.6). Based on this data, since 2018, the plume has continued to migrate downgradient. This data will be used for ongoing monitoring, future remediation evaluation and design, and any future modeling.

Figure 3.5: Drill rig from Cascade Drilling, L.P. during monitoring well installation on Crooks Avenue, August 2023

Figure 3.6: Photo of New Groundwater Monitoring Well along Webster Road, October 2023

Status of Plume Monitoring

Water Board staff conducts quarterly groundwater monitoring of private residential wells and groundwater monitoring wells owned by the City of Barstow. In Fall 2023, Water Board staff had the opportunity to collect monitoring well split samples with Atlas Environmental Engineering Inc., the consultant for the City of Barstow who monitors the nitrate plume in the area (Figure 3.7).

Figure 3.7: Lahontan Water Board staff and Atlas Environmental staff conducting groundwater monitoring sampling, October 2023.

APTIM also conducts groundwater monitoring of the wells installed under the SB445 contract. Based on the current contract with APTIM, semiannual groundwater monitoring is scheduled to go through May 2026 to monitor all wells located on Figure 3.4. Since 2018, the plume footprint has remained relatively consistent in size. The plume continues to move downgradient from the source area and remains undefined past well MW-38 which is located east of Marks Road (Figure 3.8). Perchlorate values continue to increase southeast of the source area, with the plume moving more easterly towards the leading edge of the plume.

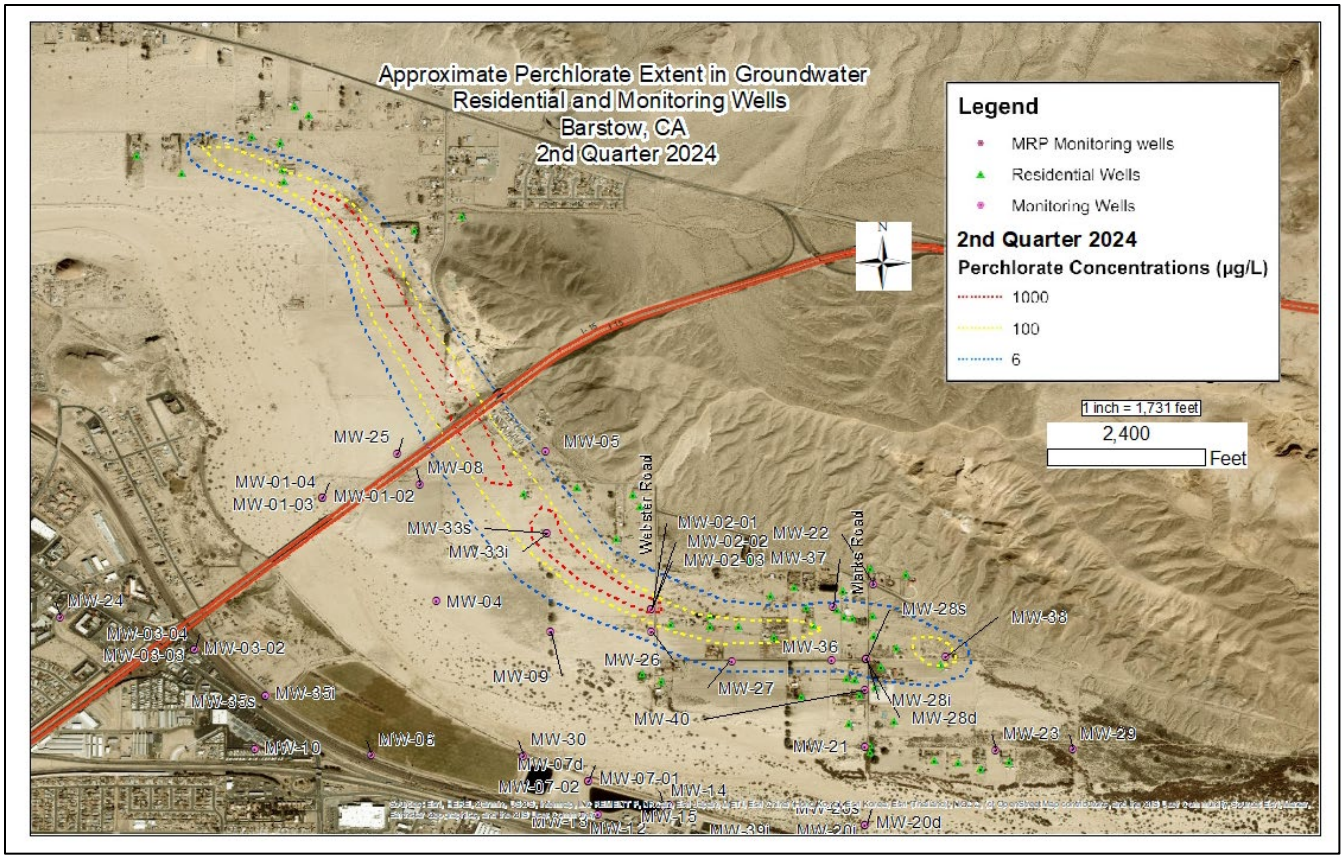

Figure 3.8: Approximate Perchlorate Extent in Groundwater 2nd Quarter 2024, June 2024

Bottled Water Update

Replacement bottled water has been offered to eligible residents since 2011 with funding extended to June 2026. Under the terms of the funding, the Lahontan Water Board can provide bottled water to residents that meet income eligibility requirements. Since the 2023 update, more residences have started receiving replacement bottled water; the contract now provides bottled water to nine of the affected residential locations.