



Barstow Groundwater Perchlorate Contamination

Background

This fact sheet is the third update on the results of recent investigations of perchlorate contamination in soil and groundwater in the Barstow area. The chemical perchlorate was discovered in November 2010 in wells used by Golden State Water Company and in two private residential water supply wells. Municipal supplies by Golden State Water Company were flushed of the contamination and contaminated water is not being distributed in the public water supply. The U.S. Environmental Protection Agency (EPA) is conducting a soil investigation of the suspected perchlorate contamination source area at 30433 Poplar Street. The California Regional Water Quality Control Board, Lahontan Region (Water Board) has completed an investigation of the extent of perchlorate-contaminated groundwater down gradient of the suspected source area.

Recent Activities

The Water Board and the EPA are working together to determine the distribution of perchlorate in soil at the source area and the extent of groundwater contamination down gradient of the site.

EPA conducted a site assessment which included soil sampling in March and August 2011. The results of this effort are included in a report entitled: *Mojave River Pyrotechnics Assessment Report*, dated October 2011 (available at http://www.waterboards.ca.gov/lahontan/water_issues/programs/perchlorate/index.shtml). Significant perchlorate contamination (up to 130,000 mg/kg) was found in soil at the residential property at 30433 Poplar Street. A groundwater sample collected at the residence detected perchlorate at 110,000 micrograms/liter parts ($\mu\text{g/L}$). Soil and groundwater sample results indicate that part of the property is contaminated with perchlorate. Perchlorate was found in discreet areas at the former pyrotechnics manufacturing facility located at 36131 Yucca Avenue, however, it was well below the action level of 55 mg/kg and deemed to be no threat to groundwater.

In December 2011, private contractors working for the Water Board performed a groundwater investigation down gradient of the source area. The purpose of the investigation was to gain information on the extent of perchlorate in the shallow groundwater. The results of this investigation are contained in a report entitled *Perchlorate*

Groundwater Investigation Report, 30433 Poplar Street, Barstow, California (available at http://www.waterboards.ca.gov/lahontan/water_issues/programs/perchlorate/index.shtml). This effort was funded from the State Water Resources Control Board Cleanup and Abatement Account which consists of liabilities assessed by the State and regional Water Boards.

The groundwater investigation determined that the highest concentration of perchlorate is limited to an area between the source at 30433 Poplar Street and the Golden State Water Company Soap Mine Road production well. At its widest point, the plume is approximately 1,400 feet wide. The groundwater investigation found lower concentrations of perchlorate extending approximately 1.25 miles from the source area.

Temporary wells were drilled and sampled for the groundwater investigation. There were 22 groundwater sample points aligned along rows perpendicular to the assumed groundwater flow direction, extending from the source area toward the south-southeast. Sample location density was highest in the area closest to source. The sample locations were based on assumed groundwater flow direction, available groundwater quality data from private residential wells and access constraints.

Perchlorate was detected at 12 of the 22 groundwater sample locations (see map). Detectable concentrations of perchlorate ranged

from 4.5 to 13,000 µg/L. The perchlorate-impacted groundwater appears to be highest near the source area and gradually decreases toward the southeast, forming a relatively narrow plume. The groundwater investigation was limited to the shallow groundwater. The investigation did not sample deeper groundwater and did not completely define the full extent of the shallow perchlorate plume.

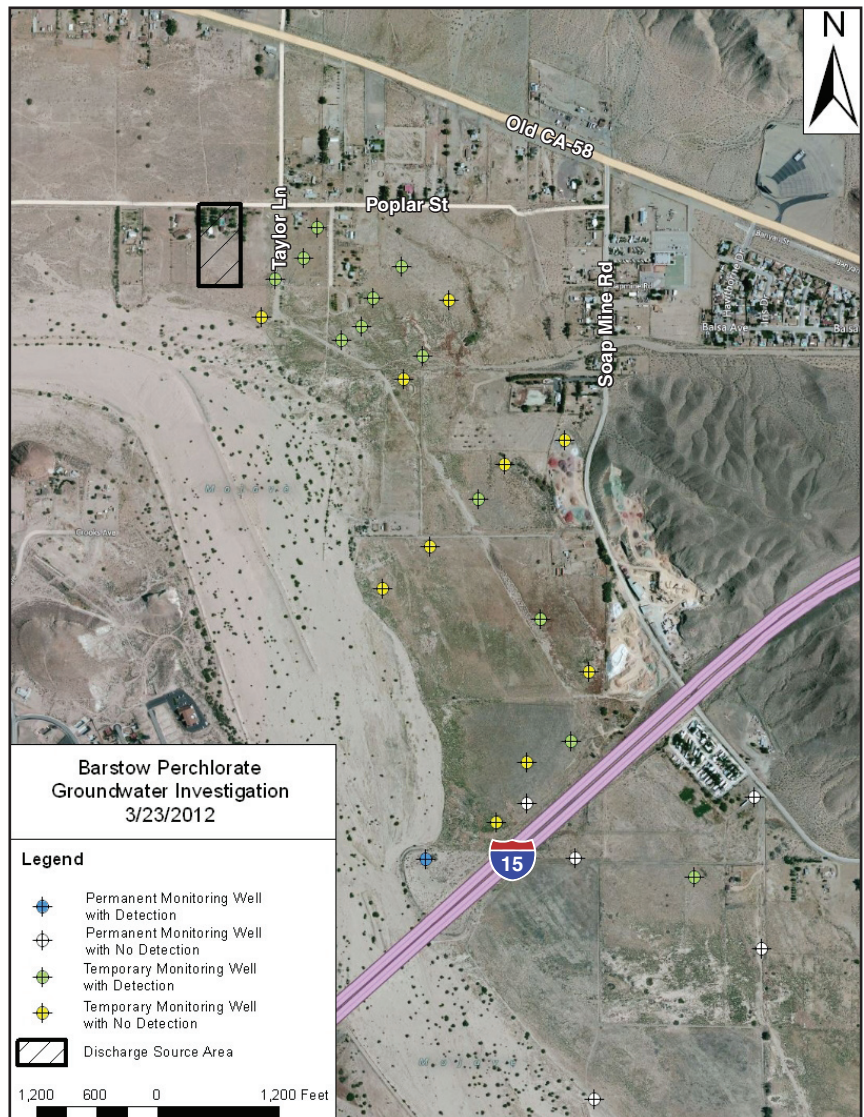
The Water Board, with the assistance of the City of Barstow, has sampled groundwater from a number of existing permanent monitoring and domestic supply wells in the area on a regular basis. Perchlorate has not been detected in the permanent groundwater monitoring wells in the area north of the Mojave River and east of the I-15 Freeway (see map with monitoring wells designated in white surrounding temporary wells in green that were part of groundwater study). The latest results were from samples taken in December 2011. This regular sampling confirms the consistent presence of perchlorate in two private domestic supply wells near the source area.

Perchlorate and Drinking Water Standards

Perchlorate is used in rocket fuel, fireworks, flares and explosives. California has set the Maximum Contaminant Level (MCL or drinking water standard), at 6 µg/L (also known as parts per billion or ppb) for perchlorate. The federal government has not yet set an MCL for perchlorate. MCLs are set for consumption purposes only; therefore, it is important to not drink or prepare food with water that exceeds an MCL. Boiling the water does not remove perchlorate and may actually concentrate it in the water. One may, however, use water that exceeds an MCL for other household purposes such as bathing, washing dishes, washing clothes, general cleaning and irrigation. MCLs are set for humans; no standards exist for consumption by animals or for irrigation purposes.

Next Steps

EPA will continue assessment activities at the residential property on Poplar Street as well as begin the evaluation of alternatives for the removal, treatment, containment and control of perchlorate-contaminated soil. This evaluation should be completed and cleanup activities begun by EPA in mid-summer 2012. The Water Board is working with other state and federal agencies to determine future steps that may be taken for additional groundwater investigation and remediation, and possible funding sources to address the problem.



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