National Aeronautics and Space Administration

2018 YEAR in REVIEW

JPL Groundwater Cleanup Project

Final Groundwater Cleanup Plan Approved; Project Enhancements Ongoing

This 2018 Year in Review is part of NASA's effort to keep the public informed about the progress of groundwater cleanup efforts at and in the vicinity of NASA's Jet Propulsion Laboratory (JPL).

BACKGROUND

The groundwater chemicals being addressed are volatile organic compounds (VOCs) and the chemical compound perchlorate. The chemicals originated from long-discontinued liquid and solid waste disposal practices during the 1940s and 1950s when wastes from JPL drains and sinks were disposed of in brick-lined seepage pits – a waste management practice that was common at the time. Today, Laboratory chemical wastes are either recycled or sent off facility for treatment and disposal at permitted hazardous waste facilities.

A Major Milestone

Early in 2018, NASA and the regulatory agencies overseeing NASA's groundwater cleanup project at JPL approved and signed a final cleanup plan referred to as the Record of Decision (ROD). The parties agreed that continuing the operation of the three groundwater treatment plants at and near JPL is the best approach to reaching the cleanup goals and maintaining protection of human health and the environment. NASA prepared a fact sheet on the ROD, summarizing the investigations and remedial actions that led to its approval, as well as the significance of the ROD itself. Both the ROD and the fact sheet have been posted onto the groundwater cleanup Website, https://jplwater.nasa.gov.

Planning for Two Major Project Enhancements

While NASA and the regulatory agencies believe the cleanup plan presented in the ROD is the best approach for groundwater cleanup, NASA recognizes that over time enhancements can be identified to improve efficiency in existing operations and reduce the timeframe needed to clean the aquifer. During 2018, NASA continued efforts associated with enhancements to the source area treatment system (see below) and the Monk Hill Treatment System (MHTS) (see page 2). At the same time, progress continued with cleanup operations at all three systems:

ON JPL PROPERTY AT THE "SOURCE AREA."

NASA and the regulators overseeing the cleanup agree that continuing the operation of the three groundwater treatment plants at and near JPL is the best approach to reaching the cleanup goals and maintaining protection of human health and the environment.

Construction of a new extraction well and installation of new treatment equipment at the on-facility source area groundwater treatment plant were both completed in 2018. The new extraction well will remove chemicals from groundwater outside the current treatment zone and will enhance removal of chemicals beneath the JPL facility. The new treatment equipment will be used to replace the existing fluidized bed reactor perchlorate-removal technology with an ion exchange technology. Now that lower levels of perchlorate in the source area groundwater have been achieved through treatment, ion exchange technology becomes more effective. Concurrent with these construction efforts, the source area treatment system continued to operate in 2018, removing 32 pounds of perchlorate from groundwater beneath JPL and one pound of VOCs. Since system startup in January 2005, the total amount of unwanted chemicals in groundwater beneath JPL has been reduced by more than 98 percent.

While chemical removal has been significant, the levels are still above the cleanup goal, and removing the remaining chemicals from the groundwater is expected to take another five to ten years. This is typical in groundwater remediation because chemical removal gets harder as concentrations decrease to meet the low (i.e., in the parts-per-billion concentration) cleanup levels. It takes a long time to flush enough water through the aquifer to achieve the very low cleanup level goals.

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2018 YEAR in REVIEW CONTINUED

OFF-JPL TREATMENT SYSTEMS

IN THE ARROYO SECO, located approximately in the middle of the affected area, the Monk Hill Treatment System (MHTS) consists of four Pasadena drinking water wells and a treatment plant located on Windsor Avenue.

NASA and Pasadena Water and Power (PWP) continued with plans to construct a new drinking water well located in the northern portion of the Arroyo Seco and to modify the nearby Behner Treatment Plant. The new well would increase removal of targeted chemicals by an estimated 40 percent, which would significantly reduce the time needed to clean up the aquifer. Groundwater from the new well would be piped to and treated at the Windsor Avenue plant along with water from the four existing wells. This new well would be strategically located to better capture chemicals originating from the JPL site. PWP's nearby Behner Treatment Plant, currently not in use, would be put back into operation for storage and treatment of process water generated by the MHTS. Process water is currently managed at the Windsor Avenue plant, but would be more efficiently managed at the Behner location. The Behner plant can store large volumes of process water, which could then be treated and discharged into the spreading basins for infiltration back into the aquifer.

In 2018, the MHTS removed 52 pounds of perchlorate from groundwater and 15 pounds of VOCs. Since system startup in 2011, chemical levels in groundwater extracted by the MHTS have been reduced by more than 75 percent.

"The **new well** at the MHTS would **increase removal** of targeted chemicals by an estimated **40 percent,** which would **significantly reduce** the time needed to clean up the aquifer."

AT LINCOLN AVENUE WATER COMPANY (LAWC) drinking water wells in Altadena, at the outer edges of the affected area.

The LAWC system, now with three drinking water wells since a third was put into operation in late 2017, removed 76 pounds of perchlorate during 2018 and 17 pounds of VOCs. Chemical concentrations in the LAWC groundwater have now been reduced by more than 50 percent since startup in 2004.

Continued Groundwater Monitoring

With 25 monitoring wells on and in the vicinity of JPL, NASA remains confident that the treatment systems in place continue to be effective in remediating the affected groundwater. Quarterly monitoring reports continued to be filed in 2018 and posted at the groundwater cleanup website: https://jplwater.nasa.gov.

Community Outreach

Our **commitment** remains strong to groundwater cleanup and to **communicating** with neighbors and **community** members about our progress.

Community Outreach

Community outreach remains a cornerstone of NASA's environmental cleanup program. During 2018, NASA…

Published a 2017 Year in Review document,

Updated the public via the project website on a variety of aspects of the cleanup, including the completion and signing by NASA and State and Federal regulators of the final Record of Decision,

Began work on other project website updates that would better organize information and outreach efforts,

Distributed the Final ROD and associated fact sheet to regulators, stakeholders, JPL staff, and interested community members,

Responded to questions from stakeholders resulting from distribution of the Final ROD and associated fact sheet,

Conducted a site visit during a monitoring well sampling for students in the advanced environmental studies class at John Muir High School,

Attended a retirement party for LAWC General Manager Bob Hayward and welcomed new General Manager Jennifer Betancourt, and

Responded to routine inquiries from the community about NASA's cleanup effort.

For information, contact

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