National Aeronautics and Space Administration

2021 Year in Review

JPL GROUNDWATER CLEANUP PROJECT

This 2021 Year in Review is part of NASA's ongoing efforts to keep the public informed about the progress of groundwater cleanup 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 common during the 1940s and 1950s when wastes from JPL drains and sinks were disposed of in brick-lined seepage pits. Today, all chemical wastes are either recycled or sent off-facility for treatment and disposal at permitted hazardous waste facilities. NASA is cleaning up the groundwater chemicals under the Federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly known as Superfund.

NASA Groundwater Cleanup Advances at and Near JPL in 2021

During 2021, NASA was able to successfully continue groundwater cleanup activities at and in the vicinity of JPL while meeting health- and pandemic-related safety requirements throughout its operations.

NASA also maintained its commitments:

To clean up groundwater associated with long-discontinued solid and liquid waste disposal practices at JPL, and

To keep the public informed about and involved with the cleanup as much as possible.

With restrictions in place due to the ongoing pandemic and with impacts from the ongoing drought in Southern California, NASA staff were still able throughout 2021 to continue both with operations and maintenance of its 16-year-old onsite groundwater treatment system and with NASA's quarterly chemical-level testing at 25 JPL-area groundwater monitoring wells. Even so, the drought did impact the cleanup program. At certain monitoring locations, for example, groundwater levels in the aquifer fell below the levels needed for sampling. At the onsite treatment system, by the end of the year, only one of four extraction wells had sufficient water levels for pumping. Monitoring groundwater levels and drought conditions will remain an important focus in 2022 and beyond.

Throughout the year, NASA also continued to make progress with the NASA-funded treatment systems owned by Pasadena Water & Power (PWP) and the Lincoln Avenue Water Company (LAWC). While the drought did impact the ability to pump water from some wells, PWP and LAWC were able to operate the key wells needed for cleanup throughout the year, both to remove chemicals and to ensure containment of the affected area.

> "NASA established relationships that have allowed members of the community to continuously reach out and have their questions or concerns addressed."

Toward the end of the year, NASA began work on its CERCLA-required Third Five-Year Review, which will be finalized with approval from the US Environmental Protection Agency and state of California regulators early in 2022. That Review is evaluating data collected since the Second Five-Year Review, conducted in 2017, to evaluate progress and protectiveness of the cleanup actions in place, and to identify any recommendations moving forward. NASA will also report on responses to questionnaires sent to a number of stakeholders on how NASA is doing with outreach to and responsiveness with the public and area drinking-water purveyors.

Response to those questionnaires was highly positive. For example, one person responded, "From the very beginning, NASA engaged the community and was able to provide complex information in a way they [community members] could understand. … [NASA] also established relationships that have allowed members of the community to continuously reach out and have their questions or concerns addressed."

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NASA remains committed to ongoing communication and transparency in all groundwater cleanup activities at JPL

"Source Area" Groundwater Cleanup Progress in 2021

2021 marked the first full year with the new ion exchange perchlorate-removal technology at the source area and a new groundwater extraction well; both became operational in late 2020. Some 2,124 pounds of perchlorate as well as 48.7 pounds of VOCs have now been removed from groundwater beneath JPL since system startup in January 2005. The total amount of unwanted chemicals in groundwater beneath JPL has been reduced by almost 98 percent. While chemical removal has been significant, cleanup needs to continue. Reduced groundwater chemical levels are still above the stringent cleanup goals set forth in the final cleanup plan outlined in the 2018 Record of Decision (ROD). Continued operation of the systems to achieve those cleanup goals is expected to take another five to ten years. This is typical in groundwater remediation because chemical removal becomes more difficult as concentrations decrease. It takes a long time to flush enough water through the aquifer to achieve the cleanup goals in the ROD.

Year 2021 Groundwater Cleanup Progress in the Arroyo Seco

The NASA-funded Monk Hill Treatment System (MHTS) consists of four City of Pasadena drinking water wells in the Arroyo Seco and a treatment plant located on Windsor Avenue. NASA and Pasadena Water and Power (PWP) continued in 2021 with planning to construct a new NASA-funded MHTS drinking water well located in the northern portion of the Arroyo. The new well would increase removal of targeted chemicals by an estimated 40 percent, and it would significantly reduce the time needed to clean up the aquifer. Since system startup in 2011, the MHTS has removed more than1,380 pounds of perchlorate from groundwater and more than 220 pounds of VOCs. Overall, chemical levels in groundwater extracted by the MHTS in the Arroyo have been reduced by nearly 90 percent.

Year 2021 Progress at the LAWC System

The Lincoln Avenue Water Company (LAWC) system, now with three drinking water wells since a third NASA-funded well was put into operation in late 2017, has now removed more than 1,419 pounds of perchlorate and more than 337 pounds of VOCs since startup in 2004. Chemical concentrations in the LAWC groundwater have now been reduced by nearly 85 percent.

Continued Groundwater Monitoring

With 25 monitoring wells on and in the vicinity of JPL, NASA is able to demonstrate that the treatment systems in place continue to be effective in remediating the affected groundwater. NASA continued to prepare quarterly monitoring reports for 2021 which are also *posted* at the groundwater cleanup website. NASA also continued weekly monitoring of perchlorate levels in wells at the nearby Rubio Cañon Land and Water Association (RCLWA).

Completion, Filing of Annual Institutional Controls (IC) Report

The final Record of Decision requires that an annual Institutional Controls (IC) report be filed to evaluate activities that could impact the effectiveness of the cleanup program (e.g., installation of a new well). NASA completed and filed the *2020 IC report* in January 2021, as required.

Community Outreach

NASA remains committed to ongoing communication and transparency in all groundwater cleanup activities at JPL, and community outreach remains a cornerstone of the program.

During 2021, NASA community outreach included the following:

Continued maintenance of the CERCLA Project website. This included document updates, software/programming/ security updates, and posting of other content.

Responding throughout the year to community questions and or emails along with questions from community organizations and elected leaders

January distribution of the 2020 Year-in-Review.

Presentation in February on the status of the JPL cleanup made at the Altadena Town Council meeting by NASA Cleanup Project Manager Steve Slaten.

In September, as part of initiating the CERCLA-required Third Five-Year Review, NASA prepared and distributed three documents:

A Public Notice announcing the beginning of work on the Five-Year Review. That notice was *placed prominently* on the home page of the CERCLA Project website.

A questionnaire for water purveyors regarding NASA's outreach to them and NASA efforts to involve them in the cleanup process, and

A similar questionnaire for community groups and public officials

For additional information on NASA activities during 2021, or for general information or inquiries regarding the CERCLA Groundwater Cleanup Project, contact:

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