FALL/WINTER 2021

Field NOTE

An Update on NASA's Cleanup Efforts at the Santa Susana Field Laboratory

NASA presses on with groundwater studies

Treatability studies to aid in the development of final groundwater cleanup plans

NASA is eager to begin groundwater cleanup at SSFL as soon as the Department of Toxic Substances Control (DTSC) completes their Final Program Environmental Impact Report (PEIR) for SSFL and issues a decision document. In the meantime, NASA is working on pilot studies to evaluate the effectiveness of two separate groundwater treatment technologies in removing contaminants in groundwater beneath SSFL: enhanced in situ bioremediation (EISB) and bedrock vapor extraction (BVE).

"If our treatability studies are successful under the site's unique conditions, not only can we incorporate the treatment approaches into final groundwater cleanup plans, but we can also get a head start on cleanup by actively treating source areas."

- Peter Zorba, NASA SSFL Project Director

NASA SSFL Project Director Peter Zorba said that if the pilot studies are successful, NASA can consider expanding them for a full-scale remedy. "NASA is excited and optimistic about our groundwater treatability studies," said Zorba. "If they are successful under the site's unique conditions, not only can we incorporate the treatment approaches into final groundwater cleanup plans, but we can also get a head start on cleanup by actively treating source areas."

A drillling rig drills one of three injeciton wells for the EISB pilot studies in the Alfa Test Area at SSFL.

Enhanced In Situ Bioremediation

Since 2020, NASA has been developing plans for a pilot study to evaluate how effectively EISB can clean up groundwater. EISB is a green treatment technology that uses naturally occurring microbes to remove trichloroethylene (TCE) and other volatile organic compounds (VOCs) from the groundwater. NASA has created an EISB treatability study fact sheet with information about the EISB process and plans for the above ground treatment system.

EISB fieldwork began in Summer 2021 with the drilling of injection and monitoring wells required for the pilot study. Drilling for the remaining two injection wells and two monitoring wells is set to begin in February of 2022. Once all wells are completed, anticipated in the fall of 2022, NASA will begin construction of the above ground EISB recirculation system. This pilot study is expected to commence by early 2023.

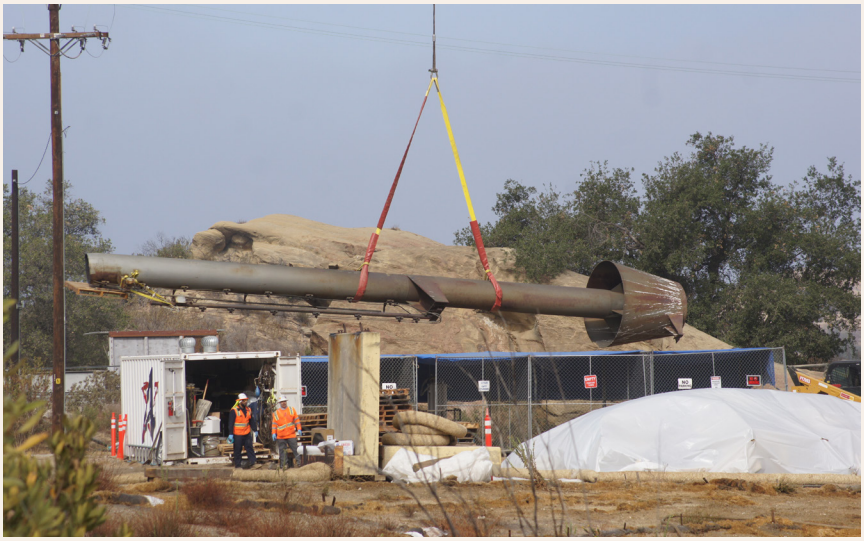
Bedrock Vapor Extraction

A second treatability study will evaluate the effectiveness of BVE to reduce VOCs in the bedrock at SSFL. Site investigations have shown that SSFL has an underlying fractured sandstone bedrock matrix that can trap VOCs in the fractures and pore spaces. Two short-term BVE pilot studies, conducted in 2014 and 2015, demonstrated that BVE is a promising remedial technology to effectively remove VOCs within the unsaturated zone above the groundwater, also known as the "vadose" zone. During the one to three-week studies, NASA achieved significant mass removal of chlorinated VOCs in two separate areas of SSFL.

NASA is expanding on these initial studies to assess BVE on a much larger scale and for a greater duration. The 18-month study will take place in the Alfa Test Area where there is a thick vadose zone with a significant bedrock fracture network and VOC vapor concentrations. During the study, bedrock vapor will be extracted and treated with granular activated carbon to remove VOCs, and NASA will monitor the bedrock at Alfa to assess remedial effectiveness.

BVE field work will begin in January 2022 with the drilling of an extraction well and two nested vapor monitoring wells. The pilot study is expected to begin in earnest in Fall 2022.

Phase 5 demolition activities in full swing at Bravo



Demolition crews remove one of the three flare stacks, also referred to as "tiki torches" from the top of Bravo Test Stand 2. NASA is donating these flare stacks to the Air Force Flight Test Museum at Edwards Air Force Base.

Since 2015, NASA has been on a mission to remove buildings and infrastructure that remain from historical operations at SSFL, in preparation for final cleanup. During the first four phases of demolition that occurred between 2015 and 2020, NASA successfully removed all obsolete structures and infrastructure, except for the six test stands and associated control houses.

This summer, NASA kicked off Phase 5 focusing on the demolition of the two Bravo test stands and associated control house. Phase 5 is the continuation of the demolition activities outlined in NASA's 2014 Record of Decision for Demolition. In June, NASA initiated pre-demolition activities such as asbestos and lead paint abatement. Now the work has shifted to the dismantling and removal of the structures. Demolition crews are taking a "top down" approach, dismantling the test stands piece by piece starting at the top and making their way down to the bottom. Once all structures have been removed, a specialized hydroseed mix of plants native to the Santa Susana site will be applied to the area to promote natural re-vegetation and erosion control. NASA expects to complete Phase 5 by late summer of 2022.

Safety First

NASA's top priority is to conduct demolition in a manner that is safe to on-site workers and the surrounding community. As with previous phases, NASA is working with the United States Army Corps of Engineers, a federal agency with unique engineering and construction capabilities and demonstrated oversight and quality assurance experience with complex demolition projects.

Demolition crews are following state and federally approved work plans that outline the practices and procedures to be implemented to ensure the health and safety of demolition crews and the public. For example, crews are required to implement dust control and suppression measures to that ensure minimization of airborne dust generation. In addition, an environmental monitor is onsite during all demolition work to ensure that debris (primarily steel and concrete) is carefully segregated and surveyed for any traces of contamination. All hazardous and non-hazardous materials will be handled and packaged in accordance with safety precautions outlined by local, state, and federal regulations. Trucks carrying demolition debris must undergo a thorough inspection to ensure proper safety measures are in place before they are cleared to leave the site for transport to a licensed disposal facility.

Historic Preservation

Bravo Test Stand 2 had a unique design featuring three flare stacks, also known as the "Tiki Torches," at the top of the stand. These flare stacks were used to redirect and safely burn off exhaust generated during rocket engine testing at the Bravo Test Stand 2. Last month, demolition crews detached and removed the "Tiki Torches" from Test Stand 2 (see photo, above). NASA is transferring these historic flare stacks to the Air Force for display at the Flight Test Museum at Edwards Air Force Base.

Recently Spotted at SSFL...

A peregrine falcon (right) was recently seen perched on Coca Test Stand 1 in NASA's Area II

A grey fox (above) was spotted hunting for prey in the former Delta Test Area in NASA's Area II

A hummingbird (below) was recently seen feeding in front of Coca Test Stand 1

All photos courtesy of Roger Lucich

CONTACT
Lori Manes | Community Outreach | NASA Santa Susana Field Laboratory
☎ (818) 806-8834 ✉ lori.manes@nasa.gov
https://ssfl.msfc.nasa.gov