

Lawrence Livermore Laboratory Superfund Cleanup 2019

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On December 11, 1980, the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund) was enacted by Congress. This new law created a tax on the chemical and petroleum industries in which funds are placed into a trust for cleaning up abandoned or currently active hazardous waste sites. The Department of Energy nuclear weapons facilities subsequently became subject to the Superfund law; however, these federal cleanup sites are funded through the Congressional appropriations process.

The worst and most contaminated of these sites are placed onto a list called the National Priorities List. The Lawrence Livermore National Laboratory (LLNL) Main Site and Site 300 are both on this National Priorities List. For each these LLNL sites, the estimate is that it won't be until 2060 before the environment is restored. Following active cleanup, at Site 300 there will be contamination left in perpetuity beyond 2060 that will require environmental monitoring. It is less clear if Main Site monitoring will still be required 41 years from today.

Recently, as the group's legal intern, I had an opportunity to participate in an all-day meeting between Tri-Valley CAREs and Superfund cleanup staff about the progress of the Superfund program at LLNL. Participating with Tri-Valley CAREs were LLNL Superfund staff, National Nuclear Security Administration staff, the Superfund project manager from EPA Region IX, and state Superfund regulators from the Department of Toxic Substances Control and the Regional Water Quality Control Boards. Tri-Valley CAREs organized the meeting as part of its Superfund oversight project. The morning session was devoted to the Main Site, the afternoon to Site 300. Here are some of the key facts I found particularly significant.

MAIN SITE

As a part of the cleanup activities at the Lawrence Livermore National Laboratory Main Site, groundwater wells have been drilled at strategic locations to remove volatile organic compounds or VOCs from the groundwater below. The most commonly found VOC is trichloroethylene or TCE. TCE is an industrial solvent that is known to cause cancer and other neurological, immunological, reproductive, and developmental issues. These accidental releases of VOCs and other chemicals are concerning as they could threaten Livermore's drinking water supply as well as the surrounding community.

VOCs can also migrate to the subsurface and become an inhalation risk in the ambient air. In the 2018 annual report on cleanup efforts, 43 kilograms of VOCs were removed from the Lawrence Livermore

National Laboratory Main Site. Thirty-two kilograms of these were from groundwater, and a further 12 kilograms were from soil vapor. This removal rate is very similar to what was removed in 2017, with a slight increase in the amount of soil vapor mass removed.

What may be even more concerning is the tritium that was found in the building 419 monitor well. Tritium is a rare and radioactive isotope of hydrogen with a half-life of 12.32 years. This means that the source of the tritium contamination is likely of recent origin. The tritium levels did decrease in 2018, but this may be due to a rise in groundwater levels from a large amount of rain received in 2017. It is imperative that LLNL continues to work to contain and clean up the tritium contamination.

The LLNL Main Site contains most of the site's nuclear weapons design facilities, including the tritium building and the plutonium facility. The LLNL Main Site was founded as the nation's second nuclear weapons design center in 1952.

SITE 300

Site 300 is the LLNL's high explosives testing facility. It is located about 17 miles East of Livermore in the Altamont Hills. This facility has been in operation since 1955, and over the years there have been numerous open-air blasts that have contained dangerous toxic and radioactive materials. Site 300 also contains unlined toxic and radioactive waste dumps. Both Site 300 and the Main Site have ongoing weapons programs.

During its time as an operational facility, Site 300's soil, surface water, and regional groundwater aquifers have been polluted with numerous toxins and radionuclides. These radionuclides include tritium and depleted uranium. It is estimated that the cleanup costs of Site 300 will be around 1.8 billion dollars.

In 2018, at Site 300, a team of geologists from the LLNL collected bedrock samples from 8 locations for analysis of uranium, radium, and thorium isotopes and metals. The goal was to collect un-weathered, unfractured, and coherent rock that was not altered by weather, water, or site contaminants to create a soil background data set for Site 300. Indoor air sampling also took place in 2018 at Site 300. Building 801 was sampled along with resampling of building 833. The results of these sampling tests are still pending.

In the 2019 plan, six new wells are proposed to be drilled at Site 300, along with two wells being decommissioned. These wells serve a similar purpose to the wells at the Lawrence Livermore National Laboratory Main Site. They will be used to help monitor contaminants in the groundwater, as well as subsurface VOCs.

As a resident of Livermore for almost 30 years, the information that I have learned with my time Tri-Valley CAREs is startling. The toxic substances in the groundwater could be potentially devastating to the water supply of Livermore and along with being a danger to the surrounding community. This is why it is so essential that Tri-Valley CAREs continues its mission of ensuring compliance by the Lab and that they continue their cleanup efforts.

Here are two of the LLNL slide presentations from the meeting detailing cleanup progress.

[CLICK HERE](#) for the LLNL slides on the Main Site cleanup.

[CLICK HERE](#) for the LLNL slides on the Site 300 cleanup.