

## THE UNITED STATES DEPARTMENT OF ENERGY/NATIONAL NUCLEAR SECURITY ADMINISTRATION HAS COMPLETED A FIVE-YEAR REVIEW OF THE BUILDING 834 COMPLEX, PIT 6 LANDFILL, AND SITE-WIDE OPERABLE UNITS AT LAWRENCE LIVERMORE NATIONAL LABORATORY'S SITE 300

The U.S. Department of Energy (DOE) /National Nuclear Security Administration has completed the combined Five-Year Review of the Building 834, Pit 6 Landfill, and Site-Wide operable units (OUs), which are respectively known as OUs 2, 3, and 8. This document describes the environmental cleanup of these areas at Lawrence Livermore National Laboratory's (LLNL) Site 300.

### **THE REVIEW PROCESS**

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or the Superfund Act) requires that the protectiveness of cleanup actions be evaluated every five years when contaminants remain at the site above levels that allow unrestricted access. The purpose of the Five-Year Review is to evaluate the progress of the cleanup remedies toward achieving the site's cleanup objectives, and to determine whether the remedy continues to be protective of human health and the environment. The Five-Year Review report summarizes the nature and extent of contamination and describes DOE's progress in cleaning up OUs 2, 3, and 8.

The final Five-Year Review report for the Building 834, Pit 6 Landfill, and Site-Wide Operable Units is now available to the public at the Laboratory's Environmental Repository in the Tracy Public Library, 20 East Eaton Avenue, Tracy, CA 95377, [telephone (209) 835-2221]; the Laboratory Discovery Center, Greenville Road at East Gate Drive, Livermore, CA 94551, [telephone (925) 423-3125]; and online at <http://enviroinfo.llnl.gov>.

La Ley de Responsabilidad, Compensación y Respuesta Ambiental Comprensiva (CERCLA, por sus siglas en inglés) requiere que las acciones para restaurar sitios designados sean evaluadas cada cinco años mientras estos sitios permanezcan contaminados a niveles sobre los que permiten acceso sin restricciones. El propósito de la Revisión Quinquenal es para evaluar el progreso hacia el logro de los objetivos de limpieza del sitio y determinar si la solución continúa protegiendo la salud humana y el medio ambiente. El informe de Revisión Quinquenal resume la naturaleza y el grado de la contaminación y describe el progreso efectuado por el Departamento de Energía (DOE, por sus siglas en inglés) para restaurar las unidades conocidas como OU 2, 3 y 8.

El informe final de la Revisión Quinquenal para el edificio 834, el vertedero Pit 6, y las unidades operables en todo el sitio ya está disponible para el público en el depósito ambiental del laboratorio en la biblioteca pública de Tracy, 20 East Eaton Avenue, Tracy, CA 95377, [teléfono (209) 835-2221]; en el Centro de Descubrimiento del Laboratorio, situado en Greenville Road en East Gate Drive, Livermore, CA 94551, [teléfono (925) 423-3125]; y en línea en <http://enviroinfo.llnl.gov>.

### **SITE HISTORY**

LLNL's Site 300 is a U.S. DOE experimental test facility operated by Lawrence Livermore National Security, LLC. Site 300 is used for the research, development, and testing of high explosives (HE) materials. Site 300 is located in the Altamont Hills between Livermore and Tracy, California. Site 300 was placed on the National Priorities List in 1992.

The Building 834, Pit 6 Landfill, and Site-Wide OUs are three of nine OUs at Site 300 where contaminants have been released to the environment from past operations. A Site-Wide Record of Decision was signed in 2008 that established the cleanup remedies and cleanup standards for the three OUs, as well as for OUs 4, 5, 6, and 7 at Site 300.

The Building 834 Operable Unit (OU 2) is located on an isolated hilltop in the southeast portion of Site 300. Facilities at the Building 834 Complex have been used to conduct experiments on weapon components since the late 1950s. From 1962 to 1978, intermittent spills and piping leaks resulted in releases of volatile organic compounds (VOCs) and silicone oils to the environment. Nitrate associated with septic-system effluent is also present in groundwater.

The Pit 6 Landfill Operable Unit (OU 3) covers an area of 2.6 acres near the southwest corner of Site 300. From 1964 to 1973, waste was buried in nine unlined debris trenches and animal pits at the Pit 6 Landfill. The waste included laboratory equipment, craft shop debris, and biomedical waste. DOE/LLNL excavated the portion of waste containing depleted uranium in 1971. VOCs, tritium, nitrate, and perchlorate were detected in groundwater downgradient of the landfill. The landfill was capped and closed in 1997 under CERCLA to prevent further leaching of contaminants resulting from percolation of rainwater through the buried waste and prevent the potential flux of VOC vapors through the soil to the ground surface.

The Site-Wide Operable Unit (OU 8) is comprised of release sites where there was no significant contamination found that can impact the groundwater, human health, or the environment. A monitoring and risk management remedy has been selected for these sites, which include (1) buildings and firing tables used for testing of high explosive materials and prototype weapons components, and (2) landfills where firing table gravel and debris were disposed. The Site-Wide Operable Unit consists of the following areas of Site 300: (1) Building 801 Firing Table and Pit 8 Landfill, (2) Building 845 Firing Table and Pit 9 Landfill, (3) Building 833, (4) Building 851 Firing Table, (5) the Pit 2 Landfill, and (6) the Pit 1 Landfill. Releases to groundwater from buildings and firing tables include VOCs and uranium-238; releases from the landfills include perchlorate, nitrate, and uranium-238.

### **CLEANUP OBJECTIVE**

The selected remedy for the Building 834 Operable Unit includes: (1) monitoring contaminants in groundwater and soil vapor to evaluate the effectiveness of the remedy in achieving cleanup standards, and (2) extracting and treating soil vapor and groundwater to mitigate risk and hazards posed by VOCs in the subsurface soil/rock, and reduce concentrations of VOCs, nitrate, and silicone oil in groundwater and VOCs in subsurface soil to cleanup standards.

The selected remedy for the Pit 6 Landfill Operable Unit includes: (1) monitoring groundwater to evaluate the effectiveness of the remedy in achieving cleanup standards and to ensure there is no impact to downgradient water-supply wells; (2) land use controls, such as access/land-use restrictions and measures to prevent use of contaminated groundwater and on-site worker exposure to contaminants volatilizing from surface water; (3) monitored natural attenuation of VOCs and tritium in groundwater; and (4) inspecting the Pit 6 Landfill cover periodically for damage that could compromise its integrity and repairing any damage found.

The selected remedies for the Site-Wide Operable Unit include monitoring, risk and hazard management, and landfill inspection and maintenance. A subsurface slab depressurization system (SSDS) is currently in place as an engineering control to prevent on-site worker exposure to VOCs volatilizing from subsurface soil into indoor air at Building 833 until indoor air sampling data indicate that the risk and hazard have been mitigated.

The cleanup standards for groundwater are drinking water standards. Because drinking water standards do not differentiate between industrial and residential use, the groundwater cleanup remedies will be protective under any land use scenario upon completion.

#### **FIVE-YEAR REVIEW RESULTS**

The United States Environmental Protection Agency (EPA) concurs with LLNL that a short-term protectiveness determination for Operable Units (OUs) 2, 3, and 8 must be deferred due to the need to characterize potential exposure pathways at seven potential release areas within these OUs. In addition, EPA continues to defer a long-term protectiveness determination for these OUs, due to continued uncertainty about the vapor intrusion (“VI”) exposure pathway in the long-term.

An environmental assessment of potential release sites in the three OUs is planned for the next five-year review period to address short-term protectiveness concerns. Analysis of vapor intrusion pathways will continue during next five-year review period to address long-term protectiveness concerns.

#### **ADDITIONAL INFORMATION**

For further information, please contact:

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