

**Lawrence Livermore National Laboratory Site 300 EM Project**  
**Baseline Summary**  
**June 2008**

**BACKGROUND**

Lawrence Livermore National Laboratory (LLNL) Site 300 is a DOE experimental test facility operated by the Lawrence Livermore National Security, Limited Liability Corporation. The facility is located in the eastern Altamont Hills about 17 miles east of Livermore and 8.5 miles southwest of downtown Tracy, California. The site covers 11 square miles, most of which is in San Joaquin County. The western one sixth of the site is located in Alameda County.

Site 300 is primarily a high-explosives test facility supporting the LLNL weapons program in research, development, and testing associated with weapons components. Operations at Site 300 include four defense programs activities: (1) hydrodynamic testing, (2) charged particle beam research, (3) physical, environmental, and dynamic testing, and (4) high explosives (HE) formulation and fabrication. No actual fissionable material is used in these hydrodynamic tests. Fencing and full-time security guards restrict access to Site 300.

DOE began environmental investigation activities at Site 300 in 1981. Prior to August 1990, investigations of potential chemical contamination at Site 300 were conducted under the oversight of the California Regional Water Quality Control Board (RWQCB). Site 300 was placed in the National Priorities List in August 1990. Since then, all investigations have been conducted in accordance with CERCLA under the oversight of the three supervising regulatory agencies: The US EPA, RWQCB, and the California Department of Toxic Substances Control.

The LLNL Site 300 Soil and Water Remediation Project is scheduled for EM completion and transfer to NNSA at the end of FY2008 with the exception of the recently characterized Building 812 Firing Table area. The Livermore Site Office Federal Project Director is currently working with NNSA and EM to decide how to handle the CD-4 determination for the remainder of the site, and plan for the Building 812 Firing Table area remediation projected for FY2012 and FY2013.

**SCOPE DESCRIPTION**

During past LLNL Site 300 operations, contaminants were released to the environment including: disposing waste fluids in sumps (dry wells), surface spills from drum storage areas, piping leaks from heat exchange systems, burial of contaminated waste in unlined pits, trenches, and landfills, debris and shrapnel scattered or released during HE detonations at firing tables, open burning of HE compounds, and discharging contaminated rinse water to unlined lagoons and retention basins. Environmental investigations identified 24 locations at Site 300 where contaminants were released to the environment. All release sites have been assigned to one of nine operable units (OUs) to more effectively manage the site cleanup. The OU designations are based on the nature and extent of contamination and topographic and hydrologic considerations.

The primary contaminants at Site 300 include trichloroethylene (TCE) and other volatile organic compounds (VOCs), HE compounds, perchlorate, tritium, uranium, nitrate, polychlorinated biphenyls (PCBs), dioxin and furan compounds, silicone oils, and metals. Ground water contamination has resulted from some of these releases.

Over the past 25 years, significant progress has been made cleaning up Site 300. DOE initiated cleanup activities at Site 300 in the mid-1980s to begin addressing contamination. These activities were conducted as treatability studies, removal actions, or as interim remedial actions under the Interim Site-Wide Record of Decision (ROD) issued in 2001. The Final Site-Wide ROD establishing ground water cleanup standards for the site is scheduled for completion in 2008.

Cleanup activities to date have included:

- Installing 21 ground water and soil vapor extraction and treatment systems.
- Testing of *in situ* treatment technologies.
- Removing contaminated soil.
- Capping and closing landfills, rinsewater lagoons, and burn pits.
- Removing firing table gravels.
- Implementing administrative and engineered controls to prevent workers from being exposed to contamination while cleanup proceeds.

These cleanup activities have resulted in significant reductions in maximum contaminant concentrations, removed contaminant mass from the subsurface, and mitigated risks to onsite workers in many areas.

## **PROJECT MANAGEMENT**

Based on the direction from EM Headquarters, the Livermore Site Office developed the near-term baseline for the LLNL Site 300 Soil and Water Remediation Project. This project baseline has undergone an independent review to verify the reasonableness of the scope, cost, and schedule for the project. An approved near-term baseline reflects the identified scope that can reasonably be accomplished for the identified cost in the identified time period if near-term baselines are funded as profiled and contingency funds are provided as required during project execution. It also establishes the baseline as an acceptable point from which to track and control future change. The review and approval process accommodates the likely changes in the EM complex, site priorities and funding plans. These changes could affect both near-term (within the next five years) and life-cycle cost, schedule and scope. Such future changes may be required to comply with applicable environmental legal obligations while maintaining essential functions necessary to protect human health, the environment and national security; reflect funding different from the baseline assumptions; incorporate technological advances; realize specific programmatic risks; or implement programmatic business cases.

## LIST OF PROJECTS

The Livermore Site Office EM program consists of one project as shown below: The Near-Term Baseline (NTB) for this project is from FY 2004 – FY 2008. An Out Year Planning Estimate Range (OPER) has not been developed for this project as it is planned to transition from EM to NNSA at the end of FY2008.

Project	Date Approved	
	Near Term Baseline (NTB)	Out Year Planning Estimate Range (OPER)
VL-LLNL-0031, LLNL Site 300 Soil and Water Remediation	Feb. 15, 2004	

## PROJECT SCOPE

### VL-LLNL-0031 – LLN Site 300 Soil and Water Remediation

The major components of DOE's cleanup of Site 300 are:

- Monitoring to determine if the cleanup is adequately protecting human health and the environment, to measure cleanup progress, evaluate plume migration, and to detect any future releases or changes in contaminant concentrations that could impact human health and the environment.
- Risk and hazard management, including institutional/land use controls, to prevent exposure where an unacceptable risk to human health remains.
- Extracting and treating contaminated ground water containing volatile organic compounds (VOCs), silicone oils, nitrate, perchlorate, HE compounds, and uranium to meet cleanup standards.
- Extracting and treating soil vapor containing VOCs. Removing VOC vapors from soil and bedrock above the water table to reduce risks to humans and protect the underlying ground water from further contamination.
- Monitored natural attenuation to reduce VOC and nitrate concentrations and tritium activities in ground water to cleanup standards.
- Installing an engineered drainage diversion system at the Pit 7 Complex to hydraulically isolate the contaminant sources in the landfills and underlying bedrock from subsurface water, thereby preventing infiltration of rainwater runoff that can result in ground water rising into the landfill pits and releasing contaminants.
- Continue evaluating innovative technologies to expedite cleanup.

# PROJECT COST

(dollars in millions)

Cost Element	Project Number
	VL-LLNL-0031
1. Prior Year Costs (1997-2007)	\$109.9
2. Total Near-Term Baseline (50% Confidence Level)	\$12.0
3. Unfunded Contingency	0
4. Performance Baseline (80% Confidence Level)	\$12.00
5. Out Year Planning Estimate Range	0
6. <b>Total Life Cycle Cost</b>	<b>\$121.9</b>

# SUMMARY LIFECYCLE BASELINE SCHEDULE

