

Fact Sheet
October 2003

Update on Environmental Activities

LAWRENCE BERKELEY NATIONAL LABORATORY

DTSC is one of six Boards and Departments within the California Environmental Protection Agency. The Department's mission is to restore, protect and enhance the environment, to ensure public health, environmental quality and economic vitality, by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention.

State of California



California
Environmental
Protection Agency



The California Department of Toxic Substances Control (DTSC) is providing this fact sheet to inform you about the current status of the cleanup activities at the Ernest Orlando Lawrence Berkeley National Laboratory (LBNL), and to invite you to our public workshop. LBNL is located at 1 Cyclotron Road in Berkeley, California.

DTSC is currently evaluating potential cleanup options to address areas at LBNL where contamination has occurred. As part of its evaluation, DTSC has required two kinds of risk assessments be prepared, a Human Health Risk Assessment and an Ecological Risk Assessment. Their results are summarized on page 6. On October 28, 2003, DTSC will hold a public workshop. Community members can meet with representatives of DTSC and LBNL to discuss the current status of the sitewide investigation.

Public Workshop

DTSC will hold a public workshop to share information with the community on the status of the Resource Conservation and Recovery Act (RCRA) Corrective Action process at the Lawrence Berkeley National Laboratory site. Representatives from the California Department of Toxic Substances Control, San Francisco Bay Regional Water Quality Control Board, and the LBNL Environmental Restoration Program will attend. The meeting will be held on:

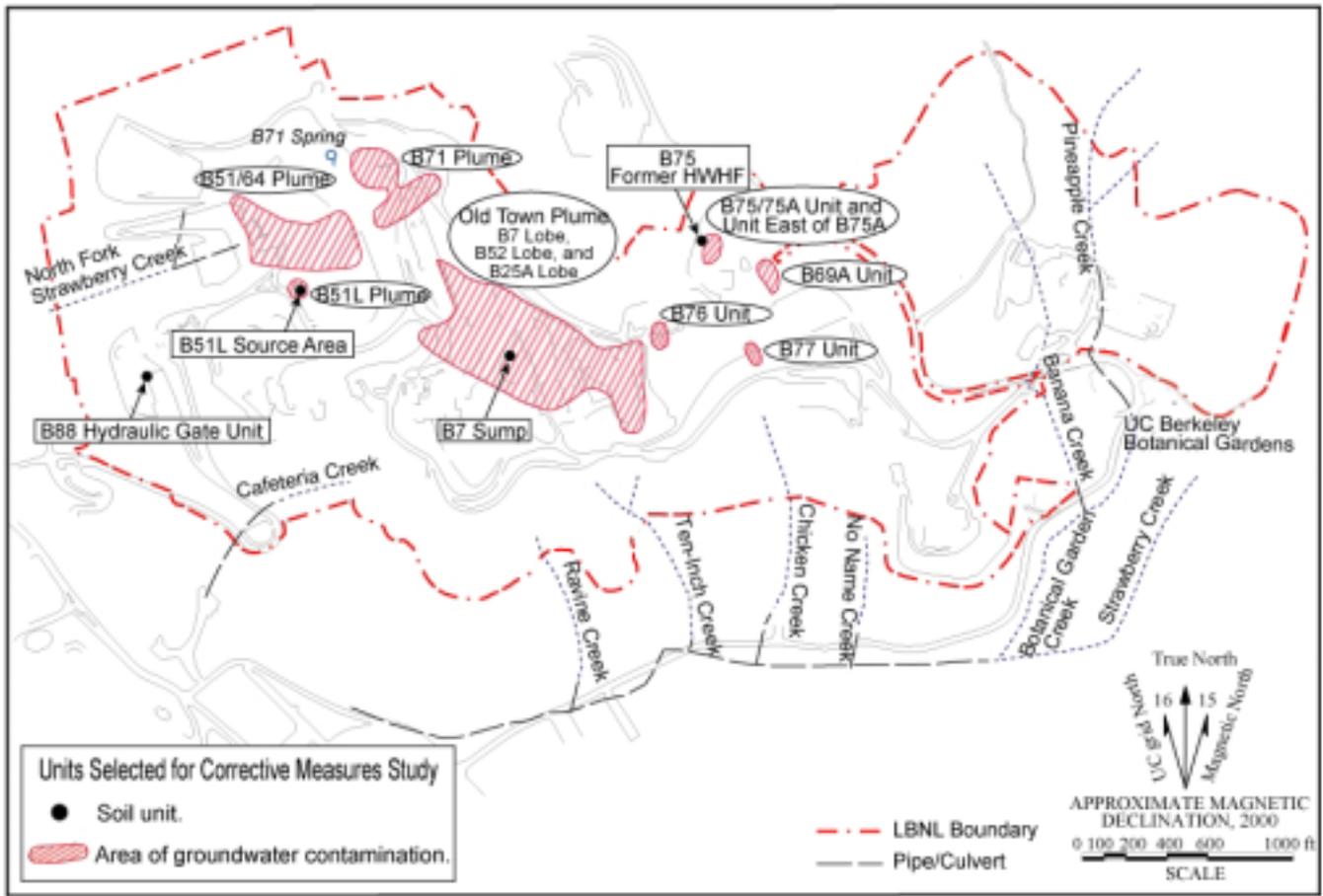
DATE: October 28, 2003
TIME: 6:30 pm
LOCATION: N. Berkeley Senior Center
ADDRESS: 1901 Hearst Street
Berkeley, Ca.
PHONE: (510) 981-5190

Contact Lora Barrett for further information at: (866) 495-5651 toll-free or by email at Lbarrett@dtsc.ca.gov

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The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.dtsc.ca.gov.



SWMUs and AOCs Recommended for Inclusion in Corrective Measures Study, Lawrence Berkeley National Laboratory (LBNL)

DESCRIPTION AND BACKGROUND

LBNL is a research facility managed by the University of California (UC) for the U.S. Dept. of Energy (DOE). It is in the Berkeley/Oakland Hills and encompasses about 200 acres adjacent to the northeast side of the UC Berkeley campus.

The western three-quarters of LBNL are located in the City of Berkeley and the eastern quarter is located in the City of Oakland. The site is bordered on the north by single-family residences and on the west by multi-family dwellings, student residence halls, and other campus buildings.

LBNL originated on the UC Berkeley Campus in 1932 as the UC Radiation Laboratory. In 1940 it was relocated to its present site in the Berkeley Hills east of the central campus. In 1972 the name was changed to Lawrence Berkeley National Laboratory and in 1995 became Ernest Orlando National Laboratory. A wide range of research is conducted at LBNL including high-energy physics, accelerator research and development, materials research, and chemistry, geology, molecular biology and biomedical research.

RCRA CORRECTIVE ACTION PROCESS

LBNL was issued a Hazardous Waste Facility Permit by DTSC in 1993. As a condition of the permit, LBNL is required to investigate and address all historic releases of hazardous waste and chemicals that may have occurred at the LBNL site. This investigation and cleanup of identified toxic chemicals is called the RCRA Corrective Action Process and is under the oversight of DTSC. Releases that were identified during this process were from past operations of the facility, and are not from LBNL's currently operating and permitted Hazardous Waste Handling Facility.

The investigation and cleanup of radioactive contamination at this site is under the regulatory oversight of the U.S. DOE and is not part of the RCRA Corrective Action Process. The RCRA Corrective Action Process has four main steps. These steps and how they relate to LBNL are described on pages 3 - 4.

STEP 1

RCRA FACILITY ASSESSMENT (RFA)

The RFA evaluates past operating practices and historical uses of the site, and identifies areas where spills, leaks, or other chemical releases either occurred or could have occurred. This process involved the review of facility records, management practices, government agency files, interviews, visual site inspection, and preliminary sampling. In November 1991 DTSC completed a RFA of the facility. In September 1992, LBNL prepared an independent RFA to supplement the DTSC findings.

RFA FINDINGS: A total of 174 units were identified during the RFA and subsequent investigations. A “unit” is a container, tank or a particular location where a chemical release has or may have occurred. Eight of these 174 units were identified as radiological units. The characterization and cleanup of the eight radiological units are being done under the oversight of the Department of Energy, which has the sole jurisdiction over radiological units. Documentation related to these eight units is available at the Berkeley Public Library. The remaining 166 units, which contained or were associated with the release of non-radioactive hazardous constituents only, are addressed under the authority of the DTSC.

Based upon the findings of the RFA, DTSC concluded that further investigation was necessary to better understand the contamination at the site and required LBNL to conduct a RCRA Facility Investigation (RFI).

STEP 2

RCRA FACILITY INVESTIGATION (RFI)

The RFI defines the source, nature, and extent of contamination for units identified in the RFA. This additional investigation helps in the decision of whether further action is needed for these locations. LBNL submitted RFI workplans in three phases during November 1992, October 1994, and October 1995, respectively. Public comments on the RFI final report were accepted between November 15, 2000 – February 15, 2001. A copy of the comments and DTSC’s response to comments is available for public review in the information repositories listed on page 8.

Also, during the RFI phase, LBNL implemented “interim corrective measures” in consultation with state and federal regulatory agencies. Interim corrective measures are actions that can be taken at any time to reduce or eliminate imminent threats to human health or the environment. These measures at LBNL included removing sources of contamination, stopping discharge of contaminated groundwater to surface waters; eliminating potential pathways that could contaminate groundwater, and preventing further migration of contaminated groundwater.

RFI FINDINGS: DTSC determined that at 121 of the 166 units, there were either no chemical releases or the chemical concentration levels were low enough that further action was not needed. The remaining 45 units were determined to require further action during the Corrective Measures Study (CMS) phase of the RCRA Corrective Action Process.

STEP 3

CORRECTIVE MEASURES STUDY (CMS)

The purpose of the CMS is to investigate the units remaining from the RFI, evaluate potential cleanup options and methods, and decide which method would be the best choice for each unit. The CMS Workplan details how each unit will be investigated and evaluated. The CMS Workplan describes how the following activities will be completed:

- Characterizing the risk to human health and the environment for each unit
- Establishing cleanup standards
- Evaluating potential cleanup alternatives

On June 18, 2002 DTSC approved the CMS Workplan.

Chemicals That Have Been Found

The principal chemicals that have been found in soil and groundwater at LBNL are in a group called Volatile Organic Compounds (VOCs). Most are solvents that have been used for cleaning equipment. These primarily include:

- Tetrachloroethene (PCE)
- Trichloroethene (TCE)
- Carbon tetrachloride
- 1,1-dichloroethene (1,1-DCE)
- Cis-1,2-dichloroethene (cis-1,2-DCE)
- 1,1,1-trichloroethane (1,1,1-TCA) and
- 1,1-dichloroethane (1,1-DCA)

Other chemicals that have been detected include:

- Polynuclear aromatic hydrocarbons (PAHs),
- Semi-volatile organic compounds (SVOCs),
- Polychlorinated biphenyls (PCBs),
- Petroleum hydrocarbons, (benzene, toluene, xylenes, and ethylbenzene) and
- Metals

STEP 4

CORRECTIVE MEASURES REMEDY SELECTION AND REPORT APPROVAL

The information collected during the RFA, RFI, and CMS phases will be used to determine which technologies to use during the Corrective Measures Implementation phase.

A CMS Report will be submitted in mid-2004 and DTSC will evaluate the corrective measure alternatives presented in the CMS Report. Based on the evaluation, DTSC will propose specific remediation measure(s) for implementation at the facility. The proposed corrective measure(s) will be evaluated against the following standards:

- Be protective of human health and the environment
- Attain the environmental media cleanup standards
- Control the source of release(s) so as to reduce or eliminate, to the maximum extent practicable, further releases that might pose a threat to human health and/or the environment, and
- Meet all applicable waste management requirements

Public review and comment as part of the Remedy Selection process allows the community to give input on the proposed remedy prior to a final decision by DTSC.

HOW WE LOOK AT HUMAN AND ECOLOGICAL RISK

DTSC uses risk assessments to determine if chemicals at a site are harmful to people or the environment, and to establish maximum allowable levels at each site where chemicals have been released into the environment. Inorganic materials (such as metals) and organic materials (such as man-made solvents) will be cleaned to levels considered safe for the way the land will be used. These cleanup levels are called risk-based or health-based standards.

HUMAN HEALTH RISK ASSESSMENT (HHRA)

The Human Health Risk Assessment estimates the potential risks to human health from chemical contamination in soil, groundwater or surface water. Such an assessment consists of four steps:

- 1) Identify harmful chemicals in the soil, groundwater, surface water, and air.
- 2) Examine the degree to which people might be exposed to the identified chemicals.
- 3) Assess the toxicity, or harmfulness of each chemical to determine health effects, and
- 4) Combine the results of the first three steps to estimate the risks to human health.

Human health risks were identified at LBNL using actual soil, groundwater, surface water, and air sample data collected during the RFI investigations. Potential exposures may involve touching, eating, or breathing contaminated soil, water, and/or air.

Chemicals were evaluated in two categories: those known to be cancerous and those that do not cause cancer but could have other negative health effects.

Action was based on the following criteria:

If exposure to a cancer-causing chemical creates less than a one-in-a-million chance of getting cancer from that chemical, no further action was recommended. If exposure creates more than one hundred-in-a-million chance of getting cancer from that chemical, we recommended further action. If the chance of getting cancer from a chemical fell in between those numbers, we looked at other factors to help us decide if further action should be taken. Examples of other factors include future use of the property, how people or animals can be exposed, etc.

For chemicals that are not cancer causing, we calculated whether exposure to that chemical could have a significant effect on people or the environment. We used a formula that considers the amount of chemical present, how harmful that chemical is, and other standards used by EPA. If the resulting number was deemed significant, (we call that “having a hazard index greater than one”) we recommended further action. If the resulting number did not reach a certain threshold (if the hazard index was less than one) we recommended no further action.

HUMAN HEALTH RISK ASSESSMENT FINDINGS

Of the 45 units carried forward from the RFI,
* 29 had soil contamination,
* 3 had surface water contamination, and
* 13 areas had groundwater contamination.

All of these units were evaluated using the Human Health Risk Assessment and the Ecological Risk Assessment procedures. Their findings are listed below.

1. Soil Contamination: Of the 29 areas with soil contamination, there are only four areas that require evaluation of cleanup methods in the CMS Report. The remaining areas are below the regulatory threshold to require any cleanup.
2. Surface Water Contamination: All areas with surface water contamination were evaluated and require no further evaluation of cleanup methods in the CMS Report.
3. Groundwater Contamination: Of the 13 areas with groundwater contamination, 11 areas will be evaluated for further corrective action based on the California Regional Water Quality Control Board requirement that potential sources of drinking water be cleaned to drinking water standards.

ECOLOGICAL RISK ASSESSMENT FINDINGS

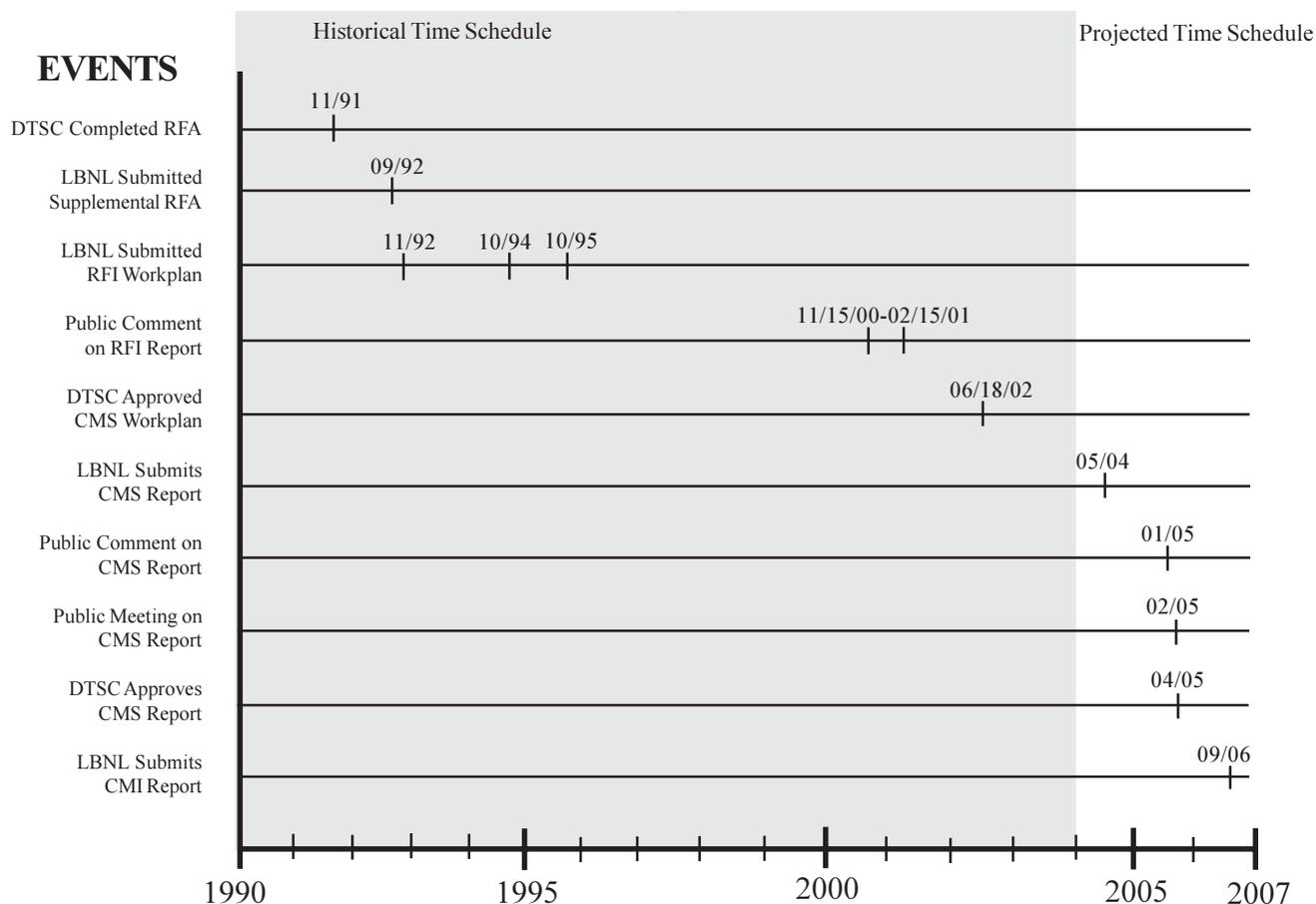
The purpose of an ecological risk assessment is to evaluate the potential impacts from a site on the surrounding environment. Site surveys and other information collected during the RFI indicated that suitable habitat for ecological receptors are present only in open space areas, which are mostly located near the Lab's perimeter. The ecological risk assessment determined that there was potential hazard to plants and/or animals in the following areas:

- Surface water and sediment in North Fork Strawberry Creek
- Surface water and sediments in tributaries of Strawberry Creek
- Surface water and groundwater at the spring near Building 71
- Soils at the following locations:
 - a) the former diesel underground storage tank (AOC 9-2) at Building 51,
 - b) six inactive above ground waste holding tanks (SWMU 11-3) near Building 74, and
 - c) the former UC poultry research station near Chicken Creek.

Exposure estimates were calculated for representative plants and aquatic animals for the specific locations of concern at LBNL.

The Ecological Risk Assessment concluded that no hazards exist to plants or animals from exposure to chemicals in soil, groundwater, sediment or surface water at Berkeley Lab.

Timeline and Milestones



RCRA Facility Assessment (RFA)

Identifies where spills, leaks, or other releases occurred or could have occurred based on past practices and historical uses.

RCRA Facility Investigation (RFI)

Investigates areas identified in the RFA. Defines source, nature and extent of any contamination.

Corrective Measures Study (CMS)

Workplan

Describes how the Corrective Measures Study will be conducted.

Corrective Measures Study (CMS) Report

Evaluates the cleanup methods. DTSC will review the proposed methods and will request public input in selecting these cleanup methods or remedies.

Public Participation

Opportunities for the community to review and have input on the final document.

FUTURE ACTIVITIES

The future corrective action activities to be conducted by LBNL and DTSC will include:

- conducting laboratory scale and field pilot scale studies to evaluate the effectiveness of potential cleanup alternatives for the areas where further cleanup was recommended.
- submittal of a CMS Report which involves proposed final remedies to DTSC for review and approval upon completion of these laboratory and field studies.
- selection and approval of preferred remedies by DTSC.
- design, construction, operation, maintenance, and monitoring the performance by LBNL of the corrective measures remedies selected by DTSC.

HOW THE PUBLIC CAN BE INVOLVED

Comment Periods

Based on the findings of the CMS Report, DTSC will propose a Notice of Remedy Selection. The public will be invited to give further comments on the proposed remediation decisions at that time. A public notice of the comment period will be distributed through the mailing list and advertised through local newspapers. A public meeting will also be held during the comment period to provide information to the community.

Public Meetings

DTSC will be holding a public workshop on October 28th, 2003 at 6:30pm. Further workshops and public meetings will be announced by mail and through local newspapers.

Mailing List

Over the life of this project, LBNL and DTSC have put together a mailing list of interested members of the public. If you did not receive this notice in the mail and would like to be put on the mailing list, please contact Lora Barrett by phone at (866) 495-5651 or by email at Lbarrett@dtsc.ca.gov.

Information Repositories

The LBNL Corrective Measures Study Workplan and Human Health and Ecological Risk Assessments are available for review at the following locations:

Berkeley Public Library
2090 Kittredge Street
Berkeley, CA 94702
(510) 981-6100

LBNL Building 50 Library
1 Cyclotron Road
Berkeley, CA 94720
(510) 486-5621

DTSC Berkeley
700 Heinz Ave, Suite 200
Berkeley, CA 94710
Appointment required: Call 540-3800

Contacts

If you have any questions or concerns please contact the following DTSC staff:

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Berkeley, CA 94710
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Notice to Hearing Impaired Individuals:

TDD users can obtain additional information about the Lawrence Berkeley National Laboratory site by using the California Relay Service (1-888-877-5378) to reach Lora Barrett at (866) 495-5651.