



U.S. Department of Energy

Oakland Operations Office, Oakland, California

FINAL ACTION MEMORANDUM FOR THE SOUTHWEST TRENCHES, RADIUM-226/STRONTIUM-90 TREATMENT SYSTEMS, AND DOMESTIC SEPTIC SYSTEM AREAS

at the:

LABORATORY FOR ENERGY-RELATED HEALTH
RESEARCH (LEHR)
UNIVERSITY OF CALIFORNIA AT DAVIS, CALIFORNIA

Prepared for:

United States Department of Energy
Oakland Operations Office
1301 Clay Street
Oakland, California 95612-5208

Prepared by:

Weiss Associates
5500 Shellmound Street
Emeryville, CA 94608-2411

April 27, 1998
Rev. 0

DOE Oakland Operations Contract DE-AC03-96SF20686

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FIGURES

- Figure 1. Site Location Map, UC Davis, California
- Figure 2. Location of Removal Sites at LEHR, UC Davis, California

ATTACHMENTS

- Attachment A – Response to Public Comments on the Draft Final EE/CA

ACRONYMS AND ABBREVIATIONS

AEC	Atomic Energy Commission (now the Department of Energy)
ALARA	As low as reasonably achievable
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CFR	Code of Federal Regulations
Co-60	Cobalt-60
CVRWQCB	Central Valley Regional Water Quality Control Board
cy	Cubic yards
DOE	U.S. Department of Energy
DSCSOC	Davis South Campus Superfund Oversight Committee
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
Ft	Feet
HI	Hazard Index
LEHR	Laboratory for Energy-Related Health Research
MCL	Maximum contaminant level
mg/kg	Milligrams per kilogram
mCi	Millicuries
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
PAHs	Polynuclear aromatic hydrocarbons
pCi/g	Picocuries per gram
PRP	Potentially Responsible Party
RA	Removal action

Ra-226	Radium-226
RAO	Removal action objective
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
Sr-90	Strontium-90
SVOCs	Semivolatile organic compounds
UC	University of California
μCi	Microcuries
VOCs	Volatile organic compounds

1. PURPOSE

The purpose of this Action Memorandum is to document approval of the proposed non-time critical Removal Actions (RAs) described herein for the former Laboratory for Energy-Related Health Research (LEHR) located at the University of California (UC) Davis (Site) (Figure 1).

The proposed RAs will be executed by DOE in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act. The proposed RAs meet the criteria for non-time-critical removal actions under the National Oil and Hazardous Substances Contingency Plan (NCP) as described in 40 CFR, Section 300.415, and is performed under the authority of Executive Order 12580.

This document was prepared in accordance with U. S. Department of Energy (DOE) and U.S. Environmental Protection Agency (EPA) Guidance (DOE, 1994 and EPA, 1993).

2. SITE CONDITIONS AND BACKGROUND

This Action Memorandum is for RAs that address environmental concerns related to contaminated soil and buried waste in the Southwest Trenches, Radium/Strontium (Ra/Sr) Treatment Systems and Domestic Septic System Areas (Removal Sites) at the Site (Figure 2). Most of the information presented in this memorandum is derived from the Draft Final Engineering Evaluation/Cost Analysis (EE/CA) for the Southwest Trenches, Radium-226/Strontium-90 Treatment Systems, and Domestic Septic System Areas (Weiss Associates, 1998a).

2.1 Site Description

The Atomic Energy Commission (AEC, now DOE) began conducting radiological studies on laboratory animals, primarily beagles, in the early 1950s. Initial studies were carried out on the main campus and involved irradiation of beagles. The Site began operating in its present location in 1958 when full-scale experimental use of radioactive materials began. Research at LEHR through the mid-1980s focused on the health effects from chronic exposure to radionuclides, primarily strontium-90 (Sr-90) and radium-226 (Ra-226). In the early 1970s, a cobalt-60 (Co-60) irradiator facility was constructed at the Site to study the effects of chronic exposure to gamma rays on bone marrow cells of beagles. In 1975, DOE initiated a program at the Site to study the potential health effects of combustion products from fossil fuel power plants. In 1983, the Toxic Pollutant Health Research Laboratory became operative at the Site. The UC Davis Institute of Toxicology and Environmental Health presently occupies portions of the Site.

From the 1940s through the mid-1960s, portions of the Site were used as a UC Davis campus landfill. UC Davis landfills were operated on-site until 1967, including Landfill Disposal Unit 1, used from the 1940s through the early 1950s, and Landfill Disposal Unit 2, used from the early 1950s through the mid-1960s. A third UC Davis Landfill, Disposal Unit 3, is located approximately 600 feet (ft) east of the Site and was used from 1963 to 1967. Burial holes and trenches around the landfills were used for disposal of low-level radioactive and mixed waste from UC Davis and LEHR research activities. Figure 2 shows the locations of the three UC Davis landfills and other waste disposal areas.

A brief summary of Site conditions, background and the nature and extent of site contamination is presented below. Additional information is discussed in the Draft Final EE/CA and the Final Site Characterization Summary Report (Weiss Associates, 1997a).

2.1.1 Removal Site Evaluations

2.1.1.1 Southwest Trenches

The Southwest Trenches area (Figure 2) served as a disposal site for low-level radioactive waste, fecal material, and laboratory wastes in the mid-1960s. Additionally, a small chemical storage and dispensing area was formerly located in the south-central portion of the Southwest Trenches Area. The approximate trench area location is shown in Figure 2, however the exact locations and dimensions of the burial trenches are not precisely known, and the volume of waste disposed in the trenches is uncertain. Exploratory trenching will be performed prior to excavation to more precisely estimate the location and volume of buried waste.

2.1.1.2 Ra/Sr Treatment Systems

The Ra/Sr treatment systems (Figure 2) consisted of two separate liquid waste treatment systems as described below.

Sr-90 Treatment System

The Sr-90 Treatment System processed liquid waste generated by Animal Hospital No. 1 from 1960 to 1987. The Sr-90 system was used to treat approximately 200 to 500 gallons of waste per day, prior to discharge to the leach field. An estimated total of up to 943 mCi of Sr-90, 39.59 μ Ci plutonium-241, and 0.136 μ Ci of americium-241 were processed by the system. An estimated 2.55 mCi of Sr-90 was released into the leach field and subsurface soil.

The Sr-90 Treatment System consisted of filters and cation exchange columns, a series of nine "Imhoff" tanks, (Tanks A through I), and a leach field. In 1962 a second leach field was constructed. The tanks are lined with concrete coated with plastic sealant and extend from the ground surface to a depth of approximately 10 ft. The total capacity of the tanks is 46,000 gallons. The tanks were overlain by a building which was removed in 1995 as part of the facility decontamination and decommissioning program.

During operation the Imhoff tanks periodically filled up with sludge, which was removed and disposed of off-site. In 1991 and 1992 liquids and sludge were removed from the tanks and disposed of off-site as low-level radioactive waste. Currently, approximately 250 gallons of sludge remain in Tank A. This sludge has been characterized and will be disposed of under the proposed RA.

2.1.1.2.1 Ra-226 treatment System

The Ra-226 Treatment System processed liquid waste generated by Animal Hospital No. 2 from 1960 to 1987. Approximately 200-500 gallons of waste containing Ra-226 and Sr-90 were processed daily, prior to discharge to the leach fields.

The system consisted of two septic tanks, an effluent distribution box, three dry wells and a leach trench. After settling of solids in the septic tanks, fluids were piped out of the tanks through a

distribution box to the three dry wells and the leach field. In 1992 the contents of the two tanks were removed and disposed of off-site.

2.1.1.3 Domestic Septic System Areas

There are seven domestic septic tanks located throughout the Site (Figure 2). Each septic system consisted of a septic tank, leach field and interconnected piping. Liquid wastes and sewage were discharged to six tanks prior to 1971 (Tank Nos. 1, 2, 3, 4, 5 and 6). In 1971 the six existing tanks were reportedly backfilled (IT Corporation, 1996), and one additional tank was installed (Tank No. 7) but reportedly never used (Dames and Moore, 1994). The tanks received only domestic sewage from the laboratories.

2.1.2 Physical Location

The Site is located immediately east of Old Davis Road, just south of Interstate 80 in Solano County California, in the southeast quarter of Section 21, Township 8 North, Range 2 East, Mount Diablo Base and Meridian. It is approximately 1.5 miles south of the town of Davis (Figure 1), and occupies a portion of the UC Davis south campus.

2.1.3 Site Characteristics

DOE has no present or planned future activities at the LEHR Site aside from environmental restoration and waste management activities. Site improvements originally completed by DOE will be transferred to UC Davis upon completion of any necessary environmental restoration associated with those structures, as described in the Memorandum of Agreement (MOA) between DOE and UC Davis (DOE, 1997).

UC Davis is currently using the LEHR Site for research activities, and plans to continue similar activities in the future. Currently, the UC Davis ITEH occupies several former LEHR facilities. ITEH activities involve approximately 200 University researchers and support staff.

2.1.4 Release or Threatened Release into the Environment of Hazardous Substance, or Pollutant, or Contaminant

Soil and waste sampling performed after the Site was added to the U.S EPA's National Priority List (NPL) indicate that radionuclides, metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides and nitrates are present at the Removal Sites. However, as discussed in Section 3 of the EE/CA, many of these compounds were detected near or below background, or were present only in isolated samples, and may represent natural Site conditions. Compounds which were detected at significant concentrations or which are laterally persistent throughout the soil in the area are listed below.

The maximum concentration detected using CERCLA procedures is shown in parentheses:

- **Southwest Trenches:** Cesium-137 (23 pCi/g), Sr-90 (16,700 pCi/g), Ra-226 (7.06 pCi/g), SVOCs (30,947 mg/kg total PAHs), chlordane (3.6 mg/kg) and nitrate (390 mg/kg).
- **Ra/Sr Treatment Systems:** Ra-226 (106.2 pCi/g), Sr-90 (37.6 pCi/g), and nitrate (110 mg/kg).
- **Domestic Septic System Areas:** Ra-226 (1.5 pCi/g), mercury (49.4 mg/kg), and nitrate (120 mg/kg).

All of these compounds were detected in both soil and waste, however some of the maximum concentrations were detected in samples of waste which was subsequently removed from the site. Ground water monitoring indicates that contaminants in the Removal Sites, with the possible exception of nitrate, have not impacted ground water. The EE/CA (Tables 3-1 through 3-9) lists background levels, toxicity characteristics, an investigation chronology and maximum concentrations detected for each of the Removal Sites.

2.1.5 NPL Status

This Site was placed on the EPA's NPL in May 1994, with both DOE and UC Davis named as Potentially Responsible Parties (PRPs). The 1997 MOA between DOE and UC Davis delineates each PRPs' area of responsibility.

2.1.6 Maps, Pictures, and Other Geographic Representations

All graphical representations pertinent to the RAs are presented in the EE/CA. A site location map and a Removal Sites location map are included in this memorandum as Figures 1 and 2, respectively.

2.2 Other Actions To Date

2.2.1 Previous Actions

Over the past six years, numerous expedited cleanup and source RAs have been successfully completed at the Site. In 1996 approximately 3,000 cubic feet of low-level radioactive waste were removed from the site under a CERCLA time-critical RA. Non-CERCLA site cleanup activities include decontamination of four on-site buildings and removal of a cobalt-60 irradiator facility. The EE/CA (Table 2-3) summarizes the more significant Site restoration actions accomplished or planned.

2.2.2 Current and Planned Actions

No actions are currently in progress at the Site. As discussed in this Action Memorandum, RAs are currently planned for the Southwest Trenches, Ra/Sr Treatment Systems and the Domestic Septic Systems. In addition, UC Davis will be conducting environmental restoration activities for its areas of responsibility as outlined in the MOA between DOE and UC Davis (DOE, 1997).

2.3 State and Local Authorities' Roles

2.3.1 State and Local Actions To Date

Site investigation began in 1984, under the guidance of the Central Valley Regional Water Quality Control Board (CVRWQCB). After being listed on the NPL in 1994, environmental investigation activities continued under CERCLA. EPA, in conjunction with the California Department of Toxic Substance Control, the California Department of Health Services, and the CVRWQCB, oversees investigations and cleanup activities performed by DOE and UC Davis.

2.3.2 Potential for Continued State/Local Response

No State or local response actions are anticipated other than continued oversight of site cleanup activities under CERCLA. DOE will provide the necessary funding and support for the RAs, and for future monitoring and maintenance.

3. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

3.1 Threats to Public Health or Welfare

The EPA (EPA, 1991) indicates that where the cumulative potential carcinogenic risk to an individual based on reasonable maximum exposure for both current and future land uses is less than 10^{-4} , and the Hazard Index (HI) is <1 , remedial action is generally not warranted unless there are adverse environmental impacts. If the Maximum Contaminant Levels (MCLs) or non-zero MCL goals are exceeded, action is generally warranted. The EPA 10^{-4} to 10^{-6} risk range is a target within which risk should be managed as part of a cleanup action. Once a decision has been made to undertake cleanup, the preference is to achieve the more protective end of the range (i.e., 10^{-6}). Records of Decision (RODs) and Action Memoranda for cleanup actions taken at sites posing risks within the 10^{-4} to 10^{-6} risk range must have documentation supporting why the cleanup is warranted.

The RAs discussed in this Action Memorandum are intended to provide a final remedy to the threat posed by residual waste in the Removal Sites. A site-wide ROD, to be completed at a future date, will evaluate the effectiveness of these RAs, and determine if additional action or controls are necessary.

3.2 Discussion of Criteria

In accordance with the NCP the following criteria must be considered in determining the appropriateness of a non-time-critical RA (40 CFR, section 300.415) to address threats to public welfare or the environment.

Criterion (i) *Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations*: Contaminant concentrations in soil may result in a greater than 10^{-4} excess cancer risk for exposed on-site personnel if the RAs are not completed.

Criterion (ii) *Actual or potential contamination of drinking water supplies*: Ground Water monitoring data indicate that no significant impact to ground water drinking supplies has occurred from the Removal Sites. Future impacts may occur if the RAs are not completed.

Criterion (iii) *Hazardous substances or pollutants or contaminants in drums, barrels, tanks or other bulk storage containers*: Records indicate that the Southwest Trenches served as a burial

area for laboratory waste. Some of this waste may be in small buried containers (e.g. bottles or bags), which may present some risk of rupture. The Imhoff and radium treatment tanks contain radioactive and potentially hazardous residues. Available information indicates that the waste material possibly present in the domestic septic tanks is non-hazardous domestic sewage.

Criterion (iv) *High levels of hazardous substances or pollutants or contamination in soils largely at, or near the surface:* None.

Criterion (v) *Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released:* Rain water infiltration into soil may encourage downward migration of contaminants. High winds may generate pesticide-bearing dust.

Criterion (vi) *Threat of fire or explosion:* Although records do not indicate that flammable materials are present, waste disposed of in the Southwest Trenches could contain potentially flammable or explosive materials.

Criterion (vii) *The availability of other appropriate Federal or State responses to respond to the release:* None.

Criterion (viii) *Other situations or factors that may pose threats to public health or welfare or the environment:* Excavation or long-term building occupancy in the vicinity of the Removal Sites could result in unacceptable exposure to hazardous substances and/or ionizing radiation.

3.3 Threats to the Environment

An Ecological Scoping Assessment (Weiss Associates, 1997b) identified six complete exposure pathways for on-site Special Status wildlife species, and seven exposure pathways for off-site Special Status wildlife species. These exposure pathways are listed in Table 4-6 of the Scoping Assessment.

The Scoping Assessment also examined the potential impact to Putah Creek of lead and mercury present in Site storm water. The Assessment concluded that although detectable levels of lead are present in storm water runoff, the detected levels are unlikely to cause a significant adverse impact to the Creek.

4. ENDANGERMENT ASSESSMENT

Actual or threatened releases of hazardous substances/pollutants and contaminants from this site, if not addressed by implementing the response actions selected in this Action Memorandum may present a future endangerment to public health, welfare, or the environment.

5. PROPOSED ACTIONS AND ESTIMATED COSTS

5.1 Proposed Actions

The specific Removal Action Objectives (RAOs) for the proposed Removal Sites are developed in the EE/CA (Section 4) and are listed below:

- Lower the excess cumulative cancer risk to an individual from exposure to site contaminants to within a nominal range of 10^{-4} to 10^{-6} using 10^{-6} as the point of departure;
- Reduce non-cancer hazard indices to levels below 1;
- Mitigate potential future impact to ground water;
- Mitigate potential ecological risks during and after RA; and,
- Minimize impact to on-site university research.

5.1.1 Proposed Action Description

Site specific Risk-Based Action Standards (RBASs) for soil were developed for the Removal Sites (Weiss Associates, 1997c). The RBASs are listed in the EE/CA (Tables 4-4 to 4-12).

The general scope of work for all three RA areas consists of removal of soil and waste, followed by confirmation sampling and analysis, backfilling and compaction of the excavation, and site restoration. All excavated waste and structures will be disposed of at an appropriate off-site disposal facility after characterization.

Recommended RA for the Southwest Trenches Area: The recommended alternative for the Southwest Trenches is Alternative 3 listed in the EE/CA – Excavation, Off-Site Disposal and Institutional Controls (EE/CA, Section 8.3). This alternative was chosen because it achieves RAOs, and limits the degree of uncertainty related to the volume of soil that needs to be excavated. Furthermore, it is likely RAOs may be attained in this area without the necessity of institutional controls.

The sequence of removal activities is summarized below, and will be discussed in detail in the RA Work Plan (Weiss Associates, 1998b):

- Prior to excavation, surface soil will be sampled to determine the extent of pesticide residue. Surface soil containing pesticides above cleanup guidelines will then be removed and confirmation sampling will be performed.
- Exploratory trenching in a grid system will be performed to locate waste disposal pits. Buried solid waste material within the trenches will be removed, and confirmation sampling will be performed. When the cleanup guideline levels have been achieved, the excavation will be backfilled with clean fill, and the site will be restored.
- An estimated 1,800 cubic yards (cy) of excavated soil and waste will be characterized, and disposed of off-site according to DOE protocol.
- Confirmation samples collected from the excavation limits will be evaluated to determine whether institutional controls will be necessary. Institutional controls implemented as part of this alternative may involve restrictions on future land disturbance activities and administrative monitoring.
- A final construction certification report documenting the completed RA will be available for public review.

Recommended RA for the Ra/Sr Treatment Systems Areas: The recommended alternative for the Ra/Sr Treatment Systems Areas is Alternative 3 in the EE/CA – Excavation, Off-Site Disposal, and Institutional Controls (EE/CA, Section 8.4). This alternative was chosen because it achieves RAOs, and limits the degree of uncertainty related to the volume of soil that needs to be excavated. Furthermore, it is likely RAOs may be attained in this area without the necessity of institutional controls.

The sequence of removal activities is summarized below, and will be discussed in detail in the RA Work Plan (Weiss Associates, 1998b):

- Prior to excavation, additional soil sampling will be conducted in the vicinity of the three dry wells to verify the horizontal and vertical extent of soil impacted above cleanup guidelines.
- The Sr-90 leach fields, the Ra-226 treatment tanks, the Sr-90 treatment tanks, and all associated piping will be excavated and removed. The three Ra-226 dry wells and the associated leach trench will be drilled out and removed. Confirmation sampling will be performed. When the cleanup guideline levels have been achieved, the excavations will be backfilled with clean fill, and the site will be restored.
- An estimated 1,000 cy of excavated soil and waste will be characterized, and disposed of off-site according to DOE protocol. The waste will be sorted, and concrete structures will be crushed prior to disposal.

- Confirmation samples collected from the excavation limits will be evaluated to determine whether institutional controls will be necessary. Institutional controls implemented as part of this alternative may involve restrictions on future land disturbance activities and administrative monitoring.
- A final construction certification report documenting the completed RA will be available for public review.

Recommended RA for the Domestic Septic System Areas: The recommended alternative for the Domestic Septic System Areas is Alternative 2 in the EE/CA – Excavation, Off-Site Disposal, and Institutional Controls (EE/CA, Section 8.5). As discussed in the EE/CA, only Septic Systems No. 3 and 6 require removal actions. This alternative was selected because it is effective and because the excavations could be efficiently performed in conjunction with the RAs proposed for the Southwest Trenches and/or the Ra/Sr Treatment Systems Areas.

The sequence of removal activities is summarized below, and will be discussed in detail in the RA Work Plan (Weiss Associates, 1998b):

- Subsurface soil at Domestic Septic System No. 3 will be sampled to confirm that no removal activities are required.
- Contaminated soil associated with Domestic Septic System No. 6 will be excavated and removed. Confirmation sampling will be performed, and when the RAOs have been achieved, the excavation will be backfilled with clean fill.
- An estimated 35 cy of excavated soil will be characterized, and disposed off-site according to DOE protocol.
- Confirmation samples taken from the excavation limits and from Domestic Septic System No. 3 will be evaluated to determine whether institutional controls will be necessary. Institutional controls implemented as part of this alternative may involve restrictions on future land disturbance activities and administrative monitoring.
- A final construction certification report documenting the completed RA will be available for public review.

5.1.2 Contribution to Remedial Performance

The selected RAs are intended to provide an effective final remedial action for the Removal Sites. An additional EE/CA for the Dog Pens Area will be developed at a later date, following additional characterization. A site wide ROD will be prepared at a later date, after both DOE and UC Davis have completed additional work. The ROD will evaluate the removal actions performed under this Action Memorandum, and determine whether additional action is necessary.

5.1.3 Description of Alternative Technologies

The EE/CA evaluated alternative technologies for each site. These alternative technologies were screened based on effectiveness, implementability, and cost. After screening available technologies, the following alternatives were developed and evaluated in the EE/CA:

Southwest Trenches: 1) No action; 2) Excavation and off-site disposal; and 3) Excavation, off-site disposal, and institutional controls.

Ra/Sr Treatment System: 1) No action; 2) Excavation and off-site disposal; and 3) Excavation, off-site disposal, and institutional controls.

Domestic Septic System Areas: 1) No action; and 2) Excavation, off-site disposal, and institutional controls.

5.1.4 Engineering Evaluation/Cost Analysis (EE/CA)

The Draft Final EE/CA was submitted to the overseeing regulatory agencies and the public on January 20, 1998. The release of the EE/CA was advertised in three local newspapers, and a fact sheet describing the proposed RAs was prepared and distributed for comment to the parties listed on the Site mailing list. Responses to comments received during the 30 day public comment period from the Davis South Campus Superfund Oversight Committee (DSCSOC) and from the Native American Heritage Commission are included in Attachment A. No other comments were received from the public.

The Draft Final EE/CA was approved by the Remedial Project Managers team with minor modifications to four pages. These pages have been revised, and submitted to all recipients of the Draft Final EE/CA. The Draft Final version will be considered the Final EE/CA.

5.1.5 Applicable or Relevant and Appropriate Requirements

Potential Applicable or Relevant and Appropriate Requirements (ARARs) reviewed for CERCLA sites fall into three broad categories based on the chemicals of concern, the site location and conditions; and the RA being considered. Federal, State and local requirements under each category are listed and reviewed in the EE/CA (Section 4).

These ARARs, along with risk evaluation data, potential ground water impacts and other considerations, were then used to develop the RAOs.

5.1.6 National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires an assessment of potential impacts that may result from implementing a proposed RA. The EE/CA (Section 7) reviews environmental impacts in a manner that is consistent with NEPA and with DOE environmental compliance guidelines.

Probable environmental impacts of all the RA alternatives were reviewed and it was found that, for the most part, the project will impact a relatively small area of previously-disturbed land, and the proposed activity would have little affect on environmental considerations. The EE/CA study concluded that no long-term, significant, and adverse environmental impacts are likely to occur from any of the proposed RAs.

5.1.7 Project Schedule

The general RA schedule is summarized below. A more detailed schedule is presented in the EE/CA (Figure 8.2).

Table 1. Proposed Removal Action Schedule

Removal Action Workplans	1 st and 2 nd quarters, 1998
Field Work:	
Southwest Trenches	2 nd through 4 th quarters, 1998
Off-site Disposal of Southwest Trenches Waste	1999
Ra/Sr Treatment System Areas	1999
Domestic Septic System Areas	1999
Confirmation sampling	1999
Post Removal Action reports	Early 2000

5.2 Estimated Costs

The total estimated cost for the three selected RAs is \$8,100,000: \$4,300,000 for the Southwest Trenches, \$3,200,000 for the Ra/Sr Treatment Systems, and \$600,000 for the Domestic Septic System Areas. Additional cost information is presented in the EE/CA (Table 8-1).

6. STATUTORY LIMITS ON REMOVAL ACTIONS

Because these RAs will be performed and funded by DOE, they are not subject to the fund-financed cost limitations of 12 months and \$2 million prescribed in 40 CFR Section 300.415(a)(5).

7. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If the proposed removal actions are delayed or not taken, the wastes present at the Site will remain in the subsurface as potential sources of ground water contamination, increasing the chance of a future release to ground water, and potentially exposing on-site personnel to greater than 10^{-4} excess cancer risk.

8. OUTSTANDING POLICY ISSUES

None.

9. RECOMMENDATIONS

This decision document describes the selected RA for three of the DOE areas at the LEHR site in Davis, California, developed in accordance with CERCLA as amended, and is consistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at the Site meet the NCP section 300.415(b)(2) criteria for a removal. The estimated total cost for the RA is \$8,100,000, which will be funded by DOE.

The selected RAs are protective of human health and the environment, comply with Federal, State, and local requirements that are legally applicable, relevant and appropriate to the RA, and are cost-effective. The selected RAs utilize permanent solutions and alternative treatment technologies to the maximum extent practical, and satisfy the statutory preference for remedies that employ treatment that reduces toxicity, mobility or volume as a principal element.

The undersigned approves implementation of the selected RAs for the Southwest Trenches, Ra/Sr Treatment Systems, and Domestic Septic Systems Areas at the LEHR site.

James T. Davis
Associate Manager for Environmental Management
Oakland Operations Office
U.S. Department of Energy

Date

10. REFERENCES

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FIGURES

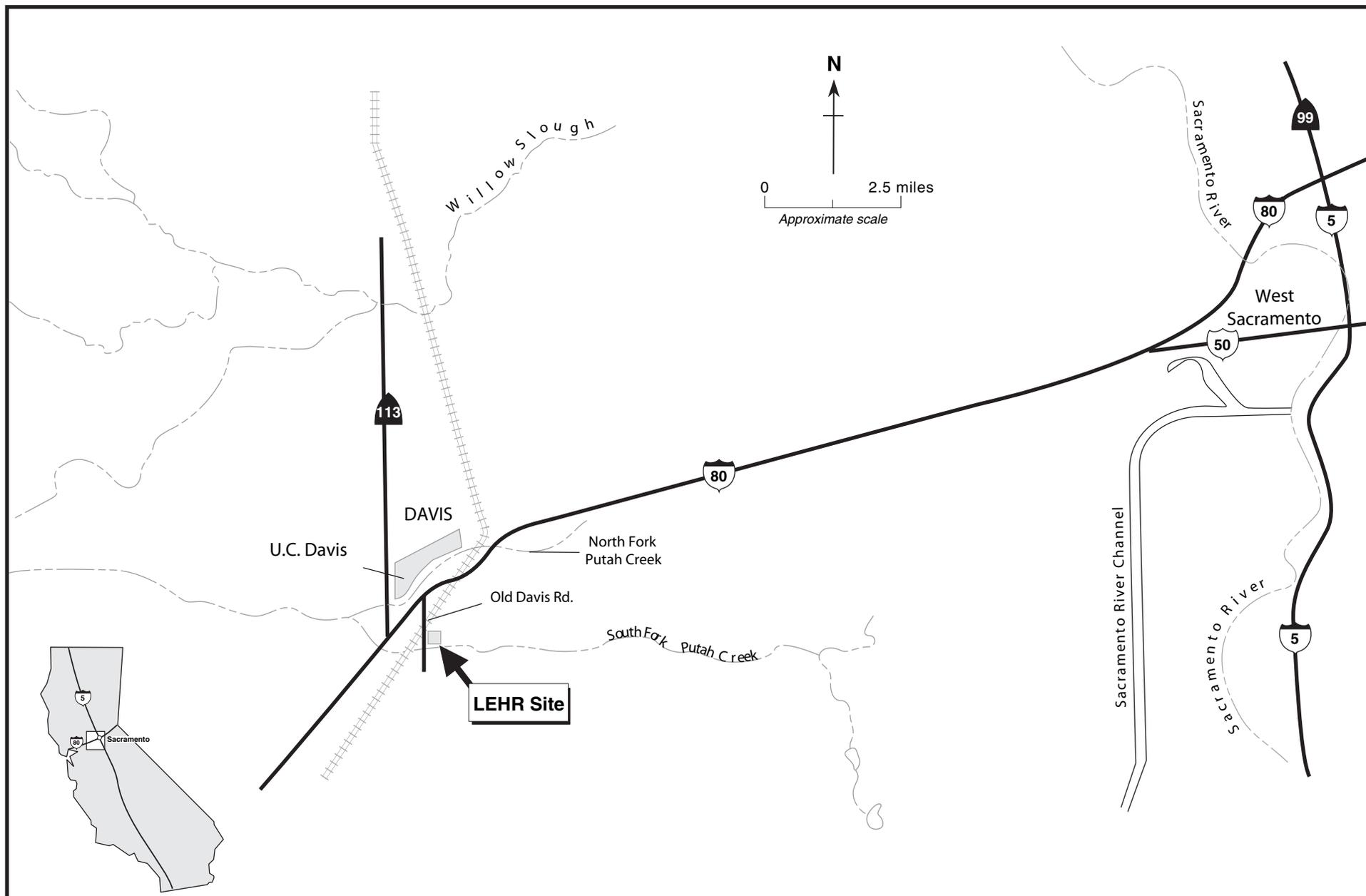


Figure 1. Location of the LEHR Site, UC Davis, California

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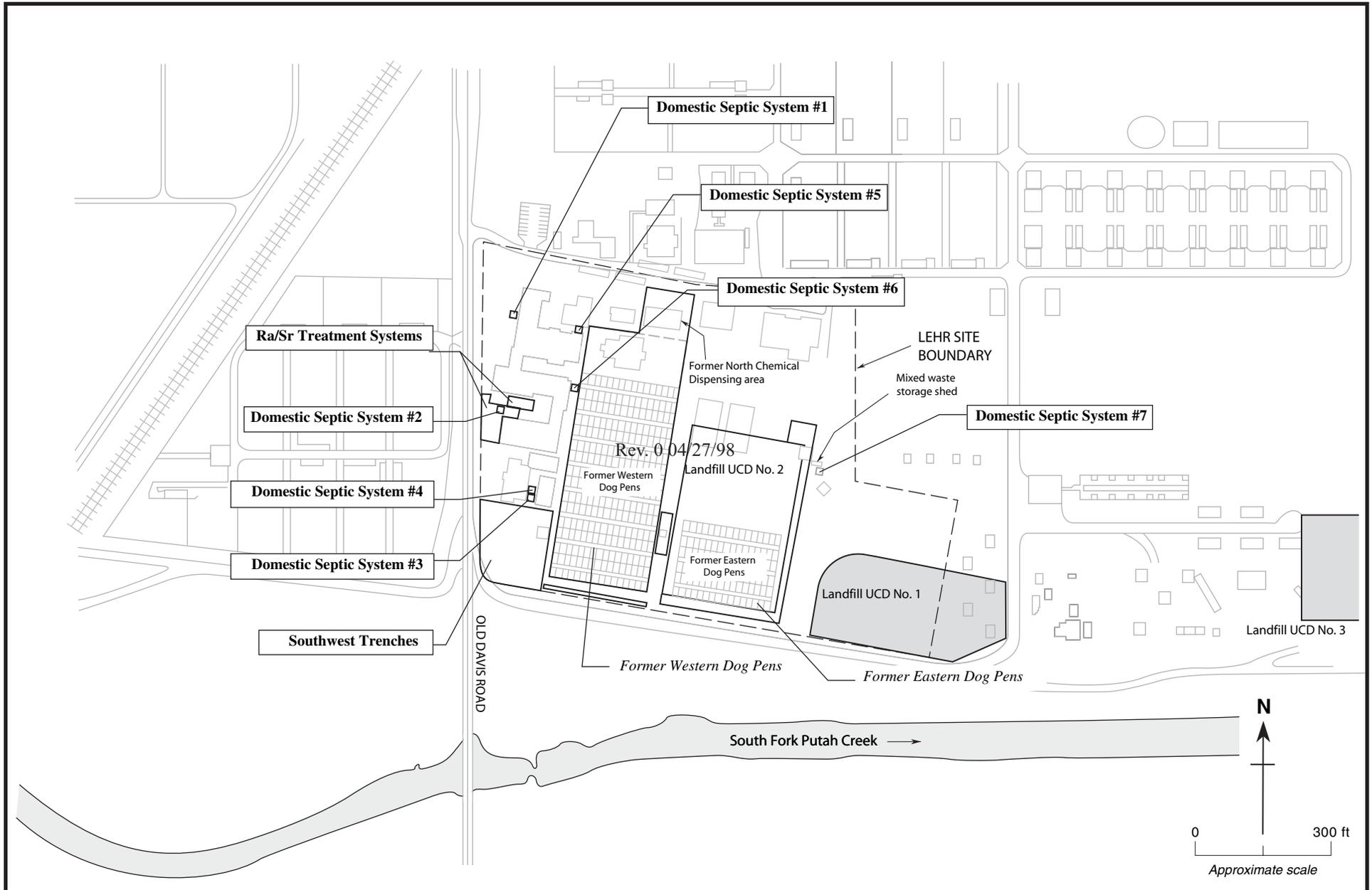


Figure 2. Location of Removal Sites at LEHR, UC Davis, California

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ATTACHMENT A

RESPONSES TO PUBLIC COMMENTS

ATTACHMENT A - RESPONSE TO PUBLIC COMMENTS

This section responds to two public comments directed to DOE, EPA and the State of California regarding the selected removal actions at the LEHR Site. The 30-day public comment period commenced on January 20, 1998 and ended on February 20, 1998. Responses to these comments are provided below, and the comments are included in this attachment.

Comment 1.

From: Native American Heritage Commission

Comment: Recommends that steps be taken to determine whether there are buried cultural resources at the site. If such resources are found, the procedures outlined in Appendix K of the California Environmental Quality Act should be followed.

Response: The Removal Action Workplans will address this issue, and will include a procedure to appropriately address discovery of buried cultural resources during the removal actions. No changes in the EE/CA are required to address this comment.

Comment 2.

From: Dr. G. Fred Lee, on behalf of DSCSOC.

Comment: Recommends that DSCSOC support the EE/CA.

Response: Comment noted. No changes in the EE/CA are required to address this comment.