

Final Tiered Initial Study

**LABORATORY FOR ENERGY-RELATED HEALTH RESEARCH
AND SOUTH CAMPUS DISPOSAL SITE (LEHR/SCDS)
INTERIM REMEDIAL ACTIONS PROJECT
(State Clearinghouse No. 97042095)**

Lead Agency:

THE REGENTS OF THE
UNIVERSITY OF CALIFORNIA

Prepared by:

UNIVERSITY OF CALIFORNIA, DAVIS



Environmental Consultant:



Sacramento, California

June 6, 1997

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TIERED INITIAL STUDY**

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University of California, Davis

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I. BACKGROUND

1. Name of Project Sponsor: University of California
2. Campus: Davis
3. County: Yolo
4. Address and Phone Number of Campus Contact: Planning and Budget Office
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University of California, Davis
Davis, CA 95616
(916) 752-9259
5. Date Checklist Completed: June 6, 1997
6. Agency Requiring Checklist: University of California
7. Name of Project: Laboratory for Energy-Related Health Research and South
Campus Disposal Site Interim Remedial Actions
(State Clearinghouse No. 97042095)
8. Name of Program EIR: University of California, Davis 1994
Long Range Development Plan EIR
(State Clearinghouse No. 94022005)
and revised analysis in the
1997 Wastewater Treatment Plant Replacement Project EIR
(State Clearinghouse No. 95123027 and No. 96072024)
9. Lead Agency for Program EIR: The Regents of the University of California
10. Date Program EIR Certified: September 23, 1994

A. Introduction

The environmental analysis for the University of California at Davis (UC Davis) Laboratory for Energy-Related Health Research and South Campus Disposal Site (LEHR/SCDS) Interim Remedial Actions project (proposed project) is tiered from the University of California, Davis 1994 Long Range Development Plan (LRDP) Environmental Impact Report (EIR). The 1994 LRDP EIR is a program EIR, prepared pursuant to Section 15168 of the California Environmental Quality Act (CEQA) Guidelines (Title 14, California Code of Regulations, Section 15000 et. seq.). The 1994 LRDP EIR analyzed full implementation of uses and physical development proposed under the 1994 LRDP. The environmental analysis in the 1994 LRDP EIR was revised by the EIR prepared for the Wastewater Treatment Plant (WWTP) Replacement Project in March 1997 (State Clearinghouse

No. 95123027 and No. 96072024). Hereafter, references to the 1994 LRDP EIR include the 1994 LRDP EIR as revised by the 1997 WWTP EIR unless otherwise noted.

The CEQA concept of “tiering” refers to the coverage of general environmental matters in broad program-level EIRs, with subsequent focussed environmental documents for individual projects that implement the program. The project environmental document incorporates by reference the discussions in the Program EIR and concentrates on project-specific issues. CEQA and the CEQA Guidelines encourage the use of tiered environmental documents to reduce delays and excessive paperwork in the environmental review process. This is accomplished in tiered documents by eliminating repetitive analyses of issues that were adequately addressed in the Program EIR and by incorporating those analyses by reference.

In accordance with CEQA Sections 15152 and 15168(c), this project is tiered to the 1994 LRDP EIR (State Clearing House No. 94022005) which is hereby incorporated by reference, and which is available for review during normal operating hours at the UC Davis Planning and Budget Office at 376 Mrak Hall, University of California, Davis. The 1994 LRDP EIR analyzed the overall effects of campus growth and facility development through the year 2005-06 and identified measures to mitigate the significant adverse project and cumulative impacts associated with that growth.

The tiering of the environmental analysis for the proposed project allows this Tiered Initial Study to rely on the 1994 LRDP EIR for the following:

- discussion of general background and setting information for environmental topic areas;
- overall growth-related issues;
- issues that were evaluated in sufficient detail in the 1994 LRDP EIR for which there is no significant new information or change in circumstances that would require further analysis; and
- long-term cumulative impacts.

Thus, this Initial Study should be viewed in conjunction with the UC Davis 1994 LRDP EIR. The purpose of this Initial Study is to evaluate the potential environmental impacts of the project with respect to the 1994 LRDP EIR to determine what level of additional environmental review, if any, is appropriate. Based on the analysis contained in this Initial Study, one of the following determinations will be made:

- the project is exempt from CEQA;
- the project incrementally contributes to, but does not exceed, environmental impacts previously identified in the 1994 LRDP EIR, no additional mitigation measures are required, and preparation of Findings consistent with this determination is appropriate;
- the project would result in new impacts that were not previously identified in the 1994 LRDP EIR, but there is no substantial evidence that such new impacts may have a significant effect on the environment and preparation of a Negative Declaration is appropriate;
- the project would result in new potentially significant impacts that were not previously identified in the 1994 LRDP EIR, but proposed project-specific mitigation measures would reduce such impacts to a point where clearly no significant effects would occur and there is no substantial evidence the project as

- mitigated may have a significant effect on the environment, in which case preparation of a mitigated Negative Declaration would be appropriate; or
- the project would result in new significant environmental impacts not previously identified in the LRDP EIR, and preparation of a tiered EIR would be appropriate.

Mitigation measures identified in the 1994 LRDP EIR that apply to the proposed project will be required to be implemented as part of the project. The mitigation measures in the 1994 LRDP EIR that are appropriate to be implemented as part of the project are identified and discussed in Section IV.

B. Public and Agency Review

The Laboratory for Energy-related Health Research and South Campus Disposal Site (LEHR/SCDS) Interim Remedial Actions Project Draft Tiered Initial Study was circulated for public and agency review from April 25, 1997 through May 27, 1997. The only comment letter received was from the Yolo County Department of Public Health—Environmental Services Branch, and that letter recommended approval of the project.

C. Organization of Tiered Initial Study

This Tiered Initial Study is organized into the following sections.

Section I - Background: provides summary background information about the project sponsor, proposed project, and 1994 LRDP. In addition, this section includes a summary introduction describing the tiering process and content of the Tiered Initial Study.

Section II - Project Description: includes the description of the proposed project.

Section III - Consistency with the 1994 LRDP: describes the project's consistency with the 1994 LRDP.

Section IV - Tiered Environmental Checklist: contains the Tiered Environmental Checklist form. The Checklist form is used to assist in evaluating the potential environmental impacts of the proposed project with respect to the 1994 LRDP EIR. The Checklist form identifies potential project effects as follows:

1. new potentially significant project impacts that were not adequately analyzed in the 1994 LRDP EIR, or previously identified significant impacts for which new feasible mitigation measures are available;
2. new less-than-significant impacts;
3. environmental impacts of the project that were adequately analyzed and mitigated in the 1994 LRDP EIR; and
4. effects that would not result in any adverse environmental impact.

This section also contains an explanation of all checklist answers, applicable recommended 1994 LRDP EIR mitigation measures, and project-specific mitigation measures.

Section V - Environmental Factors Potentially Affected: identifies which environmental factors were determined to be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the Tiered Environmental Checklist.

Section VI - Mitigation Measures: summarizes applicable 1994 LRDP EIR mitigation measures and project-specific mitigation measures identified in Section IV.

Section VII - Determination: identifies the determination of whether impacts associated with project development are significant, and what, if any, additional environmental documentation would be required.

Section VIII - Reference: lists information sources used to develop this Initial Study.

II. PROJECT DESCRIPTION

The following project description is based on information contained in several documents, including the *Engineering Evaluation/Cost Analysis, Groundwater Interim Remedial Action, LEHR Environmental Restoration* (Dames & Moore, 1997a) and *Data Gaps Work Plan, LEHR Environmental Restoration, Davis, California* (Dames & Moore, 1996a). In addition, information contained in several data transmittals is included in the project description.

The proposed project includes soil and groundwater Interim Remedial Actions (IRAs), which are near-term chemical release clean-up actions. Undertaken consistent with Sections 104 and 106 of the Comprehensive Environmental Responsibility and Compensation Liability Act (CERCLA), IRAs are intended to prevent, minimize, or mitigate damage to public health or the environment, which may otherwise result from a release or threat of release. IRAs are undertaken when appropriate response actions are limited in number and reasonably obvious. The proposed project IRAs address existing chemical and/or radiological releases to soil and groundwater believed to have resulted from operation of waste disposal areas at the LEHR/SCDS site, and the proposed project would reduce impacts associated with the chemical releases. In agreement with the U.S. Department of Energy (DOE), UC Davis has assumed the lead role for groundwater remediation activities at the site, including groundwater cleanup, and remediation of soils in certain areas.

Future remediation actions will depend on results of on-going characterization investigations at the LEHR/SCDS site. These actions will be subject to appropriate environmental analysis under CEQA and possibly the National Environmental Policy Act (NEPA) once the site is adequately characterized and a comprehensive remediation program proposed.

A. Project Location

A.1 UC Davis

The 5,150 acre Campus is located in Yolo and Solano counties approximately 72 miles northeast of San Francisco, 15 miles west of the City of Sacramento, and adjacent to the City of Davis. The Campus, in general, comprises four campus units: Central Campus, South Campus, West Campus, and Russell Ranch (see Figure 3-2, Regional and Local Setting, on page 3-5 of the 1994 LRDP Draft EIR). The "Main Campus" refers to Central, South, and West Campus units, excluding Russell Ranch.

Most academic and extracurricular activities occur within the Central Campus. The Central Campus is bounded approximately by Russell Boulevard to the north, State Route 113 (SR 113) to the west, Interstate 80 (I-80) and the Southern Pacific Railroad tracks to the south and 1st or A Street to the east. The South Campus is located south of I-80 and north of the South Fork of Putah Creek. The West Campus is located to the west of SR 113 and is bordered by Putah Creek to the south, Russell Boulevard to the north, and on the west by private property. The South and West Campus units are contiguous with the Central Campus and are used primarily for field teaching and research.

The 1,590 acre Russell Ranch portion of the Campus lies to the west, separated from the West Campus by approximately 1½ miles of privately owned agricultural land. Russell Ranch was acquired by the Campus in 1990 and is intended for use in large scale agricultural and environmental research and the study of sustainable agricultural practices. Russell Ranch is bordered roughly by County Road 96 on the east, Putah Creek on the south, Covell Boulevard on the north, and Russell Boulevard on the west and northwest.

A.2 The LEHR/SCDS Site, Surrounding Land Uses, and Project Site

This section describes the area where chemical releases are known and/or suspected to have occurred, surrounding land uses, and the area containing the proposed project, the latter referred to as the project site throughout this document.

LEHR/SCDS Site and Surrounding Land Uses

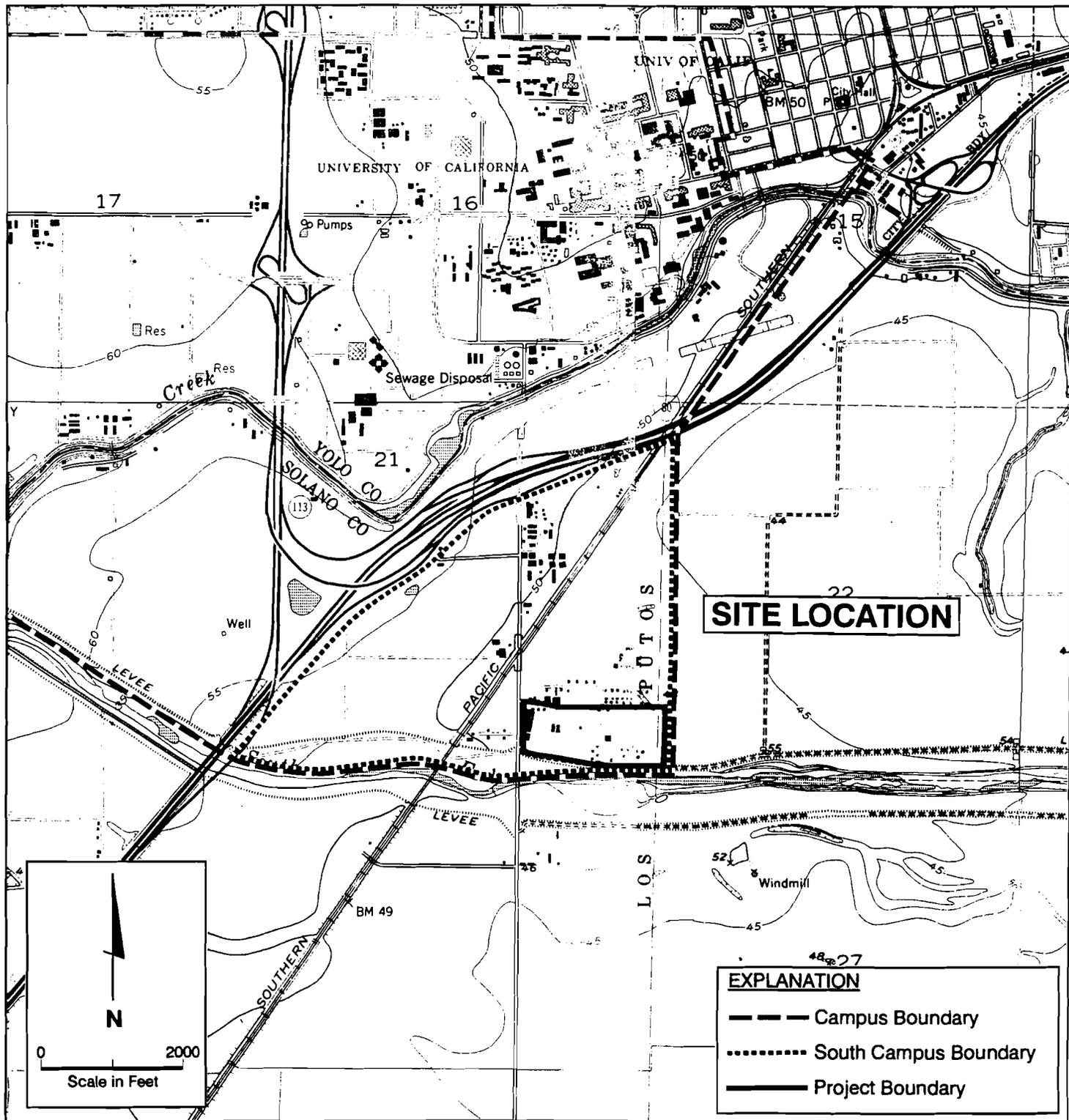
The 15-acre former LEHR site—now occupied by the Institute of Toxicology and Environmental Health Research, or ITEH—and the South Campus Disposal Site (SCDS) are located within the South Campus of UC Davis (Figure 1); this area is identified as LEHR/SCDS, throughout this document. The LEHR/SCDS site is bordered by Old Davis Road on the west; other UC Davis research facilities including the Oncology Laboratory and the California Center for Equine Health and Performance (CCEHP) to the north; an unnamed drainage canal to the east; and South Putah Creek Levee Road to the south (Figure 2). The LEHR/SCDS site is fenced and bordered by trees on the north, south, and west. A human-made channel containing the South Fork of Putah Creek, which flows west to east, is just south of the LEHR/SCDS site. Southern Pacific Railroad tracks are oriented southwest-northeast, ½-mile northwest. U.S. Interstate 80 freeway lies ⅝-mile northwest. Two residences are situated ¼-mile to the south. The remainder of the land south and east of the LEHR/SCDS site is relatively flat, tilled agricultural land.

Buildings at the LEHR/SCDS site include the following, which are illustrated on Figure 2:

- the Toxic Pollutant Health Research Laboratory
- small animal quarters
- storage and shop buildings
- the Cellular Biology Laboratory
- the Main Office and Laboratory
- the former animal hospital buildings
- the former medical clinic building
- inactive animal waste treatment systems (demolished)
- the former animal geriatrics facility
- the former cobalt-60 auxiliary building and irradiation field

These buildings are currently used for a variety of research and other uses by ITEH.

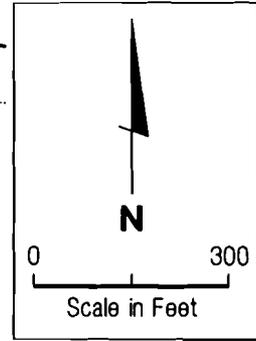
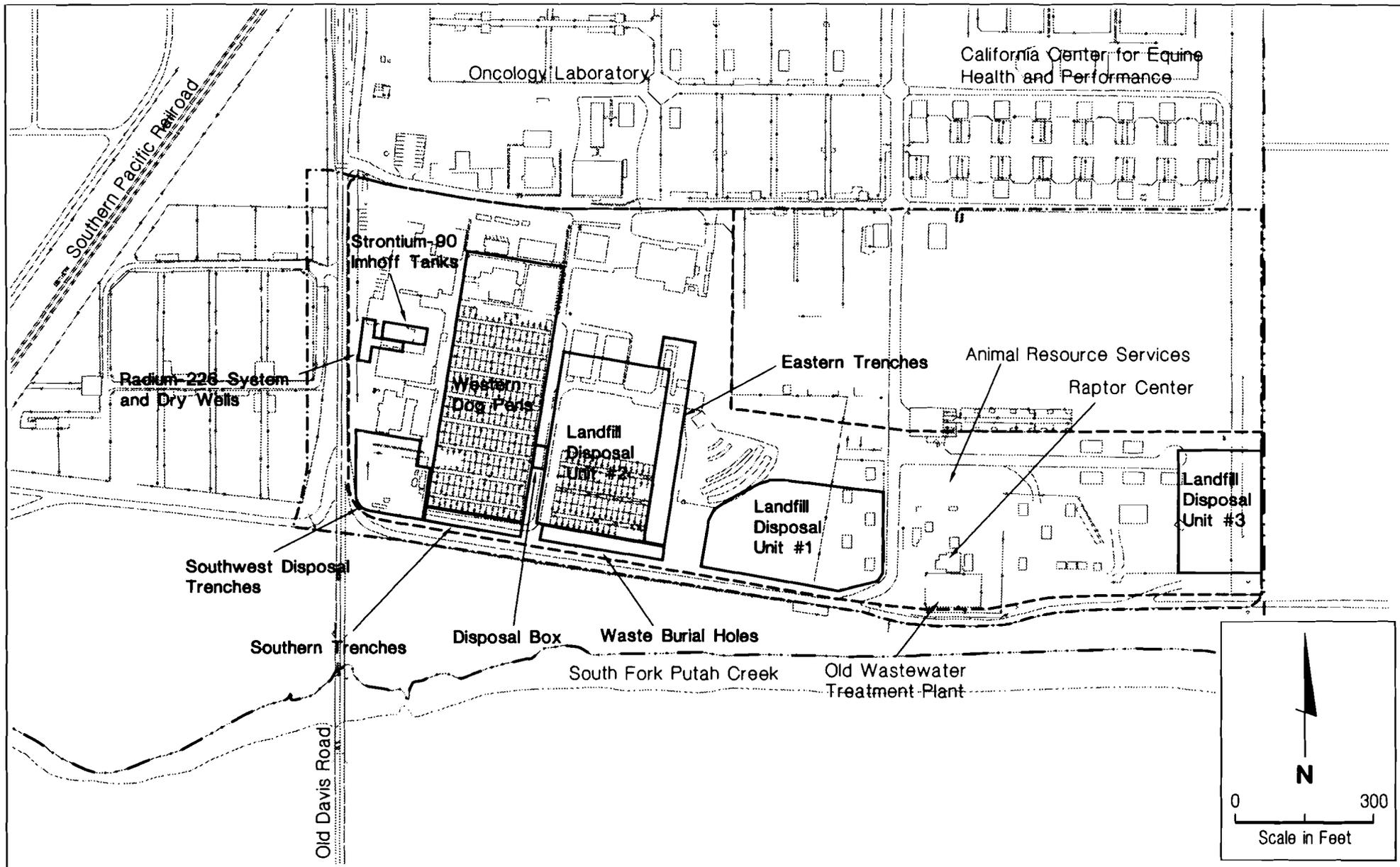
The LEHR/SCDS site includes three inactive landfill units. Inactive Landfill Units No. 1 and No. 2 are located within the southern portion of the LEHR/SCDS site (Figure 2). Inactive Landfill Unit No. 1 is located beneath



REFERENCE: USGS 7.5' Quadrangle; Merritt, CA, 1952, photorevised 1981; and Davis, CA, 1952, photorevised 1981.



SITE VICINITY MAP
 EE/CA Report - LEHR Groundwater IRA
 LEHR/SCDS Environmental Restoration
 Davis, California



EXPLANATION

- · · · — Campus Boundary
- · · · · · LEHR/SCDS Boundary
- · · · · · Project Boundary



WASTE DISPOSAL AREAS

LEHR/SCDS Groundwater IRA
 LEHR/SCDS Environmental Restoration
 Davis, California

the former cobalt-60 irradiation field at the southeast portion of the project site. Inactive Landfill Unit No. 2 is located at the south central boundary of the LEHR/SCDS site and is overlain by the former eastern dog pens and a portion of the former animal geriatrics facility. Areas near and adjacent to inactive Landfill Unit No. 2 were used to dispose of materials including tritium, carbon-14, and other radionuclide wastes in burial pits, and chemical wastes in disposal trenches. A third inactive landfill unit (No. 3) is located approximately 200 yards southeast of inactive Landfill Unit No. 1 (Figure 2). The former campus WWTP, which operated from the 1930s until 1949, and the UC Davis Raptor Center are situated near the South Fork of Putah Creek between the inactive Landfill Unit No. 1 and inactive Landfill Unit No. 3.

Project Site

The project site includes the entire LEHR/SCDS site plus additional area required for locating proposed project elements, such as pipelines, wells, treatment facilities, etc. The project site is bounded on the south by South Putah Creek Levee Road, on the east by an unnamed drainage canal; on the north by an unnamed road; and extends approximately 50 feet west of Old Davis Road.

B. Project Background, Objectives, and Characteristics

B.1 Project Background

UC Davis conducted radiological health-related and other research for the DOE from the 1950s to 1989. Full-scale experimental use of radioactive materials, including strontium-90 and radium-226 began at the LEHR facility in 1960. From the 1970s until 1985, a cobalt-60 irradiation facility operated at the LEHR facility. This facility included a building, irradiation field and numerous dog pens located at the irradiation field. In 1975, a program in basic aerosol science was initiated at the LEHR facility to link the evaluation of airborne materials and the laboratory study of these materials utilizing cellular and animal models. In 1983, construction of the Toxic Pollutant Health Research Laboratory was completed at the LEHR facility. This facility was designed for the study of highly toxic and carcinogenic agents, including both radioactive and chemical materials.

Waste Generation and Disposal

Some research activities at the site required the use of chemicals and radioactive substances, and generated waste streams related to the use of such substances. Disposal of wastes occurred both off- and on-site. In the initial stages of operation at the LEHR facility, waste was handled through a central handling facility on the main campus. However, waste handling for LEHR-generated waste was returned to the LEHR facility in the early 1960s. Waste generated by LEHR facility activities was primarily handled through two on-site processing systems, or disposed into a variety of disposal pits and trenches. Waste from research laboratories and UC Davis campus was disposed in pits and trenches at the LEHR/SCDS area. A brief summary of waste-generating processes and waste disposal areas with the potential to impact project site soil and groundwater is presented below. Waste disposal areas are identified on Figure 2.

LEHR Facility Waste Areas

- **Imhoff System** — From 1960 to 1987, effluent from strontium-90 experiments was processed through an Imhoff sewage treatment system. The Imhoff system used a series of settling tanks and cation exchange columns to treat waste prior to discharge to leach fields.
- **Radium-226 System** — The radium-226 processing system consisted of septic tanks, dry wells, and a leach trench that were used to process waste from radium-226 experiments conducted at the LEHR facility.
- **Domestic Septic Tanks** — Six on-site septic tanks were reported to have received all liquid wastes from the LEHR facility except for strontium-90 and radium-226 project wastes. The LEHR facility was connected to the main UC Davis sewage treatment plant in 1991.
- **Southwest Trenches** — Low-level radioactive solid waste generated by DOE-sponsored research at LEHR facility was disposed in trenches located in the southwest corner of the property.
- **Dog Pens** — Two outdoor dog pen areas formerly containing approximately 350 separate pens are located at the LEHR portion of the project site. These pens housed dogs which received dosages of strontium-90 and radium-226. The pen structures have been removed by DOE.

SCDS Waste Areas

- **Southern Trenches** — LEHR facility and UC Davis waste was reportedly disposed in part in two east-west oriented trenches located south of the main dog pen area. The trenches are 2 feet wide and 4 to 6 feet deep (Dames & Moore, 1997b).
- **Waste Burial Holes** — Forty-nine burial pits located south of the smaller, eastern dog pens were reported to be used by UC Davis to dispose of radioactive waste. The pits are reported to be 4 feet by 4 feet across, and 8 to 10 feet deep (Dames & Moore, 1997c).
- **Eastern Trenches** — Five to seven north-south trending trenches located between the eastern boundary of Landfill Unit No. 2 and the cobalt-60 irradiation field were reportedly used for disposal of chemical and laboratory wastes. The trenches are 2 feet wide and 4 to 6 feet deep (Dames & Moore, 1997d).
- **Landfill Unit No. 1** — The oldest of the three inactive disposal units is presently covered by the cobalt-60 irradiation field. Disposal reportedly began in this unit in the 1940s and ceased in the 1950s. General campus wastes, sewage sludge, and possibly chemical wastes appear to have been disposed at the landfill unit (Dames & Moore, 1997e).
- **Landfill Unit No. 2** — Landfill Unit No. 2 was operated from 1956 to 1967, and consisted of twelve east-west oriented disposal pits. This unit is currently partially covered by an area that previously housed some of the dog pens; the dog pens were removed in Summer 1996. Types of wastes disposed at this site were reported to include general refuse, animal parts, ash from the UC Davis incinerator, and some liquid chemicals (Dames & Moore, 1997f).
- **Landfill Unit No. 3** — UC Davis operated this unit, located east of the LEHR facility, from 1963 to 1967. Wastes were placed in two large, pit-like excavations and covered with a soil cap (Dames & Moore, 1997g).

Currently-Proposed Interim Remedial Actions (IRAs)

In 1990, UC Davis completed a Solid Waste Assessment Test (SWAT) for the inactive landfill units (Dames & Moore, 1990). The SWAT concluded that inactive Landfill Units No. 1 and No. 2 were leaking volatile organic compounds (VOCs) and hexavalent chromium. Based on the SWAT, the California Regional Water Quality Control Board (RWQCB) required UC Davis to prepare a work plan to accomplish the following tasks:

- characterize the lateral and vertical extent of soil and groundwater contamination;
- determine how contaminated soil and groundwater would be remediated; and
- identify actions to be taken to prevent future degradation of groundwater quality.

In May 1994, the LEHR/SCDS site was listed as a Superfund site by the U.S. Environmental Protection Agency under CERCLA. As part of the CERCLA process, a Remedial Investigation/Feasibility Study work plan was developed which identified and presented the background rationale, objectives, and procedures for evaluating environmental impacts at the LEHR/SCDS site. (Pacific Northwest National Laboratories (PNNL), 1994) The RI/FS work plan was supplemented by a "data gaps" work plan, which identified work necessary to better evaluate and identify remedial alternatives for SCDS waste areas. (Dames & Moore, 1996a). The following IRAs were proposed in the work plan and are part of the proposed project which is evaluated in this Tiered Initial Study:

1. An excavation and soil removal action to remove laboratory waste from the waste burial pit area located immediately south of inactive Landfill Unit No. 2 and the southern portion of the eastern waste trenches.
2. A selected excavation and soil removal action to remove chemical waste from the eastern waste trenches.
3. A groundwater pump and treat action to reduce VOCs (primarily chloroform, but minor amounts of other VOCs as well) from groundwater.

An Engineering Evaluation/Cost Analysis (EE/CA) focusing on the groundwater IRA action was developed (Dames & Moore, 1997a). An additional EE/CA, expected to be completed in mid-1997, will focus on soil IRA actions.

Project Area Geology and Hydrogeology, and Constituents of Primary Concern

In order to define the problem, and as background to the scope and procedures presented below for the proposed project IRAs, the following text presents a description of the geology and hydrogeology of the project area as well as a discussion of the distribution of chemical mass. Information presented regarding constituents in soils is based on data from soil and soil gas sampling; information on constituents in groundwater is based on monitoring wells and hydropunch sampling.

Project Area Geology

Surface soils in the project site vicinity are as follows:

- **Capay silt clay loam (Ca)** — Dark grayish-brown to grayish-brown, 40 inches thick over pale brown and yellowish-brown clay loam to 60 inches +;
- **Reiff fine sandy loam (Ra, Rw)** — Grayish-brown to light yellowish-brown fine sandy loam to greater than 60 inches depth; and
- **Yolo loam, loam clay substratum, and silty clay loam (Yo, Yr, Ys)** — Dark grayish-brown silty clay loam to approximately 20 inches in depth over a brown clay layer approximately 8 inches thick over brown loam to greater than 60 inches in depth.

These soils are relatively young, weakly developed soils that formed in alluvial parent material during late Pleistocene to Recent time. The soil horizons nearest the surface are relatively thick and organic rich, which makes these soils valuable for agricultural uses.

The major sedimentary units beneath the site and their nominal depths below ground surface (bgs) are:

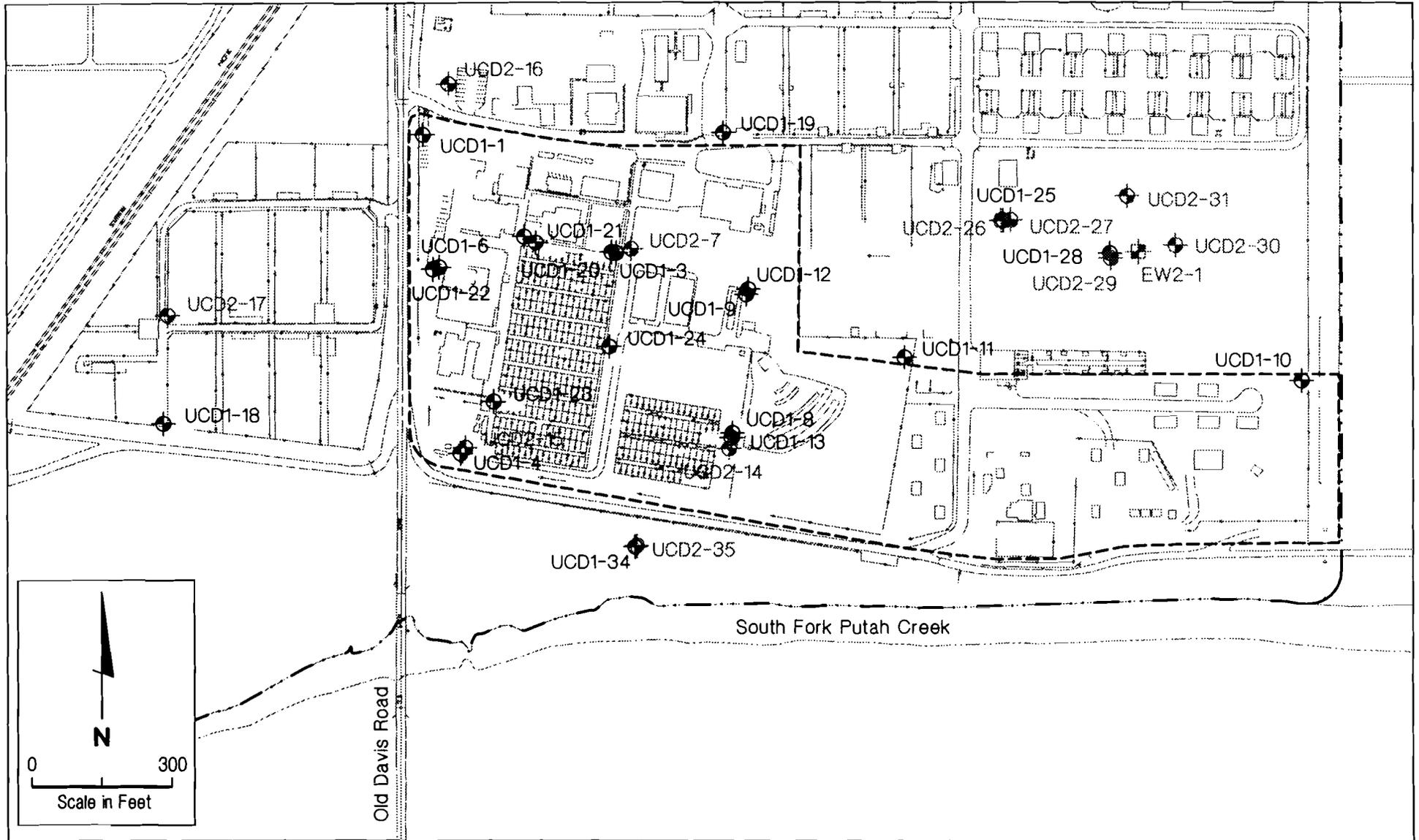
- 0 to 10 feet: surface soils;
- 10 to 80 feet: interbedded silt, clay and sand with some sand and gravel channel deposits;
- 80 to 135 feet: cobbles and gravels;
- 135 to 143 feet: clay and some silt; and
- 143 to 210 feet: clay and silty clay.

Some of the units contain gradational sequences or more than one lithology. The units appear to be relatively flat-lying, reflecting the original depositional setting.

Project Area Hydrogeology

Groundwater investigations at the project site have consisted of installing and sampling monitoring wells and collecting hydropunch water samples. Figure 3 presents LEHR/SCDS monitoring and extraction well locations. Four hydrogeologic units in the project area include the vadose zone (i.e., the area below ground surface but above the water table), hydrostratigraphic unit¹ (HSU) -1, HSU-2, and the aquitard beneath HSU-2. The aquitard is a body of distinctly less permeable material stratigraphically above or below the hydrostratigraphic units. The vadose zone is between 42 and 47 feet thick and consists primarily of unsaturated clay and silt with interbedded sand and gravel. HSU-1 is similar in materials to the vadose zone and is between 29 to 40 feet thick. The bottom of this unit varies from 76 to 88 feet below ground surface (bgs) across the site. HSU-2 is between 44 feet and 54 feet thick, consists primarily of sand in the upper portion and gravel in the lower portion, and contacts the lower aquitard between 126 feet and 130 feet bgs across the site. The aquitard below HSU-2 consists primarily of clay and silty clay, is approximately 90 feet thick, and extends to an approximate depth of 210 feet bgs.

¹ A hydrostratigraphic unit is a definable water-bearing geologic unit.



EXPLANATION

- ◆ UCD1-11 HSU-1 Monitoring Well - - - - - LEHR/SCDS Boundary
- ◆ UCD2-17 HSU-2 Monitoring Well · · · · · Campus Boundary
- ⊠ EW2-1 HSU-2 Extraction Well

WELL LOCATION MAP
 LEHR/SCDS Groundwater IRA
 LEHR/SCDS Environmental Restoration
 Davis, California

Hydrographs² have been maintained for HSU-1 and HSU-2 wells for over six years. Water levels across the site in HSU-1 and HSU-2 are typically highest in March and April, decline rapidly from April to August, and recover from September through March. Seasonal/annual fluctuations since 1990 range from a maximum drop in water elevation of approximately 40 feet between August 1994 and March 1995 to a minimum drop of 15 feet between August 1993 and March 1994 (PNNL, 1996). The seasonal changes in water levels are primarily due to pumping from HSU-2 and deeper intervals to supply local agriculture during the summer months. Water levels in both HSU-1 and HSU-2 also respond to changes in river stage in Putah Creek. HSU-1 wells located near Putah Creek respond directly to changes in stage level: when water levels in the creek rise, a rise in groundwater elevations in HSU-1 also occurs. However, HSU-2 wells located near Putah Creek show a dampened response to stage level changes.

Distribution of Constituents of Primary Concern

Distribution of each constituent of primary concern discussed below is presented on Figures 4 through 7.

Three types of constituents of primary concern at the LEHR/SCDS site include 1) chloroform and other volatile organic compounds (VOCs); 2) chromium (primarily as chromium VI in groundwater); and 3) nitrate. These three constituents are considered representative of the main types of constituents found at the LEHR/SCDS site for the following reasons, and they are more widely found and/or are found in higher concentrations than other similar constituents:

- Chloroform is the only VOC of concern detected downgradient of the source and off-site. The actions required to capture chloroform would result in the capture of the other detected VOCs.
- Hexavalent chromium is more mobile and represents a higher risk to human health than other chromium species, and is present in groundwater at the LEHR/SCDS site. Based on mobility and the distribution of chromium at the LEHR/SCDS site, 80 percent or more of the chromium detected in LEHR/SCDS groundwater is considered to be the hexavalent form.
- Nitrate is the most widespread constituent of concern, and is the most common dissolved solid or salt in the area and on the project site.

Because treatment options and results would be the same for similar constituents, effective containment or removal of these three primary constituents would also result in effective containment/removal of similar constituents. Therefore, although other constituents may occur the project site, these three constituents of concern are treated as representative.

In addition to these three representative constituents, tritium is another constituent of concern found at the site. Tritium is more prevalent and more mobile than other project area radionuclides; other radionuclides detected on site are not found consistently either in soil or groundwater and are not known to be present in concentrations that require treatment of groundwater. Therefore, while tritium is a constituent of concern, it is not representative of a class or type of constituent found at the project site.

² A hydrograph is a plot of groundwater elevations versus time.

Chloroform

Chloroform is the only VOC of concern detected downgradient of the source and off-site. The actions required to capture chloroform would result in the capture of the other VOCs detected. Therefore, this discussion focuses on chloroform as representative.

Chloroform and other VOC concentrations in soil gas are highest in the northern part of inactive Landfill Unit No. 2 and near the eastern disposal trenches (Figure 4). Based on soil gas sampling results, chloroform appears to have been released near the ground surface. Chloroform concentrations in groundwater at the LEHR/SCDS site decrease with depth near the suspected source areas (north portions of inactive Landfill Unit No. 2 and eastern trenches), and increase with depth downgradient of the source areas. Chloroform in HSU-1 occurs at higher concentrations (above 1,000 $\mu\text{g/L}$) in samples from well UCD1-12 and in hydropunch locations in the area immediately east and downgradient of UCD1-12. Further downgradient, however, HSU-1 concentrations decrease rapidly to values near the detection limit at the property boundary.

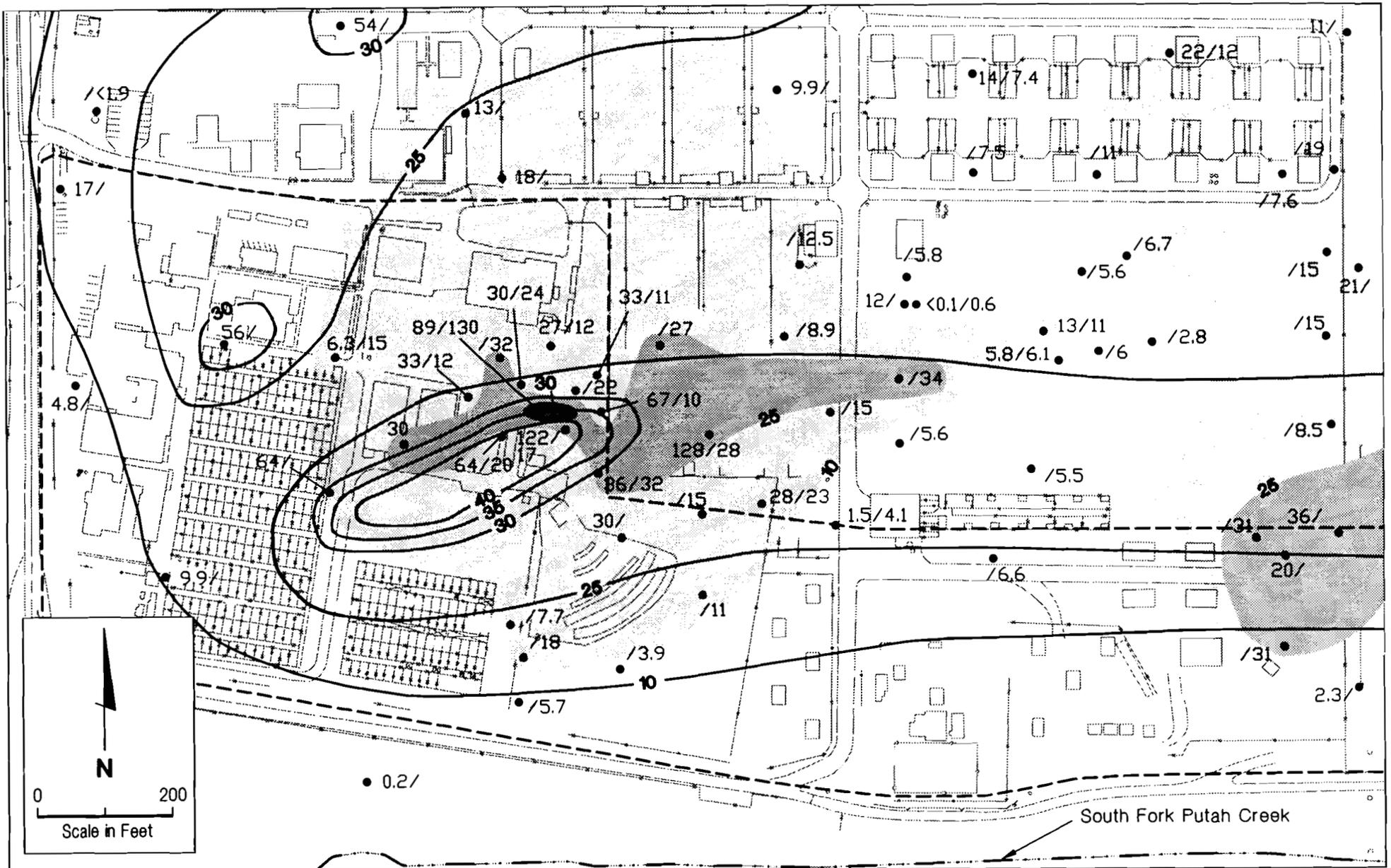
In HSU-2, data on chloroform are primarily from hydropunch samples and wells recently installed in response to recommendations of the 1994 Remedial Investigation/Feasibility Study (RI/FS) and IRA work plan. These data show that chloroform impacts are more widely distributed in HSU-2 and extend over 2,000 feet past the UC Davis property boundary (Figure 4). Chloroform has also been reported in at least two off-property agricultural wells downgradient of the site. Chloroform concentrations are highest in the middle and upper portions of HSU-2. Chloroform in the vicinity of anticipated IRA extraction is approximately 100 $\mu\text{g/L}$, as reported from extraction EW2-1 and monitoring wells UCD2-29, UCD2-30, and UCD2-31 (Dames & Moore, 1994).

Hexavalent Chromium and Chromium

Hexavalent chromium is more mobile and represents the higher risk to human health than other chromium species, and is present in groundwater at the LEHR/SCDS site. Based on mobility and the distribution of chromium at the LEHR/SCDS site, 80 percent or more of the chromium detected in LEHR/SCDS groundwater is considered to be the hexavalent form. As a result, discussion of chromium and hexavalent chromium in groundwater at the project site focuses on hexavalent chromium.

The total chromium maximum contaminant level (MCL)³ is 50 mg/L. Hexavalent chromium concentrations in groundwater at the LEHR/SCDS site decrease with depth. Within HSU-1, two areas of hexavalent chromium-contaminated groundwater are present; one is centered north of inactive Landfill Unit No. 2, and the other is located northeast of inactive Landfill Unit No. 1. Both areas contain hexavalent chromium above the MCL, with the highest concentration reported for new HSU-1 well UCD1-28 at 550 mg/L located near the anticipated extraction well. In HSU-2, only a few detections of hexavalent chromium have been reported, and impacts are both lower in concentration and less widely distributed than in HSU-1. Downgradient data from wells recently

³ Maximum Contaminant Level (MCL): Enforceable primary drinking water standards for California, adopted into regulation under the Safe Drinking Water Act. These standards are provided by the Department of Health Services as interim guidance for "safe" levels of contaminants in drinking water.

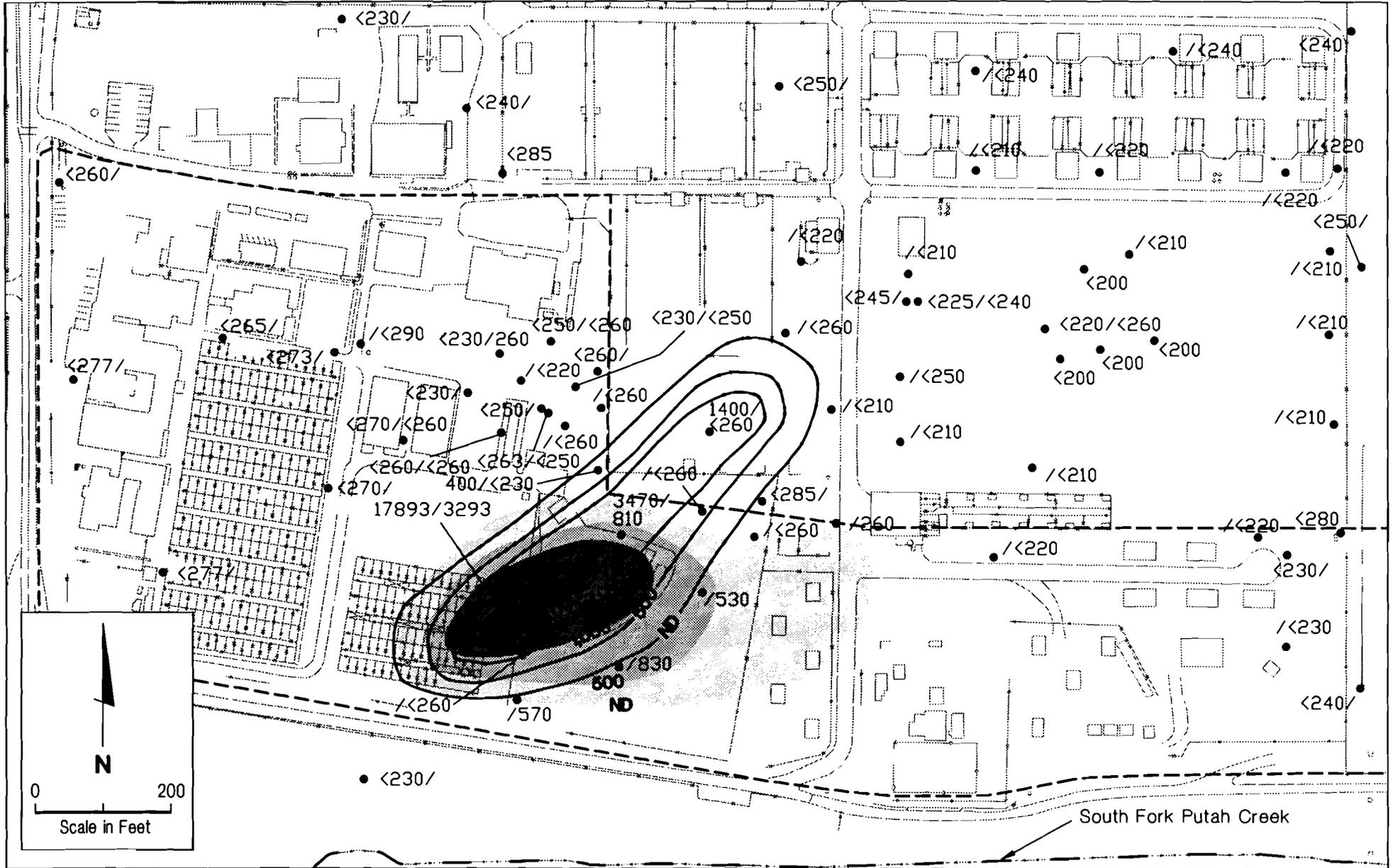


EXPLANATION

- 15/4.1 HSU-1 Concentration/HSU-2 Concentration - · - · - Campus Boundary
- HSU-1 Concentration Contour - - - - LEHR/SCDS Boundary
- ▨▨▨▨ HSU-2 Concentration Contour All Results Reported in mg/L

**CONCENTRATION CONTOUR PLOT
NITRATE IN HSU-1 AND HSU-2**

LEHR/SCDS Groundwater IRA
LEHR/SCDS Environmental Restoration
Davis, California



EXPLANATION

- | | | | |
|--------|---|-----------|-------------------------------|
| 15/4.1 | HSU-1 Concentration/HSU-2 Concentration | — · · — | Campus Boundary |
| — | HSU-1 Concentration Contour | - - - - - | LEHR/SCDS Boundary |
| ■ | HSU-2 Concentration Contour | | All Results Reported in pCi/L |

**CONCENTRATION CONTOUR PLOT
TRITIUM IN HSU-1 AND HSU-2**

LEHR/SCDS Groundwater IRA
LEHR/SCDS Environmental Restoration
Davis, California



installed in response to recommendations of the 1994 RI/FS and IRA work plan support these previous findings with relatively high detections reported from HSU-1 wells, but results below or near detection limits reported for wells screened in HSU-2.

Nitrate as Nitrogen and Total Dissolved Solids (TDS)⁴

Nitrate concentrations in project site soils are within the background range (16 to 222 $\mu\text{g/L}$) across most of the site, with some slightly elevated concentrations reported in waste zones in the eastern disposal trenches and the inactive landfill units (Figure 6).

The nitrate MCL is 10 mg/L, and the TDS MCL is 500 mg/L. Nitrate and TDS, essentially “salts”, are the most widespread of the constituents of concern in both HSU-1 and HSU-2. Regionally, nitrate in groundwater is elevated above the MCL of 10 mg/L. Much of the groundwater within HSU-1 beneath the site and surrounding property contains nitrate at concentrations above the MCL, with the highest concentrations reported downgradient of the dog pens and beneath all three landfill units. The upper portion of HSU-2 also contains nitrate in excess of the MCL. Concentrations of TDS in HSU-2 are consistently reported above the MCL of 500 mg/L in downgradient wells UCD2-7 and UCD2-14. The highest concentrations of nitrate and TDS in HSU-2 are reported in a similar area (but at lower concentrations) to the areas of highest concentrations reported in HSU-1.

Tritium

The most significant and consistently reported radionuclide in groundwater at the LEHR/SCDS site is tritium (Figure 7); tritium is more prevalent and more mobile than other project area radionuclides. Other radionuclides detected on site are not found consistently either in soil or groundwater and are not known to be present in concentrations that require treatment of groundwater. Tritium and other radionuclides in soil have been reported as elevated in soil samples collected from the waste zone in the waste burial pits and the southern part of the eastern trenches, both at relatively shallow depths (less than 10 feet bgs).

The tritium MCL is 20,000 pCi/L. Historic tritium concentrations have been detected up to 30,000 pCi/L, with the most recent round of groundwater sampling showing tritium concentrations in groundwater highest in HSU-1 (17,893 pCi/L) and decreasing with depth into HSU-2. The highest concentrations of tritium are located in the vicinity of the eastern trenches and just downgradient of the waste burial holes, the likely source area. As seen with many other compounds, the lateral distribution of tritium in HSU-1 appears to be limited to a relatively small area downgradient of the probable source areas. Tritium concentrations decrease with depth in HSU-2. Other radionuclides have not been detected in groundwater at concentrations requiring treatment.

⁴ Total Dissolved Solids (TDS): The total mass of solid residue obtained by evaporating a measured volume of filtered sample to dryness. The solid residue consists mainly of organic material with small amount of inorganic material.

B.2 Project Objectives

Objectives of the IRAs evaluated in this Initial Study as the proposed project include the following:

- Prevent, minimize, or mitigate potential threats to public health or the environment.
- Remove or contain specific sources of soil contamination located on the project site.
- Eliminate or substantially decrease potential offsite migration of constituents of concern in HSU-2 at the project site through plume containment.
- Substantially reduce the overall mass of VOCs in groundwater and other constituents of concern in soils.
- Provide information on the quality of extracted groundwater.
- Provide operational data which will aid in assessment of groundwater treatment effectiveness and the need for further groundwater remedial action.
- Provide data on groundwater reinjection effectiveness.

It should be noted that it is not an objective of this proposed project to reduce the mass of constituents of concern other than VOCs directly from groundwater during the groundwater IRA; however, it is an objective of the project to remove other constituents of concern from soils during the two soil IRAs. This is because other than VOCs, constituents of concern are found in groundwater in concentrations only slightly above background levels. For the purposes of the IRA, it was determined to be impractical to treat groundwater for these constituents due to high incremental cost relative to limited benefit gained (Dames & Moore, 1997a). Additional remedial actions may be implemented in the future to address other constituents of concern. In addition, removing constituents of concern from the soil will prevent their migration to groundwater.

B.3 Project Characteristics

Both soil and groundwater IRAs are elements of the proposed project.

Soil IRAs

The soil IRAs include removal of material from waste burial pits and selected removal of material from the eastern trenches. During the two soil removal actions, approximately 400 to 450 cubic yards (CY) of material/soil would be excavated, packaged, stored on-site, and—during the course of approximately one week—hailed off-site and disposed of. Of the excavated material to be disposed, approximately 90 percent (360 to 400 CY) would be excavated from the burial pits; the remaining 10 percent (40 to 50 CY) would be extracted from the eastern trenches.

Removal of Waste from Waste Burial Pits

The waste burial pits are located immediately south of inactive Landfill Unit No. 2 (Figure 2). The burial pits contain primarily glassware and relatively intact bottles, flasks, scintillation vials, syringes, plastic bags, and other laboratory waste. Based on the potential for the waste material in the waste burial pits to release contaminants, and the potential health and environmental risk associated with additional investigation in this area, remediation of the waste burial pits has been identified as an interim removal action under CERCLA.

The removal action in the waste burial pit area would likely consist of the following activities:

- excavation and stockpiling of five to eight feet of soil overburden;
- removal of two to three feet of laboratory waste;
- conducting confirmation sampling and additional soil removal below the waste, to a practical limit of between 20 and 25 feet based on the type of equipment used; and
- backfilling with clean fill from an offsite source and existing (clean) soil overburden.

Based on on-going investigations, including exploration, sampling, and testing of waste burial pit material, no chemical constituents are present, and radionuclide levels are below DOE and Nuclear Regulatory Commission thresholds for high-level nuclear waste (Dames & Moore, 1997c). Therefore, it is anticipated that waste in the burial pit area would be classified as low level radiological waste. Approximately 360 to 400 CY of excavated waste and soil would be packaged in Department of Transportation (DOT)-approved bins, managed consistent with CERCLA requirements, and disposed of at an appropriately-permitted disposal facility, currently anticipated to be either Hanford, Washington, or EnviroClean, Utah. Once all material is excavated and packaged, hauling to a disposal site would occur over approximately one week, and would require a total of approximately 18 to 27 trips of 15 to 20 CY-capacity trucks. Burial pit excavation would take approximately six weeks including excavation of the laboratory waste, assessment of the material below the waste, removal of the soil below the waste, material packaging, and backfilling. An extended arm backhoe, a loader, and shoring would be necessary for burial pit waste removal.

Selected Removal of Material from the Eastern Trenches

The eastern trenches are located along the eastern boundary of inactive Landfill Unit No. 2 (Figure 2). There are two areas that contain chemical waste: one toward the northern end of the trenches, and a second area toward the southern end of the trenches. The chemical waste in these areas consists of relatively intact bottles, some containing unidentified liquids, along with other laboratory waste consisting of glassware, vials, beakers, and other materials. Based on the potential for this material to continue to pollute, and the ability to remove the material and reduce the risk relatively easily, a selected removal action of these materials is proposed as part of the proposed project.

The removal action in the eastern trench area would likely consist of the following activities:

- excavation and stockpiling of two to four feet of soil overburden;
- removal of two to three feet of laboratory waste;
- conducting confirmation sampling and additional soil removal below the waste, to a practical limit of between 15 and 25 feet based on the type of equipment used; and
- backfilling with clean fill from an offsite source and existing (clean) soil overburden.

Based on on-going investigations, including exploration, sampling, and testing of eastern trench material, in accordance with Resource Conservation and Recovery Act (RCRA) and California (Title 22) standards, it is anticipated that waste in the eastern trenches would be classified as hazardous (Dames & Moore, 1997d). Approximately 40 to 50 CY of excavated waste and soil would be packaged in DOT-approved bins, managed

consistent with CERCLA requirements, and disposed of at an appropriately-permitted disposal facility. Once all material is excavated and packaged, hauling to a disposal site would occur over approximately one week, and would require a total of approximately two to three trips of 15 to 20 CY-capacity trucks. The eastern trench would take approximately one week including excavation of the waste, assessment of the material below the waste, additional removal of soil below the waste and backfilling. A backhoe would be necessary for removal of waste from the eastern trench.

Groundwater IRA

As previously noted, the groundwater IRA focusses on the removal of VOCs only. This is due to high incremental cost relative to limited environmental benefit gained for removal of other constituents of concern (Dames & Moore, 1997a).

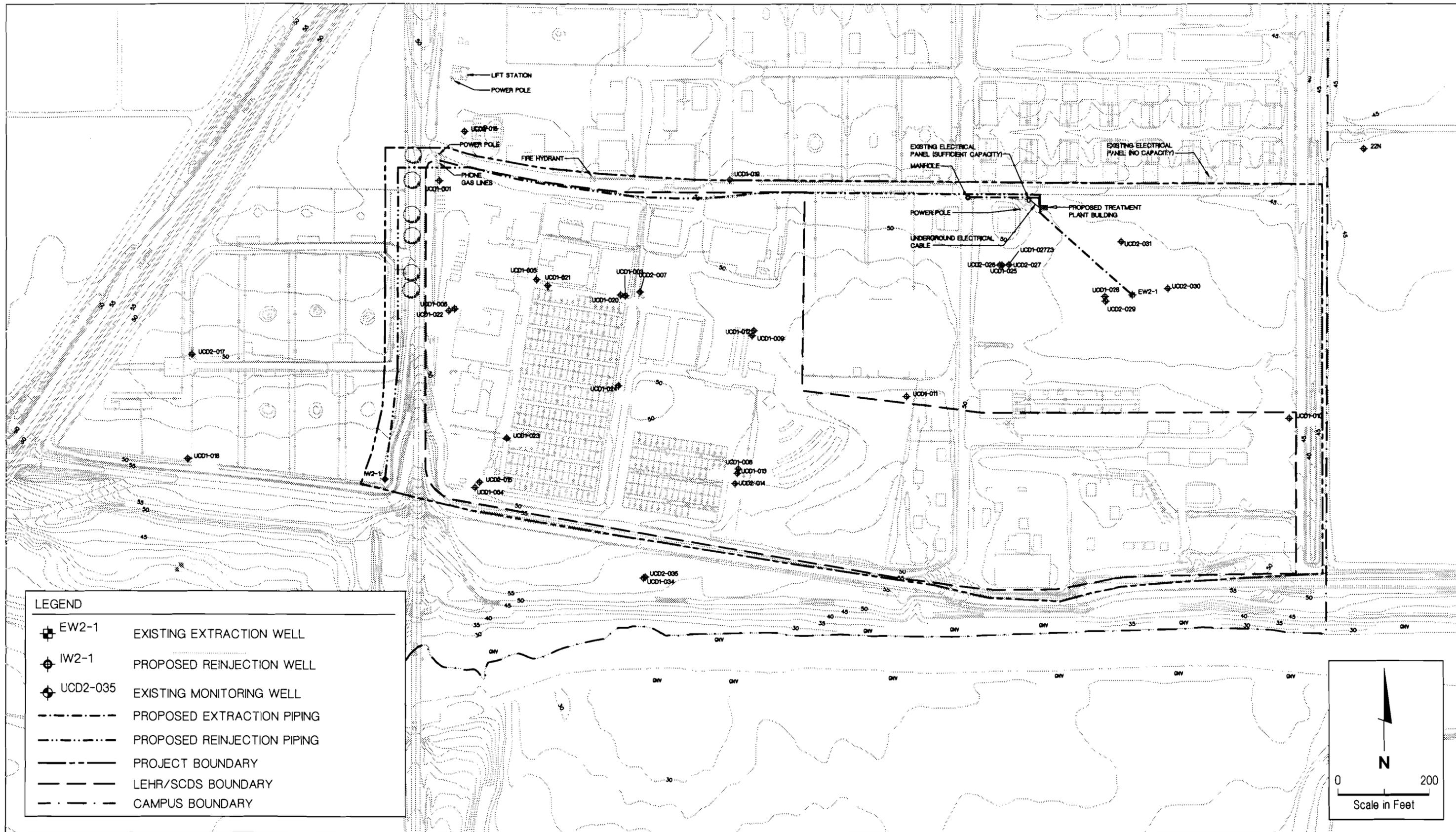
The groundwater IRA includes pumping and treating affected groundwater from HSU-2, discharging the treated water to HSU-2, and monitoring results of this "pump and treat" action. Approximately 200 gallons per minute (288,000 gallons per day) would be pumped, treated, and discharged as a result of the proposed project over a period of up to 15 years or more. Figure 8 identifies a conceptual layout of the groundwater IRA and Figure 9 identifies the proposed treatment system layout. In addition to the existing extraction wells and pump, the groundwater IRA would require the following elements:

- an on-slab treatment enclosure housing influent and effluent tanks of approximately 1,000 gallons each, an air stripper, intermediate pumps, telemetry, and short pipeline runs;
- an injection well;
- pipelines between the extraction well and the treatment enclosure and the enclosure and the injection well;
- control systems, including an audible alarm, automatic tank shutoffs to prevent overfilling, pipeline pressure sensors, and containment of 1,000 gallons of water within the enclosure through a combination of a sump and footing design; and
- environmental monitoring, including regular periodic groundwater monitoring. The monitoring program will be presented in a Removal Action Work Plan, which will also describe performance criteria, identify thresholds for considering changes to the treatment program, and describe contingency actions should monitoring results indicate a need for change or action.

In addition, the proposed project would include potential relocation of an off-site agricultural well designated 22N.

Pumping

Step drawdown and constant rate aquifer pumping tests were conducted in October 1996 to estimate aquifer parameters and support design of the groundwater IRA system. It is currently anticipated that only one extraction well (EW2-1) would be required. This well is already installed. Hydraulic containment of the affected groundwater plume can be achieved by pumping at 200 gpm flow rate from HSU-2, and by not operating the nearby irrigation well, 22N (Figure 8). Installing a pump and extracting groundwater at a 200-gpm pumping rate



CONCEPTUAL LAYOUT

LEHR/SCDS Groundwater IRA
 LEHR/SCDS Environmental Restoration
 Davis, California

FIGURE 8

from EW2-1 is technically feasible based on the observed maximum flow rate (400 gpm) achieved during the aquifer testing performed using EW2-1.

A new irrigation well is planned to replace the irrigation needs fulfilled by well 22N. Acquisition of a well permit would be required prior to installing a replacement irrigation well for 22N. Replacement includes installation of one irrigation well to a depth of 290 feet, a 50-horsepower pump, and related electrical connections. It is anticipated the replacement agricultural well would be located approximately ¼-mile east of its current location.

A general description of installation of the injection well and irrigation well follows. Well installation equipment typically includes the following: a medium-sized truck mounted drill rig; a two-ton service and fuel truck; and two or three pick-up trucks. A crew of two to three people and a supervising geologist would be on-site. The drill rig is powered by a diesel engine. Casing-hammer/reverse-air drilling would be used. This method requires an additional trailer mounted, diesel driven air compressor. Additional noise is generated with casing-hammer type drilling. Some dust is generated in the top five feet of casing-hammer drilling due to the air circulation system.

Approximately 100 cubic yards of soil cuttings and 10,000 gallons of water would be generated during drilling. The soil cuttings and water would be managed consistent with the EPA-approved Investigation-Derived Waste (IDW) Management Plan (Dames & Moore 1994b). The IDW plan specifies that soil cuttings and water generated from drilling not occurring on the LEHR/SCDS site would be discharged to the surface. Based on the planned location of the injection well (by definition, out of the area of contamination, see discussion, below) and the agricultural well 22N (not on the LEHR/SCDS site), it is not anticipated that contaminated soil and/or groundwater would be encountered.

Drill rigs and support vehicles would access each location on existing roads. Minor access route and drill rig leveling may be required in some cases, however grading work is generally not required. An average drill site would occupy an area of approximately 100 feet by 75 feet.

The purpose of well installation is to construct a cased and screened hole from which groundwater can be accessed and pumped. The well screen allows water from the target aquifer to enter the well. Casing and sealing keeps the well open and prevents migration of water from one aquifer to another along the well casing. Installation immediately follows well drilling and involves most of the same equipment used for drilling. Installation consists of:

- lowering the desired length of well screen and well casing into the open borehole;
- placing a filter pack of clean sand or gravel around the well screen between the screen and the open borehole (annular space);
- placing a bentonite clay seal over the filter pack;
- filling the remaining annular space with cement/bentonite clay grout; and
- finishing the well head with a locking protective well cover which is constructed either flush to the ground surface or two to three feet above ground surface.

After well installation, well development is necessary to prepare a newly installed well for production by removing fine grained sediment (silt and clay) from the well filter pack and the interior of the well casing. Well

development is performed by bailing water, swabbing and surging, and pumping water from the well. Equipment required for development normally consists of the development truck, an equipment trailer, and a pickup or van. The length of time spent developing a well is generally two to six hours depending on initial well condition and the volume of water in the well.

Treating

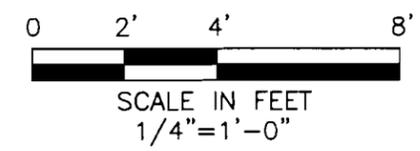
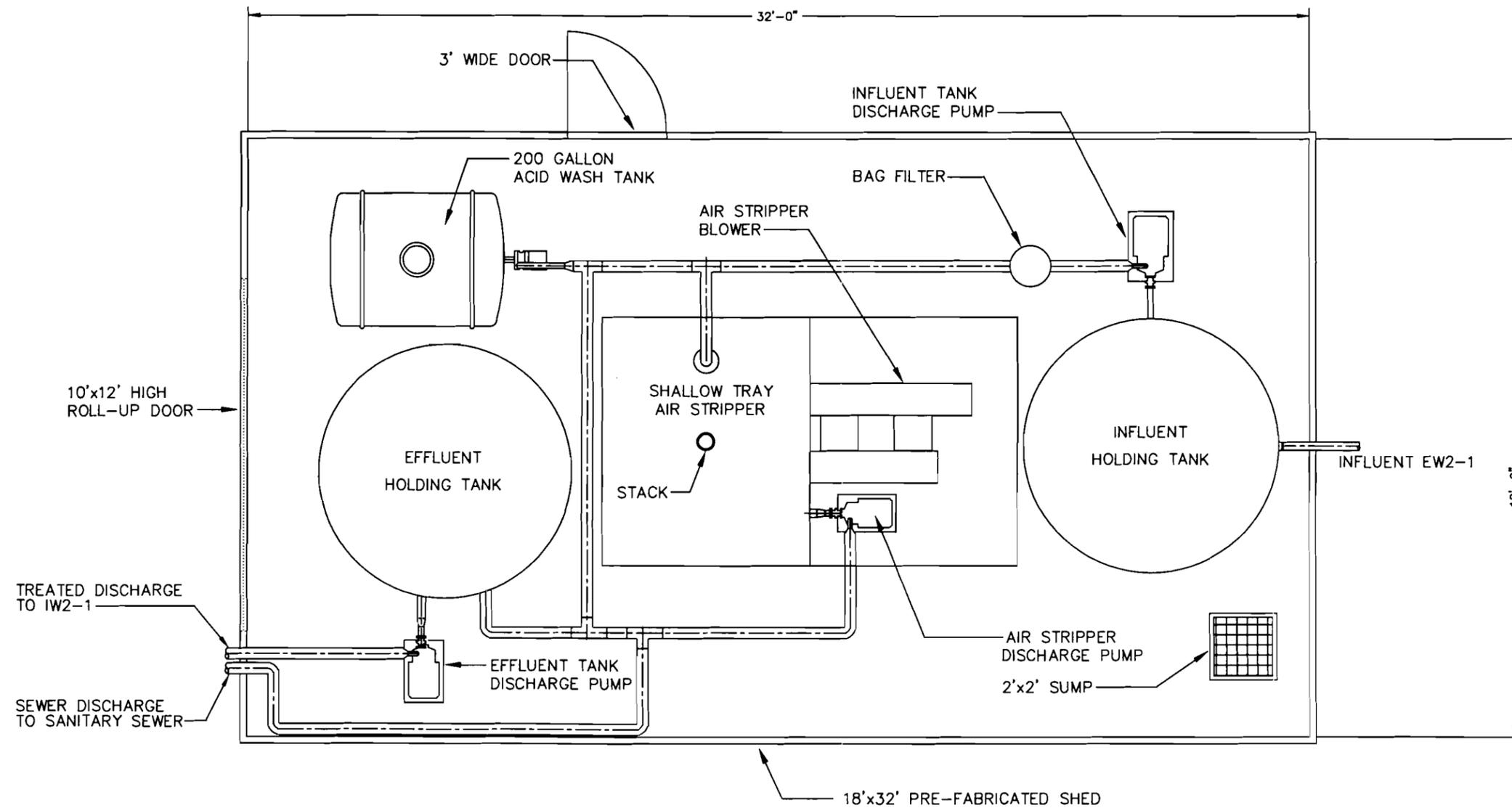
An engineering evaluation (EE/CA) was prepared to evaluate the type and level of treatment required for the groundwater IRA (Dames & Moore, 1997a). Based on the combination of chemical constituents present in the groundwater, an air stripping unit was selected as the preferred treatment type. The air stripper anticipated for the IRA project would be a manufactured "tray-type" unit. In the air stripper, the contaminated water is introduced downward into a baffled sieve type aeration tray and air is blown upward through hundreds of holes in the tray bottom creating a froth wherein the contaminants are volatilized and vented to the atmosphere. Air stripping would remove VOCs from extracted groundwater to nondetectable levels. However, air stripping would not be effective in removing chromium, nitrate, or TDS. These constituents would be discharged with the treated groundwater via reinjection, as described below. The existing extraction well is located in an area that should not receive water impacted by tritium. Based on an evaluation of VOC emission rates from the air stripping treatment system, an off-gas permit or treatment system would not be required (Dames & Moore, 1997a).

The air stripping treatment unit would be located on a newly-poured concrete slab approximately 32-feet by 18-feet. The unit would be housed in a single story metal shed-type building. Components of the air stripper include an effluent holding tank, an influent holding tank, a 200-gallon acid wash tank, an effluent tank discharge pump and a air stripper discharge pump (Figure 9).

Discharging

The engineering evaluation (EE/CA) also evaluated several disposal options for the pumped and treated groundwater. Based on the evaluation, treated groundwater would be reinjected into HSU-2 at a location upgradient of the LEHR/SCDS source area. Groundwater modeling results indicate that by locating the reinjection well upgradient of the extraction well, a large portion of the injected water is contained and recaptured by the extraction well (EW2-1). The ability to monitor and capture nearly all of the injected water would assist in evaluating and controlling the fate of chemical constituents not removed by treatment prior to reinjection. In addition, reinjection or return of groundwater to the original HSU from which it was extracted (HSU-2) ensures that water would remain for future use.

The single reinjection well (R-1) would be located just west of Old Davis Road, and just north of the northern Putah Creek levee (Figure 8). The technique used to construct the reinjection well would be the same as previously described above. Six-inch diameter pipelines would be placed from the existing extraction well (EW2-1) to the treatment system, then along the road immediately north of the site to a point west of Old Davis Road, and then south to the reinjection location.



CONCEPTUAL TREATMENT PLANT LAYOUT

LEHR/SCDS Groundwater IRA
 LEHR/SCDS Environmental Restoration
 Davis, California

Environmental Control Systems and Monitoring

The proposed groundwater pump and treat system would be designed and maintained to avoid upset conditions related to system failure, and will include such features as tank switches to avoid overfilling, trench backfilling and compacting that meet or exceed standards, shut off valves on pipes and other system elements, and regular routine inspection and maintenance of the system. Design will also include control systems which would automatically sense system conditions and shut down the pumps and treatment unit should upset conditions occur. Control systems will also include an audible alarm as well as a sump and foundation footing design of the treatment enclosure sized to contain approximately 1,000 gallons of water, the capacity of either the influent or effluent tank.

As part of project implementation, UC Davis will develop a Removal Action Work Plan that will include a groundwater monitoring program, describe performance standards and thresholds for contingency action, and describe possible contingency actions should the monitoring program detect constituents of concern at levels above the stated thresholds. Such contingency actions typically include and are not limited to increasing the zone of capture, treating groundwater for elevated concentrations of constituents of concern prior to reinjection, reducing the reinjection rate, in-well treatment, and alternative disposal methods. The Removal Action Work Plan will be developed with input of the Central Valley RWQCB, EPA, the DOE, DTSC, and DHS, and is subject to acceptance by these agencies prior to project operation.

C. Project Approval and Schedule

As a public agency principally responsible for approving or carrying out the proposed project, the Regents of California is considered the Lead Agency under CEQA, and is responsible for reviewing and certifying the adequacy of this Tiered Initial Study. Authority to approve this project has been delegated to the Campus by The Regents and would be considered by the Associate Vice Chancellor for Planning and Budget after review of this Tiered Initial Study.

Public circulation of a Notice of Preparation, a proposed Negative Declaration, and this Tiered Initial Study would occur in March 1997. After public and regulatory review of the CEQA documentation and notice, a determination would be made whether a Negative Declaration would be adopted, or if an EIR would be prepared.

Construction of the project is expected to begin on June 30, 1997, and continue until September 26, 1997. Initial groundwater treatment system startup would begin upon completion of construction. Operation of the IRA system would continue with periodic monitoring and re-evaluation of its effectiveness until the objectives of the removal action have been met.

III. CONSISTENCY WITH 1994 LRDP EIR

In order to determine consistency of the proposed project with the 1994 LRDP EIR, the following questions must be answered:

- Is the proposed project included within the scope of the development projected for the 1994 LRDP?

- Is the proposed project location in an area designated for this type of use in the 1994 LRDP?
- Are changes to Campus population which would result from proposed project implementation included within the scope of the 1994 LRDP population projections?
- Are the objectives of the proposed project consistent with the adopted objectives for the 1994 LRDP?

The following discussion describes the land use designations, population projections, and objectives contained in the 1994 LRDP which are relevant for the proposed project, and the project's consistency with each of these items.

A. 1994 LRDP Scope of Development and Land Use Designations

The proposed project site is designated for Academic and Administrative Low Density uses under the 1994 LRDP. As described on pages 3-14 and 3-16 of the 1994 LRDP Draft EIR:

...uses include space for conducting the instruction and research mission of the University of California. Academic and Administrative low-density land uses would include greenhouses, field support, laboratories, offices, agricultural-related space, animal science facilities and animal housing. Buildings are typically no more than one story.

See Figure 3-6 on page 3-15 of the 1994 LRDP Draft EIR.

Project Consistency

The proposed project involves remediation of contamination at the LEHR/SCDS site. Site remediation would allow other uses to be developed onsite including academic and administrative uses on the site; therefore, implementation of the proposed project is consistent with development and land use designations approved as part of the 1994 LRDP.

B. 1994 LRDP Population Projections

The 1994 LRDP Draft EIR (pages 3-2 and 3-3) described the following regarding Campus population projections.

Population projections for all campuses in the UC system are established in a process that is determined by State statute and policy. The specific campus population projections for UC Davis are determined by the Campus and the Office of the President, which consider:

- *the responsibility of the University as required by the State Master Plan for Higher Education to accommodate the top 12.5 percent of graduating high school students in the University of California system;*
- *the state's ability to support financially this policy commitment;*
- *population growth and specifically the number of qualified students; and*
- *the academic plan and physical capacity of the Davis campus to accommodate students.*

Project Consistency

Implementation of the proposed project would not result in a direct change in campus population. It would allow for development as planned in the LRDP and, as such, is consistent with the LRDP.

C. 1994 LRDP Objectives

The 1994 LRDP included the following resource objectives that relate to the proposed project.

- *Diverse water supply. Maintain existing dependable supplies of high-quality water from a variety of sources to serve diverse campus water needs (Water Resources Objective No. 1, page 16 of the 1994 LRDP).*
- *Water conservation. Conserve water use to safeguard aquifers (Water Resources Objective No. 3, page 16 of the 1994 LRDP).*
- *Environmental restoration. Continue to actively assess the nature and extent of potential soil and groundwater contamination on the campus. Work with appropriate regional, state, and federal agencies to prepare and implement plans for corrective action (Developed Resources Objective No. 5, page 36 of the 1994 LRDP).*
- *South Campus. Identify sites to cluster support facilities on the South Campus, in addition to the cleanup of the LEHR site (Land Use Plan Objective No. 4, page 48 of the 1994 LRDP).*

Project Consistency

The consistency of the proposed project with the identified objectives is assessed below:

- **Diverse water supply.** As part of the proposed project, groundwater pumping and treatment would reduce VOC concentrations in groundwater. The purpose of the action would be to remove VOCs from groundwater of HSU-1 and HSU-2. This action would help restore and maintain existing dependable supplies of high-quality water. The proposed project is consistent with this objective.
- **Water conservation.** The groundwater pump and treat action included as part of the proposed project would reduce constituents of concern from groundwater of HSU-1 and HSU-2. This action would help safeguard aquifers in the project area and is consistent with this objective. Reinjection of treated groundwater would serve to conserve groundwater supplies.
- **Environmental restoration.** The proposed project involves remediating site contamination at the LEHR/SCDS area and is therefore consistent with the environmental restoration objective with regards to groundwater contamination. The proposed project directly implements this objective and would allow UC Davis to work with appropriate regional, state, and federal agencies to prepare and implement plans for corrective action.
- **South Campus.** The proposed project involves remediating contamination at the LEHR/SCDS site which implements this objective as to the cleanup of the site.

Therefore, the proposed project would be consistent with objectives defined in the 1994 LRDP.

IV. TIERED ENVIRONMENTAL CHECKLIST

The Checklist form is used to assist in evaluating the potential environmental impacts of the proposed project with respect to the 1994 LRDP EIR. The Checklist form identifies potential project effects as follows:

1. new potentially significant project impacts that were not adequately analyzed in the 1994 LRDP EIR, or previously identified significant impacts for which new feasible mitigation measures are available;
2. new less-than-significant impacts;
3. environmental impacts of the project that were adequately analyzed and mitigated in the 1994 LRDP EIR; and
4. effects that would not result in any adverse environmental impact.

A discussion follows each environmental item identified in the Checklist. Included in each discussion are 1994 LRDP EIR mitigation measures, and project-specific mitigation measures, as appropriate, recommended for implementation as part of the proposed project.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
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1. PLANNING AND LAND USE

Would the proposal:

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a. Conflict with designated adjacent on-and/or off-campus land uses? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. Conflict with land use Plans or Policies adopted by adjacent jurisdictions? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. Result in the permanent loss of prime farmland from the State Department of Conservation's Inventory? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d. Result in the loss of agricultural production on or adjacent to the Campus? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e. Disrupt or divide the physical arrangement of an established community (including a low-income or minority community)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Discussion

Land use issues are addressed in Section 4.1 of the 1994 LRDP Draft EIR, as amended by the LRDP Final EIR, and in Chapter 4.6 of the 1997 WWTP Replacement Project Draft EIR, as amended by the WWTP Final EIR.

- a, b) The proposed project site is designated for Academic and Administrative Low Density uses under the 1994 LRDP. Uses include space for conducting the instruction and research mission of the University of California. Academic and Administrative low-density land uses would include greenhouses, field support, laboratories, offices, agricultural-related space, animal science facilities and animal housing. Buildings are typically no more than one story. Site remediation would safely allow academic and administrative uses on the site in the future.

The proposed project site is bordered by Old Davis Road on the west, other UC Davis research facilities including the Oncology Laboratory and the California Center for Equine Health and Performance (CCEHP) to the north, Animal Resource Service facilities, the Raptor Center, and the old WWTP to the east, and the Putah Creek Levee Road to the south. A human-made channel containing the South Fork of Putah Creek, which flows west to east, is just south of the site. Southern Pacific Railroad tracks are oriented southwest-northeast, ½-mile northwest of the site. U.S. Interstate 80 freeway lies ¾-mile northwest of the site. Several residences are situated ¼-mile south of the site. The remainder of the land south and east of the site is relatively flat, tilled agricultural land. The site is fenced and bordered by trees on the north, south, and west. Proposed project activities would not change existing or planned land uses. Therefore, the proposed project would be consistent with the 1994 LRDP land use plan (which is consistent with the Solano County General Plan) and would not conflict with any designated adjacent on-or off-campus land uses or any land use plans or policies adopted by adjacent jurisdictions.

- c, d) The proposed project site is designated as “Urban and Built-up Land” by the State of California Department of Conservation for Yolo and Solano Counties Important Farmlands Maps (please see Figure 4.1-5 on page 4.1-30 of the 1994 LRDP EIR). Therefore, the proposed project would not result in the permanent loss of prime farmland or of agricultural production on or adjacent to the Campus.
- e) The proposed project involves remediating site contamination at the LEHR/SCDS area within the limits of the existing UC Davis campus and would not disrupt or divide the physical arrangement of an established community.

Summary

The proposed project would not result in new significant planning and land use impacts that have not already been examined in the 1994 LRDP EIR.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
2. POPULATION AND HOUSING.				
<i>Would the proposal:</i>				
a. Cumulatively exceed Campus population projections in the 1994 LRDP?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Induce substantial growth in an area either directly or indirectly (e.g., through projects in an undeveloped area or extension of major infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Displace existing housing, especially affordable housing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Conflict with the population projections or housing policies set forth in the City of Davis General Plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Population, employment, and housing issues are addressed in Section 4.2 of the 1994 LRDP Draft EIR as amended by the Final EIR.

- a, b) The project would not result in a direct change in existing campus population nor would it result in development in an undeveloped area or extend infrastructure. Therefore the proposed project would not substantially affect cumulative population growth or induce growth.
- c, d) The project involves remediating contamination at the LEHR/SCDS site. There are no housing units at the site and the project does not propose new housing units. Therefore, the proposed project would not displace any existing housing or conflict with the UC Davis 1994 LRDP or Solano County General Plan population or housing projections.

Summary

The proposed project would not result in new significant population, employment and housing impacts that have not already been examined in the 1994 LRDP EIR.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
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3. GEOLOGY.

Would the proposal result in or expose people to potential impacts involving:

a. Fault rupture?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Seismic ground failure including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Seiche, tsunami, or volcanic hazard?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Landslides or mudflows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Erosion, changes in topography or unstable soil conditions from excavation, grading, or fill?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Subsidence of the land?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h. Expansive soils?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i. Unique geologic or physical features?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Geotechnical issues are addressed in Section 4.9 of the 1994 LRDP Draft EIR, as amended by the Final EIR.

- a) The project area is not located within an Alquist-Priolo Special Study Zone, therefore, the proposed project would not be exposed to risks associated with fault rupture. The closest known fault is located 12 miles northwest of the main Campus. The closest branches of the San Andreas fault system are the Green Valley (32 miles southwest) and the Rodgers Creek (47 miles southwest) faults. The San Andreas fault is located approximately 67 miles to the southwest (please see Table 4.9-2 on page 4.9-3 of the 1994 LRDP Draft EIR).
- b, c) The Campus is located in an area subject to moderate ground shaking during an earthquake event. As described in the 1994 LRDP Draft EIR, page 4.9-2:

According to the Preliminary Map of Maximum Expectable Earthquake Intensity in California, prepared by the California Department of Mines and Geology, the Campus is located in a "moderate" severity zone, representing a probable maximum earthquake intensity of VII or VIII

on the Modified Mercalli Scale which corresponds to an earthquake measuring 6.0 to 6.9 on the Richter Scale....Effects of ground shaking during such an event could include structural damage to stucco, masonry walls, and chimneys exposing people to the associated risks of falling objects and building collapse.

The proposed project includes construction of an approximately 32-feet by 18-feet concrete slab as a foundation for the air stripping treatment unit. Secondary seismic effects (such as ground shaking, liquefaction, and ground settlement) could cause structural damage to the concrete slab and to the metal shed-type building housing the treatment unit during an earthquake event as the site is located in a moderate severity zone. The 1994 LRDP EIR mitigation measures would safeguard that project impacts from seismically-induced ground shaking would be reduced to a less-than-significant level:

4.9-1(a) *Prior to final design, the Campus shall review and approve all building plans for compliance with the Uniform Building Code and Title 24.*

Compliance with 1994 LRDP EIR Mitigation Measure 4.9-1(a) would safeguard that project activities would result in no new impacts relating to seismically-induced ground shaking than previously identified in the 1994 LRDP EIR and no further mitigation is required.

- d) The project area is not located in an area subject to seiche, tsunami, or volcanic hazard.
- e) The project area is located in an area of flat topography and is not subject to landslides or mudflows.
- f) Soils of the project area are mostly characterized by moderately rapid permeability, very slow runoff, minimal erosion hazard, and moderate to high shrink-swell potential.

Implementation of the project would require some grading to prepare the site for construction, and excavation and temporary stock piling of soils. Construction activities could result in increased rates of erosion. As described above, the soil under the site can be characterized as having minimal erosion hazard, therefore, this effect would be negligible. Soil cuttings and or water generated during drilling would be discharged consistent with the EPA-approved Investigation-Derived Waste (IDW) Management Plan (Dames & Moore 1994b). The IDW plan specifies that soil cuttings and water generated from off-site drilling is assumed to be non-contaminated, and would be discharged to the surface. Based on the location of the two wells off-site, it is not anticipated that contaminated soil and or groundwater would be encountered. Water quality impacts from increased sedimentation associated with erosion during construction activities is discussed under item 4c. Mitigation measures for erosion are also discussed under item 4c.

- g) Subsidence of the land could result due to groundwater withdrawal. However, because the groundwater would be reinjected back into the ground, this effect would be negligible.
- h) As previously described, site soils exhibit a moderate to high shrink-swell potential which could result in structural damage. However, as stated on page 4.9-10 of the 1994 LRDP Draft EIR, project construction

would be required to comply with the California Uniform Building Code (UBC) to design for expansive soil impacts. Mitigation Measure 4.9-1(a) would require review of building design to verify compliance with the UBC.

- i) Project site topography is flat and no unique geologic features are known to the site. Therefore, project implementation would not result in any impacts to any unique geological features.

Summary

The proposed project would not result in new significant geology, seismicity or soils impacts that have not already been examined in the 1994 LRDP EIR, and 1994 LRDP EIR Mitigation Measure 4.9-1(a) would be implemented as part of the proposed project.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
4. WATER.				
<i>Would the proposal result in:</i>				
a. Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Exposure of people or property to water-related hazards associated with being located in a FEMA designated 100-year flood plain?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Discharge into surface waters or other alteration of surface water quality (e.g., temperature, dissolved oxygen or turbidity)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Changes in the amount of surface water in any water body?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Changes in currents, or the course or direction of water movements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Changes in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations or through substantial loss of groundwater recharge capability?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. Altered direction or rate of flow of groundwater?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Impacts to groundwater quality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- i. Substantial reduction in the amount of groundwater otherwise available for public water supplies?

Discussion

Hydrology and water quality issues are addressed in Section 4.8 of the 1994 LRDP Draft EIR, as amended by the LRDP Final EIR, and in Chapter 4.1 of the WWTP Replacement Project Draft EIR, as amended by the WWTP Final EIR.

- a) Storm water from the project area generally drains to the South Fork of Putah Creek via ditches and culverts. The proposed project would result in very minor amounts of new impervious surface cover due to the approximately 32-foot by 18-foot concrete slab and metal shed-type building housing the air stripping unit, and the reinjection well. Such a minor increase in impervious surface would result in a negligible increase in the rate and volume of storm water runoff. All areas subject to soil excavation would be regraded when the project is complete and would therefore not result in an increase or change in direction to surface runoff.
- b) The proposed project site is not located in a 100-year flood plain as defined by the Federal Emergency Management Agency (see Figure 4.8-2, 100-Year Flood Plain, on page 4.8-4 of the 1994 LRDP Draft EIR). Therefore, there would be no exposure of people or property to water-related hazards associated with being located in a 100-year flood plain.
- c) Construction activities associated with the proposed project would involve well drilling operations, excavation, stockpiling of soil overburden, and backfilling activities. These activities could result in increased rates of soil erosion which could lead to increased sediment loads in storm water runoff. This could adversely affect receiving water quality. Construction activities are expected to commence on June 30, 1997, and continue until September 26, 1997. Because construction activities are scheduled to occur during spring and summer months, and site soils are characterized as having minimum erosion potential, it is anticipated that potential water quality impacts would be minimal. Nevertheless, this impact would incrementally contribute to cumulative construction-related water quality impacts previously identified in the 1994 LRDP EIR. The 1994 LRDP EIR identified the following mitigation measure to reduce impacts to receiving water quality as a result of construction activities on sites of less than five acres to a less-than-significant level:

4.8-4(b) *For construction operations which would disturb less than five acres of land, the Campus shall include in all construction contracts a requirement that Campus contractors prepare and retain on the site an erosion control plan which would include a description of the construction site, erosion and sediment controls to be used, means of waste disposal, control of post-construction sediment and erosion control measures and maintenance responsibilities, and non-storm water management controls.*

Best Management Practices (BMPs) which could be implemented as part of an erosion control plan could include, but would not be limited to:

- (i) reduction of the area and length of time that the site is cleared and graded;*
- (ii) revegetation/stabilization of cleared areas as soon as possible;*
- (iii) implementation of comprehensive erosion, dust and sediment controls;*
- (iv) implementation of a program to control potential construction activity pollutants such as cement mortar, paints and solvents, fuel and lubricating oils, pesticides and herbicides;*
- (v) implementation of a hazardous material spill prevention, control and cleanup program.*

Compliance with 1994 LRDP EIR Mitigation Measure 4.8-4(b) would safeguard that project activities would result in no new impacts to receiving water quality as a result of construction activities than previously identified in the 1994 LRDP EIR and no further mitigation is required.

The proposed groundwater pump and treat system would be designed and maintained to avoid upset conditions related to system failure (i.e., pipelines, tanks, pumps, air stripper, etc.). However, should such conditions occur, the system will also be designed to avoid effects to area surface waters. Design will include control systems which would automatically sense system conditions and shut down the pumps and treatment unit should upset conditions occur, such as a pipeline break. Control systems will also include an audible alarm as well as a sump and foundation footing design of the treatment facility sized to contain approximately 1,000 gallons of water, the capacity of either the influent or effluent tank.

The proposed project would include several pipelines: the influent pipeline carrying untreated water between the extraction well and the treatment facility influent tank; several short runs within the treatment facility between the influent tank, the stripper, and the effluent tank; and the effluent pipeline carrying treated water between the treatment facility effluent tank and the injection well. Project design will incorporate pipeline control systems including pressure sensors which would immediately shut down the extraction pump if a loss in influent pipeline pressure—such as that which would result from a break in that pipeline—were to occur. This would avoid substantial spillage of untreated water from a pipeline break.

In addition, failure of elements of the treatment facility, such as intermediate pumps or the influent tank, could result in spillage of untreated water within the treatment enclosure. Tank design will include automatic shutoffs to avoid tank overfilling. Project design will include a sump in the treatment enclosure with a capacity of approximately 450 gallons that will capture spillage and route it to the influent tank. The worst case treatment facility upset scenario would be catastrophic failure of the influent tank (approximately 1,000 gallons of untreated water), with overflow of the sump resulting in spillage of 550 gallons of untreated water into the treatment enclosure; the footings of the enclosure will be designed to fully contain this amount of water, and no untreated water would escape the treatment enclosure.

The combination of project design—including pipeline facility controls—and regular project maintenance would avoid operation-phase impacts to surface waters.

- d, e) The proposed project would result in a negligible increase in the amount of surface runoff, and the proposed project would not lead to a measurable change in the amount, direction, or course of surface water flow.
- f, i) The proposed project includes implementing a groundwater pump and treat action to reduce VOCs in groundwater. Groundwater is used as the source of the Campus utility, and field testing and research water systems which draw from the shallow/intermediate aquifer. The proposed project involves a groundwater pump and treat action. Extraction well (EW2-1) would pump groundwater at a flow rate of approximately 200 gpm. Removal of groundwater from EW2-1 would have a localized effect on the amount, direction and flow of groundwater beneath the LEHR/SCDS site. However, as part of the proposed project, a reinjection well would be installed to replace groundwater upgradient of the extraction well. Siting of the reinjection well just west of Old Davis Road ensures that most reinjected groundwater is within the capture zone of EW2-1. As stated on page 4.14-13 of the 1994 LRDP Draft EIR:

Present use of the shallow/intermediate aquifer by the Campus is approximately 2,000 acre-feet per year, which includes 780 acre-feet per year for the utility water system and approximately 1,230 acre feet per year for agricultural water system. Because the shallow/intermediate aquifer is used only to supplement the agricultural system, agricultural use of this water source is expected to remain the same.

Campus water use from the shallow/intermediate aquifer is projected to reach about 500 million gallons per year by 2005, which represents approximately 1.2 percent of the existing 40,900 million gallons currently used. The historical groundwater elevation data from the shallow/intermediate aquifer do not indicate a declining trend when observed over the last 30 years. Therefore, the changes to the shallow/intermediate aquifer that result from the implementation of the proposed 1994 LRDP are not considered substantial or significant.

Therefore, remediation of groundwater at the site would supplement available supplies for anticipated growth as identified in the LRDP.

- g) The proposed project includes a groundwater pump and treat action. Extraction well (EW2-1) would pump groundwater at a flow rate of approximately 200 gpm. Removal of groundwater from EW2-1 would have a localized effect on the amount, direction and flow of groundwater beneath the LEHR/SCDS site. However, as part of the proposed project, a reinjection well would be installed to replace groundwater upgradient of the extraction well. Siting of the reinjection well just west of Old Davis Road ensures that most reinjected groundwater is within the capture zone of EW2-1. Groundwater modeling shows impacts related to changes in groundwater flow and direction would be minor (Dames & Moore, 1997a).

As part of the proposed project, the nearby irrigation well 22N would be removed from service at its present location and relocated outside of the zone of influence of EW2-1. The newly-installed well would be located on the same farm where 22N currently exists in cooperation with the owners, and would service the same acreage of agricultural land as the existing well. Net water use would be unchanged. Therefore, there would be no off-site impacts to groundwater flow or direction from relocating this irrigation well.

h) Implementation of the proposed project would improve the quality of groundwater by removing VOCs to below non-detect levels prior to reinjection below the LEHR/SCDS site. This would be a beneficial effect of the proposed project. Other constituents of concern would be reinjected at concentrations in the range of existing background levels. As part of implementation of the proposed project, UC Davis will develop a Removal Action Work Plan that will include a groundwater monitoring program, and contingency actions should constituents of concern be detected at levels above background concentrations. Such actions typically include and are not limited to increasing the zone of capture, treating groundwater for elevated concentrations of constituents of concern prior to reinjection, reducing the reinjection rate, in-well treatment, and alternative disposal methods. The Removal Action Work Plan is developed with the input of and is subject to acceptance by the Central Valley RWQCB, EPA, DOE, DTSC, and DHS prior to project operation.

As described in item c), above, design of the proposed project would include automated control systems that would shut in project operation should upset conditions occur, including a pipeline break, or failure of mechanical system elements such as pumps or the treatment unit. This would avoid impacts to both surface and groundwater from potential failure of system elements.

Summary

The proposed project would result in a new less-than-significant impact related to altered direction and rate of flow of groundwater and potentially to groundwater quality. No other new hydrology and water quality impacts that have not already been examined in the 1994 LRDP EIR have been identified. Mitigation Measure 4.8-4(b) from the 1994 LRDP EIR would be implemented as part of the proposed project.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
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5. AIR QUALITY.

Would the proposal:

a. Violate any air quality standard or contribute to an existing or projected air quality violation?

During Construction:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
During Operation:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

b. Expose sensitive receptors to pollutants?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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c. Alter air movement, moisture, or temperature, or cause any change in climate?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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d. Expose sensitive receptors to objectionable odors?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Discussion

Air quality issues are addressed in Section 4.5 of the 1994 LRDP Draft EIR, as amended by the LRDP Final EIR, and in Chapter 4.2 of the WWTP Replacement Project Draft EIR, as amended by the WWTP Final EIR.

- a, b) Project construction activities including excavation, trenching, pipe installation, well installation, stockpiling of overburden material, and backfilling could expose nearby academic and administrative personnel to fugitive dust. As described on page 4.5-18 of the 1994 LRDP Draft EIR:

Construction-related activities would generate "fugitive dust" from earthmoving, excavation, demolition, and grading. The term "fugitive dust" refers to particulate matter emitted from an open area (i.e., not through a stack or an exhaust vent), due to human activities or by the forces of wind acting on exposed material such as soil or storage piles. Particulate (dust) emissions would vary with the level and type of activity, silt content and moisture of the soil, and prevailing weather.

Construction activities could potentially expose construction personnel as well as nearby off-site persons to existing soil contamination via fugitive dust. Without proper protective measures, exposure to hazardous materials in airborne contaminated soil could result in short-term or long-term health effects in persons exposed to the contamination. The 1994 LRDP EIR identified the following mitigation measure to prevent exposure of construction personnel and others to hazardous materials.

- 4.6-16(c) *A site health and safety plan, in compliance with OSHA requirements, shall be developed by the Campus and in place prior to commencing work on any contaminated site.*

The required Health and Safety plan will be developed by the Contractor, and reviewed and accepted by U.C. Davis. The plan will include an air monitoring program that will employ several techniques to evaluate site-related air emissions and minimize their impact on the workforce, the surrounding community, and the environment. Health professionals will first evaluate likely exposure scenarios associated with proposed site activities. From this evaluation, exposure control criteria, known as "action levels" will be established for the monitoring program; action levels will be designed to be protective of the health of receptors of concern associated with this project.

The program will use real-time air monitoring equipment, both fixed and portable, which will permit project management to detect site-related air emissions as they occur, evaluate the emissions against the action levels, and take corrective actions if necessary. Such corrective actions may include using emission barriers such as plastic sheeting or vapor suppression foam to reduce the emissions source area until acceptable readings are maintained. In extreme cases, work may have to stop while the source area is secured.

As appropriate, real time air monitoring will be augmented with integrated sampling techniques, such as industrial hygiene monitoring to evaluate worker exposure to specific constituents. Such monitoring will

be conducted using analytical methods established by the National Institutes of Occupational Safety and Health or the Occupational Safety and Health Administration, and evaluated against appropriate occupational exposure limits. Fence line or perimeter fixed station sampling may be conducted using Environmental Protection Agency methods, with results evaluated against EPA community air quality standards or American Industrial Hygiene Association Emergency Response Planning Guidelines. All air monitoring samples will be analyzed by appropriately certified or accredited laboratories.

Mitigation Measure 4.6-16(c) would reduce impacts associated with the proposed project relative to exposure to airborne contaminants to a less than significant level.

Short-term project construction activities (e.g., excavation, trenching) would incrementally contribute to significant particulate matter (PM₁₀) emissions previously identified in the 1994 LRDP EIR. As identified in the 1994 LRDP Draft EIR on page 4.5-18, because the region is non-attainment for PM₁₀, the Yolo/Solano Air Quality Management District would require that dust suppression measures be implemented during construction activities. The 1994 LRDP EIR identified the following mitigation measure to reduce the short-term generation of PM₁₀ to the extent feasible:

- 4.5-1 *The Campus shall include in all construction contracts the following measures to reduce fugitive dust impacts.*
- (a) All unpaved construction areas shall be sprinkled with water or other acceptable Yolo-Solano AQMD dust control agents during dust generating activities to reduce dust emissions. Additional watering or acceptable AQMD dust control agents shall be applied during dry weather or windy days until dust emissions are not visible.*
 - (b) Trucks hauling dirt and debris shall be covered to reduce wind blown dust and spills.*
 - (c) On dry days, dirt or debris spilled onto paved surfaces shall be swept up immediately to reduce resuspension of particulate matter caused by vehicle movement. Approach routes to construction sites shall be cleaned daily of construction related dirt in dry weather.*
 - (d) On-site stockpiles of excavated material shall be covered or watered.*

Because the amount of materials excavated and stockpiled is expected to be approximately 400 to 450 CY or relatively minor, this impact would be reduced to a less-than-significant level by the above mitigation measure if, as anticipated, project construction does not occur in conjunction with many simultaneous projects in the vicinity of the project. If other projects are developed in the area at the same time as project construction activities, resulting cumulative dust impacts may be significant and unavoidable. This circumstance was addressed in the Findings and Overriding Considerations adopted by the Regents in connection with its approval of the 1994 LRDP. Compliance with 1994 LRDP EIR Mitigation Measure 4.5-1 would ensure that the proposed project would result in no new impacts relating to construction air quality than previously identified in the 1994 LRDP EIR and no further mitigation is required.

The 1994 LRDP Draft EIR (page 4.5-19) also identified that construction-related emissions would also include reactive organic carbons (ROC) and nitrogen oxides (NO_x), precursor to ozone (O_3) formation from construction equipment and machinery. However, this short-term increase would not be significant. As stated on page 4.5-19 of the 1994 LRDP Draft EIR:

Given the potential for construction under the 1994 LRDP and the fact that O_3 formation is dependent on a complex interaction of atmospheric and meteorological factors over a relatively large physical area (such as an air basin), short-term emissions of O_3 precursors would not be expected to lead to a violation of ambient air quality standards for O_3 in the Campus vicinity. While these emissions would contribute (temporarily) to the non-attainment status of Yolo County for O_3 , they would likely represent less than the stationary source emission thresholds and, thus, are considered less-than-significant.

Operation of the proposed project involves remediating site contamination at the LEHR facility through the use of an air stripping unit to treat contaminated groundwater. The air stripping unit would remove VOCs from the treated groundwater and vent the constituents into the atmosphere.

The need to treat the VOCs present in the resulting air stripper outgas was evaluated by reviewing the Yolo-Solano Air Quality Management District (AQMD) New Source Review (NSR) regulations (Dames & Moore, 1997a). The regulations address VOCs from two perspectives: reactive organic gases (ROG) emissions, precursors to O_3 formation (criteria pollutant), and health risk (air toxics).

Regulatory requirements under NSR for criteria pollutants require new stationary sources and major modifications to existing stationary sources that may emit ROG, to apply for an Authority to Construct/Permit to Operate (ATC/PTO) with the Yolo-Solano AQMD. However, under current regulatory requirements there is an NSR exemption to obtaining an ATC/PTO if the source has an emission rate less than 2 lb/day. NSR regulatory requirements also contain regulatory emission standards for applying Best Available Control Technology (BACT). Any stationary source emitting more than 10 lbs/day of ROG, NO_x , PM_{10} , or SO_x , or 550 lbs/day of CO, must apply BACT.

Yolo-Solano AQMD regulations also contain requirements pertaining to Toxic Air Contaminants (TACs) (Dames & Moore, 1997a). The regulatory requirements list a de minimus health risk level for requiring Toxic-Best Available Control Technology (T-BACT). The de minimus health risk trigger level after applying controls under T-BACT or off-gas emissions treatment is 1×10^{-5} . This level must be achieved to obtain a PTO, if one is required.

Air emissions from the groundwater treatment system were calculated using the conservative, worst-case assumption that all VOCs stripped from the groundwater are emitted into the ambient air. The ROG air emission estimates for the proposed groundwater treatment system is less than 0.4 lb/day, which is below the NSR permitting and BACT exemption levels.

Air emissions for TACs that are a component of VOCs were also calculated using the conservative, worst-case assumption that all the TACs stripped from the groundwater are emitted into the ambient air. The

groundwater treatment system could potentially emit three TACs that are a component of VOCs: chloroform, 1,2-dichloroethane (DCA), and 1,1-DCA. Hexavalent chromium is also present in the groundwater and is considered a TAC. However, the transfer of hexavalent chromium from groundwater to air occurs if aerosols (mist) are emitted. Since the proposed air stripper is a shallow-tray system equipped with a "mist eliminator", calculated hexavalent chromium emissions are estimated at 0.0002 lbs/year, well below the 2 lb/year Yolo/Solano de minimis levels for hexavalent chromium. Thus, hexavalent chromium was not included as a potential TAC.

A screening level health risk assessment was performed to estimate potential carcinogenic health effects from maximum downwind air concentrations of chloroform, 1,2-DCA, and 1,1-DCA. Maximum hourly concentrations to the maximum exposed individual from the treatment system were calculated using (EPAs) air dispersion model SCREEN3. One-hour modeled concentrations were converted to annual concentrations using standard EPA methodology. Calculated annual concentrations of each TAC were multiplied by their respective unit risk factors to estimate potential excess cancer cases per million people exposed. Estimated maximum potential excess cancer cases for all TACs were in the range of 7.7×10^{-7} and below 2.6×10^{-8} , well below the T-BACT regulatory levels. Due to minimal air emissions, the treatment system does not require T-BACT.

The existing extraction well is located in an area that should not receive water impacted by tritium. Tritium is not anticipated to be introduced to the treatment system even in minor amounts, nor to the atmosphere. As part of project implementation, UC Davis will develop a Removal Action Work Plan that will include a program of regular periodic monitoring of groundwater constituents as well as contingency actions in the event tritium or other constituents of concern are reported at elevated concentrations. Such actions typically include and are not limited to increasing the zone of capture, treating groundwater for elevated concentrations of constituents of concern prior to reinjection, reducing the reinjection rate, in-well treatment, and alternative disposal methods. While not anticipated, should tritium be detected in the treatment system, the system will be shut down until appropriate measures, identified in the plan, are implemented. The Removal Action Work Plan would be developed with the input of and would be subject to acceptance by the Central Valley RWQCB, EPA, DOE, DTSC, and DHS prior to project operation.

- c) Implementation of the proposed project would not alter air movements, moisture, temperature, or cause any change in climate.
- d) Development of the proposed project would not expose sensitive receptors to objectionable odors.

Summary

The proposed project would not result in new air quality impacts that have not already been examined in the 1994 LRDP EIR, and LRDP EIR Mitigation Measures 4.5-1 and 4.6-16(c) will be implemented as part of the proposed project.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
6. TRANSPORTATION/CIRCULATION.				
<i>Would the proposal result in:</i>				
a. Increased traffic volumes in relationship to the capacity of the future transportation network resulting in level of service violations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Hazards to safety from design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Inadequate emergency access or access to nearby uses?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Insufficient parking capacity on Campus?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Increased pedestrian and bicycle traffic in areas which may not have adequate facilities for these modes of travel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Increased conflicts between bicyclists, pedestrians, and transit vehicles, causing increased congestion and safety problems?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Conflicts with adopted policies supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h. Increased demand for transit services?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i. Rail, waterborne or air traffic impacts?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Transportation and circulation issues are addressed in Section 4.3 of the 1994 LRDP Draft EIR, as amended by the Final EIR.

- a) The project involves remediating contamination at the LEHR/SCDS site. Over a one week period, 15 to 20 CY haul trucks would make approximately 20 to 30 trips to transport contaminated material from the project site to the disposal sites. Therefore, the project operation would not result in the creation of additional vehicle trips with the exception of a minor increase during the construction phase. The proposed project would not result in LOS violations.
- b) The proposed project does not include any design features which would result in safety hazards.

- c) The proposed project would not interfere with emergency access to existing or future on-site or adjacent uses.
- d) The proposed project would have no effect on Campus parking capacity.
- e) The proposed project would not increase pedestrian or bicycle traffic in the project area.
- f) The proposed project would not increase conflicts between bicyclists, pedestrians, and transit vehicles thereby causing increased congestion and safety problems.
- g, h) Implementation of the proposed project would not increase demand on transit services or conflict with adopted policies supporting alternative transportation.
- i) The project does not involve rail or waterborne traffic.

Summary

The proposed project would not result in new transportation or circulation impacts that have not already been examined in the 1994 LRDP EIR.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
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7. BIOLOGICAL RESOURCES.

Would the proposal result in impacts to:

a.	Endangered, threatened or rare species or their nesting or foraging habitats (including, but not limited to plants, fish, insects, animals, and birds)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b.	Locally designated species?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c.	Locally designated natural communities (e.g., oak forest, coastal habitat, etc.)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Wetland habitat (e.g., marsh, riparian and vernal pool)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e.	Wildlife dispersal or migration corridors?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Biological resource issues are addressed in Section 4.7 of the 1994 LRDP Draft EIR, as amended by the LRDP Final EIR, and in Chapter 4.4 of the 1997 WWTP Replacement Project Draft EIR, as amended by the WWTP Final EIR.

- a) The LEHR/SCDS site contains areas disturbed by human activities. Buildings, roads, pasture land, and deposited landfill material and other disturbances comprise the project site. The area around the project site is occupied by agriculture or academic buildings. As such, much of the native vegetation has been removed or heavily disturbed. Three special status species that may potentially occur in the project area include the valley elderberry longhorn beetle, Swainson's hawk, and burrowing owl.

Valley Elderberry Longhorn Beetle

The 1994 LRDP EIR included the following mitigation measures to reduce potential impacts to the valley elderberry longhorn beetle to a less than significant impact:

4.7-7 *During the project design stage and as a condition of project approval, the Campus shall:*

- (a) *Conduct a project-specific survey for all potential VELB (valley elderberry longhorn beetle) habitat, including a stem count and an assessment of historic or current VELB use;*
- (b) *Avoid and protect all potential VELB habitat within a natural open space area where feasible; and*
- (c) *Where avoidance is infeasible, develop and implement a VELB mitigation plan in accordance with the most current USFWS mitigation guidelines for unavoidable take of VELB habitat pursuant to either Section 7 or Section 10(a) of the Federal Endangered Species Act.*

A site survey for Valley elderberry bushes (*Sambucus mexicanus*) was conducted in February 1997, and none were found in the project area.

Swainson's Hawk

Raptor nesting surveys have been conducted on the entire UC Davis campus annually since 1990. From 1990 through 1996, three Swainson's Hawk nest sites have been located within ½ mile of the project. All three were in riparian vegetation along the south fork of Putah Creek.

Nest 1 - This nest was occupied in 1990 and 1991, but has not been occupied since. It is located approximately 800 feet east of Old Davis Road and 600 feet west of the Southern Pacific Railroad tracks on the south bank of the Creek. This nest site is approximately ½ mile southwest of the proposed treatment plant building and 800 feet southwest of the proposed site for the reinjection well. The nest site is screened from proposed construction activities by existing trees, buildings, and the levee along the south fork of

Putah Creek. The birds that occupied this nest site are habituated by disturbances given the close proximity of the railroad tracks and Old Davis Road.

Nest 2 - This nest was occupied in 1995 and 1996. It is located approximately 600 feet east of Old Davis Road. It is approximately ¼ mile southwest of the proposed treatment plant building and 900 feet southeast of the proposed site for the reinjection well. The nest site is screened from proposed construction activities by existing trees, buildings, and the levee along the south fork of Putah Creek.

Nest 3 - This nest was occupied only in 1994. It is located approximately ¼ mile east of Old Davis Road. It is approximately ¼ mile south of the proposed treatment plant building and 1,600 feet east of the proposed site for the reinjection well. The nest is screened from proposed construction activities by existing trees, buildings, and the levee along the south fork of Putah Creek.

To safeguard that project activities do not affect Swainson's Hawk nesting efforts, the following 1994 LRDP EIR mitigation measures shall be implemented.

- 4.7-4(b) *The Campus shall continue to conduct annual surveys to determine the location of nesting Swainson's hawks on the Campus. If nesting Swainson's hawks are found during the survey at a previously unknown location within one-half mile of a project site and not within 100 yards of a previously documented site, the Campus shall, prior to project construction, contact the California Department of Fish and Game to determine the potential for disturbance to nesting Swainson's hawks and will implement feasible changes in the construction schedule or other appropriate adjustments to the project in response to the specific circumstances.*

If, after five years, a previously recorded nest site remains unoccupied by a Swainson's hawk, it will no longer be considered as a Swainson's hawk nest site subject to this mitigation.

- 4.7-6(a) *The Campus shall conduct a pre-construction breeding season survey of the proposed project site, and within a one-half-mile radius of the site, to determine the presence or absence of any nesting Swainson's hawks.*

If any Swainson's hawks are nesting within a one-half-mile radius of the project site, the Campus shall, in consultation with DFG, determine the potential for disturbance to nesting Swainson's hawks and will implement feasible changes in the construction schedule or other appropriate adjustments to the project in response to the specific circumstances.

- 4.7-6(b) *The Campus shall continue to conduct annual surveys to determine the location of nesting Swainson's hawks on and within ½-mile of the Campus. If nesting Swainson's hawks are found during the survey at a previously unknown location*

within one-half mile of a project site and not within 100 yards of a previously documented site, the University shall, prior to project construction, contact the California Department of Fish and Game to determine the potential for disturbance to nesting Swainson's hawks and will implement feasible changes in the construction schedule or other appropriate adjustments to the project in response to the specific circumstances.

If, after five years, a previously recorded nest site remains unoccupied by a Swainson's hawk, it will no longer be considered as a Swainson's hawk nest site subject to this mitigation.

Construction of the proposed IRA project is expected to occur during the summer and early fall of 1997. Due to the distances from proposed project activities (except the reinjection well) and existing screening by buildings and trees, the project is not expected to disturb Swainson's Hawk nesting activities. Construction of the reinjection well could potentially disturb nesting at nests 1 and 2 described above. Birds nesting during the construction phase of the project at sites closer than known nest sites could also be disturbed by construction activities. Compliance with 1994 LRDP EIR Mitigation Measures 4.7-4(a) and (b), and 4.7-6(a) and (b) would safeguard that proposed project activities would result in no new impacts relating to the loss of raptor nesting habitat (including Swainson's hawk) than previously identified in the 1994 LRDP EIR and no further mitigation is required.

Burrowing Owls

Burrowing owls are known to have formerly occurred on the Central Campus; however, no nesting pairs have been observed since 1991. Some individual burrowing owls have been observed sporadically at some locations on the West Campus and at inactive Landfill Unit No. 3 on the South Campus near the project site. Burrowing owls could occupy the project site prior to initiation of construction. The 1994 LRDP EIR identified the following mitigation measure relevant to the proposed project to reduce impacts to burrowing owl habitat:

- 4.7-3(b) *The Campus, in consultation with the DFG, shall conduct a pre-construction breeding-season survey (approximately February 1 through August 31) of proposed project sites during the same calendar year that construction is planned to begin. The survey shall be conducted by a qualified biologist to determine if any burrowing owls are nesting on or directly adjacent to any proposed project site.*

If phased construction procedures are planned for the proposed project, the results of the above survey shall be valid only for the season when it is conducted.

- 4.7-3(c) *During the construction stage, the Campus in consultation with the DFG, shall avoid all burrowing owl nest sites potentially disturbed by project construction during the breeding season while the nest is occupied with adults and/or young.*

The occupied nest site shall be monitored by a qualified biologist to determine when the nest is no longer used. Avoidance shall include the establishment of a 300-foot to 500-foot diameter non-disturbance buffer zone around the nest site. Disturbance of any nest sites shall only occur outside of the breeding season and when the nests are unoccupied based on monitoring by a DFG approved biologist. The buffer zone shall be delineated by highly visible temporary construction fencing.

Based on approval by DFG, pre-construction and pre-breeding season exclusion measures may be implemented to preclude burrowing owl occupation of the project site prior to project-related disturbance.

Compliance with 1994 LRDP EIR Mitigation Measures 4.7-3(b) and (c) would safeguard that proposed project activities would result in no new impacts relating to the loss of nesting habitat for burrowing owls other than those previously identified in the 1994 LRDP EIR and no further mitigation is required.

b, c,

d, e) The project site contains areas disturbed by human activities. Buildings, roads, and deposited landfill material are included on the site. No wetland habitat, or special-status plant or animal species are known to occur or are anticipated to occur on the site due to its developed nature.

Summary

The proposed project would not result in new biological resource impacts that have not already been examined in the 1994 LRDP EIR, and Mitigation Measures 4.7-3(b) and (c), 4.7-4(b), 4.7-6(a) and (b), and 4.7-7 will be implemented as part of the proposed project.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
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8. ENERGY AND MINERAL RESOURCES.

Would the proposal:

a. Conflict with adopted energy conservation plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Use non-renewable resources in a wasteful and inefficient manner?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the State?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Energy issues are addressed in Section 4.15 of the 1994 LRDP Draft EIR, as amended by the Final EIR.

- a, b) As part of the proposed project, an air stripping unit and a reinjection well would be installed to treat contaminated groundwater and dispose of it to HSU-2. These units would utilize electrical power supplied from Campus sources. Although these units would create a new demand for electricity, the amount would be considered insignificant as compared to existing power usage and available power supply. Construction equipment used for the proposed project would utilize petroleum products. Standard construction practices including limiting unnecessary operation and idling of equipment would help insure that non-renewable resources are not used in a wasteful and inefficient manner.
- c) Implementation of the proposed project would not affect the availability of mineral resource.

Summary

The proposed project would not result in new energy/mineral impacts not examined in the 1994 LRDP EIR.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
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9. HAZARDS.

Would the proposal involve:

a. Exposure to existing hazardous materials or waste contamination during construction activities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Increased use of hazardous chemicals and disposal of hazardous waste that could expose people to potential health and safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Increased use of radioactive materials and disposal of radioactive waste that could expose people to potential health and safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Increased use of biohazardous materials and disposal of biohazardous waste that could expose people to potential health and safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Increased use of laboratory animals that could increase the risk of animal bites, escapes, and disease transmission?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Increased transportation of hazardous materials to, from, and within the Campus that could expose people to	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	potential health and safety risks as a result of an accidental release?				
g.	Possible interference with an emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h.	Increased fire hazard in areas with flammable brush, grass, or trees?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Hazardous materials and public safety issues are addressed in Section 4.6 of the 1994 LRDP Draft EIR, as amended by the LRDP Final EIR, and in Chapter 4.3 of the 1997 WWTP Replacement Project Draft EIR as amended by the WWTP Final EIR.

- a) Implementation of the proposed project could potentially expose workers and the public to existing soil and groundwater contamination. Without proper protective measures, exposure to hazardous materials in contaminated soil could result in various short-term or long-term health effects in persons exposed to the contamination. Work at locations that are contaminated with hazardous materials could pose adverse health and safety risks for workers or the public if the contaminants are not identified and properly managed in accordance with applicable health and safety regulations. The 1994 LRDP EIR identified the following mitigation measure to prevent the exposure of construction workers to hazardous materials.

4.6-16(c) *A site health and safety plan, in compliance with OSHA requirements, shall be developed by the Campus and in place prior to commencing work on any contaminated site.*

The required Health and Safety plan will be developed by the Contractor, and reviewed and accepted by U.C. Davis. Mitigation Measure 4.6-16© would reduce impacts to construction workers associated with the proposed project to a less than significant level.

Effects of potential airborne contaminants are addressed in section 5, item b.

- b-e) Fundamentally, the proposed project would not increase the use of or generate waste associated with hazardous chemicals, radioactive materials, biohazardous materials, or laboratory animals. Managed cleanup of the site would help reduce potential impacts to human health and safety related to existing site contamination. Therefore, no impacts would result related to increased use of or increased generation of waste related to the use of chemicals, radioactive materials, biohazardous materials, or laboratory animals.
- f) Transport of hazardous materials to and from UC Davis within the Davis region is discussed in the 1994 LRDP EIR and the impact is identified as less than significant (page 4.6-71).

The proposed project would result in inter-regional transport and disposal of approximately 30 truck loads of containerized waste associated with hazardous chemicals and low-level radioactive materials. All waste

will be packaged in DOT-approved bins, managed consistent with CERCLA requirements, and disposed of at an approximately-permitted disposal facility.

The probability of an accident leading to a release during the transport of these materials to the disposal facility was calculated using U.S. Department of Commerce Percent Practices of Highway Transportation of Hazardous Materials methods. (U.S. Department of Commerce, 1990) The worst-case scenario (based on the highest number of miles traveled) was used based on transport of waste to EnviroClean in Utah, one of the two identified low-level radioactive material disposal facilities, and the one located the greatest distance from the project site. Using the stated method and applying it to the worst-case scenario, the probability of an accident leading to a release during all hazardous material transport (i.e, all 30 trips to Utah) was calculated to be 1.2×10^{-03} . The worst-case estimate reflects potential releases of any size; the likelihood of a release sufficiently large to cause any injury or damage would be much lower. Given the small amount of hazardous material transported, ongoing and planned compliance with regulatory requirements, and the very low probability of a release, this would be considered a less than significant impact.

- g) The proposed project would not interfere with emergency response plans or emergency evacuation plans due to a minor increase in traffic.
- h) Implementation of the proposed project would not increase existing fire hazard in areas with flammable brush, grass, or trees.

Summary

The proposed project would result in a new hazard impacts related to increased transportation of hazardous materials. No other new hazards impacts that have not already been examined in the 1994 LRDP EIR have been identified. LRDP Mitigation Measure 4.6-16(c) will be implemented as part of the proposed project.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
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10. NOISE.

Would the proposal result in:

- | | | | | | |
|----|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| a. | Increases in existing outdoor and indoor noise levels on- and/or off-Campus? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. | Exposure of people to significant noise levels from traffic, railroad or other sources? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Discussion

Noise issues are addressed in Section 4.4 of the 1994 LRDP Draft EIR, as amended by the LRDP Final EIR, and in Chapter 4.8 of the 1997 WWTP Replacement Project Draft EIR as amended by the WWTP Final EIR.

a, b) Construction activities may expose adjacent academic uses to short-term increases in noise levels. The 1994 LRDP EIR identified the following mitigation measure to reduce impacts from construction noise to a less-than-significant level:

4.4-1 *For projects determined to have the potential to significantly affect nearby sensitive receptors, the Campus shall include in all construction contracts one or more of the following noise reduction measures:*

- (a) Construction activities that would impact sensitive receptors in the City of Davis and Campus residences shall be limited to the hours between 7:00 A.M. and 7:00 P.M. on weekdays and 8:00 A.M. to 8:00 P.M. on weekends;*
- (b) Stationary equipment shall be placed to direct emitted noise away from sensitive noise receptors or placed within a noise attenuating structure;*
- (c) If feasible, stockpiling and vehicle staging areas shall be located at least 100 feet from occupied academic, administrative, and residential areas;*
- (d) The loudest construction activities, such as demolition, shall be scheduled, if feasible, during summer, Thanksgiving, winter, and spring breaks when fewer people would be disturbed by construction noise;*
- (e) Potentially affected academic, administrative, and residential areas shall be informed by letter a week before the start of each construction, demolition, or grading operation; and*
- (f) Construction equipment shall be properly outfitted and maintained with noise reduction devices to minimize construction-generated noise. Significant noise-generating construction equipment shall be shielded by noise-attenuating buffers such as structures or truck trailers when within 100 feet of occupied academic, administrative, and residential areas.*

Compliance with Mitigation Measure 4.4-1 ensures that proposed project activities would result in no new impacts associated with construction noise than previously identified in the 1994 LRDP EIR and no further mitigation is required.

The proposed project involves remediation of contamination at the LEHR/SCDS site, and relevant sources of potential operation-phase noise include traffic and treatment facility operation. During operation, traffic levels at the proposed project site would not increase over current levels, and would therefore not increase noise over current levels.

The treatment facility would be enclosed in a building, which would effectively dampen noise. Recent (March 27, 1997) noise monitoring was conducted at a Sacramento-area groundwater treatment facility

with similar features and design to the proposed project. Noise levels were 65 dB(A) 50 feet from the facility. This level of noise would be barely distinguishable from background noise 100 feet from the source. Operation of the treatment facility would not expose on-campus or off-campus receptors to noise levels substantially higher than those which currently exist.

Summary

The proposed project would not result in new noise impacts that have not already been examined in the 1994 LRDP EIR and 1994 LRDP EIR Mitigation Measure 4.4-1 will be implemented as part of the proposed project.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
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11. PUBLIC SERVICES.

Would the proposal have an effect upon, or result in a need for new or altered services in any of the following areas:

a. Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Libraries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Maintenance of public facilities, including roads?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Other governmental services?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Public services issues are addressed in Sections 4.12 and 4.13 of the 1994 LRDP Draft EIR, as amended by the Final EIR.

- a) The Campus Fire Department provides service to the project area. As described on page 4.12-2 of the 1994 LRDP Draft EIR, the Campus Fire Department is currently staffed by 16 career firefighting personnel, and administrative and support staff. Fire protection service demand on the Campus is based on a ratio of personnel to increased square footage (3.5 fire fighters per 1,000,000 assignable square feet (asf)). The proposed project would not result in the construction of additional assignable square footage. In addition, service is already provided to the area and it is not anticipated the proposed project would result in a need for additional fire department services over that which currently exists.

- b) The Campus Police Department provides service to the project area. As described on page 4.12-3 of the 1994 LRDP Draft EIR, the Department is authorized for a staff of 50 sworn officers, although it is currently staffed with 46 sworn officers, 10 dispatchers and eight support staff. Police protection service demand is based on a ratio of personnel to increased population (0.72 officers per 1,000 population). The proposed project would not result in an increase in population and police service is already provided to the project area, therefore, there would be no increase in the demand for police protection services except routine patrols which already occur in the project area.
- c, d,
- f) The proposed project would not result in an increase in campus population. Therefore, there would be no need for new or altered school, library, or other governmental services.
- e) The proposed project includes two soil/material removal and disposal actions, installation of an agricultural well, and installation, operation, and maintenance of an air stripping unit, pipelines, and an injection well. Construction of the proposed project would generate minor amounts of construction-related traffic for approximately three months. Disposal of soil and material would be by truck, and is estimated to generate a total of 20 to 30 haul truck trips over a one-week period, or four to six trips per day for one week. The capacity of these trucks would be 15 to 20 yards, which is similar in size and weight to agricultural vehicles currently utilizing area roadways.

Maintenance of the proposed project would generate negligible amounts of small-vehicle traffic. The proposed project equipment would be maintained and operated entirely by UC Davis, and would not require other public resources to be expended for its operation or maintenance. All construction activity would be in the summer months when the road and subgrade are dry and not prone to damage. There would be no discernable effect on roadways or other public, non-Campus facilities, including Old Davis Road, as a result of the proposed project. Therefore, the proposed project would have no effect on maintenance of public facilities.

Summary

No other new public service impacts that have not already been examined in the 1994 LRDP EIR would occur.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
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12. UTILITIES AND SERVICE SYSTEMS.

Would the proposal result in a need for new systems or supplies, or substantial alterations to the following utilities:

- a. Electricity or natural gas?

b. Telecommunication systems?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Local or regional water treatment or distribution facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Sewer or septic tanks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Storm water drainage?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Solid waste disposal?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Local or regional water supplies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Utilities and service systems are addressed in Section 4.14 of the 1994 LRDP Draft EIR, as amended by the Final EIR.

- a) Implementation of the proposed project would include installation of an air stripping unit and a reinjection well. As stated on page 4.15-4 of the 1994 LRDP Draft EIR:

While Campus growth would increase demand for energy, UC Davis and the UC system have established policies to comply with and exceed state standards (Title 20 and 24) for energy conservation and all new buildings will incorporate standard energy conservation measures. Implementation of these measures will minimize increased energy needs. In addition, the City of Davis General Plan includes energy conservation policies to help reduce excess use of energy in all types of development in the City. Further, PG&E indicates the ability to provide the additional electrical and gas needs of future development to the service area. Through 2004, WAPA can supply the service area with the quantity of electricity currently supplied. However at this time, WAPA does not have the ability to increase that quantity.

In addition, PG&E confirms that adequate infrastructure will be provided to deliver electricity and natural gas to new development in the service area. PG&E does not anticipate the need to develop new energy sources to meet these future energy demands. Therefore, this is considered to be a less-than-significant impact.

The project would use only minor amounts of electricity but no natural gas. As a result, the proposed project would not result in a need for substantial new electrical systems or supplies or a substantial alteration of existing supplies.

- b) The proposed project would have no effect on existing telecommunications facilities.
- c) The proposed project would not result in a need for new or a substantial alteration of existing (potable) water treatment or distribution facilities.

- d) The proposed project would not utilize the existing or planned WWTP plant for treatment of groundwater contamination from the LEHR/SCDS site. Therefore, the proposed project would have no effect on sewer or septic tank systems.
- e) The proposed project is expected to have no impact on existing storm water drainage systems.
- f) Implementation of the proposed project would not result in an increase in the amount of solid (i.e., municipal) waste generated over that which currently exists. However, the proposed project includes removal of existing low-level radiological and chemical waste. This waste along with any contaminated soil would be removed, packaged in DOT-approved bins, managed and disposed of at an appropriately-permitted facility, either at Hanford, Washington or EnviroClean, Utah.
- g) The proposed project involves implementing a groundwater pump and treat action to reduce constituents of concern including VOCs in groundwater. Groundwater is used as the source of the Campus utility water system which draws from the shallow/intermediate aquifer. As stated on page 4.14-13 of the 1994 LRDP Draft EIR:

Present use of the shallow/intermediate aquifer by the Campus is approximately 2,000 acre-feet per year, which includes 780 acre-feet per year for the utility water system and approximately 1,230 acre feet per year for agricultural water system. Because the shallow/intermediate aquifer is used only to supplement the agricultural system, agricultural use of this water source is expected to remain the same.

Campus water use from the shallow/intermediate aquifer is projected to reach about 500 million gallons per year by 2005, which represents approximately 1.2 percent of the existing 40,900 million gallons currently used. The historical groundwater elevation data from the shallow/intermediate aquifer do not indicate a declining trend when observed over the last 30 years. Therefore, the changes to the shallow/intermediate aquifer that result from the implementation of the proposed 1994 LRDP are not considered substantial or significant.

Therefore, remediation of groundwater at the site would supplement available supplies for anticipated growth as identified in the LRDP.

Summary

The proposed project would not result in any new public utilities and infrastructure impacts that have not already been examined in the 1994 LRDP EIR.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for Which 1994 LRDP EIR is Sufficient	No Impact
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13. AESTHETICS.

Would the proposal:

a. Affect valued elements of the Central Campus visual landscape?	□	□	□	■
b. Disrupt long-distance views from the Campus and surrounding areas?	□	□	□	■
c. Be incompatible with the existing character of the area?	□	□	□	■
d. Create light or glare?	□	□	□	■

Discussion

Visual quality and aesthetics are addressed in Section 4.11 of the 1994 LRDP Draft EIR, as amended by the LRDP Final EIR, and in Chapter 4.7 of the WWTP Replacement Project Draft EIR, as amended by the WWTP Final EIR.

a-d) The proposed project is located in the South Campus. The visual landscape of the South Campus includes low-density academic and support buildings adjacent to large agricultural/open space areas. The proposed project involves remediating site contamination at the LEHR/SCDS site. Only minor above ground facilities would be constructed as part of the proposed project. These facilities would not affect valued elements of the South Campus or be incompatible with the existing character of the area.

Campus terrain (including the project area) is primarily flat. The proposed project includes the installation of an air stripping unit housed within a one-story metal shed-type building. This building would not disrupt long-distance views from the Campus or surrounding areas. Also, no additional lighting would be installed with the proposed project and therefore light and glare impacts would not occur.

Summary

The proposed project would not result in new aesthetic impacts that have not already been examined in the 1994 LRDP EIR.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
14. CULTURAL RESOURCES.				
<i>Would the proposal:</i>				
a. Damage or destroy paleontological resources?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Damage or destroy archaeological resources?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Damage or destroy historical structures and landscape features?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Have the potential to cause a physical change which would affect unique ethnic cultural values?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Restrict existing religious or sacred uses within the potential impact area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

Cultural resources are addressed in Section 4.10 of the 1994 LRDP Draft EIR, as amended by the Final EIR.

- a) There are no known paleontological resources under the Campus. Furthermore, the project area is already developed and/or disturbed. Therefore, no impact would be anticipated to occur to paleontological resources.
- b) Prior archaeological investigations have indicated that archaeological sensitivity of locations in the vicinity of the Campus depends upon the particular microenvironment. Prehistoric sites are known to occur on terraces or high points along waterways with the most sensitive areas located along the banks of the tributaries and historic channels of Putah Creek. The project area is located approximately 200 feet north of the South Fork of Putah Creek, a human-constructed channel built in the 1870s. The historic Putah Creek channel is on the central campus approximately one mile north of the project site. The 1994 LRDP EIR identified the following mitigation measures to further reduce the potential for disturbing previously unidentified archaeological and historic resources on sites requiring minimum investigation (*i.e.*, outside areas of known archaeological sensitivity) to a less-than-significant level:

4.10-1(b) For sites requiring minimum investigation, the following steps will be taken.

- (i) *Prior to disturbing the soil, contractors shall be notified that they are required to watch for potential archaeological sites and artifacts and to notify the campus if anything is found. In addition, campus employees whose work involves routinely disturbing the soil shall be trained to recognize evidence of potential archaeological sites and artifacts.*
- (ii) *If resources are discovered during activities, all soil disturbing work within 100' of the find shall cease. The resources shall be evaluated by a qualified archaeologist who will determine and advise the campus on the potential for the activity to affect a significant archaeological resource.*
- (iii) *If the activity might affect a significant archaeological resource, consistent with CEQA and Appendix K of the CEQA Guidelines addressing archaeological impacts a plan for surveying the remainder of the site and conducting appropriate data recovery and other Mitigations shall be prepared and implemented using the services of a qualified archaeologist.*
- (iv) *If human remains are found, the County coroner shall be contacted. The coroner shall contact the Native American Heritage Commission, which shall notify the appropriate descendant. The Campus shall coordinate re-interment of Native American remains with the NAHC and the designated descendant.*

Compliance with 1994 LRDP EIR Mitigation Measure 4.10-1(b) would safeguard that proposed project activities would not result in any new impacts related to prehistoric resources other than those previously identified in the 1994 LRDP EIR, and no further mitigation is required.

- c) Implementation of the proposed project would not damage or destroy any historic structures because no structures currently exist on the project site. Much of the project area is disturbed by human activities including waste disposal. As a result, the project area does not contain significant landscape features. Therefore, activities in this area would not create a significant impact and no further mitigation is required.
- d, e) Implementation of the proposed project involves the remediation of contaminated soil and groundwater which would not affect unique ethnic cultural values, or restrict existing religious or sacred uses, as none have been identified on the project site.

Summary

The proposed project would not result in new cultural resource impacts that have not already been examined in the 1994 LRDP EIR and 1994 LRDP EIR Mitigation Measure 4.10-1(b) will be implemented as part of the proposed project.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
--------	--	----------------------------------	--	-----------

15. RECREATION.

Would the proposal:

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a. Increase the demand for on- and/or off-Campus parks or other recreational facilities? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. Affect existing recreational opportunities? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Discussion

Recreation issues are addressed in Section 4.13 of the 1994 LRDP Draft EIR, as amended by the Final EIR.

- a) The proposed project would not result in an increase in campus population, therefore, it would not increase the demand for on- and/or off-Campus parks or other recreational facilities.
- b) The proposed project involves remediating contamination at the LEHR/SCDS site which currently does not provide recreational opportunities. Therefore, the proposed project would have not effect on existing recreational opportunities.

Summary

The proposed project would not result in new recreation impacts that have not already been examined in the 1994 LRDP EIR.

Issues	Potentially Significant Impact/New Mitigation Required	New Less Than Significant Impact	Impact for which 1994 LRDP EIR is Sufficient	No Impact
--------	--	----------------------------------	--	-----------

16. MANDATORY FINDINGS OF SIGNIFICANCE.

a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

The cumulative significant impacts to which the project would contribute were determined in the LRDP EIR not to be susceptible to substantial reduction or avoidance. These avoidable cumulative impacts were addressed in the Findings and Overriding Considerations adopted by The Regents in connection with approval of the 1994 LRDP.

V. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the Tiered Environmental Checklist.

- | | |
|---|---|
| <input type="checkbox"/> Land Use and Planning | <input type="checkbox"/> Hazards |
| <input type="checkbox"/> Population and Housing | <input type="checkbox"/> Noise |
| <input type="checkbox"/> Geological Problems | <input type="checkbox"/> Mandatory Findings of Significance |
| <input type="checkbox"/> Water | <input type="checkbox"/> Public Services |
| <input type="checkbox"/> Air Quality | <input type="checkbox"/> Utilities and Service Systems |
| <input type="checkbox"/> Transportation/Circulation | <input type="checkbox"/> Aesthetics |
| <input type="checkbox"/> Biological Resources | <input type="checkbox"/> Cultural Resources |
| <input type="checkbox"/> Energy and Mineral Resources | <input type="checkbox"/> Recreation |
| | <input checked="" type="checkbox"/> None Identified |

Based on the analyses in this Initial Study, all potentially adverse environmental impacts of the proposed project were adequately addressed in the 1994 LRDP EIR. As a result, no additional environmental review is required for the project and the preparation of findings consistent with this conclusion is appropriate.

VI. MITIGATION MEASURES

The following is a summary of the 1994 LRDP EIR Mitigation Measure which would be implemented as part of the proposed project. The mitigation measures are presented in the order they appear on the checklist.

3. Geology

- 4.9-1(a) *Prior to final design, the Campus shall review and approve all building plans for compliance with the Uniform Building Code and Title 24.*

4. Water

- 4.8-4(b) *For construction operations which would disturb less than five acres of land, the Campus shall include in all construction contracts a requirement that Campus contractors prepare and retain on the site an erosion control plan which would include a description of the construction site, erosion and sediment controls to be used, means of waste disposal, control of post-construction sediment and erosion control measures and maintenance responsibilities, and non-storm water management controls.*

Best Management Practices (BMPs) which could be implemented as part of an erosion control plan could include, but would not be limited to:

- (i) reduction of the area and length of time that the site is cleared and graded;*
- (ii) revegetation/stabilization of cleared areas as soon as possible;*
- (iii) implementation of comprehensive erosion, dust and sediment controls;*
- (iv) implementation of a program to control potential construction activity pollutants such as cement mortar, paints and solvents, fuel and lubricating oils, pesticides and herbicides;*
- (v) implementation of a hazardous material spill prevention, control and cleanup program.*

5. Air Quality

- 4.5-1 *The Campus shall include in all construction contracts the following measures to reduce fugitive dust impacts.*

- (a) All unpaved construction areas shall be sprinkled with water or other acceptable Yolo-Solano AQMD dust control agents during dust generating activities to reduce dust emissions. Additional watering or acceptable APCD dust control agents shall be*

applied during dry weather or windy days until dust emissions are not visible.

(b) Trucks hauling dirt and debris shall be covered to reduce wind blown dust and spills.

(c) On dry days, dirt or debris spilled onto paved surfaces shall be swept up immediately to reduce resuspension of particulate matter caused by vehicle movement. Approach routes to construction sites shall be cleaned daily of construction related dirt in dry weather.

(d) On-site stockpiles of excavated material shall be covered or watered.

4.6-16(c) *A site health and safety plan, in compliance with OSHA requirements, shall be developed by the Campus and in place prior to commencing work on any contaminated site.*

7. Biological Resources

4.7-3(b) *The Campus, in consultation with the DFG, shall conduct a pre-construction breeding-season survey (approximately February 1 through August 31) of proposed project sites during the same calendar year that construction is planned to begin. The survey shall be conducted by a qualified biologist to determine if any burrowing owls are nesting on or directly adjacent to any proposed project site.*

If phased construction procedures are planned for the proposed project, the results of the above survey shall be valid only for the season when it is conducted.

4.7-3(c) *During the construction stage, the Campus in consultation with the DFG, shall avoid all burrowing owl nest sites potentially disturbed by project construction during the breeding season while the nest is occupied with adults and/or young. The occupied nest site shall be monitored by a qualified biologist to determine when the nest is no longer used. Avoidance shall include the establishment of a 300-foot to 500-foot diameter non-disturbance buffer zone around the nest site. Disturbance of any nest sites shall only occur outside of the breeding season and when the nests are unoccupied based on monitoring by a DFG approved biologist. The buffer zone shall be delineated by highly visible temporary construction fencing.*

Based on approval by DFG, pre-construction and pre-breeding season exclusion measures may be implemented to preclude burrowing owl occupation of the project site prior to project-related disturbance.

- 4.7-4(b) *The Campus shall continue to conduct annual surveys to determine the location of nesting Swainson's hawks on the Campus. If nesting Swainson's hawks are found during the survey at a previously unknown location within one-half mile of a project site and not within 100 yards of a previously documented site, the Campus shall, prior to project construction, contact the California Department of Fish and Game to determine the potential for disturbance to nesting Swainson's hawks and will implement feasible changes in the construction schedule or other appropriate adjustments to the project in response to the specific circumstances.*

If, after five years, a previously recorded nest site remains unoccupied by a Swainson's hawk, it will no longer be considered as a Swainson's hawk nest site subject to this mitigation.

- 4.7-6(a) *The Campus shall conduct a pre-construction breeding season survey of the proposed project site, and within a one-half-mile radius of the site, to determine the presence or absence of any nesting Swainson's hawks.*

If any Swainson's hawks are nesting within a one-half-mile radius of the project site, the Campus shall, in consultation with DFG, determine the potential for disturbance to nesting Swainson's hawks and will implement feasible changes in the construction schedule or other appropriate adjustments to the project in response to the specific circumstances.

- 4.7-6(b) *The Campus shall continue to conduct annual surveys to determine the location of nesting Swainson's hawks on and within 1/2-mile of the Campus. If nesting Swainson's hawks are found during the survey at a previously unknown location within one-half mile of a project site and not within 100 yards of a previously documented site, the University shall, prior to project construction, contact the California Department of Fish and Game to determine the potential for disturbance to nesting Swainson's hawks and will implement feasible changes in the construction schedule or other appropriate adjustments to the project in response to the specific circumstances.*

If, after five years, a previously recorded nest site remains unoccupied by a Swainson's hawk, it will no longer be considered as a Swainson's hawk nest site subject to this mitigation.

- 4.7-7 *During the project design stage and as a condition of project approval, the Campus shall:*
- (a) *Conduct a project-specific survey for all potential VELB (valley elderberry longhorn beetle) habitat, including a stem count and an assessment of historic or current VELB use;*
 - (b) *Avoid and protect all potential VELB habitat within a natural open space area where feasible; and*
 - (c) *Where avoidance is infeasible, develop and implement a VELB mitigation plan in accordance with the most current USFWS mitigation guidelines for unavoidable take of VELB habitat pursuant to either Section 7 or Section 10(a) of the Federal Endangered Species Act.*

9. **Hazards**

- 4.6-16(c) *A site health and safety plan, in compliance with OSHA requirements, shall be developed by the Campus and in place prior to commencing work on any contaminated site.*

10. **Noise**

- 4.4-1 *For projects determined to have the potential to significantly affect nearby sensitive receptors, the Campus shall include in all construction contracts one or more of the following noise reduction measures:*
- (a) *Construction activities that would impact sensitive receptors in the City of Davis and Campus residences shall be limited to the hours between 7:00 A.M. and 7:00 P.M. on weekdays and 8:00 A.M. to 8:00 P.M. on weekends;*
 - (b) *Stationary equipment shall be placed to direct emitted noise away from sensitive noise receptors or placed within a noise attenuating structure;*
 - (c) *If feasible, stockpiling and vehicle staging areas shall be located at least 100 feet from occupied academic, administrative, and residential areas;*
 - (d) *The loudest construction activities, such as demolition, shall be scheduled, if feasible, during summer, Thanksgiving, winter, and spring breaks when fewer people would be disturbed by construction noise;*
 - (e) *Potentially affected academic, administrative, and residential areas shall be informed by letter a week before the start of each construction, demolition, or grading operation; and*
 - (f) *Construction equipment shall be properly outfitted and maintained with noise reduction devices to minimize construction-generated noise. Significant noise-generating construction equipment shall be shielded by*

noise-attenuating buffers such as structures or truck trailers when within 100 feet of occupied academic, administrative, and residential areas.

14. **Cultural Resources**

4.10-1(b) *For sites requiring minimum investigation, the following steps will be taken.*

- (i) Prior to disturbing the soil, contractors shall be notified that they are required to watch for potential archaeological sites and artifacts and to notify the campus if anything is found. In addition, campus employees whose work involves routinely disturbing the soil shall be trained to recognize evidence of potential archaeological sites and artifacts.*
- (ii) If resources are discovered during activities, all soil disturbing work within 100' of the find shall cease. The resources shall be evaluated by a qualified archaeologist who will determine and advise the campus on the potential for the activity to affect a significant archaeological resource.*
- (iii) If the activity might affect a significant archaeological resource, consistent with CEQA and Appendix K of the CEQA Guidelines addressing archaeological impacts a plan for surveying the remainder of the site and conducting appropriate data recovery and other Mitigations shall be prepared and implemented using the services of a qualified archaeologist.*
- (iv) If human remains are found, the County coroner shall be contacted. The coroner shall contact the Native American Heritage Commission, which shall notify the appropriate descendant. The Campus shall coordinate re-interment of Native American remains with the NAHC and the designated descendant.*

VII. DETERMINATION

Pursuant to Sections 15152 and 15168 of the CEQA Guidelines, this Tiered Initial Study has been prepared to evaluate the potential environmental impacts of the proposed project in relation to the programmatic environmental analysis contained in the 1994 LRDP EIR. On the basis of this evaluation, I find as follows:

- The proposed project is exempt from CEQA pursuant to the general exemption (CEQA Guidelines, 15061(b)(3)), a statutory exemption, and/or a categorical exemption, and that if a categorical exemption, none of the exceptions to the exemption apply. A NOTICE OF EXEMPTION will be prepared.
- Pursuant to Section 15168(c)(2) of the CEQA Guidelines, the proposed project may incrementally contribute to, but will not exceed, the impacts previously identified in the 1994 LRDP EIR, and the project will otherwise result in no new significant impacts. Further, no new mitigation measures, other than those previously identified in the 1994 LRDP EIR, are required. FINDINGS consistent with this determination will be prepared.
- The proposed project may incrementally contribute to, but will not exceed, significant environmental impacts previously identified in the 1994 LRDP EIR. Further, the proposed project will result in no new significant impacts other than those previously identified in the 1994 LRDP EIR. However, the project will have environmental effects not previously addressed in the 1994 LRDP EIR, but there is no substantial evidence that such effects may have a significant impact on the environment. No new mitigation measures, other than those previously identified in the 1994 LRDP EIR, are required. A NEGATIVE DECLARATION will be prepared.
- I find that the proposed project may incrementally contribute to, but not exceed, certain significant impacts previously identified in the 1994 LRDP EIR, and that for such impacts, no new mitigation measures, other than those previously identified in the 1994 LRDP EIR, are required. In addition, the project may result in potentially significant impacts not previously identified in the 1994 LRDP EIR, but proposed project specific mitigation measures would reduce the effect of such impacts to a point where clearly no significant effects would occur. On the basis of the Tiered Initial Study and implementation of all proposed Project specific mitigation measures, there is no substantial evidence that the project as mitigated may have a significant effect on the environment. A MITIGATED NEGATIVE DECLARATION will be prepared.
- The proposed project may incrementally contribute to, but will not exceed, certain significant environmental impacts previously identified in the 1994 LRDP EIR. For such impacts, no new mitigation measures, other than those previously identified in the 1994 LRDP, are required. Further, there is substantial evidence that the project may result in a significant environmental impact that was not previously identified in the 1994 LRDP EIR, and/or will exacerbate a significant environmental impact previously identified in the 1994 LRDP EIR. A TIERED ENVIRONMENTAL IMPACT REPORT will be prepared that addresses the new impacts not previously identified in the 1994 LRDP EIR.


Signature

June 6, 1997
Date

Richard F. Keller, Director
Physical, Environmental, and Capital
Planning

University of California, Davis

VIII. REFERENCES

- CERCLA, 1980. Comprehensive Environmental Responsibility and Compensation Liability Act of 1980 (as amended, 42 USC§9601 et seq.).
- Dames & Moore, 1990. *Final SWAT (Solid Waste Assessment Test) Report Old UCD Landfill*, University of California, Davis.
- _____, 1994a. *Draft RI/FS Work Plan, Volume I, LEHR Environmental Restoration*, Davis, California. September.
- _____, 1994b. *Waste Management Plan for Investigation Derived Wastes (IDW), Draft RI/FS Work Plan, Volume I, LEHR Environmental Restoration*, Appendix D. September.
- _____, 1996a. *Data Gaps Work Plan, LEHR Environmental Restoration*, Davis, California.
- _____, 1996b. *Technical Memorandum/Work Plan Pre-Design Activities*, LEHR Groundwater IRA, University of California, Davis. July 15.
- _____, 1997a. *Engineering Evaluation/Cost Analysis, Groundwater Interim Remedial Action, LEHR Environmental Restoration*. Davis, California. January.
- _____, 1997b. *Landfill Unit No.1 Data Transmittal, Data Gaps, Limited Field Investigation, South Campus Disposal Site*. Davis, California. January.
- _____, 1997c. *Landfill Unit No.2 Data Transmittal, Data Gaps, Limited Field Investigation, South Campus Disposal Site*. Davis, California. January.
- _____, 1997d. *Landfill Unit No.3 Data Transmittal, Data Gaps, Limited Field Investigation, South Campus Disposal Site*. Davis, California. January.
- _____, 1997e. *Eastern Trenches Data Transmittal, Data Gaps, Limited Field Investigation, South Campus Disposal Site*. Davis, California. April.
- _____, 1997f. *Eastern Trenches Data Transmittal, Data Gaps, Limited Field Investigation, South Campus Disposal Site*. Davis, California. April.
- _____, 1997g. *Eastern Trenches Data Transmittal, Data Gaps, Limited Field Investigation, South Campus Disposal Site*. Davis, California. April.
- EIP Associates, 1994. *UC Davis Long Range Development Plan, Draft Environmental Impact Report*. With appendices. April.

EIP Associates, 1994. *UC Davis Long Range Development Plan, Final Environmental Impact Report*. September.

Pacific Northwest National Laboratory (PNNL), 1994. *Remediation Investigation/Feasibility Study Work Plan: LEHR Environmental Restoration. Davis, California*.

_____, 1996. *Annual 1995 Winter Monitoring Report, LEHR Environmental Restoration*, University of California, Davis, California.

Solano County, 1988. *Solano County General Plan Land Use and Circulation Element*.

U.C. Davis, 1994. *Long Range Development Plan, 1994-2005*. September.

U.S. Department of Commerce, National Technical Information Service, 1990. *Percent Practices of Highway Transportation of Hazardous Materials*. May.

**Appendix A – Comment Letters
on Administrative Draft Initial Study**

**Appendix A - Comment Letters
on Administrative Draft Initial Study**

At the request of certain regulatory agencies, copies of an administrative draft Initial Study for the LEHR/SCDS Interim Remedial Actions project were provided for their review and comment prior to publication. These agencies included:

Ms. Hedy Ficklin
Environmental Protection Agency
Federal Facilities Cleanup Office, Section I
M.S. H-9-1
San Francisco, CA 94105

Mr. Duncan Austin
Department of Toxic Substances Control
1051 Croydon, Suite 3
Sacramento, CA 95827

Ms. Susan Timm
Central Valley Regional Water Quality Control Board
3443 Routier Road, Suite A
Sacramento, CA 95827-3098

Mr. Steve Hsu
DHS-Radiological Health Branch
601 N. 7th Street, M.S. 178
Sacramento, CA 94234-7320

Several verbal comments were received by UC Davis and have been incorporated in the Draft Initial Study. In addition, the Central Valley Regional Water Quality Control Board and Department of Health Services-Radiologic Health Branch submitted written comments (Please see following letters). In response to the comments in these letters, the following changes have been incorporated in the Draft Initial Study.

Central Valley Regional Water Quality Control Board

- Comment 1** The text has been revised.
- Comment 2** The discussion of Constituents of Primary Concerns has been revised. Only groundwater remedial actions are limited to VOCs, and the reason other groundwater constituents will not be treated is explained under project objectives.
- Comment 3** The discussion regarding Tritium has been revised to indicate that it is not representative of a class or type of constituents found at the project site.
- Comment 4** Only the groundwater remedial actions are limited to VOCs. Soil remediation actions

will also result in the removal of source materials for other constituents of concern. A section describing the "Environmental Control Systems and Monitoring" elements of the project has been added to the project description.

Comment 5 The text has been revised.

Comment 6 The objective presented is a direct quote from the 1994 UC Davis Long Range Development Plan (LRDP), is not a part of the proposed project, and has not been revised. However, the third bullet in this section of the Initial Study quotes the objective from the 1994 LRDP concerning Environmental Restoration. This objective addresses this comment.

Comment 7 The discussion following Item h has been expanded, and a section describing the "Environmental Control Systems and Monitoring" elements of the project has been added to the project description. Due to the number of controls that are part of the proposed project, no mitigation measures have been proposed.

Comment 8 The text has been revised.

Department of Health Services-Radiologic Health Branch

Comment 1 The text has been revised to indicate the likely range of depths that will be excavated. The actual depth will be recorded as part of project documentation.

Comment 2 A discussion of the potential for releases of tritium has been added to the Air Quality discussion in items a and b.

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION**

3443 Rautier Road, Suite A
Sacramento, CA 95827-3068
PHONE: (916) 255-3000
FAX: (916) 255-3015



21 March 1997

Ms. Julie McNeal
Environmental Health and Safety TB 30
University of California
Davis, CA 95616

**SECOND ADMINISTRATIVE DRAFT TIERED INITIAL STUDY, LABORATORY
FOR ENERGY-RELATED HEALTH RESEARCH AND SOUTH CAMPUS
DISPOSAL SITE (LEHR/SCDS), SOLANO COUNTY**

I have reviewed the subject document received 21 February 1997. Please consider the following comments when preparing the Initial Study for circulation.

1. **Page 8, Project Area Geology and Hydrogeology and Constituents of Primary Concern**
In the last sentence, UCD should make clear that hydropunch data is groundwater sampling data. UCD could say "Information presented regarding chemicals in soils is based on soil, and soil gas sampling results and in groundwater is based on data from groundwater monitoring wells and hydropunch samples."
2. **Page 10, Distribution of Constituents of Primary Concern**
UCD should state what other constituents fall into the four "main types" of constituents found at LEHR. Since UCD proposes only treating for volatile organic compounds (VOCs), it should discuss what treatments could be used for the other three "constituent types" and why it is not proposing treatment for these constituents for this removal action.
3. **Page 12, Tritium**
UCD states that tritium is representative of similar constituents. UCD should explain what constituents at SCDS sites are similar to tritium.
4. **Page 12, Project Objectives**
I have comments on the following UCD objectives:
 - a) Substantially reduce the overall mass of constituents of concern (COCs) in groundwater and
 - b) Over time, decrease the mass of COCs in HSU-1 at the project site.

The proposed removal action is directed only at cleaning up VOCs. Other COCs in the extracted groundwater will be reinjected into HSU-2. There is a possibility of increasing the total mass of COCs in HSU-2. UCD should include mitigation methods to prevent an increase of COCs in HSU-2 and clarify that only VOCs will be substantially reduced in groundwater with the proposed removal action.

5. Page 15, Treating

The last sentence on this page should clarify that air stripping would not be effective in removing "any levels" of chromium, nitrate, and TDS. The sentence implies that air stripping removes high levels of these constituent but not slightly elevated levels.

6. Page 18, Project Consistency, first bullet

UCD should rewrite the first sentence after "Diverse water supply" to "... groundwater pumping and treatment would reduce VOC concentrations in groundwater."

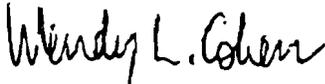
7. Page 25 and Page 28, h.

On page 25, UCD should reconsider which box to check after "Impacts to groundwater quality?" On Page 28, after h), UCD should discuss the potential for constituents of concern to be above background in treated groundwater, especially if pulled down from HSU-1. UCD should discuss the groundwater monitoring program to determine if groundwater quality is impaired by injection and propose mitigation measures. These measures could be, though not limited to, increasing the zone of capture, treating the groundwater for elevated concentrations of COCs before injection, reducing injection rate, in-well treatment and/or changing disposal methods of treated water.

8. Page 28, g

Referring to the replacement well for irrigation well 22N, UCD states, "The newly-installed well would draw water from the same hydrostratigraphic [sic] unit and at the same pumping rate." UCD does not know at this time the design or production rate of the proposed well.

If you have any questions, please contact me at (916) 255-3057.


for SUSAN TIMM
Remedial Project Manager

ST:st/lsb

cc: Ms. Hedy Ficklin, U.S. Environmental Protection Agency, San Francisco
Ms. Susan Fields, U.S. Department of Energy, Oakland
Mr. Duncan Austin, Department of Toxic Substances Control, Sacramento
Mr. Steve Hsu, Department of Health Services, RHB, Sacramento
Ms. Julie Roth, DSCSOC, Davis

DEPARTMENT OF HEALTH SERVICES

714/744 P STREET
P.O. BOX 942732
SACRAMENTO, CA 94234-7320



(916) 322-3482

March 11, 1997

Mr. Brian Oatman, Project Manager
Environmental Health & Safety
University of California, Davis
Davis, California 95616-8648

ADMINISTRATIVE DRAFT TIERED INITIAL STUDY FOR LEHR/SCDS INTERIM
REMEDIAL ACTIONS (IRA) ON GROUNDWATER, FEBRUARY 21, 1997

Dear Mr. Oatman:

Thank you for the opportunity to review the subject study received on February 24, 1997. The Radiologic Health Branch (RHB) staff understands that there will be a formal review/comment period of thirty (30) days after the subject report is published in the near future. As a result of the review of the above referenced document, California RHB has the following comments:

1. The practical limit mentioned in page 13 should be clearly specified for confirming the soil below the waste after the removal action in the waste burial pits is completed; and
2. The potential tritium release during the treatment phase of the groundwater was not mentioned or evaluated in page 15 where the treatment of groundwater was discussed. It is indicated that air stripping would remove the volatile organic chemicals from the extracted groundwater to nondetectable levels. The RHB staff suggests that the exposure of potential tritium release during treatment of groundwater be evaluated against the National Emission Standards for Hazardous Air Pollutants (NESHAPS) requirements.

Mr. Brian Oatman
March 11, 1997
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If you have any questions concerning this matter, please contact me at (916) 322-3284 or Mr. Stephen Hsu, LEHR Remedial Project Manager for DHS/RHB at (916) 322-4797.

Sincerely,

A handwritten signature in cursive script, appearing to read "Edgar D. Bailey". The signature is written in dark ink and is positioned above the typed name.

Edgar D. Bailey, C.H.P., Chief
Radiologic Health Branch