LABORATORY FOR ENERGY-RELATED HEALTH RESEARCH

University of California, Davis
Davis, California 95616

Environmental Monitoring Report

Calendar Year 1987

Department of Energy Operating Contractor

DE/AC03/76SF00472

Prepared by:

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INTRODUCTION

The Laboratory for Energy-Related Health Research (LEHR) is an organized research unit of the University of California, Davis. The Laboratory's broad research objective is to provide new knowledge and understanding of potential health problems associated with energy utilization and to contribute to the safe and healthful development of energy resources for the benefit of humankind.

The research utilizes a multi-disciplinary program directed toward the basic scientific investigation of toxicological effects and biomedical problems from exposure to hazardous substances. Some areas of specific research interest center around the biology, radiobiology, and general health of the skeletal system and its blood-forming components; the properties and toxicology of airborne materials; the use of the beagle as an experimental animal model; carcinogenesis and the use of animal studies to derive human risk.

DESCRIPTION OF FACILITY AND PROCESSES

LEHR is a federal government-owned, University-operated (contractor) facility located on a fifteen-acre parcel of land owned by the University of California. The site is located on the UC Davis Campus remotely situated from other campus locations in a rural area designated for animal research.

The LEHR site may be divided into specific facilities and/or processes which may impact the environment. These include an indoor/outdoor Cobalt-60 beam irradiator, on-site fluid radioactive waste treatment facilities, a radioactive waste burial ground, and the usual research laboratory operations.

GENERAL ENVIRONMENTAL SUMMARY

The environmental monitoring program of the LEHR site includes ambient gamma radiation monitoring of the Cobalt-60 facility, the initiation of a soil and groundwater study in conjunction with site decommissioning efforts, and the routine documentation of radioactive wastes processed and disposed of through the campus program.

The information in the body of the summary shows that there are known sources of radiological environmental impact which have not been shown to adversely effect the environs surrounding LEHR to date.

BODY OF THE ENVIRONMENTAL SUMMARY

The potential radiologic impact of the LEHR site is summarized by the specific sources involved:

I. The Cobalt-60 Beam Irradiation Facility

In 1986, outdoor irradiations were suspended with indoor irradiations continuing into 1987. Continued fenceline monitoring of ambient radiation levels has occurred. One unusual reading of 44 milliroentgens for the last quarter of 1987, was telephonically reported to DOE SAN with no written report filed. All other quarterly results were less than 20 milliroentgens.

II. On Site Fluid Radioactive Waste Treatment Facilities

Currently, the Strontium-90 ion exchange/Imhoff tank/leach field disposal unit and the Radium-226 septic system are not actively used for waste treatment and disposal purposes. The Imhoff tank was physically disconnected from the leach field in 1986. Both the Strontium-90 and Radium-226 facilities contain quantities of radioactive materials and possibly hazardous chemical waste material and are awaiting decommissioning and decontamination operation. In 1987, a soil and groundwater study was initiated to evaluate environmental impacts from the facilities.

III. On-site Radioactive Waste Burial Ground

Currently, this is not actively receiving radioactive waste materials for disposal. The last known burial occurred in 1974. The 1987 Soil and Groundwater Study will also evaluate the environmental impact from this facility.

IV. Research Laboratory Operations

All liquid and solid radioactive waste materials generated by LEHR laboratories are introduced into the UC Davis waste stream. These wastes are processed in accordance with campus, state, and federal regulations. In summary, dry wastes and animal carcasses are packaged and disposed of through a commercial vendor at a licensed low-level radioactive waste site operated by U.S. Ecology or incinerated at the campus' state-approved incinerator. Bulk liquid wastes are either solidified and shipped off-site to a licensed, low-level, radioactive waste site or disposed of via the sanitary sewerage system (by EH&S), according to state and campus regulations. Scintillation media is shipped off-site to Quadrex for disposal. The remaining LEHR radioactive waste is considered a mixed waste and is

being held on-site until ultimate disposition may be determined and approved by the DOE. Additionally, the volumes and activities of the waste described in this section were the subject of the 1987 DOE SWIMS reporting system (copy enclosed for your information).

There are routine atmospheric releases through laboratory fume hoods, however, the materials handled at any one time do not exceed campus levels for required stack monitoring.

References

1. California Radioactive Material License No. 1334-57 expiration date November 15, 1994

2. Title 17, California Radiation Control Regulations

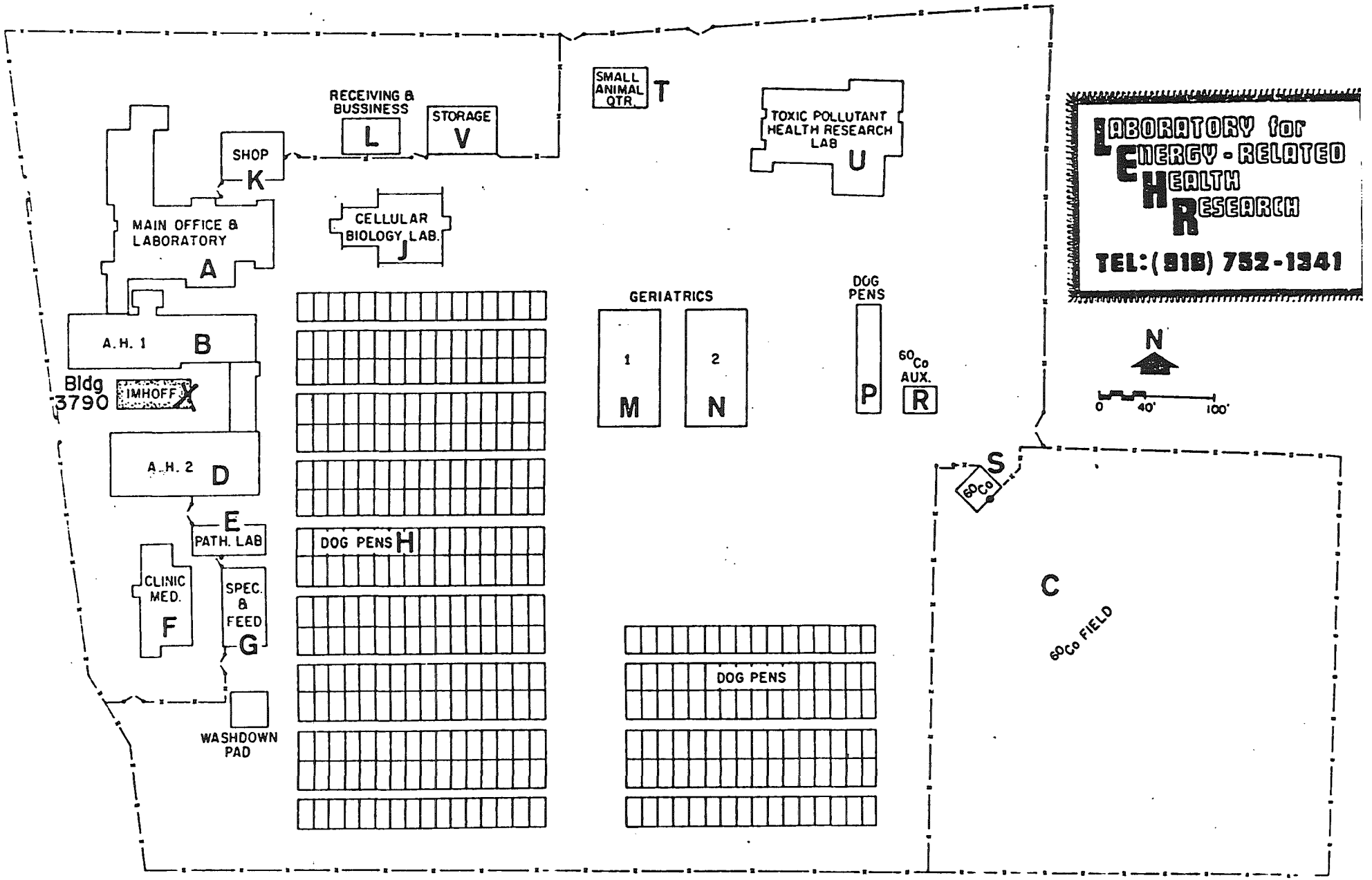
3. Title 10, Code of Federal Regulations

4. DOE ORDER 5484.1

5. LEHR Site Map (copy enclosed)

6. LEHR Environmental Monitoring Reports 1986, 1985, 1984, 1983, 1982, and 1981

7. 1987 DOE SWIMS Report (copy enclosed)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RECEIVING & BUSSINESS
L
STORAGE
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SHOP
K
MAIN OFFICE & LABORATORY
A
SMALL ANIMAL QTR.
T
TOXIC POLLUTANT HEALTH RESEARCH LAB
U
CELLULAR BIOLOGY LAB.
J
GERIATRICS
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40'
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A.H. 1
B
Bldg 3790
IMHOFF
A.H. 2
D
E
PATH. LAB
CLINIC MED.
F
SPEC. & FEED
G
WASHDOWN PAD
DOG PENS
H
S
60Co
C
60Co FIELD
DOG PENS

SCTION 0: BCADG 874A8
OPERATIONS OFFICE: SAN FRANCISCO OPERATIONS
CONTRACTOR: UNIVERSITY OF CALIFORNIA
SITE: UNIV OF CALIF AT DAVIS
OPERATION TYPE: GENERATION
FISCAL YEAR: 87
FISCAL QUARTER: 4
ACTUAL / FORECAST: ACTUAL
NUCLIDE CATEGORY: 8

CURIE QUANTITY (CURIES)	GROSS VOLUME (CUBIC METER)	GROSS WEIGHT (GRAMS)	TREATMENT	PRE-TREATMENT VOLUME (CUBIC METERS)	POST-TREATMENT VOLUME (CUBIC METERS)	PRE-TREATMENT WEIGHT (GRAMS)	POST-TREATMENT WEIGHT (GRAMS)
2.568E-02	6.598E+00	3.699E+06	C	3.738E+00	1.246E+00	5.307E+05	5.307E+05

NUCLIDE DESCRIPTION	INPUT AMOUNT	UNIT	NUCLIDE CURIES	NUCLIDE GRAMS	COMMENTS
C-14	5.900E-03	C	5.900E-03	1.323E-03	
H-3	2.100E-04	C	2.100E-04	2.176E-08	
I-125	1.900E-02	C	1.900E-02	1.092E-06	
PU-241	3.200E-04	C	3.200E-04	2.857E-06	
RA-226	1.000E-06	C	1.000E-06	1.012E-06	
SR-90	1.000E-06	C	1.000E-06	7.194E-09	
TH-228	1.500E-04	C	1.500E-04	1.825E-07	
TH-232	1.000E-04	C	1.000E-04	9.174E+02	

WASTE CODES	PERCENT COMBUSTIBLE	VOLUME (CUBIC METERS)	WEIGHT (GRAMS)	COMMENTS
RW	90	6.230E-01	3.289E+05	
DS	70	1.246E+00	5.307E+05	
NC	15	4.723E+00	2.833E+06	

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7. DOE Environmental Report File