U.S. Department of Energy

Finding of No Significant Impact

Cancer Research Institute

Loma Linda University Medical Center

AGENCY: U.S. Department of Energy

ACTION: Finding of No Significant Impact

SUMMARY: The Department of Energy has prepared an Environmental Assessment (EA) DOE/EA-0975, evaluating the construction, equipping and operation of the Cancer Research Institute at the Loma Linda University Medical Center on its campus in Loma Linda, California.

Based on the analysis in the EA, the DOE has determined that the proposed action does not constitute a major federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969 (NEPA). Therefore, the preparation of an Environmental Impact Statement is not required.

DESCRIPTION OF THE PROPOSED ACTION:

The DOE proposes to authorize the Loma Linda University Medical Center to proceed with the detailed design, construction, and equipping of the proposed Cancer Research Institute. House Report 102-177 which accompanied the FY 1992 Energy and Water Appropriations Act (PL 102-104), indicated that $10,000,000 had been included in DOE's FY 1992 appropriations to assist the Loma Linda University Medical Center with construction of the proposed facility.

The Cancer Research Institute facility is planned as a multi-story, 137,000 square foot building with a basement. The principal investigators and the specific circumstances of their research projects would determine the mix of research and other activities within a given area; however, basic research is expected to be conducted in areas such as; molecular biology, cell biology, genetic therapy and enigineering, monoclonal antibodies research, immunology, and protein biology.

ALTERNATIVES:

The DOE considered the no-action alternative. The University is committed to implementing the project without the DOE grant. Therefore, the environmental impacts of the no action alternative would be consistent with those of the proposed action.

The University considered other sites and locations on their campus for the proposed facility in their early planning for the project. The proposed site best satisfied the University's need, including cost effectiveness and consistency with the Master Plan of the University. All alternative sites were within several hundred feet of each other and would involve equivalent baseline conditions; therefore, environmental impacts of the proposed action at alternative sites would be consistent with those evaluated for the proposed site.

ENVIRONMENTAL IMPACTS:

No significant environmental impacts associated with the proposed construction, equipping and operations are anticipated. This finding of no significant impact for the proposed action is based on the following factors which are supported by information and analysis in the EA.

Impacts of Construction/Installation

None of the categories of sensitive resources (e.g. floodplain, wetland, Coastal Zone, endangered species, prime farmland) occur on or near the site. Demolition would include removal and disposal of an abandoned underground diesel storage tank from the site prior to construction to be managed according to appropriate standards and procedures. Air quality impacts would be associated with delivery trucks and on-site construction machinery, and would be low level and transient. Noise levels would be those conventionally associated with daytime construction, and are not likely to disrupt residences, workers or outdoor recreation. Traffic impact would not significantly affect local circulation or parking.

Impacts of Operations

Domestic and sanitary wastes would meet local requirements and can be readily accommodated by existing municipal services. Hazardous wastes would be produced by the various laboratory operations, and would likely consist of 400 lbs per year of flammable liquids, and 25 lbs of surplus chemicals that would be managed in accordance with the University's existing hazardous waste management program under an existing permit from the San Bernardino Department of Environmental and Health Services as "large quantity generator" under RCRA. Biological and medical waste would be properly treated at an on-site incinerator owned and operated by the University as permitted by the Southern California Air Quality Management District. Annual radioactive wastes consisting mainly of 30 millicuries in solid form, 15 millicuries liquid would be disposed of following established regulatory programs as part of the University's waste management and disposal program. The impact of CRI produced wastes on applicable university permits, on health of workers or the public, or on the environment would be insignificant.

Radiation Exposure: Radiation exposures as may be associated with the use of radionuclides would be regulated by the University's Radiation Safety Officer under appropriate federal and state regulatory programs to assure that exposures of personnel and the public are within safe limits as prescribed by Federal and state regulation. Expected personal exposures for approximately 20 involved personnel would be about 500 mrem per year (as compared with 5000 mrem/yr permitted by NRC regulations). Accordingly, the proposed CRI is not likely to result in significant levels of exposure.

Air Quality: Public exposure to radioactive air emissions resulting from venting of laboratory areas using radionuclides would be much less than allowed by EPA's National Emission Standards for Hazardous Air Pollutants. Toxic air emissions, mainly from laboratory solvents vented from laboratory areas would likewise result in public exposures much less than permitted under California regulation. The local air quality basin is non-attainment for CO, ozone, and particulates. The CRI will contribute minimal amounts of CO by increasing the load on two existing gas-fired cogeneration units by 2.7%. Accordingly the proposed CRI is not likely to have a significant impact on air quality.

Other Effects: Noise generated indoors or outdoors would be insignificant. Socioeconomic impacts would be positive but small in the scale compared to the University's current overall economic activity. Accident risk would be very low as evidenced by zero reportable accidents involving hazardous materials or radiation exposures at the University in the past ten years. The structure has been designed to experience only minor damage for an earthquake whose return period has been estimated to be 500 years. Overall, the incremental impacts of the project are small in relation to the ongoing impact of the University, and do not constitute significant cumulative impacts.

DETERMINATION:

Based on the analysis in the EA, the DOE has determined that the proposed Cancer Research Institute does not constitute a major Federal Action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969. Therefore, an Environmental Impact Statement on the Proposed Action is not required.

PUBLIC AVAILABILITY: Copies of this EA (DOE/EA-0975) are available from:

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for Cherri J. Langenfeld
Manager
Chicago Operations Office

DOE/EA-0975

ENVIRONMENTAL ASSESSMENT

CANCER RESEARCH INSTITUTE
LOMA LINDA UNIVERSITY MEDICAL CENTER

Prepared By

U.S. DEPARTMENT OF ENERGY

AUGUST, 1994

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1.0 DOCUMENT SUMMARY

The Department of Energy (DOE) proposes to authorize Loma Linda University Medical Center (LLUMC), Loma Linda, California, to design, construct and equip the Cancer Research Institute (CRI). DOE would fund $10 million of the total estimated $20,378,000 cost for the proposed CRI . The proposed facility would become a vital component of the Loma Linda University and Medical Center's goal to become a National Cancer Institute (NCI) designated comprehensive cancer center. The proposed CRI would facilitate the generation of laboratory cancer research, the transfer of research to the clinical setting, and the development of training and education. The proposed facility would be vital to the institution's mission of fighting cancer and would be recognized by the NCI as a comprehensive cancer center.

Under the no-action alternative, DOE would not authorize LLUMC to proceed with construction on any other action which would affect the environment or limit alternatives. Alternative sites on campus that were considered by the University were less desirable from the standpoint of several criteria including cost and fit with master planning objectives.

The campus site is not a part of wetlands, floodplain, coastal zones, or prime farmland. The site has an old underground diesel fuel storage tank but has no history of prior residential and commercial uses, and has no unique historical, cultural, archeological, or natural features.

The proposed construction would entail the removal of selected trees and the tank and would cause the transient environmental impacts typical of building erection, including temporary and intermittent daytime nuisance to nearby institutional units.

The proposed CRI would use radioactive and biological materials, as well as a number of hazardous chemicals including toxic, flammable, and corrosive laboratory solvents and reagents. All such uses would be consistent with applicable Federal, state, and local laws and regulations regarding management, waste disposal, and emissions to the air.

Public exposures to toxic and radioactive air emissions would be much less than permitted under applicable regulations and standards. The local air quality basin is non-attainment for carbon monoxide (CO), ozone, and particulates. The increased load on two existing gas-fired cogeneration units due to the CRI would be de minimis under EPA standards for determining conformity with implementation plans.

The storage, handling, laboratory use, and disposal of hazardous materials at the proposed CRI would be monitored and controlled by the University's existing Hazardous Chemical Waste Program following applicable state and federal regulations as supplemented by University manuals. The risk of accidents at the proposed Institute would be similar to the risk at other University laboratories using hazardous materials. The University has had no reportable fires or other accidents involving hazardous materials at its laboratories over the past ten years.

The proposed project would conform with all applicable federal, state, and local land-use plans and policies. In addition, the project involves an environmental review pursuant to the California Environmental Quality Act.

2.0 PURPOSE AND NEED FOR AGENCY ACTION

The Congress has expressed its intent that DOE provide funds to assist particular universities and facilities. The DOE's purpose in authorizing the University to proceed with this proposed project would be to carry out this congressional intent (described in Section 3.1) and to contribute to its own mission by supporting research programs such as those which would be conducted at Loma Linda University Medical Center.

Creation of the proposed CRI would provide the Loma Linda University Medical Center the ability to achieve the following goals (Ref 20):

- secure a National Cancer Institute (NCI) support grant and NCI designation as a Comprehensive Cancer Center;
- attract accomplished research personnel to the University and its Region (San Bernardino, Riverside, Inyo, and Mono Counties);
- provide a critical mass of integrated laboratory facilities;
- provide an environment conducive to collaborative research; and,
- promote interaction among research personnel and collaboration with clinicians in Loma Linda University Medical Center and Loma Linda University faculty.

3.0 DESCRIPTION OF ALTERNATIVES INCLUDING THE PROPOSED ACTION

3.1 Proposed Action

The DOE proposes to authorize Loma Linda University Medical Center to proceed with the detailed design, construction, and equipping of the proposed CRI. House Report 102-177 accompanying the fiscal year 1992 Energy and Water Appropriations Act (PL 102-104) indicated that $10,000,000 had been included in DOE's fiscal year 1992 appropriation to assist the Loma Linda University Medical Center with construction of the proposed CRI.

A grant was executed with the University on September 26, 1992; grant funds are available to the University for the limited purpose of performing preliminary studies, including the analysis necessary to conduct this environmental assessment. However, under the terms of the grant, the grantee may not initiate construction or take any other action which would affect the environment or limit alternatives until the DOE NEPA process has been completed and DOE has determined that such action should proceed.

3.2 Project Description

3.2.1 Construction Activities

The proposed CRI would be housed in a four-story, 137,000 square foot building that includes a basement. The structural system would consist of a steel frame and a concrete-filled metal deck (for the office and common areas) erected on pile foundations. The system would be built of concrete columns and shear walls with a waffle slab in the lab areas. Exterior materials would include poured-in-place concrete, exterior cement plaster, and aluminum/glass curtain walls. Colors and landscape details are designed to be consistent with the adjacent campus landscape (Refs. 1, 20). The vicinity of the Loma Linda campus is shown in Figure 1. The proposed site in relation to the LLUMC is shown in Figure 2. The site plan for the proposed CRI is provided in Figure 3. The 18-month construction project would entail site clearing, pile driving, erection of forms, pouring of concrete, dismantling of forms, interior finishing work, installation of utility services, and other conventional construction activities (Refs. 1, 29).

3.2.2 Operation Activities

The following kinds of basic research would be conducted: molecular biology, cell biology, genetic therapy and engineering, monoclonal antibodies research , pharmacology, immunology, and structural (protein) biology. The following facilities would support the basic research activities: equipment rooms (refrigerators, freezers, and centrifuges), instrument rooms (scintillation and nuclear magnetic resonance), cold rooms, and rooms for miscellaneous purposes (tissue culture storage, media preparation, glassware washing, and chemical storage) (Refs. 1, 20).

The principal investigators, and the specific circumstances of their research projects, would determine the mix of research and other activities within a given area. The spectrum of research anticipated would make extensive use of a wide variety of hazardous chemical and radiological substances, some of which would produce waste products for disposal and emissions to the air. These wastes and emissions are described in Section 5.2.

In addition, some research at the proposed CRI would occasionally employ the proton facility located in the existing proton treatment center in the Medical Center by sending material for irradiation by the proton beam staff only. This would involve no new construction or adaptation of the proton beam accelerator or treatment facility, nor would it significantly increase existing beam operations or exceed the programmed capacity of proton beam services (Refs. 1, 20).

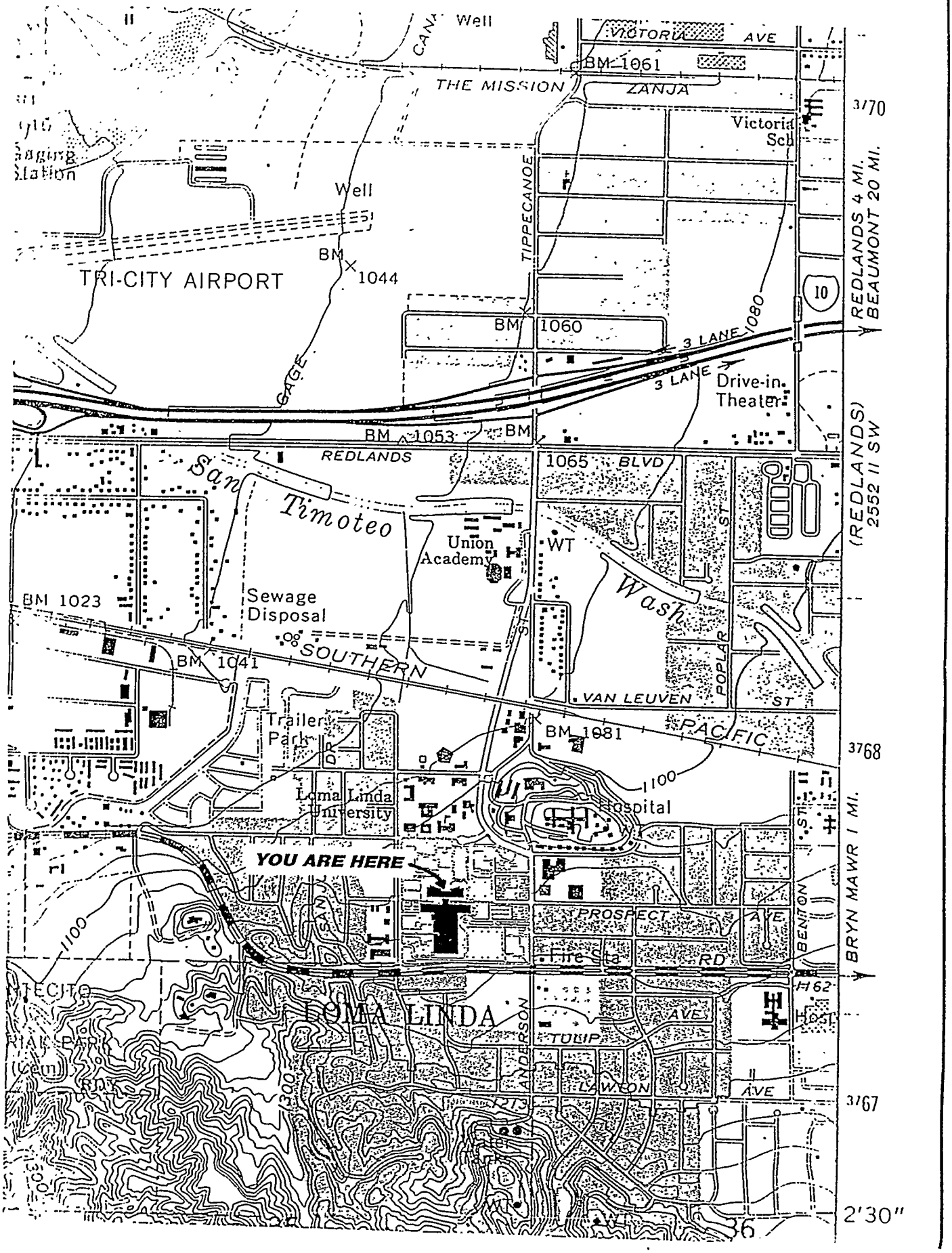

FIGURE 1 **SITE LOCATION**

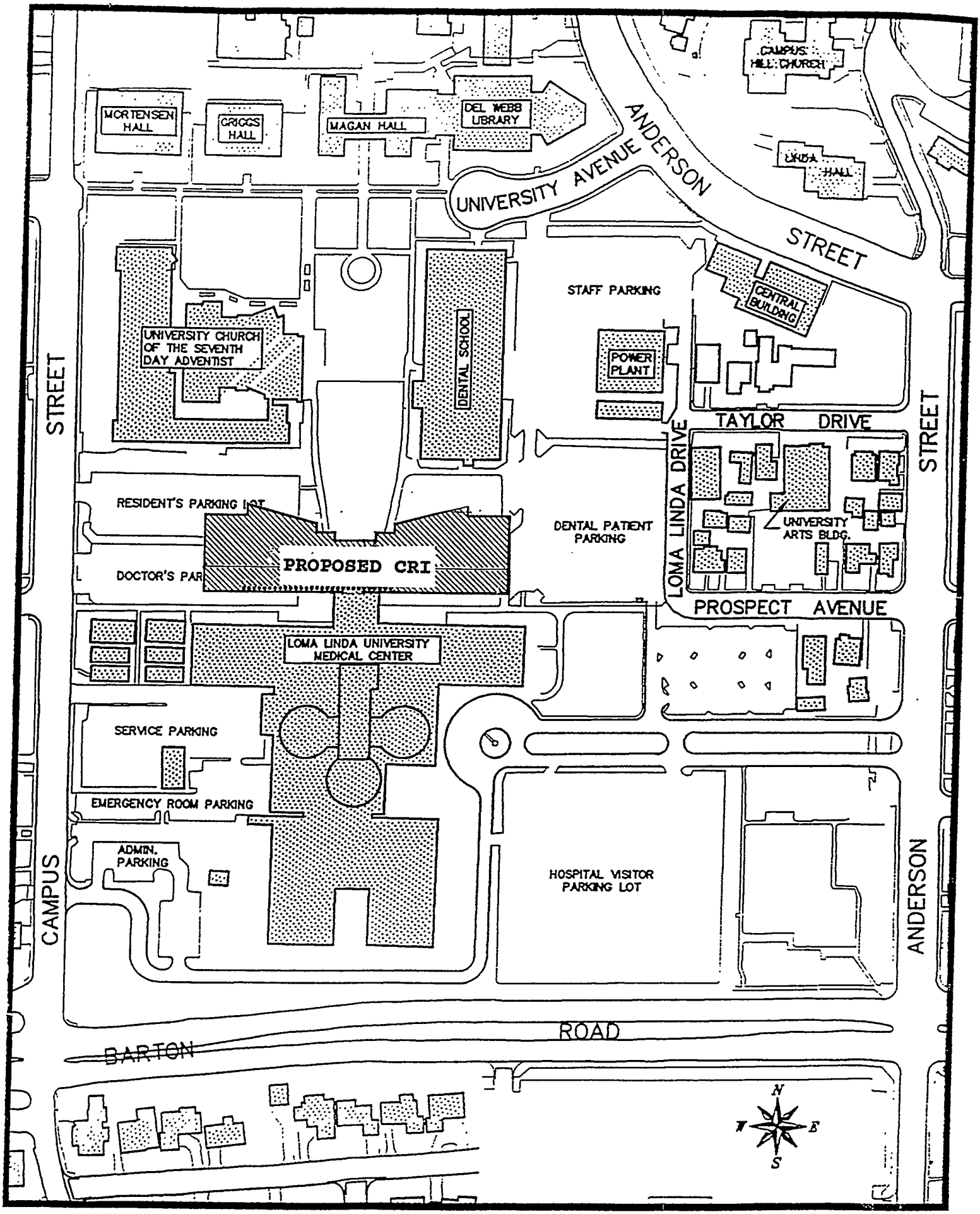

FIGURE 2 **LOMA LINDA UNIVERSITY MEDICAL CENTER**

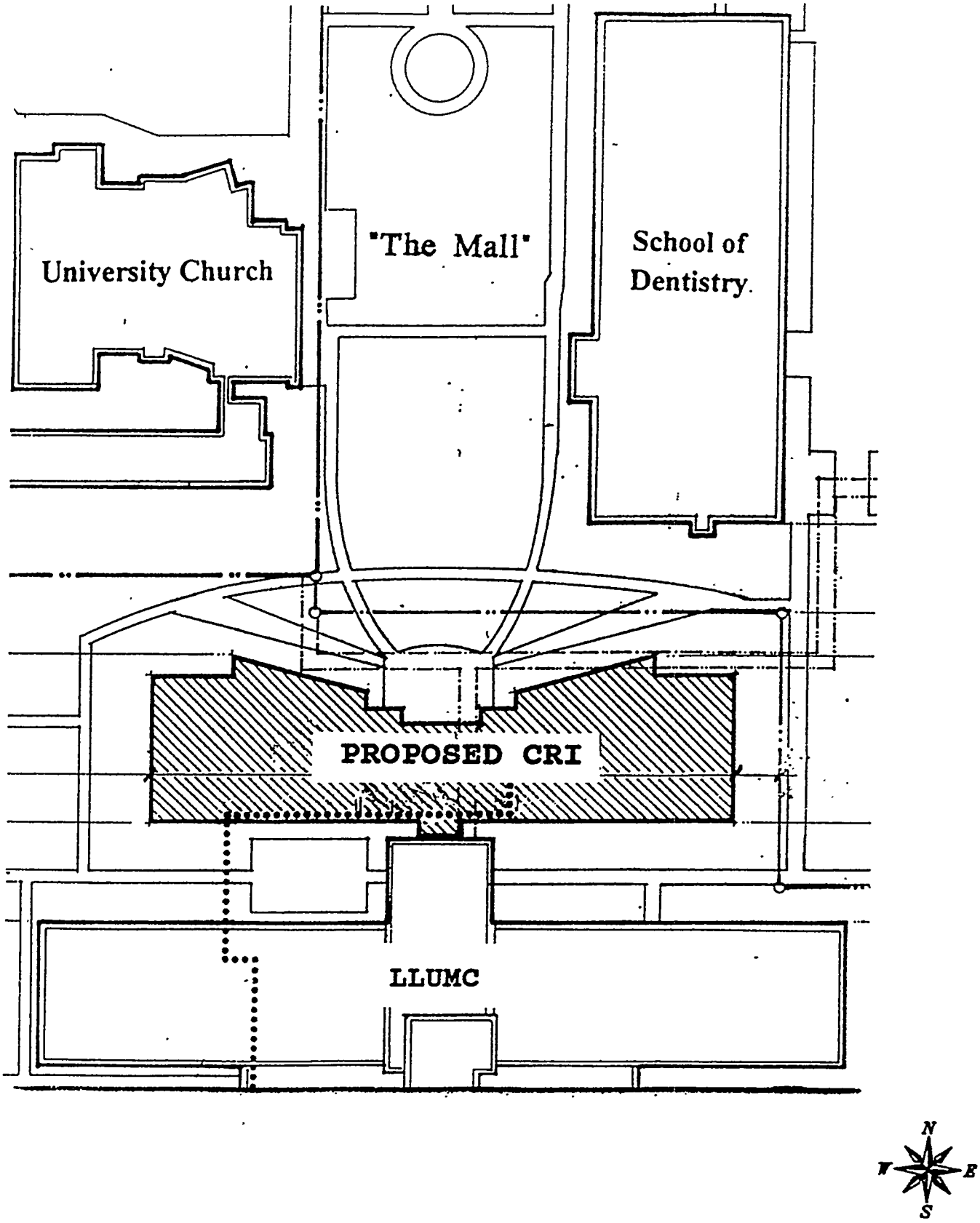

FIGURE 3 PROPOSED CANCER RESEARCH INSTITUTE

3.3 No Action Alternative

The proposed facility would become a vital component of the Loma Linda University Medical Center's (LLUMC) goal to become a National Cancer Institute (NCI) designated comprehensive cancer center. The proposed CRI would facilitate the generation of laboratory cancer research, the transfer of research to the clinical setting, and the development of training and educational programs. Moreover, it would provide hands-on experience to young scientists, physicians, and engineers in a world-class research setting. In addition to facilitating intramural research, the proposed facility would be made available to the wider regional and national research communities. It would also seek collaboration with industrial investigators. The proposed facility would be vital to the institution's mission of fighting cancer and would be recognized by the NCI as a comprehensive cancer center (Reference 1).

Under the no action alternative, the DOE would not authorize the Loma Linda University Medical Center to proceed with construction or any other action that would affect the environment or limit alternatives. The LLUMC is committed to implementing the project without the DOE grant and thus, the environmental impacts of the no action alternative would be consistent with those of the proposed action.

3.4 Site Alternatives

A LLUMC location subcommittee considered six on-campus site alternatives in mid 1993 in the course of planning the project following the congressional appropriation, but prior to grant award. This was done to validate the site selection which had been made prior to the congressional appropriation. The following criteria were scored in the course of planning the project: cost, adaptability to the LLUMC Master Plan, adaptability to the LLUMC Master Plan, current cancer research, current animal research, visibility, aesthetics, parking, ease of faculty usage, ease of students usage, ease of utilities coordination, gallery accessibility, funding source expectations, flexibility, and ease of construction. The proposed project site that best met these criteria was selected by the University (Ref. 20). Of the preceding, the following are specifically "environmental" criteria: visibility, aesthetics, parking, ease of faculty useage, ease of student usage, and ease of coordination of utilities.

The alternative sites are all within several hundred feet of each other. All would involve approximately equivalent environmental baseline conditions in terms of soil and foundation conditions and the nature of the immediate environment. The environmental consequences of any of the alternatives would be equivalent.

4.0 THE AFFECTED ENVIRONMENT

4.1 Site Description

The proposed CRI would be constructed on a site offering 111,000 square feet of building and footprint and landscape space for the proposed building directly north of the existing Loma Linda University Medical Center building. The campus, the area surrounding the construction site includes other campus buildings,

walkways, landscaped areas, parking lots, and infrastructure installations such as water, sewer, and power conduits (see Figures 1, 2, and 3)(Ref. 1).

The lot slopes to the north at a grade of 4%. The only local wildlife consists of small mammals and birds that inhabit urban or developed settings (e.g., pigeons, sparrows, jays, and squirrels). Palm trees measuring up to 24 inches in diameter are located in the southern portion of the proposed site. Small trees and shrubs are also present at several locations on the site.

The proposed project site and surrounding land use is zoned "I" (Institutional) by the City of Linda Loma General Plan. This zoning has been in place since incorporation of the City of Loma Linda in 1970. The proposed site is completely bounded by institutional property and buildings. The proposed site for the proposed CRI is part of the campus master plan.

4.2 Air Quality

The area is currently non-attainment for CO, particulates and ozone.

4.3 Surface/Ground Water

The site does not have surface water. The Bunker Hill Basin aquifer underlies the proposed site.

4.4 Soil

The underlying soil is San Emigdio fine sandy loam. The soil is a Holocene-age alluvium with a depth at least several hundred feet. No bedrock or groundwater was encountered in site borings. Some construction fill materials associated with an old construction ramp when the Medical Center was constructed was encountered, as well as some fill associated with a possible underground fuel tank. (Ref 1, Appendix B)

5.0 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

5.1 Construction Impacts

5.1.1 Sensitive Resources

5.1.1.1 Historic/Archeological

There are no known archeological or cultural resources associated with the proposed site (Ref. 2).

5.1.1.2 Federal/State-Listed or Proposed Protected Species or Critical Habitats

There are no federal or state listed or proposed protected species or critical habitats known to be associated with the proposed site (Refs. 3, 4, 5).

5.1.1.3 Floodplain/Wetlands/Coastal Zone

The proposed site does not lie in a designated floodplain or wetland nor are there wetlands which could be affected by the site by virtue of down slope location (Refs. 6, 7), nor does it lie in the coastal zone (Ref. 8).

5.1.1.4 National Forests, Parks, Trails

No State or national forests, parks, trails, scenic rivers, or other similarly protected natural resources are associated with the proposed site and its vicinity (Ref. 1).

5.1.1.5 Prime Farmland

The proposed site is part of the University Campus that is zoned for Institutional use and does not meet the U.S. Department of Agriculture definition for prime or unique farmland.

5.1.1.6 Special Sources of Water

The Bunker Hill Basin aquifer underlying the proposed site, is not a designated sole-source aquifer by the Environmental Protection Agency (Ref. 21). The proposed project under planned operation would not pose a threat to the aquifer since wells, underground injection, or other activities that could threaten aquifer water quality are not part of the proposed project (Ref. 21).

5.1.2 Erosion/Run-Off

During excavation and construction, soil erosion would be controlled by channeling runoff to ponding areas on site for settling of entrained materials. After settling, the clarified water would then be pumped into the existing campus storm drainage system. Off-site storm water is currently controlled by a campus drainage system that is designed to divert runoff from the campus directly to the storm drain. No storm water permit would be required for the site as it comprises less than 5 acres. The proposed project site is not within any identified floodway or drainage channels (Ref. 1).

5.1.3 Demolition/Construction Waste Disposal

5.1.3.1 Asbestos Removal

No friable asbestos or potential exposure to asbestos would be encountered during project execution with the possible exception of removal of old transite water pipe if unexpectedly encountered during excavation and tie-in of new utility connections to existing campus utility services. Any encountered asbestos-containing materials would be removed and disposed of by the University's Office of Hazardous Material Safety in accordance with the applicable laws and regulations (Ref. 1).

5.1.3.2 Excavation Waste

Approximately 17,000 cubic yards of soil would be excavated from the proposed site. The soil of the proposed site is currently not known to be contaminated and would be stockpiled at an on-campus site for use as future construction material. In addition, as part of this project, the University would develop a soil-sampling plan under County supervision to identify potentially contaminated soil, and to dispose of such soil in accordance with applicable laws and regulations (Ref. 27).

5.1.3.3 Demolition Waste

Other than an abandoned underground fuel storage tank and possibly old transite water pipe at the proposed site that would have to be removed there would be no demolition waste as there is no previous structure to be demolished as part of the project. The tank would be recycled or otherwise disposed of pursuant to applicable local regulations.

5.1.3.4 Construction Waste

There would be approximately 3600-3800 cubic yards of construction waste generated by building the proposed project. The composition of the waste would be as follows: wood (recyclable) 15-20%; cardboard (recyclable) 0-5%; concrete masonry 40%, metals (partially recyclable) 20%; and plastics/paper (partially recyclable) 20% (Ref. 1).

The general trash and debris would be transported to the San Bernardino County Soil Waste Management Landfill. Recyclable materials is taken to the San Bernardino County Museum Community Recycling Project, and to Colton Metals, a waste acceptance firm (Ref. 1).

5.1.4 Air Quality Impacts

Emissions from the proposed construction project would be associated with the traffic to and from the site, and with the operation of on-site equipment such as excavating machinery, compressors, etc. Air quality would be regulated by the South Coast Air Quality Management District (SCAQMD), a regional regulatory body chartered by the State of California. Construction equipment operators would be required to provide records of maintenance and fuel consumption, as the SCAQMD has been empowered to levy an emissions tax on improperly maintained vehicles (Ref. 1).

Dust generated during the proposed construction would be mitigated by paved parking lot that is planned to be a staging area. Standard water spray methods would be used to mitigate dust otherwise created during excavation, pile driving, etc. (Ref. 1).

The SCAQMD grants air-emission permits to individual pieces of equipment rather than to the facility as a whole. Individual permits for equipment at the proposed CRI would be obtained prior to their operation. The proposed CRI would not change the status of any existing permits (Ref. 20).

5.1.5 Noise

The proposed construction would produce only those temporary noise disturbances associated with construction machinery and construction-related traffic. Typical machinery would include bulldozers, a small mobile crane, air compressors, and a cement mixer. Piles would be drilled and poured rather than driven to reduce noise (Ref. 4). Typical noise levels for a bulldozer would be 107 decibels (db) at the source, 87-102 db at 50 feet (ft), 81-96 db at 100 ft, 75-90 db at 200 ft, and 69-84 db at 400 ft. These levels compare to the pain threshold of 125 db, and an annoyance threshold of 65 db. At these levels, persons outdoors within a 400 feet radius of the source (assuming no topographic attenuation) would experience noise in the annoyance range of 65 to 125 db. For persons indoors, the noise levels would be considerably attenuated depending upon the acoustical insulation properties of walls and windows. Furthermore, the sources of noise would be intermittent and temporary during excavation, pile construction, land grading, and structure assembly. Construction activities involving major sources of noise would be restricted to the daytime (Refs. 1, 11, 20). Noise receptors would include persons working at the Dental School, in Church offices, and at the Medical Center. Distances to these receptors can be gaged by reference to Figure 2. The noise receptors closest to the construction site would include the Medical Center, the Dental School, and the University Church as shown on Figure 3.

5.1.6 Transportation Impacts

5.1.6.1 Traffic And Parking

The traffic load generated by the proposed construction would be approximately 300 vehicle trips per day, in addition to a normal traffic load on campus streets of 2,900 vehicles per day (Ref. 28). The principal access, Barton Road, normally has a load of approximately 22,000 vehicles per day (Ref. 10).

The City of Loma Linda, Department of Community Development reviewed the parking and the traffic implications of the proposed project. The Department reports that a comprehensive parking study for the University, addressing parking needs over the next five years, would be conducted taking the proposed CRI into account (Ref. 17). Commenting on traffic, the Department reports "No mitigation measures are recommended with the proposed development" although it states "However, traffic signal timing should be modified and will be included in the pending citywide State funded Fuel Efficient Signal Management Study to include the modification of the signal timing at affected intersections" (Ref. 18).

The proposed site is not currently used, consequently there is no displacement of University activities associated with the proposed construction. Since an existing parking lot would be used as a staging area, the construction plan includes temporary parking arrangements for medical staff and employees at existing alternative parking locations on campus. After construction all parking lots will be restored to full service (Ref. 1).

5.1.6.2 Heliport Air Traffic

There is a potential impact on the operation of a local heliport from crane operations during construction. This impact would be mitigated by measures such as obstruction lighting and loose materials control (Ref. 19).

The California Department of Transportation concluded that the proposed finished building would not have an impact on the existing north heliport (Ref. 19).

5.1.6.3 Land Use And Zoning

The City of Loma Linda Planning Commission recommended approval of the proposed project, and the City Council approved (Ref. 33).

5.2 Operation Impacts

5.2.1 Domestic Waste

The University currently produces a total of 11,500 cubic yards of solid waste annually for collection by the University Housekeeping department. It is picked up by Browning Ferris Industries, and transported to the San Timeoteo Canyon landfill operated by the Norcal Corporation for the Department of Solid Waste Management, County of San Bernardino (Refs. 1, 20).

The proposed project would produce approximately 1000 cubic yards of additional domestic solid waste annually.

5.2.2 Sanitary Waste

The proposed project would produce approximately 4,800 gallons per day of sanitary sewage for discharge to the City of Loma Linda collection and treatment systems. This amount compares with 484,500 gallons per day produced by the entire University (Ref. 34). The City reports that the incremental load can be readily accommodated (Refs. 12, 24).

Approximately 7 pounds (lbs) per year of neutralized chemical waste (see section 5.2.3) would be discharged by the proposed CRI in addition to about 125 lbs by the University to the sanitary sewer pursuant to an Industrial User Permit covering the University. The permit allows 100,000 gallons per day of industrial discharge and specifies the limits shown on Table 5.1 (Ref. 20):

Table 5.1 Daily Minimum or Monthly Average Neutralized Chemical Waste Discharged by the proposed CRI

Parameter	Daily Maximum or Monthly Average (mg/l)
Biochemical Oxygen Demand	300
Chloride	210
Sodium	210
Mercury	0.1
pH	5-11
Total Chromium	2.13
Phenols	2.13
Suspended Solids	300
Silver	2.5
Sulfate	180
Total Dissolved Solids	500

For example, if the daily maximum of 500 mg/l of dissolved solids were discharged with the maximum allowable flow of 100,000 gallons, then about 417 lbs of total dissolved solids would be permitted each day (152,205 lbs per year). The project discharges are thus much smaller than the allowed amounts by some orders of magnitude.

5.2.3 Hazardous Waste

5.2.3.1 Gross Quantities and Sources

The proposed project would add approximately 400 gallons of flammable liquids per year to the University's 3,000 gallons per year of flammable liquid waste including acetone, toluene, and xylene.

The proposed project would add approximately 25 lbs per year of surplus chemicals to the existing University total of 500 lbs per year. These materials are segregated by their hazardous characteristics (acids, bases, heavy metals, sharp objects, etc.) and are either neutralized on site with subsequent discharge to the sanitary sewer (as permitted), or packaged and shipped to an Resource Conservation and Recovery Act (RCRA) permitted treatment, storage, or disposal facility (TSDF), Rollins OPC. Of the proposed CRI's 25 lbs, approximately 7 lbs would be neutralized for subsequent discharge to the sanitary sewer (see Section 5.2.2).

5.2.3.2 Methods of Storage and Handling

The University is permitted by the County of San Bernardino Department of Environmental Health Services (DEHS) through a Memorandum of Understanding with the California Environmental Protection Agency Department of Toxic Substances Control, to handle hazardous materials, generate hazardous wastes, operate underground storage tanks, and generate and treat medical wastes. Under the DEHS permit program the University has an establishment number of 86008977 and is classified as a "large quantity generator" with no quantity limits for either generation or storage (Refs. 1, 20, 25).

The University has an EPA Identification Number of CAT080030877 and a Board Equalization Number of HFHQ38001867. These numbers must appear on all manifests for shipment of hazardous wastes from this facility to a licensed TSDF (Ref. 20). Wastes are removed by licensed contractors such as NSSI/Source who remove mixed wastes (Ref. 22).

Details on methods of storage and handling for each of the hazardous wastes under the permit are provided by the University Hazardous Chemical Waste Program Guidelines and Procedures (Appendix A of Ref 1).

5.2.4 Biological/Medical Waste

The proposed facility would produce approximately 26,000 lbs per year of medical wastes in the form of research animals and laboratory wastes (cultures, Petri dishes, pipettes, biologically contaminated glassware). This amount compares with the 170,000 lbs currently produced by the University annually (Ref. 20).

Currently the University's medical waste is managed on site in accordance with approved practices described in University Guidelines and Procedures (Ref. 13) in accordance with the California Medical Waste Management Act. The current waste is treated at an incinerator that is owned and operated by the University (see section 5.2.7.5) (Ref. 20).

These wastes are picked up daily to limit amount in storage. These wastes are assumed to be infectious and are managed in accordance with the California Medical Waste Management Act. The proposed CRI waste would be merged with the University's and treated at the incinerator which has a capacity of 292,000 lbs per year.

5.2.5 Radioactive and Mixed Hazardous/Radioactive Waste

5.2.5.1 Gross Quantities and Sources

The annual quantities that would be produced by the proposed project would be less than 15 millicurie (mCi) of various isotopes in solid form with a half-life of less than 60 days, and a similar amount of solids exceeding a 60 day half-life. There would be no more than an additional 15 mCi as aqueous liquids, and less than 2 mCi as mixed waste. These amounts compare with the current University totals of 100 mCi solid, 100 mCi aqueous liquid, and 10 mCi mixed waste (Refs. 1, 20, 30).

Over the last ten years the University has not produced any regulated mixed waste. In the event that research to take place at the proposed CRI produces mixed waste, it would be shipped by a permitted broker to a permitted disposal facility such as NSSI/Sources/Services, Inc.

The source of radioactive wastes are the same as for biological medical waste described in section 5.2.4. They result from the administration of radionuclides to human patients and to animal subjects for purposes of treatment, diagnosis and study of processes. The spent radionuclides reside in blood, other body fluids and tissues which are separated from that portion of the biological/medical waste stream which does not contain radionuclides.

5.2.5.2 Disposal

Radioactive waste from the proposed facility would be handled and disposed of by the LLUMC's Office of Radiation Safety, in accordance with the requirements specified in the University's Radioactive Materials License #0060-36 (Ref. 14), in the LLUMC Radiation Safety Manual, and in California Code of Regulations (CCR) Title 17.

These wastes would be properly packaged for storage and ultimate transfer to a permitted waste disposal contractor, NSSI/Sources & Services (Ref. 22).

5.2.5.3 Health and Safety

5.2.6 Radioactive Exposures

5.2.6.1 Materials Covered by License

The proposed CRI would involve handling of the radioactive materials shown on Table 5.2 with an external estimated exposure being typically less than 2 milliroentgen equivalent man (mrem) (a unit of dose) per hour at one meter (Refs. 1, 4, 20, 29, 30).

Research operations at the proposed facility would employ the existing proton beam at the proton treatment center. The proposed CRI personnel would experience no potential exposure from this source since materials would be irradiated by the proton beam staff only. Radiation exposure to the proton beam staff is controlled by the Loma Linda University Radiation Safety Program, which includes a badging and monitoring program (Ref. 15).

Table 5.2 Radioactive Waste Handled by the proposed Cancer Research Institute

Isotope	Half Life	Expected Average Annual Use (millicurie)
Carbon-14	5730 years	100
Calcium-45	163 days	10
Cobalt-57	271 days	10
Chromium-51	28 days	10
Gadolinium-153	242 days	10
Hydrogen-3	12.2 years	100
Iodine-125	60 days	10
Indium-111	2.8 days	10
Phosphorus-32	14 days	100
Rubidium-86	18.7 days	10
Sulfur-35	88 days	100
Yttrium-90	2.6 days	10

5.2.6.2 Radiation Control

The proposed CRI would not cause the University to exceed any of the above license limits. Radiation exposures to the above isotopes would be monitored and controlled in accordance with the applicable laws and regulations (10 Code of Federal Regulations (CFR), Part 20 and CCR Title 17), as specified in the University's broad-scope radioactive materials license (#0060-36) and as described in the Radiation Safety Manual (14,15). Exposures would be monitored via internal and external dosimetry for any personnel whose exposure is likely to exceed 10% of the maximum permissible annual dose of 5 rem (5000 mrem) per year per 10 CFR Part 20.

The regulation ((10 CFR 20.107) states: "Nothing in the regulations in this part shall be interpreted as limiting the intentional exposure of patients to radiation for the purposes of medical diagnosis or medical therapy". The following section deals with issues related to radioactive exposure of the public.

5.2.6.3 Training

Training in the management of radionuclides and in limiting exposure to radioactivity is provided by the University in accordance with its Radioactive Material License (Ref 14) and the Radiation Safety Manual (Ref 15).

5.2.6.4 History of Radiation Exposures

Personnel currently working at LLUMC in similar capacities typically receive less than 500 mrem per year.

5.2.6.5 Health Effects of Radiation Exposure

The dose-to-risk conversion factor for estimating cancer deaths from exposure to low doses of ionizing radiation are 500 cancer deaths per million person rem for the general population and 400 for workers. (Source: Preamble to 56 Federal Register 23363, May 21, 1991). The 500 mrem dose indicated above translates to 200 cancer deaths per million persons exposed at that level.

Approximately 20 persons will have jobs exposing them to ionizing radiation and would accordingly be badged. The proportional number of expected cancer deaths for a population of 20 would be 0.004 per year, and over a 100 year project life time would likely produce 0.4 additional deaths.

5.2.7 Air Emissions

5.2.7.1 Radioactive

The University has identified 22 radionuclides that would be subject to radionuclide-exposure limits via air emissions per 40 CFR 61 Section I, National Emission Standards for Hazardous Air Pollutants (NESHAP): Carbon-14 (C-14), Calcium-45 (Ca-45), Cobalt-57 (Co-57), Cobalt-58, Chromium-51 (Cr-51), Gallium-67, Gadolinium-153 (Gd-153), Hydrogen-3 (H-3), Iodine-123, Iodine-125 (I-125), Iodine-131, Indium-111, Molybdenum-99, Phosphorus-32 (P-32), Rubidium-86 (Rb-86), Sulfur-35 (S-35), Strontium-89, Technetium-99m, Thallium-201, Tin-113, Xenon-133, Yttrium-90 (Y-90). Those emitted by the proposed CRI are C-14, Ca-45, Co-57, Cr-51, Gd-153, H-3, I-125, P-32, Rb-86, S-35, and Y-90.

The NESHAP allowable exposure limit to the public is 10 mrem per year for radionuclides other than iodine which has a 3 mrem per year limit. Compliance with the NESHAP standards in this case is based on meeting a de minimis standard: i.e. the University as a whole (including the proposed CRI) not exceeding maximum possession quantities as set in Appendix E, Table 1 of the regulation (Refs. 20, 29). Radionuclides meeting the possession criteria are not subject to NESHAP more rigorous tests of compliance such as dispersion modelling. These results are shown on Table 5.3

For each radionuclide listed, the estimated University possession including the proposed CRI amounts ranges up to several orders of magnitude less than the possession limit per 40 CFR 61 Subpart I, Appendix E. Thus, even if the proposed CRI were to possess amounts which were several fold more than stated above, it would not threaten violation of the NESHAP standards which have been established with an adequate margin of safety to protect the health of the public.

All laboratory hoods at the proposed CRI would be equipped with appropriate filters or scrubbers to minimize any residual releases of these materials to the environment.

Table 5.3 Estimated University Possession Limit of Radionuclides

RADIONUCLIDE	TOTAL UNIVERSITY POSSESSION (Curies)	POSSESSION LIMIT PER 40 CFR 61, APPENDIX E (Curies)
C-14	0.00375	290
Ca-45	0.002	58
Co-57	0.011	1.5
Cr-51	0.016	63
Gd-153	0.00025	2
H-3	0.0943	15,000
I-125	0.0192	6.2
In-111	0.9441	49
P-32	0.1233	17
Rb-86	0.002	17
S-35	0.014	75
Y-90	0.003	110

5.2.7.2. Criteria Pollutants

To produce steam and hot water on campus, and to meet a portion of the electricity demand, the University maintains two co-generation units (both gas fired with diesel capability in case of emergency loss of gas supply) with a unit load of 59,353 million BTU (mmBTU) per hour. These units drive a 6 megawatt electrical generator. NOx emissions when using natural gas for the units are 4.7 lbs/hr and 2.48 lbs/hr respectively. CO emissions are 4.45 lbs/hr and 0.72 lbs/hr respectively. (Ref 38). There are an additional two boilers of 70,600 mmBTU capacity. (Ref 4)

The proposed facility would have an approximate thermal load of 3,150 mmBTU per hour. This thermal load, if it is met by the two co-generation units, would constitute a demand of 2.7% of capacity. For estimating purposes the units are conservatively assumed to operate 24 hours per day.

The expected increment of criteria emissions would be approximately: follows (Ref 38):

	Total Emissions unit 1 tons/day	unit 2 tons/day	Increment of CRI Demand unit 1 tons/day	unit 2 tons/day
NOx	.056	.030	.0015	.0010
CO	.053	.0086	.0014	.0002
SOx	negligible			
Particulates	negligible			
Ozone: 0	negligible			

These emissions can be compared with emission limits permitted by the South Coast Air Quality Management District (SCAQMD) for the co-generation units.

Table 5.4 Emission Limits permitted by the South Coast Air Quality Management District

Parameter	Gas Unit (lbs/hour) (tons/day)	Diesel Unit (lbs/hour) (tons/day)
NOx	191 (2.3)	229 (2.75)
Sulphur Oxides	2 (0.24)	74 (0.29)
CO	182 (2.18)	466 (5.6)
Organics	36 (0.43)	36 (0.43)
Particulates	36 (0.43)	62 (0.74)

Reported emissions are well within the permit limits for the routine gas operations and the proposed facility would not require a revisions of these permits.

The area is currently in a non-attainment zone for CO, particulates, and ozone. The percentage of days in which the State 8 hour standard on CO is exceeded is less than 10%. The 1 hour ozone standard is exceeded 45% of days and the 24 hour particulates standard is exceeded 70% of days (Ref 39).

While the proposed project is in a non-attainment zone, no private emitter such as the University would be responsible for the regulatory implications of non-attainment. Nor does "non-attainment" with the standard necessarily imply "non-compliance" with the Clean Air Act. Non-compliance would be associated with failure of the SCAQMD to implement certain air quality control programs. In any event, operation of the proposed project, by itself, would not threaten to

violate the Clean Air Act.

The Draft 1994 Air Quality Management Plan prepared by the Southern California Air Quality Management District, reports the following baseline and projected emissions:

	1990 Baseline (tons/day)	1996 Projection (tons/day)
VOC*	1452	1103
S	556	523
M	896	580
NOx	1332	1097
S	219	163
M	1113	934
CO	6749	4912
S	114	125
M	6335	4787
SOx	120	108
S	38	40
M	82	68
PM10	833	878
S	742	796
M	91	82

S = Stationary Sources
M = Mobil Sources
* Volatile Organic Compounds
** Particulate Matter greater than 10 microns

A comparison of incremental emissions from the proposed CRI with air quality baseline and projected values for each criteria pollutant shows an extremely small contribution. The emissions are clearly de minimis as defined by the EPA requirements for determining conformity with State or Federal implementation plans in non attainment areas 40CFR 51.852(b). The net impact on air quality should also consider that cogeneration units, by producing electricity, are creating a corresponding reduction in air quality emissions at utility boiler plants elswhere in the district.

5.2.7.3 Hazardous Air Pollutants (NESHAPS)

The University reports releases of a number of toxic compounds to the air, any of which may also be released by the proposed CRI. None of these have specified exposure standards per NESHAP. This section describes those releases as reported by the University to the SCAQMD.

5.2.7.3.1 Sources

Within the SCAQMD, 33 toxic compound releases are regulated under AB2588 "Air Toxics Hot Spots Information and Assessment Plan." Accordingly, the University has disclosed that 33 toxic compounds are released to the air. The amounts released are not precisely known, but the University has satisfied the SCAQMD that none of the reportable quantity limits shown on Table 5.5 would be exceeded. The addition of the proposed CRI would add up to 10% increase over existing level, but would not alter non-reportable status. (Ref 20)

With the exception of Benzene (18 lbs), University possession of the 33 substances were below the regulated reportable quantity. Most of the benzene emissions are associated with the on-campus use of gasoline for motor vehicles and the proposed CRI would not add any benzene emissions. The University also reports the emission of less than 10 lbs of Mercury to the air, which is below the accuracy threshold for reporting requirements. The proposed CRI would not emit any mercury (Ref 20).

In addition to the above, the SCAQMD has made a list of substances for which a facility must report production, use, or other presence. The University has reported that the following substance are used: Aminopterin; Cyclophosphamide; Hydrazine Sulfate; Lead Acetate; Mineral Oil; Mitomycin C; Toluidine Blue O; and Trypan Blue (Ref. 20).

Quantitative estimates of emissions to the air of any of the above (if any) are not available as they are not required by the SCAQMD. The proposed CRI may contribute to these emissions.

5.2.7.3.2 Impact On Air Quality

Based on this information, the proposed CRI would not threaten to violate California air quality regulations which are more rigorous than the Federal NESHAP standards (40 CFR 61). Possession amounts less than reportable quantities are associated with very high regulatory confidence that potential emissions would not have an adverse impact on air quality. In most cases, the level of emissions associated with the possession limits would not be detectable by standard air quality monitoring methods. Accordingly, these emissions would not have an adverse impact on air quality.

Table 5.5 Compounds and Reportable Quantities per Regulation

Compound	Reportable Quantity (lbs/year)
Acrylamide	100
Benzene	10
Benzidine	10
Cadmium Chloride	1
Cadmium Iodide	1
Carbon Tetrachloride	10
Chloramphenicol	100
Chloroform	10
Chromic Acid	100
Chromium Trioxide	100
Creosote	100
Cresol Red	100
Cycloheximide	100
Glutaraldehyde	100
Hydrogen Chloride	100
Lead Nitrate	10
Lead Sulfide	10
Mercuric Chloride	10
Mercury	10
Methanol	100
Methyl Methacrylate	100
Nitrobenzene	100
p-Dimethylamino Azobenzene	100
Phenol	100
Propylene	100
Selenium Sulfide	100
Sodium Hydroxide	100
Thioacedamide	100
Toluene	100
Trichlorethylene	100
Xylene	100
Xylene Cyanide	100
1,4-Dioxane	100

5.2.7.3.3 Health Effects

The Federal and California air quality regulations are based in part on potential health effects from public exposure to the toxic emissions. Since the cumulative emission levels associated with the proposed CRI and the University are too small to be computed or monitored (per the reportable quantity criterion), it may be concluded that there would be not adverse health effects. In the absence of federal standards for public exposure to most toxic substances, the American Conference of Governmental Industrial Hygienists (ACGIH) has established voluntary Threshold Limit Values (TLV) and Biological Exposure Indices (Ref 34).

Geraghty and Miller (Ref 35) have analyzed exposure of the public in relation to ACGIH recommended TLVs to some of the toxic emissions reported in Table 5.5 using an atmospheric dispersion model. The level of emissions in grams per second (g/sec) which would cause exposure at the TLV level would be as follows:

Table 5.6. Emission Rates

Parameter	Emission Rate (g/sec)
Chloroform	1,802
Methanol	36,153
Trichlorethylene	12,468
Xylene	15,961

The above may be compared with a maximum University proposed CRI emission level of 0.0014 grams per second (equivalent to 100 lbs per year), conservatively assuming that the entire possession would be released to the atmosphere. The proposed emissions are many orders of magnitude less than levels which would cause adverse health effects according the ACGIH TLVs. Extrapolating the Geraghty and Miller results to the other releases reported for the proposed CRI reveals that in all cases the maximum potential release would be orders of magnitude less than the corresponding TLVs. Accordingly, it can be concluded that the cumulative proposed CRI and University toxic emissions would have no adverse health effects.

While health effects to workers from exposure to the toxic releases have not been quantitatively analyzed, the small quantities involved are extremely unlikely to cause adverse health effect. All laboratories at the University are designed with standard ventilation systems which continually remove toxic substances from the indoor working environment which would ensure that ambient work place concentrations of these substances would be maintained at insignificant levels in relation to the TLV levels at which health concerns would be encountered.

5.2.7.5 Pathological Waste Incinerator

The University operates a pathological waste incinerator that has a treatment capacity of 292,000 lbs per year. The incinerator is licensed by the SCAQMD (Permit # D03504) and is monitored for compliance with air quality limits for dioxin and furans (SCAQMD Rule 1406) as well as for compliance with criteria emission levels and chloride emissions (California Health and Safety code) (Ref. 26). These emissions are in addition to those reported in section 5.2.7.3. The current University load on the incinerator is approximately 200,000 lbs per year and the proposed CRI would add approximately 26,000 lbs per year. There is room for additional incinerator capacity in the future. Ash is disposed of in a licensed landfill through a licensed waste contractor.

5.2.8 Noise

Sources of noise in the proposed facility would include conventional heating, ventilating and air conditioning machinery, and conduits. The proposed CRI would include standard noise absorption enclosures and rooms (engineering controls) in the interior of the building. Pumps, motors, and compressors would be isolated

from building work areas through the application of conventional housing and soundproofing material. Accordingly, the indoor level of noise would be typical of office buildings, and would be well below that which would create a disturbance or cause harmful effects on persons (approximately 40 to 60 db depending on location, season, time of day, and local indoor activity level) (Ref. 16). Some noise from the building would escape to the outside environment through ventilation outlets on the roof. These noises would be expected to be low-level rushing or hissing sounds characteristic of air flowing through forced conduits and will probably be inaudible at the ground level (Ref. 16).

5.2.9 Socioeconomic Impacts

The proposed CRI would add approximately 150 jobs and $ 6,200,000 dollars to the University payroll. These figures compare with approximately 4,000 existing jobs and $165,000,000 dollars on the yearly University payroll (Ref. 28). The proposed CRI would enhance the attractiveness of the University in competing for federal and other sources of research funding.

5.2.10 Off-normal Operations

5.2.10.1 Accidents

LLUMC has not had any reportable accidents or releases of radioactive material to the environment, based on records going back to 1983.

Incidents involving hazardous materials at the University campus have been minor in nature; small, highly-localized splashes of liquids have not resulted in major injury, illness, or death. University personnel are required to attend annual training covering fire safety, hazardous materials safety, blood borne pathogen safety, and other pertinent topics. Given the small inventory of hazardous materials, even a worst case accident scenario would not likely have catastrophic consequences.

5.2.10.2 Risk of Natural Disasters

Seismic hazards are endemic to the region. "Moderate to severe seismic shaking of the site can be expected during the lifetime of the proposed structure...The site does not lie within or immediately adjacent to an Alquist-Priolo Special Studies Zone designated by the State of California to include traces of suspected active faulting. No active faults are shown on or in the immediate vicinity of the site on published geologic maps. No evidence for active faults in or immediately adjacent to the site was observed during the geologic field reconnaissance or on the aerial photographs reviewed" (Ref. 23).

Active fault zones that could cause movement at the proposed site include the San Jacinto fault, located about 2/3 mile southeast of the site, the San Andreas fault zone, located about 7 miles northeast of the site, and the Loma Linda fault zone, located about 1/3 mile northeast of the proposed site. Historic earthquakes induced at the proposed site by these and other faults have been studied, and a probabilistic hazard analysis has been performed (Ref. 23).

The maximum expected earthquake intensity at the Loma Linda campus is Richter Scale 6 or MMI Intensity 8: "Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures." This event would have an approximate probabilty of exceedance of 10% during the next 50 years, or a return period of approximately 500 years.(Ref 37)

Accordingly, the proposed structure and foundation would be designed and constructed in accordance with or in exceedance of applicable earthquake codes to experience only slight damage at Richter scale 6 or MMI 8. In addition, studies have been performed resulting in recommendations for general site grading, seismic design considerations, initial site preparation, preparation of fill areas, excavations, compacted soils, and pile foundation criteria which would be followed during design and construction of the proposed facility. Finally, the University has decided to upgrade the structural design in response to data from the recent Northridge earthquake event of January 1994 (Ref 36)

5.2.11 Cumulative Impacts

Cumulative impacts are defined as "the environmental impact of the action when added to other past, present and reasonably foreseeable future actions...individually minor but collectively significant..." per 40 CFR 1508.7. Cumulative impacts have been considered in the context of each environmental impact discussed in this document.

5.3 Compliance With Regulations

The proposed CRI would not require any new environmental permits, and all aspects of environmental regulation would be covered by existing LLUMC held permits and environmental, safety and health programs (Ref. 25). The permits would not need to be modified for the proposed CRI (Ref. 20).

The following local permits would be required for construction and occupancy (Refs. 28, 34):

- City of Loma Linda Permits
  - Grading Permit, Site
  - Building Permit, Building
  - Occupancy Permit, Building
  - Public Works Permit, Street Repairs
- California Office of State Wide Health Planning and Development
  - Building, Permit Utilities Relocation
  - Excavating Permit (existing University permit covers project)

DOE preparation of this Environmental Assessment (EA) has proceeded concurrently with University compliance with the California Environmental Quality Act (CEQA) via the City of Loma Linda as the State's "Lead Agency" for this project.

Under the California Environmental Quality Act the decision to prepare a proposed Negative Declaration is made by the Lead Agency. The law requires public notification and a public review period with a copy sent to "every Responsible Agency and trustee concerned with the project and every other public agency with jurisdiction by law over natural resources effected by the project", as well as distribution through the State Clearinghouse for distribution to state agencies.

At a public hearing on November 23, 1993 the City Council approved a "mitigated Negative Declaration" for the proposed project (Ref. 31). Mitigation measures relate to long term planning of local traffic and parking. "None of the mitigation measures have to be completed prior to the issuance of Building Permits for the project, but will be monitored for completion prior to completion of construction" (Ref. 31).

6.0 RELATIONSHIP OF THE PROPOSED ACTION TO OTHER ACTIONS AND ACTIONS BEING CONSIDERED UNDER NATIONAL ENVIRONMENTAL POLICY ACT REVIEW

The proposed action is not related to other actions which may be subject to NEPA review.

7.0 RELATIONSHIP OF THE PROPOSED ACTION TO ANY APPLICABLE FEDERAL, STATE, REGIONAL, OR LOCAL LAND USE PLANS AND POLICIES LIKELY TO BE AFFECTED.

The proposed action would not pose a conflict with any other applicable federal, state, or local land-use plans that may apply to the site. The proposed action is related to other actions in the sense that it represents a part of the implementation of a master plan for University development.

8.0 LISTING OF PERSONS AND AGENCIES CONSULTED

City of Loma Linda Planning Department, Roline E. Laska,

California Department of Fish and Game, Mr. Fred Worthley

California Department of Conservation, Ms. Deborah Herrmann

U.S. Fish and Wildlife Service, Mr. Craig Faanes

Los Angeles District, Corps of Engineers, Robert S. Joe, Chief, Planning Division

California Coastal Commission, James R. Raives, Federal Consistency Coordinator

City of Loma Linda, Community Development Director, Dan Smith, Director

U.S. Environmental Protection Agency

City of Loma Linda, Department of Public Services, A.R. Cablay, Director

California Department of Transportation, Division of Aeronautics, Duane H. Ferguson, Aviation Consultant

San Bernardino Valley Water Conservation District, Nereus L Richardson, General Manager & Chief Engineer

9.0 REFERENCES

1. Environmental Report, Design and Construction of the Cancer Research Institute, Loma Linda University and Medical Center, Prepared by the Loma Linda University Environmental Impact Task Force, Mitch Latinkic, Chairman, September 7, 1993. With Appendices:
   - A: Loma Linda University Hazardous Chemical Waste Program Guidelines and Procedures
   - B: Geotechnical/Geologic Investigation
   - C: Parking Study Report

2. Historical Resources Review for the City of Loma Linda Planning Department, Loma Linda Expansion - Cancer Research Center, Roline E. Laska, August 3, 1993

3. California Department of Fish and Game, Certificate of Fee Exemption, November 24, 1993

4. Letter from M. Mitchell Latinkic, LLUMC to Fred March transmitting marked up review copy of working draft of EA

5. Letter from U.S. Fish and Wildlife Service

6. Federal Emergency Management Agency, Flood Insurance Rate Map, Loma Linda, July 16, 1987

7. Letter from Los Angeles District, Corps of Engineers, Robert S. Joe, Chief, Planning Division, August 12, 1993

8. Letter from California Coastal Commission, Jurisdiction Letter, James R. Raives, Federal Consistency Coordinator, September 17, 1993

9. Letter from City of Loma Linda, Community Development Director, Dan Smith, Director, July 26, 1993

10. Memorandum from Kenneth J. Breyer, LLUMC Construction and Architectural Services to M. Mitchell Latinkic, December 6, 1993

11. Environmental Impact Data Book, Jack Golden et al, Ann Arbor Science, 1979)

12. Letter from City of Loma Linda, Department of Public Services, A.R. Cablay, Director, August 3, 1993

13. Loma Linda Hazardous Chemical Waste Program Guidelines and Procedures, Waste Management Requirements, Code T-9B, Section B, Revised September 1992

14. Radioactive Materials License #0060-36 issued by State of California, Department of Health Sciences, Radiologic Health Branch

15. The Radiation Safety Manual, Loma Linda University, April 1993

16. Environmental Impact Data Book, Chapter 8 - Noise, Tables 8-1 to 8-4, Anne Arbor Science, 1979,

17. Letter from City of Loma Linda, Community Development Director, Dan Smith, September 22, 1993

18. Letter from City of Loma Linda, Department of Public Services, A.R. Cablay, Director, September 22, 1933

19. Letter from (California) Department of Transportation, Division of Aeronautics, Duane H. Ferguson, Aviation Consultant, September 20, 1993

20. Letter of November 22, 1993 from M.M. Latinkic to F. March responding to request for additional data (with attachments):

    Unnumbered Marked up working draft of EA of November 10, 1993
    1. Statement of Research Programs
    2. Statement of Goals
    3. Statement of Alternatives Considered; Site Scoring; Members of Location Subcommittee; Site Selection Criteria; Questionnaire for Site Evaluation; Maps with locations of sites considered; Site Selection Process Timetable;
    4. Site Map

    Unnumbered Letter from Dober, Lidsky, Craig and Associates, June 23, 1994, Review of Site Options
    5. Statement on non-involvement of underlying aquifer
    6. Additional University inputs to sections of hazardous wastes, biological wastes, air emissions, accident analysis and compliance with regulations.
    7. Data on radioactive and mixed hazardous waste, data on radioactive exposures and data relative to NESHAP compliance.
    8. Traffic flows on adjacent streets
    9. Required Permits/Construction
    10. Views of the proposed site.

21. Letter from San Bernardino Valley Water Conservation District, Nereus L Richardson, General Manager & Chief Engineer, November 17, 1993

22. Letter from NSSI/Source & Services, Robert D. Gallagher, President, July 19, 1993

23. Geotechnical/Geological Investigation, Proposed Cancer Research Center, Loma Linda University Medical Center, CMJ Inc., August 13, 1993

24. Letter from City of Loma Linda, Department of Public Services, A. Cablay, Director, July 29, 1993

25. Letter from County of San Bernardino, Environmental Health Services, James E. Smith, Hazardous Materials Field Services, July 19, 1993.

26. Information faxed by Donna Gurule, LLUMC to Fred March, December 1, 1993.

27. Memorandum from Kenneth J. Breyer, LLUMC to Fred March, November 23, 1993.

28. Memorandum from Mitch Latinkic, LLUMC to Fred March, December 1, 1993.

29. Transmittal from Marc Martz, LLUMC Assistant Radiation Officer to Fred March, November 18, 1993.

30. Memorandum From Mark Martz, LLUMC Assistant Radiation Officer to Fred March, corrections to data in Ref 20, December 3, 1993.

31. Letter from City of Loma Linda, Dan Smith, Community Development Director, December 3, 1993 (includes attachment of "Notice of Declaration")

32. Information faxed by Donna Gurule, LLUMC to Fred March, December 10, 1993.

33. Letter from City of Loma Linda, Robert H. Christman, Mayor

34. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Council of Governmental Industrial Hygienists, 1993-94

35. Air Pollution Hazard Analysis for the Institute for Micro-manufacturing at Louisiana Tech University, Geraghty and Miller, December 15, 1992

36 Cancer Research Institute, Structural Upgrade Design, NBBJ Architects, May 1994

37 Report on Seismicity, EQE, Chapter 3 of *Seismic Risk Assessment for Loma Linda University, May 1988*, transmitted to M. Mitchell Latinkic from Ken Boyer, LLUMC Architectural and Construction Services, May 24, 1994.

38. Air Quality Emissions Data for Loma Linda University, Memorandum from Donna Gurule, Director, Loma Linda Hazardous Materials and Safety Program, June 8, 1994

39. Draft 1994 Air Quality Management Plan, Southern California Air Quality Management District

APPENDIX
SUPPORTING DOCUMENTS

California Department of Fish and Game, Certificate of Fee Exemption, November 24, 1993

Letter from U.S. Fish and Wildlife Service - pending

Letter from Los Angeles District, Corps of Engineers, Robert S. Joe, Chief, Planning Division, August 12, 1993

Letter from California Coastal Commission, Jurisdiction Letter, James R. Raives, Federal Consistency Coordinator, September 17, 1993

Letter from City of Loma Linda, Community Development Director, Dan Smith, Director, July 26, 1993

Letter from City of Loma Linda, Department of Public Services, A.R. Cablay, Director, August 3, 1993

Letter from City of Loma Linda, Community Development Director, Dan Smith, September 22, 1993

Letter from City of Loma Linda, Department of Public Services, A.R. Cablay, September 22, 1983

Letter from (California) Department of Transportation, Division of Aeronautics, Duane H. Ferguson, Aviation Consultant, September 20, 1993

Letter from San Bernardino Valley Water Conservation District, Nereus L Richardson, General Manager & Chief Engineer, November 17, 1993

Letter from NSSI/Source & Services, Robert D. Gallagher, President, July 19, 1993

Letter from City of Loma Linda, Department of Public Services, A. Cablay, Director, July 29, 1993

Letter from County of San Bernardino, Environmental Health Services, James E. Smith, Hazardous Materials Field Services, July 19, 1993.

Letter from City of Loma Linda, Dan Smith, Community Development Director, 12-3-93 (includes attachment of "Notice of Determination" and "Mitigated Negative Declaration")

Letter from City of Loma Linda, Robert H. Christman, Mayor

DISTRIBUTION OF NEPA DOCUMENTS {PUBLIC NOTICE, ENVIRONMENTAL ASSESSMENT (DOE-EA 0975), FINDING OF NO SIGNIFICANT IMPACT} FOR THE CANCER RESEARCH INSTITUTE, LOMA LINDA UNIVERSITY MEDICAL CENTER, LOMA LINDA, CALIFORNIA

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