4.6 HAZARDS AND HAZARDOUS MATERIALS

During the course of daily operations, UCI researchers and staff use many materials classified as hazardous by federal or state law. Such hazardous materials include chemical reagents, solvents, fuels, paints, cleansers, and pesticides that are used in activities such as laboratory research, building and grounds maintenance, vehicle maintenance, and fine arts. In addition to these materials, radioactive isotopes and biohazardous materials are used in laboratory research. On-campus activities can also generate hazardous byproducts that must be disposed of as hazardous wastes.

Most activities related to hazardous materials occur inside buildings. Therefore, once hazardous materials are delivered to campus facilities, inadvertent sewer disposals, accidents in outdoor areas, and air emissions from the fume hood and other building vents would be the sources of potential releases for hazardous materials to the immediate outside environment. Hazardous materials could also be released to the environment during their delivery to or removal from campus facilities. The potential for such releases is considered in this section, with the exception of the potential impacts from toxic air emissions, which is considered in Section 4.2, Air Quality, and water quality issues associated with sewer disposal, which are discussed further in Section 4.7, Hydrology and Water Quality, and Section 4.14, Utilities, Service Systems, and Energy.

This section also considers the potential for impacts related to hazardous materials sites and the potential for physical hazards, such as proximity to airports and wildland fire hazards.

4.6.1 ENVIRONMENTAL SETTING

4.6.1.1 USE AND DISPOSAL OF HAZARDOUS MATERIALS AT UCI

The term hazardous material is defined in different ways for different regulatory programs. This EIR uses the definition from California Health and Safety Code Section 25501(n) and (o), which defines hazardous material as:

> Any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. "Hazardous materials" include, but are not limited to, hazardous substances, hazardous wastes, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

By convention, most hazardous materials are thought to be hazardous chemicals, but certain radioactive materials and biohazardous materials, as defined here, are also hazardous. This EIR considers hazardous materials to include hazardous chemicals, radioactive materials, and biohazardous materials that are used on campus, as well as hazardous materials associated with infrastructure.

The policy of the University of California is to maintain a safe environment for its students, academic appointees, and visitors, and to conduct operations in compliance with applicable regulations and health and safety standards. The UCI Environmental Health and Safety Office (EH&S) has broad administrative and surveillance responsibilities over operations on the campus to assist in ensuring that appropriate standards of safety including biological and radiation safety, fire prevention, sanitation, and hygiene are met for the protection of University personnel, property, and the public. EH&S develops and assists the

campus community in the implementation of compliance strategies for all federal and State regulations governing the handling of hazardous materials and wastes on campus.

EH&S is charged with issuing policies, evaluating departmental activities, and disseminating general information regarding the handling, storage, and disposal of hazardous materials and wastes. These responsibilities are achieved through discussions with department heads, training of employees and teaching assistants, and also through distribution of various safety manuals, newsletters, and other publications. In coordination with the Radiation Safety Committee, EH&S manages the radiation safety program and further ensures that all teaching and research laboratories that use radioisotopes and radiation-producing machines achieve their program objectives legally and safely. They also collect and manage radioactive wastes. In accordance with California regulations and the University Broad Scope Radioactive Materials License, individuals planning to use radioactive materials must apply for an Authorization from EH&S.

Specific EH&S hazardous waste management responsibilities include:

- Collecting hazardous materials from laboratories;
- Determining whether materials can be recycled;
- Delivering hazardous waste to a 90-day storage and handling facility;
- Classifying and segregating hazardous waste by its compatibility characteristics, physical form, and hazard class;
- Packaging compatible waste in accordance with applicable federal and State regulations;
- Labeling each waste container with appropriate information; and
- Arranging for the transportation and disposal of hazardous wastes by a registered hauler to a legally authorized treatment, storage, or disposal facility.

EH&S is also responsible for accident prevention, general safety fire prevention, and hazardous materials emergency response of the campus.

Hazardous materials used on the campus fall within four general categories: general chemicals, radioactive materials, biohazardous materials, and hazardous materials associated with infrastructure. Each of these categories is described in more detail in the following sections. Table 4.6-1 summarizes the more specific types of hazardous materials present at UCI and their associated hazards. These hazardous materials are related to a variety of campus activities such as teaching and research laboratories, academic and administrative users, physical plant, grounds services, and campus residences. Table 4.6-2 summarizes the annual quantities of hazardous wastes disposed of by UCI during calendar year 2005.

General Chemicals

Many chemical materials, some hazardous, are used for instructional and research activities, as well as facilities maintenance, during the course of daily campus operations. Virtually all of the buildings on the UCI campus contain commercial products, including janitorial and office supplies that could be considered “hazardous materials” under regulatory definitions. Non-household type hazardous materials used in teaching and research laboratories include chemical reagents, solvents, radioisotopes, and biohazardous substances. UCI Facilities Management units, including grounds, custodian services, pest management, and craft shops, use a wide variety of commercial products formulated with hazardous materials. These include fuels, cleaners, degreasers, solvents, paints, lubricants, pesticides and herbicides, adhesives, and sealers.

Table 4.6-1. Hazardous Materials Used at UCI

Substance	Example(s)	Use(s)	Hazard(s)
Solvents	Alcohols, ether, ethers, toluenes, and hexanes	Lab chemicals, paint removers, degreasers, and pesticides	Flammable, some explosive; toxic; damage to skin and respiratory tract; systemic damage to liver, kidneys, nervous system, etc.
Oxidizers	Hydrogen peroxide, perchloric acid, nitric acid, silver nitrate, potassium dicholorate, and ammonium persulfate	Lab chemicals	Stimulates combustion of organic materials
Compressed gases	Methane, oxygen, and nitrogen	Labs, welding, and other campus shops	Flammable, some explosive (with potential for propellant effect, and some toxic
Corrosives	Hydrochloric nitric, sulfuric, acetic acid, sodium hydroxide, and ammonium hydroxide	Lab chemicals, cleaning agents, paints and paint thinners, freon refrigerants, pesticides, and herbicides	Damage to skin and respiratory tract; some react to produce fire, explosion, or toxic fumes
Reactives	Alkyl metals (sodium potassium), and hydrides	Lab chemicals	Explosive (with or without detonation); toxic fumes; and explodes with exposure to water
Toxics	Heavy metals, chlorinated hydrocarbons, arsenic, and cyanide compounds	Lab chemicals, pesticides, photographic chemicals, and paints or dyes	Capable of causing acute or chronic systemic damage or death, cancer, infertility, and birth defects
Biohazards	Bacteria and viruses	Health clinic waste, labs, and medical waste	Capable of producing diseases
Radioactivity	Radionuclides (radioisotopes)	Teaching and research labs and experiments	Capable of causing acute or chronic systemic damage, cancer, infertility, and birth defects

Source: STA Inc, 1989.

Table 4.6-2. Hazardous Waste Disposal by UCI in 2005

Hazardous Waste	Amount (unit)	Disposal Method
Asbestos	70,000 lbs	Landfill
Automotive		
Used oil, oily water, radiator coolant	2,900 gals	Recycle
Used oil filters	400 lbs	Recycle
Regulated lab chemicals, chemotherapy drugs, human and animal specimens, pharmaceuticals, materials, poisonous by inhalation, and miscellaneous chemicals	12,100 lbs	Incinerate/ Retort[(1)] / Recycle
Laboratory wastes (includes all sharps, mercury, acids, bases, etc.)	50,000 lbs	Incinerate
Electronic components (Cathode Ray Tubes and Universal Waste – Electronic Devices)	80,000 lbs	Recycle
Batteries (mercury, nickel-cadmium, alkaline, lithium, lead acid, nickel iron, nickel metal hydride, and silver zinc)	8,115 lbs	Recycle
Paint waste (lab packed flammable and latex paints)	5,000 lbs	Recycle
Radioactive wastes		
Aqueous Liquid Waste	620 gals	Shipped off site for treatment or disposal
Dry Solid Waste	414 cubic feet and 1500 lbs	
Recycled waste (fluorescent tube light bulbs)	100,000 linear feet	Recycle
Solvent wastes	100,000 lbs	Incinerate

(1) Generally, mercury is removed from soil and other waste material using a retort or other thermal process. Retort facilities heat mercury to 600° Fahrenheit or higher to force the substance into a vapor phase. The vapor is pulled via vacuum though distillation coils and cooled to a form a liquid, which is filtered.

Source: Environmental Health & Safety UCI, May 2006.

The campus is registered with the EPA as a large quantity generator of chemical hazardous waste. The UCI campus does not dispose of these wastes on site. All chemical waste recycling or disposal is managed through EH&S. In most cases, EH&S picks up waste from a collection location or generator site and manages the recycling or disposal process for that waste. Some special projects may require a department to contract directly with a waste disposal vendor. In these cases, any waste removal must first be approved by EH&S. UCI uses only approved and audited contractors, transporters, and disposal sites. In addition, UCI must file reports with the state detailing waste disposal and recycling activities in addition to paying annual hazardous waste taxes based on the volumes of waste disposed.

Hazardous materials collected by EH&S for disposal are packaged and properly labeled, which includes segregating incompatible materials, placing them in appropriate sealed containers, and identifying all components with approximate concentrations. Chemical wastes are further segregated by type, and consolidated, bulked, or compacted before a licensed hauler transports them from the campus to permitted off-campus facilities for incineration, treatment, recycling, or other disposal.

Chemical waste generated through campus activities that are collected by EH&S are brought to a central hazardous waste storage and handling facility at the EH&S Services Building, and packaged in accordance with federal and State requirements. Within 90 days, the waste is shipped off the campus by licensed transporters for recycling, treatment, and/or disposal at licensed treatment storage or disposal facilities in California and other states.

While municipal landfills were once the most common destination for hazardous waste, federal laws (1984 Amendments to the Resource Conservation and Recovery Act [RCRA]) and State (Hazardous Waste Control) now ban their use for many of the most commonly generated hazardous wastes. Alternative treatment and disposal technologies, including incineration and recycling, are now more common methods of disposing of hazardous wastes. Table 4.6-2 shows typical disposal methods for UCI's hazardous wastes.

In addition, the campus has developed hazardous waste minimization and recycling guidelines in order to minimize amounts of hazardous materials used and generated. These guidelines include effective chemical purchasing, i.e., buying only the amount of chemicals required for any given activity and not buying such chemicals in bulk amounts. UCI also implements resource efficient procedures such as scaling down experiments and using less hazardous chemicals.

Radioactive Materials

Radioactive substances contain atoms that spontaneously emit radiation from the transformation of unstable atomic nuclei, which result in chemically different substances that may or may not be radioactive. Radioactive atoms are called "radionuclides" or "radioisotopes." Because radioactive materials emit ionizing radiation, their presence can be detected easily. Researchers and health care professionals take advantage of this easy detectability by using radioactive materials to study various biochemical functions in animals and humans. Radiopharmaceuticals (radioisotopes or drugs containing radioisotopes) are used in medicine and research. Limited types and quantities of radioisotopes are also used in research laboratories. All radioisotopes used on campus are done so in accordance to law, listed in the campus Broad Scope Radioactive Materials License issued by the state, and are stored in sealed containers designed to prevent release of radioactive materials to the environment.

Exposure to ionizing radiation can result in adverse human health effects that range from short-term mild symptoms (such as sunburn) to serious illness or death, depending upon the amount and concentration of

the radioactive source and the duration of the exposure. The extent to which exposure would result in any adverse effects depends on the radioisotope and the amount of duration of exposure.

After their use, radioisotopes become low-level radioactive waste (LLRW). Like chemical hazardous wastes, LLRW from campus teaching, research, and health science-related activities are collected and managed by EH&S. UCI normally collects dry and liquid LLRW directly from its sources (researchers or clinical users). In accordance with strict regulatory guidelines and procedures, EH&S transports the waste to the EH&S Services Building, which is designed to safely store and contain LLRW. EH&S also prepares and packages the waste for shipment and disposal, or for decay-in-storage within the EH&S Services Building.

Dry LLRW with a half-life of less than 115 days is stored for decay (as part of the decay-in-storage program) in accordance with the Broad Scope Radioactive Materials License until its radiation levels are indistinguishable from background levels. The waste is then shredded and disposed of as non-radioactive waste. Liquid LLRW, with a half-life of less than 115 days, is decayed and discharged to the sewer in accordance with the Broad Scope Radioactive Materials License.

For wastes that are longer-lived, the final disposal depends on the hazard class of the LLRW. The federal Nuclear Regulatory Commission regulations divide LLRW into Classes A, B, and C, depending on the concentration of isotopes and the half-life of the material. Class A is waste that consists of either short-lived radionuclides (i.e., half-lives below 30 years) or low concentrations of certain long-lived radionuclides; Class B is waste that must meet more rigorous requirements on waste form to ensure stability after disposal; and Class C is waste that must not only meet more rigorous requirements on waste form to ensure stability, but also requires additional measures at the disposal facility to protect against inadvertent intrusion (10 CFR171-173). Class A waste must be disposed of in a manner that will isolate it for at least 100 years, while Class B and C waste must be isolated for at least 300 and 500 years respectively. In addition, Class C waste disposal must include barriers that will prevent people from accidentally encountering the waste in the future. As of the school year 2006-2007, LLRW generators can ship waste to two out-of-state facilities: (1) the Barnwell, South Carolina LLRW disposal facility, and (2) the Envirocare of Utah, Inc. LLRW disposal facility. UCI ships its waste to Envirocare in Utah.

As the school year 2006-2007, all of the radioactive waste generated at UCI is either decayed on campus in solid or liquid form, or disposed of off campus. The *UCI Radiation Safety Manual* (February 2004) prescribes the radiation safety program for the campus, which ensures that all sources of ionizing radiation are handled in accordance with the official policies and procedures of the campus and governmental agency requirements.

Biohazardous Materials

A biohazardous material is a material that harbors a biological agent capable of causing diseases in humans, animals, or plants. Biohazardous materials include infectious agents, microbiological specimens, and cultures of microorganisms capable of causing disease; microbiological specimens or cultures included in National Institutes of Health (NIH)/Centers for Disease Control and Prevention (CDC) Risk Group 2, 3, or 4; recombinant organisms containing deoxyribonucleic acid (DNA) from infectious agents; human blood, body fluids, or unfixed tissue; laboratory waste contaminated with biohazards; animal parts, tissues, or fluids suspected of containing an agent infectious to humans, whether deliberately introduced or naturally occurring; and discarded materials suspected of contamination with infectious agents.

Medical waste is a general term that includes both biohazardous and sharps waste (California Health and Safety Code Section 117690). Sharps waste includes devices capable of cutting or piercing, such as hypodermic needles, razor blades, and broken glass (California Health and Safety Code Section 117755). Medical waste mixed with hazardous chemical waste is also referred to as *mixed waste*. Medical waste includes *pathology waste*, recognizable human anatomical parts and fixed human surgery specimens and tissues, and *chemotherapy waste*, waste such as gloves, towels, empty bags, and intravenous tubing that contains or is contaminated with chemotherapeutic agents.

UCI generates approximately 5,500 pounds of medical waste per month, which classifies UCI as a large quantity generator. Primary types of waste produced at UCI are human blood and blood products and contaminated sharps.

Pursuant to applicable regulations, UCI has developed programs, practices, and procedures for monitoring, inspecting, and reporting waste management to reduce community and worker exposure to potential hazards associated with medical wastes and biological hazards. Activities that could create biohazardous aerosols are conducted in biosafety cabinets, which filter all released air to remove biohazardous materials. Biosafety cabinets and equipment with special filters to remove biological agents are used and tested regularly by outside contractors. Regulations specify that the maximum amount of time medical and biohazardous wastes may be stored is seven days when stored above the temperature zero degrees Celsius (32 degrees Fahrenheit) or 90 days when stored below zero degrees Celsius.

In compliance with UCI programs, which respond to State and federal regulations, laboratory and medical infectious/biohazardous waste must be disposed of in one of the following methods:

- Disposal off-campus at a state-approved autoclave or incinerator. UCI has two contracted medical waste haulers which collect material generated by UCI once a week. Approximately 85 percent of medical and biohazardous waste is shipped off site for disposal.
- Autoclave (as a minimum) and disposed of in accordance with requirements of medical solid waste disposal procedures. Any other substitute sterilization techniques may be used only with the approval of the UCI Biosafety Officer. Approximately 15 percent of medical and biohazardous waste is autoclaved to render the waste non-infectious before disposal.
- Discharge into approved sewer system (liquids and semi-liquids only) after disinfection. Chemicals other than bleach may not be poured into the sewer.
- Recognizable human anatomical remains must be cremated or interred.
- Research animals containing infectious agents must be disposed as medical waste.

Hazardous Materials Associated with Infrastructure

Substances such as asbestos, lead, and mercury could be present in some buildings on campus. Underground utility tunnels may also contain asbestos. Any activity that involves cutting, grinding, or drilling during building renovation or demolition or relocation of underground utilities could release friable asbestos fibers, unless proper precautions are taken. Lead, a naturally occurring metallic element, can be found in numerous uses and sources, such as paint, water pipes, and solder in plumbing systems. Lead-based paint on buildings and structures may contaminate surrounding soils. Elemental mercury, an insoluble liquid metal, is commonly used in laboratory and medical equipment, such as thermometers and manometers (used for measuring pressure), electrical equipment, and some water pumps. In addition, some equipment containing polychlorinated biphenyls (PCBs) may still be present in research labs and lighting ballasts containing PCBs may be present in buildings, but all low-voltage and high-voltage PCB transformers on campus have been removed.

UCI has a comprehensive asbestos management plan in place to protect the health of the UCI community. The UCI Asbestos Operations and Maintenance (O&M) Plan outlines the responsibilities of the Asbestos Control Coordinator and project managers from UCI departments which have the potential to disturb asbestos-containing materials. In accordance with Sections 25915 through 25916 of the California Health and Safety Code, EH&S maintains an inventory of on-campus buildings that could contain asbestos and provides on-going campus-wide notification of these locations. UCI is in compliance with applicable OSHA regulations regarding general and construction industry standards for asbestos.

UCI implements a Child Care Facility Lead Management Program, which is designed to identify, assess, and manage lead containing building components in UCI-managed child care facilities in order to prevent and/or minimize potential lead exposure to occupants. In addition, all State and federally mandated procedures that relate to hazardous materials that may be present in campus buildings or other infrastructure are implemented during renovation and demolition activities. Contractors who disturb or potentially disturb asbestos, lead, or other infrastructure-related hazardous materials are required to comply with all federal, State, and local regulations regarding hazardous materials.

4.6.1.2 TRANSPORTATION OF HAZARDOUS MATERIALS

The campus contracts with licensed hazardous waste transporters to ensure that all hazardous wastes generated by the campus are transported off campus for treatment or disposal at licensed hazardous waste facilities. Hazardous materials are routinely transported by truck or rail. The U.S. Department of Transportation (USDOT), Office of Hazardous Materials Safety prescribes strict regulations for the safe transportation of hazardous materials, as outlined in Title 49 of the Code of Federal Regulations. In California, the California Highway Patrol (CHP) has the primary responsibility for enforcing federal and State regulations and responding to hazardous materials transportation emergencies. Specifically, Section 31303 of the California Vehicle Code requires that when hazardous materials are transported on state or interstate highways, the highway(s) that offer the shortest overall transit time possible shall be used. Transportation of hazardous materials in commerce along any city or state roadways within or near the campus is subject to all hazardous materials transportation regulations established by the California Highway Patrol and the Orange County Department of Environmental Health (DEH).

4.6.1.3 LISTED HAZARDOUS MATERIAL SITES

The potential exists for buildings or sites that would be affected by project development to have been contaminated by hazardous substances as a result of former uses of the sites, leaks from unidentified underground storage tanks (UST), or unidentified buried debris that could contain hazardous substances or hazardous by-products. A UST is a tank or combination of tanks and connected piping having at least 10% of their combined volumes underground. This applies to tanks storing over 110 gallons of petroleum products or hazardous substances. According to UCI EH&S, the only known leaking USTs on campus are located at UCI's Corporation Yard on the North Campus. Between 1995 and 2005, several environmental firms were retained by UCI to asses the condition of subsurface soils and groundwater within the vicinity of the USTs. Over the years, eight groundwater monitoring wells were installed and monitored on a quarterly basis. Results indicated that volatile petroleum hydrocarbon compounds and high concentrations of benzene were present near the USTs. In 1998, the USTs were removed and a new two-compartment fuel aboveground storage tank (AST) was installed on the site.

During the tank removal, approximately 270 cubic yards of contaminated soils were removed from the area surrounding the USTs and fuel dispensers. However, excess contaminants still subsisted in the soils and continued to migrate into the groundwater. Intrinsic bioremediation was recommended to treat the excess soil and groundwater contamination, but proved to be insufficient. Subsequently, by June of 2006,

a soil vapor extraction system was installed to remove contaminants from the soil. Soil vapor extraction is an in situ remedial technology that reduces concentrations of volatile constituents in petroleum products adsorbed to soils in the unsaturated zone. This process may take up to a year or more to be completed. EH&S anticipates the process to be completed by the end of 2007. A one-year post-remedial groundwater monitoring will be initiated following the soil vapor extraction in order to evaluate the removal of contaminants. Because of the removal of the USTs and of continuous remedial applications, this site poses a low environmental concern.

4.6.1.4 AIRCRAFT ACCIDENT HAZARDS

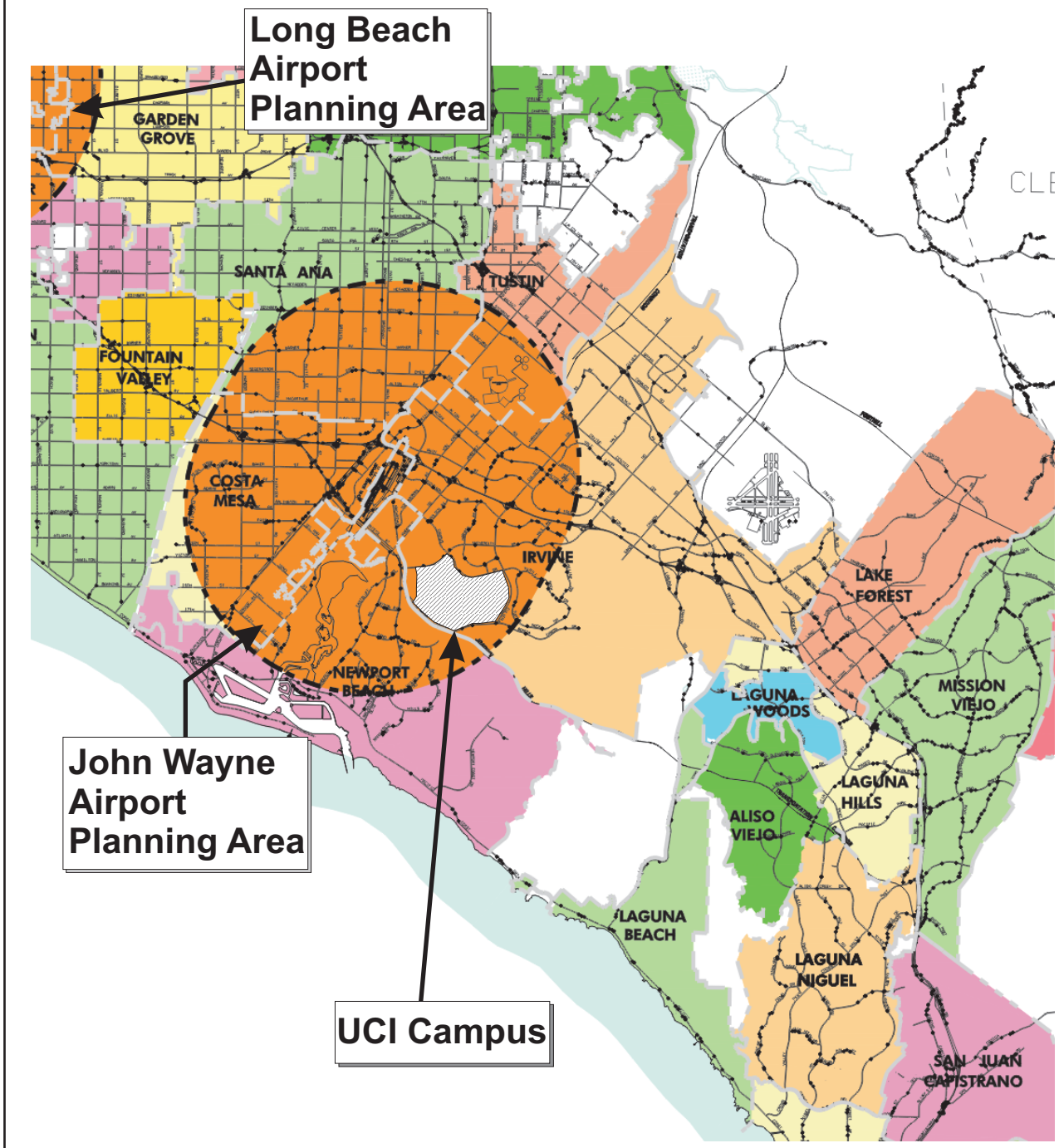
UCI is located approximately 1.5 miles southeast of John Wayne Airport (JWA) and falls within the airport's planning area (Figure 4.6-1). The Airport Land Use Commission (Commission) for Orange County defined the planning area for JWA as all areas within the 60 db CNEL Noise Contour. In addition, UCI is subject to the Height Restriction Zone described in the JWA Airport Environs Land Use Plan (AELUP) as all structure elevations more than 200 feet above ground level; these are the areas that lie above or penetrate the 100:1 Imaginary Surface as defined in Federal Aviation Regulation (FAR) Part 77.13. For all on-campus development proposals that involve construction or alteration of a structure more than 200 feet above ground level, UCI will comply with the JWA AELUP referral requirements promulgated under FAR Parts 77.13 and 77.25, including filing a Notice of Proposed Construction or Alteration. UCI will also comply with all conditions of approval imposed or recommended by the Federal Aviation Administration (FAA), the Commission, and any other applicable federal and state procedures.

Accident Potential Zones have not been adopted for JWA because none could be justified with the available data (Airport Land Use Commission, 2002). According to the California Airport Land Use Planning Handbook (2002), the majority of general aviation aircraft landing accidents takes place on or immediately adjacent to the runway. According to the JWA AELUP, seven off-airport accidents occurred within the planning area between the years of 1969-1978. These accidents were a combination of airport vicinity accidents, en route accidents, and accidents at the airport. This was the most up-to-date information of past accidents available at the time of the AELUP in 2002. Additional data on airport accidents is available from the National Transportation Safety Board and from the FAA. According to these agencies, approximately 120 incidents occurred at or in the vicinity of JWA between May 1981 and May 2006. Four of the incidents are classified as "substantial;" the remainder are classified as "minor." No reports were found indicating aircraft accidents occurring within the vicinity of the UCI campus.

4.6.1.5 WILDLAND FIRE HAZARDS

Wildland fires are prevalent during the dry summer months in the foothills of Orange County. UCI is located in a developed area and is not substantially prone to the spread of wildland fires. However, the southern portion of the campus contains large open areas of rolling hills including the NCCP reserve and other areas consisting of coastal sage scrub, grassland, and other plant communities. This type of vegetation is extremely susceptible to wildland fire, especially during the dry months of summer and early fall. Adjacent homes within the University Hills Faculty and Staff Housing area could be threatened in the event of a wildfire. If a wildland fire incident should occur, the Orange County Fire Authority (OCFA) is responsible for responding to the situation.

Because the existing development area adjacent to the NCCP reserve (University Hills Faculty and Staff Housing in the South Campus) pre-dates the current OCFA Fuel Modification Zone guidelines, a 100-foot "Defensible Space" zone has been established. The Defensible Space zone is maintained by the Irvine Campus Housing Authority in cooperation with UCI Facilities Management and consistent with OCFA



SOURCE: Orange County Airport Land Use Commission, 2005

PLANNING AREAS FOR ORANGE COUNTY AIRPORTS **FIGURE 4.6-1**

standards for this type of development interface. High fuel vegetation and other combustible materials are prohibited from the Defensible Space zone. Current projects within the University Hills Housing area that abut open space areas, specifically Planning Area 9, follow current OCFA Fuel Modification Zone guidelines which include graduated zones of fuel reduction. UCI and OCFA staff meet periodically to review maintenance of the Defensible Space zone and the Fuel Modification areas. Additional information on fire protection at UCI is discussed in Section 4.11, Public Services, of this EIR.

4.6.1.6 UCI SAFETY PLANS AND PROGRAMS

Hazardous Materials Business Plan

Pursuant to the California Hazardous Materials Release Response Plan and Inventory Law, UCI has prepared a Hazardous Materials Business Plan containing information about the location of, and emergency procedures for, campus buildings in which hazardous materials are handled, as well as employee training. Orange County administers the Response Plan and Inventory Law requirements for UCI and other private and public entities subject to the law. UCI's business plan requires that all personnel working with hazardous materials receive annual training in safe handling of hazardous materials, hazardous waste, and basic emergency spill response.

Emergency Management Plan

In addition to the Business Plan, UCI has prepared an Emergency Management Plan that addresses the campus community's planned response to various levels of human-made or natural emergency situations including fires, hazardous spills, earthquakes, flooding, explosion, and civil disorders. The purpose of the Plan is to provide information that will save lives during extraordinary emergency events and hasten the resumption of normal campus operations during the recovery process. An effective organizational emergency response depends on an informed campus community containing members who are familiar with campus procedures and understand their personal responsibility for emergency preparedness and response.

Upon declaration of an emergency, the Incident Management System (IMS) is immediately instituted. The IMS is a system that provides for clear and effective command, control, and management of resources during an emergency. Overall management of an emergency event under the IMS is centralized in an Emergency Operations Center (EOC). The primary role of an EOC is to bring together all relevant information about the emergency into one place, organize that information into a useful format, and facilitate the coordination of resources needed to respond to the emergency. The EOC Manager has the responsibility and authority to direct all EOC activity and is responsible for overall emergency policy and coordination of UCI actions with federal, State, and local agencies.

UCI Environmental Health and Safety Office (EH&S)

UCI Environmental Health & Safety (EH&S) Office ensures that UCI complies with applicable health, safety and environmental laws, regulations and requirements; and, that campus activities are conducted in a manner that protects students, faculty, staff, visitors, the public, property, and the environment. EH&S areas of responsibility include Occupational Health and Saftey, Injury and Illness Prevention, Environmental Sanitation, Fire Safety, Hazardous Material Management, Biological Safety, Hazardous Waste Management, and Radiation and Laser Safety including surveillance of all uses of radioactive materials and radiation-producing machines and providing consultation and radiation safety services in conformance with campus policies and standards, government regulations, license conditions, and national radiation protection standards and recommendations.

UCI's Safety Committees

UCI maintains several safety committees (some of which are mandated by law) that are represented by a mix of faculty members, community members, representatives from the larger academic departments, graduate student representatives, the Chemical Officer, and the Departmental Safety Coordinator. Each committee is described below.

- *Institutional Review Board (IRB)* – The IRB reports to the Vice Chancellor for Research on all matters regarding the welfare of human research subjects and is responsible for reviewing all applications for human subjects use involving gene therapy, radioactive materials or radiation-producing machines on campus (except diagnostic x-rays at the Student Health Center).
- *Radiation Safety Committee (RSC)* – The RSC reports to the Vice Chancellor for Administrative and Business Services on all matters related to radiation safety and recommends such policies and procedures. This committee is responsible for reviewing and approving all proposed uses of radiation and radioisotopes and for advising and guiding EH&S in carrying out the campus radiation safety program.
- *Emergency Management Advisory Committee (EMAC)* – The EMAC is the lead group for establishing the UCI Emergency Management Policy and Program. The committee functions as a steering committee to support and advance emergency management efforts at all levels of the campus as recommended by NFPA 1600 Standard on Disaster/Emergency Management and Business Continuity Programs.
- *Reactor Operations Committee (ROC)* – The ROC reports to the Executive Vice Chancellor and is responsible for review of all matters relating to the use of the UC Irvine Nuclear Reactor Facility. All users must comply with the Facility's Standard Operating Procedures Manual, the Facility's Nuclear Reactor License, and all applicable federal regulations and campus policies.
- *Institutional Biosafety Committee (IBC)* – The IBC reports to the Vice Chancellor for Administrative and Business Services and is responsible for review of all work with infectious agents, select agents, human and non-human primate materials, and recombinant DNA, including those labeled with radioactive materials.

Laboratory Safety Guidelines

This plan is intended to help researchers recognize, evaluate, and control hazards in their laboratory. It includes federal and State health and safety standards and published practices, standards, and guidelines of nationally recognized health and safety groups. The UCI Laboratory Safety Guidelines serves as a companion document to the Biosafety, Radiation, and Laser Safety Manuals.

Biosafety Manual

This handbook specifies the practices, procedures, and requirements for safe handling and use of biohazardous materials for research, clinical, and teaching activities at UCI. UCI's policy is that all research and teaching involving biohazardous materials be conducted in a safe manner in order to protect the greater community at large, as well as the academic community.

Radiation Safety Manual

UCI uses radioactive materials under a Broad Scope Radioactive Material License issued by the State of California. This manual represents the radiation safety program for all locations on that license, including the campus. The UCI Medical Center has its own separate license issued by the state. The radiation safety

program ensures that all sources of ionizing radiation are handled in accordance with the official policies and procedures of the campus and governmental agency requirements.

Radiation Safety Training

The radioactive materials license issued to the UCI campus by the Radiologic Health Branch of the California Department of Health Services establishes minimum training requirements for new radioactive materials users. UCI provides training through an initial orientation which consists of completing several required forms, viewing a half-hour Radiation Safety video, reading the Radiation Safety Training Syllabus, and passing the Radiation Safety Quiz. New users are required to receive supervised, on-the-job training by the responsible principal investigator or a senior researcher designated by the responsible principal investigator. Written documentation is maintained verifying this training. UCI also offers a radiation safety seminars six times a year.

Laser Safety Manual

This manual describes UCI's laser safety program and provides guidance for the safe use of lasers and laser systems. The safe use of lasers is readily achieved by following nationally recognized standards, provided in the American National Standard for the Safe Use of Lasers.

Spill Prevention Control and Countermeasure Plan

The Spill Prevention Control and Countermeasure (SPCC) Plan has been developed in response to Title 40, CFR Part 112. This Plan was specifically created to address potential spills from oil storage containers at UCI. The SPCC does not include operations conducted at off-site locations, such as the UCI Medical Center. This Plan addresses operating procedures implemented to prevent oil spills, control measures installed to prevent a spill from reaching navigable waters, and countermeasures to contain, clean up, and mitigate the effects of an oil spill that reaches navigable waters.

4.6.2 REGULATORY FRAMEWORK

Applicable federal and State laws and regulations governing the generation, handling, transportation, and disposal of hazardous materials are described in the following sections. Federal agencies that regulate hazardous materials include the EPA and the Occupational Safety and Health Administration (Fed/OSHA). At the State level, agencies such as the Department of Toxic Substances Control (DTSC), California Occupational Safety and Health Administration (Cal/OSHA), and the Office of Emergency Services govern the use of hazardous materials.

4.6.2.1 FEDERAL

Resource Conservation and Recovery Act of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984

Federal hazardous waste laws are generally promulgated under the Resource Conservation and Recovery Act (RCRA). These laws provide for the "cradle to grave" regulation of hazardous wastes. Any business, institution, or other entity that generates hazardous waste is required to identify and track its hazardous waste from the point of generation until it is recycled, reused, or disposed.

The EPA has the primary responsibility for implementing RCRA; however, individual states are encouraged to seek authorization to implement some or all of RCRA provisions. California received authority to implement the RCRA program in August 1992. The California DTSC is responsible for

implementing the RCRA program as well as California's own hazardous waste laws, which are collectively known as the Hazardous Waste Control Law. Under the Certified Unified Program Agency (CUPA) program, DTSC has in turn delegated enforcement authority to the Orange County, which has direct oversight of hazardous waste generation, transportation, treatment, storage, and disposal at UCI.

Hazardous Materials Transportation Act

The U.S. Department of Transportation regulates hazardous materials transportation under Title 49 CFR. State agencies with primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol and the California Department of Transportation. These agencies also govern permitting for hazardous materials transportation.

Title 29 CFR, Occupational Safety and Health Act

The federal Occupational Safety and Health Act is intended to ensure that employers provide their workers with a work environment free from recognized hazards to safety and health, such as exposure to toxic chemicals, excessive noise levels, mechanical dangers, or unsanitary conditions. Operation of this program is delegated to the state and operated by Cal/OSHA. These regulations apply to all UCI employees, including student employees and research assistants. Standards are created by the National Institute for Occupational Safety and Health (NIOSH) as the research institution for Fed/OSHA. These standards are adopted at the state and local level and are enforced on the campus by Cal/OSHA and other agencies.

Title 40 CFR Part 112, Oil Pollution Prevention

A Spill Prevention Control and Countermeasure (SPCC) plan is required by Title 40, CFR Part 112. In California, owners and operators of ASTs must comply with federal regulations pertaining to oil spill prevention and aboveground petroleum storage. The SPCC plan provides an analysis of the potential for release from ASTs and the measures that could be put into place to reduce the potential of release. Facilities subject to these regulations must complete an SPCC plan if they contain tanks with a capacity of 660 gallons or more, or if the total facility capacity exceeds 1,320 gallons. Because the capacity of ASTs on campus exceeds these thresholds, UCI has prepared an SPCC plan.

Title 42 CFR Select Agent Regulation

In addition to Title 29 of the CFR, which regulates worker safety in laboratories, federal laws relative to biological safety are contained in Title 42 of the CFR. Title 42 CFR Part 73, published in December 2002, implements provisions of the Public Health Security and Bioterrorism Preparedness Response Act, which requires the Secretary of Health and Human Services to regulate the possession of certain biological agents ("select agents") harmful to humans. The regulation controls the access, use, and transfer of select agents to ensure that these are shipped only to institutions or individuals equipped to handle them appropriately and only to those who have legitimate reasons to use them. The CDC is responsible for implementing this regulation; a facility must register with the CDC if it possesses a select agent or agents. Some toxins are excluded from registration if the facility possess below a maximum amount as indicated by the CDC. Some of the select agents and toxins subject to regulation by the CDC are also regulated by the U.S. Department of Agriculture (USDA) under 9 CFR part 121. Eleven laboratories on campus use select agents. However, ten of these possess less than the maximum quantity for exemptions, and therefore are not registered with the CDC. One laboratory on campus is registered with the USDA to use select agents.

Atomic Energy Act

In the United States, the use of radioactive materials is in general regulated by the Nuclear Regulatory Commission (NRC) under the Atomic Energy Act. The UCI Nuclear Reactor is operated by the Department of Chemistry for use in radiochemistry applications. The reactor is a 250 kilowatt steady-state power Mark I TRIGA reactor built by General Atomics. TRIGA reactors are water and zirconium hydride, which are moderated to be especially safe for training and research purposes. Fuel is uranium enriched to 20% in U-235. Past work in this facility has included measurements on the JFK assassination bullet lead, mercury levels in ancient specimens of swordfish and tuna, sculptures in the Getty Museum in Los Angeles, ancient bones, samples of mosaics, and tracing manganese pollutants. Work has also been done to test systems and detectors for homeland security screening applications. The facility has provided short-lived radioactive isotopes on occasion for tracer studies in industry and medicine.

Animal Welfare Act of 1966

The Animal Welfare Act of 1966 (and its subsequent amendments) is the primary federal law that governs the use of animals in research, testing, and teaching in the United States. This Act is implemented and enforced by the USDA. It provides the basis for the regulatory authority given to the USDA to ensure the welfare of animal species that are covered by the Act and used in regulated activities. The Act includes all warm-blooded vertebrates but specifically exempts all farm animals used in food and fiber research or production (the treatment of which is addressed in the Federation of Animal Science Societies' *Guide for the Care and Use of Agricultural Animals in Research and Teaching* [1999]). The Act also exempts laboratory rats and mice used in research.

Federal regulations and accreditation standards require that all proposed uses of animals undergo review by the Institutional Animal Care and Use Committee (IACUC). The UCI IACUC is a faculty committee responsible for reviewing all animal use protocols, ensuring compliance with federal regulations, inspecting animal facilities and laboratories and overseeing training and educational programs. The primary role of IACUC is to ensure the ethical and humane care and use of animals in research, testing, and teaching. The committee is composed of scientists, non-scientists, veterinarians, and community members. Members are appointed by the Vice Chancellor for Research, the UCI Official responsible for the animal care and use program.

U.S. Public Health Service Policy on the "Humane Care and Use of Laboratory Animals"

The U.S. Public Health Service (PHS) Policy on the "Humane Care and Use of Laboratory Animals" requires institutions to establish and maintain proper measures to ensure the appropriate care and use of all animals involved in research, research training, and biological testing conducted or supported by the PHS. The PHS Policy is intended to implement and supplement the U.S. Government Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training. Because there are several facilities and laboratories on-campus that use laboratory animals, UCI is required to abide by this regulation.

National Animal Welfare Guidelines and Accreditation

The Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC International) is a private nonprofit organization that promotes the humane treatment of animals in science through a voluntary accreditation program. UCI submits to this voluntary accreditation program in addition to complying with local, State, and federal laws that regulate animal research. By undergoing the voluntary accreditation process, the research programs demonstrate that they not only meet the minimum regulatory

requirements but actually exceed them to achieve excellence in animal care and use. AAALAC International relies on the *Guide for the Care and Use of Laboratory Animals* (published by the National Research Council) as its primary standard for evaluation of laboratory animal care and use programs. In this guide, "laboratory animals" refer to any vertebrate animals, including traditional laboratory animals, farm animals, wildlife, and aquatic animals. As a condition of accreditation, AAALAC International requires correction of any deficiencies in programs or physical facilities that they observe during site visits.

Health Research Extension Act

The Health Research Extension Act of 1985 is implemented by the Director of the National Institutes of Health (NIH) and is supported by the U.S. Public Health Service Policy on the Humane Care and Use of Laboratory Animals. This Act establishes guidelines for the proper care and treatment of animals used in biomedical and behavioral research,. The guidelines require animal care committees at each entity that conducts biomedical and behavioral research with funding from the NIH to ensure compliance with the guidelines. The UCI IACUC meets this requirement for research on the campus.

Federal Plant Pest Act

The federal agencies primarily responsible for regulating transgenic materials in the United States are the USDA, the EPA, and the Food and Drug Administration (FDA). Transgenic materials include microorganisms, plants, and animals that have been genetically engineered or modified and generally do not meet the standard criteria for hazardous materials. Recombinant DNA techniques create new genetic combinations by changing, adding, or subtracting DNA genes, but this methodology does not necessarily mean that new organisms are created. Much research is performed using tissue cultures or benign bacteria grown under laboratory-controlled conditions. With the exception of transgenic bacteria that could be infectious (considered biohazardous waste), transgenic materials generally do not pose a threat to public health or the environment. Under the authority of the federal Plant Pest Act, the USDA Animal and Plant Health Inspection Service (APHIS) regulates importation, interstate movement, and environmental release of transgenic plants and organisms. APHIS licenses, through permits, the field testing of food crops before commercial release. At UCI, there are laboratories which conduct research with recombinant DNA and genetically engineered organisms; however, no USDA permits are required, as of the 2006-2007 school year.

Federal Insecticide, Fungicide, and Rodenticide Act

The federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) provided the EPA with authority to label pesticides and establish standards for certification of restricted pesticide application. The EPA also has the authority to delegate pesticide enforcement authority to states by entering into cooperative agreements with state pesticide programs. Since 1975, California has had primary authority over pesticide enforcement within the state.

The EPA uses its authority under FIFRA to regulate the distribution, sale, use, and testing of plants and microbes producing pesticidal substances. FIFRA regulations apply to UCI research projects involving these substances. FIFRA also governs campus pest control operations.

Food, Drug, and Cosmetic Act

The FDA, under the authority provided by the federal Food, Drug, and Cosmetic Act, regulates food and feed derived from new plant varieties and sets tolerance limits for substances used as pesticides on and in

food and feed and for residues of herbicides used on certain crops. UCI conducts clinical investigations which may use substances subject to regulation by the Food, Drug, and Cosmetic Act.

Agricultural Bioterrorism Protection Act

This law requires that entities that possess, use, or transfer agents or toxins deemed a severe threat to animal or plant health or products must notify and register with the Secretary of the USDA. USDA's Animal and Plant Health Inspection Service (APHIS) has been designated by the Secretary as the agency for implementing the provisions of the law for USDA. UCI researchers using these agents would be required to register with the USDA. As of the 2006-2007 school year, no laboratories conduct research using such agents.

Centers for Disease Control and National Institutes of Health Guidelines

The CDC and NIH have issued federal guidelines that address biological safety. Because research at UC campuses often involves federal funding, compliance with these guidelines becomes mandatory for most research. The CDC and the NIH have developed containment and handling guidelines for use in microbiological and biomedical laboratories. UCI has adopted these guidelines as standard practice and instituted biosafety levels in its laboratories.

Biosafety Levels. Various biologically hazardous substances are used for research on campus. Biological research may involve the use of recombinant DNA molecules, infectious agents, parasites, and other biological agents including bloodborne pathogens. UCI has adopted the most current guidelines set forth in the U.S. Department of Health and Human Services publications *Biosafety in Microbiological and Biomedical Laboratories* (2007) and *Guidelines for Research Involving Recombinant DNA* (2002) to classify biohazardous agents and to determine the level of safety precautions that must be used. Four biosafety levels (BSL) apply to biohazardous materials operations, depending on the risk group of the agent used. BSL 1 is for the least hazardous biological agents and BSL 4 is for the most hazardous biological agents. The UCI campus contains BSL-1, BSL-2, BSL-2+, and BSL-3 facilities. As of June 2007, there are approximately 150 BSL-1 facilities, 350 BSL-2 facilities, 4 BSL-2+ facilities, and 1 BSL-3 facility on campus. No Biosafety Level 4 agents or laboratories exist on campus, as the 2006-2007 school year. The Department of Health and Human Services guidelines describe BSLs 1, 2, 3, and 4 as follows:

- *Biosafety Level 1 (BSL-1)* - Defined and characterized strains of viable microorganisms not known to cause disease in healthy humans. Many agents not ordinarily associated with disease processes in humans are, however, opportunistic pathogens and may cause infection in the young, the aged, and immunodeficient or immunosuppressed individuals.
- *Biosafety Level 2 (BSL-2)* - Moderate-risk agents present in the community and associated with human disease of varying severity. With good microbiological techniques, these agents can be used safely in activities conducted on the open bench, provided the potential for producing splashes or aerosols is low. Primary hazards to personnel working with these agents relate to accidental precutaneous or mucous membrane exposure, or ingestion of infectious materials. Procedures with aerosol or high splash potential that may increase the risk of such personnel exposure must be conducted in primary containment equipment or devices. A Biosafety Level 2+ facility is defined as a BSL-2 facility that is used in conjunction with BSL-3 procedures and practices, with appropriate safety equipment. BSL-2+ containment reduces the risk to laboratory personnel who are working with infectious agents that are not environmental hazards.
- *Biosafety Level 3 (BSL-3)* - Indigenous or exotic agents with a potential for respiratory transmission and which may cause serious and potentially lethal infection. Primary hazards to

personnel working with these agents relate to autoinoculation, ingestion, and exposure to infectious aerosols.

- *Biosafety Level 4 (BSL-4)* - Dangerous and exotic agents that pose a high individual risk of life-threatening disease, which may be transmitted via the aerosol route and for which there is no available vaccine or therapy. The primary hazards to personnel working with BSL-4 agents are respiratory exposure to infectious aerosols; mucous membrane or broken skin exposure to infectious droplets; and autoinoculation. All manipulations of potentially infectious diagnostic materials, isolates, and naturally or experimentally infected animals pose a high risk of exposure and infection to laboratory personnel, the community, and the environment.

Biological Safety Cabinets. Aerosol control of infectious agents or other biologically derived molecules is usually achieved by using a biological safety cabinet. There are three primary classes of biological safety cabinets, which are distinguished by their respective design, containment, and cleanliness capabilities.

Class I cabinets are similar to conventional laboratory hoods with an open-face and negative pressure design, but Class I cabinets exhaust through a high-efficiency particulate air (HEPA) filter.

Class II cabinets, also referred to as laminar-flow biological safety cabinets, are effective in protecting operators from research materials as well as protecting research materials from external contamination. These cabinets are designed with an inward airflow to protect personnel, HEPA-filtered downward vertical laminar flow for product protection, and HEPA-filtered exhaust air for environmental protection.

Class III cabinets are totally enclosed, ventilated cabinets of gas-tight construction. Operations in the cabinet are conducted through attached protective gloves.

4.6.2.2 STATE

Hazardous Materials Release Response Plans and Inventory Act

Chapter 6.95 of the California Health and Safety Code requires facilities that use, produce, store, or generate hazardous substances or have a change in business inventory to have a Hazardous Materials Management Plan (HMMP) or Business Plan. The plan must disclose the type, quantity, and storage location of materials. The law also requires a site-specific emergency response plan, employee training, and designation of emergency contact personnel.

As a state agency and large-quantity user of hazardous materials, UCI is required to submit an HMMP to the local administering agency, the Orange County Fire Authority (OCFA). As discussed in Section 4.6.1.6 above, UCI's HMMP describes hazardous materials storage and handling practices and contains procedures for monitoring storage, performing regular inspections, detecting releases, and testing the detection systems on a regular basis. Compliance with the hazardous materials programs at UCI is verified through annual self-audits, with periodic random follow-up audits by the OCFA.

Title 23 CCR, Underground Storage Tank Act

The UST monitoring and response program is required under Chapter 6.7 of the California Health and Safety Code and Title 23 of the CCR. The program was developed to ensure that the facilities meet regulatory requirements for monitoring, maintenance, and emergency response in operating USTs. The County DEH is the local administering agency for this program. UCI operates four 20,000 gallon USTs that are subject to this program.

Aboveground Petroleum Storage Act

The Aboveground Petroleum Storage Act requires registration and spill prevention programs for ASTs that store petroleum. In some cases, ASTs for petroleum may be subject to groundwater monitoring programs that are implemented by the Regional Water Quality Control Boards and the State Water Resources Control Board. UCI operates 15 ASTs. A majority of these are in conjunction with emergency generators. Two ASTs are a 10,000 gallon tank that is split. In one tank, it stores both gasoline (7,000 gallon) and diesel #2 (3,000 gallon), the other tank stores 5,000 gallons each of 20% biodiesel (B20) and 100% biodiesel (B100). These tanks are subject to this regulation.

SB 1889, Accidental Release Prevention Law/California Accidental Release Prevention Program

SB 1889 requires California to implement a new federally mandated program governing the accidental airborne release of chemicals promulgated under Section 112 of the Clean Air Act. Effective January 1, 1997, the California Accidental Release Prevention Program (CalARP) replaced the previous California Risk Management and Prevention Program (RMPP) and incorporated the mandatory federal requirements. CalARP addresses facilities that contain specified hazardous materials, known as "regulated substances" that, if involved in an accidental release, could result in adverse off-site consequences. CalARP defines regulated substances as chemicals that pose a threat to public health and safety or the environment because they are highly toxic, flammable, or explosive. There are labs at UCI which use chemicals on the CalARP list but none of the labs possess these chemical in excess of threshold quantities.

Title 22, California Hazardous Waste Control Law

As previously discussed, the DTSC regulates the generation, transportation, treatment, storage, and disposal of hazardous waste under the RCRA and the California Hazardous Waste Control Law. Both laws impose "cradle to grave" regulatory systems for handling hazardous waste in a manner that protects human health and the environment. The DTSC has delegated some of its authority under the Hazardous Waste Control Law to county health departments and other Certified Unified Program Agencies, including the Orange County DEH.

Title 8 CCR, California Occupational Safety and Health Act

Cal/OSHA regulations apply to all UCI employees, including student employees and research assistants.

Worker Safety. In California, under the California Occupational Safety and Health Act, Cal/OSHA enforces federal OSHA requirements as well as more stringent state regulations. Cal/OSHA hazardous materials regulations include requirements for safety training, availability of safety equipment, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces hazard communication program regulations, which include identifying and labeling hazardous substances, providing employees with Material Safety Data Sheets, if requested, and describing employee training programs. These regulations also require the campus to prepare emergency action plans, including escape and evacuation procedures. Title 8 also establishes general industry safety orders for bloodborne pathogens, sharps injury prevention, and disposal of infectious wastes. All laboratories that involve the handling of biohazardous materials must comply with Cal/OSHA standards.

Asbestos and Lead Programs. The removal and handling of asbestos-containing materials is governed primarily by EPA regulations under Title 40 of the CFR but is implemented by the South Coast Air Quality Management District (SCAQMD). Fed/OSHA also has a survey requirement under Title 29 CFR,

which is implemented by Cal/OSHA under Title 8 CCR. These regulations require facilities to take all necessary precautions to protect employees and the public from exposure to asbestos.

The Cal/OSHA lead standard for construction activities is implemented under Title 8 of the CCR. The standard applies to any construction activity that may release lead dust or fumes, including, but not limited to, manual scraping, manual sanding, heat gun applications, power tool cleaning, rivet busting, abrasive blasting, welding, cutting, or torch burning of lead-based coatings. Unless otherwise determined by approved testing methods, all paints and other surface coatings are assumed to contain lead at prescribed concentrations, depending on the application date of the paint or coating.

Emergency Response to Hazardous Materials Incidents

California has developed an Emergency Response Plan to coordinate emergency services provided by federal, State, and local governments, and private agencies. The plan is administered by the Office of Emergency Services and includes response to hazardous materials incidents. The Office of Emergency Services coordinates the response of other agencies, including the Cal/EPA, the California Highway Patrol, the California Department of Fish and Game, the Regional Water Quality Control Board, the South Coast Air Quality Management District, and the Orange County Fire Authority.

Medical Waste Management Act of 1990

In 1990, the California legislature adopted the Medical Waste Management Act, which provides for the regulation of medical waste generators, transporters, and treatment facilities. The California Department of Health Services (DHS) has adopted statewide regulations covering medical waste treatment permits and shares regulatory authority with local programs that choose to enforce the requirements.

California Radiation Law

California is an “agreement state” with respect to federal radiation law. The agreement is that the state will administer the NRC federal regulations found in Title 10 of the CFR. The DHS is the agency responsible for administering the agreement. Under the agreement, the rules for California must be adequate to protect public health and safety and compatible with those of the NRC. The California rules are codified under Title 17 of the CCR and Division 20 of the Health and Safety Code. Under the California Radiation Control Law, the Radiological Health Branch of the DHS administers these rules. The state’s rules govern the receipt, storage, use, transportation, and disposal of sources of ionizing radiation and provide for the protection of users of these materials and the general public from radiation hazards. The DHS controls the use of radioactive materials in California by issuing Radioactive Material Licenses to California users of radioactive materials and radiation-producing machines. Several types of licenses exist; UCI has a Broad Scope Radioactive Materials License granted by the DHS.

Title 3 CCR, Food and Agriculture Code

Under Divisions 6 and 7 of the Food and Agriculture Code, Title 3 CCR, the California Department of Pesticide Regulation is vested with primary responsibility to enforce pesticide laws in California. The County Agricultural Commissioners grant site-specific permits for use of restricted pesticides and conduct periodic on-site observations of application sites and field worker safety. UCI personnel engaged in official duties relating to agricultural use of pesticides are exempt from the need to obtain an agricultural pest control advisor license, but campus personnel handling or applying restricted pesticides or the supervising applicator must obtain a State Qualified Applicator Certificate.

4.6.3 PROJECT IMPACTS AND MITIGATION

4.6.3.1 ISSUE 1 – TRANSPORT, USE, AND DISPOSAL OF HAZARDOUS MATERIALS

Hazards and Hazardous Materials Issue 1 Summary

Would implementation of the 2007 LRDP result in a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?

Impact: The 2007 LRDP would result in increased transport, use, and disposal of hazardous materials that could pose a hazard to the public and environment but these activities are, and would continue to be, comprehensively managed by UCI pursuant to state and federal laws and regulations.	**Mitigation:** No mitigation is required.
Significance Before Mitigation: Less than significant.	**Significance After Mitigation:** Not applicable.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, implementation of the 2007 LRDP may have a significant adverse impact if it would create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

Impact Analysis

Campus operations under the 2007 LRDP would involve the continued transport, use, and disposal of hazardous materials (chemical, radiological, biohazardous, and hazardous materials associated with infrastructure). In addition, implementation of the 2007 LRDP would result in increased land uses and activities that generate hazardous materials such as laboratories, medical/research facilities, academic activities, general maintenance, landscaping, and construction on the UCI campus. Therefore, UCI's transport, use, and disposal of hazardous materials is expected to increase in general proportion to the growth of the campus. While the amount and type of hazardous materials may vary over time with changes in disposal, products, research, and additions to hazardous materials lists, the general range and type of hazardous materials used on campus is not expected to substantially change through the duration of the 2007 LRDP implementation. Impacts associated with the four general categories of hazardous materials (chemical, radiological, biohazardous, and hazardous materials associated with infrastructure) used at UCI are discussed in the following sections.

General Chemicals Use. Implementation of the 2007 LRDP would lead to an increase in the number of laboratories and the expansion of other facilities that use hazardous materials and generate waste. Various chemicals that may be used may pose different levels of hazards in their use. Some substances, such as acetone, are flammable, while others, like cyanide and mercuric chloride, are toxic. Some non-radioactive chemicals have the potential for causing cancer or acute and chronic illnesses. The properties and health effects of chemical substances are unique to the individual materials, although they often can be grouped by chemical types. No classifications exist to rate the level of hazard posed by all substances under all circumstances. While some substances may present little hazard, others may be capable, in certain situations, of causing severe health effects.

Workers might be exposed to hazardous chemicals through inhalation, skin absorption (contact), ingestion, and injection (cuts). UCI policies and procedures address the procurement, handling, and disposal of carcinogenic, controlled, volatile, flammable, and explosive substances. EH&S is charged with implementing measures, both directly and through campus departments, designed to ensure compliance with applicable laws and regulations.

Laboratories and other facilities constructed under the 2007 LRDP would continue to comply with all hazardous materials standards for UCI. To minimize exposure to chemicals in the air, researchers and other workers would continue to take standard procedural precautions, such as working under fume hoods when using chemicals likely to present exposure hazards. Fume hoods and other engineering controls would be required to meet Cal/OSHA requirements and fume hood ventilation rates would continue to be checked annually by EH&S. Proper use of the fume hoods and other engineering controls would keep indoor laboratory air toxics concentrations below the suggested guidelines of the American Conference of Governmental Industrial Hygienist Threshold Limit Values and the legal limits of the OSHA Permissible Exposure Levels.

To prevent exposure through skin contact, campus policies and procedures require that protective clothing, such as laboratory coats, gloves, and safety glasses, be worn while handling hazardous materials and wastes. Proper washing after handling chemicals is also required and, in accordance with state laws and campus policy, eating, drinking, applying cosmetics, and chewing gum or tobacco are not allowed in laboratories except in designated clean areas. These restrictions are imposed to prevent the potential ingestion of chemicals.

Campus departments are primarily responsible for ensuring that safe work practices are followed; EH&S supports departments with this responsibility. EH&S also reviews proposed laboratory designs for nonstructural seismic safety concerns and compliance with Cal/OSHA requirements to provide appropriate protection for the workers.

Exposure to the public, including nearby homes and schools, from hazardous materials used on campus is limited, because most hazardous materials use and storage on campus takes place indoors. Therefore, the only potential pathway for public exposure would be air emissions. Particulate-borne air emissions (i.e., bacteria, viruses, radioisotopes) would be controlled by HEPA filtration at a very high degree of efficiency. Potential evaporative chemical emissions from laboratory fume hoods are analyzed in Section 4.2, Air Quality.

Environmental and health and safety laws and regulations are continually updated and have been revised and added to in recent years. The various federal, State, and local agencies that monitor campus regulatory compliance require time to receive, interpret, and transmit changes to the regulated community. In turn, regulated entities such as UCI require some time to receive proper notice, to understand changed laws and regulations, to acquire proper equipment, to inform campus workers, and to train or hire new staff to comply with the changes. Hence, compliance is an evolutionary and perpetual process. UCI is committed to providing a safe environment for the campus and the local community by implementing the increasingly complex laws and regulations regarding the use of hazardous materials.

One serious incident has occurred in a UCI laboratory within the past several years. On July 23, 2001, in Reines Hall, a chemistry graduate student suffered second degree burns over 15 to 18 percent of his body in a fire which was ignited by an explosion during a benzene distillation procedure. From this event, the campus modified and improved its emergency procedures. Specifically, EH&S implemented safer chemical storage procedures and developed a more thorough inventory system for stored chemicals. In order to improve how the University responds to emergencies, EH&S improved its relationships with

local fire personnel and the Orange County Fire Authority (OCFA). As part of the multi-disciplinary approach to emergency management, EH&S works with local responders and conducts regular meetings to improve response capability. Lastly, after this incident, EH&S revised and updated the emergency management plan and routinely tests the plan with real-time disaster drills.

Through implementation of the programs discussed above and as discussed in Section 4.6.1, the laboratories on campus have achieved a high level of compliance with regulatory standards and campus policies. The campus would continue to implement all of these programs under the 2007 LRDP as mandated by State and federal laws and regulations; therefore, the impact of increased hazardous chemical materials use on campus by UCI laboratories and departments and from maintenance and support operations would be less than significant.

General Chemicals Disposal. Hazardous chemical wastes are generated whenever hazardous chemicals are used. General types of hazardous chemical wastes include spent solvents from laboratories and the physical plant, discarded laboratory reagents and reaction products, unused paints and oils, and contaminated materials such as gloves and containers. Implementation of the 2007 LRDP would increase the number of research laboratories on campus and therefore may result in an increase in hazardous chemical waste generation. However, in the past several years, the UCI campus has experienced a decrease in the amount of chemical materials disposed as waste due to changes in lab practice.

The extent of student and worker exposure to hazardous wastes is related to the training they receive, how conscientiously they follow safety procedures, how well engineering controls are maintained and operated, and the extent to which compliance is supervised and enforced. The campus has prepared guidelines for proper disposal of hazardous wastes based on regulations established by the U.S. EPA and the California DTSC. To facilitate safe management, hazardous wastes are subcategorized into groups with similar or closely related properties. Before EH&S collects materials, they must be packaged and labeled properly, which includes placing them in appropriate sealed containers, segregating incompatible materials, and identifying all components with approximate concentrations. Hazardous materials transported to the EH&S Services Building are separated into subcategories based on the handling methods employed, storage locations at the facility, and the ultimate destination of the materials. Flammable wastes (mostly solvents), corrosives (acids and bases), certain oils, poisons, heavy metals, and oxidizers are shipped off site for recycling, treatment, or disposal. Chemical wastes, once packed for disposal, are further categorized according to their off-campus disposal methods.

The EH&S Services Building is a 14,000 square foot facility that includes hazardous waste storage. Based on consultation with UCI's Manager of Environmental Programs, the existing building provides sufficient capacity to accommodate future increases in waste generation resulting from the 2007 LRDP and does not anticipate a need to expand the facility or construct a new facility to accommodate increased hazardous waste.

A small portion of the waste disposed of off site is neutralized or rendered nonhazardous by off campus treatment facilities (for example acid neutralization and metals recovery) before disposal. The majority of the hazardous waste disposed of off campus is land-banned (cannot be disposed of in a landfill), and most of this is shipped out-of-state for incineration. Because most of the hazardous waste hauled off site by vendors cannot be disposed of in a landfill, and only a small amount of waste can be neutralized and landfilled, the increase in hazardous waste generated by projects constructed under the 2007 LRDP would not affect the capacity of regional landfills. The campus has implemented programs and controls to detect inadvertent release of hazardous material to the sanitary sewer or landfill. Pouring hazardous wastes down drains and disposing of hazardous materials with ordinary solid waste are prohibited by law.

Implementation of the 2007 LRDP may result in an increase in hazardous chemical waste generation at UCI. Compliance with hazardous waste storage and transportation regulations and continuation of the programs and controls in place to manage hazardous wastes and detect inadvertent releases of hazardous materials to the sanitary sewer and/or landfill, as mandated by state and federal laws, would minimize the hazards to workers, the public, and the environment. As of the 2006-2007 school year, treatment, storage, and disposal facilities are available with the capacity to accept and safely manage UCI chemical waste. Therefore, implementation of the 2007 LRDP is anticipated to result in a less than significant impact related to the disposal of hazardous chemical waste.

Radioactive Materials Use. Average background radiation exposure in the United States is about 360 millirem per year (National Safety Council 2003). Typical average doses to workers at campus facilities are less than 100 millirem per year, a level below naturally occurring or background radiation and below applicable standards. Implementation of the 2007 LRDP would not be anticipated to change the typical dose level.

Radiation poses a health risk to those who are exposed, but exposure can be prevented with proper protective equipment and procedures. Radioactive materials at UCI are monitored closely. In accordance with the UCI Broad Scope Radioactive Materials License, prior to obtaining radioactive materials, each principal investigator must apply for a Radiation Use Authorization (RUA) from the Radiation Safety Committee. The RUA specifies the particular radioisotopes to be used and maximum limits on the quantities possessed. The UCI radiation safety program, which is required by the Radiation Control Law and documented in the Radiation Safety Manual, is designed to provide adequate protective measures against exposure for visitors, students, faculty, staff, and the community at large.

These existing measures are designed to reduce the risk of illness and accidents. Continued implementation of these measures as mandated by State and federal law would occur under the 2007 LRDP. The additional research programs that would be implemented under the 2007 LRDP may increase the use of radioactive substances over current amounts. However, given that adequate safety controls, plans, and procedures are mandated and in place to limit exposure to radiation from radioisotopes and radiation-producing machines, the potential of the 2007 LRDP to expose campus occupants to significant health or safety risks is low. Therefore, the impact would be less than significant.

Radioactive Materials Disposal. Existing campus research laboratories generate small amounts of solid and liquid low-level radioactive waste. With the additional research facilities that would be constructed under the 2007 LRDP, the amounts of radioactive waste at UCI may increase. Radioactive waste is segregated, sealed, and labeled by the generating researcher, who calls EH&S for pickup. EH&S removes radioactive materials from laboratories and takes them to the EH&S Services Building to prepare them for eventual disposal by one of two methods. The material is either (1) held for decay, then disposed of as nonradioactive, or (2) transported off campus for decay and disposal.

The EH&S Services Building is hazardous waste storage facility which also stores radioactive waste. Based on consultation with UCI's Manager of Environmental Programs, this building will be able to accommodate an increase in waste generation under the 2007 LRDP and does not anticipate a need to expand the facility or construct a new facility to accommodate increased radioactive waste.

Radioactive waste generation, if not adequately managed, can pose health or safety threats analogous to those mentioned for radioactive materials use. The programs, controls, and procedures implemented on campus provide safe handling, treatment, and disposal of radioactive waste. Because these measures will continue to be implemented as mandated with the implementation of the 2007 LRDP, the associated impact would be less than significant.

Biohazardous Materials Use. Implementation of the 2007 LRDP would increase the use of biohazardous materials on campus. UCI has particular strengths in the biosciences, and the 2007 LRDP would accommodate an increase in building space designated for research which could be used for biomedical purposes. Due to the dynamic nature of academic research, it is not possible to predict all potential biological agents or research applications that might conceivably occur within future research facilities at UCI. The types of biological agents used in the future would likely include materials currently used and new research could create a need for new and different biological agents. Most of the agents used on campus require laboratories operating at BSL-1, BSL-2, and BSL-2+, with a one operating at BSL-3. Under the 2007 LRDP, laboratories operating at these levels may increase; however, no BSL-4 laboratories are anticipated. If a BSL-4 laboratory were required on campus, a capital improvement project would be required and that project would require appropriate review under CEQA and other applicable regulations.

Biohazardous materials can potentially affect humans through air (inhalation of aerosols), water (release to the sewer), waste disposal, and accidents. The type of potential illness is dependent on the type and amount of biohazardous material to which a person is exposed. Improper handling techniques can increase the risk of exposure of building occupants to biohazardous materials. Most biohazardous materials, due to their limited viability in the environment, pose no significant hazard to workers or to the community; others could pose a potential hazard if accidentally released. Most biological agents are thought to have a limited ability to survive outside the body. Information on this subject is limited, but research continues on the actual survival parameters of these agents under varying conditions. For example, survival of viruses in the environment is dependent on a complex interaction of factors such as ambient temperature, relative humidity, texture and composition of surfaces, exposure to light, presence of other organic material, and for aquatic environments, the chemical and physical properties of the water. To provide a greater margin of safety, control measures are based on conservative estimates of maximum periods that viruses can remain infectious (i.e., a worst-case basis).

Protection from biological agents is provided to campus employees, the campus community and the public, including nearby residents and school children, through a variety of engineering and administrative controls. Each type of control is aimed at minimizing a potential route of entry by the agent to the worker. Some of these controls also work to minimize potential routes of exposure for the public at large. Exposure to biohazardous agents can occur through (1) inhalation, (2) ingestion, (3) absorption through skin or mucous membranes, and (4) penetration through broken skin. In a survey of nearly 4,000 cases of laboratory-associated infections in the United States, inhalation of infectious aerosols was considered a plausible, yet unconfirmed source of infection in over 80 percent of the cases where a worker was exposed to a biological agent.

To minimize workers' exposure to hazards, the campus has established a Biosafety Program. In accordance with applicable regulations and UCI policy, protective measures are used and protective clothing is worn when working with biohazardous material to prevent exposure by skin contact. The potential for ingestion of hazardous biological agents is minimized by following the UCI policy banning eating in laboratories and requiring proper washing. Also in accordance with campus policy aimed at reducing the chance of ingestive exposure, mouth pipetting is not allowed.

Engineering controls provide a degree of containment of biological agents and minimize personal contact with these agents. These safety features are built into facility and equipment design and operation. The most significant engineering control that can be implemented is observation of the correct BSL criteria of laboratory and equipment design. The campus utilizes BSL-1, BSL-2, and BSL-2+ for most of its laboratory applications. Access to campus laboratories operated at BSL-3 is limited to trained workers, and special air filtration requirements apply.

Biohazardous aerosols that can cause inhalation exposure are generated during the mixing, shaking, and other disruptive handling of biological organisms. Current campus policies require that if BSL-2 or BSL-3 materials are involved, these activities must be conducted in biosafety cabinets, which contain aerosols and filter all released air to remove biohazardous materials. HEPA-filtered ventilation systems and biological safety cabinets are tested and certified annually by an external contractor; this includes filter leak and velocity tests. EH&S retains records of these tests. Most HEPA filters for biosafety cabinets recirculate air into laboratories and are 99.97 percent effective in screening out particles at 0.3 micron in size. Airborne viruses do not usually travel alone but on a host bacteria or aerosol (i.e., a water droplet or dust particle), for which HEPA filters are very effective; therefore, HEPA filters effectively remove biohazardous particles. Filters are decontaminated, typically with formaldehyde gas, before they are removed for disposal.

Laboratory equipment that could generate aerosols, such as shakers and centrifuges, must be sealed or contained during use. In the laboratory, aerosols deposit in relatively short distances from point sources. Potential aerosol emissions, if not controlled within a biosafety cabinet, are controlled by splash guards and decontamination of surrounding work surfaces. When a laboratory activity is completed, most tissues, fluids, and cell cultures are treated as infectious waste. This infectious material is collected in biohazard-labeled bags, autoclaved, collected by EH&S personnel, and sent to the landfill once sterilized.

UCI employees working with biohazardous materials could be exposed to biological agents through contact with open wounds from skin punctures due to animal bites and scratches, or cuts and lacerations with contaminated cages or sharp edges. This risk is minimized by protective clothing and training. Exposure to contaminated aerosols and splashes associated with increased laboratory research and washing of contaminated cages is also a potential risk. However, UCI staff is required to wear respiratory protection when research protocols involve readily aerosolized agents, such as measles or tuberculosis. Therefore, exposure to aerosols and splashes is not considered a normal means of disease transmission with agents studied at UCI unless these droplets settle and survive on surfaces that are contacted by an open wound.

The potential impact of increasing the number of diseased animals and research material on employee health is considered less than significant because regulatory requirements and the current regulatory guidelines for controlling employee exposures to blood-borne pathogens would be followed. These programs are continuously monitored and upgraded as necessary. Such programs include the Cal/OSHA Bloodborne Pathogen Standard, the Centers for Disease Control guidelines for work in laboratory and animal facilities, Guidelines for Animal Transport and Quarantine, and National Institutes of Health guidelines for work with recombinant DNA.

Cal/OSHA's Bloodborne Pathogen Standard requires the campus to implement an Exposure Control Plan to minimize potential risks related to handling human blood, and other potentially infected materials. As part of these programs, departments working with human material offer hepatitis B vaccinations to all employees and students who work with human blood, free of charge. The vaccinations are available at the Student Health Center and UCI Medical Center. The Exposure Control Plan also outlines the requirements for worker training and prescribes safety measures such as engineering controls (e.g., splash guards) and personnel protective equipment (e.g., face shields and gloves).

Cal/OSHA has oversight of all campus laboratories. Cal/OSHA mandates methods of documenting, investigating, and controlling accidents that result in skin penetration. Evidence presented during Cal/OSHA rulemaking procedures indicate that safety and health program measures like those described above are effective in reducing the number and severity of injuries and illness in the workplace. Cal/OSHA does not regularly audit the campus laboratories but conducts inspections in the event of an

accident or a complaint. EH&S, however, inspects all laboratories at least annually, and DHS inspects campus laboratories every 12 to 18 months.

The potential impacts of increasing the use of biohazardous materials at UCI on employee health, the public, and the environment is considered less than significant because regulatory requirements and the current campus guidelines and practices for controlling employee exposures to infectious agents would be followed and would minimize impacts outside of the research laboratories.

Biohazardous Materials Disposal. Biohazardous waste is any liquid or solid waste generated through the handing of specimens from humans or animals that may contain infectious agents. Cultures of infectious agents, human anatomical remains, and animal carcasses that may be infectious are also considered to be biohazardous waste. Research laboratories using biohazardous materials and animal care activities at UCI produce biohazardous waste. Most laboratory tissues, fluids, and cultures are considered to be potentially infectious waste. Potentially infected animal care wastes can include animal excreta, bedding and uneaten food, cage washing solutions, animal carcasses and tissues, workers' disposable protective clothing and sharp objects such as needles, scalpels, and broken glass.

Implementation of the 2007 LRDP would increase campus biohazardous waste generation because use of biohazardous materials would increase. Biohazardous waste generated at UCI is picked-up by contractors for treatment or is treated on campus. The majority of biohazardous waste (approximately 85 percent) is picked up by a contractor for off-site disposal. Approximately 15 percent of waste is treated by autoclaving, which renders the waste nonhazardous by applying steam pressure. Once treated, the waste can be disposed of as nonhazardous waste at a landfill. Biohazardous wastes that also contain hazardous chemical or radioactive waste are categorized and handled as hazardous or radioactive. Generated wastes are segregated, handled, labeled, stored, and transported to minimize direct or indirect exposure of personnel. Some campus activities also produce biohazardous waste that cannot be autoclaved, such as animal carcasses. Wastes of this kind are double-bagged, refrigerated, and picked up by an outside contractor for incineration. EH&S guides and assists with the disposal of medical waste and performs regular inspections of campus medical waste generator and treatment sites.

Based on consultation with UCI's Manager of Environmental Programs, the EH&S Services building would be able to accommodate an increase in waste generation under the 2007 LRDP, including biohazardous waste, and does not anticipate a need to expand the facility or construct a new facility to accommodate increased biohazardous waste.

Existing campus health and safety practices and compliance with federal and state regulations minimize the potential for adverse health effects related to biohazardous waste. New UCI projects implemented under the 2007 LRDP would comply with these practices. Therefore, the impact of increased generation of biohazardous waste by UCI laboratories would be less than significant.

Use and Disposal of Hazardous Materials Associated with Infrastructure. Due to their age, numerous campus buildings are assumed to contain some form of asbestos or lead paint. Workers can be exposed through inhalation or ingestion of lead dust or asbestos particles when lead paint is disturbed or made friable by drilling, sanding, or other destructive processes. An unknown number of fluorescent light ballasts containing PCBs are also present in some campus buildings. Building materials may also be contaminated as a result of radioactive or chemical hazardous materials use in the building resulting in spills or aerosol releases that may deposit contaminants on the floors or walls. If contamination is present, exposure can be minimized through worker training and appropriate engineering and administrative controls and protective equipment.

During project planning, EH&S and the campus project manager coordinate assessment of potentially contaminated buildings and needed remediation. In addition, Design and Construction Services and Facilities Management routinely direct surveys for asbestos and lead paint in existing buildings proposed for modification, and develop appropriate abatement plans. Implementation of health and safety plans and site remediation plans for work within existing buildings is a condition of campus and contractor construction management.

UCI performs lead and asbestos surveys for all remodeling and demolition projects. State law requires that contractors and workers be notified of the presence of asbestos in buildings constructed before 1979. The DHS requires the certification of employees and supervisors performing construction activities involving lead in residential and public buildings. Standard specifications included in all campus construction contracts specify that contractors who disturb or potentially disturb asbestos or lead must comply with all federal, State, and local rules and regulations regarding hazardous materials. Contractors are also required to stop work and inform UCI if they encounter material believed to be asbestos, PCBs, lead, or other hazardous materials. Fluorescent light ballasts containing PCBs are disposed of by UCI.

Prior to any demolition or renovation work in a laboratory, all hazardous materials must be removed and EH&S or other qualified personnel must survey the laboratory for contamination. EH&S then performs a confirmation survey for contamination resulting from the use of radioactive or biohazardous materials, chemical carcinogens, fume hoods or biosafety cabinets, and hazardous chemicals. EH&S uses a survey meter and collects wipe samples to test for radioactivity before removing a room from a Radiation Use Authorization (RUA). If the EH&S auditor finds reasons to suspect a major chemical spills or if there are concerns about waste disposal, sampling for chemical constituents may be performed.

Campus practices include investigating existing buildings for the presence of hazardous materials or wastes as part of the site selection process, preparation and implementation of site remediation plans for buildings with chemical or radioactive contamination, and development and implementation of health and safety plans before beginning work on contaminated sites. Compliance with federal and State regulations, campus policies, and current EH&S procedures minimizes the potential for exposure of workers to contaminated building materials. UCI would continue to comply with the federal and state regulations under the 2007 LRDP. The impact would therefore be less than significant.

Transport of Hazardous Materials and Waste. As discussed above, implementation of the 2007 LRDP would increase hazardous materials use and hazardous waste generation on campus. Consequently the transport of hazardous materials to and from campus would also increase. UCI policy requires that packaging of chemicals to be transported on public roads conform with all legal requirements, including those of the U.S. Department of Transportation and the California Departments of Agriculture, Health, and Highway Patrol, and to the guidelines of the International Civil Aeronautics Organization and the International Air Transport Association. All hazardous waste is picked up from generators by EH&S or a licensed hazardous waste contractor, and generators must properly package and label all hazardous wastes. Under the 2007 LRDP, UCI would continue to require compliance with these safety regulations, guidelines, and policies. Therefore, the impact of the increased transport of hazardous materials to and from campus would be less than significant.

Mitigation Measures

The 2007 LRDP would have a less than significant impact on the use, disposal, and transportation of hazardous materials to the public with compliance of existing associated regulations, programs, practices and procedures; therefore, no mitigation measures are required.

4.6.3.2 ISSUE 2 – ACCIDENTAL RELEASES

Hazards and Hazardous Materials Issue 2 Summary

Would implementation of the 2007 LRDP result in the release of hazardous materials into the environment through reasonably foreseeable accidents?

Impact: Implementation of the 2007 LRDP could result in increased transport, use, and disposal of hazardous materials, which could increase the chance for accidents to occur; however, safeguards mandated by federal and State laws and regulations would minimize the risk of accidents. Further, procedures are in place to handle any future accidents that may occur.	**Mitigation:** No mitigation is required.
Significance Before Mitigation: Less than significant.	**Significance After Mitigation:** Less than significant.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, implementation of the 2007 LRDP may have a significant adverse impact if it would create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Accidental release of hazardous materials would be injurious to the health and safety of persons and/or the environment if released and exposed to the public.

Impact Analysis

Under current practice at UCI, hazardous materials and waste storage on campus must comply with applicable regulations, including suitable containers that are sealed at all times (when not adding or removing waste). Packages of hazardous materials opened at EH&S are resealed before they are delivered to campus laboratories. Most containers of hazardous materials are delivered to campus users in their original packaging. A few solvents are received in bulk and dispensed by EH&S into safe containers for pickup or delivery.

The U.S. Department of Transportation, Office of Hazardous Materials Safety prescribes strict regulations for the transportation of hazardous materials, as described in Title 49 CFR. Transportation along state roadways within or near campus is also subject to all hazardous materials transportation regulations established by the California Highway Patrol pursuant to the California Vehicle Code. As detailed in the discussion of Issue 1, Section 4.6.3.1 above, campus policy requires that all hazardous materials shipped on public roads be packaged in compliance with all applicable regulations. Compliance with these regulations minimizes the potential for accidental release of hazardous materials being transported to or from campus.

As also explained above, almost all hazardous materials are delivered to the users in their original packaging. Any packages opened by EH&S is resealed before the package is delivered to the users. The exception to this is that some solvents are delivered in bulk and transferred to smaller containers for distribution. Hazardous wastes are picked up from users only by EH&S staff, who check the wastes for appropriate packaging, or by licensed hazardous waste haulers. Further, all individuals who handle hazardous materials are appropriately trained and are provided with copies of the Material Safety Data Sheets (MSDS), which outline procedures to follow in the event of accidental release or exposure. Safety equipment is available in all areas where hazardous materials are used.

Despite all campus safety protocol, accidents may still occur. However, UCI has prepared an Emergency Management Plan, which addresses the campus community's planned response to various levels of human-made or natural emergency situations, including the release of hazardous materials, to be specifically handled by EH&S. Responsible units providing technical expertise in containment and cleanup of spill chemicals, radioactive, biological, asbestos-containing, or other regulated materials are EH&S, Orange County Fire Authority, County HAZMAT (if available), and outside contractors. A Hazardous Materials Business Plan also addresses emergency and spill response procedures which include, but is not limited to specific emergency response instructions, locations of personnel and equipment resources (i.e., telephone numbers, fire extinguishers, spill kits, safety showers/eyewashes, first aid kits, etc.), and specialty hazard instructions as well as appropriate training. Compliance with all applicable federal and State laws, as well as campus programs, practices, and procedures related to the transportation, storage, and use of hazardous materials would continue under the 2007 LRDP, minimizing the potential for a release and providing for prompt and effective cleanup if an accidental release occurs. Therefore, the impacts related to accidental release due to the increased transportation, storage, or use of hazardous materials under the 2007 LRDP would be less than significant.

Mitigation Measures

Implementation of the 2007 LRDP would have a less than significant impact on the release of hazardous materials into the environment from an accident due to compliance with associated regulations, programs, practices, and procedures; therefore, no mitigation measures are required.

4.6.3.3 ISSUE 3 – HAZARDS TO NEARBY SCHOOLS

Hazards and Hazardous Materials Issue 3 Summary

Would implementation of the 2007 LRDP result in activities that emit hazardous emissions or handle hazardous materials within one-quarter mile of an existing or proposed school?

Impact: A small increase in the use and disposal of hazardous materials and waste would be located within one-quarter mile of an existing school; however, compliance with hazardous materials regulations would minimize risk to nearby educational facilities.	**Mitigation:** No mitigation is required. Compliance with applicable laws and regulations would occur.
Significance Before Mitigation: Less than significant.	**Significance After Mitigation:** Not applicable.

Standards of Significance

Based on Appendix G of the CEQA Guidelines and Section 21151.4 of the Public Resources Code, implementation of the 2007 LRDP may have a significant adverse impact if it would result in a health or safety hazard based on activities that emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school (kindergarten through 12th grade).

Impact Analysis

There are five schools located within one-quarter mile of the campus: the UCI Farm School, Tarbut v' Torah School, Vista Verde Elementary School, Turtle Rock Elementary School, and University High School. In addition, the UCI Child Development Center located on Jamboree Boulevard on the UCI North Campus provides elementary school programs for students with Attention Deficit Hyperactivity Disorder

(ADHD) and related behavioral and learning problems.. The Farm School, located on UCI's East Campus, is a non-traditional school for children ages 5-12 and consists of approximately 50 children. The Farm School will close in mid-June 2007.

Six day care/pre-schools are also located on campus. One is the University Montessori School located on the South Campus in University Hills. The other five are located on the East Campus in the Verrano Place Housing area. A new infant/toddler center is under construction on the East Campus and will be completed and open in fall 2007. There are several other schools located within the vicinity of the UCI campus, but they are located greater than one quarter mile away. These schools include Bonita Canyon Elementary School and Rancho San Joaquin Middle School. University High School, Turtle Rock Elementary School, Vista Verde Elementary School, and Tarbut v Torah are the only schools located within one-quarter mile of the UCI campus. The other schools are located within five miles of the campus.

While hazardous materials and waste could be handled within one-quarter mile of an existing school as a result of implementation of the 2007 LRDP, this situation is unlikely as all schools within the campus vicinity are located adjacent to campus residential areas and a significant distance from any teaching, research, and campus support facilities where a majority of hazardous waste would be handled. Likewise, it is unlikely that hazardous materials and waste would be handled in the vicinity of the day care and preschool centers as these facilities are similarly located with residential neighborhoods and a significant distance from teaching, research, and campus support facilities. The closest academic building to the University Montessori School with the potential to handle hazardous materials is the Engineering Laboratory Facility, which is over one-quarter mile from the University Montessori School. The closest facility to the day care centers on the East Campus with the potential to handle hazardous materials is the Student Health Center, which is approximately one-quarter mile from the centers. Furthermore, hazardous materials or waste handled in the vicinity of the day care or pre-school centers would not exist in quantities significant enough to pose a risk to occupants of the school or the campus community. As explained in the discussion for Issue 1 above, hazardous materials in laboratories are typically handled in small quantities. The potential consequences of accidental releases would be limited to a single building and in most cases are limited to the individual laboratory where the spill occurred, and people outside the buildings would not be exposed; therefore, the impact to those attending existing or proposed schools would be less than significant.

In addition, UCI would comply with Section 15186 of the CEQA Guidelines which establishes requirements for school projects, as well as projects near schools, to ensure that potential health impacts resulting from exposure to hazardous materials, wastes, and substances are examined and disclosed in an environmental document. Section 15186 also states that hazardous materials that must be considered a risk are those which may impose a health or safety hazard to persons who would attend or would be employed at the school. Specifically, when a project located within one-quarter mile of a school involves the construction or alteration of a facility that might reasonably be anticipated to emit hazardous or acutely hazardous air emissions or handle acutely hazardous materials or a mixture containing acutely hazardous materials in a quantity equal to or greater than that specified in Section 25536(a) of the Health and Safety Code, the Lead Agency must (1) consult with the affected school district regarding the potential impact of the project when circulating the environmental document and (2) notify the affected school district in writing prior to approval and certification of the environmental document.

The 2007 LRDP does not include specific proposals for new development that might involve the use or transport of hazardous materials and the campus would continue to comply with the provisions of Section 15186 of the CEQA Guidelines as it applies to any future development. Compliance with federal and State regulations pertaining to hazardous wastes, including the CEQA Guidelines section specified above,

along with the existing campus programs, practices, and procedures would ensure that risks associated with hazardous emissions or materials to existing or proposed schools located one-quarter mile from the campus would remain less that significant through proper handling procedures, disposal practices, and/or clean-up procedures.

Mitigation Measures

Implementation of the 2007 LRDP would have a less than significant impact associated with hazards to nearby school facilities; therefore, no mitigation measures are required.

4.6.3.4 ISSUE 4 – LISTED HAZARDOUS MATERIALS SITES

Hazards and Hazardous Materials Issue 4 Summary

Would implementation of the 2007 LRDP result in activities located on a listed hazardous materials site creating a significant hazard to the public or environment?

Impact: Development is proposed in the area of a potentially hazardous site; however, because this site will be fully rehabilitated by the end of 2007 and prior to any construction, this site is of low environmental concern and is not expected to create a significant hazard to the public or environment.	**Mitigation:** No mitigation is required
Significance Before Mitigation: Less than significant.	**Significance After Mitigation:** Not applicable.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, implementation of the 2007 LRDP may have a significant adverse impact if it would result in activities located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.

Impact Analysis

As previously mentioned in Section 4.6.1.3, a potentially hazardous site is located in the North Campus. Leaking underground storage tanks (LUSTs) were removed from the Corporation Yard located on the North Campus in 1998. Several remediation methods were used prior to, and following, the removal of the UST's. However, some methods proved to be moderately successful while others were unsuccessful. The most recent and current remediation method being used is the Soil Vapor Extraction method. This technology has been proven to be most effective in reducing concentrations of volatile organic compounds (VOCs) and certain semi-volatile organic compounds (SVOCs) found in petroleum products at UST sites (EPA 2006). Because most of the contaminants have been removed over the past 10 years, this method is the last of the remediation process before the site can be considered closed. In addition, because of previous remediation processes, this site no longer poses a significant risk to the environment and occupants that reside on the site, and therefore is of low environmental concern. According to UCI EH&S, this site is expected to be fully rehabilitated by the end of 2007.

This North Campus site is developed and is located in an area that is designated as mixed use in the 2007 LRDP. While there are no plans for immediate additional development on this site, there are plans to further develop this site within the next 10 years. By then, the remediation process will have been completed and the site will have been completely closed, thereby barring any environmental implications

or risks to construction workers or occupants of the site. Additionally, according to UCI EH&S, no other known hazardous material sites exist on campus. Therefore, implementation of the 2007 LRDP would have a less than significant impact to the public or environment associated with this hazardous site.

Mitigation Measures

Implementation of the 2007 LRDP would have a less than significant impact associated with hazardous material sites to the environment and public.

4.6.3.5 ISSUE 5 – HAZARDS FROM NEARBY AIRPORTS

Hazards and Hazardous Materials Issue 5 Summary

Would implementation of the 2007 LRDP result in an aircraft safety hazard?

Impact: Because of the location of the campus from John Wayne Airport (the nearest airport) and the lack of accidents in the vicinity of the campus, safety hazards to people residing or working on the UCI campus due to aircraft from John Wayne Airport are not likely to occur (Haz-5).

Mitigation: No mitigation is required.

Significance Before Mitigation: Less than significant.

Significance After Mitigation: Not applicable.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, implementation of the 2007 LRDP may have a significant adverse impact if it would result in a safety hazard for people residing or working in the project area due to the hazards from aircraft from John Wayne Airport (JWA).

Impact Analysis

As discussed in Section 4.6.1.5, the UCI campus is located 1.5 miles east of the JWA and is within the airport planning area for JWA, but is not located within a designated Accident Potential Zone because none have been adopted for JWA based on available airport accident data. Furthermore, no aircraft accidents have occurred in the vicinity of the UCI Campus within the past 30 years. As such, it is unlikely that aircraft operating at JWA would pose a safety hazard to people residing or working at the UCI Campus. Therefore, implementation of the 2007 LRDP would not result in a significant aircraft safety hazard associated with JWA.

Mitigation Measures

The 2007 LRDP would have a less than significant impact on aircraft accident hazards; therefore, no mitigation measures are required.

4.6.3.6 ISSUE 6 – EMERGENCY RESPONSE AND EVACUATION PLANS

Hazards and Hazardous Materials Issue 6 Summary

Would implementation of the 2007 LRDP impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Impact: Temporary road closures due to construction associated with implementation of the 2007 LRDP, along with operational obstructions (e.g., non-synchronized traffic signals, locked gates), may interfere with evacuation routes (Haz-6).

Mitigation: Notify emergency response providers of road closures (Haz-6A); install optical preemption devices on traffic signals along emergency access routes (Haz-6B); and install emergency opening devices on electronically-operated gates on campus (Haz-6C).

Significance Before Mitigation: Significant.

Significance After Mitigation: Less than significant.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, implementation of the 2007 LRDP may have a significant adverse impact if it would impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.

Impact Analysis

UCI trains and equips campus emergency response personnel to respond to hazardous materials emergencies; prepares and updates safety planning documents; implements safety training upon occupying new buildings; develops the Illness and Injury Prevention Plan, Chemical Hygiene Plan, and Evacuation Site Plan for all new buildings as necessary; and assigns a Building Coordinator for each building. In addition, the OCFA is trained and equipped to implement emergency hazardous materials intervention and control techniques on campus.

UCI has an Emergency Management Plan which addresses planned responses, instructions, and procedures to various levels of human-made or natural emergency situations for all campus staff, students, and visitors. Multiple emergency response regions, located throughout the campus, are equipped to provide necessary supplies and trained personnel in the event of an emergency.

The types of hazardous materials used by new facilities developed under the 2007 LRDP would be similar to those used by existing facilities. Although the number of hazardous materials incidents could increase, the types of incidents would be similar to those that have occurred in recent years, which have been minimal and rarely require non-UCI assistance. Therefore, the potential impact of implementation of the 2007 LRDP resulting in an exceedence of emergency response capabilities would be less than significant.

Implementation of the 2007 LRDP could interfere with emergency response and evacuation on the campus through construction-related road closures and through operational obstructions (e.g., non-synchronized traffic signals, locked gates, etc.). Under UCI procedures, multiple emergency access or evacuation routes are available on campus as alternative routes for emergency response services in the event of a temporary roadway closure and/or changes in campus traffic patterns. However, operational obstructions could be present along some of these routes that would interfere with emergency response. For example, traffic signals along emergency access routes may not be synchronized to provide adequate "green" signal time to allow emergency response vehicles uninterrupted flow of travel. In addition, electronically-operated gates on campus would impede emergency vehicle access. Therefore, the potential

impact to emergency response and evacuation plans on campus from temporary construction-related lane closures and operational obstructions would be considered significant.

Impact Haz-6 Temporary road closures due to construction associated with implementation of the 2007 LRDP, along with operational obstructions (e.g., non-synchronized traffic signals, locked gates), may significantly interfere with evacuation routes.

Mitigation Measures

Implementation of mitigation measures Haz-6A, Haz-6B, and Haz-6C would reduce the significant impacts associated with construction-related road closures and operational obstructions to a level of Less than Significant.

Haz-6A Prior to initiating on-site construction for future projects that implement the 2007 LRDP and that would involve a lane or roadway closure, the construction contractor and/or UCI Design and Construction Services shall notify the UCI Fire Marshal. If determined necessary by the UCI Fire Marshal, local emergency services shall be notified of the lane or roadway closure by the Fire Marshal.

Haz-6B All traffic signals installed on emergency access ways shall include the installation of optical preemption devices for emergency services.

Haz-6C All electronically-operated gates installed within the UCI Campus shall include emergency opening devices, as approved by the Orange County Fire Authority.

4.6.3.7 ISSUE 7 – WILDLAND FIRES

Hazards and Hazardous Materials Issue 7 Summary

Would implementation of the 2007 LRDP expose people or structures to a significant risk of loss, injury or death involving wildland fires?

Impact: Exposure of people or structures to wildland fires would be limited because fuel modification plans would be prepared for areas adjacent to areas prone to wildfire, which would be approved by the OCFA.

Mitigation: No mitigation is required.

Significance Before Mitigation: Less than significant.

Significance After Mitigation: Not applicable.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, implementation of the 2007 LRDP may have a significant adverse impact if it would expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Impact Analysis

Vegetation communities prone to wildfire include coastal sage scrub and grasslands. The coastal sage scrub community includes plant materials that provide heavy fuel which can ignite high intensity wildland fires. Grasses are considered to be a flashy fuel which can easily ignite during dry conditions. The moisture content of grasses is largely dependent on weather conditions; typically, grasses will gain and

lose moisture in a matter of hours. For this reason, grasses can be prone to catching fire year-round, if conditions are dry. Grass fires are typically low-intensity fires and tend to extinguish quickly; while grass fires are not usually subject to becoming large scale wildfires, they can still pose a risk if life or property are threatened. As shown in Figures 4.3-2A through 4.3-2D, Plant Communities Maps, patches of coastal sage scrub are located on the North Campus in the SJFM buffer; on the West Campus in land designated as open space in the 2007 LRDP; and on the East Campus in land designated as Mixed Use in the 2007 LRDP. Patches of grassland are located on the West Campus in designated open space and on the South Campus in land designated as Housing Reserve. Grassland is located in additional areas on campus; however, these areas are slated for development under the 2007 LRDP.

The coastal sage scrub on the North Campus has been planted as a part of habitat restoration research in an area identified as a landscape buffer between future industrial and mixed use development and the SJFM. There is a limited amount of vegetation present within these research areas and if these research plots result in heavy fuel loads that pose wildland fire risk, the vegetation may be selectively removed by the University at the time the North Campus areas are developed and occupied. As of June 2007, there is only a limited amount of fuel that could be burned. Likewise, the grassland and coastal sage scrub patches located on the West Campus and the South Campus are limited. Therefore, it is unlikely that a large scale wildfire would occur. However, the OCFA requires fuel modification zones or defensible space zones around all development occurring within a fire hazard zone in accordance with the OCFA's Fuel Modification Plans and Maintenance Manual. Further, conceptual fuel modification plans, including the identification of the responsible parties, must be approved by the OCFA. Therefore, a fuel modification plan would be prepared for any development occurring adjacent to open space areas, which would reduce any potential wildfire risk to below a level of significance.

The open space/residential interface adjacent to the exiting University Hills Faculty and Staff Housing area pre-dates the OCFA's fuel modification guidelines; however, a 100-foot "Defensible Space" zone is maintained consistent with OFCA standards for this type of development interface. High fuel vegetation and other combustible materials are prohibited from the Defensible Space zone. Current projects within the University Hills Housing area that are adjacent to open space areas, such as Planning Area 9, and any development within the Housing Reserve, would follow current OCFA fuel modification zone guidelines which include graduated zones of fuel reduction. UCI and OCFA staff meet periodically to review maintenance of the Defensible Space zone and fuel modification areas.

Future North Campus development would occur adjacent to the SJFM Reserve. As required by the OCFA, future development would incorporate appropriate fuel modification or defensible space requirements to protect North Campus development from wildland fires in the Reserve. Likewise, additional development is proposed for the West and South Campus areas, where fuel modification plans would be required to be approved by the OCFA. Additional development of the campus would not expose people or structures to increased risks associated with wildland fires, because future development occurring on campus would be accompanied by fuel modification plans which would reduce the potential for wildfires to occur. Therefore, impacts as a result of wildland fires are less than significant.

Mitigation Measures

The 2007 LRDP would have a less than significant impact on wildland fires through compliance with appropriate fire safety regulations; therefore, no mitigation measures are required.

4.6.4 CUMULATIVE IMPACTS AND MITIGATION

Hazards and Hazardous Materials Cumulative Issue Summary

Would implementation of the 2007 LRDP have a cumulatively considerable contribution to a cumulative hazards and hazardous materials impact considering past, present, and probable future projects?

Cumulative Impact	Significance	LRDP Contribution
Transport, Use, and Disposal of Hazardous Materials: Increased regional development that increases the amount of hazardous materials transported, used, and disposed would be subject to laws and regulations.	Less than significant.	N/A
Accidental Releases: Increased regional development may increase the amount of hazardous materials transported in the region; however, laws and regulations would reduce the potential for accidental release.	Less than significant.	N/A
Hazards to Nearby Schools: Laws and regulations would reduce or eliminate potential impacts to nearby schools associated with hazardous materials.	Less than significant.	N/A
Listed Hazardous Materials Sites: Future development would comply with laws and regulations regarding hazardous materials sites.	Less than significant.	N/A
Hazards from nearby airports: Future developments would be reviewed and regulated through the Land Use Plan for John Wayne Airport and the Airport Land Use Commission.	Less than significant.	N/A
Emergency Response and Evacuation Plans: Future developments would undergo CEQA review and be required to implement measures to mitigate impacts.	Less than significant.	N/A
Wildland Fires: Increase development in fire prone areas would subject additional structures And people to risks associated with wildland fires.	Significant.	Not cumulatively considerable.

4.6.4.1 TRANSPORT, USE, AND DISPOSAL OF HAZARDOUS MATERIALS

The geographic context for the analysis of cumulative impacts from the transport, use, and disposal of hazardous materials ranges from the immediate surrounding area to the City of Irvine region. It is anticipated that future growth in the Irvine region would result in an incremental increase in the amount of hazardous materials transported, used, treated, and disposed area-wide. Although each development site has potentially unique hazardous materials considerations, it is expected that future growth would comply with federal and State statutes and regulations applicable to hazardous materials and would be subject to existing and future plans or programs of enforcement by the appropriate regulatory agencies. Further, it is possible that future development in the City of Irvine would involve significant renovation and demolition activities, which would potentially subject construction workers to health and safety risks through exposure to hazardous materials, although the individual workers potentially affected would vary from project to project. It is anticipated that future development projects would adhere to the applicable

requirements that regulate worker safety and exposure. For these reasons, cumulative impacts resulting from the transport, use, and disposal of hazardous materials would be less than significant.

4.6.4.2 ACCIDENTAL RELEASES

The geographic context for the analysis of cumulative impacts from accidental releases of hazardous materials ranges from the immediate surrounding area to the City of Irvine region. It is anticipated that future growth in the Irvine region would result in an incremental increase in the amount of hazardous materials transported, used, treated, and disposed area-wide, which could result in a higher risk of accidental release. However, the U.S. Department of Transportation, Office of Hazardous Materials Safety prescribes strict regulations for the transportation of hazardous materials. Therefore, it is anticipated that future projects within the City of Irvine involving hazardous materials would comply with applicable hazardous materials safety requirements during use and transport of materials to reduce the potential for an accidental release to occur. For these reasons, cumulative impacts resulting from the accidental release of hazardous materials would be less than significant.

4.6.4.3 HAZARDS TO NEARBY SCHOOLS

The geographic context for the analysis of cumulative impacts of hazards to nearby schools encompasses the City of Irvine region. Future development in the City of Irvine may also involve hazardous emissions or the handling of acutely hazardous materials, substances, or wastes within one-quarter mile of an existing or proposed school. It is anticipated that future development would comply with applicable laws and regulations pertaining to hazardous wastes, and that risks associated with hazardous emissions or materials to existing or proposed schools located within one-quarter mile of future development would be eliminated or reduced through proper handling, disposal practices, and/or clean-up procedures. Therefore, cumulative impacts on schools associated with hazardous emissions or handling of hazardous materials would be less than significant.

4.6.4.4 LISTED HAZARDOUS MATERIALS SITES

The geographic context for the analysis of cumulative impacts from listed hazardous materials sites encompasses the City of Irvine region. Future development in the City of Irvine would potentially expose residents and construction workers to contaminated soil or groundwater, including on or near sites included on a list of hazardous materials sites compiled pursuant to government code Section 65962.5. However, development projects would adhere to the applicable laws and regulations that govern underground storage tanks and pesticide use, as well as requirements applicable to disposal and cleanup of contaminants. In addition, it is anticipated that risk associated with identified hazardous materials sites would be eliminated or reduced through proper handling, disposal practices, and/or clean-up procedures. Pursuant to law, most sites affected by hazardous materials cannot be developed unless adequate clean-up or treatment is achieved. Therefore, cumulative impacts on the public or environment associated with development on or near hazardous materials sites would be less than significant.

4.6.4.5 HAZARDS FROM NEARBY AIRPORTS

The geographic context for the analysis of impacts from nearby airports is generally site-specific, rather than cumulative in nature, because the risk posed to each future development project is based on location. Future development in the City of Irvine and surrounding communities will also be located in the vicinity of John Wayne Airport (JWA). The risk posed to each future development project is based on location, and is therefore unique. It is likely that such risk would be a factor in any decision to approve or deny future development proposals. All land uses that may be impacted by JWA are reviewed and regulated through the Land Use Plan for John Wayne Airport, the City of Santa Ana, and the Airport Land Use

Commission. As a result, cumulative risks to future development associated with proximity to JWA would be less than significant.

4.6.4.6 EMERGENCY RESPONSE AND EVACUATION PLANS

The geographic context for the analysis of cumulative impacts to emergency response and evacuation plans encompasses the City of Irvine region. Construction and operation associated with future development in the City of Irvine could result in activities that could interfere with adopted emergency response or evacuation plans, such a temporary construction barricades or other obstructions that could impede emergency access. It is anticipated that future development projects in the area would undergo CEQA review of potential impacts on adopted emergency response or evacuation plans, and would be required to implement measures necessary to mitigate potential impacts. As a result, cumulative impacts related to interference with adopted emergency response or evacuation plans would be less than significant.

4.6.4.7 WILDLAND FIRES

The geographic context for the analysis of cumulative impacts from wildland fires encompasses the Orange County region. Because the prevalent vegetation communities in Orange County are prone to wildfires, a significant risk of wildland fires exists in the City of Irvine. Although the City and the Orange County Fire Authority (OCFA) have developed policies to manage the fire risk by enforcing fuel modification zones and defensible space zones, existing and future residents and structures will continue to be at risk. Therefore, the continued development of residential areas in wildland prone areas would result in a significant cumulative impact. Implementation of the 2007 LRDP would create new development adjacent to wildfire prone areas; however, these areas would be subject to the OCFA's requirements to prepare a fuel modification plan for each development, which would reduce the risk of wildland fires. The contribution of the 2007 LRDP to a significant cumulative wildland fire impact is, therefore, not considered to be cumulatively considerable.

4.6.5 REFERENCES

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