4.24.3 Safety (CEQA)

4.24.3.1 Introduction

The safety analysis addresses the impacts of potential incidents or releases at LAX facilities that handle large volumes of toxic or flammable materials, namely the Central Utility Plant (CUP), fuel farm, and Liquefied Natural Gas (LNG)/Compressed Natural Gas (CNG) facilities, as well as airport security concerns and the potential of the LAX Master Plan to affect aviation incidents and accidents at LAX, including birdstrikes. Conclusions regarding the significance of impacts provided in this section are strictly for the purposes of CEQA. Technical Report 14c*, Safety Technical Report,* contains detailed information regarding existing facilities, including their risks and safeguards; the regulatory framework for risk of upset issues; and the methodologies used to assess existing and future risk. Technical Report 14c*, Safety Technical Report,* Attachment A, *Aviation Incidents and Accidents*, and Technical Report S-9b*, Supplemental Safety Technical Report,* provide detailed information on the safety record of the commercial aviation industry, on the accident and incident history at LAX between 1962 and 2000, and on the FAA's and other aviation safety guidelines and standards. Chapter 3, *Alternatives,* includes a description of the changes in security procedures that have been implemented since the events of September 11, 2001. Potential impacts associated with releases of small quantities of hazardous materials at LAX are addressed in Section 4.23, *Hazardous Materials*. Hazardous material spills are also discussed in Section 4.7, *Hydrology and Water Quality*. Emergency response is addressed in Section 4.26.1, *Fire Protection*.

4.24.3.2 General Approach and Methodology

The safety analysis addresses the facilities and conditions at LAX that could potentially result in an incident, accident, or "upset" of some kind that could pose a potential hazard to the health or safety of passengers, visitors, airport employees, or people that live or work in the LAX vicinity. The facilities evaluated include those that handle large volumes of toxic or flammable materials. Aviation accidents, incidents, birdstrikes, and airport security, are also addressed. The general approach and methodology for risk of upset, aviation incidents and accidents, birdstrikes, and airport security is different for each and is discussed separately below.

Risk of Upset

Potential impacts associated with the risk of upsets[849] at facilities that store flammable or toxic materials at LAX were evaluated by comparing the overall risks[850] posed by LAX facilities under baseline conditions to those projected under the No Action/No Project Alternative and the four build alternatives. The risk of upset analysis considers the likelihood and consequences of an upset, as well as the regulatory and operational safeguards in place to prevent an upset or minimize its effects.

The term "hazard analysis" (or risk of upset analysis) is often used to describe the overall procedure for evaluating the hazards, consequences, vulnerabilities, probabilities, and risks associated with the presence of hazardous materials. The first step in a risk of upset analysis is to identify the location of potential release sources and the characteristics of these sources. This step is known as hazard identification.

For the risk of upset analysis, hazard identification was performed to determine which current and proposed facilities at LAX pose the greatest risk to people or property. Facilities were selected for analysis based on two criteria:

- Storage of acutely hazardous materials.
- Storage of large quantities of flammable or explosive fuels or other materials.

Four facilities at LAX currently handle large volumes of toxic or flammable materials: the CUP, the Fuel Farm, the LNG/CNG Facility, and the CNG Station. These facilities, shown in **Figure F4.24.3-1**, Central Utility Plant, Fuel Farm, and LNG/CNG Facility Locations for Baseline Conditions, were identified as those that had the potential to present the greatest risk of a major upset. New, expanded, and/or relocated

849 An upset is an accidental occurrence involving a substantial release of a toxic or flammable substance to the environment.

850 Risk is a combined measure of the probability and severity of a potential scenario.

facilities of one or more of these types would be constructed under the four build alternatives as described in subsection 4.24.3.6, *Environmental Consequences*, below.

Although other facilities at LAX use and store hazardous and flammable materials, they do so in quantities that are substantially less than the CUP, the fuel farm, and the LNG/CNG facilities. These other facilities are not located any closer to people, aircraft, or buildings than the CUP, fuel farm, and LNG/CNG facilities, and therefore do not pose as great a risk of upset or require evaluation for this analysis.

The analysis for each facility focused on the reasonably-foreseeable, worst-case accident scenario, as these accidents are likely to pose the highest risk to people or property. These scenarios are highly unlikely and have never occurred at LAX. The reasonably-foreseeable, worst-case scenarios were identified from existing risk analyses or were selected based on industry standards for the types of incidents most likely to occur at a specific facility. The probability and consequences of these scenarios were determined from previous analyses supplemented with new modeling, where necessary.

The potential area of effect that would result from an upset is referred to as a "hazard footprint." The hazard footprints associated with each of the facility types were calculated based on commonly-used risk modeling programs developed by various U.S. government agencies, as described below. The hazard footprints are depicted in figures provided in this section. For all hazard footprints, the largest radius of injury is indicated in the figures. The methods and models used to derive these hazard footprints are presented below. Specific information about the models and the parameters used in the modeling process is provided in Technical Report 14c, *Safety Technical Report.*

Central Utility Plant

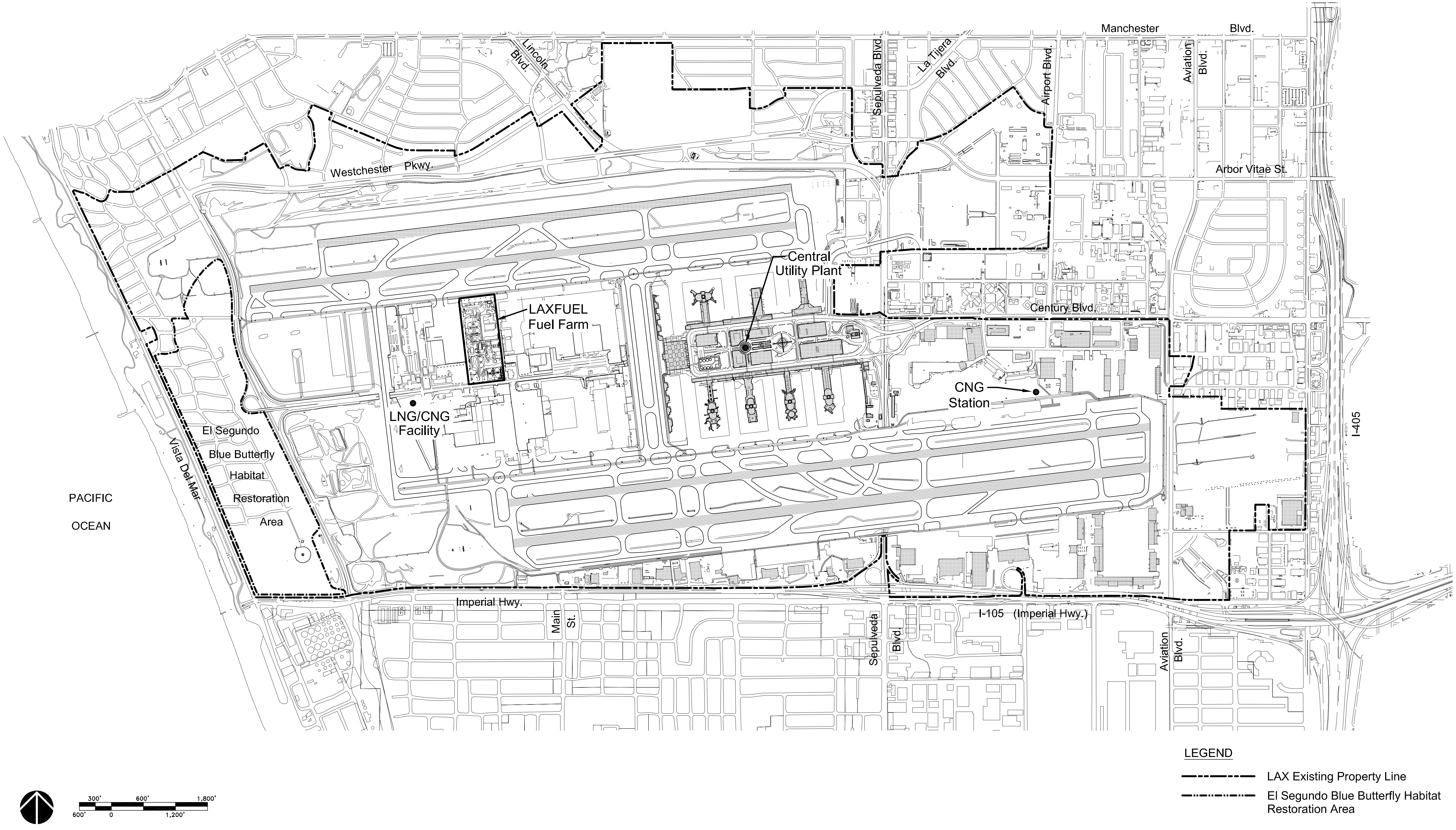
Sulfuric acid is the only hazardous material used at the CUP in large quantities.[851] A sulfuric acid release scenario was identified as the reasonably-foreseeable worst-case scenario likely to occur during risk analysis performed in support of the Risk Management and Prevention Plan[852] prepared for the CUP in August 1994.

For this analysis, hazard footprints for a sulfuric acid release scenario were identified for the existing CUP under baseline conditions, the No Action/No Project Alternative, and Alternative D, and for existing and future CUPs under Alternatives A, B, and C. The hazard footprints were determined by modeling using the DEnse GAs DISpersion (DEGADIS) model. DEGADIS was specifically designed by the Federal Emergency Management Agency (FEMA) to examine the results of an accidental release of dense, or "heavier-than-air," gases, such as sulfuric acid mist, and is commonly used in the risk evaluation industry.

DEGADIS defines a hazard footprint for a potential release scenario, showing the probable extent of the effects of the upset. This hazard footprint indicates two separate radii, each of which depicts concentrations of sulfuric acid corresponding to the Emergency Response Planning Guidelines (ERPGs), Levels 2 and 3. ERPGs were developed by the American Industrial Hygiene Association Emergency Response Planning Committee to assist emergency response personnel in planning for a catastrophic chemical release to the community. They are frequently used as guidelines for exposure levels in preparing risk evaluation documents. ERPG-2 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action. ERPG-3 is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing life-threatening health effects.

851 In January 2000, the CUP discontinued the use of gaseous chlorine, replacing it with a less hazardous sodium hypochlorite solution (liquid bleach).

852 Risk Management and Prevention Plans (RMPPs) are no longer required by law. Instead, the California Accidental Release Prevention Program (CalARP) requires the preparation of Risk Management Plans (RMPs). However, due to changes in the requirements, sulfuric acid is not a covered substance, and facilities that use and store sulfuric acid are not required to prepare an RMP. As a result of this, and the elimination of chlorine gas use at the CUP, an RMP is not required for the CUP. Regardless, the results of risk analysis in the RMPP with respect to sulfuric acid remain valid and are used in this Final EIS/EIR to describe baseline and future risks associated with the use and storage of sulfuric acid at the CUP.



Source: Camp Dresser & McKee Inc., 2004.

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LAX Master Plan Final EIS/EIR

Central Utility Plant, Fuel Farm, and LNG/CNG Facility Locations for Baseline Conditions

Figure
F4.24.3-1

Fuel Farm

The reasonably-foreseeable worst-case fuel-related scenarios at LAX were assumed to occur at the bulk fuel storage facility ("fuel farm"), as this location stores the largest volume of fuel. For baseline conditions, this facility is the current LAXFUEL Fuel Farm. Alternatives A, B, and C include an expanded or relocated fuel farm, either on-site under Alternatives A and C, or off-site at the Scattergood Electric Generating Station or the oil refinery located south of the airport under Alternative B. Under Alternative D, the LAXFUEL Fuel Farm would retain its existing capacity and would remain in its existing location, but the overall fuel farm footprint would be reduced. For reasons discussed below, the same fuel farm upset scenarios were examined regardless of the size and location of the fuel farm, although conditions specific to each site (i.e., the size of the largest tank) formed the basis of each analysis.

Two fuel farm upset scenarios were evaluated: a major fuel release without subsequent ignition and a major fuel release with subsequent ignition (pool fire). The aircraft fuel stored in the largest quantities at LAX is "Jet A fuel," which is a kerosene type fuel, made up of hundreds of different hydrocarbons. Due to the physical properties of Jet A fuel (e.g., low volatility and low explosion potential), an explosion would only be expected under confined conditions and, as flame speeds associated with Jet A fuel are not conducive to detonation, the probability of explosion is very low. Due to the use of floating roof tanks at the fuel farm, which limit the accumulation of vapor and provide good fire coverage, an explosion is not considered to be a reasonably-foreseeable scenario and was not examined. Additionally, ignition is unlikely because Jet A fuel cannot be ignited from a single flame source; the fuel must be heated to a certain temperature before ignition can occur. Regardless, a release with ignition was examined for this analysis.

The analysis of the consequences of a major fuel release without subsequent ignition was performed in a qualitative, rather than a quantitative manner, and does not result in a hazard footprint. The most probable path for the fuel was determined by examining drainage patterns, including the storm drain system at LAX, the presence/absence and operation of a retention basin, and the conditions and failures that would permit fuel to reach Santa Monica Bay.

The second scenario considered at the fuel farm involves failure of the single largest fuel storage tank in the largest containment area and the subsequent ignition of the fuel (pool fire).[853] The berm of the containment area is assumed to remain intact in this scenario and it is assumed that the contents of other tanks within a single containment area do not ignite. This assumption is based on fire code requirements, which allow multiple tanks to share a single containment area, and the properties of Jet A fuel.

For the fuel farm fire incident analysis, the Automated Resource for Chemical Hazard Incident Evaluation (ARCHIE) model was used. ARCHIE is a model developed by FEMA, the U.S. Department of Transportation (USDOT), and the U.S. Environmental Protection Agency (USEPA) to provide emergency planning personnel with the resources necessary to undertake comprehensive evaluations of potentially hazardous facilities and activities, and is commonly used in the risk evaluation industry. ARCHIE is a conservative model and may overestimate the size of the hazard footprint associated with a particular incident.

For the fuel farm scenarios, it was assumed that an incident flux (a measure of thermal radiation level per unit time per unit area) of approximately 1,600 British Thermal Units (BTU)/hr-ft^2 would cause second degree burn injuries on bare skin and that an incident flux level of 3,200 BTU/hr-ft^2 would cause third degree burns that may cause death. These two levels are based on experimental data and are typically used in determining injury and fatality hazard footprints.[854] It was assumed that an exposure of greater than 3,000 BTU/hr-ft^2 of heat flux would cause any buildings that are not fire resistant to ignite. This value is based on the National Fire Protection Association (NFPA) Guidance 59A[855] and Title 49 of the Code of Federal Regulations (CFR) Part 193.[856]

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853 A pool fire occurs when a pool of flammable liquid is ignited. The actual combustion takes place within the material evaporating from a layer of liquid at the base of the fire. Pool fires can burn until the fuel is consumed. The primary dangers of a pool fire are thermal radiation and direct flame contact.

854 FEMA, USDOT, and USEPA, Handbook of Chemical Hazard Analysis Procedures, 1989.

855 National Fire Protection Association, NFPA 59A: Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG), 1996.

856 U.S. Code of Federal Regulations, Title 49 Code of Federal Regulations Part 193--Liquefied Natural Gas Facilities: Federal

LNG/CNG Facilities

The ARCHIE and DEGADIS models were used to perform a hazard analysis for a potential release of methane at the LNG/CNG facilities.[857] The ARCHIE and DEGADIS models are described above. The analysis considered pool fire, flame jet,[858] and flash fire[859] scenarios. Explosions were not considered because research indicates that it is highly unlikely that an unconfined vapor cloud of methane released from LNG/CNG facilities would explode.[860]

The effects of each scenario were modeled based on the size of the individual LNG and CNG containers. Because each facility (under baseline and future conditions) would use similarly sized containers, the hazard footprint was applied to all facilities under all alternatives. The land uses that would be potentially affected by these hazard footprints were evaluated.

As with the fuel farm pool fire analysis, for pool fire scenarios associated with the LNG/CNG facilities, it was assumed that an incident flux of approximately 1,600 BTU/hr-ft^2 would cause second degree burn injuries on bare skin and that an incident flux level of 3,200 BTU/hr-ft^2 would cause third degree burns that may cause death. For flash fire scenarios, the hazard footprint was determined by the location of the lower flammability limit[861] of the methane vapor cloud from the release point. For flame jet scenarios, the hazard footprint was based on the length of the flame jet. It was assumed that an exposure of greater than 3,000 BTU/hr-ft^2 of heat flux would cause any buildings that are not fire resistant to ignite.

Aviation Incidents and Accidents

Despite all of FAA's and the industry's efforts on aviation safety regulation, aircraft incidents and accidents occur. Subsection 4.24.3.3, *Affected Environment/Environmental Baseline,* covers the extensive historical accident and incident information of the FAA's Bureau of Transportation Statistics (BTS), the National Transportation Safety Board (NTSB), and the Airline Transportation Association (ATA) to understand the changes in aviation safety over time. Information on the incident and accident history at LAX was also obtained from FAA and the NTSB for reference purposes. Complete copies of this information are included in Technical Report 14c, *Safety Technical Report,* Attachment A, and Technical Report S-9b*, Supplemental Safety Technical Report*.

Birdstrikes

The baseline conditions with respect to birdstrike hazards were evaluated by identifying existing bird attractants, the birdstrike occurrence history at LAX, and the measures currently implemented to avoid birdstrike hazards. In accordance with FAA Order 5050.4A, *Airport Environmental Handbook,* the locations of any solid waste disposal facilities within 10,000 feet of runways were identified. The conditions with respect to birdstrike hazards under the alternatives were evaluated qualitatively by examining proposed improvements and changes in open space that may serve as bird attractants.

Although the number of aircraft operations is a factor in the occurrence of birdstrikes, the occurrence of birdstrikes is dependent upon several factors, most importantly the presence or absence of bird attractants on or very near the airfield.

Airport Security

As discussed in Chapter 3, *Alternatives*, airport security considerations are now of key importance due to the terrorist attacks of September 11, 2001. The newly formed Transportation Security Administration (TSA) is in the process of developing requirements to secure the nation's airports. The ability of the Master Plan alternatives to comply with federal security requirements was evaluated to the extent

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Safety Standards.

857 Camp Dresser & McKee Inc., Final Initial Study, Proposed LNG/CNG Fueling Facility, July 21, 1997.

858 A flame jet occurs when flammable gas is released from a pipe or vessel at high pressures, is ignited, and combusts as it is released. Because the release is under high pressure, the flame generated can reach a significant distance from the release point. The primary danger of a flame jet is direct flame contact.

859 A flash fire is the non-explosive combustion of a vapor cloud resulting from a release of flammable material into the open air, which, after mixing with air, contacts an ignition source. The primary dangers of a flash fire are thermal radiation and direct flame contact. Flash fires generally last no more than a few tenths of a second.

860 American Institute of Chemical Engineers, Guidelines for Chemical Process Quantitative Risk Analysis, 1989.

861 The concentration of a compound in air below which the mixture will not catch on fire.

possible, although specific and definitive security requirements for airports have not yet been fully established.

4.24.3.3 Affected Environment/Environmental Baseline

Individuals that could be potentially affected by an upset at the CUP, fuel farm, or LNG/CNG facilities include airport employees, passengers, and visitors. Additionally, off-airport land uses could potentially be affected in the event of an upset at one of these facilities or an aircraft accident, including one caused by birdstrike.

Sensitive receptors are those off-airport land uses that could be most affected by a risk of upset, such as public and private educational facilities for pre-schoolers through high school grades, general acute care hospitals, long-term health care facilities, and nearby residential populations. The sensitive receptors nearest the airport that could potentially be affected by an upset scenario at LAX are identified in Technical Report 1, *Land Use Technical Report*.

Risk of Upset

Central Utility Plant

The CUP, in operation since 1961, is located near the Central Terminal Area (CTA) and provides chilled water and hot water for use in heating and air conditioning at LAX. The CUP operations rely on cooling towers to dissipate excess heat gathered through the air conditioning process. Operation of the cooling towers requires substantial quantities of water, which is treated to prevent biological growth and scaling. The cooling tower is supported by an adjoining water treatment and supply facility, which employs sulfuric acid to adjust the pH of the cooling tower water.

Sulfuric acid is stored at the CUP in a 1,000-gallon capacity glass-lined tank, with no more than 700 gallons of sulfuric acid stored in the tank at any time. Long-term exposure to low concentrations of sulfuric acid vapors, or short-term exposure to high concentrations, can result in adverse health effects from inhalation.

Operations at the facility are highly regulated to prevent incidents and accidents and the CUP complies with all relevant federal, state, and local safety regulations to minimize the risk of an upset. Preventive measures currently incorporated into the CUP operations include specific procedures addressing the safety and design features, engineered failsafe and back-up systems, handling practices, equipment start-up and shut-down procedures, sulfuric acid detection and monitoring, maintenance and employee training programs, emergency response procedures, and auditing and inspection programs.

Release Scenarios

The reasonably-foreseeable worst-case scenario for the existing CUP is the potential release of sulfuric acid caused by a line break between the sulfuric acid tank and a variable stroke injector pump that feeds sulfuric acid to the cooling tower. This would result in the release of sulfuric acid into a water-filled berm, and subsequent formation of a cloud comprised of diluted sulfuric acid vapors.

Using the modeling methods described above in subsection 4.24.3.2, *General Approach and Methodology*, the approximate maximum downwind distances from the CUP within which a risk to human health would exist were identified. **Table F4.24.3-1**, Maximum Downwind Distances for CUP Sulfuric Acid Release Scenario, presents the maximum downwind distances that would be subject to a risk to human health. **Figure F4.24.3-2**, Hazard Footprints for Baseline Conditions, presents the potentially affected area for a sulfuric acid release scenario at the CUP. Each depiction of the hazard footprint accounts for wind direction and dispersion. As shown in **Figure F4.24.3-2**, the hazard footprints defined by ERPG-2 and ERPG-3 extend to some of the roadway, public, and terminal areas of the airport. No residences or other sensitive receptors would be affected. No such incidents have occurred at the existing CUP.

Table F4.24.3-1

Maximum Downwind Distances for CUP Sulfuric Acid Release Scenario

Release Scenario	Level of Concern (parts per million)	Maximum Downwind Distance (feet)
Sulfuric Acid Release	2.4, ERPG-2	459
	7, ERPG-3	262

Source: Team Environmental Services, Off-Site Consequence Analysis, August 17, 1994.

Fuel Farm

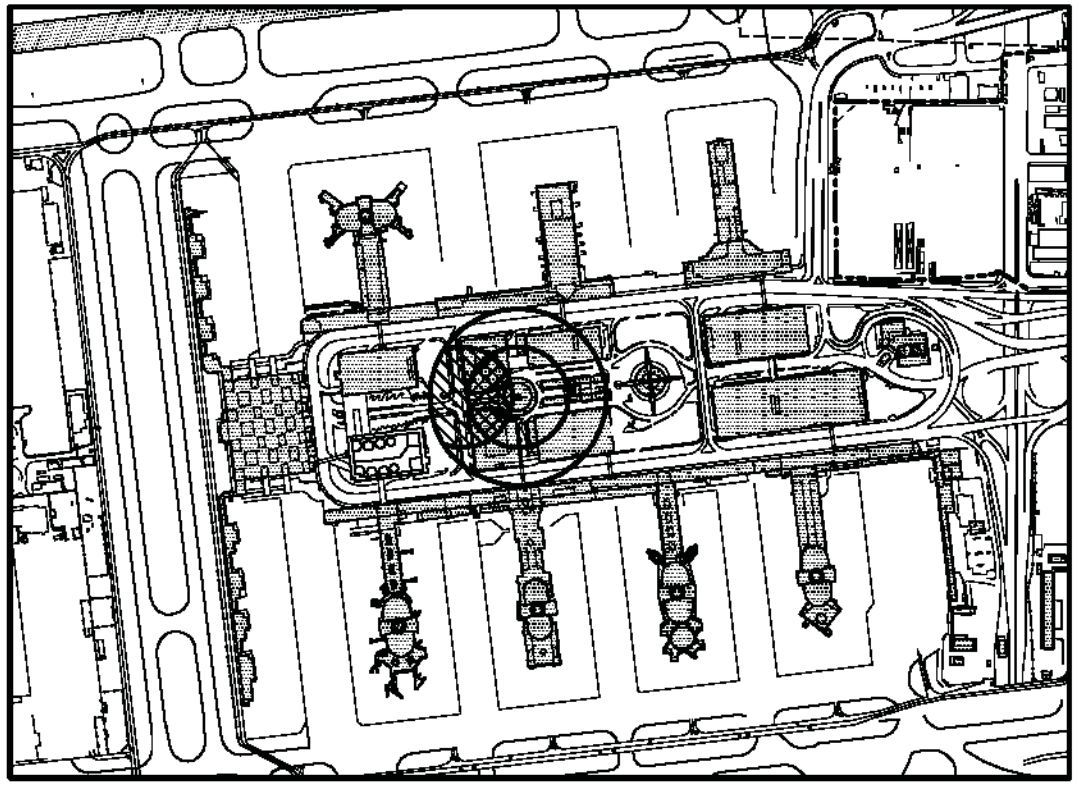
LAXFUEL Corporation stores more fuel than any other tenant at LAX, and is by far the largest supplier of fuel consumed at the airport. LAXFUEL Corporation maintains approximately 26 million gallons of Jet A fuel storage in an aboveground storage tank (AST) facility. The facility is located on World Way West and consists of 17 ASTs, 15 of which contain Jet A fuel. Several of the Jet A fuel ASTs have a capacity of 2.5 million gallons each. Additionally, the facility includes two smaller tanks, including one relief tank and one waste fuel tank. The LAXFUEL Fuel Farm underwent major expansion and renovation and has been operating at this location in this configuration since January of 1995.

The vast majority of fuel spills at LAX have involved less than 100 gallons and tend to be caused by operational errors. Most spills are immediately contained and cleaned up using absorbent material. Between 1989 and 2001, there were five fuel spills reported at LAX involving quantities exceeding 1,000 gallons. Most of these spills did not occur at the fuel farm. Such occurrences are more likely to occur than the worst-case upset scenario. Section 4.23, *Hazardous Materials*, and Technical Report S-8, *Supplemental Hazardous Materials Technical Report*, present additional information regarding these occurrences.

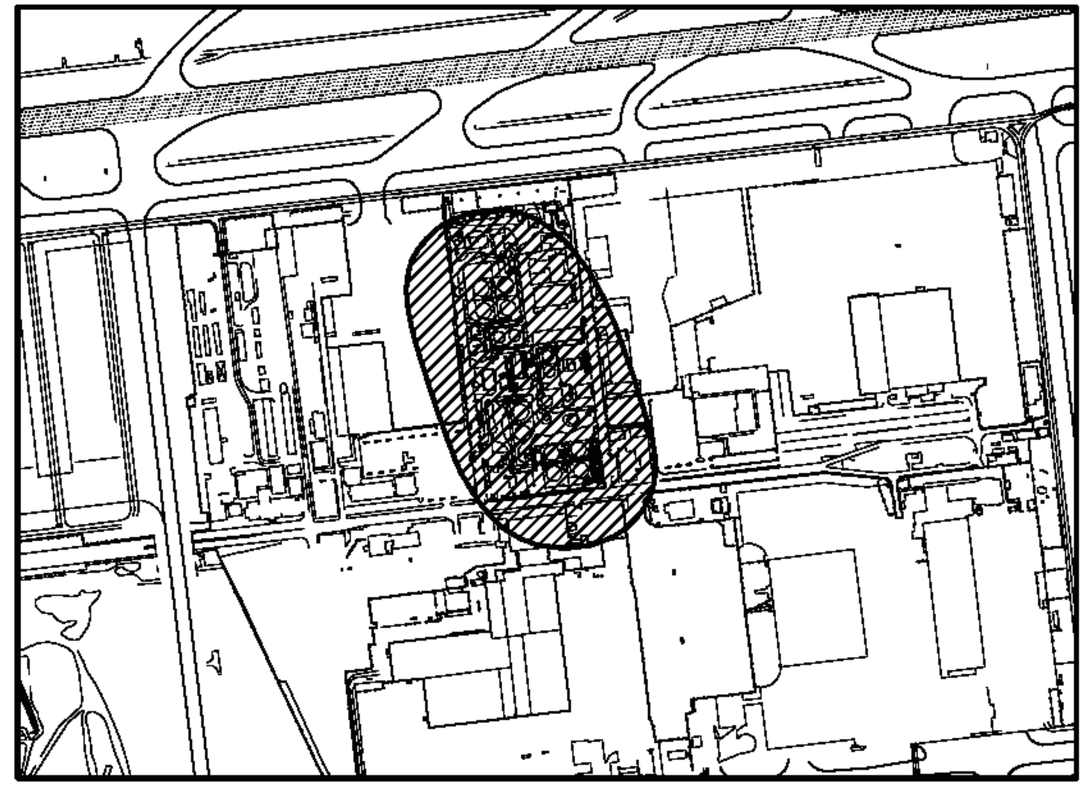
Consistent with Los Angeles Fire Department (LAFD) requirements, LAXFUEL Corporation has developed numerous design, operational, maintenance, safety, and emergency response plans designed to ensure that petroleum release events at the fueling facility do not occur. The LAXFUEL Fuel Farm is also designed and operated to minimize the risk of an upset of any kind and minimize the effects of an upset, should one occur. The LAXFUEL Fuel Farm is in compliance with relevant requirements of the Los Angeles Fire Code, including property setback provisions, distances between tanks, and tank construction requirements.

Some of the more important plan elements and facility safeguards employed at the LAXFUEL Fuel Farm are briefly described below:

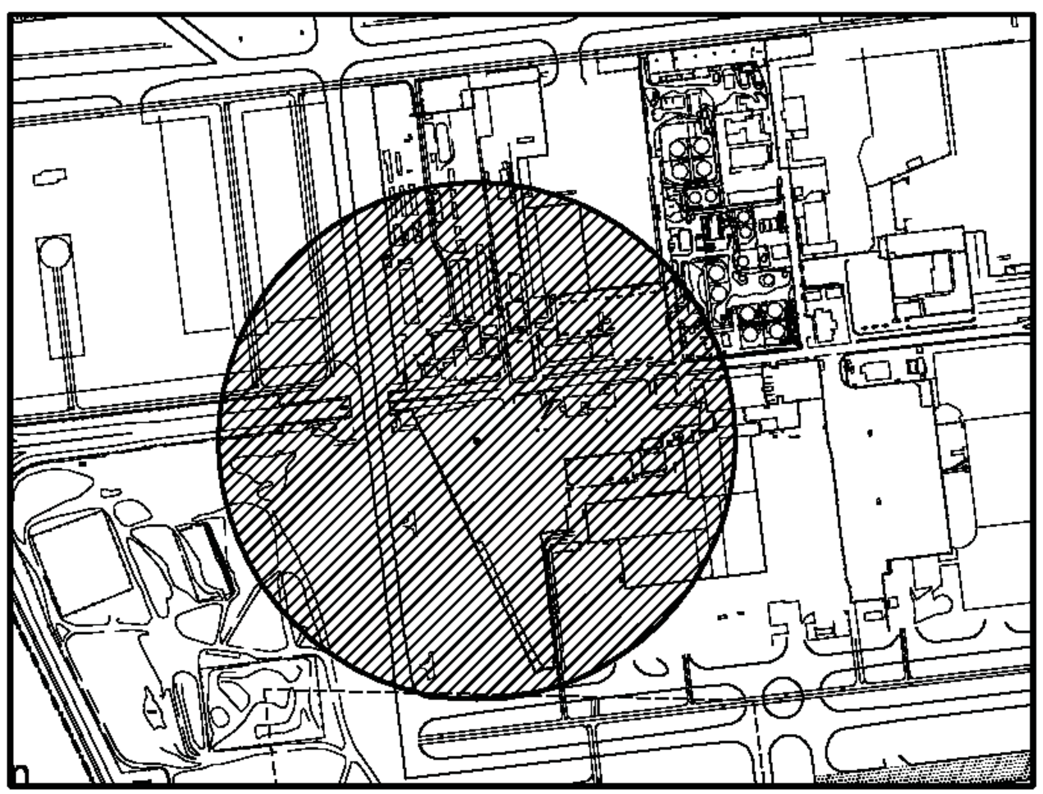
- **Facility Design:** Each tank, or set of tanks (with a maximum of four), is located within a lined secondary containment area. In accordance with applicable regulations, the secondary containment areas are large enough to hold the contents of the largest tank, as well as rainfall from a 24-hour, 25-year storm event. The impervious secondary containment areas have a 30-millimeter thick liner fastened to the dike walls. The perimeter walls of the containment areas are eight feet high and the containment areas are equipped with fuel detection systems. The secondary containment areas drain into one of two oil-water separators. Liquid, primarily from precipitation, is discharged from the oil-water separator to the airport storm drain system, where it is conveyed to an on-site retention basin and further treated in a clarifier operated by LAWA prior to discharge to the Hyperion Treatment Plant (see Section 4.7, *Hydrology and Water Quality*). The tanks are also fitted with high-level detectors, which both warn operators of an impending overfill and provide automatic shutoff of incoming fuel. All inlet and outlet fuel valves are motorized and controlled remotely by operators. The tanks meet the current state requirements for ASTs, including containment and leak and overfill detection.



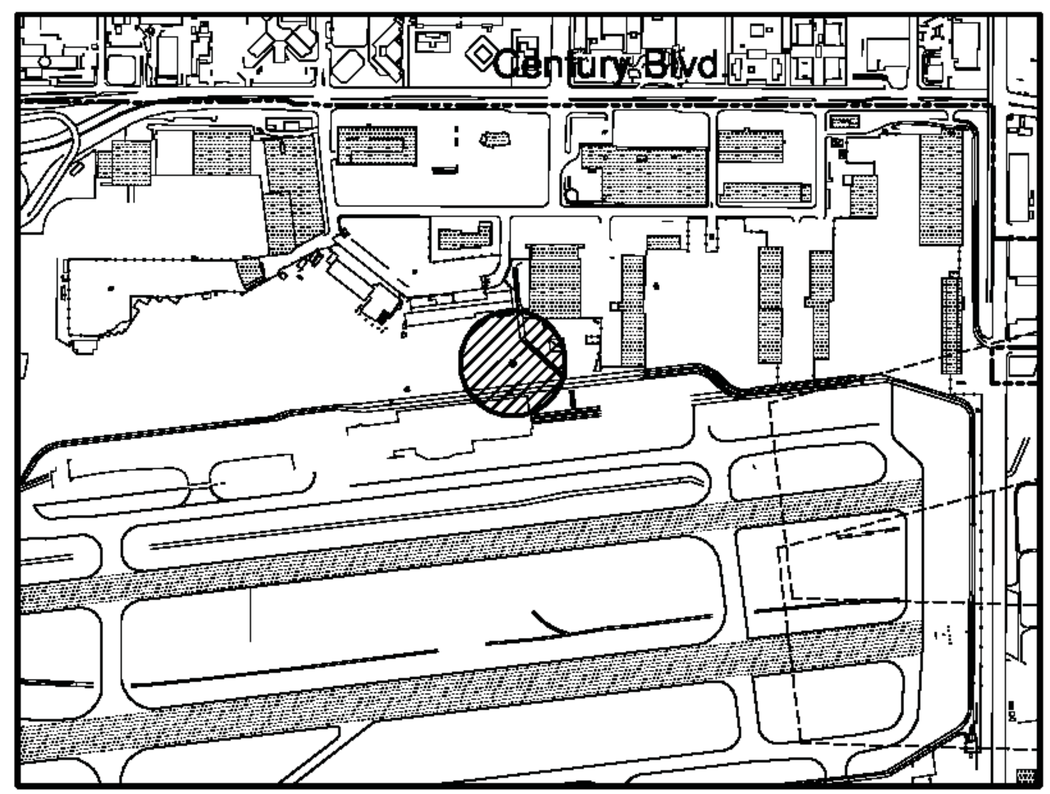
Hazard Footprint for the Existing CUP



Hazard Footprint for the Existing LAXFUEL Fuel Farm



Hazard Footprint for the Existing LNG/CNG Facility



Hazard Footprint for the Existing CNG Station

LEGEND

- ERPG-2 Impacted Population
- ERPG-3 Impacted Population
- Hazard Zone

Source: Camp Dresser & McKee Inc., 2004.

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Hazard Footprints for Baseline Conditions

Figure
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- **Operations, Maintenance, and Safety Procedures:** Self-inspection procedures include daily visual inspections of the facility for leaks, abnormal operations, or observed hazards. A Tank Inspection Checklist has been developed to aid in the self-inspection process. These procedures cover the tanks, foundation, and piping. Inspection procedures and schedules have also been developed for checking emergency response equipment and secondary containment structures. The fuel handling system at the LAXFUEL Fuel Farm is designed to automatically detect the release of jet fuel from the tanks or associated pipelines.
- **Emergency Response Procedures:** LAXFUEL Corporation has developed a comprehensive Facility Specific Response Plan (FSRP), which incorporates the requirements of the Oil Pollution Act of 1990, Oil Spill Prevention and Response (OSPR), and Spill Control and Countermeasure (SPCC) Plans. This program includes a complete Emergency Response Action Plan, which describes notification procedures, facility response team responsibilities, role of the crisis management team, facility evacuation plan, and immediate response actions. The remainder of the FSRP discusses the hazard evaluation, discharge scenarios, and the automated discharge detection systems. It also establishes procedures for plan implementation, self-inspection, spill response training, and facility drills and exercises.
- **Emergency Response Resources:** The LAFD fire response team is trained to fight hydrocarbon fuel fires and has three stations located at LAX; fire protection at LAX is discussed in Section 4.26.1, *Fire Protection*. In addition, fire suppression systems are located in the tanks as well as in the bermed area.

<u>Release Scenarios</u>

As discussed in subsection 4.24.3.2, *General Approach and Methodology,* the potential release scenarios at the LAXFUEL Fuel Farm include a major fuel release without subsequent ignition and a major fuel release with subsequent ignition (pool fire). The major fuel release scenario without subsequent ignition for the existing LAXFUEL Fuel Farm would involve the failure of the largest of four ASTs situated within a lined secondary containment structure. As long as the secondary containment remained intact, the fuel would be contained and could be recovered using vacuum trucks and pumps. However, if the secondary containment failed, or the valves leading to the oil-water separator malfunctioned, fuel would be released into the storm drain system. The fuel would travel west inside the storm drains down World Way West toward the ocean, then south along Pershing Drive. Dry weather flows from this portion of the airport are diverted into a two million gallon retention basin in the southwest corner of LAX, where they are usually pumped through a clarifier and then into the sanitary sewer. If the maximum capacity of the retention basin is exceeded during a storm event, then the storm water is diverted directly to the Los Angeles County Storm System for discharge into the ocean. Under these circumstances, fuel could potentially reach Santa Monica Bay. However, this would only occur if there were a combination of tank failure, secondary containment or valve failure, and diversion of flows from the retention basin directly to Santa Monica Bay. It is unlikely that the safeguards in place to prevent fuel releases would all fail concurrently.

The fuel farm pool fire scenario assumes that the largest single tank (2.5 million gallons) in the largest containment area were to rupture and the fuel to subsequently ignite. It is assumed that the containment area berm would remain intact. Using the modeling methods discussed in subsection 4.24.3.2, *General Approach and Methodology*, if the fire were not extinguished, the following consequences would be expected:

- The nominal flame height would be approximately 208 feet.
- Within 270 feet of the center of the pool, exposure could result in fatality.
- Within 386 feet of the center of the pool, a human would experience second degree burns with severe pain.

Figure F4.24.3-2 shows the hazard footprint for the facility, assuming that the fire was contained within the bermed areas. As indicated in **Figure F4.24.3-2**, in the event of a pool fire at the LAXFUEL Fuel Farm, individuals may be injured on the access road near the operations center, and at adjacent buildings, including those currently occupied by Dobbs House, Marriott Corporation, and the Los Angeles West Terminal Fuel Corporation (LAWTFC). No residences or other sensitive receptors would be affected. The ignition of surrounding structures is not expected to occur due to the fact that the incident flux at the nearest building would be less than 3,000 BTU/hr-ft^2. No such incidents have occurred at the existing fuel farm.

Off-Site Fuel Farm Sites

Two sites close to LAX are being considered for the construction of an off-site fuel farm under Alternative B: Scattergood Electric Generating Station and the oil refinery located south of the airport.

Scattergood

The proposed Scattergood Fuel Farm site was formerly used for the storage of fuel oil as an emergency fuel supply for the City of Los Angeles Department of Water and Power (LADWP) Scattergood Generating Station boilers. The four tanks that currently exist at the site are situated in a bermed area that acts as secondary containment in case of a release. The tanks are no longer in use. Two of the tanks are empty; one contains approximately 46,400 barrels (1.9 million gallons) of Fuel Oil No. 6 and another 5,400 barrels (226,800 gallons) of Fuel Oil No. 6. Appurtenant insulated piping is found throughout the site, which was used to supply fuel oil to the tanks and deliver the fuel oil to the generating station boilers. The western portion of the site is currently being leased to Occidental Petroleum Company. The leasehold houses an oil production facility consisting of an oil pump and two aboveground tanks.

The only known fuel release incident at the Scattergood Generating Station occurred on July 20, 1993, when one of the four emergency fuel oil tanks ruptured, spilling approximately 1.5 million gallons of fuel oil into the containment area. Ignition did not occur. A small portion of the fuel oil flowed onto Grand Avenue through a pipe penetration in the dike that was not properly sealed, although fuel is not known to have reached Santa Monica Bay. Active cleanup of the spill was performed under the oversight of the Los Angeles County Health Department.[862]

On the existing site, there is a slight potential for a fuel release or fire. However, the tanks are no longer in active service, so they are not filled or emptied on a regular basis. Most release incidents occur during these types of activities. Additionally, the relatively small amount of fuel remaining in the tanks is Fuel Oil No. 6, which is solid at room temperature and does not flow easily. A release would likely be contained within the bermed area and would not enter the storm drain system or flow to Santa Monica Bay.

Oil Refinery Located South of the Airport

The proposed oil refinery fuel farm site is in an area currently used for loading fuel into tanker trucks. Existing refinery equipment and operations are designed to reduce the potential for a risk of upset occurrence and minimize the effects of an incident, should one occur. The entire facility is equipped with fire hydrants and fire water monitors, which can direct a large volume of water on a fixed area. Fusible link systems and air actuated emergency isolation valves are in place to isolate pumps and prevent vessels from draining flammable liquids into a fire. In addition, the refinery has an on-site storm water retention system. This system provides for the collection and testing of storm water on the refinery. If necessary, treatment is provided prior to discharge. The oil refinery has an on-site response team, trained in responding to petroleum emergencies, as well as an oil spill contingency plan and an SPCC plan.[863]

Because very little fuel is actually stored on the proposed fuel farm site, there is very little potential for a fuel fire under baseline conditions. There is a small risk of a fuel release, due to the risks inherent in the fuel transfer from the hydrant system to trucks.

LNG/CNG Facilities

Two facilities at LAX currently store and dispense LNG or CNG fuels: a LAWA-operated LNG/CNG Facility on World Way West near the Continental Airlines leasehold, and a CNG Station on the United Airlines leasehold operated by ENRG (formerly Pickens Fuel Corporation). The LAWA LNG/CNG Facility currently consists of one 13,000-gallon and two 4,500-gallon aboveground LNG tanks and three 10,000-gallon standard cubic feet (SCF) aboveground CNG tanks (vessels). The CNG Station consists of six 10,000 SCF aboveground CNG tanks (vessels).

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862 City of Los Angeles, Department of Water and Power, Phase I Environmental Site Assessment for the Tank Farm Area of the Scattergood Generating Station, November 1997.

863 South Coast Air Quality Management District, Revised Draft Environmental Impact Report Chevron Refinery - El Segundo, Reformulated Gasoline Projects, December 16, 1994.

The LNG/CNG facilities comply with applicable regulatory requirements, including Los Angeles Fire Code setback requirements. Both the LNG/CNG Facility and the CNG Station are located close to LAFD stations, with trained emergency response readily available. LNG facilities in particular are regulated by 49 CFR Part 193, which includes specific requirements for many aspects of the design, construction, and operation of LNG facilities, including siting of facilities to minimize the hazards to persons and off-site property; vapor barriers; impoundment capacity; emergency procedures; tank inspection; corrosion protection; training; gas detection; fire detection; and warning signs.

In addition to compliance with all applicable regulatory requirements, including Los Angeles Fire Code setback requirements, the LAWA LNG/CNG Facility has incorporated the following facility safeguards:

- LAWA and tenants have modified their Emergency Response and Evacuation Plans to reflect the potential risk presented by the LNG/CNG Facility.
- Employees within a one-quarter-mile radius of the facility received an LNG/CNG awareness fact sheet that describes the operation of the LNG/CNG Facility and provides information regarding emergency alarms and proper emergency procedures (i.e., evacuation).

Release Scenarios

Both LNG and CNG consist primarily of methane, a flammable hydrocarbon that is lighter than air, but behaves like a dense gas during a release. CNG and LNG are both gaseous at room temperature, although LNG is stored at high pressures to maintain liquid form in the vessel. A CNG release could form a vapor cloud of gaseous methane and a LNG release could form a boiling liquid vapor pool or a vapor cloud of gaseous methane.

In accordance with standard industry practices, the accidental release scenarios considered for the LNG/CNG facilities are listed in **Table F4.24.3-2**, Calculated Hazard Radii for LNG/CNG Facilities.

Table F4.24.3-2

Calculated Hazard Radii for LNG/CNG Facilities

Scenario	Hazard Radius[1]
Release of methane through a 0.5-inch opening in a CNG tank and subsequent ignition of a methane vapor cloud (flash fire)	70 - 274 feet
Release of methane through a 0.5-inch opening in a CNG tank and immediate ignition of high pressure methane vapor as it escapes the CNG tank (flame jet)	108 feet
Release of methane through a 2-inch opening in an LNG tank and subsequent ignition of a methane vapor cloud (flash fire)	308 - 1,345 feet
Release of methane through a 2-inch opening in an LNG tank and subsequent ignition of a liquid pool of methane in the containment area surrounding the LNG tank (pool fire)	164 feet

1 For flame jet, the hazard radius represents the reach of the flame jet. For pool fire, the hazard radius represents the distance at which serious injury (third degree burns) would result. For flash fire, the hazard radius represents the distance to ½ the lower flammability level.

Source: Camp Dresser & McKee Inc., 1998.

Some reasonably-foreseeable events that could initiate such releases include: faulty metallurgy in the storage tanks, a moderate earthquake resulting in a vessel or pipeline crack, corrosion, or a leaking relief valve. If a leak occurred, an ignition source would have to be present in order for a pool fire, flame jet, or flash fire to occur. Possible consequences of these release scenarios include flame jets, pool fires, and flash fires, as explained under subsection 4.24.3.2, *General Approach and Methodology*.

Using the modeling methods described in subsection 4.24.3.2, *General Approach and Methodology*, the hazard radii would range from 70 to 1,345 feet, depending upon the scenario and meteorological conditions. **Table F4.24.3-2** presents these hazard radii. **Figure F4.24.3-2** shows the extent of the potential hazard footprint for the LNG/CNG Facility and the CNG Station. As indicated in

Figure F4.24.3-2, in the event of a worst-case incident at the LNG/CNG Facility, individuals may be injured along World Way West, and at adjacent buildings, including those currently occupied by Continental Airlines and LAWA offices. No residences or other sensitive receptors would be affected. In the event of an incident at the CNG Station, individuals on the United Airlines leasehold may be injured. No such incidents have occurred at the existing LNG/CNG facilities.

Aviation Incidents and Accidents

Responsibilities for Ensuring Aviation Safety

Aviation today is one of the safest forms of public transportation, particularly in the U.S., as a result of the combined efforts of FAA and the aviation industry. This was not always the case. Early in the development of aviation as a mode of transportation, aviation safety was threatened by the use of untested and poorly equipped airplanes and inexperienced pilots, as well as a lack of airport emergency management systems. This environment, combined with airlines fighting for economic survival, made for a difficult start to a budding industry with great potential to serve the transportation needs of a sprawling country. Starting with the establishment of the 1926 Air Commerce Act through the establishment of the FAA as a branch of the USDOT and up to the present day, aviation safety has become one of the highest priorities of the federal government.

The FAA is responsible for regulating all aspects of air transportation, including airports. These regulations ensure a high level of safety in airport operations. This regulatory process begins with airport planning and continues through design, construction, operation, and maintenance of all facilities. The existing operation and maintenance of LAX as a commercial airport is inspected and certified by the FAA.[864] All aspects of the existing LAX design and operation are subject to FAA standards. Where current design standards cannot be met, operational restrictions are in place at FAA's direction to limit the use of certain facilities so as to maintain the prescribed standard level of safety. The FAA requires on-going review of the LAX design and operation as standards are updated over time.

Aviation safety for aircraft in flight and for people on the ground is enhanced by the efforts of various levels of government to control land use around airports. The FAA takes an active role in protecting air navigation through promoting control over land uses such as tall structures and bird attractants (e.g., landfills) that threaten air safety near airports and along airways. The State of California promotes control over land use around airports through the establishment of Airport Land Use Commissions (ALUCs). Los Angeles County, through its ALUC, exercises control over land use to help ensure the safety of people living near airports in the county. The City of Los Angeles further protects its residents, property owners, and users of LAX (and its other airports) by also exercising control over building heights and land uses within the Hazard Area established by its Planning and Zoning Code. These guidelines and standards are also addressed in Section 4.2, *Land Use*, and are discussed below.

Federal Aviation Administration

The FAA is charged with regulating, promoting, developing, and ensuring the safety of civil airports, including LAX. The FAA is also mandated to provide safe and efficient airspace for use by civilian and military aircraft by designating, maintaining, and governing federal airways and their associated navigation facilities. The impacts of an airport's projects on airspace are typically addressed in a separate analysis performed by the FAA following completion of environmental review.

One of the FAA's primary roles is to develop and enforce the civil air regulations for safety standards, including those associated with airfield layout and operations, aircraft operation, and examination and inspection of facilities and personnel. To protect human health and welfare from the risk of aircraft incidents and accidents, the FAA has established extensive safety regulations governing the operation of aircraft as well as the design of airports. These safety regulations are incorporated into FAA's Airport Design Standards.[865]

The requirements contained in the Airport Design Standards are based on the requirements for safe aircraft takeoff, landing, and ground movement. They have evolved as experience and research have

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864 U.S. Department of Transportation, Federal Aviation Administration, FAR Part 139 Certification and Operations: Land Airports Serving Certain Air Carriers, May 1998.

865 U.S. Department of Transportation, Federal Aviation Administration, FAA Advisory Circular 150/5300-13, Airport Design, Change 5, Appendix 8, February 14, 1997.

increased FAA's understanding of what is necessary to enhance aviation safety. Changes have been derived from commission reports (like the 1952 report by the President's Airport Commission, chaired by James Doolittle), NTSB accident reports, and other sources.

All development carried out on federally-regulated airports, such as LAX, must be conducted in accordance with an approved Airport Layout Plan (ALP). Before any major changes are undertaken in airport facilities involving the runways and taxiways, FAA must approve the ALP. FAA evaluates the safety of the plan and its compliance with FAA regulations. The ALP should, to the extent practicable, conform to FAA Airport Design Standards, with exceptions due to local conditions approved on a case-by-case basis.

It is common at airports throughout the country to have ALPs that depart from the Airport Design Standards in order to meet local site conditions and constraints. Such differences do not compromise safety. All departures from Airport Design Standards require a case-by-case analysis by FAA, and the facilities must show an acceptable level of safety. Often, operational changes are made to preserve an acceptable level of safety.

FAA Airport Design Standards include safety compatibility criteria to which airports must conform. The basic objective of safety compatibility criteria is to minimize the risk associated with potential aircraft accidents. The primary strategy is to limit the intensity of land use in locations most susceptible to an off-airport aircraft accident through density limitations, open space requirements, and the restriction of certain sensitive types of land uses from the runway area. The Airport Design Standards establish minimum land use-related guidelines to protect people and property on the ground. Three zones of increasing size are defined in proximity to runways:

- **Runway Object Free Area (ROFA):** a two-dimensional ground clearance area surrounding the runway and extending beyond the runway end. Within the ROFA, parked aircraft and natural or manmade objects are prohibited, except aviation objects that are fixed by their function.
- **Runway Safety Area (RSA):** "a defined surface surrounding the runway and extending beyond the runway end, prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or veer off the runway…[that] provides greater accessibility for firefighting and rescue equipment during such incidents." Based on FAA statistical data, the RSA should capture 90 percent of undershoots and overruns. In addition to the two-dimensional standards, FAA has longitudinal and transverse gradient standards for RSAs. The RSA should be cleared, drained, and graded, and is usually turfed. Under dry conditions, this area should be capable of supporting occasional aircraft that could overrun the runway without causing structural damage to the aircraft, as well as fire fighting and snow removal equipment (in cold climates).
- **Runway Protection Zones (RPZs):** trapezoidal-shaped areas located at ground level beyond each end of a runway. Land uses are limited in RPZs to preclude obstruction to aircraft operations proximate to the runway. The purpose of the RPZ is to enhance the protection of people and property on the ground. RPZs vary in size depending upon the type of landing approach available at an airport and the characteristics of the critical aircraft operating at the airport. RPZs are divided into "object free" and "controlled activity" areas. FAA guidelines state that "it is desirable to clear the entire RPZ of all above ground objects." The FAA recommends that airport operators control the land within the RPZ.

In addition to designation of the above safety areas, FAA provides standards for runway, taxiway, and taxilane design, including width, length, separation, radius of turns, layout, and pavement material composition.

Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*,[866] also serves as a means of monitoring and protecting the airspace required for safe operation of aircraft at or near an airport. This regulation establishes imaginary surfaces extending outward from the runways in which it is required that the FAA be notified of any proposed development or structural changes that would obstruct the path of operating aircraft. These standards also provide guidance to state and local governments in their efforts to control land use around airports so as to protect aircraft in flight and people on the ground.

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[866] U.S. Department of Transportation, Federal Aviation Administration, FAR Part 77, Objects Affecting Navigable Airspace, January 1, 1998.

LAX was built prior to the establishment of the FAA's current design standards for airports serving large commercial jets. For this reason, not all of the safety areas and safety zones surrounding the four LAX runways universally meet today's recommended dimensions for new airport development.

Although not applied to the current ALP, FAA has established a mechanism for allowing existing airports to continue operating unimpeded through the declaration of safe aircraft operating parameters known as "declared distances." Guidance on the application of this methodology is contained in FAA Advisory Circular (AC) 150/5300-13 - Airport Design. Appendix 14 of this AC states, "The use of declared distances for airport design shall be limited to cases of existing constrained airports where it is impracticable to provide the runway safety area (RSA), the runway object free area (ROFA), or the runway protection zone (RPZ) in accordance with the design standards in Chapters 2 and 3 [*of AC 150/5300-13*]."

The general principal in the application of declared distances is the independent treatment of each of the four aircraft runway performance distances:

- Take-Off Run - The distance to accelerate from brake release to lift-off, plus safety factors.
- Take-Off Distance - The distance to accelerate from brake release past lift-off to start of takeoff climb, plus safety factors.
- Accelerate Stop Distance - The distance to accelerate from brake release to V_1[867] and then decelerate to a stop, plus safety factors.
- Landing Distance - The distance from the threshold to complete the approach, touchdown, and decelerate to a stop, plus safety factors.

The ALP is used to specify the available runway length for each runway in each direction of use. FAA reviews and approves the ALP and publishes declared distances in its Facility Directory for use by pilots and airline dispatchers. The following are the four types of declared distances:

- Take-Off Run Available (TORA) - The length of runway declared available and suitable for satisfying takeoff run requirements.
- Take-Off Distance Available (TODA) - The TORA plus the length of any remaining runway or clearway beyond the far end of the TORA available for satisfying takeoff distance requirements.
- Accelerate Stop Distance Available (ASDA) - The length of runway plus stop way declared available and suitable for satisfying accelerate-stop distance requirements.
- Landing Distance Available (LDA) - The length of runway declared available and suitable for satisfying landing distance requirements.

California Department of Transportation

The California Department of Transportation (Caltrans), Division of Aeronautics, is responsible for funding, licensing, and permitting programs for airports and heliports in California. The Caltrans *California Airport Land Use Planning Handbook*[868] does not establish regulations, policies, or standards; rather, it includes recommendations and suggestions for consideration by individual airport land use commissions, counties, and cities. These recommendations include the establishment of up to six separate land use compatibility zones as described below.

Runway Protection Zone: This zone is the same as the runway protection zone defined by FAA criteria. The guidelines recommend the prohibition of all new structures and prohibition of all residential land uses within this zone. Non-residential uses, except if very low intensity in character and confined to the sides and outer end of the area, should be avoided in this zone.

Inner Approach/Departure Zone: This zone extends beyond and, if RPZ is narrow, along the sides of the RPZ. The guidelines recommend that, within this zone, the following uses be prohibited: residential uses except on large, agricultural parcels; children's schools, day care centers, hospitals, and nursing homes; and, hazardous uses (e.g., aboveground bulk fuel storage). Non-residential uses in this zone are

867 For turbojet aircraft, the maximum speed during takeoff that the pilot may abort the takeoff and stop the airplane within the accelerate-stop distance.

868 California Department of Transportation, Division of Aeronautics, California Airport Land Use Planning Handbook, January 2002.

recommended to be limited to activities which attract few people (e.g., shopping centers, theaters, multi-story office buildings, etc. are unacceptable).

Inner Turning Zone: This zone is primarily applicable to general aviation airports and encompasses locations where aircraft are typically turning from the base to final approach legs of the standard traffic pattern and are descending from traffic pattern altitude, as well as the area where departing aircraft normally complete the transition from takeoff power and flap settings to a climb mode and have begun to turn to their en route heading. The guidelines recommend that, within this zone, residential uses be limited to very low densities, non-residential uses having moderate or higher usage intensities be avoided, and that children's schools, large day care centers, hospitals, and nursing homes be prohibited. In addition, placement of hazardous uses should be avoided.

Outer Approach/Departure Zone. This zone is situated along extended runway centerline beyond the Inner Turning Zone. The guidelines recommend that, within this zone, non-residential uses having moderate or higher usage intensities be limited, and that children's schools, large day care centers, hospitals, and nursing homes be prohibited. In undeveloped areas, residential uses within this zone should be limited to very low densities; higher density residential is allowed as infill in urban areas.

Sideline Zone: This zone encompasses close-in area lateral to runway. The guidelines recommend that, within this zone, residential uses be avoided unless airport related. Common aviation-related activities are allowed provided that height-limit criteria are met. Non-residential uses having moderate or higher usage intensities should be limited, and children's schools, large day care centers, hospitals, and nursing homes should be prohibited.

Traffic Pattern Zone: This zone includes all other portions of regular flight traffic patterns and pattern entry routes. The guidelines recommend that residential uses and most non-residential uses be allowed (except for outdoor stadiums and similar uses with very high intensities) in this zone, and that children's schools, large day care centers, hospitals, and nursing homes be avoided.

Los Angeles County Airport Land Use Commission

State law requires the creation of ALUCs to coordinate planning for the areas surrounding public-use airports. In Los Angeles County, the ALUC is responsible for coordinating the airport planning of public agencies within the county. The purpose of the ALUC is to protect public health, safety, and welfare by ensuring the orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards. Within Los Angeles County, the Regional Planning Commission serves as the ALUC and reviews proposed amendments to airport Master Plans for their consistency with the pertinent comprehensive Los Angeles County Airport Land Use Plan within the County.

The ALUC has established provisions for safety, noise insulation, and regulation of building height within areas adjacent to each of the public airports in the county. The ALUC has also established numerous policies that limit the placement of certain facilities or uses within specified distances from runways. These policies, which are very similar to those for FAA RPZs, are discussed in detail in Technical Report 14c, *Safety Technical Report,* Attachment A*, Aviation Incidents and Accidents.*

City of Los Angeles

City of Los Angeles Ordinance No. 132,319 regulates the building height limits and land uses within the Hazard Area established by the Planning and Zoning Code to protect aircraft approaching and departing from LAX from obstacles. An "airport hazard" is defined as any structure, tree, or use of land that obstructs the airspace required for the flight of aircraft in landing or taking off at an airport or is otherwise hazardous to such landing or taking off of aircraft. The ordinance also requires that all buildings exceeding specified heights within a specified area must also be marked with lights to warn aircraft of their presence.

Application of Design Standards at LAX

Wing Spans

Airplanes operating at LAX today are much larger than the airplanes in service at the time of its modern-day design. The existing airfield at LAX was originally designed to serve the first commercial passenger jet aircraft, such as the Boeing 707 and Douglas DC-8. The wingspans of these aircraft are

131 feet and 143 feet, respectively. In its role as an international gateway, LAX became one of the first airports served by the original Boeing 747 and its current successor, the 747-400. The wingspans of these aircraft range from 195 to 213 feet. Larger aircraft, including the Russian-made Antonov AN-124 and the military Lockheed C-5B Galaxy, occasionally use LAX. The wingspans of these aircraft are 232 and 223 feet, respectively.

Cost-effective and safe alternatives to rebuilding the entire airport were needed to accommodate the operation of the larger aircraft mentioned above. FAA looked to the specific aircraft wingspans to develop design criteria for separating aircraft from each other and aircraft from objects on and around the airfield. It is commonly accepted that not all aircraft need access to all places on an airport. As a result, taxiway clearances may only meet those necessary for a smaller Boeing 737 or even a wide-body aircraft but may not be adequate to allow access for the larger Boeing 747. To ensure that a pilot is aware of the restricted areas on the airfield, FAA publishes complete airfield access information in its Airport Facility Directory. All pilots are required to review this information prior to operating at LAX. FAA air traffic controllers are also required to review this information and assist pilots as they maneuver their aircraft on the ground at LAX.

The following is a listing of those areas at LAX that do not meet the full design standards associated with FAA Airport Design Group V.[869] These areas are specifically restricted from certain operations or certain simultaneous operations, as noted. Each of these operational restrictions has been studied by FAA officials and found to provide the necessary level of safety. These areas are depicted in **Figure F4.24.3-3,** Impaired Separation Areas at LAX. The impaired separation areas at LAX are described below:

- Impaired wing clearance exists on taxiway B between taxiways C-6 and C-5 when taxilane C is occupied (applies to all commercial jet aircraft). Taxiways C-1, A-2, A-4, taxilanes C-6, C-7, C-8, C-9 north of taxiway C (between Terminals 4, 5, 6, 7, and 8) and taxiway D between taxilanes D-7 and D-8 will not accommodate Boeing 747 or larger aircraft.
- There is insufficient clearance between Boeing 747-400 or larger aircraft on taxiway C between taxiways C-6 and C-5 and vehicles on the adjacent service roads.
- All Boeing 747 or larger aircraft eastbound on taxiway C are prohibited from transiting to taxiway B via taxiway C-9.
- Taxiway D between taxilanes D-7 and D-8 is restricted to Boeing 767 or smaller aircraft.

On-Airport Land Use

OFAs, RPZs, and RSAs were described previously under *Federal Aviation Administration*. At LAX, the OFAs extend 400 feet on either side of the runway centerlines, along the entire length of runways, and 1,000 feet beyond each end; the RPZs start at 200 feet beyond the landing threshold and extend 2,500 feet along the runway centerline extended and at the outer end are 1,750 feet wide (the inner width is 1,000 feet) centered about the runway centerline extended; and the dimensions of the RSAs are provided in **Table F4.24.3-3**, Runway Safety Area Dimensions at LAX. These zones are also shown in **Figure F4.24.3-4**, Runway End Clearance at LAX for Baseline Conditions.

RSAs for airports serving the sizes and types of aircraft operating at LAX are currently required to be 1,000 feet long (beyond the end of the runway) and 500 feet wide (centered on the runway centerline). Prior to 1988, the size of RSAs varied greatly from airport to airport. At that time, the FAA encouraged airports to have RSAs that were 1,000 long beyond the ends of all runways and 500 feet wide, but these dimensions were not required. The RSAs were standardized in 1988 with the adoption of the current Airport Design Advisory Circular 150/5300-13, Change 5.[870] FAA has recognized in the past that many airports could not reasonably provide this additional safety area beyond the end of an existing runway and maintain the current runway length. With this reality in mind, FAA has grandfathered these non-standard RSAs until such time as new or reconstructed runways are considered to replace the existing runways. As shown in **Table F4.24.3-3**, non-standard RSAs currently exist at LAX. Each of these non-standard RSAs has been studied by FAA officials and found to provide the necessary level of safety.

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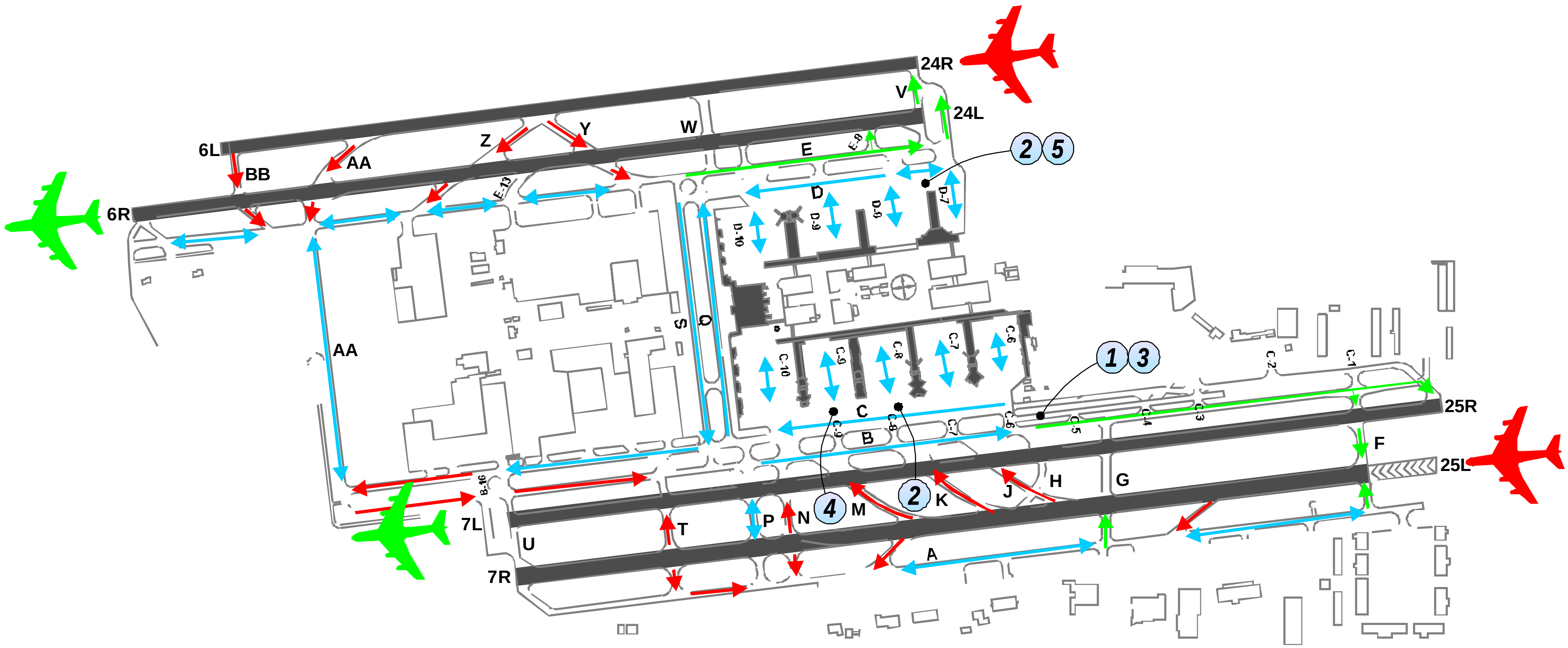
869 Design Group V aircraft have wingspans between 171 and 214 feet. These include Boeing 747 and 777, and Airbus A330/A340 aircraft.

870 U.S. Department of Transportation, Federal Aviation Administration, Airport Design Advisory Circular 150/5300-13, Change 5, 1989.



1 Impaired wing clearance may exist on taxiway B between C-6 and C-5 when taxilane C is occupied.

2 Taxiways C-1, A-2, A-4, taxilanes C-6, C-7, C-8, C-9 north of taxiway C (between Terminals 4, 5, 6, 7 and 8) and taxiway D between taxilanes D-7 and D-8 will not accommodate B747 aircraft.

3 There is insufficient clearance between vehicles on the adjacent service roads and B747-400 aircraft on taxiway C between C-6 and C-5.

4 All B747 aircraft eastbound on taxiway C are prohibited from transiting to taxiway B via C-9.

5 Taxiway D between taxilanes D-7 and D-8 (north of Terminal One) is restricted to B767 or smaller aircraft.

NOT TO SCALE

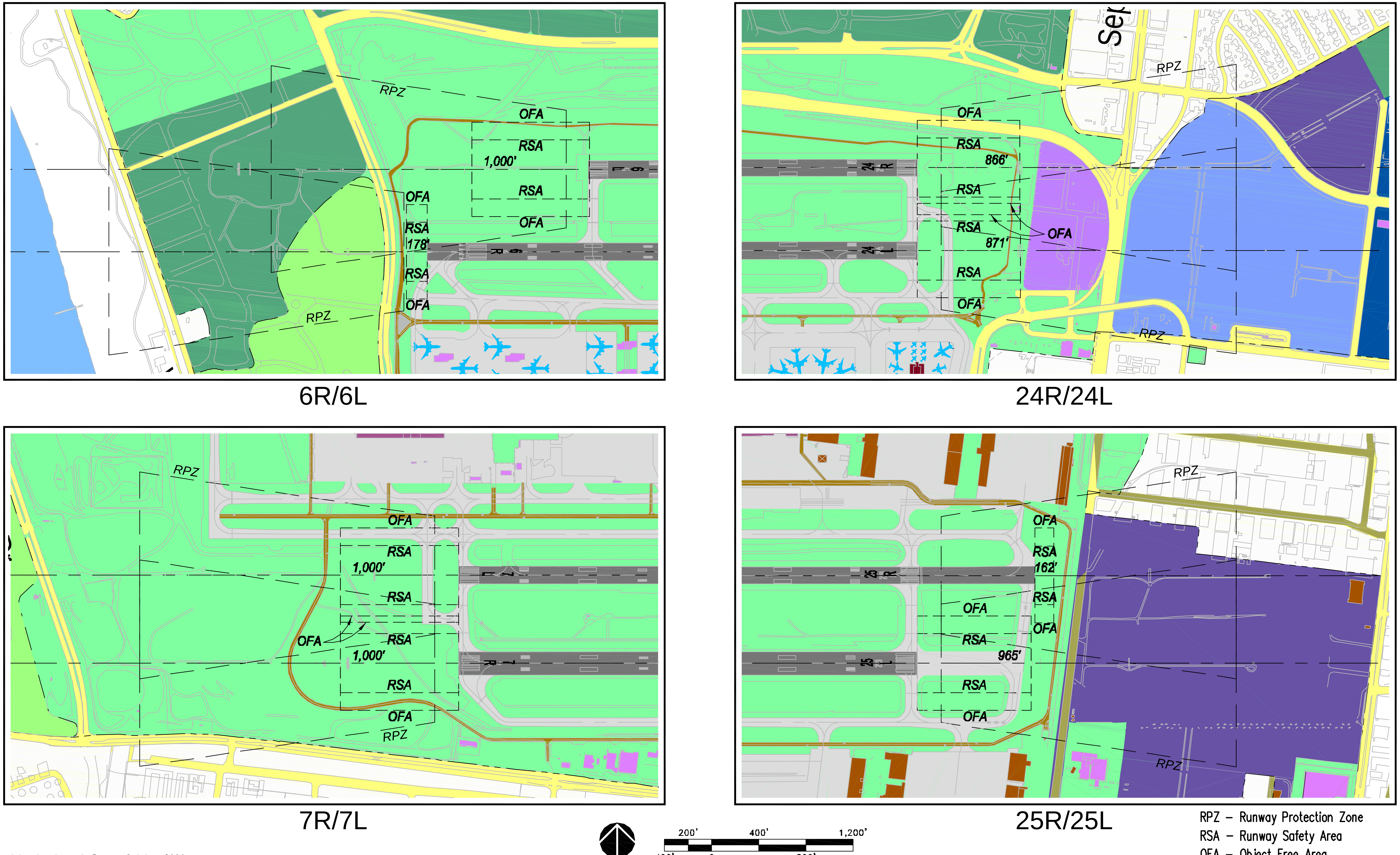
Departures
Arr/Dep
Arrivals

Prepared by:Landrum&Brown, June23,2000

LAX Master Plan Final EIS/EIR

Impaired Separation Areas at LAX

Figure F4.24.3-3



RPZ – Runway Protection Zone
RSA – Runway Safety Area
OFA – Object Free Area

Prepared by: Landrum & Brown, October 2000

LAX Master Plan Final EIS/EIR

Runway End Clearance at LAX
for Baseline Conditions

Figure
F4.24.3-4

Table F4.24.3-3

Runway Safety Area Dimensions at LAX

Runway	Length Beyond Runway End (feet)	Width (feet)
Runway 24L	178	500
Runway 6R	871	500
Runway 24R	1,000	500
Runway 6L	866	500
Runway 25L	1,000	500[1]
Runway 7R	965	500
Runway 25R	1,000	500
Runway 7L	162	500

[1] Westerly 450 feet beyond the runway end of Runway 25L, the width is 430 feet.

Source: Landrum & Brown, 2000.

Incident and Accident History

U.S. Airline and Aviation Industry Record

The past 50 years have witnessed profound improvements in aviation safety; improvements that are continuing today. In fact, the chances of an aviation accident occurring that would affect LAX and its environs is extremely remote and, typically, such accidents are based on random sequences of unusual events. The system of continuous regulatory and voluntary improvements to air safety put into place during the past 50 years is generally responsible for a high level of safety of aircraft in flight and on the ground.

Aviation Safety Data

Before presenting aviation safety data, it is important to understand its context. The definition of an aviation accident is very broad. It can involve events that range in severity from a flight attendant receiving a broken ankle as a result of turbulence at altitude, to the catastrophic loss of one or more aircraft and hundreds of lives. In order to give more meaning to accident counts, governmental authorities traditionally have categorized accidents as fatal and non-fatal. However, even this categorization would be of limited use in accident studies; e.g., the death of a ramp agent resulting from the push back of an aircraft from the airport gate still would be classified as an aviation accident. Therefore, the aviation insurance and aircraft manufacturing industries have taken an alternative approach to this issue by categorizing accidents as "hull (aircraft) loss" and "non-hull loss." Recently, the NTSB introduced a new categorization system that divides accidents into either "Major, Serious, Injury, or Damage."[871] This improvement in the way accident dates is reported permits a more realistic and focused view of specific types of accident risk.

When analyzing accident data it is important to understand accident rates. Accident counts alone are not reliable indicators of the relative safety of airlines/operators, aircraft types, or segments of the air transportation industry. For example, the more frequently-used aircraft types tend to be involved in accidents more than the less frequently used types. The method most commonly used to address these issues is to calculate accident rates in terms of accident counts divided by some measure of aviation activity; i.e., accident counts divided by flight hours, departures, miles, etc. This is the methodology the

[871] Major Accident - One that results in the destruction of an aircraft operated under FAR Part 121, or in which there were multiple fatalities, or that an aircraft operated under Part 121 is substantially damaged (damage or failure which adversely affects the structural strength, performance or flight characteristics of the aircraft and requires major repair or replacement of the component) and at least one fatality occurs.
Severe Accident - One that results in only one fatality and an aircraft operated under Part 121 is not substantially damaged, or there was at least one serious injury and the aircraft was substantially damaged.
Injury Accident - A non-fatal accident having at least one serious injury but without substantial damage to an aircraft.
Damage Accident - An accident in which there are no fatalities or serious injuries but an aircraft is substantially damaged.

NTSB uses to compare the historical accident record of the principal segments of the air transportation industry.

One other important reminder when reviewing aviation safety data is to understand the effect of time on the statistics. The aviation industry is characterized by rapid change. Whereas airline operations once were characterized by point-to-point service, hub and spoke service now dominates the industry. In addition, the airline industry experienced a major consolidation through mergers and bankruptcies beginning in the late 1970s with industry deregulation. Airline activity has more than doubled over that period. New technologies are constantly being introduced, such as aircraft collision avoidance systems. Overall, the aviation industry of today is very different from the industry of two decades ago. Because of the dynamic nature of the aviation industry, care must be exercised to avoid comparing conditions or events spanning over too long a period. The following analysis assesses the accident rates of commercial aviation from 1982 through 2000.

Trends in Accident Rates

The number of passengers carried on large U.S. commercial airlines (carriers operating under 14 CFR Part 121 rules) more than doubled between 1982 and 2000. Flight hours, miles flown, and departures by these same carriers more than doubled in each case. During that same period, the fatal accident rates among the same scheduled and unscheduled commercial airlines fell by a factor of 2.5. **Figure F4.24.3-5**, Comparison - U.S. Air Carrier Flight Hours to Air Carrier Accident Rates (1982-2000), **Figure F4.24.3-6**, Comparison - U.S. Air Carrier Miles Flown to Air Carrier Accident Rates (1982-2000) and **Figure F4.24.3-7**, Comparison - U.S. Air Carrier Departures to Air Carrier Accident Rates (1982-2000), show this comparison between the falling fatal accident rates and the growing activity.

A closer look at accident rates by NTSB classification reveals that "major" accidents (those in which a fatality was included) have fallen by three times since 1982. "Serious" accidents have fallen by nearly as much. Accidents involving "Injury" and "Damage," as defined by NTSB, have been trending up slightly over the same period. This is partly due to the inclusion of smaller commuter airlines (carriers operating under 14 CFR Part 135 rules) flying airplanes with between 10 and 29 seats in the "air carrier" category since March 20, 1997. This size airline has traditionally had more accidents than those experienced by larger airlines. **Figure F4.24.3-8,** Accident Rates by NTSB Classification for U.S. Air Carriers - 14 CFR Part 121 (1982-2000), compares the trends among these classifications of accidents.

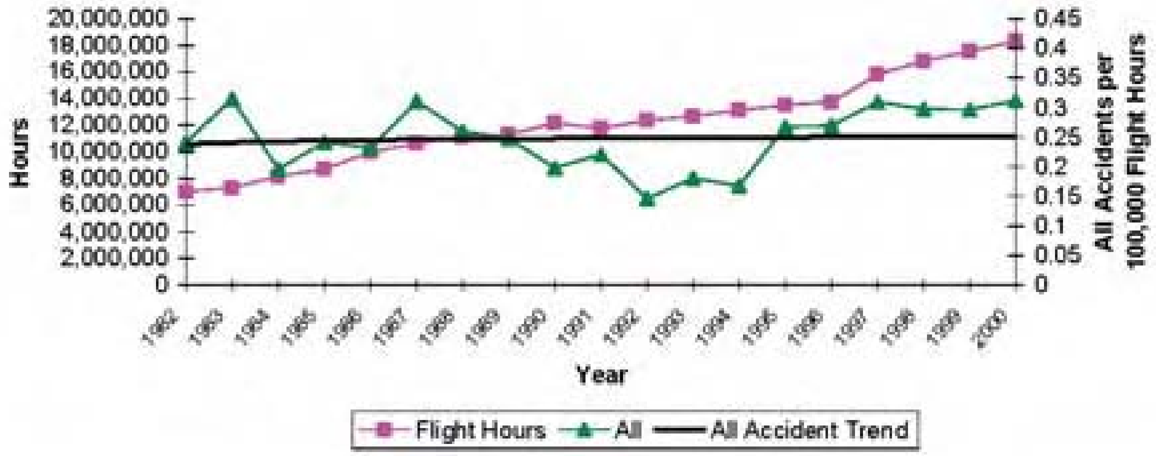
The falling rate of aircraft accidents has also translated into a reduction in the rates of serious passenger injury and of passenger fatalities among large U.S. air carriers. Passenger enplanements more than doubled between 1982 and 2000 while the average serious injury rate was reduced by a third and the fatal injury rate was reduced by half. **Figure F4.24.3-9**, Comparison - Air Carrier Accident Rates to Passenger Enplanements (1982-2000), depicts the comparison between the growth in enplanements and the reduction in the passenger injury rates.

Aircraft incidents and accidents among small commuter and on-demand air taxi air carriers flying aircraft with less than 10 seats (14 CFR Part 135) are also extremely rare but higher than the larger Part 121 carriers. Until 1997, this category included airlines flying airplanes with up to 29 seats. As stated above, those with at least 10 seats have been moved to the large, or Part 121, air carrier category. Over the last 15 to 20 years, the overall accident rate for these types of air carriers was, on average, over six times as high as the accident rate of large airlines. The fatal accident rate of these smaller carriers has been, on average, over 10 times as high the accident rate of large airlines.

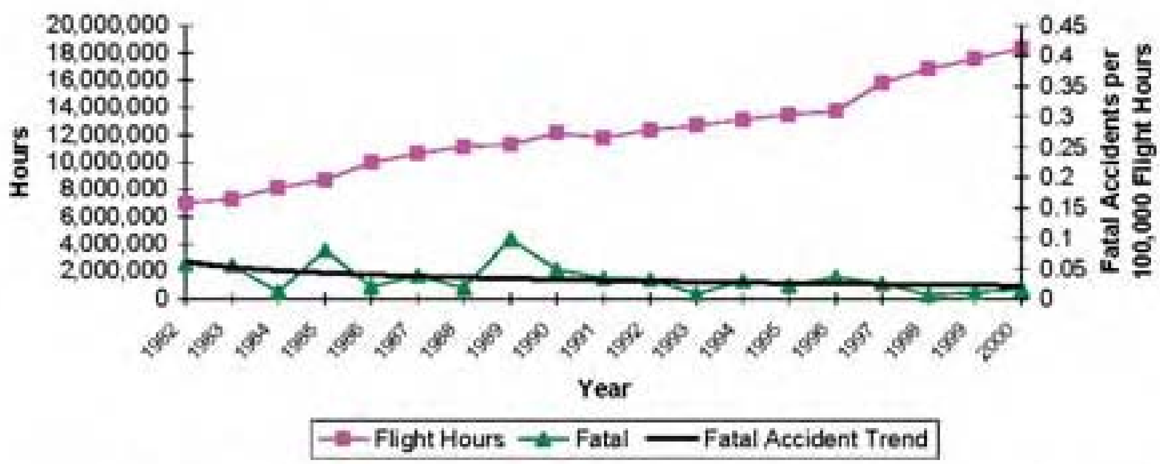
Aircraft incidents and accidents among general aviation users is very low compared to most forms of transportation but higher than all types of commercial air carriers. While accident rates among general aviation users have been falling over the last 15 years, they still remain substantially higher than all categories of commercial passenger airlines. On average, accident rates among general aviation are seven times higher than those of small (Part 135) airlines and 29 times higher than those of large (Part 121) airlines. Fatal accident rates among general aviation users over those of small (Part 135) and large (Part 121) airlines during the same time period were 5 and 47 times higher, respectively.

Aircraft incidents and accidents are usually the result of random sequences of unusual events that rarely ever repeat in the same way with the same result. These rates offer little or no predictive reliability for specific types of incidents and accidents at specific airports because of the low number of accidents (as compared to operational measures such as the number of passengers carried, hours flown, miles flown, or aircraft departures).

Comparison of Flight Hours to All Accidents



Comparison of Flight Hours to Fatal Accidents

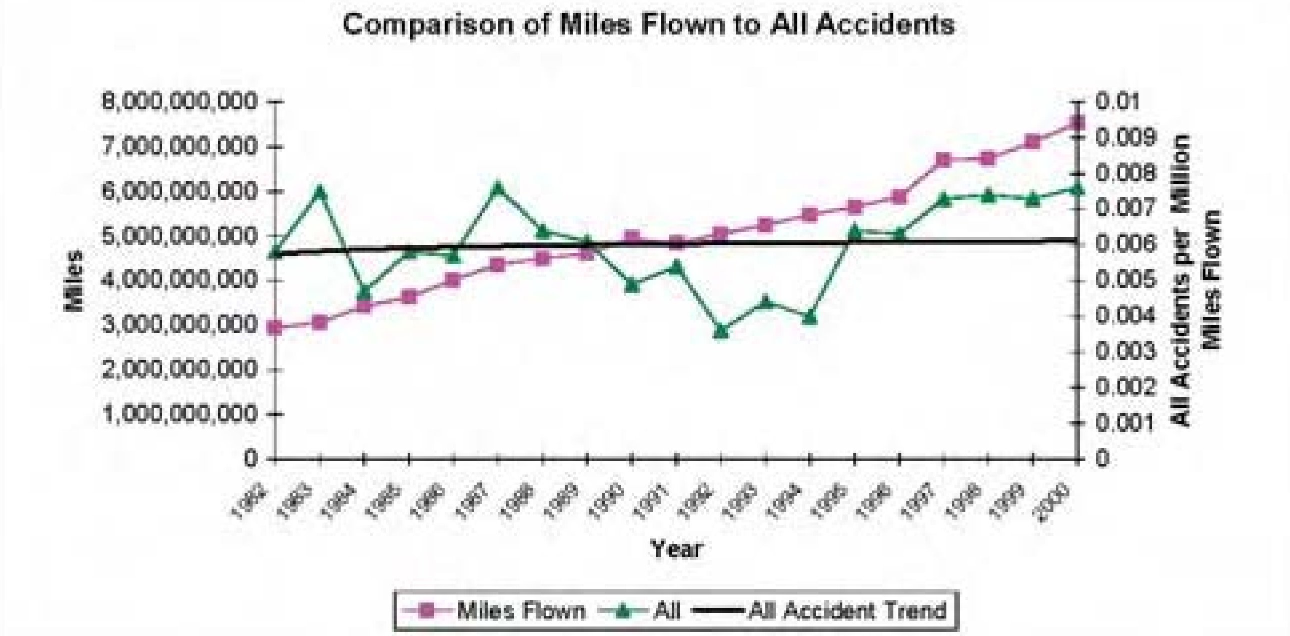


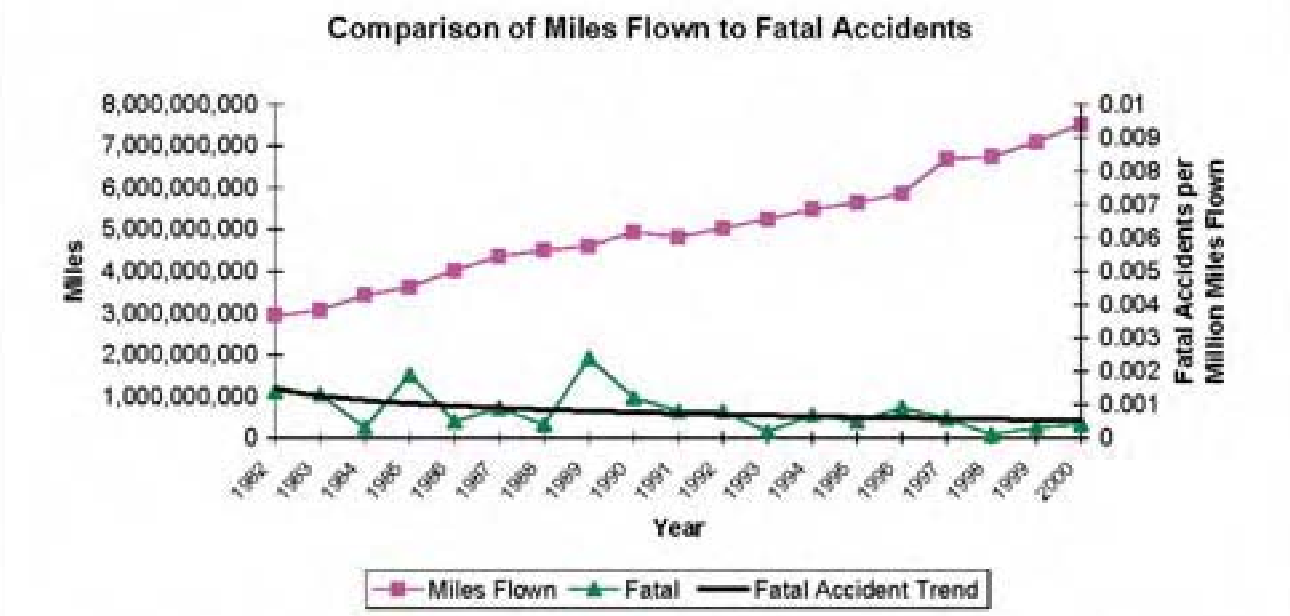
Notes: 1) Includes U.S. Air Carriers operating under 14 CFR Scheduled and Non-Scheduled Service (since 3/20/97 includes aircraft with 10 or more seats formerly operated under 14 CFR 135).

Source: NTSB

Prepared by: Landrum & Brown, December 11, 2002

LAX Master Plan Final EIS/EIR	Comparison - U.S. Air Carrier Flight Hours to Air Carrier Accident Rates (1982-2000)	Figure F4.24.3-5





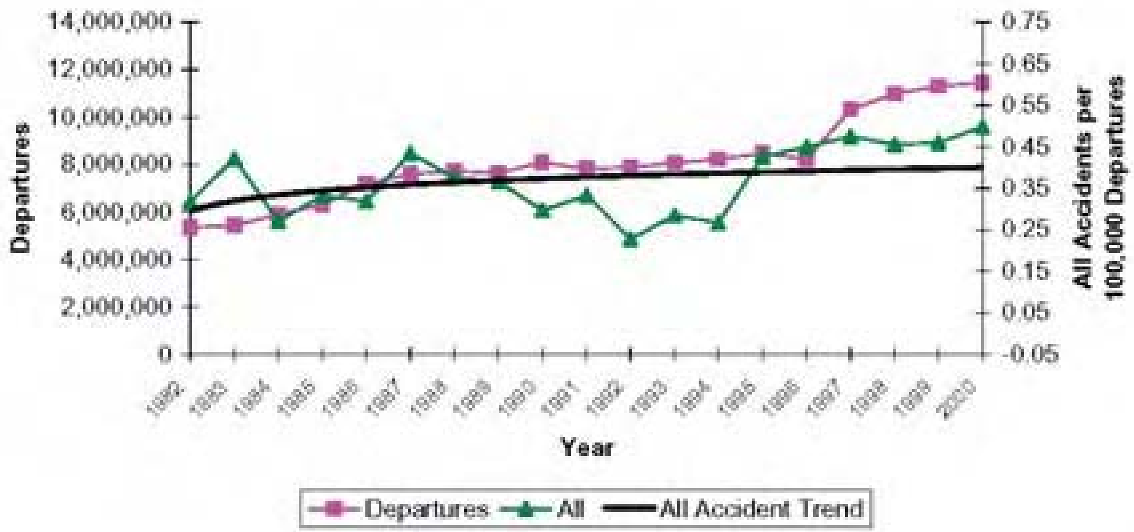
Notes: 1) Includes U.S. Air Carriers operating under 14 CFR Scheduled and Non-Scheduled Service (since 3/20/97 includes aircraft with 10 or more seats formerly operated under 14 CFR 135).

Source: NTSB

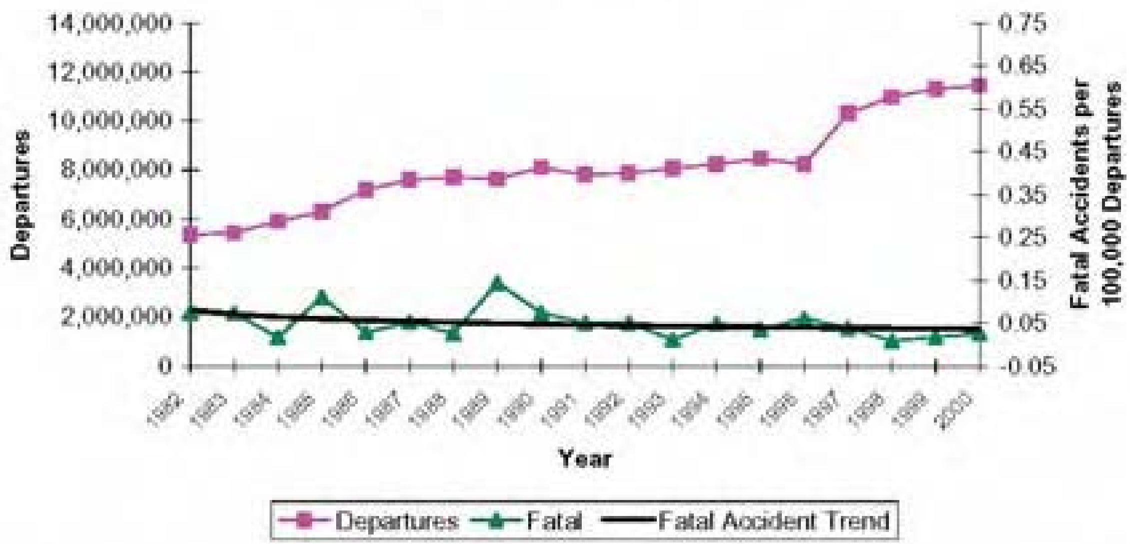
Prepared by: Landrum & Brown, December 11, 2002

LAX Master Plan Final EIS/EIR	Comparison - U.S. Air Carrier Miles Flown to Air Carrier Accident Rates (1982-2000)	Figure F4.24.3-6

Comparison of Departures to All Accidents



Comparison of Departures to Fatal Accidents

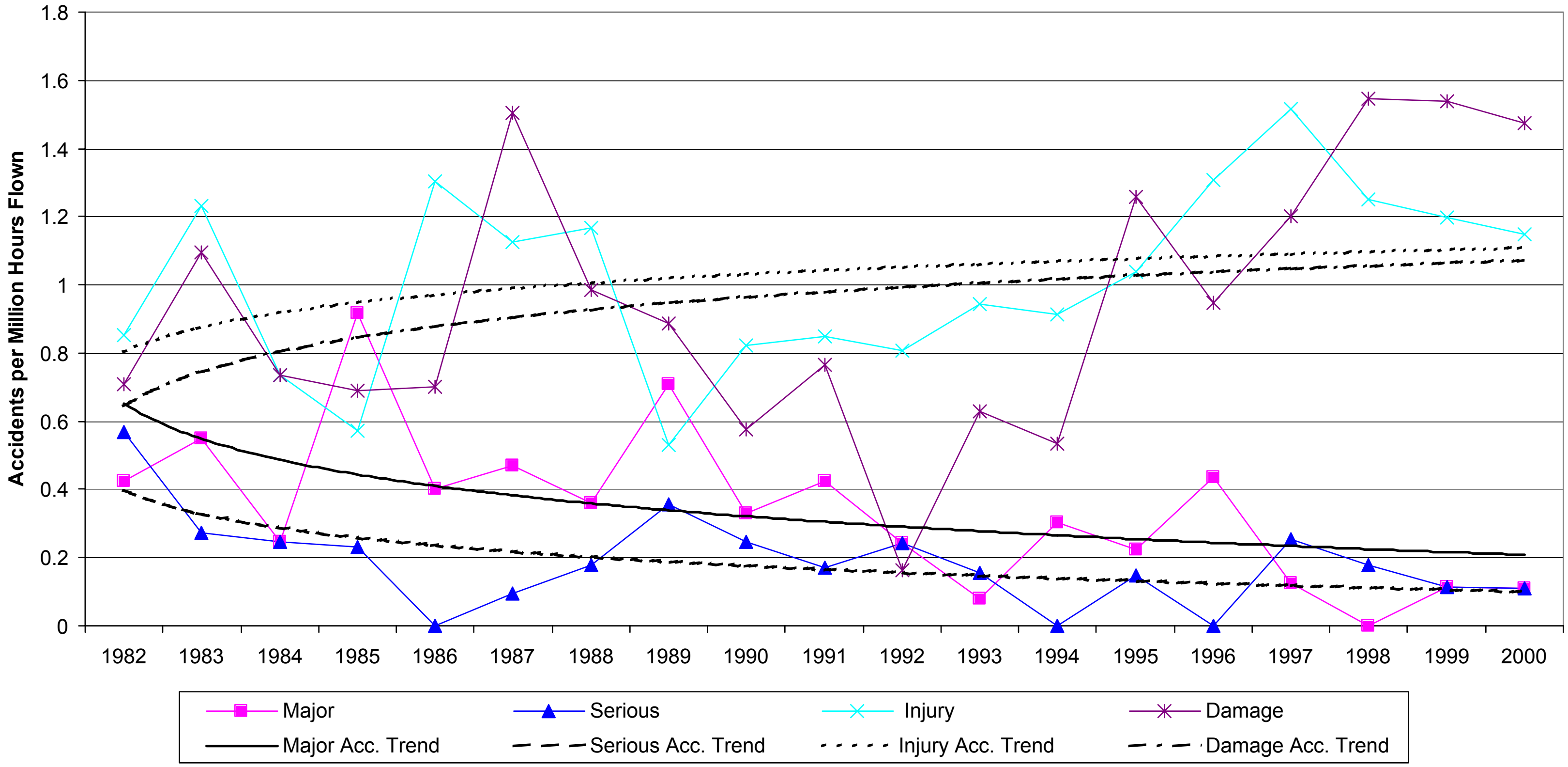


Notes: 1) Includes U.S. Air Carriers operating under 14 CFR Scheduled and Non-Scheduled Service (since 3/20/97 includes aircraft with 10 or more seats formerly operated under 14 CFR 135)

Source: NTSB

Prepared by: Landrum & Brown, December 11, 2002

LAX Master Plan Final EIS/EIR	Comparison - U.S. Air Carrier Departures to Air Carrier Accident Rates (1982-2000)	Figure F4.24.3-7



Definitions of NTSB Classifications

Major - An accident in which any of three conditions is met: a Part 121 aircraft was destroyed, there were multiple fatalities, or there was one fatality and a Part 121 aircraft was substantially damaged.

Serious - An accident in which at least one of two conditions is met: there was one fatality without substantial damage to a Part 121 aircraft, or there was at least one serious injury and without substantial damage to a Part 121 Aircraft.

Injury - A nonfatal accident with at least one serious injury and without substantial damage to a Part 121 aircraft.

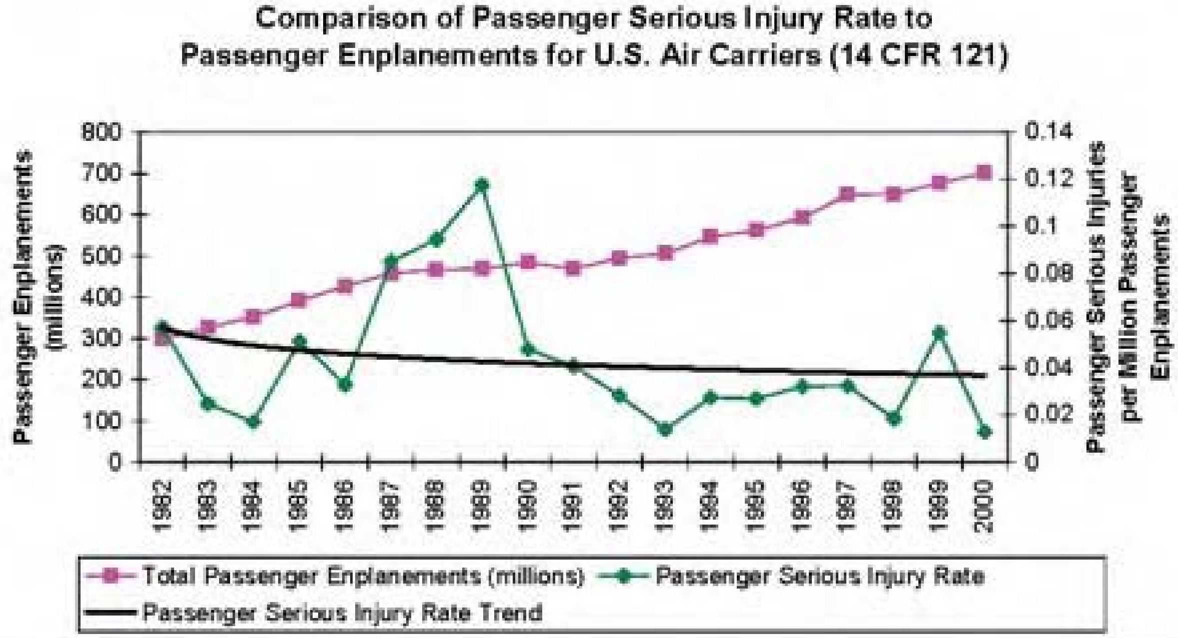
Damage - An accident in which no person was killed or seriously injured, but in which any aircraft was substantially damaged.

Source: NTSB

Prepared by: Landrum & Brown, December 11, 2002

Accident Rates by NTSB Classification for U.S. Air Carriers - 14 CFR 121 (1982-2000)

Figure
F4.24.3-8



Source: NTSB

Prepared by: Landrum & Brown, December 11, 2002

LAX Master Plan Final EIS/EIR	Comparison - Air Carrier Accident Rates to Passenger Enplanements (1982-2000)	Figure F4.24.3-9

The aviation system, including airports, is regulated to ensure investigation and feedback to correct causes of accidents in order to reduce the accident rate, numbers of fatalities, and overall risk of mortality to passengers and crew members on a typical flight. All aviation accidents are investigated to determine probable cause. Systemic problems found to contribute to aircraft incidents and accidents are constantly addressed and corrected by FAA and the entire aviation industry. This system of continuous regulatory and voluntary improvements to air safety will ensure a high level of safety for aircraft in flight and property on the ground around LAX in the future, even as airport activity increases.

Locations of Accidents

Data on accident location are available from the NTSB and the FAA. For each accident/incident investigated by the NTSB, a factual report is completed. Included in this data are distance from airport center and direction from airport. A compilation of NTSB data for U.S. airports only for the years 1974 through 1981 (*NTSB Annual Review of Aircraft Accident Data: U.S. General Aviation - Calendar Years 1974-1981*) shows that 47 percent of all aircraft accidents (commercial and general aviation) take place on an airport, 30 percent are en route accidents (occurring more than five miles from an airport), and 23 percent are classified as airport-vicinity accidents (occurring within five miles of airport).[872]

In 1990, the FAA published a 10-year study of the location of commercial aircraft accidents relative to the runway involved (for U.S. airports only) titled *Location of Aircraft Accidents/Incidents Relative to Runways*. A total of 246 incidents and accidents occurring between 1978 and 1987 were analyzed. During this period, 57 percent were limited to the immediate vicinity of the runway and approximately 35 percent were classified as occurring during landing or takeoff. Landing incidents/accidents were defined as events where the aircraft impacted the ground more than 2,000 feet from the runway threshold. A departing accident/incident was determined to be an event that occurred after liftoff, but before the first power reduction. The remaining seven percent occurred when the aircraft undershot the runway (landed as much as 2,000 feet short of the threshold).[873]

An examination by Caltrans of the 1990 FAA study of incidents/accidents, and several other studies addressing similar issues, indicates that the majority of aircraft landing accidents take place on or immediately adjacent to the runway. The greatest proportion of takeoff/departure accidents occur during the initial climb phase. Compared to landing accidents, a much greater dispersion of accident location is typical for takeoff accidents. The total number of accidents studied was split almost equally between takeoff and landing accidents. The nighttime accident rate was found to be greater than the daytime rate.[874]

Aviation Incidents and Accidents at LAX

Information regarding incidents and accidents[875] at LAX was obtained from the FAA Accident/Incident Data System (AIDS) database and the NTSB Aviation Accident and Incident Data System.[876] **Table F4.24.3-4**, Aircraft Accidents and Incidents at LAX (1982 - 2000), presents the accident and incident history of LAX for the 19-year period ending in the Year 2000. Between 1982 and 2000, there were 26 accidents at LAX, with loss of life occurring in two of the accidents. These accidents have been attributed to various causes, including pilot error, mechanical failure, inadequate air traffic control supervision, service personnel error, evacuation procedure error, and weather. Of the two fatal accidents, one was attributed to pilot error and the other to inadequate air traffic control supervision. Between 1982 and 2000, there were 49 incidents at LAX. None of the accidents or incidents at LAX have been attributed to departures from Airport Design Standards. The rate of incidents and accidents is dependent upon many factors, as discussed below.

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872 California Department of Transportation, Division of Aeronautics, Airport Land Use Planning Handbook, December 1993.

873 California Department of Transportation, Division of Aeronautics, Airport Land Use Planning Handbook, December 1993.

874 California Department of Transportation, Division of Aeronautics, Airport Land Use Planning Handbook, December 1993.

875 According to NTSB Regulation Part 830, "aircraft accident" means an occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage. "Incident" means an occurrence other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations.

876 FAA National Aviation Safety Data Analysis Center (NASDAC), Databases section, Available: http://www.nasdac.faa.gov/asp/fw_ntsb.asp [2003].

Table F4.24.3-4

Aircraft Accidents and Incidents at LAX (1982-2000)

Year	Accidents	Fatal Injuries	Incidents
1982	0	0	0
1983	0	0	4
1984	0	0	5
1985	0	0	1
1986	2	0	2
1987	10	0	3
1988	0	0	0
1989	3	0	1
1990	1	0	3
1991	2	34	3
1992	0	0	4
1993	1	0	2
1994	0	0	0
1995	1	0	1
1996	2	4	1
1997	0	0	6
1998	1	0	1
1999	3	0	5
2000	0	0	7
Total	26	38	49

Sources: NTSB and FAA, 2002.

As indicated above, two fatal accidents associated with LAX operations have occurred since 1982. One, in 1996, was a single airplane accident. The other one is discussed below. Also discussed below is a very well-known accident: a midair collision over Cerritos that resulted in fatalities in the air and on the ground. However, the only link to LAX of this accident is that one of the aircraft involved was en route to LAX at the time.

One fatal accident occurred on February 1, 1991, on the runway at LAX. A Skywest Airlines Swearingen Metroliner and a USAir Boeing 737-300 collided when the USAir 737 landed on top of the Skywest Swearingen, which was positioned on the runway for takeoff. Thirty-four people were killed as a result of the accident. In addition both planes were entirely destroyed, 13 people were seriously injured, and 17 minor injuries were sustained. The FAA attributed the accident to inadequate supervision of air traffic control personnel, improper air traffic control clearance, and inadequate substantiation process. NTSB reports make recommendations as to how to improve operations to avoid similar accidents in the future. As a result of this accident, the FAA instituted several procedures to enhance aviation safety at LAX and other airports. Thirteen different recommendations were implemented, including the following:

- FAA modified air traffic control procedures at LAX to segregate arrivals and departures to specific runways.
- FAA provided formal training for air traffic control supervisors to improve their understanding of the intent, objectives, and administration of the technical appraisal program.
- FAA directed the general aviation community and the airlines to take steps to ensure that pilot training programs, including cockpit resource management training and flight operations procedures, place sufficient emphasis on the need for pilots to maintain vigilance in monitoring air traffic control radio communication frequencies for potential traffic conflicts with their aircraft, especially when on an active runway and/or when conducting a final approach to a landing.

Another well-known fatal accident in the Los Angeles region is not attributed to LAX. The only link between this accident and LAX is that one of the aircraft involved was en route to LAX at the time. It occurred on August 31, 1986, when an Aeromexico DC-9 inbound to LAX from Tijuana, Mexico, collided over Cerritos with a Piper Archer 28-181 en route from Torrance Airport to Big Bear City. (As noted above, this accident was not associated with LAX operations and, as such, is not included in **Table F4.24.3-4**). Eighty-two people were killed as a result of the midair collision, including all the passengers and crew on both aircraft as well as 18 people on the ground. The Piper Archer had made an unauthorized penetration of controlled airspace and the accident was attributed to inadequate FAA procedures and inadequate visual lookout by both pilots, as well as radar issues. As a result of this accident, the FAA instituted several procedures to enhance aviation safety at LAX and other airports including:

- FAA implemented procedures to track, identify, and take appropriate enforcement action against pilots who intrude into airport radar service areas without the required air traffic control communications.
- FAA required that transponder equipment with Mode C altitude reporting for operations around all terminal control areas and within airport radar service areas be compatible with implementation of traffic alert and collision avoidance system requirements for air carrier aircraft.
- FAA expedited action to add Visual Flight Rules conflict alert logic to automated radar terminal system computers as an interim measure to the ultimate implementation of the advanced automation system.

No recommendations from either this accident or the USAir/Skywest accident involved the City of Los Angeles or LAWA. As mentioned previously, the only connection between the Cerritos accident and LAX is that the Aeromexico flight was en route to LAX.

In addition to the procedural changes noted above, FAA recently modified procedures pertaining to the Visual Flight Rules (VFR) Flyway in the immediate vicinity of LAX to reduce the potential for a mid-air collision.

Birdstrikes

FAA guidelines recommend that landfills not be located near airports due to concerns that these may attract birds and increase the chances that birdstrikes will interfere with aircraft engine operation or damage an airframe. Per FAA Order 5200.5, sanitary landfills are considered incompatible if located within 10,000 feet of a runway end used or planned to be used by turbine powered aircraft. They are also considered incompatible if located within a five-mile radius of a runway that attracts or sustains hazardous bird movement into, or across, the runways or approach and departure patterns of aircraft.[877]

Currently, no active solid waste landfills are located within a five-mile radius of LAX. Existing bird attractants at LAX include the dunes area and the detention basin located at the southwest corner of the airfield. Birds are also attracted to the open space on the airfield, particularly toward the western end and within the LAX Northside property. LAX currently has approximately 1,194 acres of open space, 307 of which are in the LAX/El Segundo Dunes.

Despite the fact that aircraft collisions with birds may damage equipment and result in hazards to human health and safety, it is thought that less than 20 percent of all birdstrikes to civil aircraft are reported to FAA.[878] As shown in **Table F4.24.3-5**, Birdstrikes at LAX by Year, between January 1991 and December 2000, LAX had a total of 395 birdstrikes. The number of birdstrikes reported to LAX has increased from 16 birdstrikes in 1991 to 97 in 2000. This increase does not correspond directly to the increase in aircraft operations, which increased less than 20 percent, while the reported birdstrikes increased almost 600 percent. This increase may be due to a greater awareness of birdstrike reporting by LAX personnel, as well as an increase in aircraft operations. FAA has noted that between 1991 and 1997, there was a 53 percent increase in the number of birdstrikes reported nationwide, which is in agreement with LAX's increase during this same period.[879] No data are available on the costs incurred due to birdstrikes at LAX. No accidents at LAX were attributed to birdstrikes during this period.

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[877] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5200-33, Hazardous Wildlife Attractants on or Near Airports, 1997.

[878] Allen, Jennifer, U.S. Department of Agriculture, Wildlife Services, Memorandum to Stephen Yee (LAWA), January 27, 1999.

[879] Allen, Jennifer, U.S. Department of Agriculture, Wildlife Services, Memorandum to Stephen Yee (LAWA), January 27, 1999.

Table F4.24.3-5

Birdstrikes at LAX by Year

Year	Number of Birdstrikes
1991	16
1992	17
1993	17
1994	20
1995	26
1996	26
1997	41
1998	47
1999	88
2000	97[1]
Total	395

1 Includes a birdstrike incident on August 27, 2000 in which a KLM-Royal Dutch Airlines Boeing 747 experienced a contained engine-failure during takeoff initial climb from runway 25R at LAX. Pieces of the engine landed on Dockweiler State Beach, in the Dunes, and in a parking lot. No injuries onboard or on the ground resulted. The aircraft landed back at LAX without incident.

Source: Jennifer Allen, U.S. Department of Agriculture, Wildlife Services, Memorandum to Stephen Yee (LAWA), January 27, 1999; LAWA, 2002.

Birds can be discouraged from frequenting the airport vicinity through various means. LAX uses anti-perching devices on structures such as signs, lights, fences, and building edges. In accordance with FAA requirements, the airfield is maintained to avoid the ponding of water, the growth of vegetation, and the development of other conditions that may serve as attractants to nuisance wildlife, including birds.

Airport Security

In the aftermath of the terrorist attacks on September 11, 2001, the President of the United States signed into law the Aviation and Transportation Security Act (ATSA), which among other things established the new Transportation Security Administration (TSA) within the Border and Transportation Security directorate of the U.S. Department of Homeland Security. The TSA has statutory responsibility for security of all of the nation's airports. Tools used by the TSA include intelligence, regulation, enforcement, inspection, and screening and education of carriers, passengers, and shippers.

As discussed in Chapter 3, *Alternatives*, new security measures were immediately implemented at LAX in response to the events of September 11, 2001. The requirements of the TSA are continuing to evolve and LAWA officials are working with TSA to determine and accommodate the needs of the administration. LAWA met the congressionally-mandated deadline that all checked baggage on passenger flights be screened for explosives after December 31, 2002 through the implementation of a number of interim measures at the existing LAX terminals. These measures include the installation of explosive detection and explosive trace detection systems in the existing ticket lobbies of the terminals. Longer-term plans are being developed to install explosive detection systems into the existing baggage sortation systems in each of the terminals at LAX. These "in-line" systems will greatly improve the efficiency of the explosive screening process and will relieve the space congestion in the ticket lobbies that was created by the present short-term solution.

In addition to the requirements of screening baggage for explosives, the TSA is in the process of developing additional recommendations and requirements to increase security at the nation's airports.

FAA is also charged with regulating, promoting, developing, and ensuring the safety of civil airports. The FAA is also mandated to provide safe and efficient airspace for use by civilian and military aircraft by designating, maintaining, and governing federal airways and their associated navigation facilities.

4.24.3.4 Thresholds of Significance

4.24.3.4.1 CEQA Thresholds of Significance

A significant safety impact would occur if the direct and indirect changes in the environment that may be caused by the particular build alternative would potentially result in one or more of the following future conditions:

- A substantial increase in the likelihood or consequences of an upset incident.
- A compromise in aviation safety.
- Construction of runways within 10,000 feet of a solid waste landfill.
- Construction of facilities or implementation of operational conditions that would serve as attractants to birds.

Neither the *Draft L.A. CEQA Thresholds Guide* nor the State CEQA Guidelines provide specific guidance for safety thresholds of significance. The first threshold of significance is utilized because it addresses the potential concerns relative to risk of upset. It captures the two concepts that comprise risk (likelihood and consequences) and addresses the important issue of the relative risk associated with baseline conditions and the Master Plan build alternatives.

Neither the Caltrans *California Airport Land Use Planning Handbook* nor the *Los Angeles County Airport Land Use Plan* provide guidance or direction on performing analyses for aviation safety. The second threshold of significance is utilized because it addresses the potential concerns relative to aviation safety associated with the build alternatives. It also captures the concept most essential to aviation safety: no compromise to safety is acceptable to the FAA, Caltrans, LAWA, airlines, or passengers.

The third and fourth thresholds address birdstrikes. The third threshold was adapted from FAA guidance on the location of solid waste disposal facilities, a potential bird attractant, with respect to airport runways.[880] The fourth threshold is utilized to address other potential conditions that could contribute to birdstrike hazards.

4.24.3.4.2 Federal Standards

FAA Order 5050.4A, *Airport Environmental Handbook,* does not require the analysis of aviation safety as an environmental impact category for an environmental impact statement. However, the handbook requires an evaluation to determine if solid waste disposal facilities (i.e., landfills) are located within 3,000 meters (approximately 9,843 feet) of all runways planned to be used by turbojet analysis.

Except for the requirement that all checked baggage on passenger flights be screened for explosives after December 31, 2002, no other federal standards related to security requirements have been developed.

4.24.3.5 Master Plan Commitments

No Master Plan commitments for safety are proposed.

4.24.3.6 Environmental Consequences

This section describes the environmental impacts of the No Action/No Project Alternative and the four build alternatives. The effects of risk of upset for each alternative are discussed and a hazard footprint is delineated for potential reasonably-foreseeable, worst-case upsets at the CUP, fuel farm, and LNG/CNG facilities. The facilities that pose a risk of upset are similar for each alternative.

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[880] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5200-33, Hazardous Wildlife Attractants on or Near Airports, 1997.

4.24.3.6.1 No Action/No Project Alternative

Risk of Upset

Central Utility Plant

Under the No Action/No Project Alternative, the existing CUP would continue to operate at its current capacity and location. Sulfuric acid would continue to be used and stored in similar quantities at the CUP.

If a release of sulfuric acid were to occur from the CUP, the maximum hazard footprint would have a radius of approximately 262 feet for ERPG-3 and 459 feet for ERPG-2, which is the same as under baseline conditions. **Figure F4.24.3-10**, Hazard Footprints for No Action/No Project Alternative - 2015, depicts the areas that would be affected by a sulfuric acid release, accounting for wind direction and dispersion (but not for structures). As seen in **Figure F4.24.3-10**, the hazard footprints would extend to some of the roadway, public, and terminal areas of the airport. No residences or other sensitive receptors would be affected.

If a release were to occur, the sulfuric acid could pose a risk to the health and safety of LAX workers and passengers. The consequences of a sulfuric acid release would be potentially serious. Sulfuric acid is highly corrosive to metals and bodily tissue. Repeated or prolonged inhalation of a mist of sulfuric acid can cause inflammation of the upper respiratory tract and contact to eyes can be extremely irritating and may result in total loss of vision.

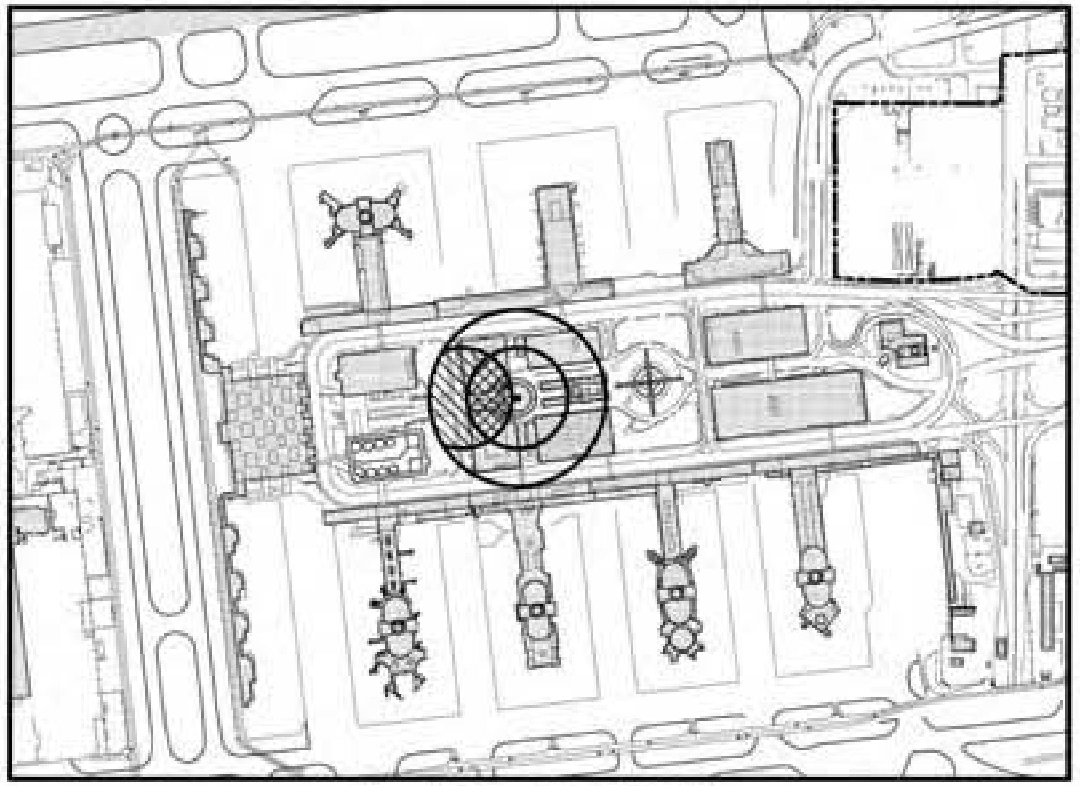
However, the likelihood of a sulfuric acid release is small. The CUP is subject to strict regulatory requirements. As discussed under subsection 4.24.3.3, *Affected Environment/Environmental Baseline*, the CUP complies with all applicable regulatory requirements. In order to minimize the risk of a release, the CUP employs safety and design features, including hazardous material handling practices, equipment start-up and shutdown procedures, sulfuric acid detection and monitoring, maintenance programs, employee training programs, emergency response procedures, and auditing and inspection programs. Additionally, sulfuric acid does not easily form a mist; a release is more likely to remain in an easily contained liquid form.

Should a sulfuric acid mist form, the presence of a solid CUP building, as well as parking garages, terminals, and other structures would restrict the movement of the mist. It is also important to note that the prevalent wind conditions are in either an easterly or westerly direction. This would minimize the amount of sulfuric acid directed toward the south and north, where passengers could be exposed while entering and exiting vehicles at the terminals.

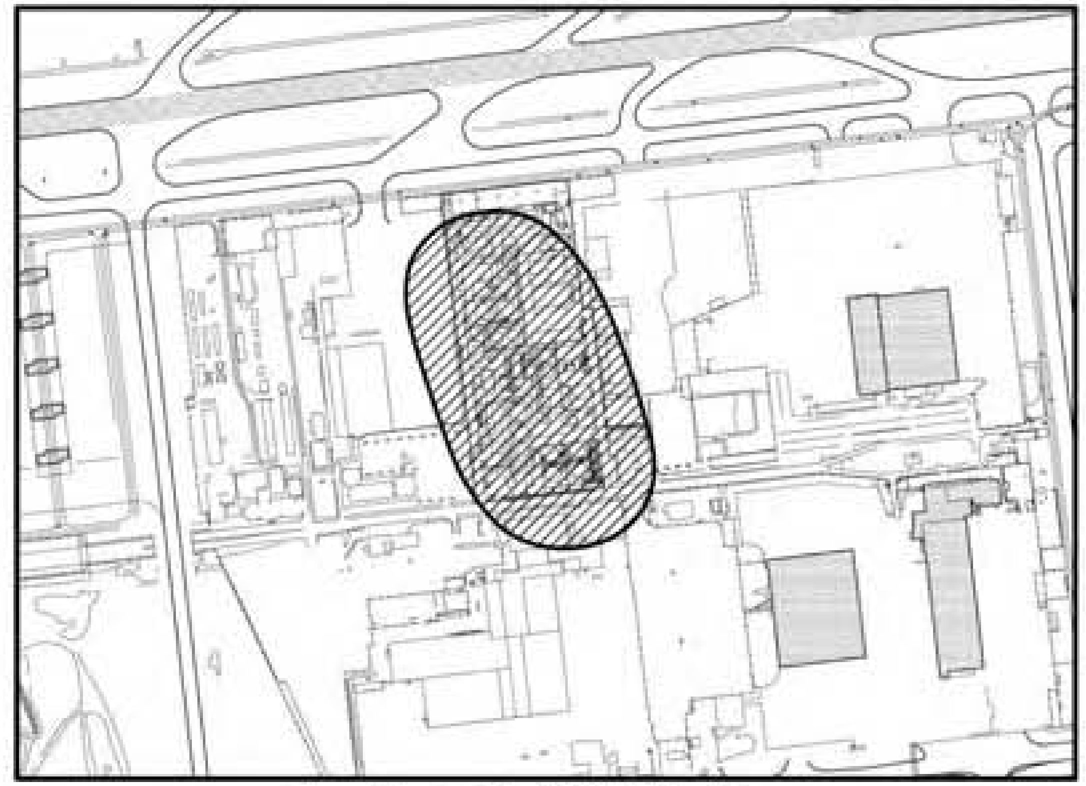
Although the consequences of a sulfuric acid release scenario could be quite serious, regulatory and operational conditions would reduce the likelihood of such a release. Under the No Action/No Project Alternative, the CUP would be the same size and at the same location as under baseline conditions, with the same hazard footprint. The risk of a sulfuric acid release under the No Action/No Project Alternative would be the same as that under baseline conditions.

Fuel Farm

Under the No Action/No Project Alternative, the existing LAXFUEL Fuel Farm would continue to operate at its current capacity and location. An upset at the fuel farm could result in one of two scenarios: a major fuel release without subsequent ignition and a major fuel release with subsequent ignition (pool fire). In order for a major fuel release to occur at the LAXFUEL Fuel Farm, one of the ASTs situated within a lined secondary containment structure would have to fail. As long as the secondary containment remained intact, the fuel would be contained and could be recovered using vacuum trucks and pumps. However, if the secondary containment failed, or the valves leading to the oil-water separator malfunctioned, fuel would be released into the storm drain system. The fuel would travel west inside the storm drains down World Way West toward the ocean, then south along Pershing Drive. Dry weather flows from this portion of the airport are diverted into a two million gallon retention basin in the southwest corner of LAX, where it is usually pumped through a clarifier and then into the sanitary sewer. If the maximum capacity of the retention basin is exceeded during a storm event, then the storm water is diverted directly to the Los Angeles County Storm System for discharge into the ocean. Under these circumstances, fuel could

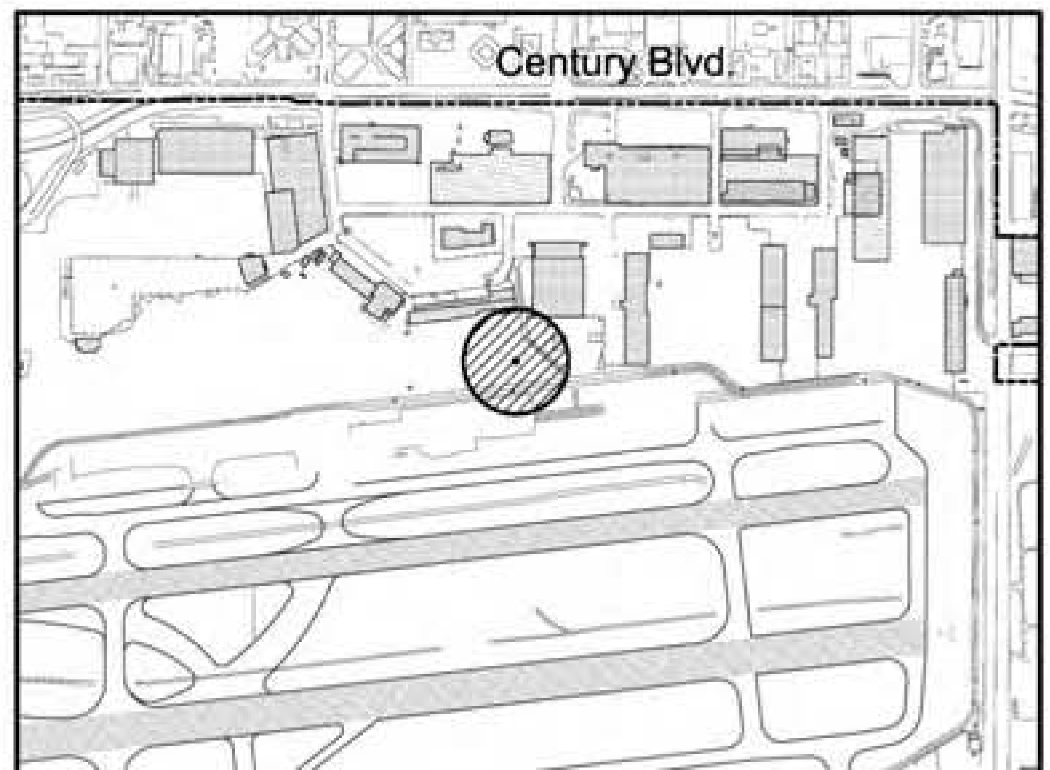


Hazard Footprint for CTA CUP



Hazard Footprint for LAXFUEL Fuel Farm

Hazard Footprint for LNG/CNG Facility



Hazard Footprint for CNG Station

LEGEND

- ERPG-2 Impacted Population
- ERPG-3 Impacted Population
- Hazard Zone

Source: Camp Dresser & McKee Inc., 2000.

DWG: FEIS_4_24_03-10.dwg USER: negretegd DATE: Jan 15, 2004 12:04pm

LAX Master Plan Final EIS/EIR	Hazard Footprints for No Action/No Project Alternative - 2015	Figure F4.24.3-10

potentially reach Santa Monica Bay. However, this would only occur if there were a combination of tank failure, secondary containment or valve failure, and diversion of flows from the retention basin directly to Santa Monica Bay. It is highly unlikely that the safeguards in place to prevent fuel releases would all fail concurrently.

Due to the regulatory and operational safeguards in place, the risk of a major fuel release resulting in the discharge of fuel to Santa Monica Bay would be extremely small. The likelihood and consequences of a release of fuel (without subsequent ignition) to Santa Monica Bay would be the same as under baseline conditions.

Under the No Action/No Project Alternative, if a single 2,520,000-gallon tank in the largest containment area were to rupture and the fuel to subsequently ignite, a pool fire would result. If the fire were not extinguished, the following consequences would be expected:

- The nominal flame height would be approximately 208 feet.
- Within 270 feet of the center of the pool, exposure could result in fatality.
- Within 386 feet of the center of the pool, a human would experience second degree burns with severe pain.

Figure F4.24.3-10 shows the hazard footprint for a pool fire, assuming that the fire was contained within the bermed areas. As indicated in **Figure F4.24.3-10**, in the event of a pool fire at the LAXFUEL Fuel Farm, individuals may be injured on the access road near the operations center, and at adjacent buildings, including those currently occupied by Dobbs House, Marriott Corporation, and LAWTFC. The ignition of surrounding structures would not be expected to occur due to the fact that the incident flux at the nearest building would be less than 3,000 BTU/hr-ft^2. No residences or other sensitive receptors would be affected. This hazard footprint is the same as under baseline conditions.

As discussed under subsection 4.24.3.3, *Affected Environment/Environmental Baseline*, fuel farm facilities are required to comply with several specific regulations and function according to strict operating procedures in order to minimize the risk of a release. The LAXFUEL Fuel Farm currently complies, and would continue to comply, with these regulations and employ numerous operational safeguards.

Due to the numerous safety features described in subsection 4.24.3.3, *Affected Environment/Environmental Baseline*, and compliance with all applicable setback and regulatory requirements, the risk of a pool fire at the LAXFUEL Fuel Farm would be low. The conservative nature of the ARCHIE model likely results in a larger modeled hazard footprint than would occur in an actual upset. Under the No Action/No Project Alternative, the LAXFUEL Fuel Farm would be the same size and at the same location as under baseline conditions, with the same hazard footprint. The likelihood and consequences associated with this scenario would not be any greater than under baseline conditions.

LNG/CNG Facilities

The LAWA LNG/CNG Facility currently consists of one 13,000-gallon and two 4,500-gallon aboveground LNG tanks and three 10,000-gallon standard cubic feet (SCF) aboveground CNG tanks (vessels).

Under the No Action/No Project Alternative, the LAWA LNG/CNG Facility would be the same size and at the same location as under current conditions. The CNG Station would continue to operate at its current capacity and location on the United Airlines leasehold.

A release at the LNG/CNG Facility could result in one of three scenarios: a flash fire, a pool fire, or a flame jet. If a release were to occur at the LNG/CNG Facility, the hazard footprint would extend approximately 1,345 feet. **Figure F4.24.3-10** shows the extent of the potential hazard footprint. As indicated in **Figure F4.24.3-10**, in the event of an incident at the LNG/CNG Facility, individuals may be injured along World Way West and at adjacent buildings. The ignition of surrounding structures would not be expected to occur due to the fact that the incident flux at the nearest building would be less than 3,000 BTU/hr-ft^2. No residences or other sensitive receptors would be affected. This hazard footprint is the same as under baseline conditions.

A release at the CNG Station could result in one of two scenarios: a flash fire or a flame jet. If a release were to occur at the CNG Station, modeling indicates that the hazard footprint would extend approximately 274 feet. **Figure F4.24.3-10** shows the extent of the potential hazard footprint. As indicated in **Figure F4.24.3-10**, in the event of an incident at the CNG Station, individuals may be injured on the United Airlines leasehold. The ignition of surrounding structures is not expected to occur due to the fact that the incident flux at the nearest building would be less than 3,000 BTU/hr-ft^2. No residences or other sensitive receptors would be affected. This hazard footprint is the same as under baseline conditions.

As discussed previously, LNG/CNG facilities are highly regulated in order to prevent releases and mishaps. Although not required by law, LAWA has implemented additional safety procedures at the LNG/CNG Facility, including training of nearby employees and LAFD personnel.

Due to the safety-related project design features and compliance with all applicable setbacks and safety requirements, the likelihood of an incident at the LNG/CNG facilities is low. Additionally, the conservative nature of the ARCHIE model likely results in a larger hazard footprint than would occur in an actual upset. Under the No Action/No Project Alternative, the LNG/CNG Facility and CNG Station would be the same sizes and at the same locations as under baseline conditions, with the same hazard footprints. The likelihood and consequences of an LNG or CNG incident under the No Action/No Project Alternative would be the same as under baseline conditions.

Aviation Incidents and Accidents

Under the No Action/No Project Alternative, no runway extensions, relocations, or additions are proposed. LAX would continue to operate safely with the existing runway configuration. Although the airport facilities would not meet all current design standards, operational restrictions described in subsection 4.24.3.3, *Affected Environment/Environmental Baseline,* would continue to be implemented. The impact of these restrictions would be to limit aircraft operations in the peak hour and thereby reduce the operational efficiency of the airfield. While these restrictions would increase flight delays at LAX, they would not compromise the safe operation of aircraft at LAX.

It is not anticipated that the design standards associated with the runway configuration of the No Action/No Project Alternative would adversely affect aircraft or passenger safety. **Figure F4.24.3-11**, Runway End Clearance at LAX for No Action/No Project Alternative, depicts the runway ends and their associated RSAs, OFAs, and RPZs for the No Action/No Project Alternative.

Under this alternative, aircraft operations are projected to increase by 2.5 percent in 2015 due to increased demand. The additional operations would not increase the risk of an aircraft accident or incident at LAX.

Under the No Action/No Project Alternative, LAX Northside would be developed with mixed uses and Continental City would be developed primarily with office uses. All proposed structures within both developments would be built in accordance with the building height restrictions established by the City of Los Angeles to assure the safety of the air approach corridors to the runways at LAX. As originally proposed, all buildings at Continental City would be designed for the possible construction of helistops. The impacts of helicopter traffic at LAX were evaluated in the *Continental City Draft Environmental Impact Report*.[881] As indicated in that EIR, all helicopter traffic generated by Continental City would be licensed by the State of California and would utilize heliport corridors established by the FAA for travel to and from areas to the north and south of the project site. All departures and arrivals at Continental City would be controlled by the LAX tower. Additionally, LAX Northside and Continental City would comply with all applicable local, state, and federal standards and ordinances.

Birdstrikes

Under the No Action/No Project Alternative, the existing bird attractants at LAX, including the Los Angeles/El Segundo Dunes, the detention basin, and airfield open space, would not be changed. In accordance with FAA requirements, the airfield would continue to be maintained to avoid the ponding of water, the growth of vegetation, and the development of other conditions that may serve as attractants to nuisance wildlife, including birds. Degraded habitat containing Riverside fairy shrimp cysts would be retained, but could not be improved due to concerns about birdstrikes. This issue is discussed in greater detailed in Section 4.11, *Endangered and Threatened Species of Flora and Fauna.*

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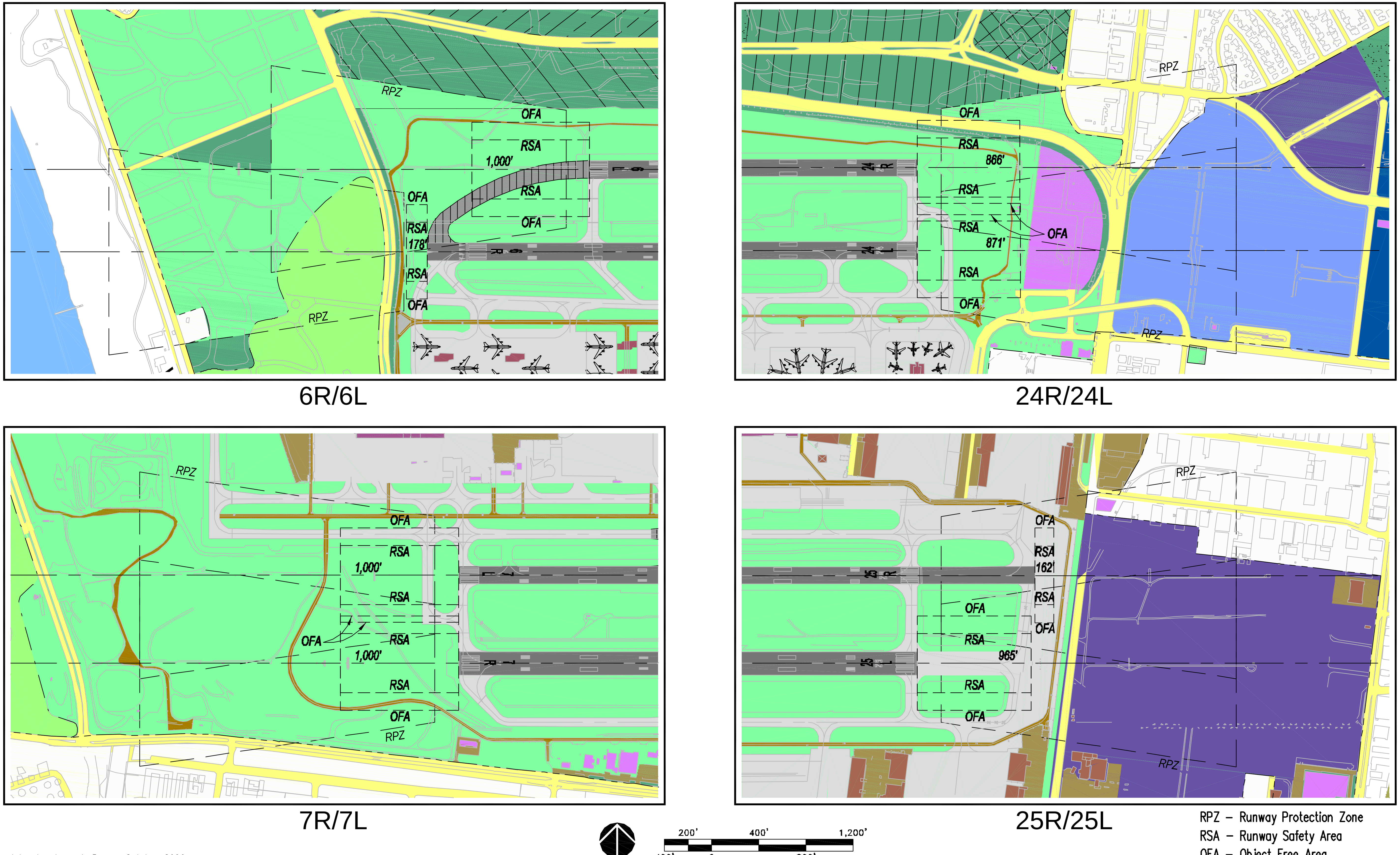
881 Jim Hinzdel & Associates, Inc., et al. Continental City Draft Environmental Impact Report. EIR No., 407-82 SUB, August 1984.



Prepared by: Landrum & Brown, October 2000

LAX Master Plan Final EIS/EIR	**Runway End Clearance at LAX for No Action/No Project Alternative**	Figure **F4.24.3-11**

There would not be any new runways constructed, nor would any new facilities or operational conditions be implemented that would serve as attractants to birds. LAX Northside would be developed with up to 4.5 million square feet of office, business park, and light industrial uses. As a result, the existing open space within this area would be reduced, thereby reducing its attraction to birds. Although the development would include landscaped areas, they would be considerably smaller than the existing open space.

Airport Security

As discussed above, LAWA met the congressionally-mandated deadline that all checked baggage on passenger flights be screened for explosives after December 31, 2002 through the implementation of a number of interim measures at the existing LAX terminals. LAWA will incorporate any future airport security requirements set forth by the federal government. The ability to accommodate future federal airport security requirements under the No Action/No Project Alternative may be constrained by the space limitations of existing facilities, particularly the CTA. While it is anticipated that LAWA would comply with the mandated requirements, and consequently an adverse impact related to airport security would not occur, there are likely to be other resultant adverse impacts related to airport operations, passenger processing, etc.

4.24.3.6.2 Alternative A - Added Runway North

Risk of Upset

Central Utility Plant

Under Alternative A, there would be two CUPs operating at LAX in 2015. The existing CUP would continue to operate at its current capacity and location. In order to serve the new West Terminal Area (WTA), one additional CUP (the Westside CUP) would be constructed to the west of the WTA close-in parking structure. Sulfuric acid would continue to be used and stored in similar quantities at the CTA CUP. Although the Westside CUP would be slightly larger than the CTA CUP, due to transportation and storage practicalities, a similar quantity of sulfuric acid would be present at the Westside CUP.

If a release of sulfuric acid were to occur from either CUP, the maximum hazard footprint would have a radius of approximately 262 feet for ERPG-3 and 459 feet for ERPG-2. **Figure F4.24.3-12**, Hazard Footprints for Alternative A - 2015, depicts the areas that would be affected by a sulfuric acid release, accounting for wind direction and dispersion. As seen in this figure, the hazard footprint would extend to some of the proposed roadway, public, and terminal areas of the airport. No residences or other sensitive receptors would be affected.

Under Alternative A, the CTA CUP would be the same size and at the same location as under baseline conditions, with the same size hazard footprint. However, the construction of the Westside CUP would result in a separate, new hazard footprint near the WTA of the same size as that associated with the CTA CUP. The portion of the hazard footprint associated with the Westside CUP that would extend to public areas within the airport would be similar to that associated with the CTA CUP under baseline conditions.

As indicated previously, operations at the CUPs would be highly regulated to prevent incidents and accidents. These regulations would address safety and design features, operational procedures, handling practices, employee training programs, emergency response procedures, and auditing and inspection programs. By complying with these regulatory and operational conditions, the likelihood of such a release would be low. As indicated above, the hazard footprints associated with the CTA CUP and the Westside CUP would extend to public areas to the same extent as the current CTA CUP under baseline conditions. Although there would be two hazard footprints under Alternative A, it is extremely unlikely that upsets would occur concurrently at both facilities. If simultaneous upsets were to occur, the hazard footprints for each are distinct (i.e., affect different areas of the airport) and would not have an additive effect. Therefore, the consequences of an upset at either CUP would be similar to those under baseline conditions. Because the construction of a second CUP would not substantially increase the likelihood or consequences of an incident, the risk of upset impact of a sulfuric acid release at the CUP would be less than significant.

LAXFUEL Fuel Farm

Under Alternative A, initially, the existing LAXFUEL Fuel Farm would continue to operate at its current capacity and location. Fuel would continue to be stored and dispensed in similar quantities as under baseline conditions. As a result, the likelihood of a major fuel release without subsequent ignition would be the same as under baseline conditions and the No Action/No Project Alternative, except that the retention basin would be removed. Although removal of the basin would eliminate one safeguard, there would be numerous other safeguards (e.g., secondary containment, compliance with all seismic safety regulations, emergency fuel shutoff valves and high-level detectors, etc.) that would prevent fuel from reaching Santa Monica Bay. Because the likelihood and consequences of a fuel release would not substantially increase over baseline conditions, the risk of upset impact would be less than significant.

By 2015, the existing LAXFUEL Fuel Farm would be replaced by a larger On-Site Fuel Farm located west of Sepulveda Boulevard along Imperial Highway, as shown in **Figure F4.24.3-12**. The On-Site Fuel Farm would consist of twelve 120,000-barrel (approximately 5 million gallons) floating roof tanks. Failure of one of these tanks, along with the concurrent failure of either the drain valve or the secondary containment wall, would result in the discharge of the overflow to the storm drain system. Under these circumstances, fuel could potentially reach Santa Monica Bay. However, this would only occur if there was a secondary containment or valve failure.

As discussed previously, fuel farm facilities are required to comply with several specific regulations and function according to strict operating procedures in order to minimize the risk of a release. The On-Site Fuel Farm would comply with these regulations. Secondary containment would be provided and would drain to oil-water separators. Structures would meet all seismic safety regulations. Emergency fuel shutoff valves and high-level detectors would be in place and inspections would be performed regularly. The On-Site Fuel Farm would have an FSRP detailing procedures to minimize the extent of a release, should one occur.

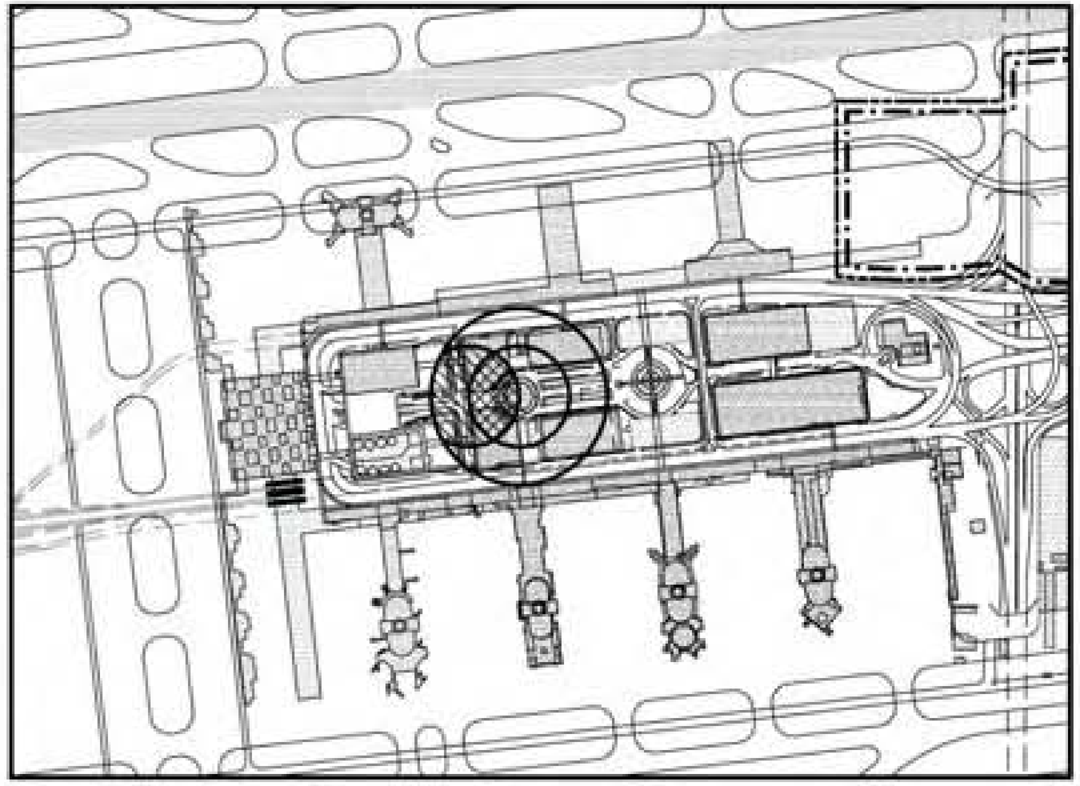
Due to the regulatory and operational safeguards in place, the likelihood and consequences of a major fuel release from the On-Site Fuel Farm resulting in the discharge of fuel to Santa Monica Bay would be extremely small. The likelihood for this scenario to occur would be similar to that under baseline conditions or No Action/No Project Alternative. Moreover, a fuel release would result in the same consequences as under baseline conditions. Because the likelihood and consequences would not substantially increase, the risk of upset impact associated with this scenario is considered to be less than significant.

Under Alternative A in 2015, if a single 120,000-barrel (approximately 5 million gallons) tank in the containment area were to rupture and the fuel to subsequently ignite, a pool fire would result. If the fire were not extinguished, the following consequences would be expected:

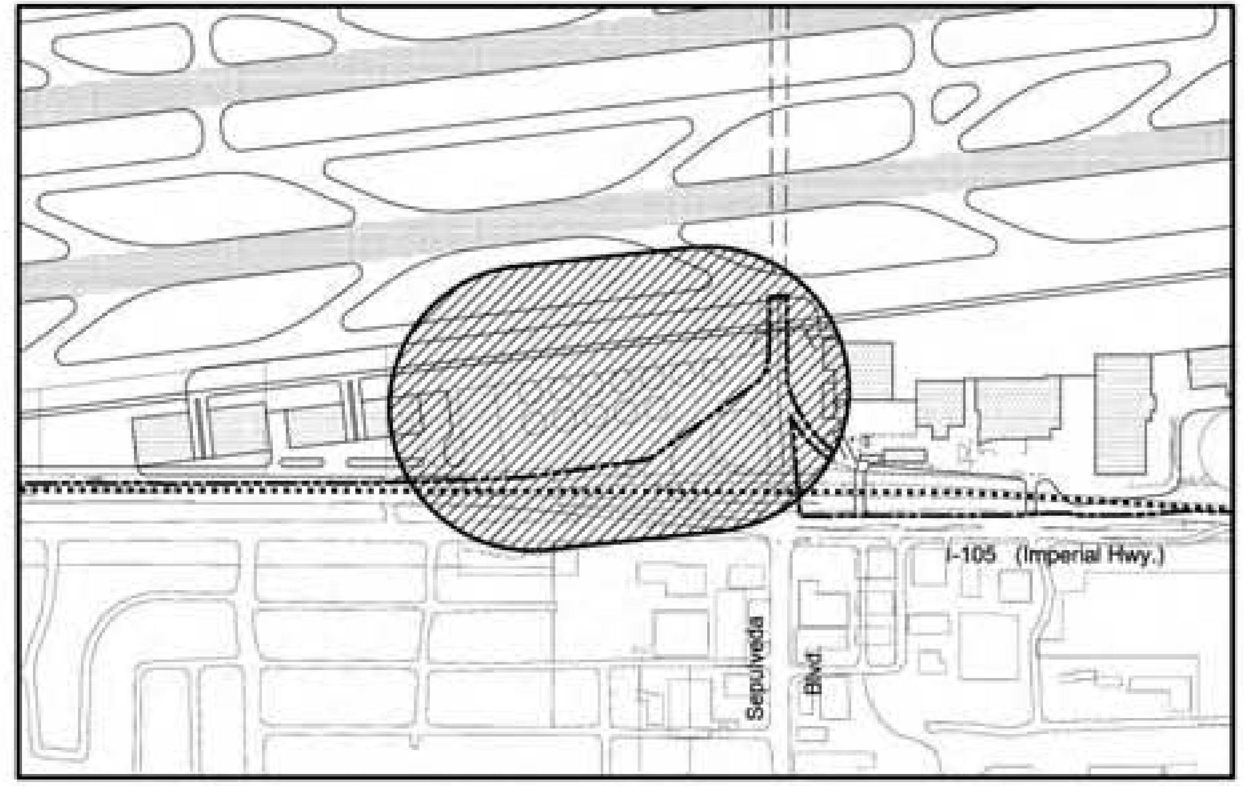
- The nominal flame height, assuming no tilt to wind, would be slightly in excess of 327 feet.
- Within 518 feet from the center of the pool, exposure could result in fatality.
- Within 742 feet from the center of the pool, a human would experience second-degree burns with severe pain.

Figure F4.24.3-12 shows the hazard footprint for a pool fire at the On-Site Fuel Farm under Alternative A, assuming that the fire were contained within the bermed areas. This hazard footprint would be larger than that associated with the existing LAXFUEL Fuel Farm because the secondary containment area would be larger in order to provide sufficient containment volume. As indicated in **Figure F4.24.3-12**, in the event of a fire at the Alternative A On-Site Fuel Farm, individuals on on-airport access roads, Imperial Highway, and Imperial Avenue may be injured. On-airport facilities that may be affected by injurious levels of heat radiation would include the flight kitchen facilities located west of the On-Site Fuel Farm. The ignition of surrounding structures is not expected to occur. No residences or other sensitive receptors would be affected.

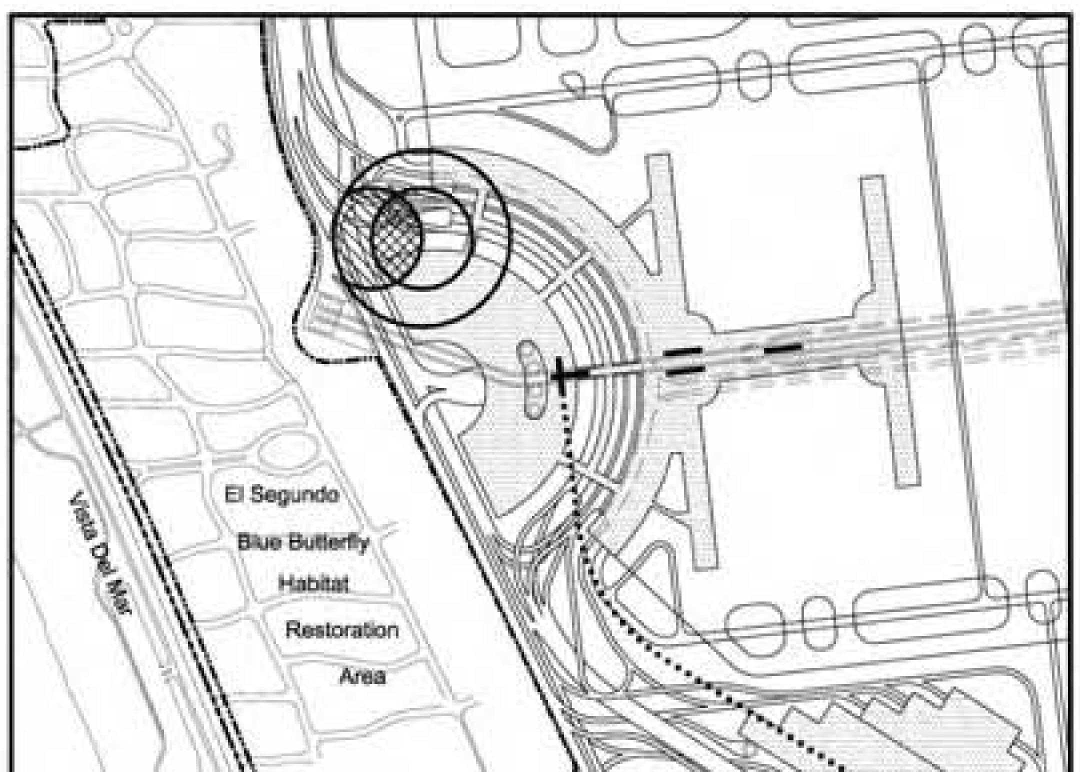
As discussed previously, the existing LAXFUEL Fuel Farm is highly regulated in order to prevent releases and mishaps. LAFD would have several on-airport fire stations and fire personnel are trained in techniques for fighting hydrocarbon fires. The numerous operational and design features in place at the LAXFUEL Fuel Farm would be incorporated into the On-Site Fuel Farm.



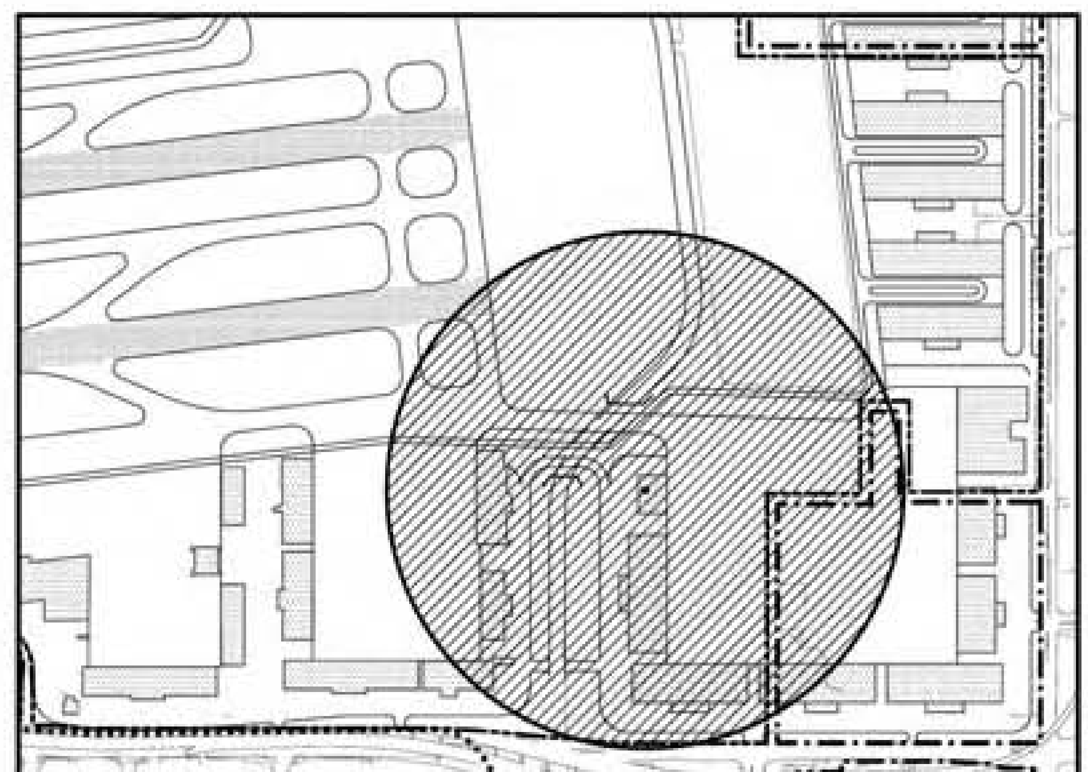
Hazard Footprint for CTA CUP



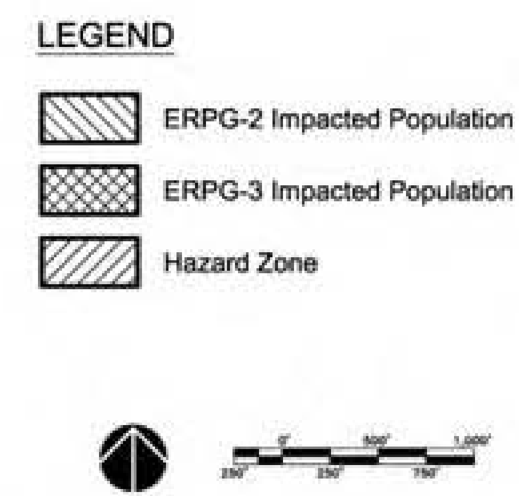
Hazard Footprint for On-Site Fuel Farm



Hazard Footprint for Westside CUP



Hazard Footprint for LNG/CNG Facility



Source: Camp Dresser & McKee Inc., 2000.

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LAX Master Plan Final EIS/EIR	**Hazard Footprints for Alternative A - 2015**	Figure **F4.24.3-12**

Due to the numerous planned safety features, similar to those described in subsection 4.24.3.3, *Affected Environment/Environmental Baseline*, and compliance with all applicable setback and safety requirements, the likelihood of a pool fire at the relocated On-Site Fuel Farm would be low. The conservative nature of the ARCHIE model likely results in a larger modeled hazard footprint than would occur in an actual upset. The likelihood for this scenario to occur would not be any greater than that under baseline conditions or the No Action/No Project Alternative. However, should an incident occur, the hazard footprint would be larger than under the baseline conditions or No Action/No Project Alternative and would affect a different area. The larger footprint would result from the larger secondary containment area, which would allow a larger pool fire to form. While the hazard footprint would extend to a greater area, the consequences would be similar to baseline conditions. As under baseline conditions, the hazard footprint would extend to buildings used by airport employees and to portions of a public roadway. No residences or other sensitive receptors would be affected. Because the likelihood and consequences of a pool fire under Alternative A in 2015 would not substantially increase over baseline conditions, the risk of upset impact of this scenario would be less than significant.

LNG/CNG Facility

Under Alternative A, the existing LNG/CNG Facility would be relocated to a site north of Imperial Highway and east of Sepulveda Boulevard, near the East Imperial Cargo Complex. The facility would be expanded over baseline conditions to include a total of six LNG tanks and 16 CNG tanks (vessels). Although the number of tanks would increase, the maximum tank sizes (used in modeling) would remain the same as baseline conditions. The CNG Station would be removed.

A release at the relocated LNG/CNG Facility could result in one of three consequences: a flash fire, a pool fire, or a flame jet. If a release were to occur at the LNG/CNG Facility, the maximum impact radius would be approximately 1,345 feet. This is the same radius of impact associated with the existing LNG/CNG Facility under baseline conditions, because the largest tank at the proposed facility would be the same size as the largest tank at the existing LNG/CNG Facility, although it would affect a different area. **Figure F4.24.3-12** shows the extent of the potential hazard footprint. As indicated on the figure, in the event of a reasonably foreseeable, worst-case incident at the relocated LNG/CNG Facility, individuals along Imperial Highway and at adjacent cargo buildings may be injured. The ignition of surrounding structures would not be expected to occur. No residences or other sensitive receptors would be affected. Although the hazard footprint would be in a different location than under baseline conditions, the nature of the potentially exposed area would be similar. As with baseline conditions, under Alternative A, the hazard footprint would extend to buildings used by airport employees and to a public road.

As discussed previously, LNG/CNG facilities are highly regulated in order to prevent releases and mishaps. Although not required by law, LAWA would implement additional safety procedures at the relocated facility, including training of nearby employees and LAFD personnel.

Due to planned safety features and compliance with all applicable setback and safety requirements, the likelihood of an incident at the relocated LNG/CNG Facility would be low. The conservative nature of the ARCHIE model likely results in a larger modeled hazard footprint than would occur in an actual upset. The maximum tank size at the facility would not be any larger than under baseline conditions or the No Action/No Project Alternative. Therefore, the hazard footprint would be the same size as well. As indicated above, although the footprint would be in a different location, the nature of the exposure would be similar. As a result, the consequences of an incident at the LNG/CNG Facility under Alternative A in 2015 would be similar to baseline conditions. Because the likelihood and consequences of an incident at the LNG/CNG Facility would not substantially increase over baseline conditions, the risk of upset impact associated with the relocated LNG/CNG Facility would be less than significant.

Aviation Incidents and Accidents

Under Alternative A, a new runway would be constructed on the north airfield and the existing runways would be upgraded and relocated, resulting in three runways on the north airfield and two on the south airfield. Navigational aids would be installed, removed, and/or relocated to accommodate the reconfigured runways. Alternative A would include taxiways to accommodate the Boeing 747 as the design aircraft (Group V) and modified Group VI[882] solutions for the operation of anticipated limited

[882] Design Group VI aircraft have wingspans between 214 and 262 feet.

numbers of the New Large Aircraft (NLA). In addition, both the new runway, and all of the existing runway ends, would be designed to have RSAs that meet current FAA standards of 1,000 feet long by 500 feet wide. All new and redesigned runways and taxiways would meet current FAA Airport Design Standards. **Figure F4.24.3-13,** Runway End Clearance at LAX for Alternative A - 2015, depicts the runway ends and their associated RSAs, OFAs, and RPZs for Alternative A. A below-ground-level parking garage and consolidated rental car facility are both shown within the RPZs associated with Runways 7L and 7R. While these uses would require FAA review, no new operational restrictions are anticipated to be necessary under Alternative A and no adverse impacts with respect to aviation incidents and accidents would occur.

Under Alternative A, aircraft operations are projected to increase by over 22 percent in 2015. As indicated previously, there is no statistical correlation between number of operations and number of incidents and accidents. Because of the lack of statistical correlation, it is not possible to quantify an increase in aircraft accidents or incidents due to the increased operations. Strict adherence to FAA rules and regulations pertaining to aircraft safety would ensure that no compromise in aviation safety would occur, although the additional operations may necessitate increases in air traffic control personnel at LAX. Therefore, no impacts to aviation incidents and accidents would occur as a result of the increased operations anticipated under this alternative.

Under Alternative A, Westchester Southside would be developed with mixed uses. All proposed structures within Westchester Southside would be built in accordance with the building height restrictions established by the City of Los Angeles to assure the safety of the air approach corridors to the runways at LAX. With compliance with all applicable local, state, and federal standards and ordinances, Westchester Southside would not have any impacts on aviation incidents and accidents.

Birdstrikes

Under Alternative A, the Los Angeles/El Segundo Dunes, an existing bird attractant at LAX, would not be modified in such a way that it would increase birdstrike hazards (see Section 4.10, *Biotic Communities)*. However, the detention basin would be eliminated, removing an existing bird attractant from the LAX vicinity, and the airport open space would be substantially reduced by the construction of several hundred acres of new facilities at the western end of LAX and within Westchester Southside, as shown in **Table F4.24.3-6**, Non-Developed Area at LAX.

Table F4.24.3-6

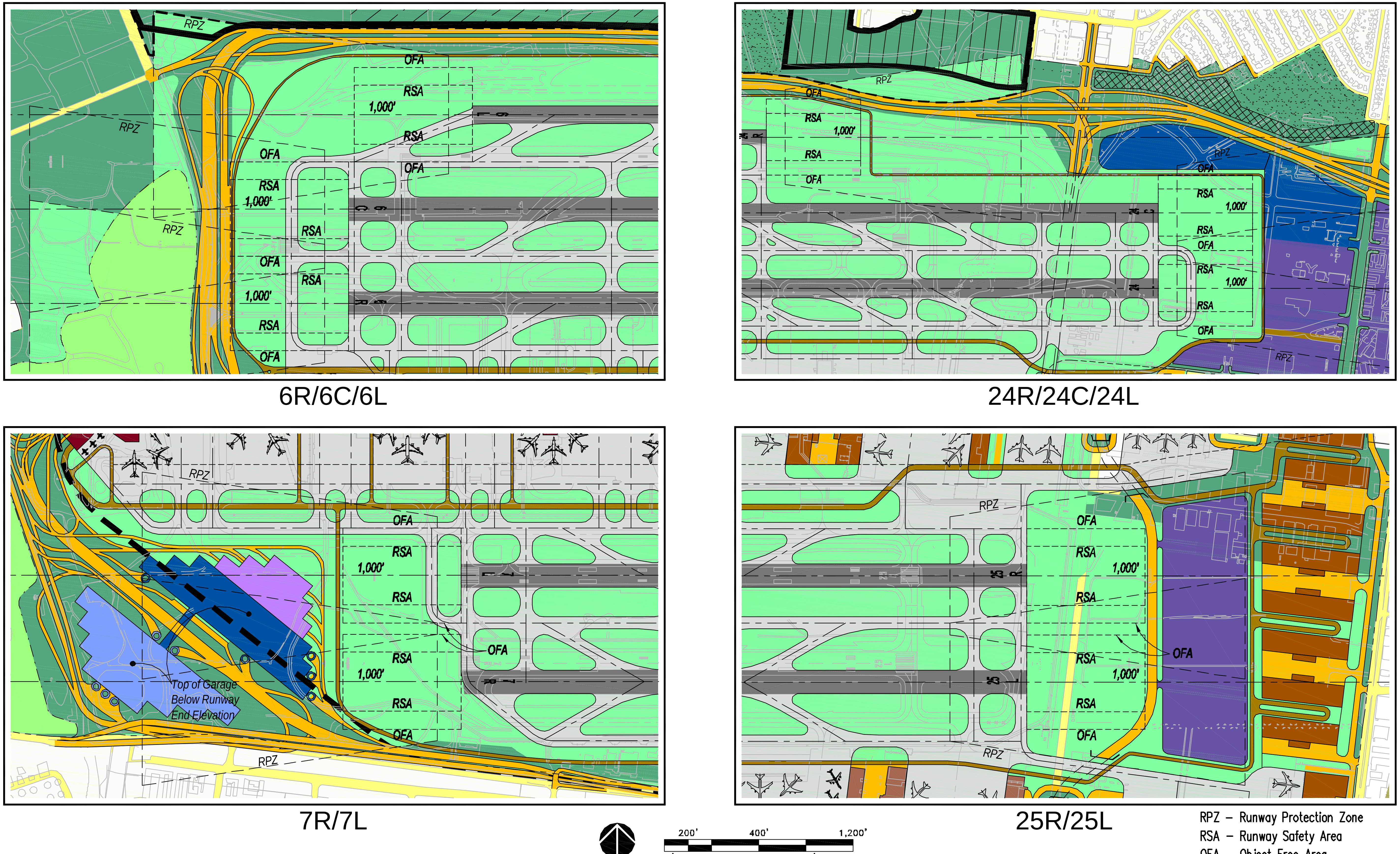
Non-Developed Area at LAX

	Non-Developed (Acres)[1] 2015
No Action/No Project Alternative	1050.0
Alternative A	749.9
Alternative B	701
Alternative C	830.2
Alternative D	851.6

1 Includes the undeveloped acres within the Los Angeles/El Segundo Dunes.

Source: Sapphos Environmental Inc., 2004.

Alternative A would result in the construction, extension, and relocation of runways; however, no runways would be located within 10,000 feet of a solid waste landfill. No new facilities would be constructed or operational conditions implemented that would serve as attractants to birds. In accordance with FAA requirements, the airfield would continue to be maintained to avoid the ponding of water, the growth of vegetation, and the development of other conditions that may serve as attractants to nuisance wildlife, including birds. Therefore, under Alternative A, potential impacts with respect to birdstrikes would be less than significant.



Prepared by: Landrum & Brown, October 2000

RPZ – Runway Protection Zone
RSA – Runway Safety Area
OFA – Object Free Area

LAX Master Plan Final EIS/EIR

Runway End Clearance at LAX
for Alternative A - 2015

Figure
F4.24.3-13

As shown in **Table F4.24.3-6**, the amount of airport open space under Alternative A would be less than that associated with the baseline conditions or the No Action/No Project Alternative. Therefore, the potential for birdstrikes under Alternative A would be less than that under baseline conditions or the No Action/No Project Alternative.

Airport Security

As discussed above, LAWA met the congressionally-mandated deadline that all checked baggage on passenger flights be screened for explosives after December 31, 2002 through the implementation of a number of interim measures at the existing LAX terminals. The TSA is in the process of developing additional airport security requirements. It is too early to determine the details of how future federal requirements would be fully accommodated under Alternative A; however, inasmuch as this alternative proposes a substantial amount of new development, including new, larger terminal facilities, new parking areas, new surface transportation facilities, and various airfield improvements, it is anticipated that an extensive array of security features and operational practices as required by the federal government could be accommodated within the final plans and provisions of this alternative. Given that current security requirements have been accommodated within the existing airport facilities, it is clear that accommodating those requirements would not represent a material change in the basic characteristics of Alternative A. Thus, under Alternative A, no significant adverse impacts related to airport security are anticipated to occur.

4.24.3.6.3 Alternative B - Added Runway South

Risk of Upset

Central Utility Plant

Impacts associated with risk of upset at the CUPs under Alternative B would be the same as those associated with Alternative A. Under Alternative B, there would be two CUPs operating at LAX in 2015. The CUPs would be the same size, and at the same locations, as under Alternative A. **Figure F4.24.3-14**, Hazard Footprints for Alternative B - 2015, depicts the areas that would be affected by a sulfuric acid release, accounting for wind direction and dispersion. These hazard footprints would be the same as those associated with Alternative A. As with Alternative A, under Alternative B, the hazard footprints associated with the CTA CUP and the Westside CUP would extend to public areas to the same extent as the current CTA CUP under baseline conditions. Although there would be two hazard footprints under Alternative B, it is extremely unlikely that upsets would occur concurrently at both facilities. If simultaneous upsets were to occur, the hazard footprints for each are distinct (i.e., affect different areas of the airport) and would not have an additive effect. Therefore, the consequences of an upset at either CUP under Alternative B would be similar to those under baseline conditions. Because the construction of a second CUP would not substantially increase the likelihood or consequences of an incident over baseline conditions, the risk of upset impact of a sulfuric acid release at the CUP would be less than significant.

LAXFUEL Fuel Farm

Under Alternative B, initially, the existing LAXFUEL Fuel Farm would continue to operate at its current capacity and location. The likelihood of a major fuel release without subsequent ignition would be the same as under baseline conditions and the No Action/No Project Alternative, except that the retention basin would be removed. Although removal of the basin would eliminate one safeguard, there would be numerous other safeguards to prevent fuel from reaching Santa Monica Bay. The impact would be less than significant. As with Alternative A, under Alternative B, because the likelihood and consequences of a fuel release would not substantially increase over baseline conditions, the risk of upset impact would be less than significant.

Off-Site Fuel Farm

By 2015, the existing LAXFUEL Fuel Farm would be replaced by an off-site fuel farm. Two sites close to LAX are being considered for the construction of an off-site fuel farm under Alternative B: Scattergood Electric Generating Station and the oil refinery located south of the airport.

Scattergood

The Scattergood Fuel Farm site is approximately one mile south of LAX on a portion of the site currently occupied by LADWP's Scattergood Electric Generating Station at Vista del Mar Road and Grand Avenue. The Scattergood Fuel Farm would consist of ten 120-foot diameter, 70-foot tall, floating roof tanks. Each tank would be located in an individual 160-foot by 160-foot containment area, with a containment wall six feet high. This individual containment area would be sufficient to hold approximately one-third of the volume of a tank. If greater than one-third of the volume of the tank were to be released, the excess fuel would travel via pipe to a storm water and overflow retention basin located on the western portion of the site (as described in Section 4.7, *Hydrology and Water Quality*).

As discussed previously, fuel farm facilities are required to comply with several specific regulations and function according to strict operating procedures in order to minimize the risk of a fuel release. Structures would meet all seismic safety regulations. Emergency fuel shutoff valves and high-level detectors would be in place and inspections would be performed regularly. The Scattergood Fuel Farm would have an FSRP detailing emergency response procedures to minimize the extent of a release, should one occur. In the unlikely event of a major fuel release, secondary containment measures, in conjunction with the on-site overflow retention basin, would contain the release on-site and prevent released fuel from reaching receiving waters (i.e., Santa Monica Bay).

The potential for a release of fuel to Santa Monica Bay to occur would be similar to that under baseline conditions or the No Action/No Project Alternative. A release would only occur in the event of a secondary containment failure and a concurrent retention basin overflow. Due to the regulatory and operational safeguards in place, the likelihood and consequences of a major fuel release resulting in the discharge of fuel to Santa Monica Bay would be extremely small. Because the likelihood and consequences would not substantially increase, the risk of upset impact associated with this scenario is considered to be less than significant.

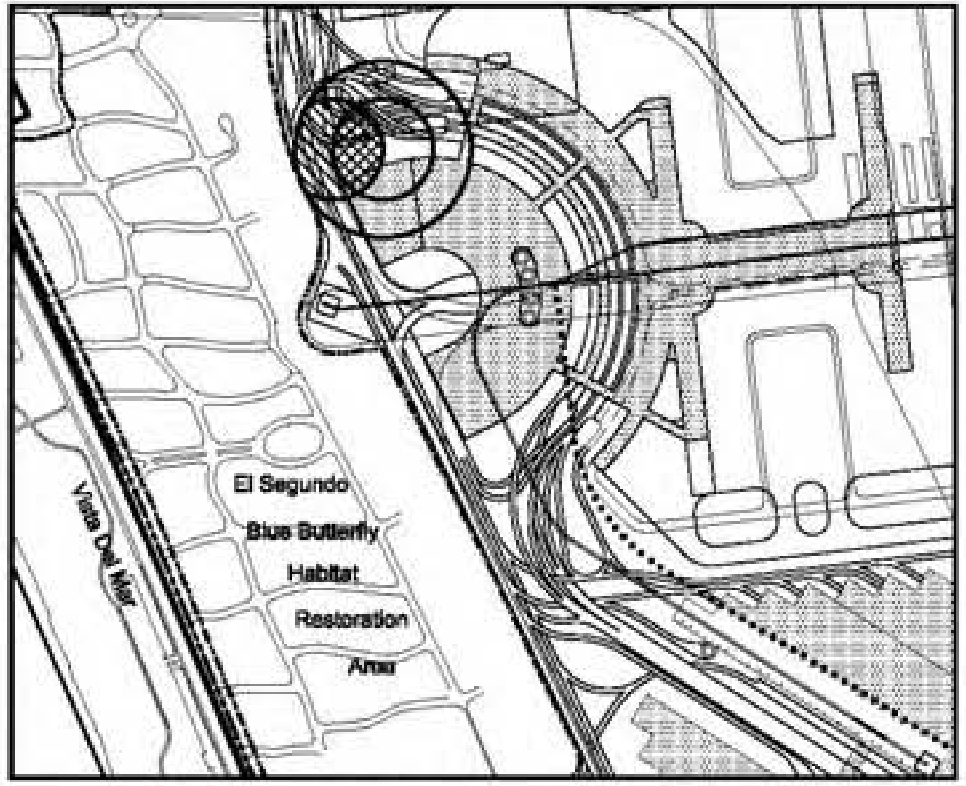
Under Alternative B in 2015, if a single tank in its individual containment area at the Scattergood Fuel Farm were to rupture and the fuel subsequently to ignite, a pool fire would result. If the fire were not extinguished, the following consequences would be expected:

- The nominal flame height, assuming no tilt to wind, would be slightly in excess of 188 feet.
- Within 233 feet from the center of the pool, exposure could result in fatality.
- Within 334 feet from the center of the pool, a human would experience second-degree burns with severe pain.

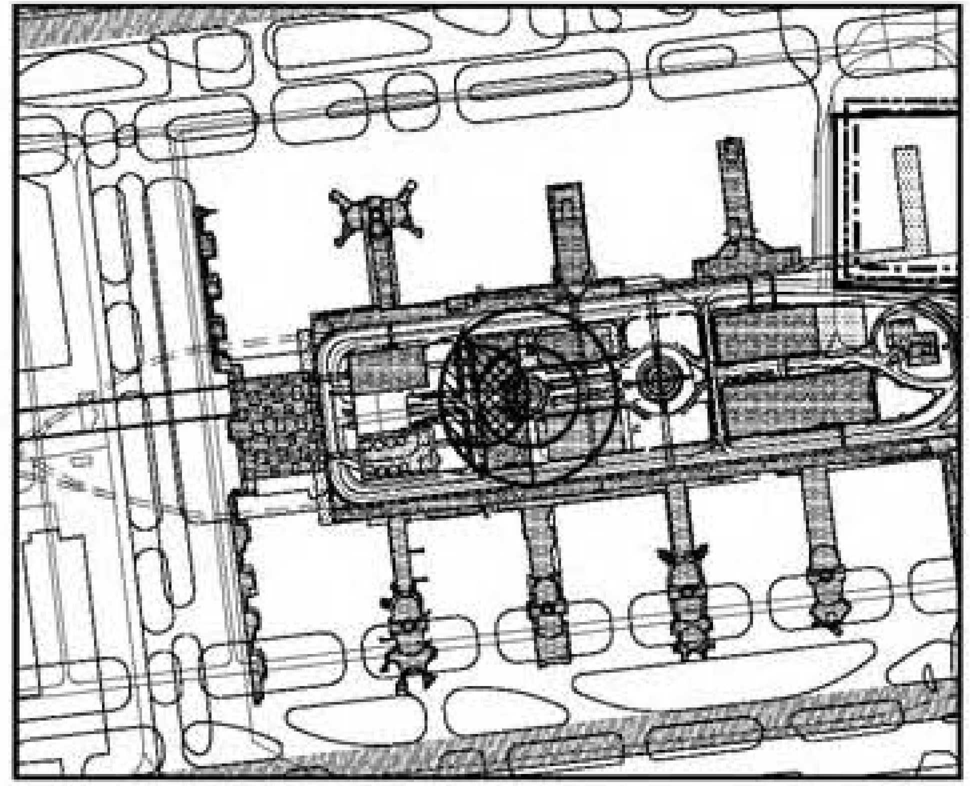
Figure F4.24.3-14 shows a representative hazard footprint for the Scattergood Fuel Farm. Because each tank would have an individual containment area, each would have a different hazard footprint as well. The hazard footprint for the Scattergood Fuel Farm would be smaller than that associated with the existing LAXFUEL Fuel Farm because the containment area, and therefore the pool fire, would be smaller. As indicated in **Figure F4.24.3-14**, in the event of a pool fire at the Scattergood Fuel Farm, the modeled hazard footprint would extend onto Grand Avenue. However, residences located to the east would not be affected and the ignition of surrounding structures would not occur. Although the hazard footprint would be in a different location than under baseline conditions, the nature of the potentially exposed area would be similar. As with baseline conditions, under Alternative B, the hazard footprint would extend to a public road, but not to off-site land uses.

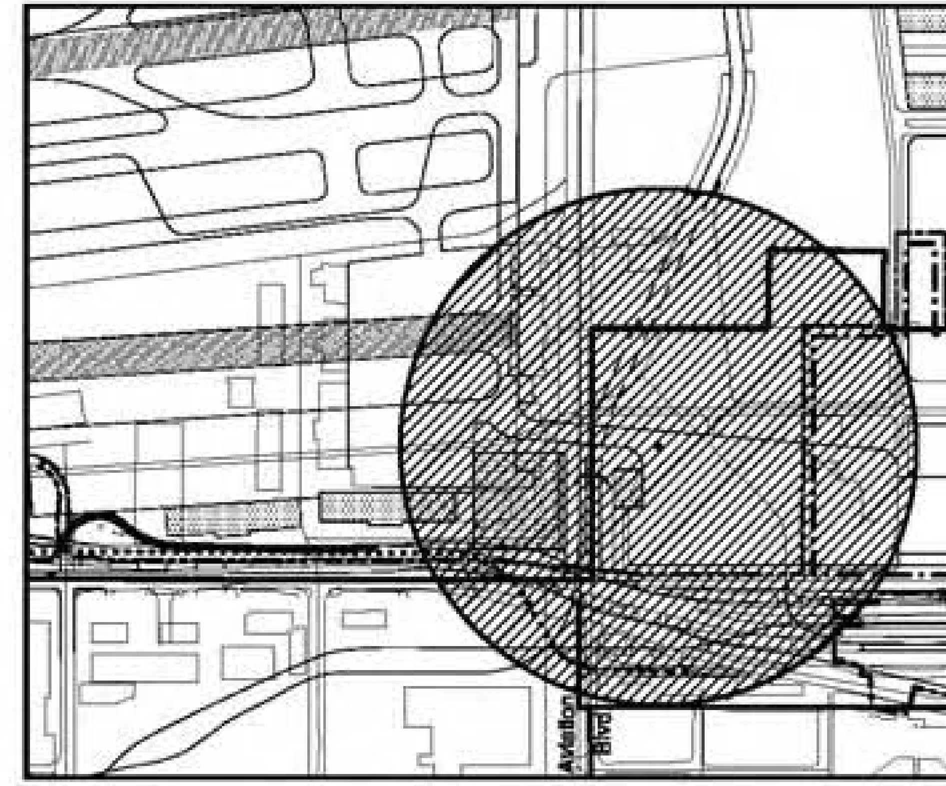
As discussed previously, the existing LAXFUEL Fuel Farm is highly regulated in order to prevent releases and mishaps. LAFD has several nearby fire stations and fire personnel are trained in techniques for fighting hydrocarbon fires. The numerous operational and design features in place at the LAXFUEL Fuel Farm would be incorporated into the Scattergood Fuel Farm.

Due to the numerous planned safety features, similar to those described under subsection 4.24.3.3, *Affected Environment/Environmental Baseline*, and compliance with all applicable setback and safety requirements, the likelihood of a pool fire at the Scattergood Fuel Farm would be low. The conservative nature of the ARCHIE model likely results in a larger modeled hazard footprint than would occur in an actual upset. The likelihood for this scenario to occur would not be any greater than under baseline conditions or the No Action/No Project Alternative. Should an incident occur, the hazard footprint would

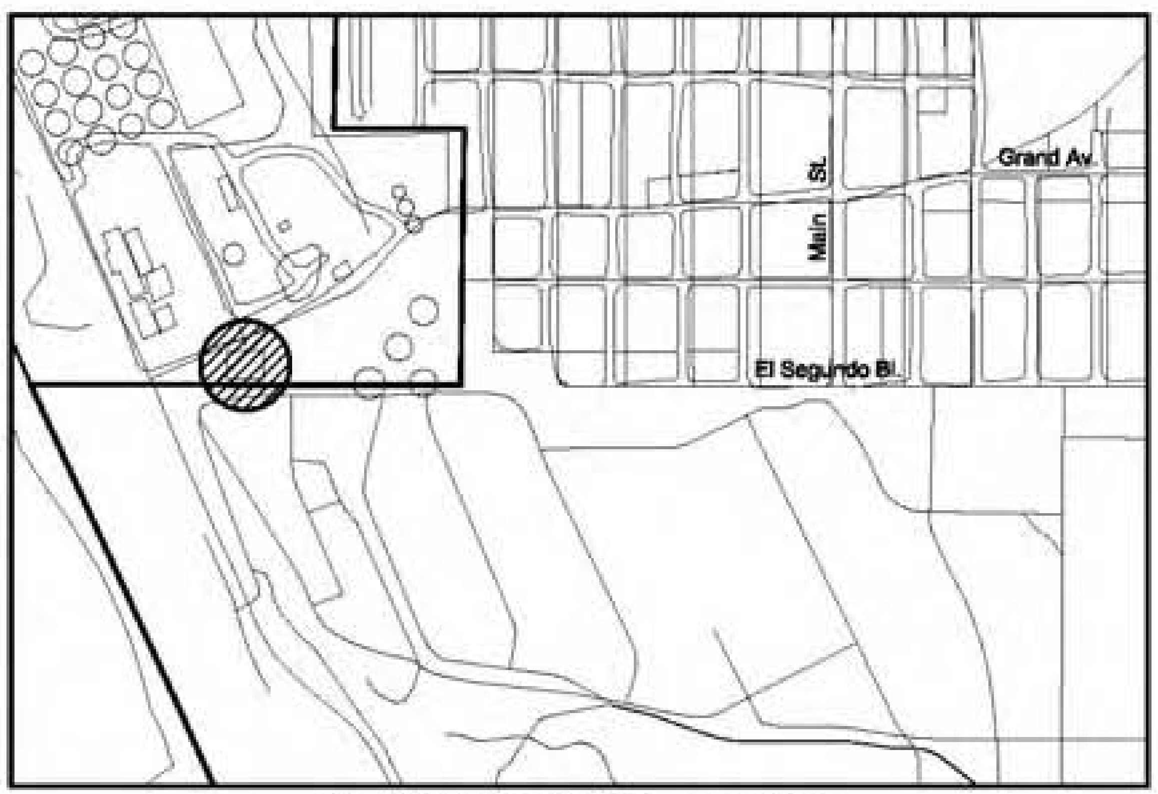


Hazard Footprint for Westside CUP

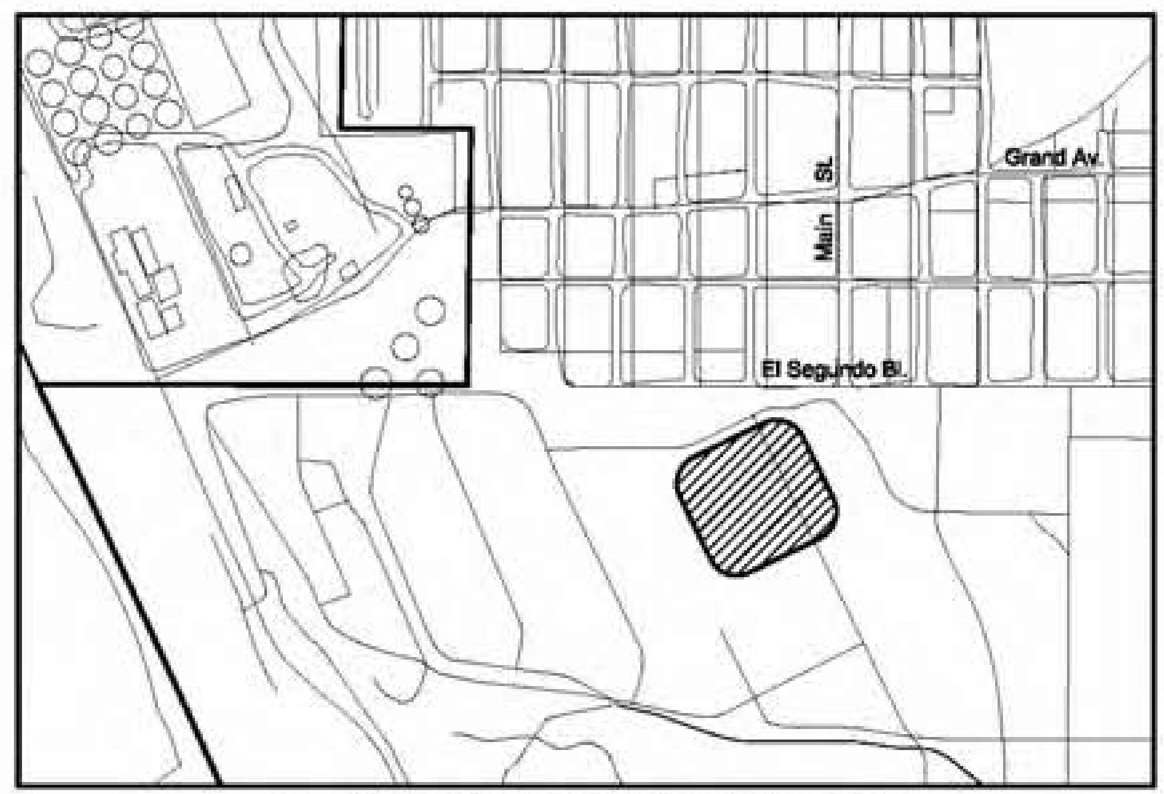

Hazard Footprint for CTA CUP



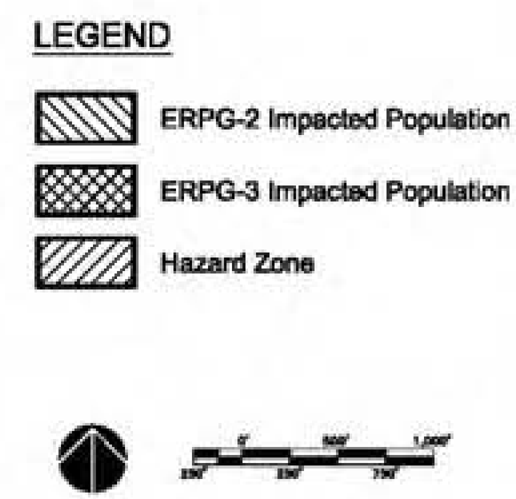
Hazard Footprint for LNG/CNG Facility



Hazard Footprint for Scattergood Fuel Farm



Hazard Footprint for the Oil Refinery Fuel Farm Site



Source: Camp Dresser & McKee Inc., 2000.

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Hazard Footprints for Alternative B - 2015

Figure
F4.24.3-14

be smaller than under baseline conditions but would affect a different area. As indicated above, although the footprint would be in a different location, the nature of the exposure would be similar. As a result, the consequences of a pool fire at the Scattergood Fuel Farm under Alternative B in 2015 would be similar to baseline conditions. Because the likelihood and consequences of a pool fire under Alternative B would be similar to baseline conditions, the risk of upset impact associated with the proposed Scattergood Fuel Farm would be less than significant.

Oil Refinery Located South of the Airport

As an alternative to the Scattergood Fuel Farm site, the existing LAXFUEL Fuel Farm could be replaced by a larger fuel farm located at the oil refinery approximately one mile south of LAX. The oil refinery fuel farm would consist of twelve 120,000-barrel floating roof tanks, with eight tanks in a south containment area and four tanks in a north containment area, and the two containment areas separated by an internal refinery roadway.

Failure of one of these tanks, along with failure of either the drain valve or the secondary containment wall, would result in the release of a portion of this fuel to the refinery's storm drain system. All storm water, and other fluids, discharged to the oil refinery's storm drain system are collected in several aboveground tanks. Depending upon the results of sampling, the fluid is either discharged without treatment or treated at a facility on the refinery before being discharged. In the unlikely event of a major fuel release, the refinery's storage and treatment facilities, in conjunction with the fuel farm's secondary containment measures, would prevent released fuel from reaching receiving waters (i.e., Santa Monica Bay).

As discussed previously, fuel farm facilities are required to comply with several specific regulations and function according to strict operating procedures in order to minimize the risk of a release. Secondary containment would be provided and drain to oil-water separators. Structures would meet all seismic safety regulations. Emergency fuel shutoff valves and high-level detectors would be in place and inspections would be performed regularly. The oil refinery fuel farm would have an FSRP detailing emergency response procedures to minimize the extent of a release, should one occur. Additionally, the refinery has adequate facilities to contain storm water and is structured to keep any releases on-site.

The potential for a release of fuel to Santa Monica Bay to occur would be similar to that under baseline conditions or the No Action/No Project Alternative, because the oil refinery fuel farm would have a similar level of containment to prevent a release to receiving waters. Due to the regulatory and operational safeguards in place, the likelihood of a major fuel release resulting in the discharge of fuel to Santa Monica Bay would be extremely small. Because the same receiving water body would be potentially affected, the consequences of an incident would be similar. Because the likelihood and consequences would not substantially increase over baseline conditions, the risk of upset impact associated with this scenario is considered to be less than significant.

Due to distance of the south containment from a "public way" (as defined by the City of Los Angeles Fire Code), the four-tank north containment area would have the greatest potential to affect a public way. Under Alternative B in 2015, if a single 120,000-barrel tank in the north containment area were to rupture and the fuel were to ignite, a pool fire would result. If the fire were not extinguished, the following consequences would be expected:

- ♦ The nominal flame height, assuming no tilt to wind, would be approximately 223 feet.
- ♦ Within 299 feet from the center of the pool, exposure could result in fatality.
- ♦ Within 429 feet from the center of the pool, a human would experience second-degree burns with severe pain.

Figure F4.24.3-14 shows the hazard footprint for a pool fire at the oil refinery fuel farm site under Alternative B, assuming that the fire were contained within the bermed areas. The extent of impact for the oil refinery fuel farm would be greater than that associated with the largest containment area within the existing LAXFUEL Fuel Farm because the containment area, and therefore the pool fire, would be larger. As indicated in **Figure F4.24.3-14**, in the event of a pool fire at the oil refinery fuel farm, the hazard footprint would not extend outside the refinery. Ignition of surrounding structures is not expected to occur. No residences or sensitive receptors would be affected.

As discussed previously, the existing LAXFUEL Fuel Farm is highly regulated in order to prevent releases and mishaps. The numerous operational and design features in place at the LAXFUEL Fuel Farm would be incorporated into the oil refinery fuel farm. In addition, the refinery has an on-site fire station and fire personnel are trained in techniques for fighting hydrocarbon fires.

Due to the numerous planned safety features, similar to those described under subsection 4.24.3.3, *Affected Environment/Environmental Baseline*, and compliance with all applicable setback and safety requirements, the likelihood of a pool fire at the oil refinery fuel farm would be low. The conservative nature of the ARCHIE model likely results in a larger modeled hazard footprint than would occur in an actual upset. The likelihood for this scenario to occur would not be any greater than under baseline conditions and the No Action/No Project Alternative. However, should an incident occur, the extent of impact would be larger than under the baseline conditions and No Action/No Project Alternative and would affect a different area. The larger extent of impact would result from the larger secondary containment area, which would allow a larger pool fire to form. While the extent of impact would be greater, the consequences would be similar. The hazard footprint would extend to areas of the refinery, which are not accessible to the public. Because the likelihood and consequences of a pool fire under Alternative B in 2015 would not substantially increase over baseline conditions, the risk of upset impact associated with this scenario is considered to be less than significant.

LNG/CNG Facility

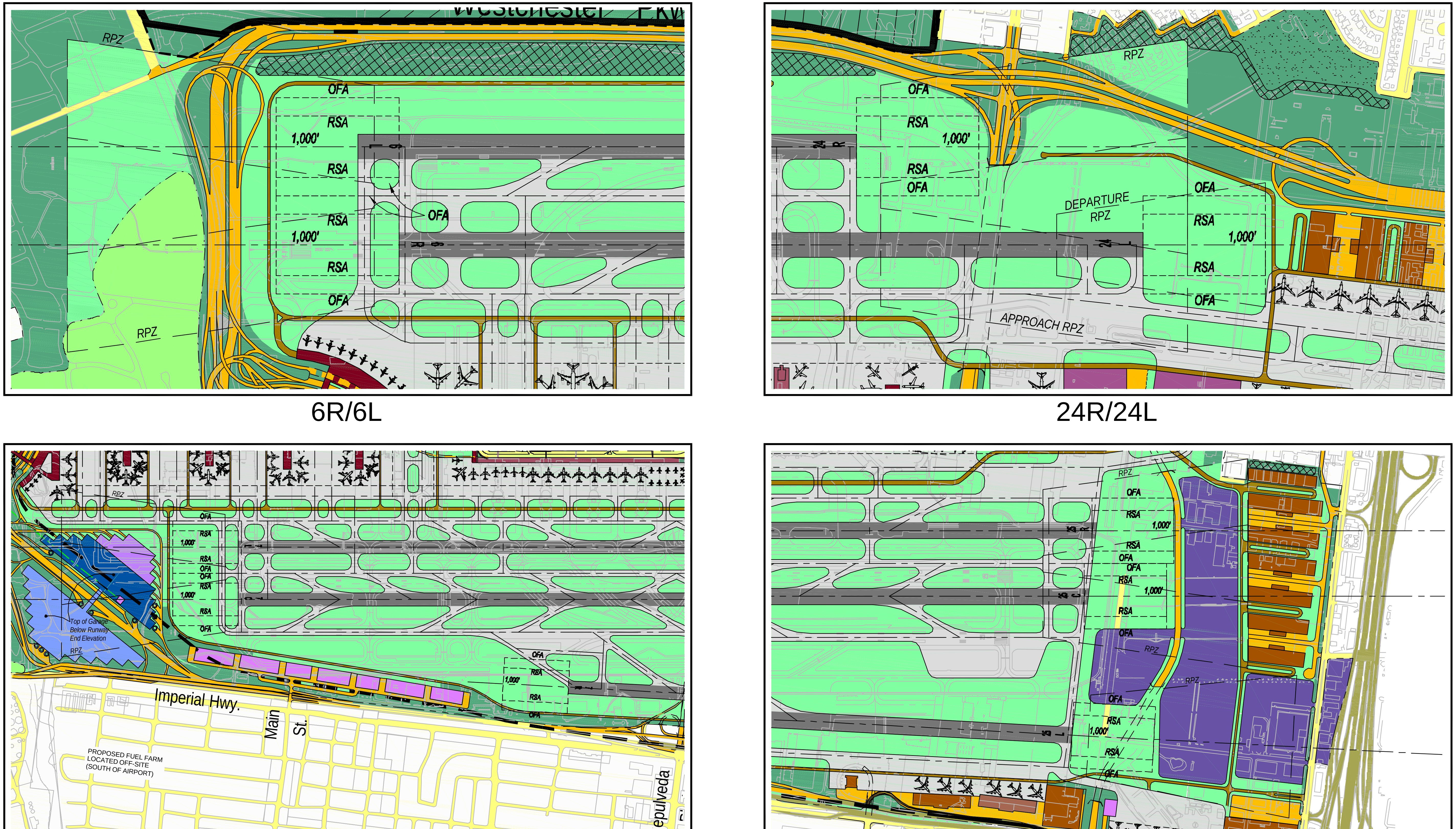
Impacts associated with risk of upset at the LNG/CNG facilities under Alternative B would be the same as those associated with Alternative A. Under Alternative B, the existing LNG/CNG Facility would be relocated to a site north of Imperial Highway and east of Sepulveda Boulevard, near the East Imperial Cargo Complex. The facility would be expanded over baseline conditions by 2015. The CNG Station would be removed.

Figure F4.24.3-14 shows the extent of the potential hazard footprint associated with the relocated LNG/CNG Facility. This hazard footprint would be the same as that associated with Alternative A. Under Alternative B, as indicated on **Figure F4.24.3-14**, in the event of a reasonably foreseeable, worst-case incident at the relocated LNG/CNG Facility, individuals along portions of Imperial Highway, I-105, Aviation Boulevard and the Green Line, and at adjacent cargo buildings may be injured. The ignition of surrounding structures would not be expected to occur. No residences or other sensitive receptors would be affected. As with Alternative A, the consequences of an incident at the LNG/CNG Facility under Alternative B would be similar to baseline conditions. Because the likelihood and consequences of an incident at the LNG/CNG Facility would not substantially increase over baseline conditions, the risk of upset impact associated with the proposed LNG/CNG Facility would be less than significant.

Aviation Incidents and Accidents

Under Alternative B, a new runway would be constructed on the south airfield and the existing runways would be upgraded and relocated, resulting in three runways on the south airfield and two on the north airfield. Navigational aids would be installed, removed and/or relocated to accommodate the reconfigured runways. Alternative B would include taxiways to accommodate the Boeing 747 as the design aircraft (Group V) and modified Group VI solutions for the operation of anticipated limited numbers of the NLA. In addition, all of the existing runway ends would be redesigned, and the new runway designed, to have Runway Safety Areas (RSAs) that meet current FAA standards of 1,000 feet long by 500 feet wide. **Figure F4.24.3-15**, Runway End Clearance at LAX for Alternative B - 2015, depicts the runway ends and their associated RSAs, Object Free Areas (OFAs) and Runway Protection Zones (RPZs) for Alternative B. All new and redesigned runways and taxiways would meet current FAA Airport Design Standards. A below-ground-level parking garage and consolidated rental car facility are both shown within the RPZs associated with Runways 7L and 7C. While these uses would require FAA review, no new operational restrictions are anticipated to be necessary under Alternative B and no adverse impacts with respect to aviation incidents and accidents would occur.

As with Alternative A, under Alternative B, aircraft operations are projected to increase by over 22 percent in 2015. As indicated previously, there is no statistical correlation between number of operations and number of incidents and accidents. Because of the lack of statistical correlation, it is not possible to



6R/6L

24R/24L

7R/7C/7L

25R/25C/25L

200' 400' 1,200'
400' 0 800'

RPZ – Runway Protection Zone
RSA – Runway Safety Area
OFA – Object Free Area

Prepared by: Landrum & Brown, October 2000

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Runway End Clearance at LAX for Alternative B - 2015

Figure
F4.24.3-15

quantify an increase in aircraft accidents or incidents due to the increased operations. Strict adherence to FAA rules and regulations pertaining to aircraft safety would ensure that no compromise in aviation safety would occur, although the additional operations may necessitate increases in air traffic control personnel at LAX. Therefore, no impacts to aviation incidents and accidents would occur as a result of the increased operations anticipated under this alternative.

Under Alternative B, Westchester Southside would be developed with mixed uses. All proposed structures within Westchester Southside would be built in accordance with the building height restrictions established by the City of Los Angeles to assure the safety of the air approach corridors to the runways at LAX. With compliance with all applicable local, state, and federal standards and ordinances, Westchester Southside would not have any impacts on aviation incidents and accidents.

Birdstrikes

The potential for birdstrikes under Alternative B would be similar to that under Alternative A. Briefly, as with Alternative A, under Alternative B, no runways would be located within 10,000 feet of a solid waste landfill, no new facilities would be constructed or operational conditions implemented that would attract birds, and there would be a decrease in the amount of open space on the airport, including the elimination of the detention basin, an existing bird attractant. Therefore, the potential for birdstrikes would be less than that under baseline conditions or the No Action/No Project Alternative. In summary, under Alternative B, potential impacts with respect to birdstrikes would be less than significant.

Airport Security

As discussed above, LAWA met the congressionally-mandated deadline that all checked baggage on passenger flights be screened for explosives after December 31, 2002 through the implementation of a number of interim measures at the existing LAX terminals. The TSA is in the process of developing additional airport security requirements. It is too early to determine the details of how future federal requirements would be fully accommodated under Alternative B; however, inasmuch as this alternative proposes a substantial amount of new development, including new, larger terminal facilities, new parking areas, new surface transportation facilities, and various airfield improvements, it is anticipated that an extensive array of security features and operational practices as required by the federal government could be accommodated within the final plans and provisions of this alternative. Given that current security requirements have been accommodated within the existing airport facilities, it is clear that accommodating those requirements would not represent a material change in the basic characteristics of Alternative B. Thus, under Alternative B, no significant adverse impacts related to airport security are anticipated to occur.

4.24.3.6.4 Alternative C - No Additional Runway

Risk of Upset

Central Utility Plant

Impacts associated with risk of upset at the CUPs under Alternative C would be the same as those associated with Alternatives A and B. Under Alternative C, there would be two CUPs operating at LAX in 2015. The CUPs would be the same size, and at the same locations, as under Alternatives A and B. **Figure 4.24.3-16**, Hazard Footprints for Alternative C - 2015, depicts the areas that would be affected by a sulfuric acid release, accounting for wind direction and dispersion. These hazard footprints would be the same as those associated with Alternatives A and B. As with Alternatives A and B, under Alternative C, the hazard footprints associated with the CTA CUP and the Westside CUP would extend to public areas to the same extent as the current CTA CUP under baseline conditions. Although there would be two hazard footprints under Alternative C, it is extremely unlikely that upsets would occur concurrently at both facilities. If simultaneous upsets were to occur, the hazard footprints for each are distinct (i.e., affect different areas of the airport) and would not have an additive effect. Therefore, the consequences of an upset at either CUP under Alternative C would be similar to those under baseline conditions. Because the construction of a second CUP would not substantially increase the likelihood or consequences of an incident over baseline conditions, the risk of upset impact of a sulfuric acid release at the CUP would be less than significant.

LAXFUEL Fuel Farm

As with Alternatives A and B, under Alternative C, initially, the existing LAXFUEL Fuel Farm would continue to operate at its current capacity and location. As a result, the likelihood of a major fuel release without subsequent ignition would be the same as under baseline conditions and the No Action/No Project Alternative, except that the retention basin would be removed. Although removal of the basin would eliminate one safeguard, there would be numerous other safeguards (e.g., secondary containment, compliance with all seismic safety regulations, emergency fuel shutoff valves and high-level detectors, etc.) to prevent fuel from reaching Santa Monica Bay. As with Alternatives A and B, under Alternative C, because the likelihood and consequences of a fuel release would not substantially increase over baseline conditions, the risk of upset impact would be less than significant.

By 2015, the existing LAXFUEL Fuel Farm would be expanded with additional fuel farm facilities constructed south of the existing site. The expanded On-Site Fuel Farm would add six 120,000-barrel floating roof tanks. Failure of one of these tanks, along with the concurrent failure of either the drain valve or the secondary containment wall, would result in the discharge of the overflow to the storm drain system. Under these circumstances, fuel could potentially reach Santa Monica Bay. However, this would only occur if there were a secondary containment or valve failure.

As discussed previously, fuel farm facilities are required to comply with several specific regulations and function according to strict operating procedures in order to minimize the risk of a release. The expanded On-Site Fuel Farm would comply with these regulations. Secondary containment would be provided and would drain to oil-water separators. Structures would meet all seismic safety regulations. Emergency fuel shutoff valves and high-level detectors would be in place and inspections would be performed regularly. The On-Site Fuel Farm would have an FSRP detailing procedures to minimize the extent of a release, should one occur.

The potential for a release of fuel to Santa Monica Bay to occur would be similar to that under the baseline conditions and the No Action/No Project Alternative. Due to the regulatory and operational safeguards in place, the likelihood and consequences of a major fuel release resulting in the discharge of fuel to Santa Monica Bay would be extremely small. Because the likelihood and consequences would not substantially increase, the risk of upset impact associated with this scenario is considered to be less than significant.

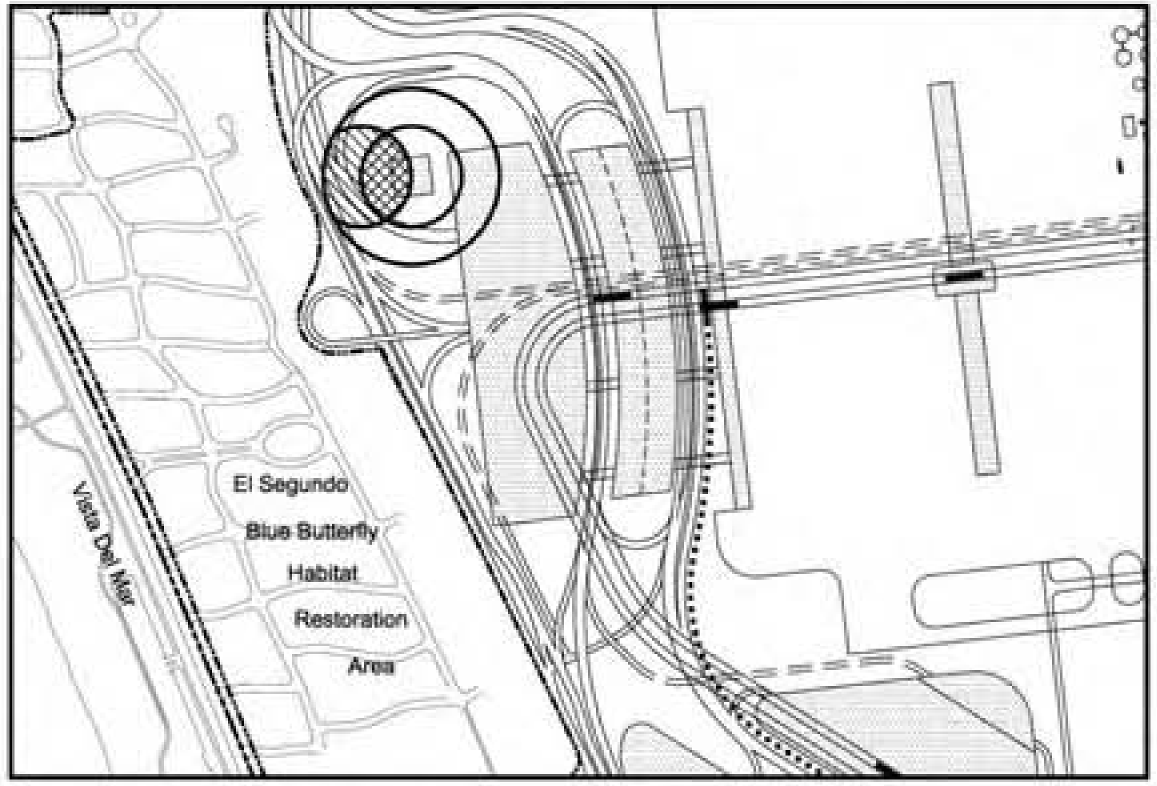
Under Alternative C in 2015, if a single 120,000-barrel tank in the containment area were to rupture and the fuel to subsequently ignite, a pool fire would result. If the fire were not extinguished, the following worst-case consequences would be expected:

- The nominal flame height, assuming no tilt to wind, would be slightly in excess of 325 feet.
- Within 515 feet from the center of the pool, exposure could result in fatality.
- Within 738 feet from the center of the pool, a human would experience second-degree burns with severe pain.

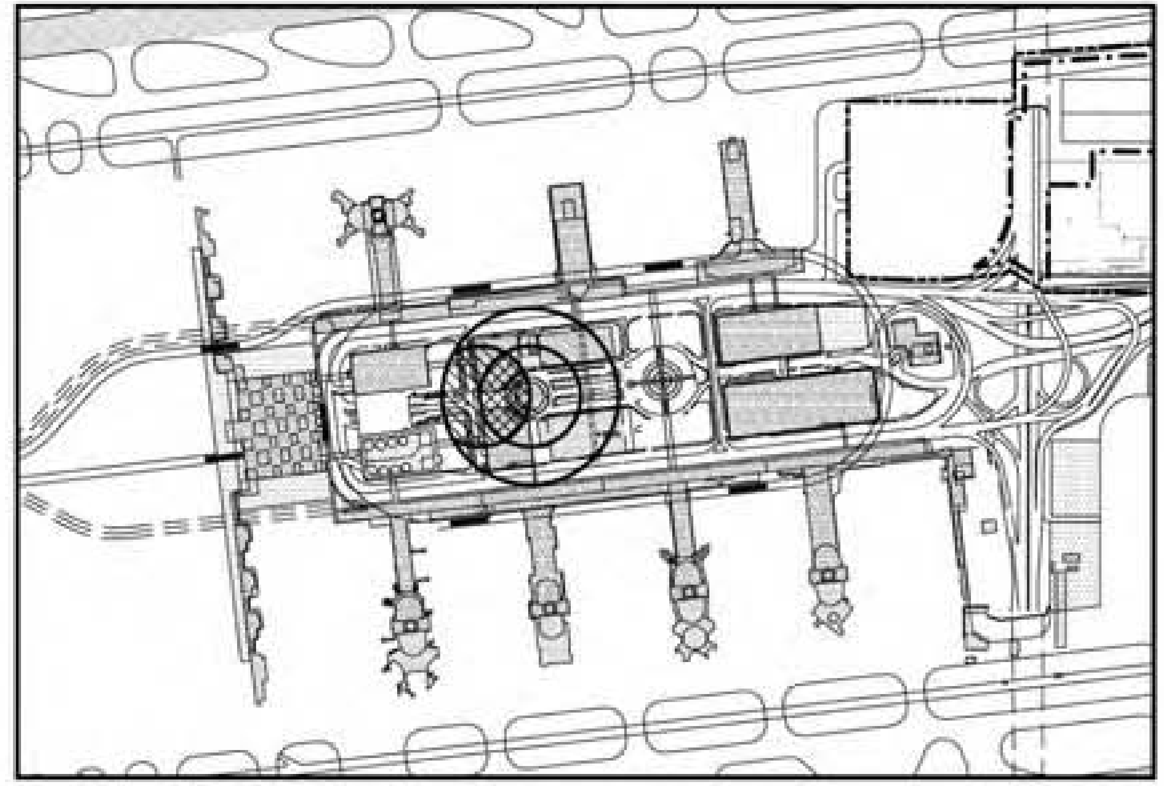
Figure F4.24.3-16 shows the hazard footprint for a pool fire at the expanded On-Site Fuel Farm under Alternative C, assuming that the fire were contained within the bermed areas. This hazard footprint is larger than that associated with the existing LAXFUEL Fuel Farm because the secondary containment area would be larger. As indicated in **Figure F4.24.3-16**, in the event of a fire at the On-Site Fuel Farm, individuals may be injured on airport taxiways and access roads. The ignition of surrounding structures is not expected to occur. No residences or other sensitive receptors would be affected.

As discussed previously, the existing LAXFUEL Fuel Farm is highly regulated in order to prevent releases and mishaps. LAFD would have several on-airport fire stations and fire personnel are trained in techniques for fighting hydrocarbon fires. The numerous operational and design features in place at the LAXFUEL Fuel Farm would be incorporated into the expanded On-Site Fuel Farm.

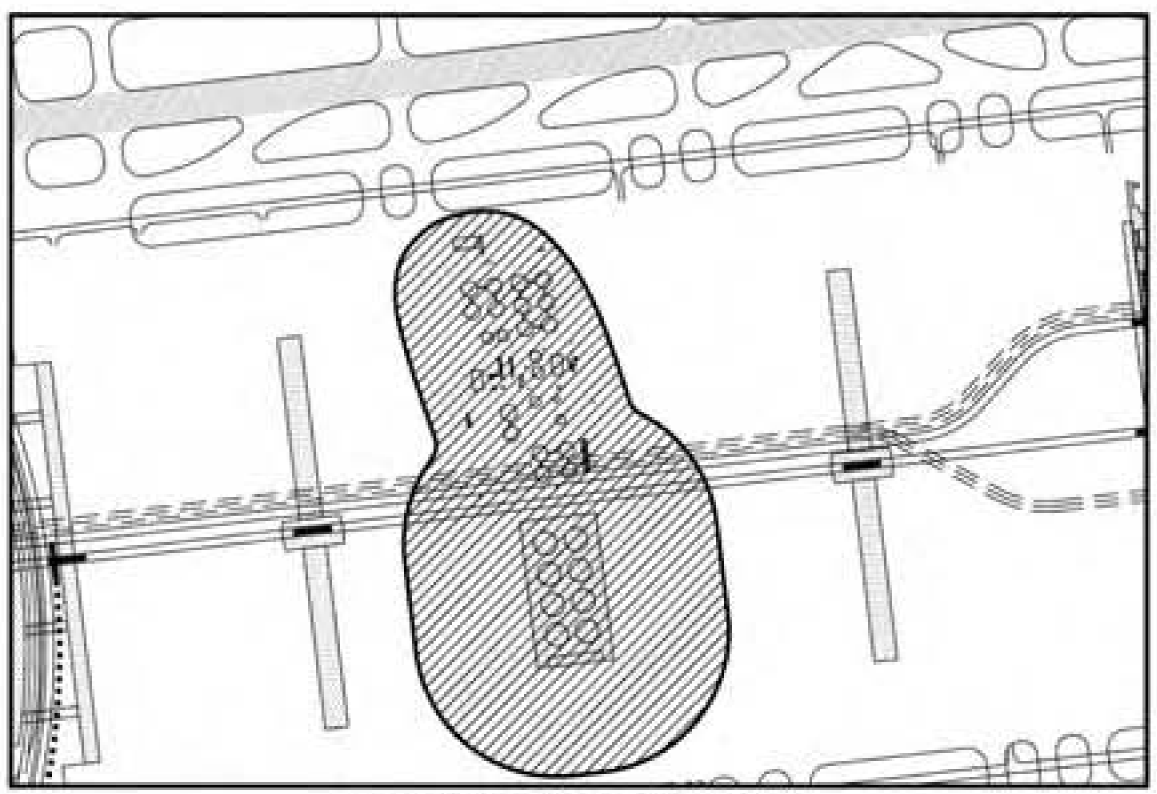
Due to the numerous planned safety features, similar to those described under subsection 4.24.3.3, *Affected Environment/Environmental Baseline*, and compliance with all applicable setback and safety requirements, the likelihood of a pool fire at the expanded On-Site Fuel Farm would be low. The conservative nature of the ARCHIE model likely results in a larger modeled hazard footprint than would occur in an actual upset. The likelihood for this scenario to occur would not be any larger than that under baseline conditions or the No Action/No Project Alternative. However, should an incident occur, the



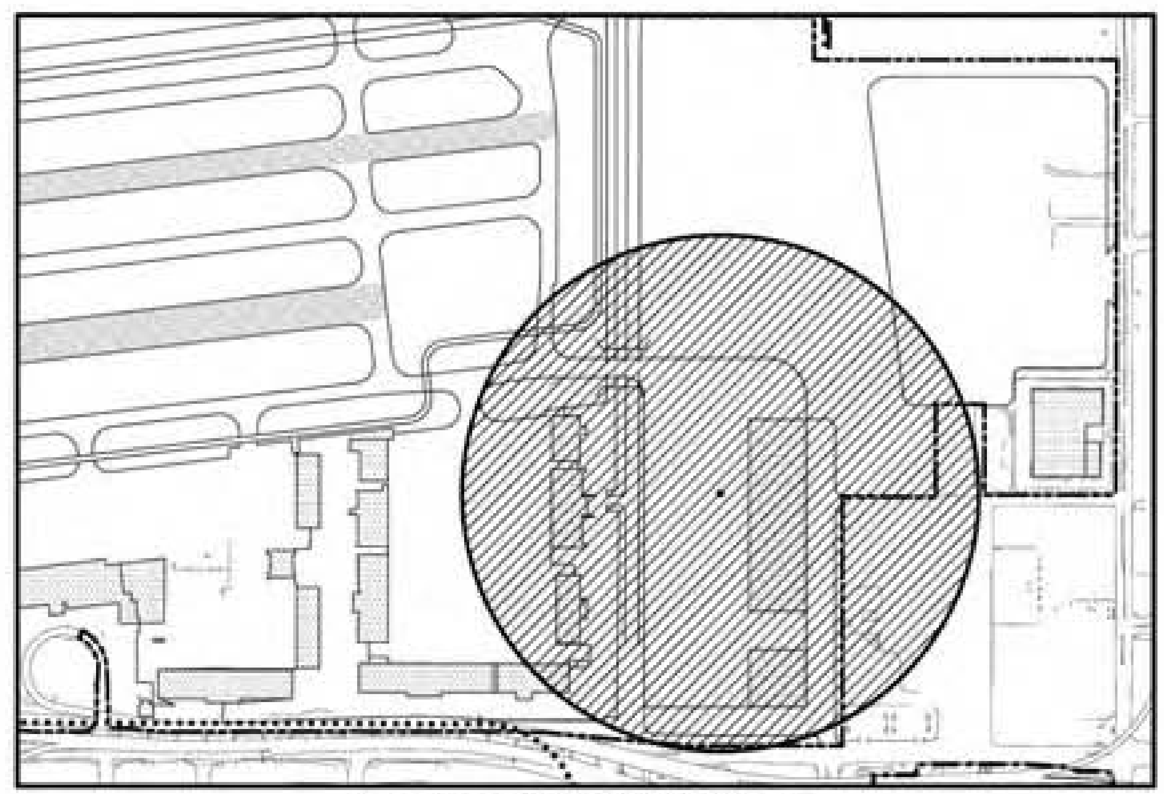
Hazard Footprint for Westside CUP



Hazard Footprint for CTA CUP



Hazard Footprint for On-Site Fuel Farm



Hazard Footprint for LNG/CNG Facility

LEGEND

- ERPG-2 Impacted Population
- ERPG-3 Impacted Population
- Hazard Zone

Source: Camp Dresser & McKee Inc., 2000.

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LAX Master Plan Final EIS/EIR	Hazard Footprints for Alternative C - 2015	Figure F4.24.3-16

hazard footprint would be different than under the baseline conditions or the No Action/No Project Alternative and would affect a different area. The larger footprint would result from the additional secondary containment area, which would allow a second pool fire to form. While the hazard footprint would extend to a greater area, the consequences would be similar to baseline conditions. As under baseline conditions, the hazard footprint would extend to buildings used by airport employees and to a public road traveled by airport visitors. No residences or other sensitive receptors would be affected. Because the likelihood and consequences of a pool fire under Alternative C in 2015 would not substantially increase over baseline conditions, the risk of upset impact of this scenario would be less than significant.

LNG/CNG Facility

Impacts associated with risk of upset at the LNG/CNG facilities under Alternative C would be the same as those associated with Alternatives A and B. Under Alternative C, the existing LNG/CNG Facility would be relocated to a site north of Imperial Highway and east of Sepulveda Boulevard, near the East Imperial Cargo Complex. The facility would be expanded over baseline conditions by 2015. The CNG Station would be removed.

Figure F4.24.3-16 shows the extent of the potential hazard footprint associated with the relocated LNG/CNG Facility. This hazard footprint would be the same as that associated with Alternatives A and B. As with Alternatives A and B, the consequences of an incident at the LNG/CNG Facility under Alternative C in 2015 would be similar to baseline conditions. Because the likelihood and consequences of an incident at the relocated LNG/CNG Facility would not substantially increase over baseline conditions, the risk of upset impact associated with the proposed LNG/CNG Facility would be less than significant.

Aviation Incidents and Accidents

Under Alternative C, the existing runways would be upgraded and relocated; no new runways would be constructed. Navigational aids would be installed, removed and/or relocated to accommodate the reconfigured runways. Alternative C would include taxiways to accommodate the Boeing 747 as the design aircraft (Group V) and modified Group VI solutions for the operation of anticipated limited numbers of the NLA. In addition, all existing runway ends would be redesigned to have RSAs that meet current FAA standards of 1,000 feet long by 500 feet wide. **Figure F4.24.3-17**, Runway End Clearance at LAX for Alternative C - 2015, depicts the runway ends and their associated RSAs, OFAs, and RPZs for Alternative C. All redesigned runways and taxiways would meet current FAA Airport Design Standards. A below-ground-level parking garage and a consolidated rental car facility are both shown within the RPZs associated with Runways 7L and 7R. While these uses would require FAA review, no new operational restrictions are anticipated to be necessary under Alternative C and no adverse impacts with respect to aviation incidents and accidents would occur.

Under Alternative C, aircraft operations are projected to increase by 4.4 percent in 2015, as opposed to 22 percent for Alternatives A and B. As indicated previously, there is no statistical correlation between number of operations and number of incidents and accidents. Because of the lack of statistical correlation, it is not possible to quantify an increase in aircraft accidents or incidents due to the increased operations. Strict adherence to FAA rules and regulations pertaining to aircraft safety would ensure that no compromise in aviation safety would occur, although additional operations may necessitate increases in air traffic control personnel at LAX. Therefore, no impacts to aviation incidents and accidents would occur as a result of the increased operations anticipated under this alternative.

Under Alternative C, Westchester Southside would be developed with mixed uses. All proposed structures within Westchester Southside would be built in accordance with the building height restrictions established by the City of Los Angeles to assure the safety of the air approach corridors to the runways at LAX. With compliance with all applicable local, state, and federal standards and ordinances, Westchester Southside would not have any impacts on aviation incidents and accidents.

Birdstrikes

The potential for birdstrikes under Alternative C would be similar to that under Alternatives A and B. Briefly, as with Alternatives A and B, under Alternative C, no runways would be located within 10,000 feet of a solid waste landfill, no new facilities would be constructed or operational conditions implemented that would attract birds, and there would be a decrease in the amount of open space on the airport. Therefore, the potential for birdstrikes would be less than that under baseline conditions or the No

Action/No Project Alternative. In summary, under Alternative C, potential impacts with respect to birdstrikes would be less than significant.

Airport Security

As discussed above, LAWA met the congressionally-mandated deadline that all checked baggage on passenger flights be screened for explosives after December 31, 2002 through the implementation of a number of interim measures at the existing LAX terminals. The TSA is in the process of developing additional airport security requirements. It is too early to determine the details of how future federal requirements would be fully accommodated under Alternative C; however, inasmuch as this alternative proposes a substantial amount of new development, including new, larger terminal facilities, new parking areas, new surface transportation facilities, and various airfield improvements, it is anticipated that an extensive array of security features and operational practices as required by the federal government could be accommodated within the final plans and provisions of this alternative. Given that current security requirements have been accommodated within the existing airport facilities, it is clear that accommodating those requirements would not represent a material change in the basic characteristics of Alternative C. Thus, under Alternative C, no significant adverse impacts related to airport security are anticipated to occur.

4.24.3.6.5 Alternative D - Enhanced Safety and Security Plan

Risk of Upset

Central Utility Plant

Under Alternative D, the existing CUP would be the same size and at the same location as under baseline conditions with the same hazard footprint. As seen in **Figure F4.24.3-18**, Hazard Footprints for Alternative D - 2015, the hazard footprints would extend to some of the roadway, public, and terminal areas of the airport. No residences or other sensitive receptors would be affected. Thus, the risk of a sulfuric acid release under Alternative D would be the same as that under baseline conditions and would be less than significant.

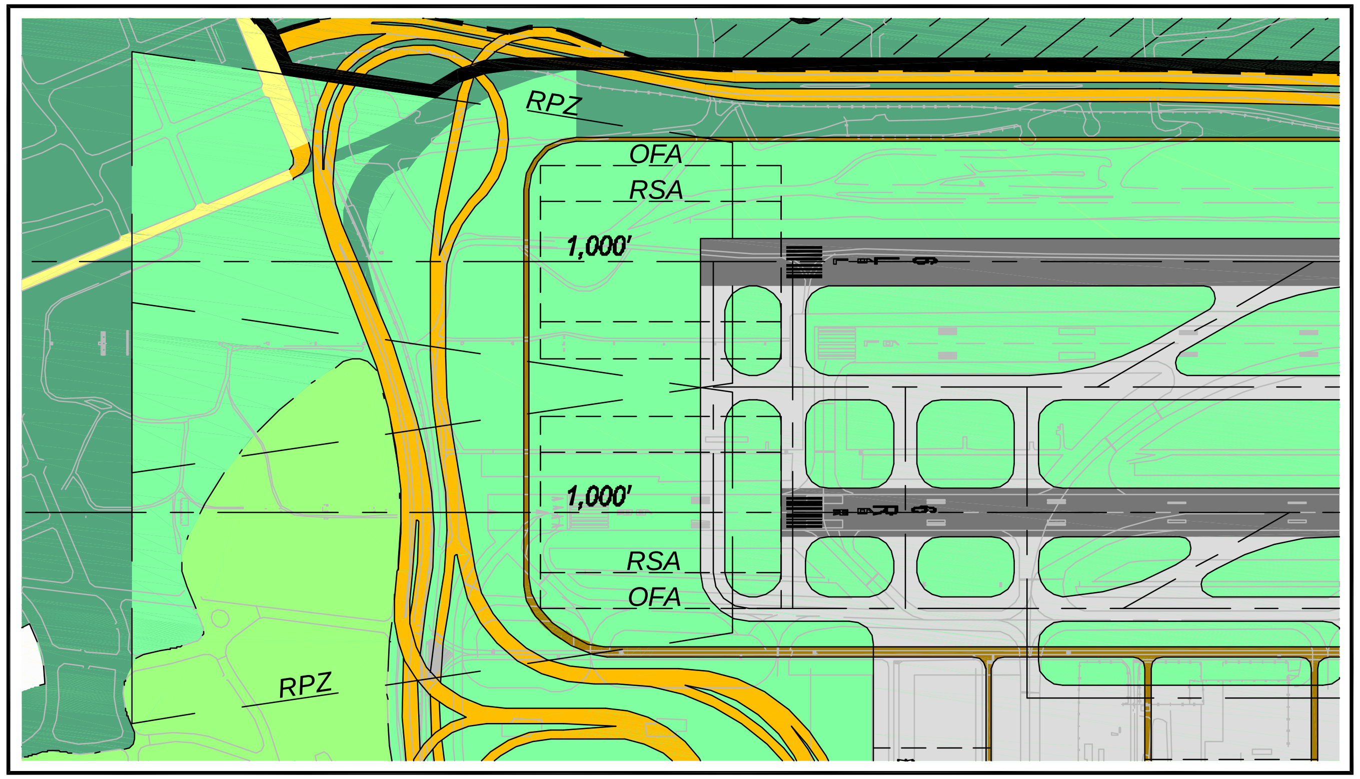
Fuel Farm

Under Alternative D, the LAXFUEL Fuel Farm would retain its existing capacity and would remain in its existing location, but the overall fuel farm site footprint would be reduced; however, the hazard footprint would be the same as under baseline conditions because the secondary containment area would be the same size. **Figure F4.24.3-18** shows the hazard footprint for a pool fire, assuming that the fire was contained within the bermed areas. As indicated in **Figure F4.24.3-18**, in the event of a pool fire at the LAXFUEL Fuel Farm, individuals may be injured on the access road near the operations center, and at adjacent buildings, including those currently occupied by Dobbs House, Marriott Corporation, and LAWTFC. The ignition of surrounding structures would not be expected to occur. No residences or other sensitive receptors would be affected. Due to the numerous safety features currently in place and compliance with all applicable setback and regulatory requirements, the risk of a pool fire at the LAXFUEL Fuel Farm would be low. Because the likelihood and consequences of a pool fire under Alternative D would be the same as under baseline conditions, the risk of upset impact of this scenario would be less than significant.

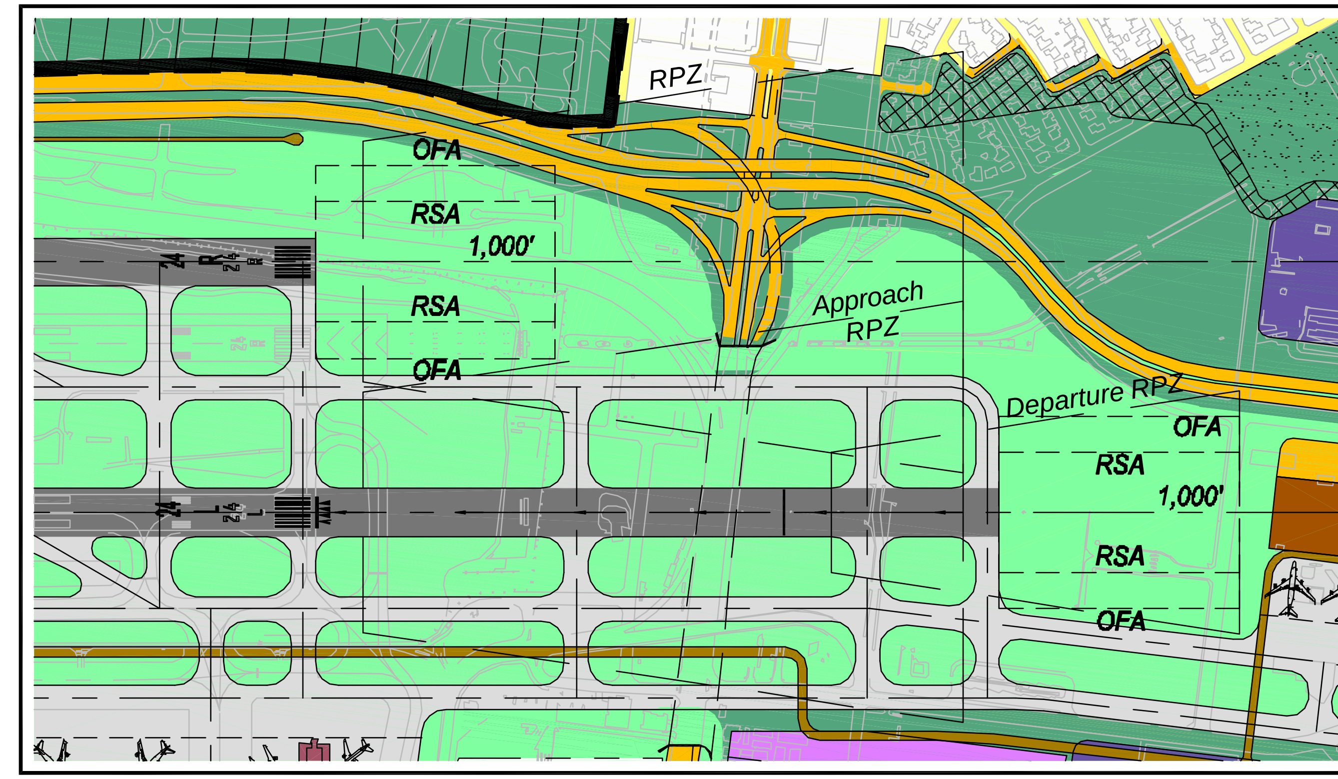
Due to the regulatory and operational safeguards in place, the risk of a major fuel release resulting in the discharge of fuel to Santa Monica Bay would be extremely small. Because the likelihood and consequences of a release of fuel (without subsequent ignition) to Santa Monica Bay would be the same as under baseline conditions, the risk of upset impact associated with Alternative D is considered to be less than significant.

LNG/CNG Facilities

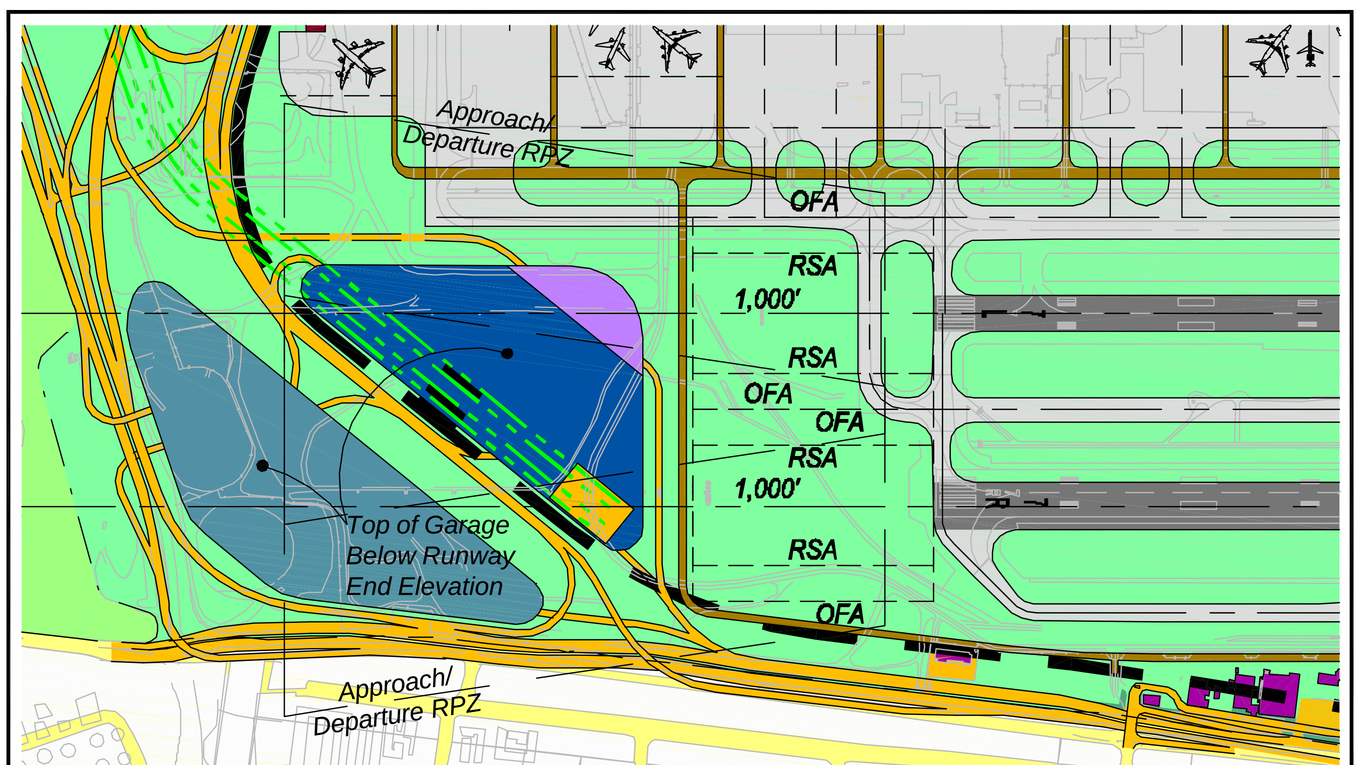
Under Alternative D, the LAWA LNG/CNG Facility would be the same size and at the same location as under current conditions with the same hazard footprint. Under Alternative D, the maximum tank size at the LNG/CNG Facility would not be any larger than under baseline conditions. Therefore, the hazard footprint would be the same as well. Due to the safety-related project design features and planned compliance with all applicable setbacks and safety requirements, the likelihood of an incident at the LNG/CNG Facility would be low. Additionally, the conservative nature of the ARCHIE model likely results



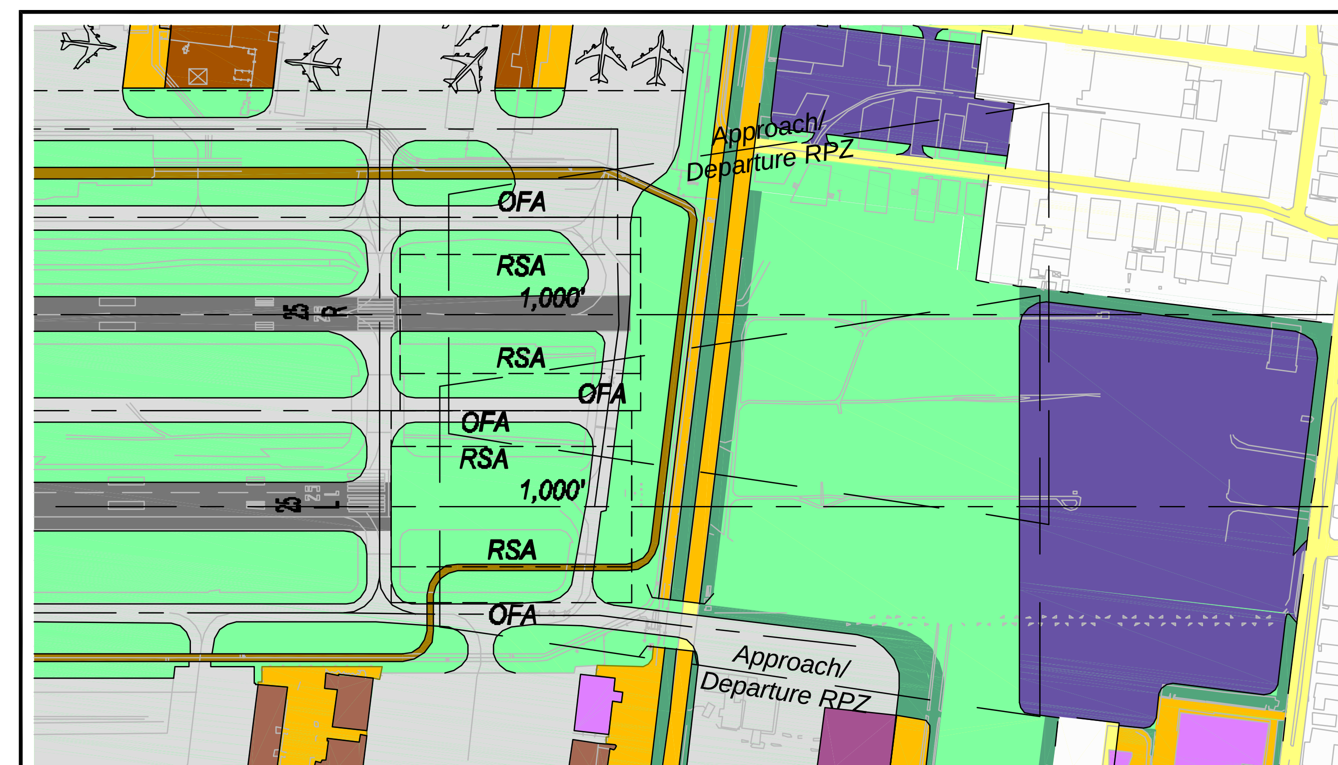
6R/6L



24R/24L



7R/7L



25R/25L

200' 400' 1,200'
400' 0 800'

RPZ – Runway Protection Zone
RSA – Runway Safety Area
OFA – Object Free Area

Prepared by: Landrum & Brown, October 2000

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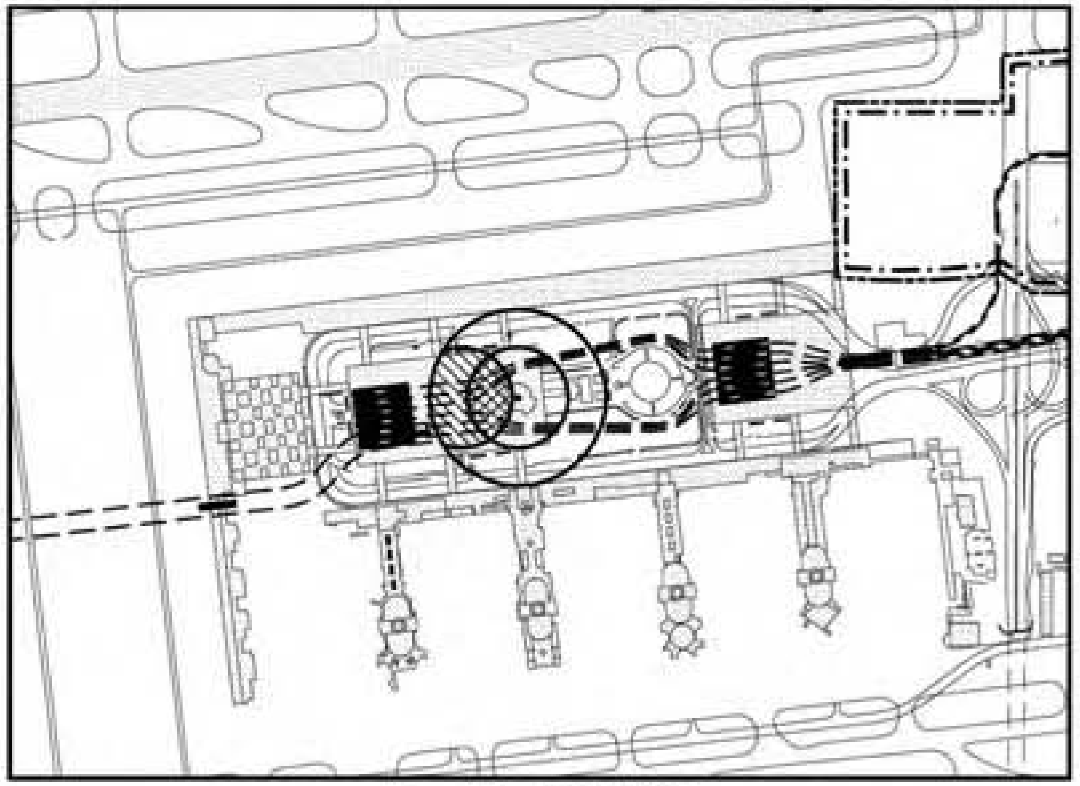
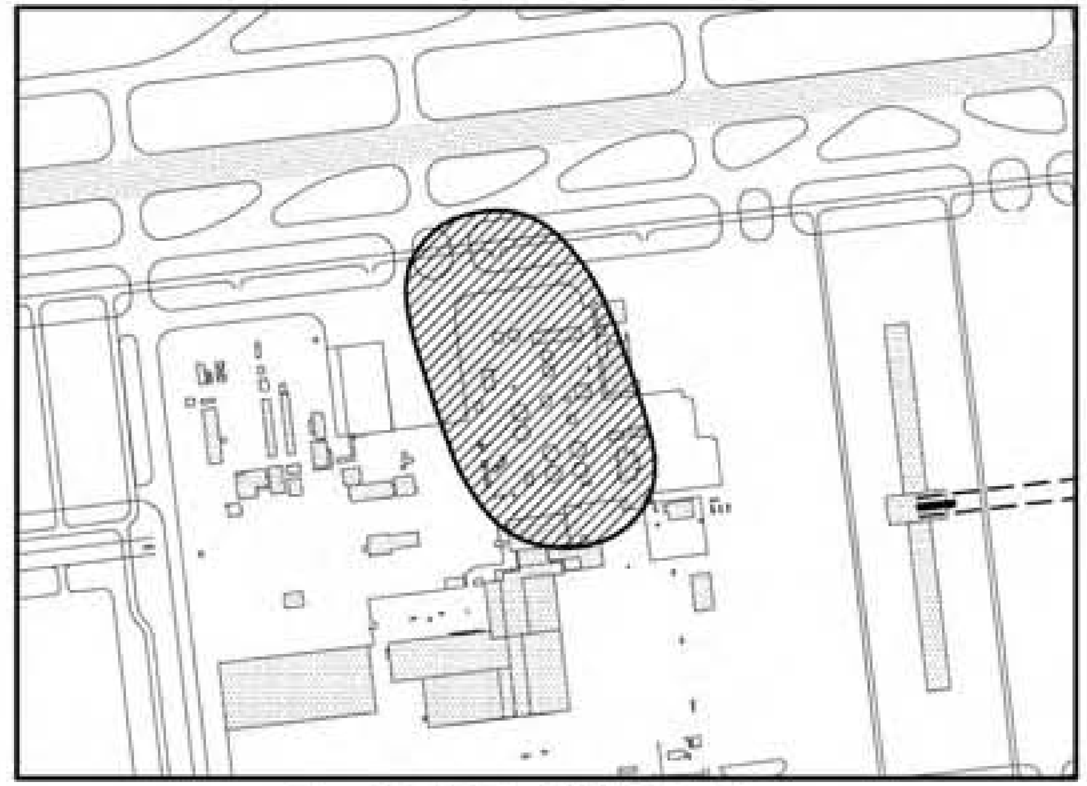
Runway End Clearance at LAX for Alternative C - 2015

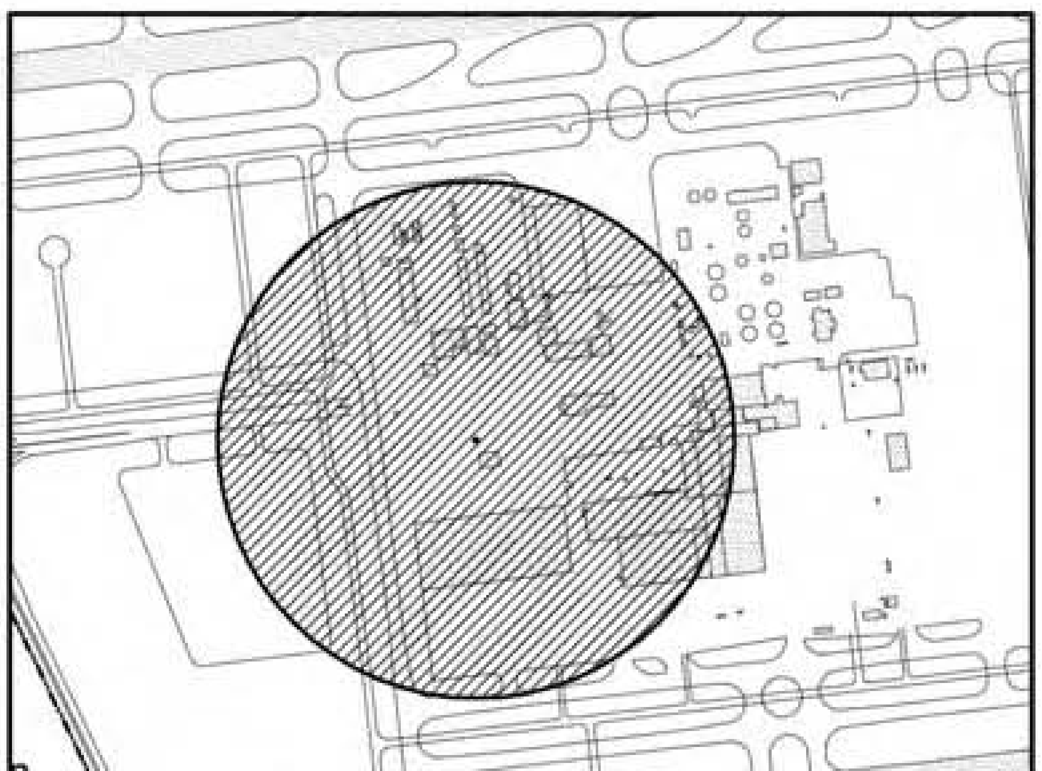
Figure
F4.24.3-17



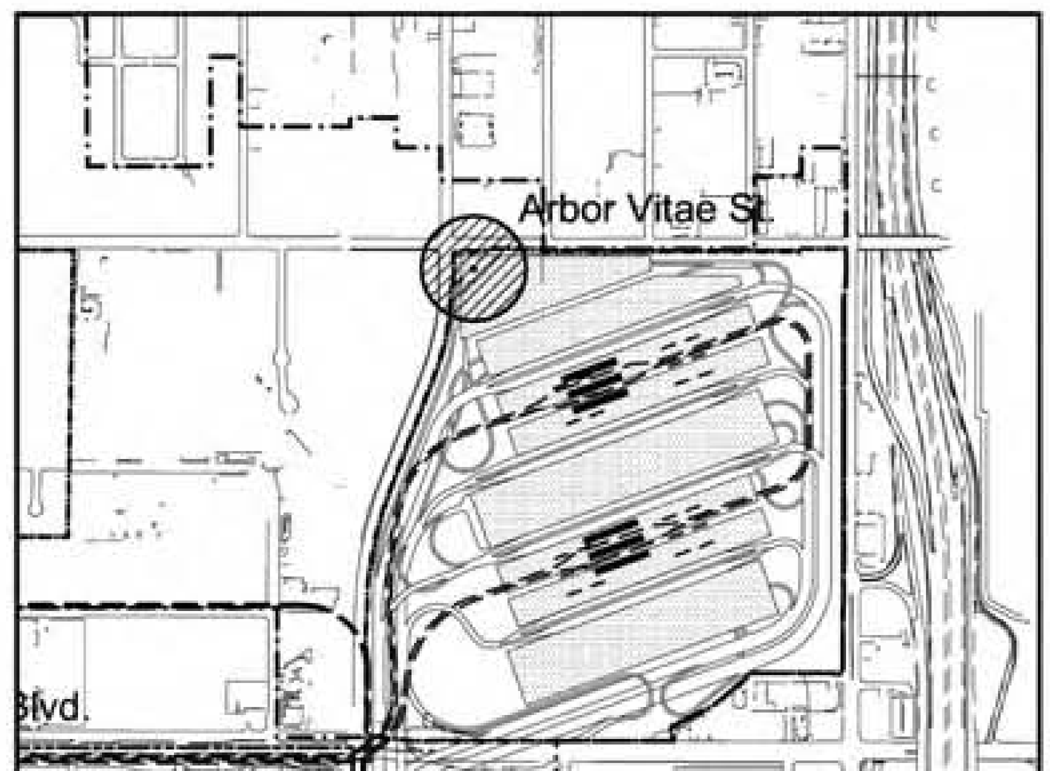
Hazard Footprint for CUP



Hazard Footprint for LAXFUEL Fuel Farm



Hazard Footprint for LNG/CNG Facility



Hazard Footprint for CNG Station

LEGEND

- ERPG-2 Impacted Population
- ERPG-3 Impacted Population
- Hazard Zone

Source: Camp Dresser & McKee Inc., 2003.

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Hazard Footprints for Alternative D - 2015

Figure **F4.24.3-18**

in a larger hazard footprint than would occur in an actual upset. LNG/CNG facilities are highly regulated in order to prevent releases and mishaps. Because the likelihood and consequences of an LNG or CNG incident at the LNG/CNG Facility under Alternative D would be the same as under baseline conditions, the risk of upset impact of this scenario would be less than significant.

Under this alternative, the CNG Station would be relocated to the southeast corner of Arbor Vitae Street and Aviation Boulevard. The relocated CNG Station would be the same size with the same overall capacity as under baseline conditions. Under Alternative D, the maximum tank size at the CNG Station would not be any larger than under baseline conditions. Therefore, the hazard footprint would be the same as well although it would be at a different location. As indicated in **Figure F4.24.3-18**, in the event of an incident at the relocated CNG Station, individuals may be injured along public streets (Arbor Vitae Street and Aviation Boulevard) and at adjacent uses (a law school, rental car storage, and a gas station). The ignition of surrounding structures would not be expected to occur. No residences or other sensitive receptors would be affected. While the hazard footprint would be located in another area, the consequences would be similar to baseline conditions. CNG facilities are highly regulated in order to prevent releases and mishaps. Due to the planned safety features and compliance with all applicable setback and safety requirements, including Los Angeles Fire Code setback requirements, the likelihood of an incident at the relocated CNG Station would be low. Because the likelihood and consequences of a CNG incident at the relocated CNG Station under Alternative D would be similar to baseline conditions, the risk of upset impact of this scenario would be less than significant.

Aviation Incidents and Accidents

Under Alternative D, the existing runways would be upgraded and relocated; no new runways would be added. Alternative D would maintain the existing four-runway system with modifications to the two north and south airfield runways. Taxiways in this alternative would be designed to accommodate the Boeing 747-400 as the design aircraft (Group V) with operational and modified Group VI solutions for the operation of anticipated limited numbers of the New Large Aircraft (NLA). In addition, all existing runway ends would be redesigned to have Runway Safety Areas (RSAs) that meet current FAA standards of 1,000 feet long by 500 feet wide. **Figure F4.24.3-19**, Runway End Clearance at LAX for Alternative D - 2015, depicts the runway ends and their associated RSAs, OFAs, and RPZs for Alternative D. A surface parking lot would be located within the RPZs associated with Runways 25R and 25L and consolidated rental car facility would be located within the RPZs of runways 24R and 24L. While these uses would require FAA review, no new operational restrictions are anticipated to be necessary under Alternative D and no adverse impacts with respect to aviation incidents and accidents would occur.

As discussed in subsection 4.24.3.3, *Affected Environment/Environmental Baseline*, LAX was built prior to the establishment of the FAA's current design standards for airports serving large commercial jets. For this reason, not all of the safety areas and safety zones surrounding the four LAX runways universally meet today's recommended dimensions for new airport development.

However, the FAA has established a mechanism for allowing existing airports to continue operating unimpeded through the declaration of safe aircraft operating parameters known as "declared distances."

Declared distances are proposed for Alternative D as a means for the project to satisfy FAA design standards while also controlling project costs and minimizing physical impacts of airport reconstruction to neighboring areas.

Under Alternative D, clearways[883] would be identified off of five of the eight runway ends. The identification of clearways allows for the increase of an aircraft's gross takeoff weight without extending the physical runway pavement. This would result in airport cost efficiencies through the reduction of airport reconstruction impacts while allowing aircraft operators to maximize their aircraft utilization.

In the north airfield, Runway 6L/24R would have a physical pavement length of 10,420 feet. The west end of the runway would have a 1,000-foot displaced threshold in order to provide the recommended 1,000-foot Runway Safety Area (RSA). A 500-foot clearway would extend off of the west end of the

[883] A clearway is a clearly defined area connected to and extending beyond the runway end available for completion of the takeoff operation of turbo jet-engined airplanes. The clearway is a plane, extending out and up from the runway end, with a slope of no greater than 1.25%. The clearway plane is required to be 500 feet wide and has a practical length of no greater than 1,000 feet. No object or terrain may penetrate the clearway plane.

runway, increasing Take-Off Distance Available (TODA) for Runway 24R while a 1,000-foot clearway would extend from the east end, increasing TODA for aircraft departing Runway 6L.

Also in the north airfield, Runway 6R/24L would have a physical pavement length of 11,700 feet. Both runway ends would have displaced thresholds of 1,000 feet to accommodate the recommended 1,000-foot RSA. A 300-foot clearway would extend from the west end of the runway increasing TODA for Runway 24L to 12,000 feet.

In the south airfield, Runway 7L/25R would have a physical pavement length of 12,091 feet. Runway 7L/25R is the only runway at LAX that would not be modified under Alternative D. The east end of the runway would have a displaced threshold of 957 feet. The 25R arrival threshold displacement would allow the runway's approach path to clear Air Freight Building #3 (Building 415 on Sheet 3 of the future Airport Layout Plan Package for Alternative D). A 1,000-foot clearway would be extended from the west end of the runway allowing for increased TODA for westbound departures from the runway.

Also in the south airfield, Runway 7R/25L would have a physical pavement length of 11,096 feet. Runway 7R/25L would not have displaced thresholds at either end. A 1,000-foot clearway would be identified at the west end of the runway allowing increased TODA for westbound departures from the runway.

The methodology for the declared distances for Alternative D is summarized below for each runway in each direction of operation.

Runway 6L/24R

The Runway 6L arrival threshold would be displaced 1,000 feet to provide a standard RSA. The Runway 24R end of the runway has a full 1,000-foot RSA located off of the physical pavement end.

Runway 6L

- Take-Off Run Available (TORA) = 10,420 feet (full length)
- TODA = 11,420 feet (full length plus 1,000-foot clearway)
- Accelerated Stop Distance Available (ASDA) = 10,420 feet (full length)
- Landing Distance Available (LDA) = 9,420 feet (full length less area behind arrival threshold)

Runway 24R

- TORA = 10,420 feet (full length)
- TODA = 10,920 feet (full length plus 500-foot clearway)
- ASDA = 10,420 feet (full length)
- LDA = 9,420 feet (full length less area behind arrival threshold)

Runway 6R/24L

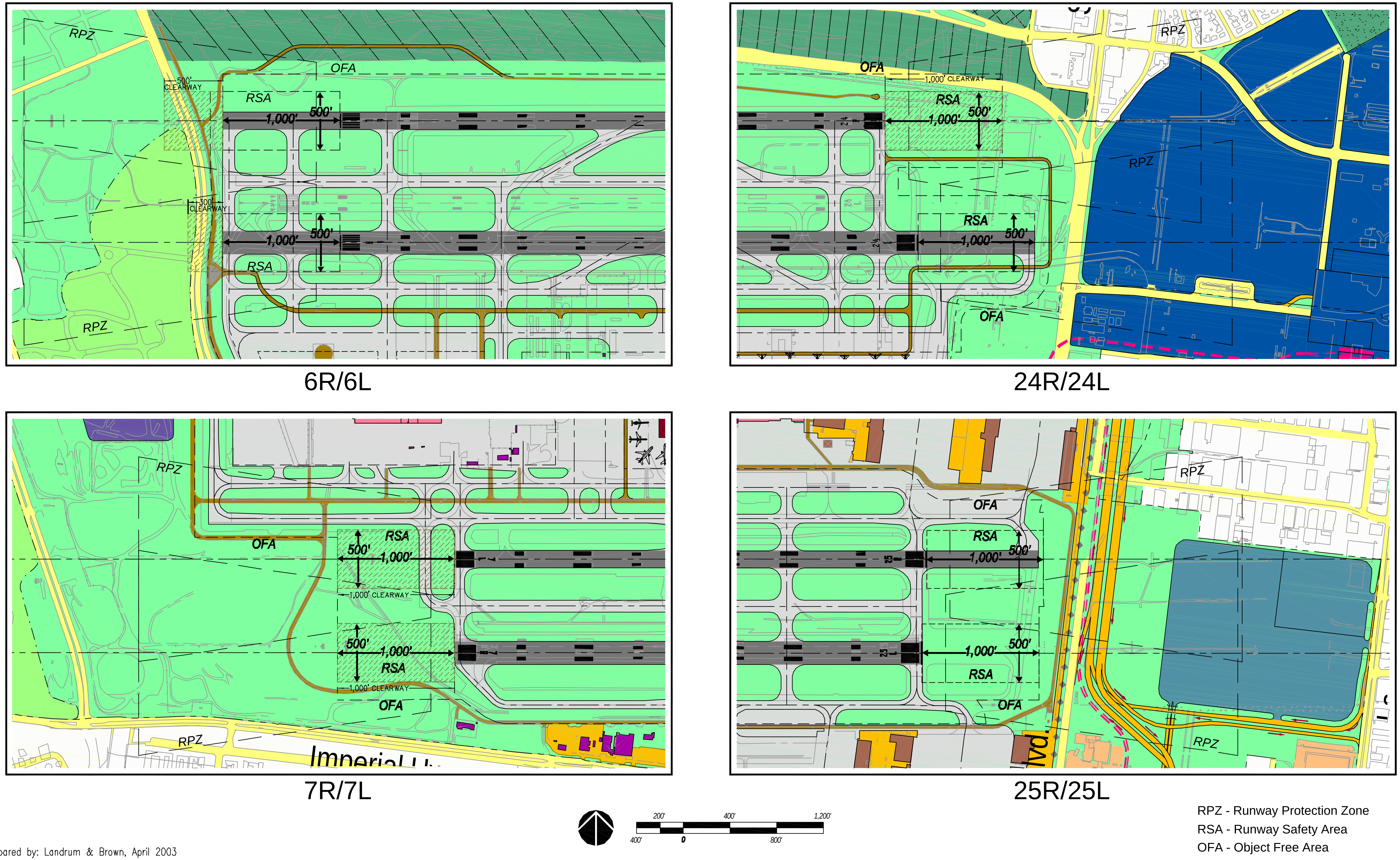
The arrival thresholds at both ends of this runway would be displaced 1,000 feet to provide the required RSA at each end.

Runway 6R

- TORA = 11,700 feet (full length)
- TODA = 11,700 feet (full length)
- ASDA = 10,700 feet (full length less area behind opposite arrival threshold)
- LDA = 9,700 feet (full length less area behind arrival threshold and opposite arrival threshold)

Runway 24L

- TORA = 11,700 feet (full length)
- TODA = 12,000 feet (full length plus 300 foot clearway)
- ASDA = 10,700 feet (full length less area behind opposite arrival threshold)
- LDA = 9,700 feet (full length less area behind arrival threshold and opposite arrival threshold)



Prepared by: Landrum & Brown, April 2003

LAX Master Plan Final EIS/EIR

Runway End Clearance at LAX for Alternative D - 2015

Figure **F4.24.3-19**

Runway 7L/25R

The 25R arrival threshold would have a displacement of 957 feet. The threshold displacement distance on Runway 25R is due to an obstacle in the approach path to the runway and is not solely for the provision of a 1,000-foot safety area.

Runway 7L

- TORA = 12,091 feet (full length)
- TODA = 12,091 feet (full length)
- ASDA = 11,134 feet (full length less area behind opposite arrival threshold)
- LDA = 11,134 feet (full length less area behind opposite arrival threshold)

Runway 25R

- TORA = 12,091 feet (full length)
- TODA = 13,091 feet (full length plus 1,000-foot clearway)
- ASDA = 11,134 feet (full length less area behind opposite arrival threshold)
- LDA = 11,134 feet (full length less area behind opposite arrival threshold)

Runway 7R/25L

There would be no threshold displacements on this runway.

Runway 7R

- TORA = 11,096 feet (full length)
- TODA = 11,096 feet (full length)
- ASDA = 11,096 feet (full length)
- LDA = 11,096 feet (full length)

Runway 25L

- TORA = 11,096 feet (full length)
- TODA = 12,096 feet (full length plus 1,000-foot clearway)
- ASDA = 11,096 feet (full length)
- LDA = 11,096 feet (full length)

As discussed above, use of Declared Distances under Alternative D would satisfy FAA airport design requirements. Thus, no adverse impacts with respect to aviation incidents and accidents would occur.

Under Alternative D, aircraft operations are projected to increase compared to baseline conditions. As discussed previously, there is no statistical correlation between the number of operations and number of incidents and accidents. Because of the lack of statistical correlation, it is not possible to quantify an increase in aircraft accidents or incidents due to the increased operations. Strict adherence to FAA rules and regulations pertaining to aircraft safety would ensure that no compromise in aviation safety would occur, although additional operations may necessitate increases in air traffic control personnel at LAX. Therefore, no impacts to aviation incidents and accidents would occur as a result of the increased operations anticipated under this alternative.

Under Alternative D, LAX Northside would be developed with mixed uses. All proposed structures within LAX Northside would be built in accordance with the building height restrictions established by the City of Los Angeles to assure the safety of the air approach corridors to the runways at LAX. With compliance with all applicable local, state, and federal standards and ordinances, LAX Northside would not have any impacts on aviation incidents and accidents.

Birdstrikes

Under Alternative D, the Los Angeles/El Segundo Dunes, an existing bird attractant at LAX, would not be modified in such a way that it would increase birdstrike hazards. In addition, airport open space would be substantially reduced by the construction of uses within LAX Northside.

Alternative D would result in the upgrading and relocation of runways; however, no runways would be located within 10,000 feet of a solid waste landfill. No new facilities would be constructed or operational conditions implemented that would serve as attractants to birds. In accordance with FAA requirements, the airfield would continue to be maintained to avoid the ponding of water, the growth of vegetation, and the development of other conditions that may serve as attractants to nuisance wildlife, including birds. Therefore, under Alternative D, potential impacts with respect to birdstrikes would be less than significant.

Airport Security

As discussed above, LAWA met the congressionally-mandated deadline that all checked baggage on passenger flights be screened for explosives after December 31, 2002 through the implementation of a number of interim measures at the existing LAX terminals. The TSA is in the process of developing additional airport security requirements.

Alternative D is specifically designed to protect airport users and critical airport infrastructure, to incorporate federal security recommendations as they are developed to the greatest extent possible, and to enhance on-airport presence of law enforcement and emergency response teams. By limiting access to private vehicles to the main airport infrastructure, significant threats can be identified and mitigated in new facilities designed for the new security environment. This approach reduces the risk to airport users while also protecting the airport infrastructure and its link to the economy. By creating additional space for passenger terminals, efficient passenger and baggage screening facilities can be implemented at the airport. Flexibility of the new passenger space created would allow for space to implement evolving changes in airport security technology while also being responsive to the identified security threats. Thus, under Alternative D, no significant adverse impact related to airport security is anticipated to occur.

4.24.3.7 Cumulative Impacts

As discussed in subsection 4.24.3.3, *Affected Environment/Environmental Baseline*, facilities at LAX that pose a potential hazard to the health or safety of passengers, visitors, airport employees, or people who live or work in the LAX vicinity include those that handle large volumes of toxic or flammable materials, namely the CUP, fuel farm, and LNG/CNG facilities. Additional risks at LAX are posed by the potential for aviation incidents and accidents, including those associated with birdstrikes, and risks associated with airport security.

4.24.3.7.1 No Action/No Project Alternative

Under the No Action/No Project Alternative, the existing CUP, fuel farm, and LNG/CNG facilities would continue to operate at their current capacities and locations. As such, the risk of an incident at these facilities would be the same as that under baseline conditions. No runway extensions, relocations, or additions would occur under this alternative. LAX would continue to operate safely with the existing runway configuration and departures from Airport Design Standards described in subsection 4.24.3.3, *Affected Environment/Environmental Baseline*. Increased operations due to projected growth would not increase the risk of an aircraft accident or incident at LAX. The development of LAX Northside under the No Action/No Project Alternative would reduce the existing open space within this area, thereby reducing its attraction to birds. No new facilities would be constructed or operational conditions implemented that would serve as attractants to birds.

Cumulative development in the project area, such as the Playa Vista project, would consist largely of residential and commercial land uses that would not require storage of large quantities of toxic or flammable materials. It is likely that these projects would include new gas stations and alternative fuel facilities. However, these facilities would not result in hazard footprints large enough to overlap with those from facilities at LAX. Additionally, these facilities would be designed in accordance with all applicable regulatory provisions and operational safeguards.

Aviation incidents and accidents are typically the result of random sequences of unusual and unpredictable events. Cumulative development near LAX would neither increase nor decrease the likelihood of these random sequences of events.

Cumulative development would not increase the potential for the occurrence of birdstrikes. The likelihood of birdstrikes mainly depends on the presence of bird attractants, such as open space, on or very near the airfield. Cumulative development would likely result in less open space in the airport vicinity. No land uses that would attract birds, such as solid waste landfills, are planned in the area.

With respect to cumulative impacts on airport security, no significant impacts are expected to occur. The nature of, and approach to, airport security is to address potential threats on a facility-wide basis with particular emphasis on operations (i.e., passenger processing, vehicle parking, and access within the airport, aircraft management, etc.). As such, the development of other projects in the vicinity of LAX is not expected to substantially affect the ability to identify and implement necessary and appropriate security measures for the airport.

4.24.3.7.2 Alternatives A, B, and C

Under Alternatives A, B, and C, new, expanded, or relocated CUP, fuel farm, and LNG/CNG facilities are proposed. Although the consequences of an incident at any of these facilities could be quite serious, the likelihood of an incident would remain small. The new facilities would comply with all applicable regulatory requirements and employ safety and design features in order to minimize the risk of a release. As a result, potential impacts would be less than significant. Under Alternatives A, B, and C, runway extensions, relocations, or additions are proposed. Reconfiguration of the runways at LAX would eliminate the need for departures from Airport Design Standards. The additional operations would not result in a predictable increase in the risk of an aircraft accident or incident at LAX. Therefore, no impacts to aviation safety would occur as a result of the increased operations. Under these three alternatives, the development of the West Terminal Concourses, as well as the build out of Westchester Southside, would reduce the amount of open space at LAX. This would reduce the risk of birdstrikes at LAX.

Similar to the No Action/No Project Alternative, cumulative development in the project area, such as the Playa Vista project and the development of Manchester Square under Alternative A, would not include land uses that would require storage of large quantities of toxic or flammable materials. Cumulative projects would likely include new gas stations and alternative fuel facilities. However, these facilities would not result in hazard footprints large enough to overlap with those from facilities at LAX. Additionally, these facilities would be designed in accordance with all applicable regulatory provisions and operational safeguards. As a result, an increase in the number of such facilities would not result in significant cumulative impacts to safety.

Under Alternative B, the potential locations for the fuel farm would be located near existing sources of risk, namely the Scattergood Electric Generating Station and the oil refinery located south of the airport. Operational safeguards at both existing and proposed facilities would reduce the risk of an upset. Moreover, the likelihood of concurrent upsets at more than one of these facilities would be very low. As a result, no significant cumulative impacts to safety would occur.

Aviation incidents and accidents are typically the result of random sequences of unusual and unpredictable events. Cumulative development near LAX would neither increase nor decrease the likelihood of these random sequences of events. Potential impacts associated with the cumulative increase in aircraft traffic in the airspace of Southern California will be addressed by FAA in a separate environmental review. FAA would manage regional airspace such that no cumulative impacts to safety would occur.

Cumulative development would not increase the potential for the occurrence of birdstrikes. The likelihood of birdstrikes mainly depends on the presence of bird attractants, such as open space, on or very near the airfield. Cumulative development would likely result in less open space in the airport vicinity. Additionally, no land uses that would attract birds, such as solid waste landfills, are planned in the area. Therefore, no cumulative impacts would occur.

As discussed above, the nature of, and approach to, airport security is to address potential threats on a facility-wide basis with particular emphasis on operations (i.e., passenger processing, vehicle parking, and access within the airport, aircraft management, etc.). As such, the development of other projects in the vicinity of LAX is not expected to substantially affect the ability to identify and implement necessary and appropriate security measures for the airport.

4.24.3.7.3 Alternative D - Enhanced Safety and Security Plan

Under Alternative D, the CUP, fuel farm, and LNG/CNG Facility would remain in their current locations; however, the CNG Station would be relocated. Although the consequences of an incident at any of these facilities could be quite serious, the likelihood of an incident would remain small. The existing and relocated facilities would comply with all applicable regulatory requirements and employ safety and design features in order to minimize the risk of a release. As a result, potential impacts would be less than significant. Under Alternative D, upgrading and relocating of runways is proposed. Reconfiguration of the runways at LAX would eliminate the need for departures from Airport Design Standards. The additional operations would not result in a predictable increase in the risk of an aircraft accident or incident at LAX. Therefore, no impacts to aviation safety would occur as a result of the increased operations. Under Alternative D, the build out of LAX Northside would reduce the amount of open space at LAX. This would reduce the risk of birdstrikes at LAX.

Similar to the No Action/No Project Alternative, cumulative development in the project area, such as the Playa Vista project, would not include land uses that would require storage of large quantities of toxic or flammable materials. Cumulative projects would likely include new gas stations and alternative fuel facilities. However, these facilities would not result in hazard footprints large enough to overlap with those from facilities at LAX. Additionally, these facilities would be designed in accordance with all applicable regulatory provisions and operational safeguards. As a result, an increase in the number of such facilities would not result in significant cumulative impacts to safety.

Aviation incidents and accidents are typically the result of random sequences of unusual and unpredictable events. Cumulative development near LAX would neither increase nor decrease the likelihood of these random sequences of events. Potential impacts associated with the cumulative increase in aircraft traffic in the airspace of Southern California will be addressed by FAA in a separate environmental review. FAA would manage regional airspace such that no cumulative impacts to safety would occur.

Cumulative development would not increase the potential for the occurrence of birdstrikes. The likelihood of birdstrikes mainly depends on the presence of bird attractants, such as open space, on or very near the airfield. Cumulative development would likely result in less open space in the airport vicinity. Additionally, no land uses that would attract birds, such as solid waste landfills, are planned in the area. Therefore, no cumulative impacts would occur.

As discussed above, the nature of, and approach to, airport security is to address potential threats on a facility-wide basis with particular emphasis on operations (i.e., passenger processing, vehicle parking, and access within the airport, aircraft management, etc.). As such, the development of other projects in the vicinity of LAX is not expected to substantially affect the ability to identify and implement necessary and appropriate security measures for the airport.

4.24.3.8 Mitigation Measures

Alternatives A, B, C, and D would not have a significant impact with respect to safety; therefore, no mitigation is required.