Appendix
LAX Master Plan EIS/EIR

J2. Jurisdictional Delineation

January 2001

Prepared for:

Los Angeles World Airports

Federal Aviation Administration
U.S. Department of Transportation

Prepared by:

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Waterway Name: All areas within or immediately adjacent to the Los Angeles International Airport Master Plan boundaries and the Los Angeles/El Segundo Dunes

Location: U.S. Geological Survey Venice Quadrangle, within the boundaries of Township 2 South and Township 3 South and Range 14 West and Range 15 West.

Brief Description of Proposed Work: The Federal Aviation Administration and the City of Los Angeles are preparing a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR) regarding the proposed further development of Los Angeles International Airport, as recommended in the LAX 2015 Master Plan. The Master Plan evaluates numerous project components, including, but not limited to: one or two additional 6,000 foot-long runways; relocation/extension of existing runways; improved taxiway system; new passenger terminal facilities west of Tom Bradley International Terminal, connected by an automatic people-mover system; expanded air cargo facilities; improvements to the ground access system, including connections to the regional highway and transit networks; the relocation of ancillary uses and other support facilities; and related land acquisition.

Jurisdictional Area to be Affected as a Result of the Proposed Work: There are no wetlands within the Master Plan boundaries or the Los Angeles/El Segundo Dunes. There are approximately 1.3 acres of seasonally inundated areas that meet the criteria to be defined as “waters of the United States” subject to the jurisdiction of the U.S. Army Corps of Engineers, pursuant to Section 404 of the Clean Water Act. These seasonally inundated areas meet the criteria to be defined as “waters of the United States” because they were saturated for more than 12.5% of the growing season during a year of at least average rainfall.

There are no areas subject to the authority of the California Department of Fish and Game, pursuant to Section 1600 of the State Fish and Game Code.

Compliance with The Los Angeles River Basin Plan: Under the build alternatives, a Master Plan policy is proposed that would require development of an airport-wide drainage plan as part of the design and construction of Master Plan improvements, in compliance with the Water Quality Control Plan for the Los Angeles Region and the California Ocean Plan. This drainage plan would require measures to be implemented that would ensure adequate drainage capacity to prevent flooding and control peak flow discharges by reducing peak flow rates and/or increasing the capacity of the local drainage structures. As a result of this policy, no significant impacts from flooding would occur under the three build alternatives.

Endangered Species:

The Master Plan alternatives would not result in significant impacts to species of flora that are listed as endangered or threatened pursuant to the Federal Endangered Species Act.

There are two listed wildlife species that have the potential to be impacted by the Master Plan alternatives pursuant to Section 9 of the Federal Endangered Species Act: Riverside fairy shrimp (*Streptocephalus woottoni*) and El Segundo blue butterfly (*Euphilotes battoides allyni*).

Embedded cysts of the federally-endangered Riverside fairy shrimp were found in soil samples taken from the approximately 1.3 acres of ephemerally wetted areas found in the Airfield Operations Area (AOA) in the western portion of the Master Plan boundaries. Despite the optimal conditions that occurred during the winter of 1997/1998 and spring 1998, the Riverside fairy shrimp was not observed in the adult phase of its lifecycle within the Master Plan boundaries during directed surveys. Implementation of recommended mitigation would reduce this cumulative impact to Riverside fairy shrimp to less than significant.

The federally-listed El Segundo blue butterfly is found within portions of the 302-acre Los Angeles/El Segundo Dunes. Implementation of Master Plan Alternative A would remove vegetation from 320 square feet of the El Segundo Blue Butterfly Habitat Restoration Area, resulting in a net loss of occupied habitat. Implementation of recommended mitigation measures for Alternative A would reduce the impact below the level of significance. The Master Plan, No Action/No Project Alternative, and Alternatives B and C would not affect occupied habitat of the El Segundo blue butterfly.

Historic Properties:

In accordance with Section 106 of the National Historic Preservation Act of 1966, there are seven historic resources located in the vicinity of the Master Plan boundaries that are either listed or eligible for the National or California Register of Historic Places. Five of these are located within the Master Plan boundaries, and two are located in the City of Inglewood. Of the five resources within the Master Plan boundaries, only one, Hangar One, is currently listed on the National Register. The Theme Building, located on current airport property, is eligible for the National Register, and is currently listed on the California Register. The Merle Norman Headquarters Complex, located in the proposed acquisition area, is eligible for both the National and California Register. The remaining two include the Intermediate Terminal Complex, located on current airport property, and the International Airport Industrial District, located in the proposed acquisition area. Both are ineligible for the National Register, but are eligible for listing at the state and local levels. The two resources in Inglewood include the Academy Theatre, eligible for listing on the National and California Register, and the Morningside Park Neighborhood, only considered eligible for state and local listings.

The No Action/No Project Alternative would have no effect on listed or eligible National Register resources. The construction of Alternative A would result in potentially significant noise impacts on the Academy Theatre. Under Alternative B, the redevelopment of the Imperial Cargo Complex would involve the relocation of Hangar One; and the construction of the ring road would require the demolition of the Merle Norman Headquarters Complex. Construction of Alternative B would have potential noise impacts on the Academy Theatre, similar to those discussed under Alternative A. Development of Alternative C would impact the Merle Norman Headquarters Complex and the Academy Theatre similar to Alternative B.

EXECUTIVE SUMMARY

This report summarizes the results of investigations undertaken to characterize hydrology and biology within the *LAX 2015 Master Plan* study area, in order to determine presence or absence of vernal pools and pool-associated species. The purpose of these studies is to understand the potential of the proposed Master Plan to result in significant impacts on vernal pools, which are afforded protection pursuant to Section 404 of the Clean Water Act. Similarly, there is a need to understand the potential for impacts on vernal pool-associated endangered species, which are afforded protection pursuant to the Federal Endangered Species Act. As a result of these investigations, it was determined that there are no extant vernal pools within the Master Plan study area, based upon the definition provided by the U.S. Army Corps of Engineers (USACOE). Embedded cysts were identified by microscopic examination and artificial rearing as those of the federally-listed Riverside fairy shrimp (*Streptocephalus wootton*i). Cysts were recovered from nine locations on the airfield as a result of dry season surveys conducted in accordance with U.S. Fish and Wildlife Service (USFWS) survey protocol. No adult or juvenile Riverside fairy shrimp were observed or collected during subsequent wet season surveys. However, adults of the common fairy shrimp (*Branchinecta lindahli*) were numerous, and were collected from most locations during wet season surveys as a result of the confirmed presence of the cysts of the federally-listed Riverside fairy shrimp. The nine known locations potentially constitute wetlands pursuant to the USACOE definition of vernal pools. These nine locations comprise 1.21 acres within the Master Plan study area. The USACOE normally exerts jurisdiction over ephemerally wetted areas that are occupied by vernal pool-associated listed species or other indicator species. The USFWS met with Los Angeles World Airports (LAWA) on July 20, 1998. At that meeting, the USFWS stated their intent to exert jurisdiction pursuant to the Federal Endangered Species Act based on the presence of embedded cysts.

In its scoping letter dated July 31, 1997 to LAWA and the Federal Aviation Administration (FAA), the USFWS recommended an evaluation to determine the presence or absence of vernal pools within the study area for the Los Angeles International Airport 2015 Expansion Master Plan Project Environmental Impact Statement and Environmental Impact Report (EIS/EIR). The USACOE normally exerts jurisdiction over: (1) vernal pools with hydrologic, biologic, and soil characteristics typical of wetlands; and (2) ephemerally wetted areas that support vernal pool-associated listed species or other flora and fauna typically found in association with vernal pools. The USFWS recently prepared a *Draft Recovery Plan for Vernal Pools of Southern California,* and has jurisdiction over all federally-listed rare, threatened, and endangered species that occur in association with vernal pools.

The Master Plan study area supports 1.21 acres that are potentially subject to the jurisdiction of the USFWS under the Federal Endangered Species Act and the jurisdiction of the USACOE under the Federal Clean Water Act. This report presents the results of seven investigations that were undertaken to determine the presence or absence of vernal pools and vernal pool-associated species within the Master Plan study area:

- Review of Historic Topographic Maps and Aerial Photographs
- Mapping/Monitoring of Ephemerally Wetted Areas
- Soil Characterization
- Directed Dry Season Surveys for Fairy Shrimp
- Directed Wet Season Surveys for Fairy Shrimp
- Laboratory Investigations to Identify Recovered Embedded Cysts
- Directed Surveys for Vernal Pool-Associated Plant Species

The results of these surveys will be included in the EIS/EIR and supporting Biological Assessment under preparation by the FAA. Additionally, the results of the fairy shrimp investigations are included in a separate Biological Assessment, which has been prepared in support of a Section 7 consultation with the USFWS.

The 1.21 acres of ephemerally wetted habitat are located within areas subject to routine operation and maintenance activities undertaken by LAWA to comply with wildlife hazard management requirements enforced by the FAA. Ongoing operations and maintenance activities, as well as implementation of the proposed Master Plan, will likely require coordination with the USACOE pursuant to Section 404 of the Clean Water Act. The USFWS has indicated to LAWA that ground-disturbing activities in ephemerally wetted areas where embedded cysts of Riverside fairy shrimp were collected constitute “take” pursuant to the Federal Endangered Species Act.

1.0 INTRODUCTION

This Jurisdictional Delineation has been prepared for the U.S. Department of Transportation – Federal Aviation Administration (FAA) and the City of Los Angeles – Los Angeles World Airports (LAWA) for submittal to the U.S. Army Corps of Engineers (USACOE). The FAA and the City of Los Angeles are preparing a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR) that addresses the *LAX 2015 Master Plan* (Master Plan) regarding proposed further development of Los Angeles International Airport (LAX). The Master Plan evaluates numerous project components including, but not limited to: one or two additional 6,000-foot-long runways; relocation/extension of existing runways; improved taxiway system; new passenger terminal facilities west of Tom Bradley International Terminal, connected by an automatic people-mover system; expanded air cargo facilities; improvements to the ground access system, including connections to the regional highway and transit networks; the relocation of ancillary uses and other support facilities; and related land acquisition. In November 1997, LAWA directed Sapphos Environmental, Inc. to prepare a jurisdictional delineation within the LAX Master Plan study area boundaries and the adjacent Los Angeles/El Segundo Dunes.

All areas within the Master Plan boundaries or Los Angeles/El Segundo Dunes and immediately adjacent to the Los Angeles/El Segundo Dunes were examined for potential areas subject to the jurisdiction of the USACOE. The USACOE has authority over dredge or till activities within "waters of the United States," including wetlands and other special aquatic habitats, pursuant to Section 404 of the Clean Water Act. The results of a review of historic topographic quadrangles, historic aerial photographs, and the National Wetlands Inventory Map served as the basis for design of the delineation of areas potentially subject to the jurisdiction of the USACOE. Field reconnaissance of the western portion of the AOA was undertaken between 1997 and 2000 to document the level of disturbance in the areas that historically contained vernal pools.[1]

There are no natural streams, rivers, or drainages within the Master Plan boundaries or Los Angeles/El Segundo Dunes. Surface water flows generated in the Master Plan boundaries or Los Angeles/El Segundo Dunes are discharged into man-made storm drains that empty into either the Santa Monica Bay or the Dominguez Channel. Historically, surface flows drained into an approximately 124-acre vernal pool complex in the western portion of the current AOA and the eastern portion of the Los Angeles/El Segundo Dunes. Development that occurred throughout the 1900s resulted in substantial alteration of the vegetation, soils, and hydrology in this area, however, eliminating the natural parameters for making a wetland determination.

The USACOE directed the FAA and LAWA to consider the presence or absence of wetland areas in light of the atypical situation caused by human activities. Under the atypical situation, ephemerally wetted areas (vernal pools) that are seasonally inundated or saturated for more than 12.5% of the growing season in a year of at least average rainfall meet the criteria to be defined as "waters of the United States." As such, the dredge or deposition of fill materials in such areas is subject to the jurisdiction of the USACOE, pursuant to Section 404 of the Clean Water Act. As a result of monitoring conducted during the winter of 1998/1999, a year of above-average rainfall, it was determined that approximately 1.3 acres of seasonally inundated areas within the Master Plan boundaries and the adjacent Los Angeles/El Segundo Dunes meet the criteria to be defined as "waters of the United States" pursuant to Section 404 of the Clean Water Act. These 1.3 acres are currently subject to regular operations and maintenance activities, and must be maintained free of standing water to achieve the objectives for wildlife hazards management in accordance with Title 14, Code of Federal Regulations (CFR) Part 139.337. The 1.3 acres of "waters of the United States" would continue to be subject to regular operations and maintenance activities under the No Action/No Project Alternative considered in the EIS/EIR. The three build alternatives in the EIS/EIR all require development of the 1.3 acres of "waters of the United States." There are no practical alternatives that would avoid impacts on "waters of the United States."

There are no areas within the Master Plan boundaries and the adjacent Los Angeles/El Segundo Dunes subject to the authority of the California Department of Fish and Game (CDFG), pursuant to Section 1600 of the State Fish and Game Code. The CDFG protects wetlands and other riparian resources by requiring a Streambed Alteration Agreement for projects that will divert or obstruct the natural flow of water, change the bed, channel or bank of any stream, or use any material from a streambed.

[1] Sapphos Environmental, Inc., Letter, to Ms. Phelicia Gomes, U.S. Army Corps of Engineers, Los Angeles District, December 16, 1997.

Embedded cysts of the federally-listed endangered Riverside fairy shrimp were recovered from nine ephemerally wetted areas during directed dry season surveys within the Master Plan boundaries. No larvae or adult of Riverside fairy shrimp were collected or observed during subsequent wet season surveys. The presence of such cysts provides evidence that these ephemerally wetted areas, though not definitively vernal pools, support vernal pool species, and thus would be subject to USACOE jurisdiction. Though there is a possibility that the cysts were imported into the Master Plan boundaries during earlier development activities, a Biological Assessment has been prepared as supporting documentation for the FAA's required determinations of effects on federally-listed threatened and endangered species by the proposed development alternatives at the airport. This Assessment specifically addresses the issue of impacts to the federally-listed Riverside fairy shrimp.

2.0 LOCATION

Los Angeles International Airport (LAX) is located in the southwestern portion of the County of Los Angeles, adjacent to the Santa Monica Bay and 14 miles southwest of downtown Los Angeles (**Figure 1**, Regional Map). Reference point coordinates for LAX are 33º 56' north latitude by 118º 24' west longitude. The LAX airfield is located entirely in the City of Los Angeles, Los Angeles County, California, as depicted on the U.S.G.S. Venice Quadrangle, within the boundaries of Township 2 South and Township 3 South and Range 14 West and Range 15 West, measured off the San Bernardino Meridian. The airfield lies within the Sausal Redondo Land Grant Boundary (**Figure 2**, Vicinity Map), and is bordered to the north by Westchester Parkway, to the east by Aviation Boulevard, to the south by Interstate 105, and to the west by Dockweiler Beach State Park. Cities surrounding LAX include Westchester to the north, Inglewood to the east, and El Segundo to the south. LAX encompasses approximately 3,350 acres with an average elevation of 125.5 feet above Mean Sea Level (msl). LAX constitutes a large industrial district presently made up of the following facilities and uses:

- Four east/west runways
- 3.9 million square feet of domestic and international terminal space, including 145 narrow body equivalent gates and nine passenger terminals
- 200 acres of cargo area, including 1.9 million square feet of building space
- 384 acres of ancillary space, including 30 acres of Los Angeles World Airports administrative and support facilities
- 21,930 automobile parking spaces
- 900 acres of open space, including 302 acres of the Los Angeles/El Segundo Dunes

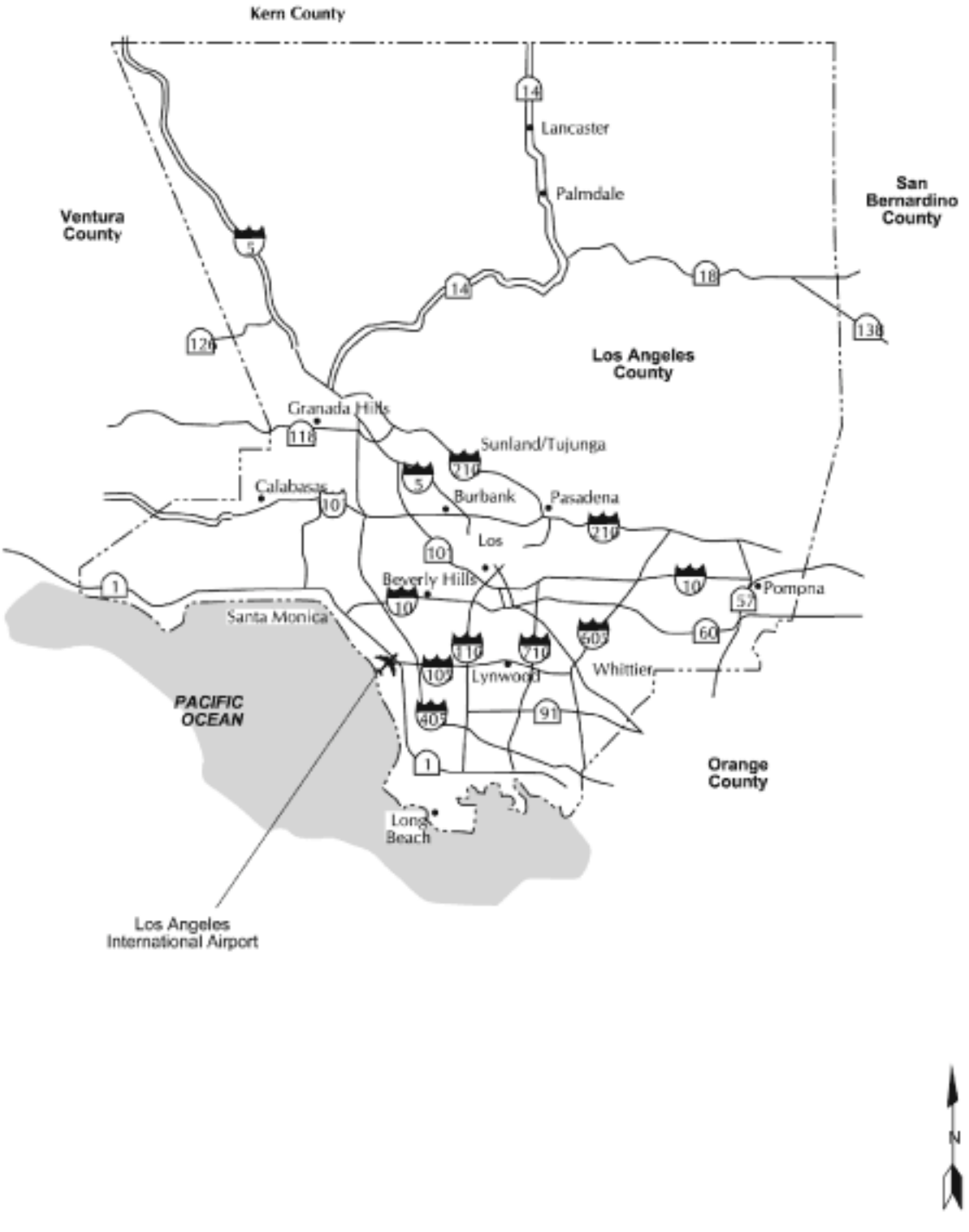
The composite acreage of all build alternatives and the No Action/No Project Alternative is 4,260 acres.

3.0 BACKGROUND

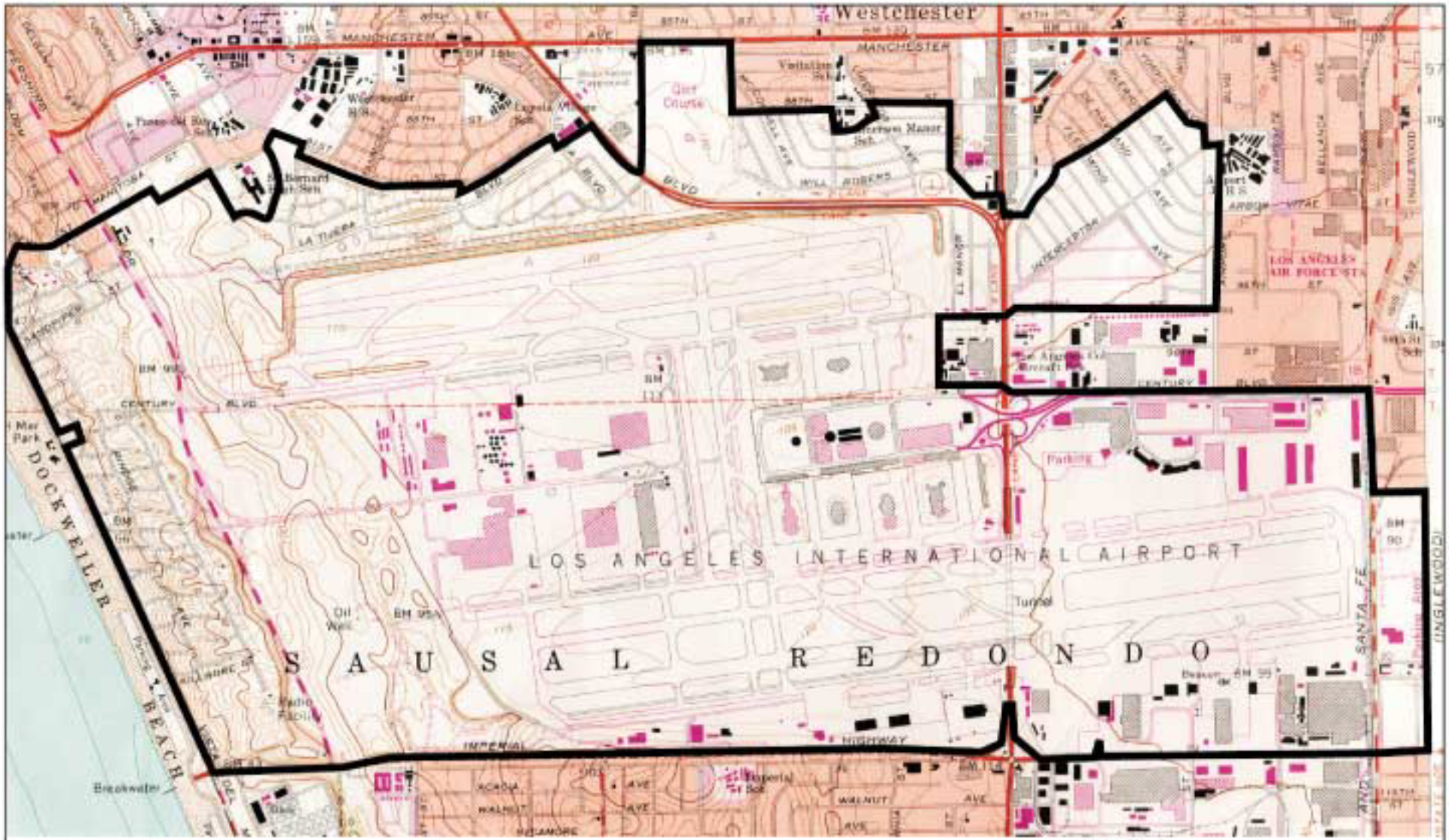
The USACOE and the CDFG exert jurisdiction over a variety of wetland habitats, which include vernal pools. The criteria for determining the significance of impacts are based on the importance of the wetland area, the proximity of the area to the project site, the proportion of the area that would be affected, the sensitivity of the area to the type of impact being considered, and the extent and degree of the proposed impact. The project would have a significant effect on wetlands if project-related activities were to result in the exceedance of any criteria established by the following: Section 404 of the Clean Water Act; Sections 7 and 9 of the Federal Endangered Species Act (ESA); Section 1600 of the State Fish and Game Code; Federal Aviation Administration (FAA) Order 5050-4A of the *Airport Environmental Handbook*; the National Register of Historic Places; and Executive Order 11990.

3.1 Project Description

Currently, Los Angeles International Airport (LAX) constitutes a large industrial district made up of the following facilities and uses: four east/west runways; 3.9 million square feet of domestic and international terminal space, including 145 narrow body equivalent gates and nine passenger terminals; 200 acres of cargo areas, including 1.9 million square feet of building space; 384 acres of ancillary space, including 30 acres of Los Angeles World Airports (LAWA) administrative and support facilities; 21,930 parking spaces; and 900 acres of open space, including 302 acres of Los Angeles/El Segundo Dunes. In order to meet the 2015 forecast for air passenger and air cargo demand, the FAA and the City of Los Angeles will evaluate the *LAX 2015 Master Plan* (Master Plan) alternatives capable of meeting most of the basic



Jurisdictional Delineation of Proposed Master Plan Improvements to Los Angeles International Airport Los Angeles County, California	**Regional Map**	**Figure 1**



Jurisdictional Delineation of Proposed Master Plan Improvements to Los Angeles International Airport Los Angeles County, California	**Vicinity Map**	**Figure 2**

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objectives of the proposed project. The Master Plan evaluates numerous project components, including, but not limited to: one or two additional 6,000-foot-long runways; relocation/extension of existing runways; improved taxiway system; new passenger terminal facilities west of Tom Bradley International Terminal, connected by an automatic people-mover system; expanded air cargo facilities; improvements to the ground access system, including connections to the regional highway and transit networks; the relocation of ancillary uses and other support facilities; and related land acquisition. A No Action/No Project Alternative and three build alternatives are described below.

3.1.1 No Action/No Project Alternative

This alternative is based on both airport and land use activities anticipated for the plan years 2005 and 2015 in the absence of any LAX Master Plan development. This scenario assumes continued growth in airport activity and continued construction of facility improvements that are under construction, fully entitled, and/or anticipated to require no environmental clearance.

3.1.2 Alternative A (Added Runway North)

Alternative A will add a new runway, Runway 24R, with a length of 6,700 feet and a width of 200 feet, on the north airfield approximately 400 feet north of current Runway 6L/24R. To complete this alternative, existing Runway 6L/24R in the north airfield will be relocated approximately 400 feet south of the existing Runway 6L/24R centerline and extended to 12,000 feet (new Runway 24C). Runway 6R/24L will be relocated 500 feet south of the existing Runway 6R/24L centerline and extended to 12,000 feet. In the south airfield, Runway 7L/25R will be reconstructed and widened to 200 feet on the existing runway centerline. Runway 7R/25L will be reconstructed and extended to 12,000 feet long and 200 feet wide, on a centerline 156 feet south of the existing runway centerline to allow for a center taxiway to be constructed between Runways 7R/25L and 7L/25R. The terminal facilities will be expanded to the west, with a new western entrance and landside terminal facilities to accommodate both the growing number of international operations at LAX and the increase in fleet size and passenger volume that accompanies such growth. The core passenger areas in the Central Terminal Area (CTA) will remain the same. The pier concourses on the CTA's north terminals and the Tom Bradley International Terminal (TBIT) will be reconfigured to allow a total of 195 gates split between the reconfigured CTA and New West Terminal Development. The New West Terminal Development area will be located on the west side of LAX, east of Pershing Drive. It will include construction of a new passenger processing terminal and construction of new concourses. Access to the new west short-term parking garage and the West Terminal to the concourses west of the TBIT and the CTA will be provided by a people-mover. Vehicular access to the West Terminal, CTA, TBIT, and other airport facilities will be enhanced by a new ring road around the perimeter that will connect with the I-405 and I-105 freeways. Cargo facilities will be expanded in the southeast corner of LAX, and additional land will be acquired in that area to provide more space for the cargo facility expansion.

To accommodate new facilities as planned in Alternative A, 273 acres of land must be acquired. All residents and businesses displaced in such a land acquisition must be relocated in compliance with all federal, state, and local regulations.

3.1.3 Alternative B (Added Runway South)

Alternative B will add a new 6,700-foot runway (Runway 25L) on the south side in the existing cargo area. To complete this alternative, the current south runways (Runways 7R/25L and 7L/25R) will be relocated to the north so that the lateral separation between the south inboard runway and the new runway will be 2,500 feet in length. In the north airfield, existing Runway 6R/24L will be extended to the east, while the west end of this runway will also be relocated to the east. These changes will result in a runway that is 12,000 feet long and 200 feet wide. In addition, the existing Runway 6L/24R centerline will be shifted to the north to allow room for a new taxiway between 6L/24R and 6R/24L. Terminal improvements and transportation improvements and access in this alternative will be similar to those described in Alternative A.

3.1.4 Alternative C (No Additional Runway)

Alternative C will improve the existing four runways by increasing their length and lateral separation. In the north airfield, Runway 6L/24R will be reconstructed approximately 350 feet north of the existing Runway 6L/24R centerline and extended to 9,400 feet long and 200 feet wide. Runway 6R/24L will be extended to 12,000 feet long and 200 feet wide along its existing centerline. In the south airfield, Runway 7R/25L will be relocated approximately 50 feet south of the existing Runway 7R/25L centerline at a length

of 11,096 feet to allow construction of a center taxiway between Runways 7R/25L and 7L/25R. Terminal improvements and transportation improvements and access in this alternative are similar to those described in Alternative A. Alternative C is the preferred alternative of the City of Los Angeles.

3.2 Regulatory Framework

3.2.1 Section 404 of the Clean Water Act

Impacts on wetland habitat (including marsh, riparian, or vernal pools) or other "waters of the United States" are defined in Section 404 of the Clean Water Act of 1977, as amended (40 CFR 230.10). This section authorizes the Secretary of the Army, acting through the Chief of Engineers, to exert jurisdiction over wetland habitat. Section 404 requires the USACOE to regulate discharges of dredge or fill material into "waters of the United States." Activities that result in the discharge of dredge or fill material into "waters of the United States" or wetlands are subject to permit by the USACOE. The USACOE may issue permits for the discharge of dredge or fill material under Section 404 in compliance with Section 404(b)(1) guidelines established by the U.S. Environmental Protection Agency. Section 404(b)(1) requires project proponents to document measures in order to avoid or minimize negative effects on wetlands in a stepwise manner. The guidelines require permits to be issued only in the absence of practical alternatives to the proposed discharge that would have less adverse impacts on aquatic ecosystems. The USACOE requires an individual permit for any activity that will affect an area in excess of ten acres of "waters of the United States." The USACOE has discretionary authority to require an Environmental Impact Statement for projects that result in impacts to an area of between 0.3 and ten acres. Projects that result in impacts of less than one acre of "waters of the United States" can be conducted pursuant to Nationwide Permit No. 26 if consistent with the standard permit conditions.

3.2.2 Sections 7 and 9 of the Endangered Species Act

Plant and animal species that are listed as federally-endangered or -threatened are provided protection pursuant to the amended Federal Endangered Species Act (ESA) of 1973. Section 9 of the ESA prohibits the "taking" of species listed by the U.S. Fish and Wildlife Service (USFWS) as threatened or endangered. As defined by the ESA, "taking" means "…*to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct*." In recognition that "take" cannot always be avoided, Section 7 includes a provision for take of plant species that are incidental to, but not the purpose of, otherwise lawful activities. Under Section 7 of the ESA, federal agencies are required, in consultation with the USFWS, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of these species. The USFWS recently completed a document entitled *Vernal Pools of Southern California Recovery Plan,* which describes four vernal pool-associated endangered species whose historic range includes the LAX airfield: San Diego button-celery (*Eryngium aristulatum* var. *parishii*), California orcutt grass (*Orcuttia californica*), San Diego fairy shrimp (*Branchinecta sandiegonensis*), and Riverside fairy shrimp (*Streptocephalus woottoni*).

3.2.3 Section 1600 of the State Fish and Game Code

Activities in stream courses are subject to the jurisdiction of the CDFG, pursuant to Section 1600 of the State Fish and Game Code. This jurisdiction includes all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream or lake in California that supports fish or wildlife resources. Under State Code, a stream is defined as a body of water that flows at least periodically, or intermittently, through a bed or channel having banks and supporting fish or other aquatic life. Included are watercourses with surface or subsurface flows that support or have supported riparian vegetation. The jurisdiction of the CDFG within altered or artificial waterways is based on the value of those waterways to fish and wildlife. The CDFG must be contacted for a Streambed Alteration Agreement for any project that may impact a streambed or wetland. The CDFG has maintained a "no net loss" policy regarding potential impact, and has required the replacement of lost habitats on at least an acre-for-acre ratio.

3.2.4 Federal Aviation Administration Guidelines

In accordance with proposed FAA guidelines for conducting environmental impact analyses, this analysis addresses considerations specified in Executive Order 11990, Protection of Wetlands: the action's overall effect on the survival and quality of the wetlands; aeronautical safety, transportation objectives, economics, and other factors bearing on the problem; consideration of the practicality of any alternatives;

inclusion of all practical measures to minimize harm; and compliance with the Fish and Wildlife Coordination Act.

The FAA requires a certificated airport to comply with the requirements of 14 CFR Part 139, specifically in accordance to wildlife hazards management, which guide routine operations and maintenance activities related to public safety. The FAA provides specific guidance related to protection of wetlands pursuant to FAA Order 50504A in the *Airport Environmental Handbook,* which states:

> Federal agencies shall … avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds: a) that there are no practicable alternatives to such construction, and b) that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use. [Chapter 5, Paragraph 47e (11) (b)]
>
> The term 'practicable' means feasible. Whether another alternative is practicable depends on its feasibility in terms of safety, meeting transportation objectives, design, engineering, environment, economics, and any other applicable factors. [Chapter 5, paragraph 47e(11) (e)]

3.2.5 National Register of Historic Places

The National Register of Historic Places (National Register) is the official list of cultural resources in the United States that have an historic value worthy of preservation. Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires that federal agencies consider any negative effects on cultural resources, listed or eligible to be listed in the National Register, in association with projects under their jurisdiction. The NHPA gives the Advisory Council on Historic Preservation the opportunity to comment on federally funded or licensed projects that have the potential to harm a resource listed on the National Register. The NHPA also mandates that federal agencies notify the Secretary of the Interior when a project has the potential to be detrimental to a listed cultural resource.

3.2.6 Executive Order 11990

Executive Order 11990 was established to further augment the National Environmental Policy Act (NEPA) in the protection of wetlands. It states that federal agencies must avoid, to the extent possible, any adverse impacts associated with wetlands. In holding federal agencies accountable for their actions, the goal of Executive Order 11990 is to insure that the agencies are cognizant of wetland areas during all phases of a proposed project.

4.0 STUDY METHODS

4.1 Review of Historic Topographic Maps and Aerial Photographs

During the initial phase of the jurisdictional delineation of the Los Angeles International Airport (LAX) airfield, a series of historic topographic maps (**Figure 3**, Vernal Pools Historically Present in the Vicinity of LAX (1918), **Figure 4**, Vernal Pools Historically Present in the Vicinity of LAX (1920), **Figure 5**, Vernal Pools Historically Present in the Vicinity of LAX (1934), and **Figure 6**, Vernal Pools Historically Present in the Vicinity of LAX (1944)) of the LAX airfield and immediate surrounding areas was reviewed, as was a series of historic aerial photographs (Appendix A). The review served to identify hydrologic and topographic features indicative of areas potentially subject to the jurisdiction of the U.S. Army Corps of Engineers (USACOE), pursuant to Section 404 of the Clean Water Act, and the California Department of Fish and Game (CDFG), pursuant to Section 1600 of the State Fish and Game Code. This review of the historic aerial photographs of the LAX airfield indicates that all undeveloped areas have been subjected to extensive grading, borrow and fill activities, and extensive earth moving activities over the last 25 years. The disturbance documented by the aerial photographs demonstrates that the majority of the airfield meets the criteria established by the USACOE for areas that do not constitute vernal pools, as defined in the USACOE Special Public Notice dated November 25, 1997.

The review of historic aerial photographs was verified and supported through interviews with staff in Environmental Management, Engineering, and Operations Bureaus of Los Angeles World Airports (LAWA). As a result of the interviews, it was determined that the airfield has been subjected to extensive borrow and fill activities. Historical documents and operating procedures for the airfield were reviewed.

Documented construction areas and other areas of known ground-disturbing activities were recorded on a set of 50-scale (1 inch:50 feet) topographic maps; these areas are shown in **Figure 7**, Historically Disturbed Areas. Soil survey maps for the County of Los Angeles were also reviewed, as was the National Wetlands Inventory Map (**Figure 8**, National Wetlands Inventory Map: Los Angeles Airport) prepared by the U.S. Fish and Wildlife Service (USFWS). The results of the review of historic aerial photographs and interviews were documented in a letter report and transmitted to the USACOE.[2] Areas within the LAX airfield are currently subject to regular operations and maintenance activities, as shown in **Figure 9**, Operations Maintenance and Safety Areas and Construction Staging Areas, for wildlife hazards management in accordance with Title 14, Code of Federal Regulations (CFR) Part 139.337.

4.2 Mapping and Monitoring of Ephemerally Wetted Areas Subject to U.S. Army Corps of Engineers and California Department of Fish and Game Jurisdiction

Upon recommendation by the USFWS, in a correspondence dated August 29, 1997, LAWA agreed to map and monitor all ephemerally wetted areas within the LAX airfield to determine the presence or absence of extant vernal pools that could potentially support sensitive plant and wildlife species. Prior to the 1997/1998 winter rains, a preliminary assessment of ephemeral wetted areas within the AOA was conducted. Field biologists searched for the presence of polygonal cracking on the soil surface, which is indicative of seasonally wetted areas. A total of twenty-eight potential sites were located and mapped during these preliminary dry season surveys. The purpose of this mapping was to determine if isolated areas maintained adequate hydrology to sustain habitat values and functions typically associated with "waters of the United States."

The USACOE directed the Federal Aviation Administration (FAA) and LAWA to consider the presence or absence of wetlands in light of the atypical situation caused by human activities. Under the atypical situation, ephemerally wetted areas that are seasonally inundated or saturated for more than 12.5% of the growing season in a year of at least average rainfall meet the criteria to be defined as "waters of the United States." The field delineation was undertaken in accordance with the USACOE *1987 Field Guide for Wetland Delineation*.[3] Following the intense rain that occurred on December 5, 6, and 7, 1997, all areas of standing water in the western portion of the airfield were mapped. All mapped areas were then monitored within ten days of each storm event. As expected, many of the previously mapped twenty-eight potential sites ponded. Additional sites of standing water were observed and mapped after the heavy rains of early December, bringing the total potential ephemeral wetted areas to fifty-two. These fifty-two discrete locations of standing water were likewise mapped (**Figure 10**, Ephemerally Wetted Areas Sampled for Soil Characterization Study). Ephemerally wetted areas were then marked with a stake, numbered, and monitored throughout the rainy season of 1997/1998, a season of above-average rainfall. Those areas that retained water for 12.5% of the growing season (eighteen days) were considered to have extant wetland hydrology. All vegetation on the sites was recorded to determine the presence/absence of a predominance of wetland vegetation. The Facultative Neutral Test, as described in the *1987 Field Guide to Wetland Delineation*, was applied to the vegetation on the sites during surveys conducted in spring 2000. Soil at each of the sites was also analyzed, as described below, for characteristics of wetland soils.

There are no areas subject to the authority of the CDFG, pursuant to Section 1600 of the State Fish and Game Code. The CDFG protects wetlands and other riparian resources by requiring a Streambed Alteration Agreement for projects that will divert or obstruct the natural flow of water, change the bed,

channel or bank of any stream, or use any material from a streambed. A review of historical aerial photographs and site reconnaissance resulted in the determination that there are no natural streams or lakes within the Master Plan boundaries.

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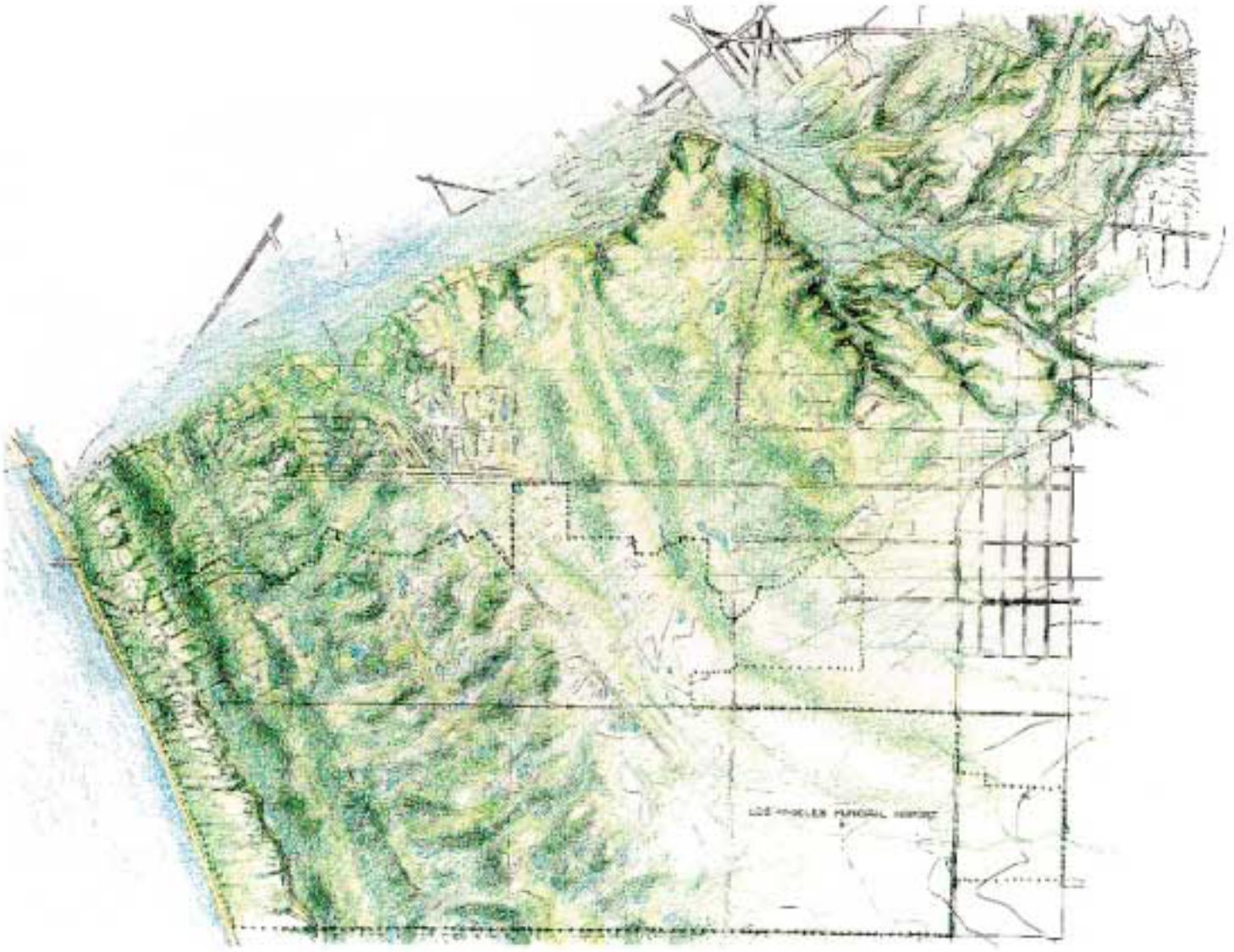
[2] Sapphos Environmental, Inc., Letter to Ms. Phelicia Gomes, U.S. Army Corps of Engineers, Los Angeles District, December 16, 1997.

[3] Wetland Training Institute, Inc., 1991, Field Guide for Wetland Delineation: Corps of Engineering Manual, 1987, pp. WT1 91-2, 133.



SOURCE: Wright Engineering Company, Property of Los Angeles Extension Company/ Inglewood Extension Company, California, 1918

N

Jurisdictional Delineation of Proposed Master Plan Improvements to Los Angeles International Airport Los Angeles County, California

Vernal Pools Historically Present in the Vicinity of LAX

Figure 3

w:\projects\1049-002\graphics\jdsection4\figure4.1-1a.ai

SOURCE: Wright Engineering Company, Property of Los Angeles Extension Company/ Inglewood Extension Company, California. 1920

Jurisdictional Delineation of Proposed Master Plan Improvements to Los Angeles International Airport Los Angeles County, California

Vernal Pools Historically Present in the Vicinity of LAX

Figure 4

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SOURCE: USGS Topographic Map of Venice, California Quadrangle: 7.5 Minute Series Map. 1934

Jurisdictional Delineation of Proposed Master Plan Improvements to Los Angeles International Airport Los Angeles County, California

Vernal Pools Historically Present in the Vicinity of LAX

Figure 5

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SOURCE: US Army Corps of Engineers, War Department, Declassified Topographic Map of Redondo, California Quadrangle : 15 Minute Series Map. 1944

Jurisdictional Delineation of Proposed Master Plan Improvements to Los Angeles International Airport Los Angeles County, California

Vernal Pools Historically Present in the Vicinity of LAX

Figure 6

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LEGEND

Areas Surveyed for Potential Vernal Pools

Areas of Construction, Staging, Burrow Sites, and Earth Movement

N

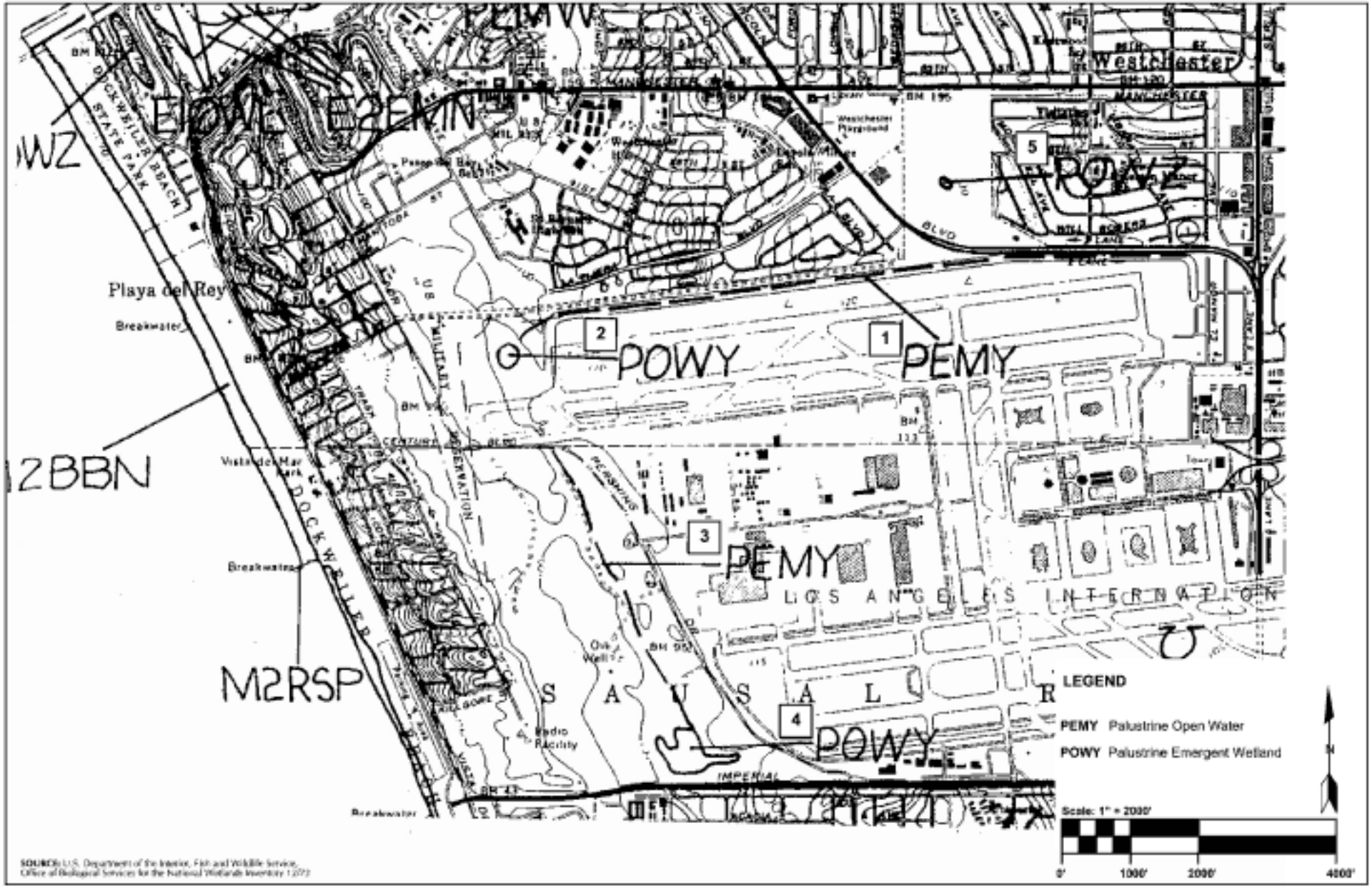
Not to Scale

Jurisdictional Delineation of Proposed Master Plan Improvements to Los Angeles International Airport
Los Angeles County, California

Historically Disturbed Areas

Figure
7

w:\projects\1049-007\graphs\gfxsection4\figure4.1-2.ftd



Jurisdictional Delineation of Proposed Master Plan Improvements to Los Angeles International Airport Los Angeles County, California	**National Wetlands Inventory Map: Los Angeles Airport**	Figure 8

w:\project\1049\002\gis\mxd\Section4\Figure4.1-3.fh8

LEGEND

- Openspace areas of routine airfield operations maintenance
- Construction, storage, fill, dirt excavation for dump site

N

Not to Scale

Jurisdictional Delineation of Proposed Master Plan Improvements to Los Angeles International Airport
Los Angeles County, California

Operations Maintenance and Safety Areas and Construction Staging Areas

Figure 9

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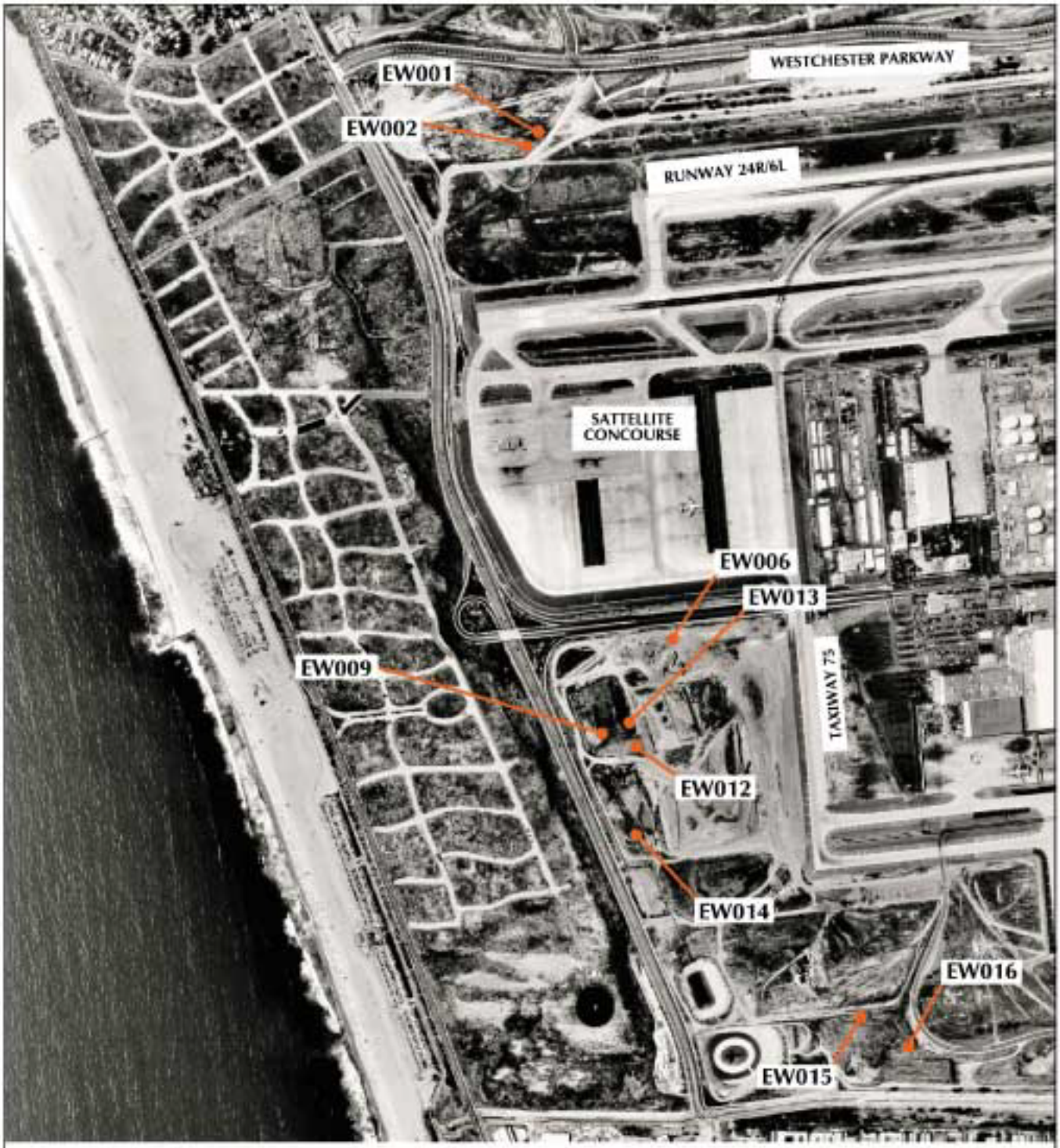

LEGEND

EW Emphemeral Wetted Areas

SOURCE: Continental Aerial Photo, Inc. 18571 Colle Lee Suite 163, Los Alamitos, CA 90720, JUNE 1993

0 150 300 600 900 FEET

Jurisdictional Delineation of Proposed Master Plan Improvements to Los Angeles International Airport Los Angeles County, California	**Areas Subject to USACOE Jurisdiction**	Figure 13

v:\projects\1049-002\graphics\[section1]\figure1-2-1.ai

4.3 Soil Characterization Study

As stipulated in the December 16, 1997[4] Sapphos Environmental, Inc. letter to the USACOE, LAWA conducted soil sampling from 50 of the 52 located and mapped ephemerally wetted areas. The purpose of the soil sampling was to assess the presence or absence of soils that are indicators for wetlands, vernal pools, or "waters of the United States," which would be potentially subject to the jurisdiction of the USACOE under Section 404 of the Clean Water Act. The characterization of soils followed protocol established by Lyon[5] and Wetland Training Institute[6], with particular emphasis placed on adhering to guidelines for atypical situations. A map of Hydric Soils of the United States[7] was reviewed.

Soil samples were collected on January 6, 7, and 23, 1998. Soil sampling was conducted three weeks after significant rainfall. Due to rain on January 8, 1998, sampling was completed on January 23 to allow for a two-week interval between the rain event and sampling. Each of the ephemerally wetted areas was located and identified from a 50-scale (1 inch:50 feet) blue-line aerial photograph, and then numbered in the field notes consistent with the original mapping number. Soil test pits were excavated to a depth of 12 inches wherever possible. Soil test pits were frequently limited to less than 12 inches by underlying hardpan or impermeable surface layer, such as consolidated sand bedrock or asphalt or preexisting roadbed. Data collected from soil test pits was recorded on standard wetland delineation forms (Appendix B). For each soil test pit, a description of each distinguishable soil layer was prepared. Munsell® Soil Color Charts were used to define soil color of each distinguishable soil layer or horizon. Soil texture was recorded. Presence or absence of soil mottles was noted. Each pit was photographed. A sampling of site photographs is included as Appendix C to this document. Four-pound bulk soil samples were collected at all but two of the 52 monitoring locations. The bulk samples were placed into plastic bags, sealed, and labeled according to site location and number. One of the sites was determined to be a plastic-lined drainage control site; therefore, no sample was collected. Another site was determined to be an asphalt roadbed; therefore, no sample was collected. Characteristics of wetland hydrology such as surface staining, inundation, and cracking were noted. Other site characteristics were noted, including evidence of grading, fill, discing, etc. All test pits were filled in before the site was abandoned.

The 50 soil samples were transferred to Food Growers Laboratory for analysis. All 50 soil samples were evaluated for soil texture (which determines the particle size) and percent organic content (which determines the percent of organic material in the soil). At the direction of the USACOE, 15 samples were also analyzed for permeability (which determines the rate at which water can pass through the soil sample) and soil suitability (which determines the pH and trace mineral content).

4.4 Directed Dry Season Surveys for Fairy Shrimp

There are two vernal pool-associated endangered fairy shrimp species whose historic range includes the LAX airfield: San Diego fairy shrimp (*Branchinecta sandiegoensis*) and Riverside fairy shrimp (*Streptocephalus wootton*i). San Diego fairy shrimp is a vernal pool habitat specialist found in small, shallow vernal pools, and has sometimes been recorded in degraded habitats such as ditches and road cuts.[8] The majority of pools inhabited by San Diego fairy shrimp are located in San Diego County, including: Marine Corps Base Camp Pendleton, inland to Ramona, south through Del Mar Mesa, Kearney Mesa, Proctor Valley, Otay Mesa, and into northwestern Baja California, Mexico.[9] The species has also been observed in Orange County and Santa Barbara County.

The Riverside fairy shrimp is a small freshwater crustacean. In its *Draft Recovery Plan*,[10] the USFWS describes the range for the Riverside fairy shrimp as extending from the Santa Rosa Plateau in Riverside County to coastal sites in Orange County, Naval Air Station/Marine Corps Base Camp Pendleton, eight complexes in Otay Mesa in San Diego County, and into northwestern Baja California, Mexico.

USFWS guidelines[11] for conducting fairy shrimp surveys specify that two years of data must be collected to determine the presence/absence of fairy shrimp species within vernal pools. The USFWS guidelines

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4 Sapphos Environmental, Inc., Letter to Ms. Phelicia Gomes, U.S. Army Corps of Engineers, Los Angeles District, December 16, 1997.
5 John G. Lyon, Practical Handbook for Wetland Identification and Delineation, Boca Raton: CRC Press, 1993, p. 157.
6 Wetland Training Institute, Inc., 1991, Field Guide for Wetland Delineation: 1987 Corps of Engineering Manual, WT1 91-2, 133 pp.
7 U.S. Department of Agriculture, Hydric Soils of the United States, Soil Conservation Service, 1987.
8 U.S. Fish and Wildlife Service, Vernal Pools of Southern California Draft Recovery Plan, Portland, Oregon, pp. 113-114, 1997.
9 U.S. Fish and Wildlife Service, Vernal Pools of Southern California Draft Recovery Plan, Portland, Oregon, pp. 113-114, 1997.
10 U.S. Fish and Wildlife Service, Vernal Pools of Southern California Draft Recovery Plan, Portland, Oregon, pp. 113-114, 1997.
11 U.S. Fish and Wildlife Service, "Interim Survey Guidelines to Permitees for Recovery Permits under Section 10(a)(1)(A) of the

state that a complete survey consists of sampling for either two full wet season surveys within a five-year period or two consecutive seasons of one full wet season survey and one dry season survey (or one dry season survey and one full wet season survey). In lieu of two separate years of wet season sampling, one season of dry soil sampling was substituted, followed by a full wet season survey, both of which were conducted within two consecutive years.

Dry season surveys were conducted on September 18, 1997 by Jacob Moorad from the Department of Biology at the University of San Diego (Branchiopod Research Group, under a federal recovery permit). Areas sampled included two sites observed to contain ostracod shells and labeled EW 002 (**Figure 11,** Ephemerally Wetted Areas 1-5 Surveyed for Vernal Pool Plants and Riverside Fairy Shrimp), and EW 014 **Figure 12**, Ephemerally Wetted Areas 6-47 Surveyed for Vernal Pool Plants and Riverside Fairy Shrimp Areas) on the map of the study area.

Dry season surveys were also conducted in November 1997 by RECON (Mr. Cam Patterson). Dry season surveys to assess the presence or absence of fairy shrimp cysts were conducted in conjunction with dry season identification and mapping of potential wetted areas at LAX. Surveys were conducted in accordance with RECON's USFWS permit (PRT-797665) and the survey guidelines for vernal pool branchiopods[12] (**Figures 11** and **12**). A total of 16 sites were sampled for branchiopods, including the San Diego and Riverside fairy shrimp. Originally, 28 sites were identified prior to the wet season as potential ephemeral wetted areas supporting vernal pool species; however, 12 of the sites were determined to be too shallow and without appropriate vegetation. Of the remaining 16 sites, ten soil samples of approximately 3.4 fl. oz. (100 ml) were taken from each locality for a total soil sample volume of approximately 34 fl. oz. (1 liter) per site.

4.5 Directed Wet Season Surveys for Fairy Shrimp

El Niño-influenced rainfall occurred early within the wet season of 1997/1998, and resulted in the ponding of water in several areas for periods sufficient to allow for the hatching of fairy shrimp in the pools at LAX. Within five to seven days of rain events, Sapphos Environmental, Inc. personnel were contacted by telephone to ascertain if rainfall amounts were sufficient to result in standing water. If standing water persisted for at least ten days, fairy shrimp sampling was conducted by RECON personnel. All fairy shrimp surveys were conducted by personnel authorized under USFWS Permit PRT-797665. RECON permitted biologists visited each site and conducted sampling to determine the presence of fairy shrimp during the wet season (**Table 1**, Survey Details: Los Angeles International Airport). Wet season surveys were conducted in December of 1997 and January, March, and April of 1998 in accordance with the USFWS guidelines[13] for wet season surveys.

Table 1

Survey Details: Los Angeles International Airport

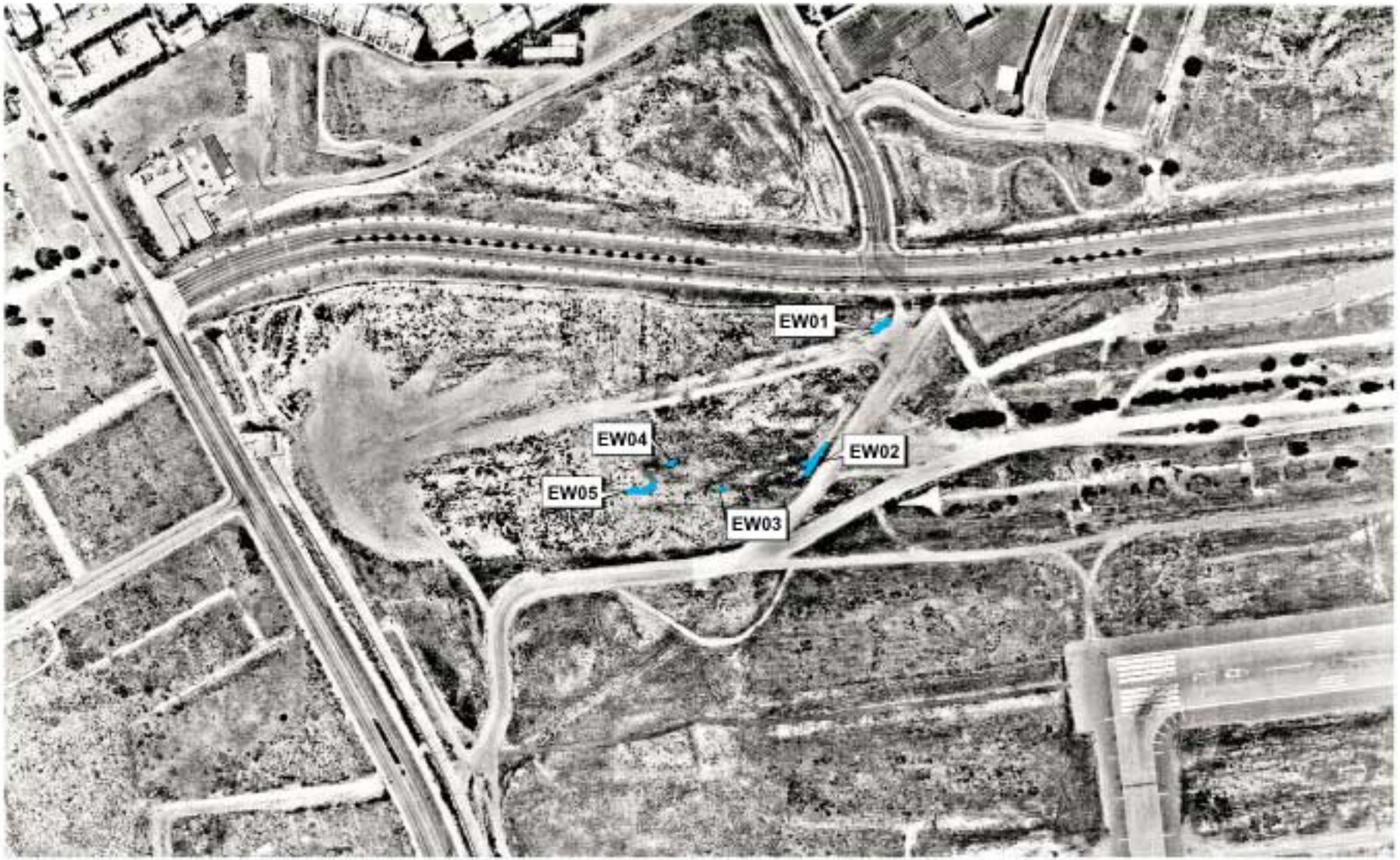
Date	Personnel	Type of Survey
11/06/97	Steve Patterson, Cam Patterson, Terri Ayers	Dry season soil sampling
12/19/97	Steve Patterson, Cam Patterson, Terri Ayers	Wet season fairy shrimp survey
01/08/98	Steve Patterson, Cam Patterson	Wet season fairy shrimp survey
01/23/98	Steve Patterson, Cam Patterson	Wet season fairy shrimp survey
03/05/98	Steve Patterson, Cam Patterson	Wet season fairy shrimp survey
03/26/98	Steve Patterson, Cam Patterson	Wet season fairy shrimp survey
04/16/98	Steve Patterson, Brad Blood, Cam Patterson	Wet season fairy shrimp survey

Source: Sapphos Environmental, Inc. 2000

Endangered Species Act for the Listed Vernal Pool Branchiopods," Carlsbad Field Office, Carlsbad, California, 1996.

[12] U.S. Fish and Wildlife Service, "Interim Survey Guidelines to Permitees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods," Carlsbad Field Office, Carlsbad, California, 1996.

[13] U.S. Fish and Wildlife Service, Interim Survey Guidelines to Permitees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods, Carlsbad Field Office, Carlsbad, California, 1996.



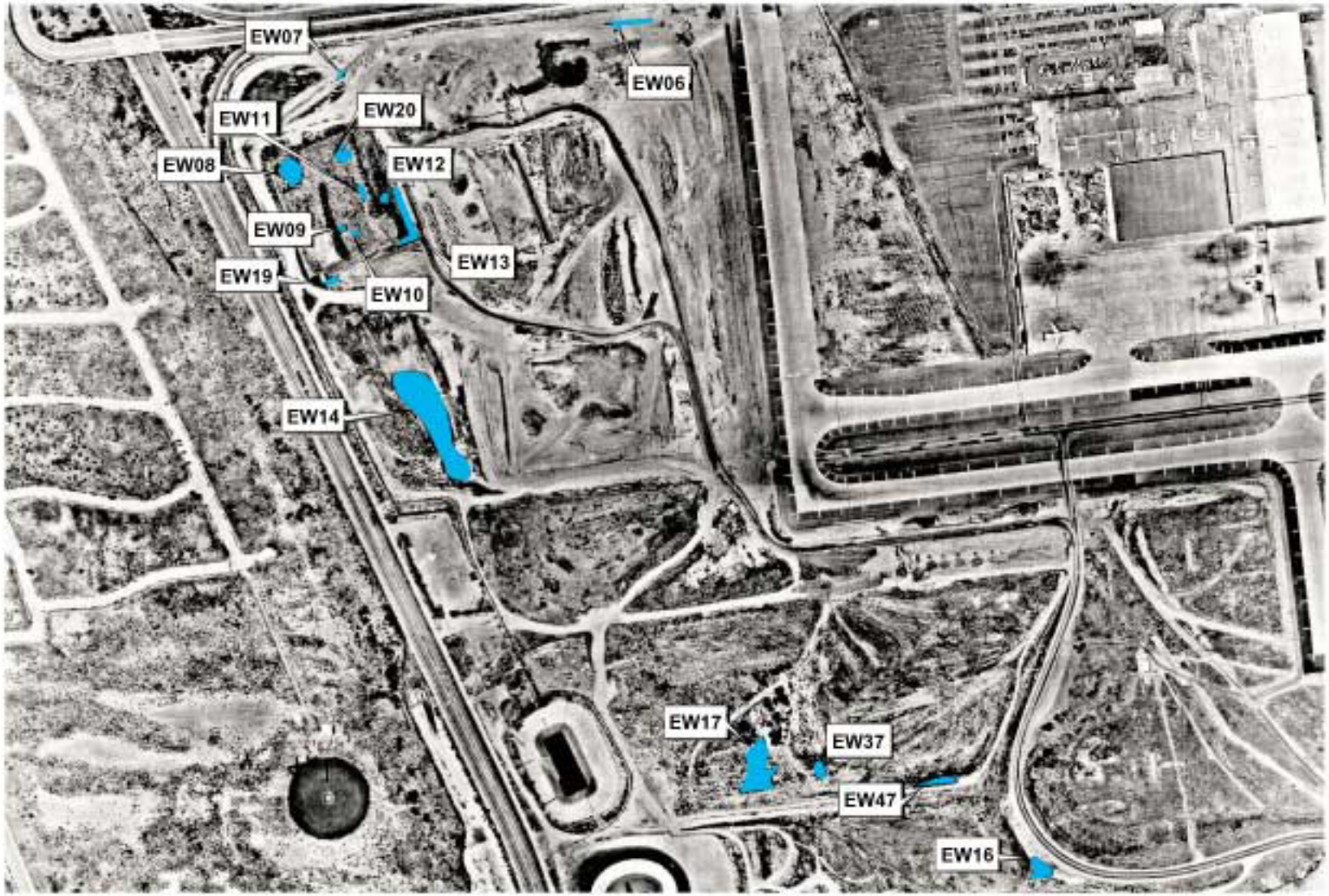
Source: Continental Aerial Photo, Inc. JUNE 1995

Not to Scale

Jurisdictional Delineation of
Proposed Master Plan Improvements to Los Angeles International Airport
Los Angeles County, California

Ephemerally-Wetted Areas 1-5 Surveyed for Vernal Pool Plants and Riverside Fairy Shrimp

Figure
11



Not to Scale

Source: Continental Aerial Photo Inc. (JUNE 1995)

Jurisdictional Delineation of
Proposed Master Plan Improvements to Los Angeles International Airport
Los Angeles County, California

Ephemerally-Wetted Areas 6-47 Surveyed for Vernal Pool Plants and Riverside Fairy Shrimp

Figure
12

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Fairy shrimp were sampled by sweeping with a hand-held or pole-mounted net through the water column in the pool and examining the net for invertebrates. Mature fairy shrimp species were identified to the species level. Survey visits were timed to correspond with observed hatching of fairy shrimp at other sites throughout Southern California that were being surveyed concurrently by RECON (March Air Force Reserve Base, Hemet, Marine Corps Base Camp Pendleton, Marine Corps Air Station Miramar, and Otay Mesa).

4.6 Directed Surveys for Threatened and Endangered Species

Surveys for threatened and endangered plants were conducted within the Master Plan boundaries. Two federally-listed endangered plant species, California orcutt grass (*Orcuttia californica*) and San Diego button-celery (*Eryngium aristulatum* var. *parishii*), were described by the USFWS as having historic ranges that include the Master Plan boundaries or Los Angeles/El Segundo Dunes.[14] These two endangered plant species are associated with vernal pool habitats.

San Diego button-celery is an annual/perennial herb that blooms between April and June.[15] San Diego button-celery is currently known from locations as far north as the Santa Rosa Plateau in Riverside County to the south, on mesas north of Ensenada, Mesa de Colonet, and San Quintin, Baja California, Mexico.[16]

California orcutt grass is an annual herb that blooms between April and June.[17] California orcutt grass is known from Placerita Canyon and Woodland Hills in Los Angeles County, Santa Rosa Plateau in Riverside County, and in pool complexes at Naval Air Station Miramar and Otay Mesa in San Diego County.[18]

Sapphos Environmental, Inc. (Dr. Steve Patterson, Dr. Irena Mendez, and Mr. Rob Witthaus) conducted directed surveys for vernal pool-associated plant species in the study area on November 11 and December 19, 1997, and January 8 and 23, March 5 and 26, April 16, July 9, and September 1, 1998. Surveys were conducted by walking the perimeters of all ponded areas and observing plant life growing in the vicinity of standing water.

In addition to surveys for California orcutt grass and San Diego button-celery in ponded areas within the study area, Sapphos Environmental, Inc. surveyed extant vernal pools known to support populations of these species. Vernal pools south of the study area at Miramar Air Force Base and Santa Rosa Plateau were surveyed on February 20, April 15, and July 8, 1998. Surveys of vernal pools north of the study area at the Cruzan Mesa were conducted on March 27 and June 30, 1998. San Diego button-celery was observed at the vernal pools south of the study area, and California orcutt grass was observed in the pools at the Cruzan Mesa. Both species were observed in vegetative and flowering stages of their life cycles. Observations of these reference populations were used to determine presence/absence of these species during directed surveys of ponded areas within the Master Plan boundaries or Los Angeles/El Segundo Dunes.

An additional seven plant species were found to have the potential to occur in the Master Plan boundaries as a result of queries of the California Natural Diversity Database (CNDDB) and local experts. Directed surveys for listed endangered and threatened plant species with the potential to occur within the Master Plan boundaries were conducted in 1998 and repeated in 2000. Directed surveys were undertaken in accordance with the protocols established by the California Native Plant Society and adopted by the CDFG. Directed surveys were performed by qualified Sapphos Environmental, Inc. biologists familiar with the natural history of these plant species. The results of these directed surveys were further augmented by qualitative surveys[19] for sensitive plants undertaken at the Los Angeles/El Segundo Dunes in 1995, 1996, 1997, 1998, and 1999.

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[14] U.S. Fish and Wildlife Service, Carlsbad, California, Letter to Mr. David B. Kessler, Federal Aviation Administration, U.S. Department of Transportation, August 29 1997.

[15] M. W. Skinner and B. M. Pavlik, California Native Plant Society's Inventory of Rare and Endangered Vascular Plants, Sacramento: California Native Plant Society, 1994.

[16] U.S. Fish and Wildlife Service, Carlsbad, California, Letter to Mr. David B. Kessler, Federal Aviation Administration, U.S. Department of Transportation, August 29, 1997.

[17] M. W. Skinner and B. M. Pavlik, California Native Plant Society's Inventory of Rare and Endangered Vascular Plants, Sacramento: California Native Plant Society, 1994.

[18] U.S. Fish and Wildlife Service, Carlsbad, California, Letter dated to Mr. David B. Kessler, Federal Aviation Administration, U.S. Department of Transportation, August 29, 1997.

[19] Qualitative surveys are performed by walking meandering transects through a predetermined area.

Beach spectacle-pod (*Dithyrea maritima*) is a perennial rhizomatous herb with yellowish flowers that blooms throughout the year. It is typically found in coastal dunes and scrub.[20] It is a state-listed threatened species, and is known in California from less than 20 occurrences.[21] Beach spectacle-pod was historically present at the Los Angeles/El Segundo Dunes.[22] The recently observed population at Hermosa Beach, approximately three miles south of the study area, was extirpated in 1998.[23] Currently, the nearest presumed extant occurrence of beach spectacle-pod is approximately two miles north of the study area in the vicinity of the Ballona Marshes.[24] This occurrence was most recently observed in 1903. The species was not observed during directed surveys in spring 1996, 1997, 1998, or 2000, and is not expected to occur in the Master Plan study area.[25]

Santa Monica Mountains dudleya (*Dudleya cymosa ssp. marcescens*) is a perennial plant with fleshy, smooth leaves and bright yellow flowers, occasionally with orange or red marks.[26] It blooms from March to June.[27] It is typically known from shaded, rocky outcrops amongst chaparral and coastal sage scrub habitats.[28] Santa Monica Mountains dudleya is a federally-listed threatened species. The nearest recorded occurrence for this species is approximately 15 miles north of the study area in Topanga State Park.[29] This species has not been observed in the study area as a result of directed surveys undertaken in May and June 2000, and is not expected to occur due to lack of suitable habitat.

Braunton's milkvetch (*Astragalus brauntonii*) is a perennial herb with dull purple flowers that bloom from March through July.[30, 31] It is a federally-listed endangered species, and is typically found in disturbed chaparral or gravelly, clay soils overlying granite or limestone.[32, 33] The nearest recorded occurrence of this species is near Will Rogers State Park, approximately ten miles northwest of the Master Plan study area. This species has not been observed in the study area, and is not expected to occur due to lack of suitable habitat.

Coastal dunes milkvetch (*Astragalus tener* var. *titi*) is an annual herb with purple flowers that bloom from April through May. It is both federally- and state-listed as endangered, and is found in moist, sandy depressions near the coast, typically coastal bluffs or dunes.[34] Historic records indicate it has occurred in the Master Plan study area.[35] Currently, it is known only from a site in Monterey Bay, approximately 270 miles north of the study area, with the possibility of persistence on military dune property in San Diego, approximately 80 miles south of the study area. Coastal dunes milkvetch was not observed in the study area during surveys conducted in spring 1996, 1997, 1998, and 2000, and is not expected to occur.[36]

Ventura marsh milkvetch (*Astragalus pycnostachyus* var. *lanosissimus*) is a perennial herb with greenish-white- to cream-colored flowers that bloom from July through October.[37, 38] This species is proposed for federal and state listing as endangered. Its occurrence was recorded at the Ballona Marsh, two miles north of the study area, in two collections dated 1881 and 1902. It was considered extinct for approximately 30 years, but was rediscovered in 1997 at a site in Ventura County.[39] Location information

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20 Qualitative surveys are performed by walking meandering transects through a predetermined area.

21 M. W. Skinner and B. M. Pavlik, California Native Plant Society's Inventory of Rare and Endangered Vascular Plants, Sacramento: California Native Plant Society, 1994.

22 California Department of Fish and Game, California Natural Diversity Database-Rarefind 2, Sacramento, 1999.

23 California Department of Fish and Game, California Natural Diversity Database-Rarefind 2, Sacramento, 1999.

24 California Department of Fish and Game, California Natural Diversity Database-Rarefind 2, Sacramento, 1999.

25 Sapphos Environmental, Inc., Technical Memorandum, November 8, 1996.

26 James C. Hickman, ed., The Jepson Manual: Higher Plants of California, Berkeley: University of California Press, 1993.

27 M. W. Skinner and B. M. Pavlik, California Native Plant Society's Inventory of Rare and Endangered Vascular Plants, Sacramento: California Native Plant Society, 1994.

28 M. W. Skinner and B. M. Pavlik, California Native Plant Society's Inventory of Rare and Endangered Vascular Plants, Sacramento: California Native Plant Society, 1994.

29 California Department of Fish and Game, California Natural Diversity Database-Rarefind 2, Sacramento, 1999.

30 M. W. Skinner and B. M. Pavlik, California Native Plant Society's Inventory of Rare and Endangered Vascular Plants, Sacramento: California Native Plant Society, 1994.

31 James C. Hickman, ed., The Jepson Manual: Higher Plants of California, Berkeley: University of California Press, 1993.

32 James C. Hickman, ed., 1993, The Jepson Manual: Higher Plants of California, Berkeley: University of California Press.

33 California Department of Fish and Game, California Natural Diversity Database-Rarefind 2, Sacramento, 1999.

34 James C. Hickman, ed., The Jepson Manual: Higher Plants of California, Berkeley: University of California Press, 1993.

35 W. D. Pierce and D. Pool, The Fauna and Flora of the El Segundo Sand Dunes, Bulletin of the Southern California Academy of Sciences, 1938; 37: 93-97.

36 Sapphos Environmental, Inc., Technical Memorandum, Subject: Biotic Communities/Threatened and Endangered Species, Literature Review for the LAX Master Plan and EIR, Prepared for the City of Los Angeles, Department of Airports, Program Management Team, November 8, 1996.

37 James C. Hickman, ed., The Jepson Manual: Higher Plants of California, Berkeley: University of California Press, 1993.

38 M. W. Skinner and B. M. Pavlik, California Native Plant Society's Inventory of Rare and Endangered Vascular Plants, Sacramento: California Native Plant Society, 1994.

39 California Department of Fish and Game, California Natural Diversity Database-Rarefind 2, Sacramento, 1999.

is not available for this occurrence. The characteristic habitat of this species is described as coastal marshes and seeps, but the recently rediscovered specimen was found on degraded coastal dune on imported fill.[40] This species has not been observed in the study area, and is not expected to occur.

Salt marsh bird's-beak (*Cordylanthus maritimus* ssp. *martitimus*) is an annual herb, gray-green in color, often tinged purple, that blooms from May through October.[41, 42] It is both federally- and state-listed as endangered.[43] It is known to occur in coastal dunes and salt marshes.[44] Salt marsh bird's-beak was historically known to exist in the vicinity, approximately five miles northwest and 17 miles southeast of the study area. No exact location was known in the Santa Monica vicinity, and the species was probably extirpated at this site.[45] At the southwest location, the species has been presumed extirpated.[46] The species is not expected to occur in the study area due to unsuitable habitat and based on qualitative surveys.[47]

Mexican flannelbush (*Fremonfodendon mexicana*) is an evergreen shrub with red-orange flowers that bloom from April through June.[48] It is a federally-listed endangered species. Mexican flannelbush is typically found in canyons in chaparral habitat on gabbroic or serpentine soils.[49] The nearest record for this species is from the vicinity of the Los Verdes Golf Course, approximately 12 miles south of the study area. This species has not been observed in the study area, and is not expected to occur due to lack of suitable habitat.

In addition to directed surveys for vernal pool-associated listed wildlife species, surveys were conducted for seven listed wildlife species with potential to occur within the Master Plan study area. These species were shown to have the potential to occur in the Master Plan study area as a result of a query of the CNDDB and local experts, in addition to consultation with the CDFG and USFWS.

Directed surveys for the federally-listed El Segundo blue butterfly have been conducted annually since 1984 (with the exception of 1985) at the Los Angeles/El Segundo Dunes. Directed surveys have employed a transect count method established in 1984 and modified in 1986. Transect surveys and block counts were performed by qualified biologists under a federal permit issued to Sapphos Environmental, Inc., pursuant to Section 10(a) of the Federal Endangered Species Act. Results of directed surveys for the El Segundo blue butterfly were transmitted to the USFWS upon completion of directed surveys in 1997, 1998, and 1999. Directed surveys will be repeated in summer 2000.

The analysis of the potential effects and adverse impacts of increased jet fly-overs on the El Segundo blue butterfly due to increases in jet exhaust emissions is based on a one-year field investigation of air emissions and deposition undertaken at the Los Angeles/El Segundo Dunes.[50]

Directed surveys for the California brown pelican, American peregrine falcon, California least tern, southwestern willow flycatcher, and least Bell's vireo were conducted in 1998; surveys for California brown pelican, American peregrine falcon, and California least tern were then repeated in 2000 to confirm the results of the 1998 surveys. Surveys for southwestern willow flycatcher and least Bell's vireo were not repeated due to lack of suitable habitat for these species within the study area. However, a habitat assessment for southwestern willow flycatcher and least Bell's vireo was undertaken in 2000 in accordance with protocols established by the USFWS. There are no survey protocols for California brown pelican, American peregrine falcon, and California least tern; however, six repeated surveys were performed. Surveys for all bird species were performed by Sapphos Environmental, Inc. biologists familiar with the natural history and behavior of each species.

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40 California Department of Fish and Game, California Natural Diversity Database-Rarefind 2, Sacramento, 1999.

41 James C. Hickman, ed., The Jepson Manual: Higher Plants of California, Berkeley: University of California Press.

42 M. W. Skinner and B. M. Pavlik, California Native Plant Society's Inventory of Rare and Endangered Vascular Plants, Sacramento: California Native Plant Society, 1994.

43 California Department of Fish and Game, California Natural Diversity Database-Rarefind 2, Sacramento, 1999.

44 M. W. Skinner and B. M. Pavlik, California Native Plant Society's Inventory of Rare and Endangered Vascular Plants, Sacramento: California Native Plant Society, 1994.

45 California Department of Fish and Game, California Natural Diversity Database-Rarefind 2, Sacramento, 1999.

46 California Department of Fish and Game, California Natural Diversity Database-Rarefind 2, Sacramento, 1999.

47 Sapphos Environmental, Inc, Technical Memorandum, Subject: Biotic Communities/Threatened and Endangered Species, Literature Review for the LAX Master Plan and EIR, Prepared for the City of Los Angeles, Department of Airports, Program Management Team; November 8, 1996.

48 M. W. Skinner and B. M. Pavlik, California Native Plant Society's Inventory of Rare and Endangered Vascular Plants, Sacramento: California Native Plant Society, 1994.

49 M. W. Skinner and B. M. Pavlik, California Native Plant Society's Inventory of Rare and Endangered Vascular Plants, Sacramento: California Native Plant Society, 1994.

50 Venkatesan, M. I. and K. A. Boyle, Analyses of Hydrocarbons and Trace Metals in Environmental Samples in support of Los Angeles International Airport 2015 Master Plan Expansion Project EIS/EIR, Prepared for Sapphos Environmental, Inc., June 28, 1999.

Directed surveys for least Bell's vireo and southwestern willow flycatcher were performed in 1998 by a qualified biologist permitted to perform such surveys by the USFWS pursuant to Section 10(a) of the Federal Endangered Species Act. A qualified biologist also surveyed for the California brown pelican, American peregrine falcon, and the California least tern (a federal permit is not required to survey for these species). Results of directed surveys for California brown pelican and California least tern were transmitted to the USFWS in December 1998. Results of directed surveys for American peregrine falcon, least Bell's vireo, and southwestern willow flycatcher were transmitted to the USFWS in September 1998.

Directed surveys for the Pacific pocket mouse were undertaken in September 1997 by qualified biologists permitted to conduct such surveys by the USFWS pursuant to Section 10(a) of the Federal Endangered Species Act. These surveys were repeated in the summer of 2000 to confirm the results obtained during surveys in 1997. Results of the 1997 directed surveys for the Pacific pocket mouse were transmitted to the USFWS in January 1998.

4.7 Habitat Evaluation Procedure Analysis

A modified Habitat Evaluation Procedure (HEP) was undertaken to evaluate the effect of each alternative on biotic communities within the study area.[51] Based on the modified HEP, environmental consequences of the No Action/No Project Alternative and the three build alternatives on sensitive flora and fauna were quantified by the calculation of habitat units[52] based on the number of acres within each biotic community, multiplied by its habitat value. Acreages were obtained utilizing a planimeter to determine the area associated with each biotic community present in each alternative. The modified HEP yielded habitat values and acreages (calculated in habitat units) for each of the habitat types present within the study area as compared with a target biotic community identified at reference sites. Historic records for areas within the Master Plan boundaries indicate that the target biotic community is a matrix of Valley Needlegrass Grassland and associated vernal pools.[53,54]

Model reference sites, identified as representing optimal habitats for a multitude of floral and faunal species, were used to evaluate the habitats within the study area. The reference sites used for this analysis were the Santa Rosa Plateau in Riverside County and the Carrizo Plain Natural Area in San Luis Obispo County. Both of these sites are comprised of native Valley Needlegrass Grassland habitat interspersed with vernal pools, and both support a diverse assemblage of native species in a configuration that maintains habitat function and species viability. Optimal habitat values (HV) were assigned to each of four criteria used to assess habitat quality at the sites: site topography/hydrology (HV = 0.2), flora (HV = 0.2), fauna (HV = 0.2), and ecosystem functional integrity (HV = 0.4). These criteria were developed based on characteristics of the same criteria found in an optimal Valley Needlegrass Grassland/vernal pool complex;[55, 56] when combined, the total habitat value for the optimal site is 1.

Each criterion was evaluated for the presence/absence of four specific characteristics, allowing for quantification of the suitability of habitats within the study area for the species expected to occur in an optimal Valley Needlegrass Grassland/vernal pool complex. The topography/hydrology criterion for an optimal Valley Needlegrass Grassland/vernal pool complex was assigned a habitat value of 0.2 based on the contribution of a habitat value of 0.05 from each of the following characteristics: mound-depression microrelief, native soils with a slope of less than 10%, areas with a period of inundation greater or equal to 30 days, and summer desiccation.[57] The floral criterion was assigned a habitat value of 0.2 based on the contribution of a habitat value of 0.05 from each of the following characteristics: vegetative cover greater than 10%, native grass cover greater than 10%, sensitive vernal pool associated-species, and listed vernal pool associated species. The faunal criterion was assigned a habitat value of 0.2 based on the contribution of a habitat value of 0.05 from each of the following characteristics: dominated by native

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51 A Habitat Evaluation Procedure is a method of quantifying habitats using the product of the suitability of the habitat for species in the area and the extent of the habitat in that area. This procedure was modified to specifically address the Valley Needlegrass Grassland/Vernal Pool complex historically present in the study area.

52 A habitat unit is a quantitative expression of habitat quality for given biotic community when compared to a reference site.

53 W. D. Pierce and D. Pool, The Fauna and Flora of the El Segundo Sand Dunes, Bulletin of the Southern California Academy of Sciences, 1938; 37: 93-97.

54 Topographic map, Property of Los Angeles Expansion Company, Inglewood Extension Company and adjacent property, Johnson, Fein, and Associates, 1918.

55 Witham, Carol W., Ecology, Conservation, and Management of Vernal Pool Ecosystems, California Native Plant Society, Sacramento, CA, ed. 1996.

56 U.S. Fish and Wildlife Service, Recovery Plan for Vernal Pools of Southern California, Region 1, Portland, Oregon, 1998.

57 These and the following listed characteristics are defined in Jon E. Kelley's Characterization and Global Distribution of Vernal Pools, in Ecology, Conservation, and Management of Vernal Pool Ecosystems: Proceedings from a 1996 Conference, Carol W. Witham, ed., California Native Plant Society, Sacramento, 1998.

fauna, grassland-associated species, vernal pool associated species, and listed vernal pool-associated species. Each of these characteristics had to show evidence of reproduction. The ecosystem functional integrity criterion[58] was assigned a habitat value of 0.4 based on the contribution of a habitat value of 0.1 from each of the following characteristics: contiguity with wetland and state-designated sensitive terrestrial habitat, regulatory conservation,[59] variety of pollinator/dispersal mechanisms present (i.e., wildlife, wind), and contiguous native habitat greater than 40 acres. A summary of the results of the modified HEP is presented in **Table 2**, Modified Habitat Evaluation Procedure for the Master Plan Study Area.

Habitat units for biotic communities within the study area are presented in **Table 3**, Habitat Units for Biotic Communities. Habitat units are used to develop mitigation of impacts to degraded habitats within the study area, with higher quality habitat at a ratio that reflects the increased value of habitats being restored.

[58] The functional integrity of an ecosystem is defined as the ability of a given habitat or group of habitats to maintain, over time, the complex interactions between the native flora and fauna characteristics of that habitat or group of habitats.

[59] Regulatory conservation refers to the established protection and conservation of a habitat as mandated by one or more regulatory agencies having jurisdiction over that habitat.

Table 2

Modified Habitat Evaluation Procedure for the Master Plan Study Area

		Master Plan Boundaries: Habitat Value				Los Angeles/El Segundo Dunes: Habitat Value					
	Habitat Value Reference Sites	Non-Native Grassland/ Rudder	Disturbed/ Bare Ground	Landscaped	Developed	Southern Foredune	Southern Dune Scrub	Disturbed Dune Scrub/ Foredune	Valley Needlegrass Grassland	Non-Native Grassland/ Ruderal	Developed
Topography/Hydrology	**0.20**	**0.05**	**0.05**	**0.00**	**0.00**	**0.05**	**0.05**	**0.05**	**0.15**	**0.15**	**0.00**
Mound-Depression Microrelief	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00
Native Soils w/Slope <10%	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00
Areas w/Period of Inundation ≥30 days	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Summer Desiccation	0.05	0.05	0.05	0.00	0.00	0.05	0.05	0.05	0.05	0.05	0.00
Flora	**0.20**	**0.05**	**0.00**	**0.05**	**0.00**	**0.05**	**0.05**	**0.05**	**0.10**	**0.05**	**0.00**
>10% Vegetative Cover	0.05	0.05	0.00	0.05	0.00	0.05	0.05	0.05	0.05	0.05	0.00
Native Grasses >10%	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
Vernal Pool Associated Species	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Listed Vernal Pool Associated Species	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fauna	**0.20**	**0.05**	**0.05**	**0.00**	**0.00**	**0.05**	**0.05**	**0.05**	**0.10**	**0.00**	**0.00**
Dominated by Native Fauna (reproducing)	0.05	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.05	0.00	0.00
Grassland-associated Species (reproducing)	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
Sensitive Vernal Pool Associated Species (reproducing)	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Listed Vernal Pool Associated Species (reproducing)	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ECOSYSTEM FUNCTIONAL INTEGRITY	**0.40**	**0.00**	**0.00**	**0.00**	**0.00**	**0.30**	**0.20**	**0.20**	**0.30**	**0.00**	**0.00**
Contiguous w/wetland and State-designated Sensitive Terrestrial Habitat	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Under Regulatory Conservation	0.10	0.00	0.00	0.00	0.00	0.10	0.1	0.00	0.10	0.00	0.00
Variety of Pollinator/dispersal mechanisms present (wind, wildlife)	0.10	0.00	0.00	0.00	0.00	0.10	0.1	0.10	0.10	0.00	0.00
Contiguous native habitat >40 acres	0.10	0.00	0.00	0.00	0.00	0.10	0.00	0.10	0.10	0.00	0.00
TOTAL HABITAT VALUE (HV)	**1.00**	**0.15**	**0.10**	**0.05**	**0.00**	**0.45**	**0.35**	**0.35**	**0.65**	**0.20**	**0.00**

Source: Sapphos Environmental, Inc. 2000

Table 3

Habitat Units for Biotic Communities

	Environmental Baseline			Alternative											
				No Action/No Project			A			B			C		
	Base-line (Acres)	Habitat Value	Habitat Units (Acres)	2005/ 2015 (Acres)	Habitat Value	Habitat Units (Acres)	2015 (Acres)	Habitat Value	Habitat Units (Acres)	2015 (Acres)	Habitat Value	Habitat Units (Acres)	2015 (Acres)	Habitat Value	Habitat Units (Acres)
Non-Native Grassland/Ruderal	704.90	0.15	105.70	580.00	0.15	87.08	341.50	0.15	51.23	301.00	0.15	45.15	398.00	0.15	59.70
Disturbed/Bare Ground	103.10	0.10	10.31	98.80	.010	0.99	8.30	0.10	0.83	7.60	0.10	0.76	43.30	0.10	4.33
Landscaped	79.20	0.05	3.96	102.10	0.05	5.11	132.80	0.05	6.64	124.90	0.05	6.25	121.00	0.05	6.05
Developed	2606.30	0.00	0.00	2712.10	0.00	0.00	3326.00	0.00	0.00	3454.20	0.00	0.00	3194.50	0.00	0.00
Subtotal	**3439.50**		**121.55**	**3493.50**		**93.18**	**3808.60**		**58.15**	**3888.20**		**52.02**	**3756.80**		**70.47**
Southern Foredune	135.60	0.45	61.02	135.60	0.45	61.02	135.60	0.45	61.02	135.60	0.45	61.02	135.60	0.45	61.02
Southern Dune Scrub	24.40	0.35	8.54	24.40	0.35	8.54	24.40	0.35	8.54	24.40	0.35	8.54	24.40	0.35	8.54
Disturbed dune Scrub/Foredune	74.60	0.35	26.11	74.60	0.35	26.11	74.60	0.35	26.11	74.60	0.35	26.11	74.60	0.35	26.11
Valley Needlegrass Grassland	17.10	0.70	11.97	17.10	0.70	11.97	17.10	0.70	11.97	17.10	0.70	11.97	17.10	0.70	11.97
Non-Native Grassland/Ruderal	16.90	0.25	4.23	16.90	0.25	4.23	16.90	0.25	4.23	16.90	0.25	4.23	16.90	0.25	4.23
Developed	38.60	0.00	0.00	38.60	0.00	0.00	38.60	0.00	0.00	38.60	0.00	0.00	38.60	0.00	0.00
Subtotal	**307.20**		**111.87**	**307.20**		**111.87**	**307.20**		**111.87**	**307.20**		**111.87**	**307.20**		**111.87**

Source: Sapphos Environmental, Inc. 2000

5.0 RESULTS

This section describes the impacts of the various development alternatives and the No Action Alternative identified in the *Los Angeles International Airport 2015 Master Plan* (Master Plan) on the areas subject to the jurisdiction of the U.S. Army Corps of Engineers (USACOE) and the California Department of Fish and Game (CDFG). The Jurisdictional Delineation considered the presence of wetland resources that were historically located within the area that is now the Los Angeles International Airport (LAX) AOA. The western portion of the current AOA and the eastern portion of the Los Angeles/El Segundo Dunes historically supported approximately 124 acres of vernal pools, a type of wetland. Development that occurred since the 1930s, however, resulted in substantial alteration of the vegetation, soils, and hydrology that precludes the presence of wetland parameters. As such, the USACOE directed the Federal Aviation Administration (FAA) and Los Angeles World Airports (LAWA) to consider the presence or absence of wetlands in light of the atypical situation caused by human activities. This analysis resulted in the identification of 1.3 acres of seasonally inundated areas that meet the criteria to be defined as "waters of the United States," pursuant to Section 404 of the Clean Water Act. These same areas are not subject to a Streambed Alteration Agreement from the CDFG pursuant to Section 1600 of the State Fish and Game Code.

This section presents the results of literature and field investigations undertaken to determine the extent of areas subject to the jurisdiction of USACOE and the CDFG, including: the review of historic topographic maps and aerial photographs; soil investigations; dry season surveys for Riverside fairy shrimp; wet season surveys for fairy shrimp; and directed surveys for other threatened and endangered species of plants and animals.

5.1 Review of Historic Topographic Maps and Historic Aerial Photographs

As indicated in historic topographic maps[60, 61, 62, 63] and aerial photographs,[64, 65] the west end of the AOA within the Master Plan boundaries supported a complex of vernal pools and native grasslands until the 1930s (**Figure 3**). Historically, this vernal pool complex may have included as many as 124 acres. A review of historic photographs revealed that construction activities undertaken by Caltrans, private developers, and the City of Los Angeles had affected most of the western portion of the airfield prior to 1990 (**Figure 7**). Construction activities that were evident in the photographs include staging, borrow and fill activities, discing, road construction, runway extension, and expansion of terminal facilities. The following discussion reviews the disturbance to surface topography in what is now the western portion of the AOA, as revealed in each historic aerial photograph.

1952: The future airfield is under agricultural use.

February 1970, North Airfield: Runway 6L/24R is under construction. A construction staging/borrow site is located northwest of the Argo Ditch impoundment pond. South Airfield: Original alignment of Pershing Drive is in place. A service road from Pershing Drive toward the Los Angeles/El Segundo Dunes area is visible, and earth moving activity is evident east of the VOR.

May 1979: The northwest corner displays a white color, showing it has been graded or disturbed to the point that the topsoils and plants have been removed. South Airfield: Pershing Drive is visible, but now appears to be partly unpaved. The new alignment of Pershing Drive is in place, along with the connector road from Pershing Drive to World Way West. In the southwest corner, several service roads are visible crisscrossing this area. Vegetation has grown over areas previously disturbed by the earth moving activities visible in the February 1970 aerial.

January 1986: North Airfield: A large graded area is visible in the north airfield. Previously disturbed sites have been recolonized by vegetation. South Airfield: Old Pershing Drive now appears to be entirely

[60] U.S. Army Corps of Engineers, War Department, Declassified Topographic Map of the Redondo, California Quadrangle: 15 minute series map, scale 1:62,500, 1944.
[61] U.S. Geological Survey, Topographic Map of the Venice, California Quadrangle: 7.5 minute map, scale 1:24,000, 1988.
[62] U.S. Geological Survey, (photo-revised 1981), Historic Topographic Map of the Venice, California Quadrangle: 7.5 minute map, scale 1:24,000, 1964.
[63] U.S. Geological Survey, Topographic Map of the Venice, California Quadrangle: 7.5 minute map, scale 1:24,000, 1934.
[64] Spence Photo Collection, Historic Aerial Photo of Los Angeles International Airport Site, November 12, 1949
[65] Spence Photo Collection, Historic Aerial Photo of Los Angeles International Airport Site, February 7, 1948.

unpaved. Large earth moving activities can be seen south of World Way West. The satellite concourse has been constructed since the May 1979 aerial.

January 1990, North Airfield: The northwest corner has been revegetated. The area north of World Way West and the satellite terminals has new construction and earth moving activities. At the corner of Pershing Drive and World Way West is a large graded and construction staging area. The area just west of old Pershing Drive also shows more disturbance in comparison to the January 1986 aerial. South Airfield: Along Imperial Highway, at the corner of Pershing Drive and Imperial Highway, a large graded area and a construction staging area can be seen. The perimeter road along Pershing has recently been regarded, as well.

January 1990: North Airfield is unchanged except for the re-growth of additional vegetation. South Airfield: This aerial demonstrates that nearly the entire area has been graded and leveled. The southern half of the south airfield is not visible in this aerial photograph.

January 1992, North Airfield: Construction of Westchester Parkway is visible. Earth moving and grading activities are visible at the northwest corner of the airfield and along the north side of the Argo drainage ditch. South Airfield: The large graded area seen in the January 1990 aerial is still visible. South of the above graded area, the construction of a large drainage pond and new graded areas along Imperial Highway can be seen. Construction of a perimeter road looping into the eastern edge of this area is complete. Taxiway 75 is now under construction, as is the extension of the southern runways.

June 1993, North Airfield: Westchester Parkway is now complete. A previously graded area at the northwestern corner of the airfield can be seen with a new re-growth of vegetation. A new area of grading can be seen south of the satellite concourse. South Airfield: Taxiway 75 and the southern runway extension are now complete. The large graded area just south of World Way West, visible in June 1992, is still in use. Construction of the fire drill site near the corner of Imperial Highway and Pershing Drive is in progress.

June 1995, North Airfield: New grading can be seen in the northwest corner and along the north side of the Argo drainage ditch. The satellite concourse has been expanded. South Airfield: The graded area south of World Way West is again seen to be subject to grading and construction. The fire drill site is complete. Most of the south airfield has apparently been subjected to recent grading and discing.

Airfield Operations

Most of the open space on the LAX airfield is under the jurisdiction of Airfield Operations, which functions under 14 CFR 139.309 and 139.305. Section 139.305 gives Operations responsibility for inspection and incident reporting for all paved areas on the airfield. Section 14 CFR 139.309 establishes Safety Areas associated with each runway and taxiway. Runway Safety Areas are paved and unpaved areas that are 500 feet wide (as measured from the center of the runway) and extend 250 feet out in each direction. Safety Areas are subject to a variety of routine maintenance activities, including mowing, grading, and discing. As stated in FAA Advisory Circular 150/5300-13, *Airport Design*, a Runway Safety Area is "*defined surface surrounding the runway prepared or suitable for reducing the risk or damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway*." The Advisory Circular also defines the Taxiway Safety Area as "*a defined surface along side the taxiway prepared or suitable for reducing the risk to an airplane unintentionally departing the taxiway*." Safety Areas extend 1,000 feet out from the terminal end of each runway. Taxiway Safety Areas are 262 feet wide and 131 feet in each direction, as measured from the center of each taxiway. All Safety Areas are maintained free of surface variations. Section 14 CFR 309 reads, "Each safety area shall be cleared and graded, and have no potentially hazardous ruts, humps, depressions or other surface variations." Section 309 also gives Operations jurisdiction over all Safety Areas. The unimproved areas of the LAX airfield subject to routine operations and maintenance activities are shaded in blue on **Figure 9**; the gray-shaded area depicts construction, storage, fill, and dirt excavation for dump sites, which support ongoing construction and maintenance projects at LAX.[66]

Operations routinely mows, grades, tills, and controls weeds and small mammal populations in the Safety Areas at LAX in accordance with the above regulations. Maintenance procedures to keep Safety Areas within FAA compliance are performed on an as-needed basis for each area, as determined by Operations. Mowing is more frequently applied than tilling or herbicidal applications. On average, each area under Operations' jurisdiction is subject to some maintenance twice each month.[67] On the south airfield, these

[66] Phillip Ewbanks, Los Angeles World Airports, Chief, Airport Operations, Personal Communications, December 17, 1997.
[67] Phillip Ewbanks, Los Angeles World Airports, Chief, Airport Operations, Personal Communications, December 17, 1997.

activities routinely involve regular disturbance to all open areas between taxiways and runways and much of the open space on the mesa, which parallels Imperial Highway. On the north airfield, these activities involve all open space between runways and taxiways, as well as between the ends of each runway and the physical extent of the airfield property, and extend northward to the edge of the Argo Ditch.

There are two areas that are not subject to maintenance under as rigorous a schedule because they are outside of the designated Safety Areas. These include a small area at the extreme northwestern corner of the airfield near the corner of Pershing Drive and Westchester Parkway and a larger area occupying the southwestern corner of the airfield. This southwestern corner, however, is routinely used for construction staging, gravel and materials storage, and borrow and fill activities. The hot drill site is located in this area, as is a large man-made drainage pond that collects runoff water from the airfield. This corner is crisscrossed with both paved and unpaved roadways.[68]

Conversations and file review with Airfield Operations staff served to verify the grading and filling activities evident in the historic aerial photographs.

Environmental Documents

Sapphos Environmental, Inc. reviewed environmental documents on file in the Office of Environmental Management at LAWA containing documentation of grading and disturbing activities within the LAX airfield. The examination included Negative Declarations prepared since the 1975 LAX *Master Plan* (including the supporting EIR). Only documents related to construction or impact to bare ground were examined. The following environmental documents prepared in support of LAX construction projects were reviewed to ascertain grading activities undertaken by the City of Los Angeles at LAX: City of Los Angeles, Department of Airports (DOA), 1994, *Federal Express Sort Facility Expansion*; DOA, 1993, *Singapore Air Cargo Facility*; DOA, 1992, *Dobbs International In-Flight Catering facility*; DOA, 1992, *Mercury Air Group Warehouse*; DOA, 1990, *U.S. Air Maintenance Facility*; DOA, 1990. *Delta Airlines Cargo Facility*; DOA, 1990, *Continental Air Cargo Facility*; DOA, 1987, *Maintenance Bureau Office and Purchasing Bureau Office*; DOA, 1987, *Greene's Ready Mix Concrete Batch Plant*; DOA, 1985, *NIKKO In-Flight Catering Company, In-Flight Catering Facility*; DOA, 1985, *Korean Air Lines Cargo Hanger - Fuel Storage Facility*; DOA, 1984, *Griley Freight Lines Parking Lot*; DOA, 1983, *LAX Pistol Range*; DOA, 1983, *China Airlines Air Cargo Handling Facility*; DOA, 1982, *City Freight Lines, Inc., Facility*; DOA, 1980, *Sunset Airport Systems Gasoline Storage Tank*; DOA, 1980, *Imperial Cargo Complex*; DOA, 1979, *Korean Airlines Reconstruction of Pavement Area to Accommodate B747 Airliners*; and DOA, 1979, *Installation of Six Space Aircraft Parking Apron*. Most of these environmental documents are pursuant to the California Environmental Quality Act of 1970.

Two previous documents prepared for the City of Los Angeles Department of Airports describe the soil conditions and underlying geology at LAX.[69,70] The following section is based upon material in these reports. LAX lies within a coastal belt of sand dunes within the Los Angeles Basin. This coastal belt is 11 miles in length along the coast, and extends up to six miles inland. Most of the natural soils at LAX consist of various sand deposits of different geologic ages. The deeper formations under the airfield are the Older Sand Dune Formation and the Lakewood Formation. These are overlaid with Alluvium and Active Sand Dune, especially at the western extent of the airport. The Older Sand Dune material consists of fine- to medium-grained sand with clay sand. Much of the surface material, which underlies the airport, consists of material from the Older Sand Dune formation dating from the Pleistocene age. This deposit reaches 100 feet in thickness under much of the airport. The deeper Lakewood formation consists of alternate layers of dense sand and clay silt. Toward the west end of the airport property, some of the surface material is from the more recent (Holocene) Active Sand Dune Formation. This formation consists of fine- to medium-grained sands up to 70 feet deep.

[68] Phillip Ewbanks, Los Angeles World Airports, Chief, Airport Operations, Personal Communications, December 17, 1997.

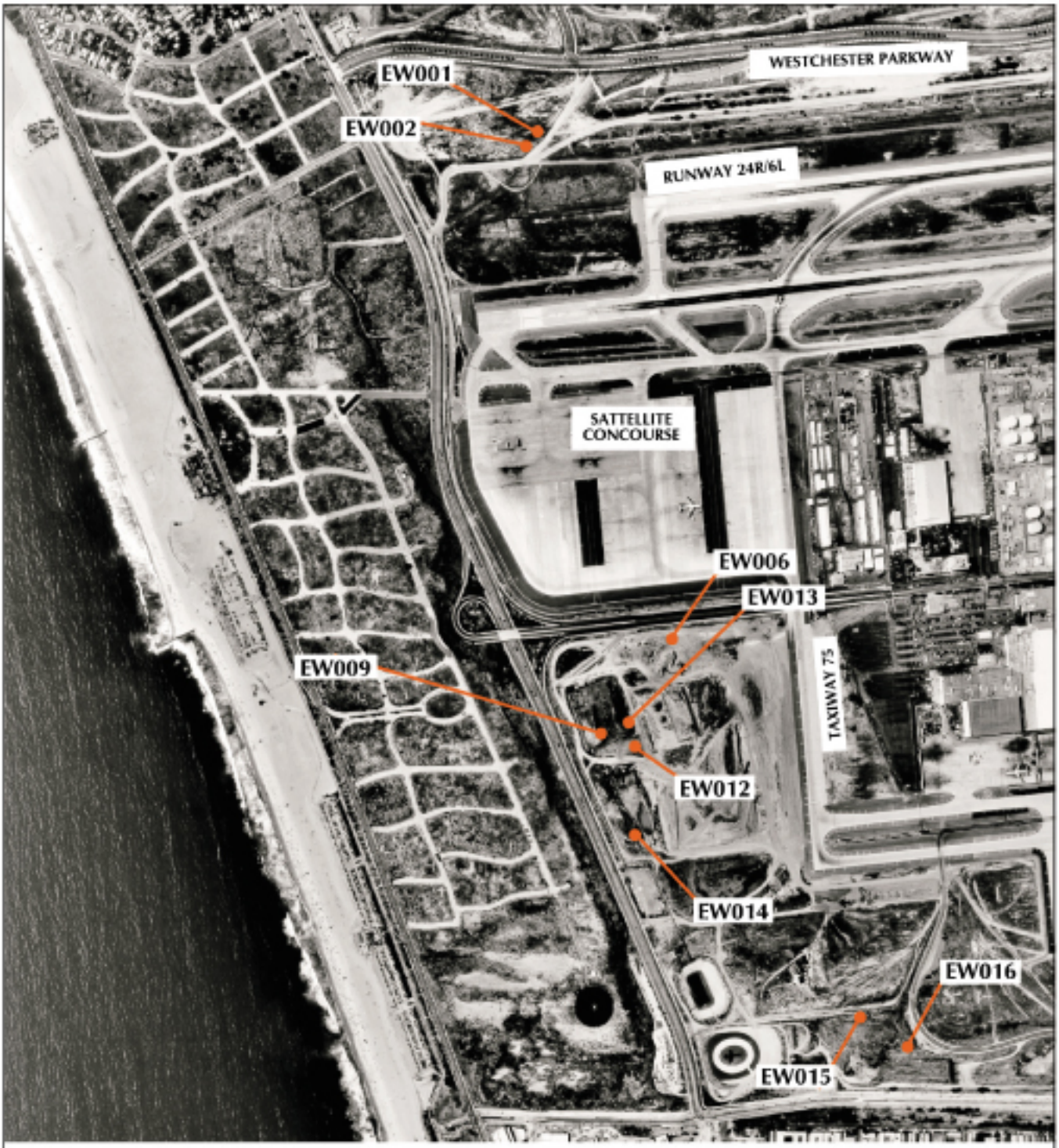
[69] City of Los Angeles, Department of Airports, Technical Memorandum, Earth Resources – Existing Conditions, Prepared by Bing Yen Associates, Irvine, California, 1995.

[70] City of Los Angeles, Department of Airports, Final Environmental Impact Report, Vol. III: Physical Environmental Impacts, Prepared by Olson Laboratories, Inc., Division of Systems Control, Inc., Anaheim, California, 1978.

5.2 Ephemerally Wetted Areas Subject to U.S. Army Corps of Engineers and California Department of Fish and Game Jurisdiction

5.2.1 Areas Subject to USACOE Jurisdiction

As a result of monitoring conducted during the winter of 1997/1998, a year of above-average rainfall, it was determined that there are a total of 1.3 acres within the AOA that meet the USACOE criteria for wetland hydrology (**Figure 4.12-6**, Areas Subject to USACOE Jurisdiction). Of the 52 sites monitored through the rainy season, 17 sites ponded water for at least seven days (**Table 4.12.1-1**, Monitoring Results for Ephemerally Wetted Areas). Three sites, EW003, EW004, and EW005, were part of a larger site that included EW001 and EW002. Sites EW003, EW004, and EW005 dried rapidly following a storm event, while Sites EW001 and EW002 retained water for at least seven days. None of the sampled areas showed evidence of hydric soils, nor were they dominated by hydrophytic vegetation. Embedded cysts of the Riverside fairy shrimp were recovered from soil samples from nine of the monitored sites: EW001, EW002, EW006, EW009, EW012, EW013, EW014, EW015, and EW016. With the exception of EW006, these sites and three additional sites (EW008, EW010, and EW011) ponded water for 18 days following a storm event in 1997/1998, thus meeting the USACOE criteria for wetland hydrology. As indicated previously, the USACOE has determined to treat the AOA as an atypical situation due to the effects of recent (1930-2000) human activities. Under the atypical situation, it has been indicated that the presence of wetland hydrology is sufficient to allow the USACOE to exert jurisdiction pursuant to Section 404 of the Clean Water Act.



LEGEND

EW Emphemeral Wetted Areas

SOURCE: Continental Aerial Photo, Inc. 10571 Calle Lee Suite 163, Los Alamitos, CA 90720, JUNE 1995

0 150 300 600 900 FEET

Jurisdictional Delineation of Proposed Master Plan Improvements to Los Angeles International Airport Los Angeles County, California	**Areas Subject to USACOE Jurisdiction**	Figure 13

v:\project\1049-002\graphics\jd\section5\figure5.2-1.ai

Table 4

Monitoring Results of Study Sites

	Evidence of:			Analysis of	Evidence of:				Evidence of:	Analysis of:			
Site	Non-Jurisdiction Yes=a,b,c,d,e N=No	Native Vegetation Y / N	Suitable Hydrology Y / N	Texture Y/N	Hydrophytic Vegetation Y/N	Hydric Soils Y/N	Vernal Pool Endemic Fauna N=No Y= *Strepto-cephalus* sp.	Ponds Water > 10 Days Y/N	Vernal Pool Indicator Plants Y/N	Organic Component Y/N	Permeability Y/N	Soil Suitability Y/N	Ponded Water Y/N
EW 001	d	Y	Y	Y	N	N	Y	Y	N	Y	Y	Y	Y
EW 002	d	Y	Y	Y	N	N	Y	Y	N	Y	N	N	Y
EW 003	d	Y	N	Y	N	N	N	N	N	Y	Y	Y	N
EW 004	d	Y	N	Y	N	N	N	N	N	Y	Y	Y	N
EW 005	d	Y	N	Y	N	N	N	N	N	Y	Y	Y	N
EW 006	a	Y	Y	Y	N	N	Y	Y	N	Y	N	N	Y
EW 007	d	N	N	Y	N	N	N	N	Y	N	N	N	Y
EW 008	c	Y	Y	Y	N	N	N	Y	N	Y	N	N	N
EW 009	e	N	N	Y	N	N	N	Y	N	Y	Y	Y	N
EW 010	e	N	Y	Y	N	N	N	Y	N	Y	Y	Y	N
EW 011	e	N	Y	Y	N	N	Y	Y	N	Y	Y	Y	Y
EW 012	e	N	Y	Y	N	N	N	Y	N	Y	Y	Y	N
EW 013	a	N	N	Y	N	N	Y	Y	N	Y	N	N	N
EW 014	c	Y	Y	Y	N	N	Y	Y	N	Y	Y	Y	Y
EW 015	a	Y	N	Y	N	N	Y	Y	N	Y	Y	Y	Y
EW 016	a	N	Y	Y	N	N	Y	Y	N	Y	N	N	Y
EW 017	e	Y	Y	Y	N	N	N	Y	N	Y	N	N	Y
EW 018	d	N	Y	Y	N	N	Y	Y	N	Y	Y	N	Y
EW 019	a/d	Y	Y	Y	N	N	N	Y	N	Y	N	N	N
EW 020	e	Y	Y	Y	N	N	N	Y	N	Y	Y	Y	Y
EW 021	d	N	N	Y	N	N	N	N	N	Y	N	N	Y
EW 022	d	N	N	Y	N	N	N	N	N	Y	N	Y	Y
EW 023	d	N	N	Y	N	N	N	N	N	Y	N	N	N
EW 024	d	Y	N	Y	N	N	N	N	N	Y	N	N	Y
EW 025	e	Y	Y	Y	N	N	N	N	N	Y	Y	Y	N
EW 026	a	Y	N	Y	N	N	N	N	N	Y	N	N	N
EW 027	a	N	Y	Y	N	N	N	N	N	Y	N	N	Y
EW 028	a	Y	N	Y	N	N	N	N	N	Y	N	N	N
EW 029	a	N	N	Y	N	N	N	N	N	Y	N	N	N
EW 030	a	Y	N	Y	N	N	N	N	N	Y	N	**N**	N
EW 031	c	N	N	Y	N	N	N	N	N	Y	N	N	N
EW 032	a/d	Y	N	Y	N	N	N	N	N	Y	N	N	Y
EW 033	a/d	Y	N	Y	N	N	N	N	N	Y	N	N	N
EW 034	a	N	Y	Y	N	N	N	N	N	Y	N	Y	Y
EW 035	e	N	Y	Y	N	N	N	N	N	Y	Y	Y	N
EW 036	a	N	N	Y	N	N	N	N	N	Y	N	Y	N
EW 037	e	N	Y	Y	N	N	N	N	N	Y	Y	N	Y
EW 038	d	Y	N	Y	N	N	N	N	N	Y	N	N	N
EW 039	a/d	N	Y	Y	N	N	N	N	N	Y	N	N	N
EW 040	a/d	N	N	Y	N	N	N	N	N	Y	N	N	N
EW 041	a/b	N	N	Y	N	N	N	N	N	Y	N	N	N
EW 042	b	N	N	N	N	N	N	N	N	N	N	N	N
EW 043	a/d	N	N	Y	N	N	N	N	N	Y	N	N	N

Table 4

Monitoring Results of Study Sites

	Evidence of:			Analysis of	Evidence of:				Evidence of:	Analysis of:			
Site	Non-Jurisdiction Yes=a,b,c,d,e N=No	Native Vegetation Y / N	Suitable Hydrology Y / N	Texture Y/N	Hydrophytic Vegetation Y/N	Hydric Soils Y/N	Vernal Pool Endemic Fauna N=No Y= *Strepto-cephalus* sp.	Ponds Water > 10 Days Y/N	Vernal Pool Indicator Plants Y/N	Organic Component Y/N	Permeability Y/N	Soil Suitability Y/N	Ponded Water Y/N
EW 044	c	Y	N	Y	N	N	N	N	N	Y	Y	Y	N
EW 045	d	Y	N	Y	N	N	N	N	N	Y	N	N	N
EW 046	d	Y	N	Y	N	N	N	N	N	Y	N	N	N
EW 047	d	N	Y	Y	N	N	N	Y	N	Y	Y	Y	Y
EW 048	b	Y	N	Y	N	N	N	N	N	Y	N	Y	N
EW 049	c	Y	Y	Y	N	N	N	N	N	Y	Y	Y	N
EW 050	d	Y	N	Y	N	N	N	N	N	Y	Y	Y	N
EW 051	a	Y	N	Y	N	N	N	N	N	Y	N	N	N
EW 052	a	N	Y	Y	N	N	N	N	N	Y	N	N	Y

a=Road Cut
b=Stock Pond
c=Man-Made Pond Impoundment
d=Borrow and Fill Site/Construction
e=Seasonally Flooded Plain

Source: Sapphos Environmental, Inc.

Table 5

Monitoring Results for Emphemerally Wetted Areas

Location	Size (square feet)	Ponded Water 1998/1999 7 Days	Ponded Water 1998/1999 18 Days	Ponded Water 1999/2000 7 Days	Ponded Water 1999/2000 18 Days	Hydric Soils	Hydrophytic Vegetation	Sensitive Vernal Pool Associated Species
EW001	123	Y	Y	Y	N	N	N	Y
EW002	292	Y	Y	Y	N	N	N	Y
EW003	74	N	N	N	N	N	N	N
EW004	95	N	N	N	N	N	N	N
EW005	212	N	N	N	N	N	N	N
EW006	1,438	Y	N	N	N	N	N	Y
EW007	275	Y	N	N	N	N	N	N
EW008	5,706	Y	Y	N	N	N	N	N
EW009	577	Y	Y	N	N	N	N	Y
EW010	312	Y	Y	N	N	N	N	N
EW011	809	Y	Y	N	N	N	N	N
EW012	548	Y	Y	Y	N	N	N	Y
EW013	4,808	Y	Y	N	N	N	N	Y
EW014	39,199	Y	Y	Y	Y	N	N	Y
EW015	2,086	Y	Y	Y	N	N	N	Y
EW016	3,936	Y	Y	Y	N	N	N	Y
EW017	13,719	Y	N	N	N	N	N	N
EW018	1,659	Y	N	N	N	N	N	N
EW019	807	Y	N	N	N	N	N	N
EW020	1,691	Y	N	N	N	N	N	N

Source: Sapphos Environmental, Inc. 2000

As indicated in Section 5.1, the 1.3 acres meeting the USACOE criteria for wetland hydrology are not characterized by hydric soils, nor are they characterized by hydrophytic vegetation.

A facultative neutral test performed in 1998 for plants associated with each of the ephemerally ponded areas and a replicate facultative neutral test performed on the 17 ephemerally ponded areas identified as holding ponded water for greater than seven days revealed that no site was dominated by wetland obligate or facultative wetland plant species. Upland plant species dominated all sites of ephemerally ponded areas.

Thirty species of plants were identified within the study area. Native plant species identified include: mulefat (*Baccharis salicifolia*), coyote bush (*Baccharis pilularis*), telegraphweed (*Heterotheca grandiflora*), tall wreath-plant (*Stephanomeria virgata*), sand pigmy-stonecrop (*Crassula connata*), Spanish lotus (*Lotus purshianus*), deerweed (*Lotus scoparius*), dove lupine *(Lupinus bicolor*), grass poly (*Lythrum hyssopifolia*), woolly plantain (*Plantago ovata*), sandbar willow (*Salix exigua*), willow (*Salix* sp.), fragrant umbrella-sedge (*Cyperus odoratus*), and rattail fescue (*Vulpia myuros*). Non-native species identified include: iceplant (*Caprobrotus edulis*), crown daisy (*Chrysanthemum coronarium*), cocklebur (*Xanthium strumarium*), wild turnip (*Brassica tournefortii*), Russian thistle (*Salsola tragus*), golden wattle (*Acacia cyclops*), bur-clover (*Medicago polymorpha*), white sweet-clover (*Melilotus alba*), long-beaked filaree (*Erodium botrys*), red-stemmed filaree (*Erodium cicutarium*), English plantain (*Plantago lanceolata*), sea lavender (*Limonium perezii*), curly dock (*Rumex crispus*), common ripgut grass (*Bromus diandrus*), soft chess (*Bromus mollis*), pampas grass (*Cortaderia selloana*), Bermuda grass (*Cynodon dactylon*), and an unidentified Poaceae.

None of the native or non-native plant species are considered indicator plant species for the presence of vernal pools.

5.2.2 Areas Subject to California Department of Fish and Game Jurisdiction

There are no areas subject to the authority of the CDFG pursuant to Section 1600 of the State Fish and Game Code. The CDFG protects wetlands and other riparian resources by requiring a Streambed Alteration Agreement for projects that will divert or obstruct the natural flow of water, change the bed, channel or bank of any stream, or use any material from a streambed. A review of historical aerial photographs and site reconnaissance resulted in the determination that there are no natural streams or lakes within the Master Plan boundaries.

5.2.3 Areas Subject to California Coastal Commission Jurisdiction

There are no wetlands within the Dunes, which is the only portion of the airport within the jurisdiction of the California Coastal Commission (CCC). The 1.3 acres that meet the USACOE criteria for wetland hydrology are located east of Pershing Drive, outside the coastal zone.

5.2.4 Environmental Consequences

This section describes the potential environmental consequences of the No Action/No Project Alternative and the three build alternatives on areas that meet the USACOE criteria for wetland hydrology. For each alternative, the potential effects to wetland areas are discussed.

An evaluation of avoidance and minimization of impacts is required under the National Environmental Policy Act. Under the No Action/No Project Alternative, the existing 1.3 acres of jurisdictional wetlands would be retained. However, minimization of impacts or avoidance of jurisdictional wetlands are not practical because the 1.3 acres of jurisdictional wetlands are located within the western AOA, and are therefore subject to routine operations and maintenance activity in compliance with Title 14, Code of Federal Regulations (CFR) Part 139. Title 14, CFR Part 139 mandates that the AOA be maintained in such a condition so as to minimize or eliminate hazards to public safety resulting from wildlife utilization of the AOA. Such routine maintenance activities may include mowing or discing of vegetation to reduce its attractiveness to wildlife and elimination of standing water.

Under the three build alternatives, minimization of impacts and avoidance are not practical for the following reasons. In order to meet future projected demands in both passenger and cargo air flights into and out of Los Angeles, expansion of the current LAX facility is warranted. The 1.3 acres of jurisdictional wetlands lie within the western end of the AOA, and this is the only open space available for the construction of new terminals and support facilities, as LAX is surrounded by development.

The environmental consequences to wetlands are largely related to loss of habitat values and functions. The 1.3 acres that meet the USACOE criteria for wetland hydrology are located within the AOA, therefore, they are subject to routine operations and maintenance activities that reduce habitat values and functions normally associated with wetlands. Impacts on wetlands under the three build alternatives would result from the conversion to development of existing open space areas that meet the USACOE criteria for wetland hydrology. Given the requirements for use of the western portion of the AOA for construction staging and access, it is anticipated that conversion of existing open space areas to development would occur during the first phase of construction prior to 2005. Therefore, impacts associated with the two planning horizons are discussed together under each alternative.

Section 404 of the Clean Water Act authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits, after notice and opportunity for public hearing, for the discharge of dredged and fill materials into the waters of the United States at specified disposal sites.[71]

The decision to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts of the proposed activity and its intended use on the public interest.[72]

The USACOE exerts discretionary jurisdiction over projects with between 0.3 and 10 acres of impact. Projects with impacts of greater than 10 acres within the USACOE's jurisdiction are subject to individual permits.

5.2.4.1 No Action/No Project Alternative

Under the No Action/No Project Alternative, continued development of LAX would consist of facility improvements that are under construction, fully entitled, and/or anticipated to require no environmental clearance. Under this Alternative, the existing 1.3 acres that meet the USACOE criteria for wetland hydrology within the Master Plan boundaries would be retained. However, as discussed above, routine operations and maintenance activities within the AOA are necessary to maintain public safety, and would continue under this Alternative. Such routine maintenance activities may include mowing or discing of vegetation to reduce its attractiveness to wildlife and elimination of standing water. Therefore, the current 1.3 acres of jurisdictional wetlands would remain in their current condition. Any action involving the

[71] 33 CFR Part 323.
[72] 33 CRF Part 320.

disposal of dredge or fill material within the 1.3 acres would be subject to jurisdiction of the USACOE, pursuant to Section 404 of the Clean Water Act.

5.2.4.2 Alternative A – Added Runway North

Under Alternative A, the 1.3 acres that meet the USACOE criteria for wetland hydrology would be permanently converted as a result of construction staging and/or airfield improvements. EW001 and EW002 would be affected by construction staging activities in support of improvements to the two existing north runways, 24R and 24L. In addition, it is likely that the construction of the proposed ring road would also affect EW001 and EW002. EW006, EW009, EW012, EW013, EW014, EW015, and EW016 would be converted during development of the West Terminal Area, short-term parking, and access/roadway improvements by 2005. Alternative A will permanently convert the 1.3 acres to development, which would be a significant impact. The impacts to jurisdictional wetlands are unavoidable under Alternative A and there are no feasible alternatives that would result in no impacts to the wetland sites.

5.2.4.3 Alternative B – Added Runway South

Under Alternative B, the 1.3 acres that meet the USACOE criteria for wetland hydrology would be permanently converted as a result of construction staging and/or airfield improvements. EW001 and EW002 would be affected by construction staging activities in support of relocation of existing runways 24L and 24R, which would occur by 2015. In addition, construction of the proposed ring road is expected to affect EW001 and EW002. EW006, EW009, EW012, EW013, EW014, EW015, and EW016 would be converted during development of the West Terminal Area, short-term parking, and access/roadway improvements by 2005. Alternative B will permanently convert the 1.3 acres to development, which would be a significant impact. Impacts to jurisdictional wetlands are unavoidable under Alternative B and there are no feasible alternatives that would result in no impacts to the wetland sites.

5.2.4.4 Alternative C – No Additional Runway

Under Alternative C, the 1.3 acres that meet the USACOE criteria for wetland hydrology would be permanently converted as a result of construction staging and/or airfield improvements. EW001 and EW002 would be affected by construction staging activities in support of relocation of existing runways 24L and 24R, which are scheduled as part of the 2005 improvements. In addition, similar to Alternatives A and B, construction of the proposed ring road is expected to affect EW001 and EW002. EW006, EW009, EW012, EW013, EW014, EW015, and EW016 would be converted by development of the West Terminal Area, proposed close-in public parking, and access/roadway improvements by 2005. By 2015, these improvements would expand with the addition of rental car facilities, employee parking, and light rail transportation systems. Alternative C will permanently convert the 1.3 acres to development, which would be a significant impact. Impacts to jurisdictional wetlands are unavoidable under Alternative C and there are no feasible alternatives that would result in no impacts to the wetland sites.

5.3 Soil Characterization

A review of the Soil Survey for Los Angeles County and the Hydric Soils of the United States revealed no evidence of hydric soils within the LAX airfield.[73] The Report and General Soil Map of Los Angeles County[74] categorizes the soils at LAX in the Oceano Association. Much of this natural surface has been overlain with various amounts of fill material. Fill material has been laid down during the many construction projects at LAX over the years.

The results of soil sampling are presented in **Table 6**, Soils Analysis Data Summary. Soil studies concluded that the identified ephemeral wetted areas within the Master Plan boundaries, including the Los Angeles/El Segundo Dunes, are not characterized by hydric soils.

[73] U.S. Department of Agriculture, Hydric Soils of the United States, Soil Conservation Service, 1987.
[74] U.S. Department of Agriculture, Report and General Soil Map Los Angeles County, California, Soil Conservation Service, 1969.

Table 6

Soil Analysis Data Summary

Sample	Results of Texture Analysis	Evidence of Hydric Soils Y/N	Percent Organic	Permeability (CM/S)	Munsell Color
EW 001	Sandy Soil	N	0.4	0.0198	Dark yellowish brown
EW 002	Sandy Soil	N	0.2	n.t.	Dark yellowish brown
EW 003	Sandy Soil	N	0.3	0.542	Dark yellowish brown
EW 006	Sandy Soil	N	0.5	n.t.	Brown and reddish brown
EW 007	Sandy Soil	N	0.9	n.t.	n.t.
EW 008	Sandy Soil	N	0.3	n.t.	Dark yellowish brown
EW 009	Sandy Soil	N	0.5	0.055	Dark brown
EW 010	Sandy Soil	N	0.6	.005	Dark yellowish brown
EW 011	Sandy Soil	N	0.6	0.001	Brown
EW 012	Sandy Soil	N	0.4	0.278	Brown
EW 013	Sandy Soil	N	0.2	n.t.	Dark yellowish brown
EW 014	Sandy Soil	N	0.3	0.036	Dark yellowish brown
EW 015	Sandy Soil	N	0.8	0.009	Dark brown
EW 016	Sandy Soil	N	n.t.	n.t.	Brown
EW 017	Sandy Soil	N	6.5	n.t.	Dark yellowish brown
EW 018	Sandy Soil	N	0.3	1.11	Dark yellowish brown
EW 019	Sandy Soil	N	0	n.t.	Dark brown
EW 020	Sandy Soil	N	0.4	0.018	Dark yellowish brown
EW 021	Gravelly Soil	N	5.7	n.t.	n.t.
EW 022	Gravelly Soil	N	1.9	n.t.	n.t.
EW 023	Gravelly Soil	N	2.8	n.t.	Reddish brown
EW 024	Sandy Soil	N	0.9	n.t.	Dark yellowish brown
EW 025	Sandy Soil	N	0.5	0.009	Dark yellowish brown
EW 026	Sandy Soil	N	0.2	n.t.	Yellowish brown
EW 027	Sandy Soil	N	1.4	n.t.	Brown
EW 028	Sandy Soil	N	0.2	n.t.	Dark yellowish brown
EW 029	Sandy Soil	N	0.2	n.t.	Brown
EW 030	Sandy Soil	N	0.1	n.t.	Dark yellowish brown
EW 031	Sandy Soil	N	1.6	n.t.	Dark yellowish brown
EW 032	Sandy Soil	N	0.2	n.t.	Dark yellowish brown
EW 033	Sandy Soil	N	2.4	n.t.	Dark yellowish brown
EW 034	Sandy Soil	N	0.2	n.t.	n.t.
EW 035	Sandy Soil	N	0.4	0.010	Dark yellowish brown
EW 036	Sandy Soil	N	0.3	n.t.	Dark yellowish brown
EW 037	Sandy Soil	N	0.2	.002	Dark brown
EW 038	Sandy Soil	N	0	n.t.	Yellowish brown
EW 039	Sandy Soil	N	2.0	n.t.	Dark yellowish brown
EW 040	Sandy Soil	N	1.4	n.t.	n.t.
EW 041	Sandy Soil	N	0.4	n.t.	n.t.
EW 042	Sandy Soil	N	0.8	0.001	n.t.
EW 043*	Asphalt rubble				
EW 044	Sandy Soil	N	n.t.	n.t.	Dark yellowish brown
EW 045	Sandy Soil	N	n.t.	n.t.	Dark greyish brown
EW 046	Sandy Soil	N	n.t.	n.t.	Dark greyish brown
EW 047	Sandy Soil	N	0.8	---	Brown
EW 048	Gravelly Soil	N	1.6	0.016	Dark greyish brown
EW 049	Sandy Soil	N	0.4	9.02	Dark brown
EW 050	Sandy Soil	N	0.1	1.04	Dark yellowish brown
EW 051	Sandy Soil	N	n.t.	n.t.	Dark yellowish brown
EW 052	Sandy Soil	N	n.t.	n.t.	Dark greyish brown

Source: Sapphos Environmental, Inc. 2000

Soil composition varied greatly. The percent of gravel ranged from 0% to 65.9%, sand ranged from 15.9% to 93%, and clay ranged from 2.7% to 23.9%. The organic content of the soils ranged from 0% to 6.5%. The soils sampled evinced a basic pH (6.8 to 10.7), in contrast with the Report and General Soil Map for Los Angeles County,[75] which states that the soils in this area of Los Angeles County display slight to strong acidity levels.

Permeability: Permeability was determined for fourteen samples across the LAX airfield. Permeability ranged from 0.001 centimeters per second (cm/s) to 0.542 cm/s.

[75] Phillip Ewbanks, Los Angeles World Airports, Chief, Airport Operations, Personal Communications, December 17, 1997.

Saturation: Soil samples were obtained two weeks after the latest rainfall. The saturation of these soils ranged from 22% to 39%.

Soil Hydrology: The Master Plan boundaries are located above the West Coast Hydrologic Basin. The Gage Aquifer is found beneath LAX. The Gage Aquifer itself is underlain by the El Segundo Aquifer. Semi-perched groundwater is present beneath LAX at depths from 20 to 70 feet. These aquifers are beneath the Bellflower Aquiclude, which forms a barrier to ground water and occurs approximately 170 feet below the ground surface.

Large portions of the AOA are routinely used as borrow and fill sites with poor drainage due to improper finish grading. The unimproved graded areas of the LAX airfield have been identified by Los Angeles County Vector Control as areas with poor drainage due to improper grading. Because of this improper grading, these areas support excess standing water after rains. Two of the areas, 3 and 4, are located in the south airfield, in areas routinely utilized as borrow and fill sites and fill material dumping areas; these tend to have irregular topography without adequate drainage routes for accumulated rainwater.

The total rainfall for the LAX area for the latter half of November through the first half of January 1998 was 6.89 inches. December was especially wet, with a monthly total of 3.86 inches. A day-by-day account of rainfall recorded in the LAX area is presented in **Table 7**, Daily Rainfall Reported at Marina del Rey. Rainfall for the season totaled over 30 inches. The rainfall data was obtained courtesy of the National Weather Service station in Marina del Rey. The Marina del Rey data is gathered by an actual observer, and is considered very reliable and accurate by the National Weather Service. The reporting station located on the LAX airfield is what is referred to as an ASOS, or Automated Surface Observation Station; the National Weather Service informed Sapphos Environmental, Inc. that the ASOS at LAX was not functioning properly at the time this information was requested.

Table 7

Daily Rainfall Reported at Marina del Rey

November 1997	Total[1]	December 1997	Total[1]	January 1998	Total[1]
11/19/97	.04	12/5/97	.35	1/3/98	.28
11/26/97	.69	12/6/97	2.29	1/4/98	.52
11/27/97	.01	12/7/97	.12	1/9/98	.52
11/30/97	.84	12/8/97	.01	1/10/98	1.09
		12/18/97	1.09	1/13/98	.15
				1/15/98	.03

[1] Rainfall reported in inches

Source: Sapphos Environmental, Inc. 2000

5.4 Directed Dry Season Surveys for Vernal Pool-Associated Species

Given the historic presence of vernal pools, particular emphasis was placed on an assessment of vernal pool-associated species. In the *Vernal Pools Recovery Plan*,[76] the USFWS designated recovery sites within the Master Plan boundaries for two federally-designated plant species and two federally-designated wildlife species. The two federally-listed vernal pool-associated plant species, California orcutt grass (*Orcuttia californica*) and San Diego button-celery (*Eryngium aristulatum* var. *parishii*), were determined to be absent as a result of directed surveys. One of the federally-listed wildlife vernal pool-associated wildlife species, San Diego fairy shrimp, was determined absent as a result of directed surveys.

The adult Riverside fairy shrimp, a federally-listed endangered wildlife species, was determined to be absent within the Master Plan boundaries.[77] The Riverside fairy shrimp was listed by the USFWS in 1993.[78] The range of the adult Riverside fairy shrimp includes limited areas of extant habitat in the coastal

[76] U.S. Fish and Wildlife Service, Vernal Pools of Southern California Recovery Plan, Portland, Oregon, 1998.
[77] U.S. Fish and Wildlife Service, Vernal Pools of Southern California Recovery Plan, Portland, Oregon, 1998.
[78] Federal Register, Department of the Interior, U.S. Fish and Wildlife Service, 50 CFR Part 17, Endangered and Threatened

areas of Ventura County, Orange County, San Diego County, and Baja California and isolated inland populations in Orange County, Riverside County, San Diego County and Baja California. The Riverside fairy shrimp is a small freshwater crustacean. Mature males are normally less than an inch long, while mature females are slightly smaller. The Riverside fairy shrimp normally inhabits vernal pools, which are seasonal aquatic habitats formed when winter rains fill shallow topographic depressions. Riverside fairy shrimp are normally found in deeper vernal pools that retain water through the warm weather of late April and May. The pools normally form over impervious clay layers, and persist for several months. In addition to these deep, cool pools, the Riverside fairy shrimp is occasionally found in road ruts and ditches. The Riverside fairy shrimp is intolerant of salty, muddy, or alkaline water.[79, 80]

The female Riverside fairy shrimp deposits eggs in the sediments of the vernal pool, which then lie dormant in the soil as the vernal pool dries up during the summer months. The cysts then emerge in the spring, when winter rains that have filled the pools reach temperatures of 15-17°C (59-63°F). The cysts are able to survive in the soil for several decades when inadequate water is available for hatching. Due to the ephemeral nature of their habitat, the Riverside fairy shrimp has a relatively short lifespan as an adult, reaching sexual maturity in three to four weeks.[81]

Riverside fairy shrimp cysts were determined to be present embedded in soil samples taken during dry season sampling at nine discrete locations within the AOA. The results of this sampling are summarized in **Table 8,** Ephemerally Wetted Areas, Site Characterization, and Riverside Fairy Shrimp Densities.

Wildlife and Plants; Determination of Endangered Status for Three Vernal Pool Plants and the Riverside Fairy Shrimp, July 16, 1993.

79 U.S. Fish and Wildlife Service, Vernal Pools of Southern California Recovery Plan, Portland, Oregon, 1998.

80 Federal Register, Department of the Interior, U.S. Fish and Wildlife Service, 50 CFR Part 17, Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Three Vernal Pool Plants and the Riverside Fairy Shrimp, July 16, 1993.

81 Thelander, Carl G., et al, ed., Life on the Edge, Santa Cruz, 1994.

Table 8

Ephemerally Wetted Areas, Site Characterization, and Riverside Fairy Shrimp Densities

Site No.	Square Feet	No. of Cysts per liter	Site Characterization
EW001	123	14-112	Site currently is located on top of fill material; no native soils are present. Site has been subject to repeated cut/fill activities. Construction activities are documented by historic aerial photographs from 1970, 1979, 1986, 1990, and 1995. Additionally, site has been documented as agricultural in 1950 historic aerial photograph. Neither hydric soils nor hydric vegetation is present on this site.
EW002	292	0-23	Site currently is located on top of fill material; no native soils are present. Site has been subject to repeated cut/fill activities. Construction activities are documented by historic aerial photographs from 1970, 1979, 1986, 1990, and 1995. Additionally, site has been documented as agricultural in 1950 historic aerial photograph. Neither hydric soils nor hydric vegetation are present on this site.
EW006	1,438	0.3	Site currently is located on top of fill material. Site has been subject to repeated cut/fill activities. Construction activities are documented by historic aerial photographs from 1979, 1986, 1990, and 1995. Additionally, site has been documented as agricultural in 1950 historic aerial photograph. Neither hydric soils nor hydric vegetation are present on this site.
EW009	577	32	Site is located on top of fill material. Site has been subject to repeated cut/fill activities. Construction activities are documented by historic aerial photographs from 1952, 1970, 1979, 1986, and 1990.
EW012	548	32	Site is located on top of fill material. Site has been subject to repeated cut/fill activities. Construction activities are documented by historic aerial photographs from 1952, 1970, 1979, 1986, and 1990.
EW013	4,808	32-64	Site is located on top of fill material. Site has been subject to repeated cut/fill activities. Construction activities are documented by historic aerial photographs from 1952, 1970, 1979, 1986, and 1990.
EW014	39,199	0-4	Site is located on top of fill material. Site has been subject to repeated cut/fill activities. Construction activities are documented by historic aerial photographs from 1970, 1979, and 1986. Site was constructed to accept stormwater drainage off western airfield.
EW015	2,086	1-4	Site is located on top of fill material. Site has been subject to repeated cut/fill activities. Construction activities are documented by historic aerial photographs from 1952, 1970, 1986, and 1990.
EW016	3,936	0-32	Site is located on top of fill material. Site has been subject to repeated cut/fill activities. Construction activities are documented by historic aerial photographs from 1952, 1970, 1979, 1986, and 1990.

Source: Sapphos Environmental, Inc.

The number of embedded Riverside fairy shrimp cysts ranged from one to 112 per liter of soil among the nine occupied locations. In addition to the cysts of Riverside fairy shrimp, cysts of the common fairy shrimp (*Branchinecta lindalli*), ranging from one to 3,293 per liter of soil, were also found.[82] The area containing embedded cysts of the Riverside fairy shrimp comprises a total of 1.3 acres.[83] The nine sampling sites are located within areas that have been subject to repeated grading (cut and fill) activities between the 1950s and the present time. In addition, the areas are subject to routine operations and maintenance activities for wildlife hazards management (including mowing, discing, and grading) as required by the FAA. The nine sites are located in areas characterized by two non-native plant communities, Non-native Grassland/Ruderal and Disturbed/Bare Ground.

[82] Jones & Stokes Associates, Inc., Letter Report, 1998.
[83] RECON, Fairy Shrimp Surveys, 1998.

5.5 Directed Wet Season Surveys for Vernal Pool-Associated Species

Wet season sampling for the Riverside fairy shrimp was undertaken during optimal conditions for this species. Ephemerally wetted areas of the LAX airfield retained water as a result of unusually high levels of winter rains that occurred. Despite these optimal conditions, no adult Riverside fairy shrimp were observed. The FAA Wildlife Hazards Management guidelines require LAWA to maintain the AOA free of standing water and tall vegetation,[84] thereby rendering the habitat unlikely to support the adult phase of the Riverside fairy shrimp life cycle. The USFWS has informed LAWA and the FAA of its intent to treat areas containing embedded cysts of the Riverside fairy shrimp as occupied habitat pursuant to the Federal Endangered Species Act.

The *Recovery Plan for Vernal Pools of Southern California* (*VP Recovery Plan*) does not designate critical habitat for the Riverside fairy shrimp.[85] However, as a result of a recent agreement between the USFWS and the Center for Biological Diversity,[86] the USFWS shall propose critical habitat for the Riverside fairy shrimp on or by September 1, 2000. The *VP Recovery Plan* recommends that existing vernal pools and their associated watersheds within the Los Angeles Basin-Orange Management Areas (which include Los Angeles International Airport) be secured from further loss and degradation. There are no extant vernal pools within the AOA.

5.6 Other Threatened and Endangered Species

In addition to the two vernal pool-associated federally-listed endangered plant species, seven additional endangered or threatened plant species were determined to have the potential to be present within the Master Plan boundaries, including the Los Angeles/El Segundo Dunes. As indicated in **Table 9**, Federally- and State-Listed Plant and Wildlife Species Potentially Occurring within the Master Plan Boundaries, the seven federally-listed plant species were determined to be absent as a result of directed surveys.

In addition to the two vernal pool-associated federally-listed endangered wildlife species, seven additional endangered or threatened wildlife species were determined to have the potential to be present within the Master Plan boundaries, including the Los Angeles/El Segundo Dunes. As indicated in **Table 9**, El Segundo blue butterfly (*Euphilotes battoides allyni*), a federally-listed endangered wildlife species, is present in the Los Angeles/El Segundo Dunes in association in terrestrial upland habitats. The FAA has initiated consultation with the USFWS pursuant to Section 7 of the Federal Endangered Species Act. As indicated in **Table 9**, the remaining six federally-listed wildlife species were determined to be absent as a result of directed surveys.

[84] Federal Aviation Administration, Title 14, Code of Federal Regulations (CFR), Wildlife Hazard Management Part 139, Section 139.337.

[85] U.S. Fish and Wildlife Service, Vernal Pools of Southern California Recovery Plan, Portland, Oregon, 1998.

[86] United States District Court for the Northern District of California, San Francisco Division. Stipulated Settlement Agreement: Center for Biological Diversity vs. Bruce Babbit, Secretary of the Department of the Interior. Civil No. C99-3202 SC, February 15, 2000.

Table 9

Federally- and State-Listed Plant and Wildlife Species Potentially Occurring within the Master Plan Boundaries

	Status			
	Federal	State	Local	Habitat Requirements and Distribution
Flora				
San Diego button-celery (*Eryngium aristulatum* var. *parishii*)	FE	SE	Determined absent as a result of directed surveys undertaken within all ephemerally wetted areas of the AOA in late spring/early summer 1998 and 2000.	Vernal pools, marshes, and chaparral from 1-150 meters above mean sea level.[1, 2] Once occurred from Riverside County, California south to northern Baja California, Mexico.[3] Historic topographic maps indicate that potentially suitable habitat was present between the backdune of what is now the Los Angeles/El Segundo Dunes and the approximate location of the Theme Restaurant. Potentially suitable habitat has been developed or substantially altered as a result of the construction and realignment of Pershing Drive, and development of operations and maintenance activities of LAX. Extant locations include vernal pools found at the Santa Rosa Plateau in Riverside County, Otay Mesa, Kearny Mesa, Del Mar Mesa, Miramar Naval Station, and Camp Pendleton in San Diego County;[3] and south to the mesas of Ensenada, Mesa de Colonet, and San Quintin, Baja California, Mexico.[4]
Beach spectacle-pod (*Dithyrea maritima*)	C	ST	Determined absent as a result of qualitative surveys conducted at the Los Angeles/El Segundo Dunes for 1995, 1996, 1997, 1998, 1999 and directed surveys in 1998 and 2000.	Coastal strand,[1] coastal dunes and scrub, and sandy soils below 50 meters above mean sea level.[2] Historically this species ranged from the central coast of California south into Baja California. Known in California from less than twenty occurrences; extirpated from half of its historical range.[5] Historically known from the Los Angeles/El Segundo Dunes. Historic topographic maps and aerial photographs indicate that potentially suitable habitat for this species within the Los Angeles/El Segundo Dunes was largely converted due to residential development between 1940 and 1974. This species has not been successfully reintroduced as a result of revegetation efforts undertaken between 1990 and 1994. Nearest known location is in the vicinity of the Ballona Marshes, near Marina del Rey.[6]
Santa Monica Mountains dudleya (*Dudleya cymosa* ssp. *ovatifolia*)	FT		No suitable habitat present within the Master Plan boundaries, including the Los Angeles/El Segundo Dunes. Determined absent as a result of qualitative surveys conducted at the Los Angeles/El Segundo Dunes in 1995, 1996, 1997, 1998, and 1999. Determined absent as a result of directed surveys conducted in 1998 and 2000. Therefore, this species is not further addressed in this document	Shaded, rocky slopes from 150-500 meters above mean sea level;[2] on volcanic cliff faces and rocky outcrops in chaparral and coastal sage scrub.[6] Found in the Santa Monica Mountains from near Westlake Village to Agoura, and in deep canyon bottoms along lower Malibu Creek and Topanga Creek. Populations in Malibu and Topanga Canyons largely on lands owned and managed by the County of Los Angeles Department of Parks and Recreation, two populations on land designated as open space by Conejo Open Space Conservation Agency, several on private land along the northern slope of Ladyface Mountain.[7] In 1980, locally abundant in Topanga State Park, Santa Monica Mountains.[6]

FE = Listed as endangered under the Federal Endangered Species Act
FT = Listed as threatened under the Federal Endangered Species Act
SE = Listed as endangered by the State of California
ST = Listed as threatened by the State of California
C = Candidate for federal listing. Formerly classified as "Category 1" these are species for which the USFWS has information on file to support issuance of proposed rule to list as endangered or threatened.

Braunton's milkvetch (*Astragalus brauntonii*)	FE		Determined absent as a result of qualitative surveys conducted at the Los Angeles/El Segundo Dunes in 1995, 1996, 1997, 1998, 1999, and directed surveys in 1998 and 2000. This species is limestone endemic. No limestone is present within the Los Angeles/El Segundo Dunes; therefore, this species is not further addressed in this document.	Brushy places, firebreaks and disturbed areas in chaparral below 450 meters above mean sea level.[1, 2] Recent burns or disturbed areas in closed-cone coniferous forest, chaparral, coastal scrub, valley and foothill grassland.[6] Strong substrate preference, considered a limestone endemic. Currently known from four general areas in Ventura, Los Angeles, and Orange counties. One population in Simi Hills, one in Santa Ynez Canyon, one in Coal Canyon, and one in Gypsum Canyon. Remaining population estimated at less than 100 individuals.[7] Documented at five sites in the Santa Monica Mountains. Four out of five populations are presumed extant.[6] There are no limestone outcrops or limestone derived soils within the Master Plan boundaries or Los Angeles/El Segundo Dunes.

Table 9

Federally- and State-Listed Plant and Wildlife Species Potentially Occurring within the Master Plan Boundaries

	Status			
	Federal	**State**	**Local**	**Habitat Requirements and Distribution**
Ventura Marsh milkvetch (*Astragalus pycnostachyus* var. *lanosissimus*)	FPE	SC	Determined absent as a result of qualitative surveys conducted at the Los Angeles/El Segundo Dunes in 1995, 1996, 1997, 1998, 1999, and directed surveys in 1998 and 2000.	Coastal marshes or seeps below 30 meters above mean sea level.[1, 2] Within reach of high tide or protected barrier beaches in coastal salt marsh or sandy bluffs.[6] Believed extinct until its rediscovery in 1997. Only known extant population on McGrath State Beach in Ventura County.[8] Historically known from the Ballona marshes and a meadow near the seashore in Santa Monica; presumed extirpated at both sites. Potentially suitable habitat to the species is limited to the fore dune, west of the Los Angeles/El Segundo Dunes immediately adjacent to Vista Del Mar Boulevard. The Master Plan would not affect foredune habitat.
Coastal dunes milkvetch (*Astragalus tener* var. *titi*)	FPE	SE	Determined absent as a result of qualitative surveys conducted at the Los Angeles/El Segundo Dunes in 1995, 1996, 1997, 1998, 1999, and directed surveys in 1998 and 2000.	Moist sandy depressions near the coast, typically coastal bluffs and dunes below 15 meters above mean sea level.[2, 6] Historically, range was known to include Monterey, Los Angeles, and San Diego Counties. It is presumed extant at three locations, one in Monterey County and two in San Diego County.
Salt marsh bird's-beak (*Cordylanthus maritimus* ssp. *maritimus*)	FE	SE	Determined absent as a result of qualitative surveys conducted at the Los Angeles/El Segundo Dunes in 1995, 1996, 1997, 1998, 1999, and directed surveys in 1998 and 2000.	Generally found in coastal salt marsh and in higher zones of salt marsh habitat between 0 and 30m. Once distributed along the coast from lower California to Oregon.[1] Historically known from Terminal Island in San Pedro Harbor and in the vicinity of Santa Monica; presumed extirpated at both sites.[6] Known to be extant at Pont Mugu Air Station, Ventura County. No suitable habitat exists for this species at the Los Angeles/El Segundo Dunes; therefore this species is not further addressed in this document.
Mexican flannelbush (*Fremontodendron mexicanum*)	FE	SE	No suitable habitat present within the Master Plan boundaries. Determined absent as a result of directed spring surveys conducted in 2000.	Occurs primarily in closed-cone coniferous forest and southern mixed chaparral, often associated with meta-volcanic soils between 300-1000 meters above mean sea level.[10] Also known from Southern Oak Woodland.[1] Associated with Southern California cypress groves.[11] Historically, less than ten native locations reported in the United States. Current distribution includes Cedar Canyon in southern San Diego County and Arroyo Seco, Baja California, Mexico. Reported occurrences in Los Angeles County likely based on garden escapees.[10] Known from Palos Verdes, but considered an erroneous occurrence.[6] The Master Plan boundaries are not within the historic range of this species. No suitable habitat for this species exists within the Master Plan boundaries; therefore this species is not further addressed in this document.

FE = Listed as endangered under the Federal Endangered Species Act
FPE = Proposed for federal listing as endangered under the Federal endangered Species Act
SE = Listed as endangered by the State of California
SC = State Candidate

Table 9

Federally- and State-Listed Plant and Wildlife Species Potentially Occurring within the Master Plan Boundaries

	Status			
	Federal	State	Local	Habitat Requirements and Distribution
California orcutt grass (*Orcuttia californica*)	FE	SE	Determined absent as a result of directed surveys of all ephemerally wetted areas within the AOA in late spring/early summer 1998 and 2000.	Vernal pools below 625 meters above mean sea level.[2] Drying mud flats and valley grassland.[1] Once occurred in vernal pools from San Quintin, Baja California, Mexico northward to Riverside, Los Angeles, and San Diego Counties in southern California. Currently known from the Santa Rosa Plateau, and a site near Hemet, Skunk Hollow pool in Riverside County; two pools at Marine Corps Air Station Miramar (Carlsbad) and four pool complexes at the Cruzan Mesa near Santa Clarita; Carlsberg vernal pool in the City of Moorpark, Ventura County; Otay Mesa in San Diego County; and Woodland Hills in Los Angeles County. In Baja California, Mexico, the species is found on Mesa de Colonet and in pools in San Quintin. The nearest record for this species is 6 miles east/southeast of LAX in the City of Gardena near the junction of Rosecrans and Western Avenues. Last seen in 1946. Known from less than twenty occurrences.[5] Populations face high degree of threat and have low potential for recovery.[4]
Fauna				
Crustaceans				
San Diego fairy shrimp (*Branchinecta sandiegoensis*)	FE		Surveys were conducted based on the USFWS's letter of comment[28] recommending protocol surveys to be conducted within the Los Angeles International Airport. This species was determined absent within the Master Plan boundaries as a result of directed wet and dry season surveys performed in winter 1997 and spring 1998.	Vernal pool specialist, found in shallow depressions containing a clay hard pan soil layer. Historically, known to occur within San Diego County.[15] Currently, discontinuously distributed along coastal Southern California and northern Baja California. They are most frequently found in San Diego County.[4] The largest number of vernal pools inhabited by the San Diego fairy shrimp is found from Marine Corps Base Camp Pendleton, inland to Ramona, and south through Del Mar Mesa, Kearney Mesa, Proctor Valley, and Otay Mesa, and into northwestern Baja California, Mexico. In Baja California, it has been recorded at two localities (Valle de las Palmas south of Tecate and Baja Mar, north of Ensenada).[18] Small populations occur in Orange County, and a single isolated female was reported from a vernal pool in Isla Vista, Santa Barbara County, California.[20] The San Diego fairy shrimp occurs in San Diego County from San Marcos and Ramona south to Otay Mesa and at Valle de Palmas in northwestern Baja California, Mexico. All known localities are below 700 meters (2,300 feet) and within 50 kilometers (30 miles) of the Pacific coast.[15] The fairy shrimp presently occurs in fewer than 70 vernal pools within 11 vernal pool complexes in coastal San Diego County.[15] The San Diego fairy shrimp has also been reported from Isla Vista in Santa Barbara County, California, but the identification of the single female individual is unconfirmed (Michael Fugate, University of Oregon, personal communication, 1993.[15] There are no records from Los Angeles and Orange Counties.[16] The embedded cysts were discovered in disturbed non-native grassland areas that do not retain the habitat characteristics of extant vernal pools. Therefore, no suitable habitat exists within the Master Plan boundaries, including the Los Angeles/El Segundo Dunes.

FE = Listed as endangered under the Federal Endangered Species Act
SE = Listed as endangered by the State of California

Table 9

Federally- and State-Listed Plant and Wildlife Species Potentially Occurring within the Master Plan Boundaries

	Status			
	Federal	**State**	**Local**	**Habitat Requirements and Distribution**
Riverside fairy shrimp (*Streptocephalus woottoni*)	FE		Surveys were conducted based on the USFWS's letter of comment[28] recommending protocol surveys to be conducted within the Los Angeles International Airport. Embedded cysts determined present on the western LAX airfield as a result of directed dry season surveys performed in winter 1997. Adult shrimp determined absent on the western LAX airfield as a result of directed dry season surveys performed in winter 1997. Adult shrimp determined absent on the western LAX airfield based on the result of directed wet season surveys in spring 1998.	Vernal pool specialist, adults found in deep vernal pools which retain water through the warm weather of late April and May, road cuts, and depressions that support suitable habitat.[4] The embedded cysts were discovered in disturbed non-native grassland areas that do not retain the habitat characteristics of extent vernal pools. Therefore, no suitable habitat exists within the Master Plan boundaries, including the Los Angeles/El Segundo Dunes. Distribution is limited to discrete localities from Los Angeles County (LAX), Orange County, Riverside County, San Diego County, and south to Baja California. San Diego County contains the most known localities.[4] The northern range of the Riverside fairy shrimp is defined by Skunk Hollow and the Santa Rosa Plateau in Riverside County and coastal sites in San Diego and Orange Counties. It is documented from one complex on Marine Corps Air Station Miramar, throughout Marine Corps Base Camp Pendleton, and eight complexes on Otay Mesa. In Baja California, Mexico, it has been found in Valle de las Palmas, and at Bajamar north of Ensenada.[18] Embedded cysts are present within the Master Plan boundaries. The nearest known location occurs from one coastal site at Dana Point in Orange County.
Insects				
El Segundo blue butterfly (*Euphilotes battoides allyni*)	FE		Surveys were conducted based on the USFWS's letter of comment[29] recommending directed surveys be conducted within the Master Plan boundaries, including the Los Angeles/El Segundo Dunes. This species was determined present within the Los Angeles/El Segundo Dunes as a result of directed surveys performed in 1995, 1996, 1997, 1998, 1999, and 2000.	Coastal sand dunes that support populations of its food plant: coastal buckwheat. Historically ranged over the entire Los Angeles/El Segundo Dunes and the northwestern Palos Verdes Peninsula in southwestern Los Angeles County. Currently distributed on three remnant habitats within its former range; Los Angeles/El Segundo Dunes, the 1.5 acre site at the Chevron Refinery Preserve, and a half-acre site at Malaga Cove, all in Los Angeles County.[12] There are currently 150.2 acres of occupied habitat for the El Segundo blue butterfly within the Los Angeles/El Segundo Dunes. Directed surveys of the El Segundo blue butterfly at the Los Angeles/El Segundo Dunes indicated continued decline in numbers between 1977 and 1979 with an estimated total of less than 2,000 adults. The City of Los Angeles initiated active habitat management measures for the El Segundo blue butterfly in 1987 and continues those work efforts as part of their annual operations and maintenance activities. Population estimates for 1999 range from 10,000 – 40,000 butterflies.
Birds				
California brown pelican *(Pelecanus occidentalis californicus*)	FE		Surveys were conducted based on the USFWS's letter of comment[29] recommending directed surveys be conducted within the Master Plan boundaries, including the Los Angeles/El Segundo Dunes. This species was determined absent within the Master Plan Boundaries as a result of directed surveys performed in spring 1998 and 2000.	Open ocean, near-shore coastal waters, and coastal estuaries.[20] Historic nesting range extended from Central Mexico north to Monterey.[21] Currently breeds on Channel Islands off southern California coast.[14] This species is a year round resident in Southern California.[13] The nearest roosting site is located at the San Pedro Harbor in Los Angeles County.[14] The nearest known seasonal visitor sighting is located at Dockweiler State Beach.[24]

FE = Listed as endangered under the Federal Endangered Species Act

Table 9

Federally- and State-Listed Plant and Wildlife Species Potentially Occurring within the Master Plan Boundaries

	Status			
	Federal	State	Local	Habitat Requirements and Distribution
American peregrine falcon (*Falco peregrinus anatum*)		SE	Surveys were conducted based on the USFWS's letter of comment[29] recommending directed surveys be conducted within the Master Plan boundaries, including the Los Angeles/El Segundo Dunes. This species was determined absent within the Master Plan Boundaries and the Los Angeles/El Segundo Dunes as a result of directed surveys performed in summer 1998 and 2000.*	Breeds primarily in woodland, forest, and coastal habitats.[20] Non-breeding habitat occurs in riparian, coastal, and inland wetlands. De-listed as federally endangered on August 25, 1999.[22] The American peregrine falcon has reoccupied most of its historic breeding range in California, including the Channel Islands, the coast and Cascade ranges, and Sierra Nevada. It can inhabit all counties in California throughout the year except during breeding season.[20] This species is an occasional visitor to the Master Plan boundaries, however no breeding habitat occurs within the Master Plan boundaries.[17] Therefore, this species is not further addressed in this document.
California least tern (*Sterna antillarum browni*)	FE		Surveys were conducted based on the USFWS's letter of comment[29] recommending directed surveys be conducted within the Master Plan boundaries, including the Los Angeles/El Segundo Dunes. This species was determined absent within the Master Plan Boundaries and the Los Angeles/El Segundo Dunes as a result of directed surveys performed in spring 1998 and 2000.	Open ocean and a colonial breeder on bare or sparsely vegetated flat substrate located along marine shores, estuarine shores, alkali flats, land fills, or paved areas throughout the year.[6] This federally-listed endangered species[23] comes to shore only to breed. Historically nested along the central and Southern California coast to the coast of Mexico.[14] Currently nests sporadically along coast from San Francisco to Baja California.[13] Nearest known breeding colony is located 3 miles north of the Master Plan boundaries.[6] Observed as a seasonal visitor to waters offshore of Dockweiler State Beach.[17] This species is not known to breed within the Master Plan boundaries. Therefore, this species is not further addressed in this document.
Southwestern willow flycatcher (*Empidonax extimus traillii*)	FE		Surveys were conducted based on the USFWS's letter of comment[29] recommending directed surveys be conducted within the Master Plan boundaries, including the Los Angeles/El Segundo Dunes. This species was determined absent within the Master Plan Boundaries as a result of directed surveys performed in summer 1998 and 2000.	Riparian acres with thick willow forests.[6] Historically nested throughout California, wherever willow thickets or other riparian habitat was found.[25] Regular nesting is currently known only from a few mountain meadows in the Sierra Nevada and several rivers in Trinity, Inyo, Kern, Santa Barbara, Los Angeles, and San Diego Counties.[14] Species becomes more widely distributed in the spring and fall migration period.[14] This species is not known to occur within the Master Plan boundaries. Therefore, this species is not further addressed in this document.
Least Bell's vireo (*Vireo belli pusillus*)	FE		Surveys were conducted based on the USFWS's letter of comment[29] recommending directed surveys be conducted within the Master Plan boundaries, including the Los Angeles/El Segundo Dunes. This species was determined absent within the Master Plan Boundaries as a result of directed surveys performed in summer 1998 and 2000.	Inhabits rivers with riparian vegetation associated with willows and other low, dense valley foothill riparian habitat, lower portions of canyons, and desert and coastal slopes.[13] Historically ranged from the northern tip of the Sierra Nevada along valleys and rivers south to Baja California, Mexico.[26] Currently breeds only in a few scattered areas of riparian habitat along the coast and western edges of the Mohave Desert in the following counties: Santa Barbara, Ventura, Riverside, Orange, San Bernardino, and San Diego.[14] This species is not known to occur within the Master Plan boundaries or Los Angeles/El Segundo Dunes. Therefore this species is not further addressed in this document.

FE = Listed as endangered under the Federal Endangered Species Act
SE = Listed as endangered by the State of California

Table 9

Federally- and State-Listed Plant and Wildlife Species Potentially Occurring within the Master Plan Boundaries

	Status			
	Federal	**State**	**Local**	**Habitat Requirements and Distribution**
Mammals				
Pacific pocket mouse (*Perognathus longimembris pacificus)*	FE		Surveys were conducted based on the USFWS's letter of comment[29] recommending directed surveys be conducted within the Master Plan boundaries, including the Los Angeles/El Segundo Dunes. This species was determined present within the Los Angeles/El Segundo Dunes as a result of directed surveys performed in 1995, 1996, 1997, 1998, 1999, and 2000.	Occurs on fine-grain, sand substrates in open coastal sage scrub, coastal dunes, coastal strand, and river alluvium habitats.[14] Species occurred historically along the Southern California coast from Los Angeles County south to Baja, California.[27] Now restricted to less than five populations, one in Orange County and others in San Diego County.[14] This species was last seen in 1938 at Marina Del Rey in the El Segundo Area.[6] This species is not known to occur within the Master Plan boundaries, therefore this species is not further addressed in this document.

FE = Listed as endangered under the Federal Endangered Species Act
SC = State Candidate
FPE = Proposed for federal listing as endangered under the Federal endangered Species Act
FT = Listed as threatened under the Federal Endangered Species Act
SE = Listed as endangered by the State of California
ST = Listed as threatened by the State of California
C = Candidate for federal listing. Formerly classified as "Category 1" these are species for which the USFWS has information on file to support issuance of proposed rule to list as endangered or threatened.

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6 California Department of Fish and Game, California Natural Diversity Database-Rarefind 2, Sacramento, 1999.
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22 50 CFR Part 17.
23 50 CFR Part 17.
24 Sapphos Environmental, Inc., Memorandum for the Record (1067-007.M15), Subject: Results of Directed Summer Surveys for Sensitive Amphibians, Reptiles, California Brown Pelican, California Least Tern, and the Endangered El Segundo Blue Butterfly at LAX/El Segundo Dunes, December 21, 1998.

Table 9

Federally- and State-Listed Plant and Wildlife Species Potentially Occurring within the Master Plan Boundaries

	Status			
	Federal	**State**	**Local**	**Habitat Requirements and Distribution**

[25] 50 CFR Part 17.
[26] 50 CFR Part 17.
[27] 50 CFR Part 17.
[28] U.S. Fish and Wildlife Service. 1997b. Letter dated August 29 to Mr. David B. Kessler, Federal Aviation Administration, U.S. Department of Transportation, P.O. Box 92007, World Way Postal Center, Los Angeles, CA 90009-2007.
[29] U.S. Fish and Wildlife Service. 1997a. Letter dated July 31 to Mr. David B. Kessler, Federal Aviation Administration, U.S. Department of Transportation, P.O. Box 92007, World Way Postal Center, Los Angeles, CA 90009-2007.

Source: Sapphos Environmental, Inc. 2000

6.0 CONCLUSIONS AND RECOMMENDATIONS

As a result of the six investigations undertaken to assess the presence or absence of vernal pools within the Los Angeles International Airport (LAX) airfield, the following conclusions are provided, summarized in **Table 10**, Vernal Pool Evaluation:

- Review of historic topographic maps and aerial photographs confirmed that there are no extant vernal pools within the LAX airfield.
- Mapping and monitoring during the winter of 1997/1998 (a year with above-average precipitation) resulted in the identification of 52 ephemerally wetted areas. Of the 52 areas mapped, 20 persisted for a period in excess of ten days. Only 17 of the 20 areas were sampled because three areas dried up during the sampling period.
- Directed dry season soil sampling demonstrated that ephemerally wetted areas at the LAX airfield are dominated by the common fairy shrimp *Branchincta lydalli.* In addition, Jones & Stokes Associates, Inc. identified embedded cysts confirmed to be the endangered Riverside fairy shrimp in nine locations.
- The number of cysts found in the nine locations was a very low number compared to other fairy shrimp species at the same site. The greatest density of cysts was found in EW014.
- Directed wet season surveys for fairy shrimp yielded no adult individuals of the endangered San Diego fairy shrimp or the Riverside fairy shrimp. Despite above-average precipitation, only location EW014 (**Figures 11** and **12**) maintained a depth sufficient to potentially support Riverside fairy shrimp. However, no adult Riverside fairy shrimp were found during directed wet season surveys. On the other hand, laboratory biologists successfully reared cysts recovered during the surveys and confirmed the hatched shrimp to be Riverside fairy shrimp.
- There are no vernal pool-associated endangered plant species present on the LAX airfield.
- It is possible that the cysts may have been artificially imported to the airport during construction of the airstrip.
- The Biological Assessment under preparation by the Federal Aviation Administration (FAA) addresses the potential for construction, operations, and maintenance activities to affect the Riverside fairy shrimp due to the presence of embedded cysts in 1.21 acres on the LAX airfield.
- The joint EIS/EIR under preparation by Los Angeles World Airports (LAWA) and the FAA will need to address impacts on 1.3 acres of ephemerally wetted habitat that contains embedded cysts of the Riverside fairy shrimp.
- The potential for significant impacts on wetlands was identified under each of the three build alternatives in association with construction staging activities and the development of the ring road, runway improvements, and appurtenant facilities. These impacts result from the permanent conversion of 1.3 acres of area meeting the U.S. Army Corps of Engineers (USACOE) criteria for wetland hydrology to development. Therefore, the following mitigation measure is recommended.

Table 10

Vernal Pool Evaluation

	No. of Sites	Mapped	Results
Dry Season Survey Efforts			
Ephemeral Wetted Areas Identified	28	*	--
Ephemeral Wetted Areas with Potential to Support Vernal Pool Species	16	*	--
Sampling for Cysts	16	*	9[1]
Wet Season Survey Efforts			
Total Ephemeral Wetted Areas Identified	51	*	20[2]/17[3]
Soil Sampling for Vernal Pool Identification	50	*	0[4]
Sampling for Adult Shrimp	17	*	0[5]
Sampling for Vernal Pool Plant Species	20	*	0[6]

[1] Cysts identified as Riverside fairy shrimp found at nine locations in low numbers.
[2] Standing water persisted at twenty sites for at least ten days following initial storm events.
[3] Standing water persisted at seventeen sites throughout surveys for adult fairy shrimp.
[4] At the direction of the USACOE, fifteen sites were sampled for permeability and soil suitability. The remaining sites were sampled for soil texture, soil pH, soil permeability, soil saturation, and soil hydrology. No sites exhibited characteristics associated with vernal pools.
[5] No adult fairy shrimp were found in any ponded site surveyed for adult fairy shrimp.
[6] No vernal pool indicator plant species were identified during surveys.

Source: Sapphos Environmental, Inc. 2000

Implementation of the following mitigation measure would provide for replacement of 1.3 acres of degraded wetland habitat with estimated habitat value of 0.15 with an equal number of acres with estimated habitat value of 0.75. It is anticipated that created vernal pool habitat could achieve habitat values of 0.75 (**Table 11**).

Table 11

Modified Habitat Evaluation Procedure for the Mitigation Site

	Habitat Reference Sites	Riverside Fairy Shrimp Wetland Habitat Mitigation Site
Topography/Hydrology	**0.20**	**0.20**
Mound-Depression Microrelief	0.05	0.05
Native Soils w/Slope <10%	0.05	0.05
Areas w/Period of Inundation ≥30 days	0.05	0.05
Summer Desiccation	0.05	0.05
Flora	**0.20**	**0.20**
>10% Vegetative Cover	0.05	0.05
Native Grasses >10%	0.05	0.05
Vernal Pool Associated Species	0.05	0.05
Listed Vernal Pool Associated Species	0.05	0.05
Fauna	**0.20**	**0.15**
Dominated by Native Fauna (reproducing)	0.05	0.05
Grassland-Associated Species (reproducing)	0.05	0.05
Sensitive Vernal Pool Associated Species (reproducing)	0.05	0.05
Listed Vernal Pool Associated Species (reproducing)	0.05	0.00
Ecosystem Functional Integrity	**0.40**	**0.20**
Contiguous w/ Wetland and State-Designated Sensitive Terrestrial Habitat	0.10	0.00
Under Regulatory Conservation	0.10	0.10
Variety of Pollinator/Dispersal Mechanisms Present (Wind, Wildlife)	0.10	0.10
Contiguous Native Habitat >40 acres	0.10	0.00
TOTAL HABITAT VALUE (HV)	**1.00**	**0.75**

Source: Sapphos Environmental, Inc. 2000

LAWA or its designee shall undertake mitigation for impacts to 1.3 acres of degraded habitat containing embedded cysts of Riverside fairy shrimp. The degraded habitat containing embedded cysts of Riverside fairy shrimp was determined to have a habitat value of 0.15, based on results of a modified HEP analysis (**Table 11**). Habitat occupied by embedded cysts of Riverside fairy shrimp shall be replaced at a suitable alternate location at a ratio of not more than 1:1. Replacement habitat shall have a habitat value of not less than 0.75, as determined by the modified HEP analysis.

LAWA or its designee, in conjunction with the USFWS, shall identify a location suitable for the creation of high-quality habitat to which the soil containing embedded cysts of Riverside fairy shrimp can be relocated. LAWA shall identify opportunities for creation of habitat suitable for embedded cysts of Riverside fairy shrimp. The FAA has determined that the creation of suitable habitat within the Los Angeles/El Segundo Dunes represents an unacceptable wildlife hazard pursuant to Title 14 CFR 139.339.[87] Therefore, LAWA shall identify opportunities for creation of suitable habitat for embedded cysts of Riverside fairy shrimp outside of the areas subject to wildlife hazards management.

Eight potentially suitable relocation sites for soils containing embedded cysts of Riverside fairy shrimp have been identified. The site closest to the AOA may exist north of LAX, on the bluffs overlooking the Ballona Wetlands.[88] The site is approximately 44 acres in size, and is located in the 7400 block of 80th Street and Berger Avenue. The site is currently proposed for development of 120 single-family residences by the Catellus Residential Group.[89] Several comment letters on the Subsequent Environmental Impact Report for the project have indicated that the site supports vernal pool habitat. In addition, the USFWS has recommended that the applicant address the potential impacts to vernal pool species from the proposed project through an assessment of the site by a qualified biologist familiar with the site and the listed vernal pool species.[90] Presence/absence of vernal pools at the Catellus site has not been verified. In the event that the site supports vernal pool habitat or suitable conditions for creation or enhancement of such habitat, it may be possible for the USFWS to work with the project applicant to incorporate the relocation of Riverside fairy shrimp cysts from LAX into suitable conserved areas of the development project. The USFWS has indicated that this would be a beneficial resolution to impacts to Riverside fairy shrimp cysts at LAX.

LAWA shall evaluate the feasibility of Henrietta Basin for use as a location for the creation of suitable habitat for the Riverside fairy shrimp. Henrietta Basin is a flood control basin located in, and owned by, the City of Torrance; it is located approximately eight miles south of LAX, west of the intersection of Spencer Street and Henrietta Street and north of Edgemere Drive. A preliminary report prepared for the site states that the basin may have historically been a part of the vernal marsh complex that once existed on the Los Angeles coastal prairie.[91] Though the report lacks a strong scientific foundation, it does describe seasonally ponded portions of the basin that seem to exhibit some vernal characteristics. A difference in characteristic vegetation has been observed between the north and south portions of the basin, potentially due to vernal properties in the southern portion. The report describes a true vernal marsh existing in the basin. Additional surveys of this site by a biologist familiar with vernal pool habitats and the species associated with them would be required to determine the suitability of the basin for relocation of Riverside fairy cysts identified at LAX.

In addition, an historic location for California orcutt grass approximately six miles east/southeast of LAX will be evaluated for its potential suitability as a restoration site.

Should use of sites within Los Angeles County be determined infeasible, LAWA shall evaluate the feasibility of the remaining six vernal pools or vernal pool complexes in the Los Angeles Basin/Orange Management Area identified by the USFWS: Chiquita Ridge, El Toro, Fairview Park, Orange County Foothills, Saddleback Meadows, and San Clemente State Park.[92] The USFWS indicated that it was its belief that all of these complexes had succumbed to development, and were no longer potential

87 United States Department of Transportation, Federal Aviation Administration, to Mr. James Ritchie (LAWA), June 30, 2000.
88 Brenda MacMillan, U.S. Fish and Wildlife Service, Personal Communication, April 27, 1999.
89 City of Los Angeles, Department of Planning, Environmental Review Section, West Bluffs Project, Subsequent Draft Environmental Impact Report, May, 1998.
90 U. S. Fish and Wildlife Service, Letter to Hadar Plafkin, RE: West Bluffs Project, City of Los Angeles-State Clearing House No. 97111005; Coastal Development Permit No. CDP-93-013, Project Coordinator, Department of City Planning, City of Los Angeles, from Jim A. Bartel, Assistant Field Supervisor, Carlsbad Field Office, 1999.
91 Dale Lincoln, The Ecology, Preservation, and Use of Henrietta Basin Marsh, Torrance, California (A Layman's Study), Prepared for: The Honorable Mayor, City Council, Planning Commission, and Parks and Recreation Commission of the City of Torrance, and the Board of Education, Torrance Unified School District, 1992.
92 U.S. Fish and Wildlife Service, Vernal Pools Recovery Plan, 1998.

enhancement sites.[93] However, in subsequent discussions with the USFWS, it was indicated that a potentially suitable enhancement site might be present in the City of El Segundo, associated with a golf course adjacent to Sepulveda Boulevard.[94] A review of aerial photographs of the area revealed a large open area south of the Lakes Golf Course and east of Sepulveda Boulevard. The area is bounded on the north and south by Union Pacific and Burlington Northern Santa Fe Railway easements, respectively. Suitability of the site is not currently known. The complex closest to LAX, Fairview Park, is approximately 40 miles to the south. Riverside fairy shrimp are known to occur in five of the six complexes; Fairview Park is the only complex in which the species is not known to occur. Fairview Park is located near the coast, similar to LAX, and is owned by the City of Costa Mesa. The park is largely used for passive recreation and, based on the presence of existing vernal pool complexes, may provide a suitable area for introduction of the cysts identified at LAX. LAWA considers the Fairview Park site as the preferred alternative for disposition of salvaged Riverside fairy shrimp cysts identified at Los Angeles International Airport.

Once a suitable location has been identified and secured, LAWA or its designee shall undertake the relocation of soils containing embedded cysts of Riverside fairy shrimp from the western portion of the airfield to the identified location. Salvage shall be undertaken from all sites containing embedded cysts of the Riverside fairy shrimp. The top six to 12 inches of soil containing the cysts shall be transplanted during the dry season to minimize damage to the cysts during transport. The soil would then be deposited and spread out in a small basin or pool-like area of similar size without active mechanical compaction to minimize potential damage to the cysts.

LAWA or its designee, in conjunction with the USFWS and a qualified wildlife biologist, shall develop a program to monitor the progress of habitat creation prior to relocation of the embedded cysts of Riverside fairy shrimp, and to monitor created habitat for the presence of adult Riverside fairy shrimp following relocation of embedded cysts of Riverside fairy shrimp annually for a period of not more than five years.

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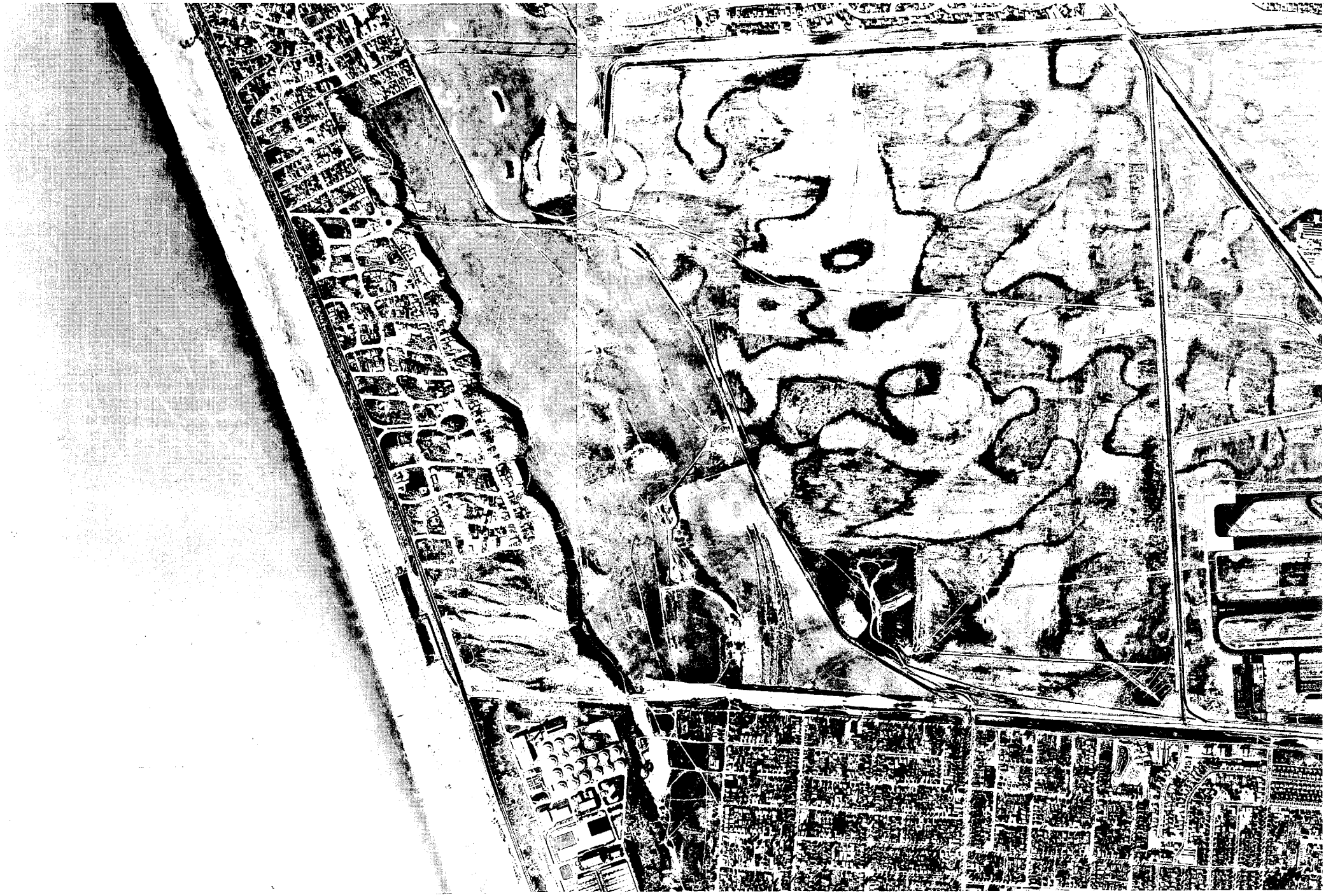
Appendix A
Historic Aerial Photographs



Los Angeles International Airport and El Segundo Dunes: November 1952

Source: Continental Aerial Photo, Inc. 10571 Calle Lee Suite 163, Los Alamitos, CA 90720

0 150 300 600 900 FE

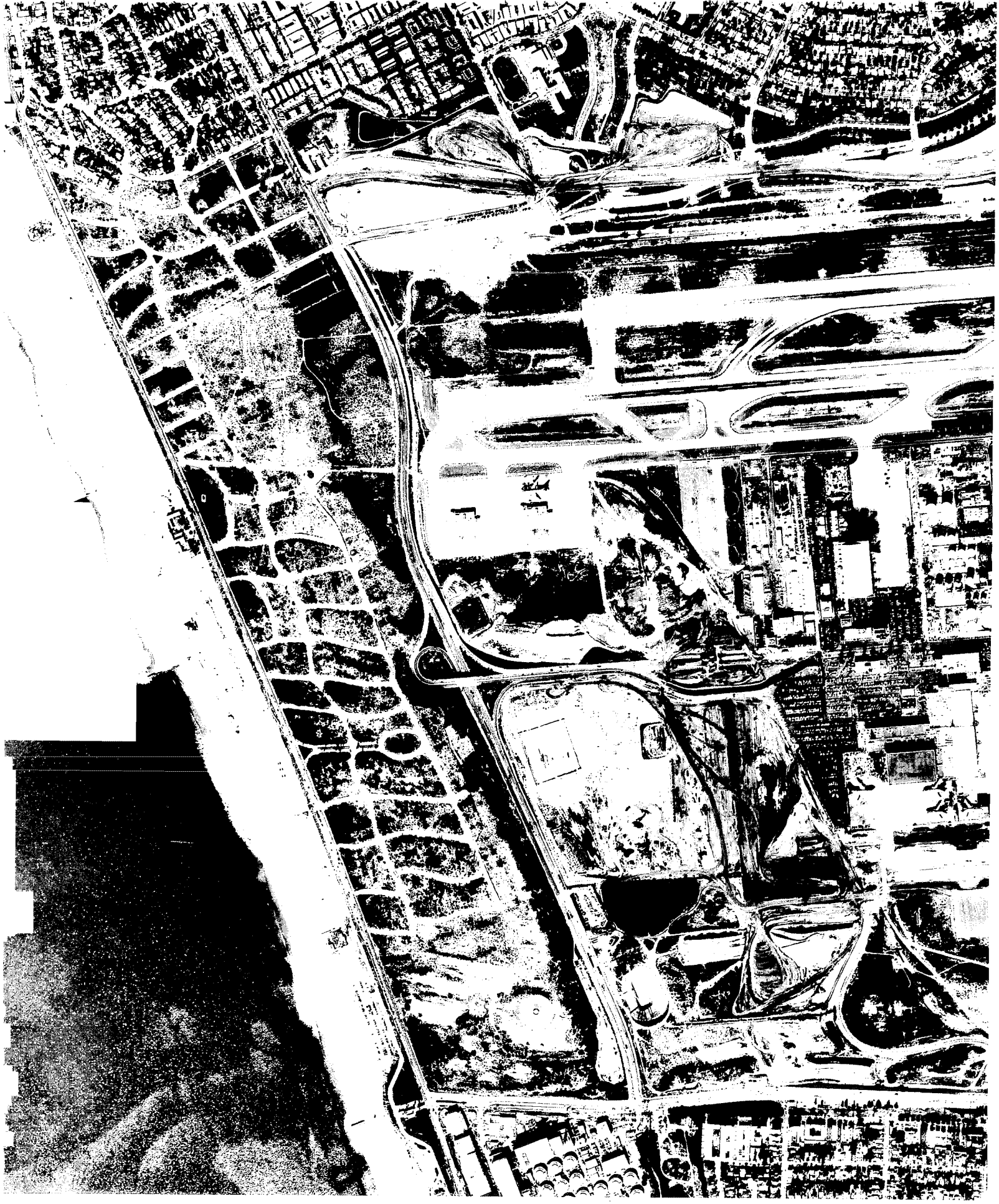
Los Angeles International Airport and El Segundo Dunes: February 1970

Los Angeles International Airport and El Segundo Dunes: May 1979

Los Angeles International Airport and El Segundo Dunes: January 1986

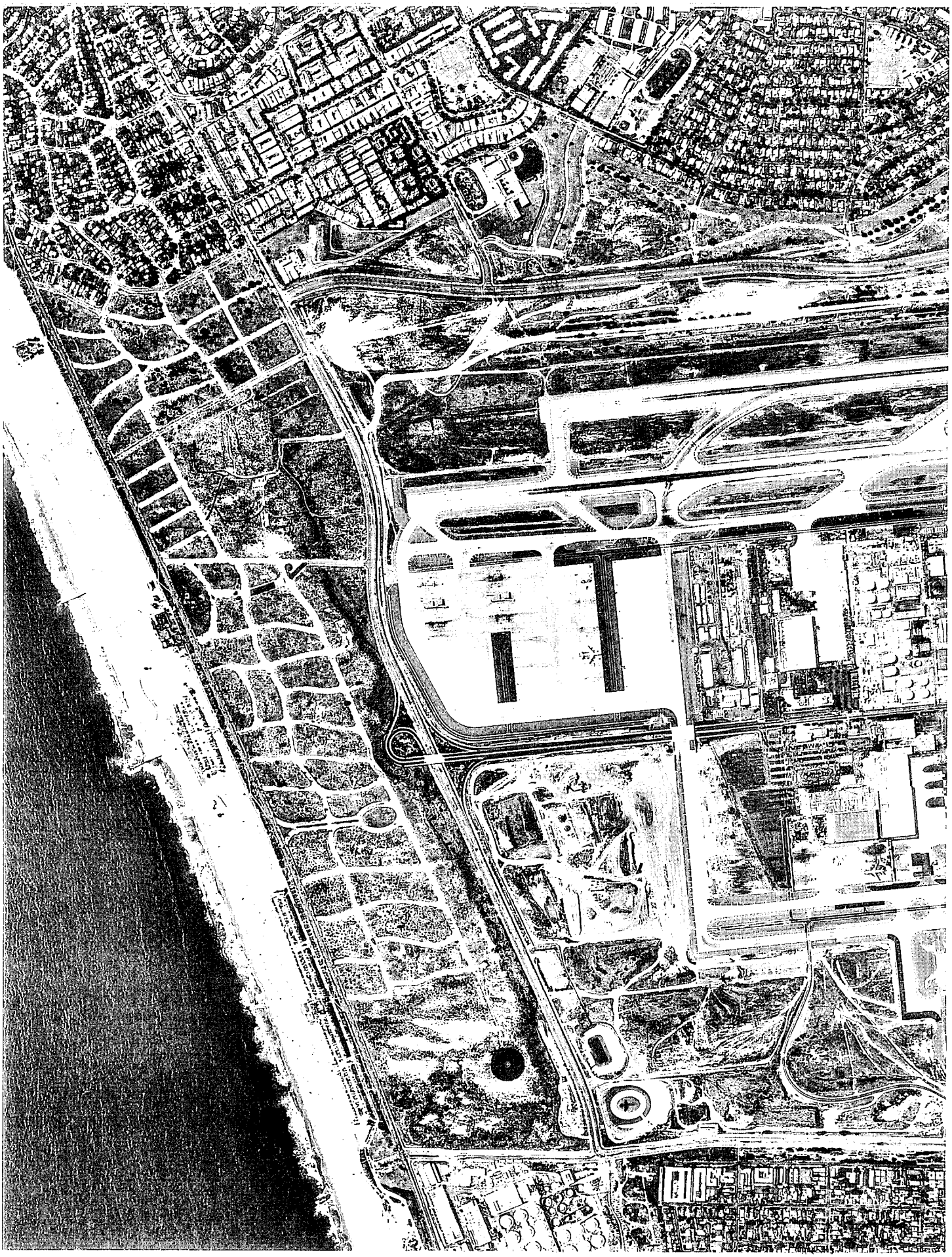
Los Angeles International Airport and El Segundo Dunes: July 1988

Los Angeles International Airport and El Segundo Dunes: June 1990



Los Angeles International Airport and El Segundo Dunes: January 1992

Los Angeles International Airport and El Segundo Dunes: June 1993



Los Angeles International Airport and El Segundo Dunes: June 1995

Source: Continental Aerial Photo, Inc. 10571 Calle Lee Suite 163, Los Alamitos, CA 90720

0 150 300 600 900 FEET

Appendix B
Field Data Sheets

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, NORTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: MCC, ESW, TAA, IMM, BRB, RKW	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: N/A 001

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Baccharis salicifolia	shrub	FACW	9. Sedge unkn	H	FACW
2. Plantago insularis	H	FACU	10.		
3. Carpobrotus edulis	H		11.		
4. Lotus Scoparius	H		12.		
5. Oxalis pes-caprae	H		13.		
6. Erodium cicutorium	H		14.		
7. Emergent grasses	H		15.		
8. Salix - unknown	~~Schr~~ Shrub		16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
___✓___ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: 9 (in.)

Depth to Saturate Soil: _____ (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___✓___ Inundated
_____ Saturated in Upper 12 inches
_____ Water Marks
_____ Drift lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
_____ Oxidized Root Channels in Upper 12 inches
_____ Water-Stained Leaves
_____ Local Soil Survey Data
_____ FAC-Neutral Test
_____ Other (Explain in Remarks)

Remarks: 2 inches of standing water present, ponded area is ≈ 280 sq. ft.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3	A				
3-11"		10 YR 3/6			Sand, Course

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
NO ___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)		(Circle)
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	Yes No	Is This Sampling Point Within a Wetland?	Yes No

Remarks: Problem Area, possible seasonal wetland (area known for historic vernal pools). Sampling area is routinely disturbed by airport operations and maintenance through mowing and discing. Site is adjacent to roadway, ponding appears due to lack of drainage because of road side berm and consolidated underlying material.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, NORTH AIR FIELD Applicant/Owner: City of Los Angeles Investigator: MCC, ESW, RKW, TAA, BRB, IMM	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: WA003

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Lotus scoparius	H		9. Pampas Grass		
2. Baccharis pilularis	Shrub		10. (=		
3. Statice lavendula	H		11.		
4. Plantago insularis			12.		
5 Lupinus bicolor			13.		
6. Oxalis pes-caprea			14.		
7. Erodium cicturium			15.		
8. Emergent Grass			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
__✓__ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____(in.)

Depth to Saturate Soil: _____(in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Sit soils are wet throughout, no seeping water in pit. no indications of saturated conditions.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3"					Root zone
3-7"		10YR 3/4			fine sand/silt
7-12"		10YR 3/3			fine sand, some organic material

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
NO Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: See Remarks for NA001

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)		(Circle)
Wetland Hydrology Present?	Yes No		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, NORTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: MCC, ESW, TAA, RKW, BRB, IMM	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: NA002

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Plantago insularis	H		9.		
2. Erodium cicutarium	H		10.		
3. Salix exuda	Shrub		11.		
4. Statice lavendula	H		12.		
5 Oxalis pes-caprae	H		13.		
6. emergent grasses	H		14.		
7.	I		15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
__✓__ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: _____ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturate Soil: 6 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
__✓__ Inundated
__✓__ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Water observed seeping into pit at 6 inches
Water observed to pond in pit at 9 inches

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6"	A	10 YR 4/4			Fine sand
6-9"		7.5 YR 3/2			Compacted sand

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
NO Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Roots evident to 4 inches

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)		(Circle)
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	Yes No	Is This Sampling Point Within a Wetland?	Yes No

Remarks: See remarks for NA001

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX South AIRFIELD Applicant/Owner: City of Los Angeles Investigator: MCC, ESW, RKW	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA012

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Oxalis pes-caprae	H		9.		
2. grass - unk A	H		10.		
3.			11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ ✓ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NONE (in.)

Depth to Free Water in Pit: NONE (in.)

Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: AREA WITH STANDING water after storm 3 weeks ago. NO STANDING water this date.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-9	A	7.5 YR 4/4			Sandy
9-12	Road bed material	with surface deposits over it.			

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Soil Core Not Take.
4lb. Soil Sample Taken for Analysis.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks:

Field photo 19 + 20

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: MCC, ESW, RKW	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA001

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Oxalis pes-caprae	H		9.		
2. Erodium cicutarium	H		10.		
3. Heterotheca	H		11.		
4. Melilotus	H		12.		
5 Salsola tragus	H		13.		
6. Sedge - unk a	H		14.		
7. Sedge - unk b	H		15.		
8. Grass - unk A	H		16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
- _____ Stream, Lake or Tide Gauge
- ✓ Aerial Photographs
- _____ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturate Soil: 7 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ✓ Inundated
- ___ Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)
- ___ Oxidized Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Water observed seeping into pit at 7 inches
Ponded water covers area of approx. 200 sq. ft.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3		10 YR 4/3			Fine sand and silt/some organic
3-12		2.5 YR 4/4			

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)		(Circle)
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	Yes No	Is This Sampling Point Within a Wetland?	Yes No

Remarks: Site is located immediately adjacent to a paved circular area of airfield and a gravel road bed (25 ft. South of a fence line). Site in area under routine operations / maintenance and has been graded and mowed.

AREA is known to have supported historic vernal pools.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South AIRFIELD Applicant/Owner: City of Los Angeles Investigator: MCC, ESW	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA0024

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. No Vegetation			9.		
2.			10.		
3.			11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: 1 (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturate Soil: 4 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___✓ Inundated
___✓ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Water observed seeping into pit at 4inches

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3		2.5 Y 4/2			GRAVEL
3-9		2.5 Y 4/3			Course Sand with Gravel

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: No Core Sample possible 2° to hard texture of soil. 4 lb. Sample taken only for analysis.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)		(Circle)
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	Yes No	Is This Sampling Point Within a Wetland?	Yes No

Remarks: Native soils appear absent from site. Site appears to be a filled and compacted construction staging area.
Field photos 9 + 10

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: MCC, ESW	Date: 11/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA 002 TB

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. no vegetation			9.		
2.			10.		
3.			11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: ½ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturate Soil: _____ (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___✓ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Standing water is located in a minor depression on gravel surface composed of compacted fill and gravel. Site appears to have been used as a construction staging area.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Compacted Soil and Gravel, Test pit not possible
No, core sample possible
4lb bulk sample taken for analysis.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Field Photo 11 + 12

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: MCC, ESW	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes No Is the site significantly disturbed (Atypical Situation) Yes No Is the area a potential Problem Area Yes No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA002C

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. no vegetation			9.		
2.			10.		
3.			11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: _____(in.)
Depth to Free Water in Pit: _____(in.)
Depth to Saturate Soil: _____(in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: soil is moist, site is a graded gravel pad.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Site surface consists of gravel, broken concrete, and asphalt.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site is a graded construction staging area, subjected to grading and ripping

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South Airfield Applicant/Owner: City of Los Angeles Investigator: MEC, ESW	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? (No) Is the site significantly disturbed (Atypical Situation) (Yes) Is the area a potential Problem Area (Yes) (If needed, explain on reverse.)	Community ID: ____ Transect ID: ____ Plot ID: SA002D

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. No Vegetation			9.		
2.			10.		
3.			11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: _____(in.)
Depth to Free Water in Pit: _____(in.)
Depth to Saturate Soil: _____(in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Soil is MoiST. Ponded water present immediately after Storm 3 weeks ago. Ponded water is no longer present.
Field photo 14.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: NO Core sample possible, No pit possible, due to gravel
H/b soil sample taken for analysis

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: _____ Investigator: _____	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA003

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Oxalis pes-caprae	H		9.		
2. Erodium	H		10.		
3. Salsola tragus	H		11.		
4. Lupinus bicolor	H		12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks: _____ Stream, Lake or Tide Gauge _____ Aerial Photographs _____ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ___✓ Inundated ____ Saturated in Upper 12 inches ____ Water Marks ____ Drift lines ____ Sediment Deposits ____ Drainage Patterns in Wetlands Secondary Indicators (2 or more required) ____ Oxidized Root Channels in Upper 12 inches ____ Water-Stained Leaves ____ Local Soil Survey Data ____ FAC-Neutral Test ____ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____(in.) Depth to Free Water in Pit: _____(in.) Depth to Saturate Soil: _____(in.)	

Remarks: Ponded area of standing water ≈ 5 sq. ft.
Site is located immediately next to a gravel stockpile

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: no core taken
4lb. bulk sample taken for analysis.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site is located at a gravel stockpile area, within a larger construction staging area.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: BRB, JAA	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA 004

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Oxalis pes-caprea	H		9.		
2. Erodium cicutarium	H		10.		
3. Hetero theca	H		11.		
4. Carpobrotus edulis	H		12.		
5 Salsola tragus	H		13.		
6. Pampass Grass	H		14.		
7. Sedge unk. A.	H		15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____(in.)

Depth to Saturate Soil: _____(in.)

Wetland Hydrology Indicators:
Primary Indicators:
____ Inundated
____ Saturated in Upper 12 inches
____ Water Marks
____ Drift lines
____ Sediment Deposits
____ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
____ Oxidized Root Channels in Upper 12 inches
____ Water-Stained Leaves
____ Local Soil Survey Data
____ FAC-Neutral Test
____ Other (Explain in Remarks)

Remarks: Soil is moist, no standing water, no seepage into pit.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-5'		10YR 5/6			Fine - medium Compacted Sand ↓
		10YR 4/4			
5-7'		10YR 5/6			

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: See Remarks for SA003. This site is 100 ft west of SA003, at the other edge of the gravel stockpile area. This site displays signs of recent use.

Field photos 10 + 11

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA 005

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. non-native grass	H		9.		
2. Oxalis pes-caprae	H		10.		
3. Heterotheca grandifolia	H		11.		
4. Erodium botrus	H		12.		
5 Stephomera virgata	H		13.		
6. Russian Thistle	H		14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks: Site is dominated by non-native vegetation.

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: NONE (in.)
Depth to Free Water in Pit: NONE (in.)
Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
____ Inundated
____ Saturated in Upper 12 inches
____ Water Marks
____ Drift lines
____ Sediment Deposits
____ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
____ Oxidized Root Channels in Upper 12 inches
____ Water-Stained Leaves
____ Local Soil Survey Data
____ FAC-Neutral Test
____ Other (Explain in Remarks)

Remarks: no surface water ponding.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3		10YR 4/4			Sand - Fine to
3-12		10YR 4/4			medium.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site is surrounded by over 6 piles of fill material, some more recent than others - evidenced by sparser vegetation.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed. explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: _____

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Erodium botrus	H		9.		
2. Vulpia myuros	H	FACU	10.		
3. Carpobrotus edulis	H		11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NONE (in.)

Depth to Free Water in Pit: NONE (in.)

Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: NO STANDING water present

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-14		10 YR 4/6			medium SAND

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Sample taken from E-W oriented portion of site, since N-S oriented area was disced. Depression is alongside a dirt road. Portions of site are sparsely vegetated.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South AIRFIELD Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA007

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Vulpia myuros	H	FACU	9.		
2. Oxalis pes-caprae	H		10.		
3. Carpobrotus edulis	H		11.		
4. Stephanomeria virgata			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NONE (in.)

Depth to Free Water in Pit: NONE (in.)

Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
____ Inundated
____ Saturated in Upper 12 inches
____ Water Marks
____ Drift lines
____ Sediment Deposits
____ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
____ Oxidized Root Channels in Upper 12 inches
____ Water-Stained Leaves
____ Local Soil Survey Data
____ FAC-Neutral Test
____ Other (Explain in Remarks)

Remarks:

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-15		10YR 4/6			medium grained sand

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No (Circle)	(Circle)	
Wetland Hydrology Present?	Yes	No		
Hydric Soils Present?	Yes	No	Is This Sampling Point Within a Wetland?	Yes No

Remarks: Site is a depression along side a service road (dirt) which runs in a N-S orientation. Site is adjacent to mounded fill material overgrown with non-native grass, oxalis, and Stephomeria virgata
Field photos 19 & 20

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: EMM	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA008

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Vulpia myuros	H	FACU*	9.		
2. Bromus mollis	H	FACU-	10.		
3. Oxalis pes-caprae	H		11.		
4. Plantago lanceolata	H	FAC-	12.		
5 Russian Thistle	H		13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
- _____ Stream, Lake or Tide Gauge
- ✓ Aerial Photographs
- _____ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NONE (in.)

Depth to Free Water in Pit: NONE (in.)

Depth to Saturate Soil: 12 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ✓ Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)
- ___ Oxidized Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 - 3		10 YR 4/3			
3 - 10		↓			
10 - 13		↓			

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)		(Circle)
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes No

Remarks: Site is a depression located in a disturbed non-native grassland field, heavily vegetated with Vulpia myuros & Bromus mollis.

Field photos 21 & 22

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South Airfield Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA009

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Vulpia myuros	H	FACU*	9.		
2. Oxalis pes-caprae	H		10.		
3. Plantago insularis	H	FACU	11.		
4. Bromus diandrus	H		12.		
5 Erodium botrys	H		13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
- ___ Stream, Lake or Tide Gauge
- ✓ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:
- Depth of Surface Water: 1 (in.)
- Depth to Free Water in Pit: 12.5 (in.)
- Depth to Saturate Soil: 10 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ✓ Inundated
- ✓ Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)
- ___ Oxidized Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: small areas of standing water

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-13		10 YR 4/3			medium to fine grained sand

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes No

Remarks: Site is a small depression
Field photos #5 + 16

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA010

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Vulpia myuros	H	FACU(*)	9.		
2. Oxalis pes-caprae	H		10.		
3. Bromus mollis	H	FACU(-)	11.		
4. Heterotheca grandifolia	H		12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 2.5 (in.)

Depth to Free Water in Pit: 13.5 (in.)

Depth to Saturate Soil: _____ (in.)

Wetland Hydrology Indicators:
Primary Indicators:
__✓__ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-14.5		10YR 4/4			medium to Fine grained sand

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)		(Circle)
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes No

Remarks: Site is a depression located in a disturbed field of non-native grasses and scattered pampas grass. Depression is thickly vegetated (Vulpia).
Field photos 24 & 25 (camera A)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA011

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Vulpia myuros	H	FACU(+)	9.		
2. Baccharis salicifolia	shrub	FACW	10.		
3. Bromus mollis	H	FACU(-)	11.		
4. Oxalis pes-caprae	H		12.		
5 Heterotheca grandiflora	H		13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
___ Stream, Lake or Tide Gauge
___✓ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 9 (in.)

Depth to Free Water in Pit: 8+ (in.)

Depth to Saturate Soil: _____ (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___✓ Inundated
___✓ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-15		10 YR 4/4			Medium - Fine grain sand

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)		(Circle)
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	Yes No	Is This Sampling Point Within a Wetland?	Yes No

Remarks: Depression is filled with water to 9 inches deep, site is surrounded on South and west by 6 foot mound of fill material. Perimeter of ponded area vegetated

Field Photo: 26 (Camera A)
1 (Camera D)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA013

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Oxalis pes-caprae	H		9.		
2. Plantago insularis	H	FACU	10.		
3. Heterotheca grandifolia	H		11.		
4. Grasses - unk.	H		12.		
5 Erodium cicutarium	H		13.		
6. Baccharis salicifolia	Shrub	FACW	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
- _____ Stream, Lake or Tide Gauge
- _____ Aerial Photographs
- _____ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NONE (in.)

Depth to Free Water in Pit: NONE (in.)

Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)
- ___ Oxidized Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Site was mapped with ponded water after storm 3 weeks ago. No standing water evident this date.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-5		10 YR 4/4			Sand - Course
5-13		10 YR 4/4			Sand - Medium

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Core Sample and bulk sample collected

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site is located immediately adjacent to gravel parimeter road, north of road side berm.
Field photos 22 & 23

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South AIRFIELD Applicant/Owner: City of Los Angeles Investigator: RKW, ESW, MCC	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA014

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Oxalis pes-caprae	H		9.		
2. Erodium circutarium	H		10.		
3. Plantago insularis	H	FACU	11.		
4. Heterotheca grandifolia	H		12.		
5 Baccharis salicifolia	H	FACW	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: NONE (in.)
Depth to Free Water in Pit: NONE (in.)
Depth to Saturate Soil: 11 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
__✓__ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Site was mapped with standing water after storm 3 weeks ago. Soil is moist, but no standing water this date.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12		10YR 4/6			Sandy

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
No Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Soil core taken, 4/6 bulk sample taken.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes No		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes No

Remarks: Field photos 15 + 16 (camera A)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South AIRFIELD Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA015

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. no vegetation			9.		
2.			10.		
3.			11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
__✓__ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NONE (in.)

Depth to Free Water in Pit: NONE (in.)

Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Site was mapped with ponded water after storm Jwks ago, No water was observed here for date.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-13		7.5 YR 4/4	7.5 YR 4/4	< 5%	Sandy

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NA Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Soil Core taken, bulk sample taken (4 Lb).

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site is located between road berm and gravel topped road
Field photo: 17 + 18

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South AIR FIELD Applicant/Owner: City of Los Angeles Investigator: MCC, ESW, RKW	Date: 1/6/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed. explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA 016

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. no vegetation			9.		
2.			10.		
3.			11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____(in.)

Depth to Saturate Soil: _____(in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Site is a plastic-lined drainage channel.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: no soil samples taken this site

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site is man-made plastic-lined drainage channel.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD	Date: 1/7/98
Applicant/Owner: City of Los Angeles	County: LA
Investigator: RKW, ESW, AMD	State: CA
Do Normal Circumstances exist on the site? Yes (No)	Community ID:
Is the site significantly disturbed (Atypical Situation) (Yes) No	Transect ID:
Is the area a potential Problem Area (Yes) No	Plot ID: SA017
(If needed. explain on reverse.)	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Oxalis pes-caprea 20%	H		9.		
2. Erodium cicutarium 5%	H		10.		
3. Carpobrotus edulis 5%	H		11.		
4. Emergent grasses 30%	H		12.		
5 Brassica nigra 1%	H		13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
__✓__ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NONE (in.)

Depth to Free Water in Pit: 7 (in.)

Depth to Saturate Soil: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
__✓__ Inundated
__✓__ Saturated in Upper 12 inches
____ Water Marks
____ Drift lines
____ Sediment Deposits
____ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
____ Oxidized Root Channels in Upper 12 inches
____ Water-Stained Leaves
____ Local Soil Survey Data
____ FAC-Neutral Test
____ Other (Explain in Remarks)

Remarks:

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-14		10 YR 3/3			medium sand

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Petroleum-smell emmitted during digging of test pit.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site with significant disturbance, Appears to have been recently disced. Parallel furrows running through the site. Road berm (with broken Asphalt) bounds site on west side; Plastic lined ditch on East side. Small amount of standing water present in some furrows

Field Photos 1 + 2 (Camera C)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: RKW, ESW, AMD	Date: 1/7/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed. explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA018

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Emergent grass 90%	H		9.		
2. Oxalis pes-caprae 10%	H		10.		
3. Carpobrotus edulis 2%	H		11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
__✓__ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: __1__ (in.)
Depth to Free Water in Pit: NONE (in.)
Depth to Saturate Soil: __0__ (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
__✓__ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Standing water present in furrows. water seeping into pit from upper soil Layers.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-5		10 YR 4/3			Medium grain Sand
5-12		10 YR 3/3			↓

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Deeper layer of compacted sand.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)	(Circle)	
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site has been disced - parallel furrows running Through area. Area displays signs of grading (mounds + hummocks present). Area surrounded by plastic-lined ditch.
Field photos 3 + 4 (camera C)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: RKW, ESW, AMD, MCC	Date: 11/7/98 County: LA State: CA
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: 3A019

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Emergent grasses 85%	H		9.		
2. Oxalis pes-caprae 2%	H		10.		
3.			11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks: noticeable difference in vegetation from site to higher elevations

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
__✓__ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NONE (in.)

Depth to Free Water in Pit: NONE (in.)

Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Site mapped with standing water after storm on 12/5/97. No standing water this date. Soil moist, but not seeping.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12"		10 YR 3/4	10 YR 7/2		MATRIX is medium grain sand.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Mottles are hard packed sand with clay - sticky.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site is a small depression ≈ 125 sq. ft amongst mounded soil - soil mounded by grading.
Field photos 11 + 12 (camera C)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: RKW, ESW, AMD	Date: 1/7/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: ____ Transect ID: ____ Plot ID: SA020

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Emergent grasses 95%	H		9.		
2. Oxalis pes-caprae 2%	H		10.		
3.			11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) ____

Remarks: Noticeable change in vegetation from area of ponding to surrounding higher elevations.

HYDROLOGY

___ Recorded Data (Describe in Remarks:
- ___ Stream, Lake or Tide Gauge
- ✓ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:
- Depth of Surface Water: 2 (in.)
- Depth to Free Water in Pit: NONE (in.)
- Depth to Saturate Soil: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ✓ Inundated
- ✓ Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)
- ___ Oxidized Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: ≈ 45 sq.ft of standing water present

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-13"		10YR 3/4	10YR 3/3	30%	Matrix - med. grain sand.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Mottles are mostly faintly-bound Sandy.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes (No)

(Circle)
Is This Sampling Point Within a Wetland? Yes (No)

Remarks: Site is a depression ± 315 sq. ft, soil mounds indicate recent grading. Depression catches water from poorly graded surrounding areas.
Field photos: 9 + 10 (camera C)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: RKW, ESW, AMD, MCC	Date: 1/7/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed. explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA 021

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Emergent grass 95%	H		9.		
2. Oxalis pes-caprae 5%	H		10.		
3.			11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
___✓___ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: NONE (in.)
Depth to Free Water in Pit: NONE (in.)
Depth to Saturate Soil: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___✓___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Standing water present on 12/5/97. NO STANDING water this date. Soil saturated to surface. water observed seeping into pit.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12"		10YR 3/4	10YR 3/1	40%	medium sandy.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Mottles appear to be made mostly of clay material

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	~~Yes~~ No		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site is a depression of ≈ 425 sq. feet. Appears to have been graded.

Field photos: 7 & 8 (camera C)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: RKW, ESW, AMD	Date: 1/7/99 County: LA State: CA
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: ____ Transect ID: ____ Plot ID: SA022

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Emergent grass 70%	H		9.		
2. Oxalis pes-caprae 20%	H		10.		
3.			11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) ____

Remarks: Vegetation changes from depression to higher elevated areas.

HYDROLOGY

___ Recorded Data (Describe in Remarks:
- ___ Stream, Lake or Tide Gauge
- ✓ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:
- Depth of Surface Water: NONE (in.)
- Depth to Free Water in Pit: 9 (in.)
- Depth to Saturate Soil: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- ✓ Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)
- ___ Oxidized Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Area mapped with surface water on 12/5/97. No standing water this date. Soil is saturated. Area may collect drainage from surrounding higher areas.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12		10YR 3/3	10YR 4/3	20%	medium sand

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site is a small depression ≈ 210 sq. feet.

Field photos: 5 & 6 (camera C).

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South AIRFIELD Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/7/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA023

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Baccharis salicifolia	Shrub	FACW	9. Bromus mollis	H	FACU(-)
2. Cortaderia selloana	H		10.		
3. Oxalis pes-caprae	H		11.		
4. Telegraph weed	H		12.		
5 Rumex crispus	H	FACW(-)	13.		
6. Carpobrotus edulis	H		14.		
7. Lotus scoparius	Shrubs		15.		
8. Acacia cyclops	Shrub		16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
- _____ Stream, Lake or Tide Gauge
- _____ Aerial Photographs
- _____ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NONE (in.)

Depth to Free Water in Pit: 1 (in.)

Depth to Saturate Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___✓ Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)
- ___ Oxidized Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-15		10YR 4/6			med-grain SAND
15-16	WATER IN PIT				

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: WATER IN PIT AT 15"

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes (No)

(Circle)
Is This Sampling Point Within a Wetland? Yes (No)

Remarks: Site is a depression adjacent to a service Road in a disturbed area, with several mounds of Fill Material covered with non-native grasses. some bare ground.
Field photos: 2+3 (camera D)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/7/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA024

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Oxalis pes-caprae	H		9.		
2. Bromus mollis			10.		
3. Sedge A			11.		
4. Carpobrotus edulis			12.		
5 Gnaphelium bicolor			13.		
6. Erodium botrus	↓		14.		
7. Baccharis salicifolia	Shrub		15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks: Largest of depressions, Baccharis salicifolia growing alongedge.

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____(in.)

Depth to Saturate Soil: 14 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
✓ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Soil Saturated at 14"

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4		10YR 5/6			med. grain sand
4-5		10YR 4/3			↓
5-14		10YR 4/4			

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Field photos: 4+5 (Camera D)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: EMM	Date: 1/7/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA025A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Oxalis pes-caprae	H		9.		
2. Carpobrotus edulis	H		10.		
3. Erodium botrys	H		11.		
4. Hetero Theca grandifolia	H		12.		
5 Bromus mollis	H	FACU(-)	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NONE (in.)

Depth to Free Water in Pit: NONE (in.)

Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-15		10 YR 4/4			medium grain sand.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
ND Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site is a depression adjacent to a gravel mound and Service Road. Gravel and tire tracks present in depression. Sparse vegetation. Site is part of a Construction Staging area.

Field photos: 8 + 9 (camera D)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: EMM	Date: 1/7/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes No Is the site significantly disturbed (Atypical Situation) Yes No Is the area a potential Problem Area Yes No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA 025 B

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Oxalis pes-caprae	H		9.		
2. Erodium botrys	H		10.		
3. Carpobrotus edulis	H		11.		
4. Heterotheca grandiflora	H		12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: NONE (in.)
Depth to Free Water in Pit: NONE (in.)
Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Standing water present after rain on 12/5/97.
No standing water this date.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-13		10YR 4/4			

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: See Remarks for SH025A

Field photos: 10 + 11 (Camera D)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South Air Field Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/7/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA025C

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Oxalis pes-caprae	H		9.		
2. Erodium botrys	H		10.		
3. Bromus mollis	H		11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
__✓__ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: NONE (in.)
Depth to Free Water in Pit: NONE (in.)
Depth to Saturate Soil: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
__✓__ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Standing water present after rains of 12/5/97.
Polygonal cracking present on surface.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3		10 YR 3/3			Course/gravelly
3-12		10 YR 4/4			Medium-Sandy

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes (No)

(Circle)
Is This Sampling Point Within a Wetland? Yes (No)

Remarks: Site is a depression in a construction staging area, gravel remains, truck tire tracks. Site is adjacent to a fenced Fill storage area.

Field photo # 12 + 13 (camera D)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South AIRFIELD Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/7/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA025D

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Oxalis pes-caprae	H		9.		
2. Erodium botrys	H		10.		
3. Carpobrotus edulis	H		11.		
4. Bromus mollis	H	FACU(-)	12.		
5 Heterotheca grandiflora	H		13.		
6. Cortaderia selloana	H		14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: NONE (in.)
Depth to Free Water in Pit: NONE (in.)
Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: STANDING WATER present after rains of 12/5/97.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site is a depression next to a fenced fill storage area. Gravel present, Asphalt at 1 inch. no soil core sample taken. Polygonal cracking present on surface. Field photos # 14 & 15 (camera D)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South AIRFIELD Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/9/98 County: _____ State: _____
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA 025 E

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. NONE			9.		
2.			10.		
3.			11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: _____(in.)
Depth to Free Water in Pit: _____(in.)
Depth to Saturate Soil: _____(in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Depression is adjacent to debis pile.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Surface to 7" Gravel and Asphalt debris
At 7" Hit an Asphalt layer.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)		(Circle)
Wetland Hydrology Present?	Yes No		
Hydric Soils Present?	Yes No	Is This Sampling Point Within a Wetland?	Yes No

Remarks: Site is Adjacent to Construction staging area. No core sample taken due to presence of Asphaltand gravel.

Field photos: 16 + 17 (Camera D)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: EMM			Date: 1/7/98 County: LA State: CA
Do Normal Circumstances exist on the site?	Yes	(No)	Community ID: _____
Is the site significantly disturbed (Atypical Situation)	(Yes)	No	Transect ID: _____
Is the area a potential Problem Area (If needed, explain on reverse.)	(Yes)	No	Plot ID: SA026

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Oxalis pes-caprae	H		9.		
2. Avena barbata	H		10.		
3. Erodium botrys	H		11.		
4. Erodium moschatum	H		12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks: Ruderal vegetation - around perimeter of Depression.

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
___✓___ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NONE (in.)

Depth to Free Water in Pit: NONE (in.)

Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: No core sample taken due to presence of Asphalt and gravel. Bulk sample taken.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site is a depression adjacent to a paved road. Asphalt and gravel present.

Field photos: #18 + 19 (Camera D)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South AIRFIELD Applicant/Owner: City of Los Angeles Investigator: RKW, ESW, AMD, MCC	Date: 1/7/98 County: LA State: CA

Do Normal Circumstances exist on the site?	Yes	(No)	Community ID: ____
Is the site significantly disturbed (Atypical Situation)	(Yes)	No	Transect ID: ____
Is the area a potential Problem Area (If needed, explain on reverse.)	(Yes)	No	Plot ID: SA027

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. NONE			9.		
2.			10.		
3.			11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) ____

Remarks: MINOR SCATTERED RUDERAL VEGETATION

HYDROLOGY

___ Recorded Data (Describe in Remarks:
- ___ Stream, Lake or Tide Gauge
- ✓ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:
- Depth of Surface Water: NONE (in.)
- Depth to Free Water in Pit: NONE (in.)
- Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)
- ___ Oxidized Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Soil MOIST, site at end of downsloping ROAD BED where it terminates at a 5' high pad of fill material. Standwater present on 12/5/97 after rain.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Soils are an old road bed. upper 6 inches consists of road bed material with compacted sand beneath. no core TAKEN.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Field photos : 13 + 14 (camera c)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South AIRFIELD Applicant/Owner: City of Los Angeles Investigator: RKW, ESW, AMD, MCC	Date: 1/7/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed. explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA 028

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Chrysanthemum coronarium	H	60%	9.		
2.			10.		
3. Oxalis pes-caprae	H	5%	11.		
4. Plantago lanceolata	H	1%	12.		
5 Erodium cicutarium	H	2%	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: NONE (in.)
Depth to Free Water in Pit: NONE (in.)
Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Soil moist, but NOT SATURATED. Depression is ± 120 sq. feet.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12"		10 YR 3/4	10 YR 3/2	10%	Sandy loam

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Mottles are a loamy clay.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site is at base of a downslope from a roadbed.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: RKW, ESW, AMD, MCC	Date: 1/7/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA029

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Plantago lotifolia			9.		
2. Emergent grasses			10.		
3. Erodium cicutarium			11.		
4. Rumex			12.		
5 Salsola			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks: AREA IS MOSTLY BARE SOIL

HYDROLOGY

___ Recorded Data (Describe in Remarks:
- _____ Stream, Lake or Tide Gauge
- ___✓___ Aerial Photographs
- _____ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-3 (in.)

Depth to Free Water in Pit: NONE (in.)

Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___✓___ Inundated
- ___ Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)
- ___ Oxidized Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Site was not mapped with STANDING WATER after rains of 12/5/97. Recent grading has caused site to collect water. Site is ± 200 sq. ft.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12"		10 YR 3/3		10 %	Sandy loam

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South AIRFIELD Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/7/98 County: _____ State: _____
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA030

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Emergent GRASS	H		9.		
2. Oxalis pes-caprae	H		10.		
3. Plantago lanceolata	H		11.		
4. Fennel	Shrub		12.		
5 Rumex crispus	H		13.		
6. Cocklebur	H		14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-3 (in.)

Depth to Free Water in Pit: NONE (in.)

Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
✓ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: STANDING WATER present ON 12/5/97 after rain, and still present. Recent TIRE tracks present bisecting depression

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1.5		10 YR 3/2			Fine Grained SAND.
1.5-6.5		10 YR 3/2			
6.5-7.5					

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: ASPHALT LAYER HIT AT 7.5 inches.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes (No)

(Circle)
Is This Sampling Point Within a Wetland? Yes (No)

Remarks: Field photos: 20 + 21 (Camera)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South AIRFIELD Applicant/Owner: City of Los Angeles Investigator: IMM	Date: 1/7/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA031

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Mule fat (Baccharis)	Shrub		9.		
2. Acacia cyclops			10.		
3. Cortaderia selloana			11.		
4. Salix "Arroyo"			12.		
5. Fennell			13.		
6. Plantago lanceae			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
- _____ Stream, Lake or Tide Gauge
- _____ Aerial Photographs
- _____ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NONE (in.)

Depth to Free Water in Pit: NONE (in.)

Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)
- ___ Oxidized Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4		10 YR 3/2			clay
4-7		10 YR 4/4			med. sand
7-13		10 YR 3/3			Sandy loam

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Site is adjacent to service road and is a Fill site with large fragments of concrete, asphalt, and gravel.
Field Photo: 22+23 (Camera D)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South AIRFIELD Applicant/Owner: City of Los Angeles Investigator: CSW RKW	Date: 1/23/98 County: L.A. State: CA.

Do Normal Circumstances exist on the site?	Yes	(No)	Community ID: _____
Is the site significantly disturbed (Atypical Situation)	(Yes)	No	Transect ID: _____
Is the area a potential Problem Area (If needed, explain on reverse.)	(Yes)	No	Plot ID: SAO33A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Chrysanthemum			9.		
2. Coronarium	60% H		10.		
3. Medicago polymorpha	5 H		11.		
4. Brassica tournefortii	20 H		12.		
5 Emergent grass	H		13.		
6. Carpobrotus edulis	H		14.		
7. Salsola traegus	H		15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
- _____ Stream, Lake or Tide Gauge
- _____ Aerial Photographs
- _____ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NONE (in.)

Depth to Free Water in Pit: NONE (in.)

Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)
- ___ Oxidized Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Some surface crusting. STANDING water present after rain of 12/5/97

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-5		10YR 4/2			med-grain sand/Loam inclusions of clay
5-10		10YR 5/4			Med sand / Loam.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
No Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Pieces of Asphalt present in soil - one large piece of road debris

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Field photos: 22+23 Camera C

Site is on fill material

Old Road bed hit at 10".

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, South AIRFIELD Applicant/Owner: City of Los Angeles Investigator: JMM, ISW, RKW	Date: 1/23/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed. explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA0383

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Medicago polymorpha 20%	H		9.		
2. Cynodon dactyla 20	H		10.		
3. Chrysanthemum	H		11.		
4. coronaria 10%			12.		
5 Erodium botrys 10%	H		13.		
6. Erodium cicutarium 5%	H		14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: NONE (in.)
Depth to Free Water in Pit: NONE (in.)
Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: some crusting on surface

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-11		10YR 4/4			med SANDY/ LOAMS
		10YR 4/2	(INTERMIXED WITH Above)		clay

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
N d Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Field photos: 24+25 (Camera C)
PAD of Dumped Asphalt immediately ADJACENT to site
Soil is Fill Material WITH mixture of SAND MATRIX

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX, SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: IMM, ESW, KKW	Date: 1/23/98 County: LA State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA033C

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cynodon dactyla 15%	H		9.		
2. Medicago polymorpha 4%	H		10.		
3. Brassica tourn fortii 10%	H		11.		
4. Erodium botrys 5	H		12.		
5 Erodium cicutarium 5	H		13.		
6. ANISC 1%			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: NONE (in.)
Depth to Free Water in Pit: NONE (in.)
Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
6-13		10 YR 4/3	10 YR 3/1 (clay)		Med-SAND/ LOAM.

Hydric Soil Indicators:

- ___Histosol
- ___Histic Epipedon
- ___Sulfidic Odor
- ___Aquic Moisture Regime
- ___Reducing Conditions
- ___Gleyed or Low-Chroma Colors
- ___Concretions
- ___High Organic Content in Surface Layer in Sandy Soils
- ___Organic Streaking in Sandy Soils
- ___Listed on Local Hydric Soils List
- NO Listed on National Hydric Soils List
- ___Other (Explain in Remarks)

Remarks: NON-NATIVE FILL MATERIAL, CLAY intermixed with SANDY MATRIX. GRAVEL AND Asphalt intermixed with soil.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Field photos: 26 (camera C)
1 (camera E)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX South Airfield Applicant/Owner: City of Los Angeles Investigator: E. Wilson, R. Witthaus	Date: 1/23/98 County: L.A. State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: SA034

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. 1% Lythrum hysopifolia	H		9.		
2. 10% Erodium cicutarium	H		10.		
3. 5% Rumex crispus	H		11.		
4. 20% Emergent grasses	H		12.		
5 20% Chrysanthemum	H		13.		
6. 5% Plantago lanceolata	H		14.		
7. 5% Oxalis pes-caprea	H		15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
- ___ Stream, Lake or Tide Gauge
- ✓ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:
- Depth of Surface Water: 0 (in.)
- Depth to Free Water in Pit: 0 (in.)
- Depth to Saturate Soil: 4" (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ✓ Inundated
- ✓ Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)
- ___ Oxidized Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Standing water observed at this site after early December storm when area was mapped. Currently there is ≈ 475 sq. ft of standing water. It rained 2 weeks prior to this date

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4"		10 YR 4/3			Medium grain Sand / loam
4-11"		10 YR 3/2			Medium grain Sand / loam; some clay

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Pieces of asphalt present in soil
Deeper layer with horizontal streaks of light sand

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Camera C Photo #20 : Soil pit
#21 : Site photo

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: I. MENDEZ, S. Wilson, R. Withhaus	Date: 1/23/98 County: L.A. State: C.A.
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: Ruderal Transect ID: ____ Plot ID: SA035

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. 20% Xanthium strumarium	H		9.		
2. 10% Cynodon dactyla	H		10.		
3. 5% Plantago lanceolata	H		11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) ____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: 0 (in.)
Depth to Free Water in Pit: 0 (in.)
Depth to Saturate Soil: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
✓ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Area was mapped with standing water following early December rain storm. Currently ≈ 125 sq. ft of standing water. Roadside ditch between 2 large pads of fill material. large concrete riprap dumped around portions of the site.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-15"		10 YR 3/3	10 YR 4/3	5%	medium sand / silt mottle are clay.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
NO Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes (No)

Is This Sampling Point Within a Wetland? (Circle) Yes (No)

Remarks: Camera E photo #2 : Soil Pit
#3 : Site photo

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX SOUTH AIRFIELD Applicant/Owner: City of Los ANGELES Investigator: I. MENDEZ, E. Wilson, R. Withaus	Date: 1/23/98 County: L. A. State: CA
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: Ruderal Transect ID: ____ Plot ID: SA 036

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Lotus scoparius	S	10%	9.		
2. Bromus diandrus	H	50%	10.		
3. Cynodon dactyla	H	30%	11.		
4. Erodium cicutarium	H	5%	12.		
5 Medicago polymorpha	H	5%	13.		
6. Crassula erecta	H	5%	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) ____

Remarks: C.cryptogamic crust present

HYDROLOGY

___ Recorded Data (Describe in Remarks:
- ___ Stream, Lake or Tide Gauge
- ✓ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:
- Depth of Surface Water: NONE (in.)
- Depth to Free Water in Pit: NONE (in.)
- Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)
- ___ Oxidized Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Site was mapped with standing water following early December rain storm. No standing water present on this date. Site is in a 20 foot deep drainage/catch basin between two large pads of fill material. large pieces of concrete rip rap in drainage

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1"					"organic material"
1-15"	10YR 4/4				medium grain sand.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? Yes (No)

(Circle)
Is This Sampling Point Within a Wetland? Yes (No)

Remarks: Camera E Photo: #4: soil Pit
#5: site photo

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX South Airfield Applicant/Owner: City of Los Angeles Investigator: E. Mendez, E. Wilson, R. Withaus	Date: 11/23/98 County: L.A. State: CA.
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: Ruderal Transect ID: ____ Plot ID: SA037

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carpobrotus edulis	H 5%		9.		
2. Emergent grasses	H 30%		10.		
3. Erodium cicutarium	H 5%		11.		
4. Medicago polymorpha	H 30%		12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) ____

Remarks: Cryptogamic crusts on site and nearby

HYDROLOGY

___ Recorded Data (Describe in Remarks:
___ Stream, Lake or Tide Gauge
_✓_ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: NONE (in.)
Depth to Free Water in Pit: NONE (in.)
Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Site mapped based on surface crusting. No standing water this date. Site is atop a large pad of fill material. Unnatural topographic relief surrounding site.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____
Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1"					organic layer
1-13"		10 YR 4/4			medium Sand.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Pieces of ~~Soil~~ Asphalt intermixed in soil

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? Yes (No)

(Circle)
Is This Sampling Point Within a Wetland? Yes (No)

Remarks: Camera 5 photo 6 : soil Pit
photo 7 : site

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: I. Mendez, E. Wilson, R. Witthaus	Date: 1/23/98 County: L.A. State: CA.
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: Ruderal Transect ID: ____ Plot ID: SA038

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Xanthium			9.		
2. Stru marium	H	80%	10.		
3. Rumex crispus	H	1%	11.		
4. Heterotheca			12.		
5 grandiflora	H	20%	13.		
6. unkn Sedge	H	20%	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) ____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs
_____ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: NONE (in.)
Depth to Free Water in Pit: NONE (in.)
Depth to Saturate Soil: NONE (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Site is a roadside ditch. Deep cracking in crust. large pieces of asphalt falling into ditch. Site was mapped with standing water following early December rain storm. No standing water this date

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2"		10 YR 3/2			clay
2"-16"		10 YR 4/3			medium sand

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Top layer is mostly an accumulation of runoff from adjacent roadbed and fill site

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)		(Circle)
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Camera Σ photo # 8: soil pit
9: site photo

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: E. MENDEZ, E. Wilson, R. Witthaus	Date: 1/23/98 County: L.A. State: CA
Do Normal Circumstances exist on the site? Yes No Is the site significantly disturbed (Atypical Situation) Yes No Is the area a potential Problem Area Yes No (If needed, explain on reverse.)	Community ID: ____ Transect ID: ____ Plot ID: SA039

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.			9.		
2.			10.		
3.			11.		
4.			12.		
5			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) ____

Remarks: NO VEGETATION

HYDROLOGY

___ Recorded Data (Describe in Remarks: ___ Stream, Lake or Tide Gauge _✓_ Aerial Photographs ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: _✓_ Inundated ___ Saturated in Upper 12 inches ___ Water Marks ___ Drift lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands Secondary Indicators (2 or more required) ___ Oxidized Root Channels in Upper 12 inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: 0 (in.) Depth to Free Water in Pit: 0 (in.) Depth to Saturate Soil: 0 (in.)	

Remarks: Site is in a roadbed. Approx. 200 sq. ft of standing water this date. Site mapped with standing water following early December storms. Site is on a asphalt roadbed.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
___Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: No soil Sample Collection. Asphalt roadbed. No pit possible

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)	(Circle)	
Wetland Hydrology Present?	Yes (No)		
Hydric Soils Present?	Yes (No)	Is This Sampling Point Within a Wetland?	Yes (No)

Remarks: Camera E : photo 10 : site photo

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: LAX SOUTH AIRFIELD Applicant/Owner: City of Los Angeles Investigator: E. Wilson, R. Withhaus	Date: 1/23/98 County: L.A. State: CA
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation) (Yes) No Is the area a potential Problem Area (Yes) No (If needed, explain on reverse.)	Community ID: Ruderal Transect ID: ____ Plot ID: SA040

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Lythrum hysopifolia	H	1%	9.		
2. Salix sp.	S	10%	10.		
3. Baccharis salicifolia	S	5%	11.		
4. Emergent grasses	H	40%	12.		
5 Plantago lanceolata	H	5%	13.		
6. Carpobrotus edulus	H	10%	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) ____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks:
___ Stream, Lake or Tide Gauge
___ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0 (in.)
Depth to Free Water in Pit: 0 (in.)
Depth to Saturate Soil: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 inches
___ Water Marks
___ Drift lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
___ Oxidized Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: ~200 Sq.ft. of standing water on this date. Standing water also noted on site following early December storm.

FIGURE 4
Data Form, Routine Wetland Determination (1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-11"		10 YR 4/4	10 YR 4/4	40 %	medium Sand

Hydric Soil Indicators:

___Histosol
___Histic Epipedon
___Sulfidic Odor
___Aquic Moisture Regime
___Reducing Conditions
___Gleyed or Low-Chroma Colors
___Concretions
___High Organic Content in Surface Layer in Sandy Soils
___Organic Streaking in Sandy Soils
___Listed on Local Hydric Soils List
NO Listed on National Hydric Soils List
___Other (Explain in Remarks)

Remarks: Soil Saturated Throughout

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes (No)

(Circle)
Is This Sampling Point Within a Wetland? Yes (No)

Remarks: Camera C photo 18: Soil Pit
19 site

Appendix C
Examples of Site Photographs

Site EW006
Disturbed area, example of a seasonably flooded plain

Site EW007
Disturbed area, example of a seasonably flooded plain

Site EW012
Disturbed area, example of a seasonably flooded plain

Site EW027
Disturbed area, example of a seasonably flooded plain

Site EW031
Disturbed area, example of a seasonably flooded plain

Appendix D

Food Growers Laboratory Soils Analysis Result Forms

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-01 Page 1
Sample ID: NA001

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	18	0.1	%	ASA/UL	1.0		0B 2A
Saturation	26	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	1.1	0.9	PPM		1.0		0B 2A
Phosphorous	7	3	PPM		1.0		0B 2A
Potassium Exch. + Sol.	24	0.1	PPM		1.0		0B22A
pH	7.7	---	units		1.0		0B12A
Soil Salinity (ec)	0.3	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	1.0	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	0.6	0.1	meq/l		1.0		0B12A
Sodium (Na)	1.6	0.1	meq/l		1.0		0B12A
SAR	1.7	0.1			1.0		0B12A
Boron (B)	0.09	0.02	PPM		1.0		0B12A
Chloride (Cl)	0.5	0.1	meq/l		1.0		0B 2A
Sulfate	0.5	0.1	meq/l		1.0		0B12A
Zinc (Zn)	0.5	0.2	PPM		1.0		0B 2A
Manganese (Mn)	8.9	0.2	PPM		1.0		0B 2A
Iron (Fe)	22	0.5	PPM		1.0		0B 2A
Copper (Cu)	0.5	0.1	PPM		1.0		0B 2A
CEC	4.3	0.1	meq/100g		1.0		0
Exchangable Calcium	3.0	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	1.2	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.1	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	81.4	0.1	%		1.0		0B 2A
% Silt	7.7	0.1	%		1.0		0B 2A
% Clay	7.3	0.1	%		1.0		0B 2A
% Organic Matter	0.4	0.1	%		1.0		1A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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Sapphos Environmental Sample ID: NA001

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	3.0	0.1	%	D422	1.0		00A 2A
2.0 mm	0.5	0.1	%	D422	1.0		00A 2A
1.4 mm	ND	0.1	%	D422	1.0		00A 2A
500 µm	12	0.1	%	D422	1.0		00A 2A
250 µm	52	0.1	%	D422	1.0		00A 2A
106 µm	20	0.1	%	D422	1.0		00A 2A
75 µm	8.1	0.1	%	D422	1.0		00A 2A
45 µm	3.0	0.1	%	D422	1.0		00A 2A
Receiving Pan	0.7	0.1	%	D422	1.0		00A 2A
% Gravel	3.5	0.1	%	PARTSIZE	1.0		00A 2A
Permeability[A]							
Permeability (20°C)	0.0198	---	cm/s	D4511-92	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Ricardo Sandoval for
Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-02 Page 1
Sample ID: NA002

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	84.6	0.1	%		1.0		0B 2C
% Silt	5.4	0.1	%		1.0		0B 2C
% Clay	10	0.1	%		1.0		0B 2C
% Organic Matter	0.2	0.1	%		1.0		1A22A
Part Size Sieve[A]							
4.75 mm	ND	0.1	%	D422	1.0		00A 2A
2.0 mm	ND	0.1	%	D422	1.0		00A 2A
1.4 mm	ND	0.1	%	D422	1.0		00A 2A
500 µm	10	0.1	%	D422	1.0		00A 2A
250 µm	61	0.1	%	D422	1.0		00A 2A
106 µm	20	0.1	%	D422	1.0		00A 2A
75 µm	7.0	0.1	%	D422	1.0		00A 2A
45 µm	2.0	0.1	%	D422	1.0		00A 2A
Receiving Pan	0.1	0.1	%	D422	1.0		00A 2A
% Gravel	0.0	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-03 Page 1
Sample ID: NA003

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	9.6	0.1	%	ASA/UL	1.0		0B 2A
Saturation	20	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	ND	0.9	PPM		1.0		0B 2A
Phosphorous	10	3	PPM		1.0		0B 2A
Potassium Exch. + Sol.	14	0.1	PPM		1.0		0B22A
pH	6.8	---	units		1.0		0B12A
Soil Salinity (ec)	0.2	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	0.6	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	0.3	0.1	meq/l		1.0		0B12A
Sodium (Na)	1.5	0.1	meq/l		1.0		0B12A
SAR	2.2	0.1			1.0		0B12A
Boron (B)	0.10	0.02	PPM		1.0		0B12A
Chloride (Cl)	0.4	0.1	meq/l		1.0		0B 2A
Sulfate	0.5	0.1	meq/l		1.0		0B12A
Zinc (Zn)	0.2	0.2	PPM		1.0		0B 2A
Manganese (Mn)	2.6	0.2	PPM		1.0		0B 2A
Iron (Fe)	20	0.5	PPM		1.0		0B 2A
Copper (Cu)	0.3	0.1	PPM		1.0		0B 2A
CEC	4.2	0.1	meq/100g		1.0		0
Exchangable Calcium	2.7	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	1.3	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.2	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	82.2	0.1	%		1.0		0B 2A
% Silt	10.2	0.1	%		1.0		0B 2A
% Clay	7.6	0.1	%		1.0		0B 2A
% Organic Matter	0.3	0.1	%		1.0		1A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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Sapphos Environmental Sample ID: NA003

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	ND	0.1	%	D422	1.0		00A 2A
2.0 mm	ND	0.1	%	D422	1.0		00A 2A
1.4 mm	ND	0.1	%	D422	1.0		00A 2A
500 µm	9.4	0.1	%	D422	1.0		00A 2A
250 µm	59	0.1	%	D422	1.0		00A 2A
106 µm	22	0.1	%	D422	1.0		00A 2A
75 µm	7.4	0.1	%	D422	1.0		00A 2A
45 µm	2.1	0.1	%	D422	1.0		00A 2A
Receiving Pan	0.3	0.1	%	D422	1.0		00A 2A
% Gravel	0.0	0.1	%	PARTSIZE	1.0		00A 2A
Permeability[A]							
Permeability (20°C)	0.0542	---	cm/s	D4511-92	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-04 Page 1
Sample ID: SA001

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	84.7	0.1	%		1.0		0B 2C
% Silt	3.3	0.1	%		1.0		0B 2C
% Clay	7.7	0.1	%		1.0		0B 2C
% Organic Matter	0.5	0.1	%		1.0		1A22A
Part Size Sieve[A]							
4.75 mm	2.9	0.1	%	D422	1.0		00A 2A
2.0 mm	1.4	0.1	%	D422	1.0		00A 2A
1.4 mm	0.3	0.1	%	D422	1.0		00A 2A
500 µm	17	0.1	%	D422	1.0		00A 2A
250 µm	54	0.1	%	D422	1.0		00A 2A
106 µm	17	0.1	%	D422	1.0		00A 2A
75 µm	5.6	0.1	%	D422	1.0		00A 2A
45 µm	1.4	0.1	%	D422	1.0		00A 2A
Receiving Pan	0.1	0.1	%	D422	1.0		00A 2A
% Gravel	4.3	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-05 Page 1
Sample ID: SA002A

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	36.7	0.1	%		1.0		0B 2C
% Silt	5.3	0.1	%		1.0		0B 2C
% Clay	4.7	0.1	%		1.0		0B 2C
% Organic Matter	2.8	0.1	%		1.0		1A22A
Part Size Sieve[A]							
4.75 mm	46	0.1	%	D422	1.0		00A 2A
2.0 mm	7.3	0.1	%	D422	1.0		00A 2A
1.4 mm	0.8	0.1	%	D422	1.0		00A 2A
500 µm	7.0	0.1	%	D422	1.0		00A 2A
250 µm	16	0.1	%	D422	1.0		00A 2A
106 µm	13	0.1	%	D422	1.0		00A 2A
75 µm	8.6	0.1	%	D422	1.0		00A 2A
45 µm	1.6	0.1	%	D422	1.0		00A 2A
Receiving Pan	0.1	0.1	%	D422	1.0		00A 2A
% Gravel	53.3	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-06 Page 1
Sample ID: SA002B

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	7.3	0.1	%	ASA/UL	1.0		0B 2A
Saturation	25	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	3.0	0.9	PPM		1.0		0B 2A
Phosphorous	10	3	PPM		1.0		0B 2A
Potassium Exch. + Sol.	79	0.1	PPM		1.0		0B22A
pH	10.7	---	units		1.0		0B12A
Soil Salinity (ec)	2.0	0.1	mmhos/c		1.0		0B12A
Limestone	0.5	0.2	%		1.0		0B22A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	10	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	0.1	0.1	meq/l		1.0		0B12A
Sodium (Na)	12	0.1	meq/l		1.0		0B12A
SAR	5.5	0.1			1.0		0B12A
Boron (B)	0.15	0.02	PPM		1.0		0B12A
Chloride (Cl)	4.4	0.1	meq/l		1.0		0B 2A
Sulfate	15	0.1	meq/l		1.0		0B12A
Zinc (Zn)	0.7	0.2	PPM		1.0		0B 2A
Manganese (Mn)	2.6	0.2	PPM		1.0		0B 2A
Iron (Fe)	11	0.5	PPM		1.0		0B 2A
Copper (Cu)	1.0	0.1	PPM		1.0		0B 2A
CEC	28	0.1	meq/100g		1.0		0
Exchangable Calcium	26	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	0.6	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	1.0	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	55.8	0.1	%		1.0		0B 2A
% Silt	9.4	0.1	%		1.0		0B 2A
% Clay	6.1	0.1	%		1.0		0B 2A
% Organic Matter	1.9	0.1	%		1.0		1A22A
Potassium	0.2	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

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Mobile 209/737-2399

Sapphos Environmental Sample ID: SA002B

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	23	0.1	%	D422	1.0		00A 2A
2.0 mm	5.7	0.1	%	D422	1.0		00A 2A
1.4 mm	0.6	0.1	%	D422	1.0		00A 2A
500 µm	11	0.1	%	D422	1.0		00A 2A
250 µm	28	0.1	%	D422	1.0		00A 2A
106 µm	22	0.1	%	D422	1.0		00A 2A
75 µm	4.9	0.1	%	D422	1.0		00A 2A
45 µm	4.3	0.1	%	D422	1.0		00A 2A
Receiving Pan	0.7	0.1	%	D422	1.0		00A 2A
% Gravel	28.6	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-07 Page 1
Sample ID: SA002C

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	27.5	0.1	%		1.0		0B 2C
% Silt	3.9	0.1	%		1.0		0B 2C
% Clay	2.7	0.1	%		1.0		0B 2C
% Organic Matter	5.7	0.1	%		1.0		1A22A
Part Size Sieve[A]							
4.75 mm	55	0.1	%	D422	1.0		00A 2A
2.0 mm	11	0.1	%	D422	1.0		00A 2A
1.4 mm	0.6	0.1	%	D422	1.0		00A 2A
500 µm	9.2	0.1	%	D422	1.0		00A 2A
250 µm	8.2	0.1	%	D422	1.0		00A 2A
106 µm	9.4	0.1	%	D422	1.0		00A 2A
75 µm	2.7	0.1	%	D422	1.0		00A 2A
45 µm	3.4	0.1	%	D422	1.0		00A 2A
Receiving Pan	0.3	0.1	%	D422	1.0		00A 2A
% Gravel	65.9	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-08 Page 1
Sample ID: SA002D

Sapphos Environmental
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Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	52.0	0.1	%		1.0		0B 2C
% Silt	6.8	0.1	%		1.0		0B 2C
% Clay	6.5	0.1	%		1.0		0B 2C
% Organic Matter	2.5	0.1	%		1.0		1A22A
Part Size Sieve[A]							
4.75 mm	28	0.1	%	D422	1.0		00A 2A
2.0 mm	6.1	0.1	%	D422	1.0		00A 2A
1.4 mm	3.4	0.1	%	D422	1.0		00A 2A
500 µm	15	0.1	%	D422	1.0		00A 2A
250 µm	14	0.1	%	D422	1.0		00A 2A
106 µm	21	0.1	%	D422	1.0		00A 2A
75 µm	6.7	0.1	%	D422	1.0		00A 2A
45 µm	3.3	0.1	%	D422	1.0		00A 2A
Receiving Pan	1.5	0.1	%	D422	1.0		00A 2A
% Gravel	34.7	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-09 Page 1
Sample ID: SA003

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	64.6	0.1	%		1.0		0B 2C
% Silt	5.7	0.1	%		1.0		0B 2C
% Clay	6.1	0.1	%		1.0		0B 2C
% Organic Matter	0.9	0.1	%		1.0		1A22A
Part Size Sieve[A]							
4.75 mm	22	0.1	%	D422	1.0		00A 2A
2.0 mm	1.5	0.1	%	D422	1.0		00A 2A
1.4 mm	ND	0.1	%	D422	1.0		00A 2A
500 µm	7.7	0.1	%	D422	1.0		00A 2A
250 µm	42	0.1	%	D422	1.0		00A 2A
106 µm	18	0.1	%	D422	1.0		00A 2A
75 µm	5.4	0.1	%	D422	1.0		00A 2A
45 µm	3.2	0.1	%	D422	1.0		00A 2A
Receiving Pan	0.3	0.1	%	D422	1.0		00A 2A
% Gravel	23.6	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-10 Page 1
Sample ID: SA004

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	88.1	0.1	%		1.0		0B 2C
% Silt	3.4	0.1	%		1.0		0B 2C
% Clay	8.0	0.1	%		1.0		0B 2C
% Organic Matter	0.2	0.1	%		1.0		1A22A
Part Size Sieve[A]							
4.75 mm	0.4	0.1	%	D422	1.0		00A 2A
2.0 mm	ND	0.1	%	D422	1.0		00A 2A
1.4 mm	ND	0.1	%	D422	1.0		00A 2A
500 µm	17	0.1	%	D422	1.0		00A 2A
250 µm	60	0.1	%	D422	1.0		00A 2A
106 µm	16	0.1	%	D422	1.0		00A 2A
75 µm	3.9	0.1	%	D422	1.0		00A 2A
45 µm	2.1	0.1	%	D422	1.0		00A 2A
Receiving Pan	0.3	0.1	%	D422	1.0		00A 2A
% Gravel	0.5	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-11 Page 1
Sample ID: SA005

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	82.0	0.1	%		1.0		0B 2C
% Silt	4.3	0.1	%		1.0		0B 2C
% Clay	10.7	0.1	%		1.0		0B 2C
% Organic Matter	0.9	0.1	%		1.0		1A22A
Part Size Sieve[A]							
4.75 mm	1.8	0.1	%	D422	1.0		00A 2B
2.0 mm	1.2	0.1	%	D422	1.0		00A 2B
1.4 mm	0.1	0.1	%	D422	1.0		00A 2B
500 µm	13	0.1	%	D422	1.0		00A 2B
250 µm	54	0.1	%	D422	1.0		00A 2B
106 µm	19	0.1	%	D422	1.0		00A 2B
75 µm	4.5	0.1	%	D422	1.0		00A 2B
45 µm	5.8	0.1	%	D422	1.0		00A 2B
Receiving Pan	1.0	0.1	%	D422	1.0		00A 2B
% Gravel	3.0	0.1	%	PARTSIZE	1.0		00A 2B

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives.Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-12 Page 1
Sample ID: SA006

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	87.4	0.1	%		1.0		0B 2C
% Silt	1.7	0.1	%		1.0		0B 2C
% Clay	7.3	0.1	%		1.0		0B 2C
% Organic Matter	0.2	0.1	%		1.0		1A22A
Part Size Sieve[A]							
4.75 mm	3.2	0.1	%	D422	1.0		00A 2B
2.0 mm	0.3	0.1	%	D422	1.0		00A 2B
1.4 mm	ND	0.1	%	D422	1.0		00A 2B
500 µm	20	0.1	%	D422	1.0		00A 2B
250 µm	53	0.1	%	D422	1.0		00A 2B
106 µm	19	0.1	%	D422	1.0		00A 2B
75 µm	2.9	0.1	%	D422	1.0		00A 2B
45 µm	1.8	0.1	%	D422	1.0		00A 2B
Receiving Pan	0.1	0.1	%	D422	1.0		00A 2B
% Gravel	3.5	0.1	%	PARTSIZE	1.0		00A 2B

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-13 Page 1
Sample ID: SA007

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Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	8.2	0.1	%	ASA/UL	1.0		0B 2A
Saturation	24	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	ND	0.9	PPM		1.0		0B 2A
Phosphorous	7	3	PPM		1.0		0B 2A
Potassium Exch.+Sol.	18	0.1	PPM		1.0		0B22A
pH	7.7	---	units		1.0		0B12A
Soil Salinity (ec)	0.3	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	0.6	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	0.5	0.1	meq/l		1.0		0B12A
Sodium (Na)	2.2	0.1	meq/l		1.0		0B12A
SAR	3.0	0.1			1.0		0B12A
Boron (B)	0.18	0.02	PPM		1.0		0B12A
Chloride (Cl)	1.2	0.1	meq/l		1.0		0B 2A
Sulfate	0.5	0.1	meq/l		1.0		0B12A
Zinc (Zn)	0.4	0.2	PPM		1.0		0B 2A
Manganese (Mn)	4.8	0.2	PPM		1.0		0B 2A
Iron (Fe)	16	0.5	PPM		1.0		0B 2A
Copper (Cu)	0.5	0.1	PPM		1.0		0B 2A
CEC	3.0	0.1	meq/100g		1.0		0
Exchangable Calcium	1.7	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	1.1	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.2	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	90.2	0.1	%		1.0		0B 2A
% Silt	3.2	0.1	%		1.0		0B 2A
% Clay	6.6	0.1	%		1.0		0B 2A
% Organic Matter	0.3	0.1	%		1.0		1A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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Sapphos Environmental Sample ID: SA007

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	ND	0.1	%	D422	1.0		00A 2B
2.0 mm	ND	0.1	%	D422	1.0		00A 2B
1.4 mm	ND	0.1	%	D422	1.0		00A 2B
500 µm	18	0.1	%	D422	1.0		00A 2B
250 µm	61	0.1	%	D422	1.0		00A 2B
106 µm	14	0.1	%	D422	1.0		00A 2B
75 µm	1.6	0.1	%	D422	1.0		00A 2B
45 µm	2.9	0.1	%	D422	1.0		00A 2B
Receiving Pan	2.4	0.1	%	D422	1.0		00A 2B
% Gravel	0.0	0.1	%	PARTSIZE	1.0		00A 2B

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Ricardo Sandoval for

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-14 Page 1
Sample ID: SA008

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	17	0.1	%	ASA/UL	1.0		0B 2A
Saturation	22	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	ND	0.9	PPM		1.0		0B 2A
Phosphorous	13	3	PPM		1.0		0B 2A
Potassium Exch.+Sol.	41	0.1	PPM		1.0		0B22A
pH	8.1	---	units		1.0		0B12A
Soil Salinity (ec)	0.4	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	1.1	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	0.6	0.1	meq/l		1.0		0B12A
Sodium (Na)	2.5	0.1	meq/l		1.0		0B12A
SAR	2.8	0.1			1.0		0B12A
Boron (B)	0.16	0.02	PPM		1.0		0B12A
Chloride (Cl)	0.6	0.1	meq/l		1.0		0B 2A
Sulfate	0.7	0.1	meq/l		1.0		0B12A
Zinc (Zn)	1.1	0.2	PPM		1.0		0B 2A
Manganese (Mn)	22	0.2	PPM		1.0		0B 2A
Iron (Fe)	24	0.5	PPM		1.0		0B 2A
Copper (Cu)	1.8	0.1	PPM		1.0		0B 2A
CEC	6.2	0.1	meq/100g		1.0		0
Exchangable Calcium	4.3	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	1.6	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.2	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	83.6	0.1	%		1.0		0B 2A
% Silt	4.1	0.1	%		1.0		0B 2A
% Clay	9.3	0.1	%		1.0		0B 2A
% Organic Matter	0.4	0.1	%		1.0		1A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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Sapphos Environmental Sample ID: SA008

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	2.3	0.1	%	D422	1.0		00A 2B
2.0 mm	0.6	0.1	%	D422	1.0		00A 2B
1.4 mm	ND	0.1	%	D422	1.0		00A 2B
500 µm	9.5	0.1	%	D422	1.0		00A 2B
250 µm	70	0.1	%	D422	1.0		00A 2B
106 µm	10	0.1	%	D422	1.0		00A 2B
75 µm	3.5	0.1	%	D422	1.0		00A 2B
45 µm	3.2	0.1	%	D422	1.0		00A 2B
Receiving Pan	0.4	0.1	%	D422	1.0		00A 2B
% Gravel	3.0	0.1	%	PARTSIZE	1.0		00A 2B
Permeability[A]							
Permeability (20°C)	0.0278	---	cm/s	D4511-92	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-15 Page 1
Sample ID: SA009

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	15	0.1	%	ASA/UL	1.0		0B 2A
Saturation	22	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	ND	0.9	PPM		1.0		0B 2A
Phosphorous	14	3	PPM		1.0		0B 2A
Potassium Exch.+Sol.	47	0.1	PPM		1.0		0B22A
pH	8.2	---	units		1.0		0B12A
Soil Salinity (ec)	0.5	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	0.9	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	0.4	0.1	meq/l		1.0		0B12A
Sodium (Na)	3.8	0.1	meq/l		1.0		0B12A
SAR	4.7	0.1			1.0		0B12A
Boron (B)	0.21	0.02	PPM		1.0		0B12A
Chloride (Cl)	1.1	0.1	meq/l		1.0		0B 2A
Sulfate	1.0	0.1	meq/l		1.0		0B12A
Zinc (Zn)	0.7	0.2	PPM		1.0		0B 2A
Manganese (Mn)	13	0.2	PPM		1.0		0B 2A
Iron (Fe)	21	0.5	PPM		1.0		0B 2A
Copper (Cu)	1.6	0.1	PPM		1.0		0B 2A
CEC	7.1	0.1	meq/100g		1.0		0
Exchangable Calcium	4.5	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	2.0	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.5	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	80.1	0.1	%		1.0		0B 2A
% Silt	4.0	0.1	%		1.0		0B 2A
% Clay	11.0	0.1	%		1.0		0B 2A
% Organic Matter	0.6	0.1	%		1.0		1A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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Sapphos Environmental Sample ID: SA009

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	4.3	0.1	%	D422	1.0		00A 2B
2.0 mm	0.6	0.1	%	D422	1.0		00A 2B
1.4 mm	0.1	0.1	%	D422	1.0		00A 2B
500 µm	13	0.1	%	D422	1.0		00A 2B
250 µm	55	0.1	%	D422	1.0		00A 2B
106 µm	19	0.1	%	D422	1.0		00A 2B
75 µm	4.1	0.1	%	D422	1.0		00A 2B
45 µm	3.1	0.1	%	D422	1.0		00A 2B
Receiving Pan	1.3	0.1	%	D422	1.0		00A 2B
% Gravel	4.9	0.1	%	PARTSIZE	1.0		00A 2B
Permeability[A]							
Permeability (20°C)	0.00155	---	cm/s	D4511-92	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Ricardo Landeros For
Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-16 Page 1
Sample ID: SA010

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	12	0.1	%	ASA/UL	1.0		0B 2A
Saturation	23	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	ND	0.9	PPM		1.0		0B 2A
Phosphorous	10	3	PPM		1.0		0B 2A
Potassium Exch.+Sol.	39	0.1	PPM		1.0		0B22A
pH	7.6	---	units		1.0		0B12A
Soil Salinity (ec)	0.3	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	0.9	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	0.5	0.1	meq/l		1.0		0B12A
Sodium (Na)	1.5	0.1	meq/l		1.0		0B12A
SAR	1.9	0.1			1.0		0B12A
Boron (B)	0.10	0.02	PPM		1.0		0B12A
Chloride (Cl)	0.6	0.1	meq/l		1.0		0B 2A
Sulfate	0.5	0.1	meq/l		1.0		0B12A
Zinc (Zn)	0.9	0.2	PPM		1.0		0B 2A
Manganese (Mn)	3.6	0.2	PPM		1.0		0B 2A
Iron (Fe)	20	0.5	PPM		1.0		0B 2A
Copper (Cu)	1.1	0.1	PPM		1.0		0B 2A
CEC	5.6	0.1	meq/100g		1.0		0
Exchangable Calcium	3.6	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	1.7	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.2	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	80.7	0.1	%		1.0		0B 2A
% Silt	5.0	0.1	%		1.0		0B 2A
% Clay	10.1	0.1	%		1.0		0B 2A
% Organic Matter	0.4	0.1	%		1.0		1A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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Sapphos Environmental Sample ID: SA010

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	3.7	0.1	%	D422	1.0		00A 2B
2.0 mm	0.5	0.1	%	D422	1.0		00A 2B
1.4 mm	ND	0.1	%	D422	1.0		00A 2B
500 µm	12	0.1	%	D422	1.0		00A 2B
250 µm	54	0.1	%	D422	1.0		00A 2B
106 µm	19	0.1	%	D422	1.0		00A 2B
75 µm	4.0	0.1	%	D422	1.0		00A 2B
45 µm	6.6	0.1	%	D422	1.0		00A 2B
Receiving Pan	1.2	0.1	%	D422	1.0		00A 2B
% Gravel	4.2	0.1	%	PARTSIZE	1.0		00A 2B
Permeability[A]							
Permeability (20°C)	0.0185	---	cm/s	D4511-92	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-17 Page 1
Sample ID: SA011

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	87.3	0.1	%		1.0		0B 2C
% Silt	1.8	0.1	%		1.0		0B 2C
% Clay	9.5	0.1	%		1.0		0B 2C
% Organic Matter	0.3	0.1	%		1.0		1A22A
Part Size Sieve[A]							
4.75 mm	1.1	0.1	%	D422	1.0		00A 2B
2.0 mm	0.3	0.1	%	D422	1.0		00A 2B
1.4 mm	ND	0.1	%	D422	1.0		00A 2B
500 µm	14	0.1	%	D422	1.0		00A 2B
250 µm	58	0.1	%	D422	1.0		00A 2B
106 µm	18	0.1	%	D422	1.0		00A 2B
75 µm	3.9	0.1	%	D422	1.0		00A 2B
45 µm	5.1	0.1	%	D422	1.0		00A 2B
Receiving Pan	0.8	0.1	%	D422	1.0		00A 2B
% Gravel	1.4	0.1	%	PARTSIZE	1.0		00A 2B

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-18 Page 1
Sample ID: SA012

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	56.6	0.1	%		1.0		0B 2D
% Silt	5.1	0.1	%		1.0		0B 2D
% Clay	4.9	0.1	%		1.0		0B 2D
% Organic Matter	1.4	0.1	%		1.0		1A22A
Part Size Sieve[A]							
4.75 mm	28	0.1	%	D422	1.0		00A 2B
2.0 mm	5.2	0.1	%	D422	1.0		00A 2B
1.4 mm	1.3	0.1	%	D422	1.0		00A 2B
500 µm	24	0.1	%	D422	1.0		00A 2B
250 µm	30	0.1	%	D422	1.0		00A 2B
106 µm	7.7	0.1	%	D422	1.0		00A 2B
75 µm	1.4	0.1	%	D422	1.0		00A 2B
45 µm	1.9	0.1	%	D422	1.0		00A 2B
Receiving Pan	0.3	0.1	%	D422	1.0		00A 2B
% Gravel	33.4	0.1	%	PARTSIZE	1.0		00A 2B

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-19 Page 1
Sample ID: SA013

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	90.7	0.1	%		1.0		0B 2D
% Silt	2.6	0.1	%		1.0		0B 2D
% Clay	6.4	0.1	%		1.0		0B 2D
% Organic Matter	0.2	0.1	%		1.0		1A22A
Part Size Sieve[A]							
4.75 mm	0.1	0.1	%	D422	1.0		00A 2B
2.0 mm	0.3	0.1	%	D422	1.0		00A 2B
1.4 mm	ND	0.1	%	D422	1.0		00A 2B
500 µm	19	0.1	%	D422	1.0		00A 2B
250 µm	61	0.1	%	D422	1.0		00A 2B
106 µm	16	0.1	%	D422	1.0		00A 2B
75 µm	3.3	0.1	%	D422	1.0		00A 2B
45 µm	0.5	0.1	%	D422	1.0		00A 2B
Receiving Pan	ND	0.1	%	D422	1.0		00A 2B
% Gravel	0.3	0.1	%	PARTSIZE	1.0		00A 2B

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-21 Page 1
Sample ID: SA015

Sapphos Environmental
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Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	87.0	0.1	%		1.0		0B 2D
% Silt	5.6	0.1	%		1.0		0B 2D
% Clay	7.4	0.1	%		1.0		0B 2D
% Organic Matter	0.2	0.1	%		1.0		1A22A
Part Size Sieve[A]							
4.75 mm	ND	0.1	%	D422	1.0		00A 2C
2.0 mm	ND	0.1	%	D422	1.0		00A 2C
1.4 mm	ND	0.1	%	D422	1.0		00A 2C
500 µm	23	0.1	%	D422	1.0		00A 2C
250 µm	52	0.1	%	D422	1.0		00A 2C
106 µm	18	0.1	%	D422	1.0		00A 2C
75 µm	5.7	0.1	%	D422	1.0		00A 2C
45 µm	1.5	0.1	%	D422	1.0		00A 2C
Receiving Pan	0.2	0.1	%	D422	1.0		00A 2C
% Gravel	0.0	0.1	%	PARTSIZE	1.0		00A 2C

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-22 Page 1
Sample ID: SA017

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	18	0.1	%	ASA/UL	1.0		0B 2A
Saturation	22	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	ND	0.9	PPM		1.0		0B 2A
Phosphorous	11	3	PPM		1.0		0B 2A
Potassium Exch. + Sol.	17	0.1	PPM		1.0		0B22A
pH	7.3	---	units		1.0		0B12A
Soil Salinity (ec)	0.8	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	1.9	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	1.2	0.1	meq/l		1.0		0B12A
Sodium (Na)	4.9	0.1	meq/l		1.0		0B12A
SAR	4.0	0.1			1.0		0B12A
Boron (B)	0.10	0.02	PPM		1.0		0B12A
Chloride (Cl)	2.7	0.1	meq/l		1.0		0B 2A
Sulfate	4.9	0.1	meq/l		1.0		0B12A
Zinc (Zn)	ND	0.2	PPM		1.0		0B 2A
Manganese (Mn)	1.2	0.2	PPM		1.0		0B 2A
Iron (Fe)	10	0.5	PPM		1.0		0B 2A
Copper (Cu)	0.2	0.1	PPM		1.0		0B 2A
CEC	2.9	0.1	meq/100g		1.0		0
Exchangable Calcium	1.8	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	0.8	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.3	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	88.2	0.1	%		1.0		0B 2A
% Silt	3.1	0.1	%		1.0		0B 2A
% Clay	6.5	0.1	%		1.0		0B 2A
% Organic Matter	0.2	0.1	%		1.0		1A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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Mobile: 209/737-2399

Sapphos Environmental Sample ID: SA017

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	1.8	0.1	%	D422	1.0		00A 2C
2.0 mm	0.3	0.1	%	D422	1.0		00A 2C
1.4 mm	ND	0.1	%	D422	1.0		00A 2C
500 µm	9.9	0.1	%	D422	1.0		00A 2C
250 µm	53	0.1	%	D422	1.0		00A 2C
106 µm	24	0.1	%	D422	1.0		00A 2C
75 µm	4.5	0.1	%	D422	1.0		00A 2C
45 µm	5.7	0.1	%	D422	1.0		00A 2C
Receiving Pan	1.1	0.1	%	D422	1.0		00A 2C
% Gravel	2.2	0.1	%	PARTSIZE	1.0		00A 2C

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-23 Page 1
Sample ID: SA018

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	18	0.1	%	ASA/UL	1.0		0B 2A
Saturation	25	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	ND	0.9	PPM		1.0		0B 2A
Phosphorous	8	3	PPM		1.0		0B 2A
Potassium Exch.+Sol.	22	0.1	PPM		1.0		0B22A
pH	7.9	---	units		1.0		0B12A
Soil Salinity (ec)	0.9	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	1.8	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	1.4	0.1	meq/l		1.0		0B12A
Sodium (Na)	5.9	0.1	meq/l		1.0		0B12A
SAR	4.6	0.1			1.0		0B12A
Boron (B)	0.16	0.02	PPM		1.0		0B12A
Chloride (Cl)	2.7	0.1	meq/l		1.0		0B 2A
Sulfate	4.9	0.1	meq/l		1.0		0B12A
Zinc (Zn)	0.6	0.2	PPM		1.0		0B 2A
Manganese (Mn)	11	0.2	PPM		1.0		0B 2A
Iron (Fe)	13	0.5	PPM		1.0		0B 2A
Copper (Cu)	0.6	0.1	PPM		1.0		0B 2A
CEC	4.4	0.1	meq/100g		1.0		0
Exchangable Calcium	2.5	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	1.5	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.4	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	88.2	0.1	%		1.0		0B 2A
% Silt	3.2	0.1	%		1.0		0B 2A
% Clay	8.6	0.1	%		1.0		0B 2A
% Organic Matter	0.2	0.1	%		1.0		1A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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FAX: 209/734-8435
Mobile 209/737-2399

Sapphos Environmental Sample ID: SA018

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	ND	0.1	%	D422	1.0		00A 2C
2.0 mm	ND	0.1	%	D422	1.0		00A 2C
1.4 mm	ND	0.1	%	D422	1.0		00A 2C
500 µm	19	0.1	%	D422	1.0		00A 2C
250 µm	65	0.1	%	D422	1.0		00A 2C
106 µm	11	0.1	%	D422	1.0		00A 2C
75 µm	4.0	0.1	%	D422	1.0		00A 2C
45 µm	1.4	0.1	%	D422	1.0		00A 2C
Receiving Pan	0.1	0.1	%	D422	1.0		00A 2C
% Gravel	0.0	0.1	%	PARTSIZE	1.0		00A 2C
Permeability[A]							
Permeability (20°C)	0.00292	---	cm/s	D4511-92	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-24 Page 1
Sample ID: SA019

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	9.8	0.1	%	ASA/UL	1.0		0B 2A
Saturation	23	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	1.4	0.9	PPM		1.0		0B 2A
Phosphorous	10	3	PPM		1.0		0B 2A
Potassium Exch. + Sol.	40	0.1	PPM		1.0		0B22A
pH	7.6	---	units		1.0		0B12A
Soil Salinity (ec)	1.3	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	4.2	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	2.6	0.1	meq/l		1.0		0B12A
Sodium (Na)	7.5	0.1	meq/l		1.0		0B12A
SAR	4.1	0.1			1.0		0B12A
Boron (B)	0.23	0.02	PPM		1.0		0B12A
Chloride (Cl)	3.2	0.1	meq/l		1.0		0B 2A
Sulfate	8.7	0.1	meq/l		1.0		0B12A
Zinc (Zn)	0.9	0.2	PPM		1.0		0B 2A
Manganese (Mn)	4.1	0.2	PPM		1.0		0B 2A
Iron (Fe)	24	0.5	PPM		1.0		0B 2A
Copper (Cu)	1.1	0.1	PPM		1.0		0B 2A
CEC	5.5	0.1	meq/100g		1.0		0
Exchangable Calcium	3.4	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	1.6	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.4	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	84.2	0.1	%		1.0		0B 2A
% Silt	5.2	0.1	%		1.0		0B 2A
% Clay	10.6	0.1	%		1.0		0B 2A
% Organic Matter	0.5	0.1	%		1.0		1A22A
Potassium	0.1	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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Sapphos Environmental Sample ID: SA019

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	ND	0.1	%	D422	1.0		00A 2C
2.0 mm	ND	0.1	%	D422	1.0		00A 2C
1.4 mm	ND	0.1	%	D422	1.0		00A 2C
500 µm	12	0.1	%	D422	1.0		00A 2C
250 µm	54	0.1	%	D422	1.0		00A 2C
106 µm	22	0.1	%	D422	1.0		00A 2C
75 µm	6.4	0.1	%	D422	1.0		00A 2C
45 µm	4.9	0.1	%	D422	1.0		00A 2C
Receiving Pan	0.6	0.1	%	D422	1.0		00A 2C
% Gravel	0.0	0.1	%	PARTSIZE	1.0		00A 2C
Permeability[A]							
Permeability (20°C)	0.0552	---	cm/s	D4511-92	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-25 Page 1
Sample ID: SA020

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	12	0.1	%	ASA/UL	1.0		0B 2A
Saturation	26	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	ND	0.9	PPM		1.0		0B 2A
Phosphorous	13	3	PPM		1.0		0B 2A
Potassium Exch. + Sol.	58	0.1	PPM		1.0		0B22A
pH	8.9	---	units		1.0		0B12A
Soil Salinity (ec)	1.1	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	2.5	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	1.3	0.1	meq/l		1.0		0B12A
Sodium (Na)	8.1	0.1	meq/l		1.0		0B12A
SAR	5.9	0.1			1.0		0B12A
Boron (B)	0.16	0.02	PPM		1.0		0B12A
Chloride (Cl)	2.5	0.1	meq/l		1.0		0B 2A
Sulfate	7.4	0.1	meq/l		1.0		0B12A
Zinc (Zn)	0.9	0.2	PPM		1.0		0B 2A
Manganese (Mn)	3.6	0.2	PPM		1.0		0B 2A
Iron (Fe)	20	0.5	PPM		1.0		0B 2A
Copper (Cu)	1.4	0.1	PPM		1.0		0B 2A
CEC	12	0.1	meq/100g		1.0		0
Exchangable Calcium	8.2	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	2.7	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.8	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	76.4	0.1	%		1.0		0B 2B
% Silt	5.1	0.1	%		1.0		0B 2B
% Clay	13.7	0.1	%		1.0		0B 2B
% Organic Matter	0.6	0.1	%		1.0		1A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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Sapphos Environmental Sample ID: SA020

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	3.1	0.1	%	D422	1.0		00A 2C
2.0 mm	1.7	0.1	%	D422	1.0		00A 2C
1.4 mm	ND	0.1	%	D422	1.0		00A 2C
500 µm	3.7	0.1	%	D422	1.0		00A 2C
250 µm	63	0.1	%	D422	1.0		00A 2C
106 µm	17	0.1	%	D422	1.0		00A 2C
75 µm	3.7	0.1	%	D422	1.0		00A 2C
45 µm	5.7	0.1	%	D422	1.0		00A 2C
Receiving Pan	1.7	0.1	%	D422	1.0		00A 2C
% Gravel	4.8	0.1	%	PARTSIZE	1.0		00A 2C
Permeability[A]							
Permeability (20°C)	0.00532	---	cm/s	D4511-92	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-26 Page 1
Sample ID: SA021

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	13	0.1	%	ASA/UL	1.0		0B 2A
Saturation	24	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	ND	0.9	PPM		1.0		0B 2A
Phosphorous	10	3	PPM		1.0		0B 2A
Potassium Exch. + Sol.	41	0.1	PPM		1.0		0B22A
pH	8.1	---	units		1.0		0B12A
Soil Salinity (ec)	1.6	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	3.1	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	2.3	0.1	meq/l		1.0		0B12A
Sodium (Na)	12	0.1	meq/l		1.0		0B12A
SAR	7.2	0.1			1.0		0B12A
Boron (B)	0.24	0.02	PPM		1.0		0B12A
Chloride (Cl)	4.6	0.1	meq/l		1.0		0B 2A
Sulfate	10	0.1	meq/l		1.0		0B12A
Zinc (Zn)	0.7	0.2	PPM		1.0		0B 2A
Manganese (Mn)	3.3	0.2	PPM		1.0		0B 2A
Iron (Fe)	21	0.5	PPM		1.0		0B 2A
Copper (Cu)	1.3	0.1	PPM		1.0		0B 2A
CEC	7.8	0.1	meq/100g		1.0		0
Exchangable Calcium	4.7	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	2.2	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.8	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	83.7	0.1	%		1.0		0B 2B
% Silt	4.4	0.1	%		1.0		0B 2B
% Clay	11.3	0.1	%		1.0		0B 2B
% Organic Matter	0.5	0.1	%		1.0		1A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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Sapphos Environmental Sample ID: SA021

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	ND	0.1	%	D422	1.0		00A 2C
2.0 mm	0.6	0.1	%	D422	1.0		00A 2C
1.4 mm	ND	0.1	%	D422	1.0		00A 2C
500 µm	5.5	0.1	%	D422	1.0		00A 2C
250 µm	62	0.1	%	D422	1.0		00A 2C
106 µm	18	0.1	%	D422	1.0		00A 2C
75 µm	4.5	0.1	%	D422	1.0		00A 2C
45 µm	5.4	0.1	%	D422	1.0		00A 2C
Receiving Pan	4.0	0.1	%	D422	1.0		00A 2C
% Gravel	0.6	0.1	%	PARTSIZE	1.0		00A 2C
Permeability[A]							
Permeability (20°C)	0.00903	---	cm/s	D4511-92	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-27 Page 1
Sample ID: SA022

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	21	0.1	%	ASA/UL	1.0		0B 2A
Saturation	28	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	ND	0.9	PPM		1.0		0B 2A
Phosphorous	13	3	PPM		1.0		0B 2A
Potassium Exch. + Sol.	30	0.1	PPM		1.0		0B22A
pH	7.9	---	units		1.0		0B12A
Soil Salinity (ec)	0.5	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	1.2	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	0.7	0.1	meq/l		1.0		0B12A
Sodium (Na)	3.4	0.1	meq/l		1.0		0B12A
SAR	3.5	0.1			1.0		0B12A
Boron (B)	0.14	0.02	PPM		1.0		0B12A
Chloride (Cl)	0.7	0.1	meq/l		1.0		0B 2A
Sulfate	2.6	0.1	meq/l		1.0		0B12A
Zinc (Zn)	1.8	0.2	PPM		1.0		0B 2A
Manganese (Mn)	13	0.2	PPM		1.0		0B 2A
Iron (Fe)	17	0.5	PPM		1.0		0B 2A
Copper (Cu)	2.5	0.1	PPM		1.0		0B 2A
CEC	5.9	0.1	meq/100g		1.0		0
Exchangable Calcium	3.7	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	1.9	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.3	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	86.9	0.1	%		1.0		0B 2B
% Silt	0.4	0.1	%		1.0		0B 2B
% Clay	11.2	0.1	%		1.0		0B 2B
% Organic Matter	0.4	0.1	%		1.0		1A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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Sapphos Environmental Sample ID: SA022

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	0.6	0.1	%	D422	1.0		00A 2C
2.0 mm	0.9	0.1	%	D422	1.0		00A 2C
1.4 mm	0.1	0.1	%	D422	1.0		00A 2C
500 µm	17	0.1	%	D422	1.0		00A 2C
250 µm	57	0.1	%	D422	1.0		00A 2C
106 µm	14	0.1	%	D422	1.0		00A 2C
75 µm	4.3	0.1	%	D422	1.0		00A 2C
45 µm	4.0	0.1	%	D422	1.0		00A 2C
Receiving Pan	1.4	0.1	%	D422	1.0		00A 2C
% Gravel	1.5	0.1	%	PARTSIZE	1.0		00A 2C
Permeability[A]							
Permeability (20°C)	0.0104	---	cm/s	D4511-92	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-28 Page 1
Sample ID: SA023

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	93.0	0.1	%		1.0		0B 2D
% Silt	0.6	0.1	%		1.0		0B 2D
% Clay	6.4	0.1	%		1.0		0B 2D
% Organic Matter	ND	0.1	%		1.0		1A22B
Part Size Sieve[A]							
4.75 mm	ND	0.1	%	D422	1.0		00A 2C
2.0 mm	ND	0.1	%	D422	1.0		00A 2C
1.4 mm	ND	0.1	%	D422	1.0		00A 2C
500 µm	19	0.1	%	D422	1.0		00A 2C
250 µm	58	0.1	%	D422	1.0		00A 2C
106 µm	14	0.1	%	D422	1.0		00A 2C
75 µm	3.6	0.1	%	D422	1.0		00A 2C
45 µm	3.4	0.1	%	D422	1.0		00A 2C
Receiving Pan	1.5	0.1	%	D422	1.0		00A 2C
% Gravel	0.0	0.1	%	PARTSIZE	1.0		00A 2C

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-29 Page 1
Sample ID: SA024

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	20	0.1	%	ASA/UL	1.0		0B 2A
Saturation	25	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	ND	0.9	PPM		1.0		0B 2A
Phosphorous	14	3	PPM		1.0		0B 2A
Potassium Exch. + Sol.	32	0.1	PPM		1.0		0B22A
pH	7.6	---	units		1.0		0B12A
Soil Salinity (ec)	0.2	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	0.8	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	0.2	0.1	meq/l		1.0		0B12A
Sodium (Na)	0.7	0.1	meq/l		1.0		0B12A
SAR	1.0	0.1			1.0		0B12A
Boron (B)	0.07	0.02	PPM		1.0		0B12A
Chloride (Cl)	ND	0.1	meq/l		1.0		0B 2A
Sulfate	0.3	0.1	meq/l		1.0		0B12A
Zinc (Zn)	0.5	0.2	PPM		1.0		0B 2A
Manganese (Mn)	7.5	0.2	PPM		1.0		0B 2A
Iron (Fe)	22	0.5	PPM		1.0		0B 2A
Copper (Cu)	0.8	0.1	PPM		1.0		0B 2A
CEC	3.8	0.1	meq/100g		1.0		0
Exchangable Calcium	3.2	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	0.6	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	ND	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	83.3	0.1	%		1.0		0B 2B
% Silt	3.3	0.1	%		1.0		0B 2B
% Clay	11.1	0.1	%		1.0		0B 2B
% Organic Matter	0.3	0.1	%		1.0		1A22B
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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Sapphos Environmental Sample ID: SA024

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	2.2	0.1	%	D422	1.0		00A 2C
2.0 mm	ND	0.1	%	D422	1.0		00A 2C
1.4 mm	ND	0.1	%	D422	1.0		00A 2C
500 µm	5.2	0.1	%	D422	1.0		00A 2C
250 µm	68	0.1	%	D422	1.0		00A 2C
106 µm	12	0.1	%	D422	1.0		00A 2C
75 µm	10	0.1	%	D422	1.0		00A 2C
45 µm	1.8	0.1	%	D422	1.0		00A 2C
Receiving Pan	0.1	0.1	%	D422	1.0		00A 2C
% Gravel	2.2	0.1	%	PARTSIZE	1.0		00A 2C
Permeability[A]							
Permeability (20°C)	0.0361	---	cm/s	D4511-92	1.0		00A 2B

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-30 Page 1
Sample ID: SA025A

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	94.6	0.1	%		1.0		0B 2D
% Silt	0.0	0.1	%		1.0		0B 2D
% Clay	5.4	0.1	%		1.0		0B 2D
% Organic Matter	ND	0.1	%		1.0		1A22B
Part Size Sieve[A]							
4.75 mm	ND	0.1	%	D422	1.0		00A 2C
2.0 mm	ND	0.1	%	D422	1.0		00A 2C
1.4 mm	ND	0.1	%	D422	1.0		00A 2C
500 µm	24	0.1	%	D422	1.0		00A 2C
250 µm	60	0.1	%	D422	1.0		00A 2C
106 µm	13	0.1	%	D422	1.0		00A 2C
75 µm	1.1	0.1	%	D422	1.0		00A 2C
45 µm	1.3	0.1	%	D422	1.0		00A 2C
Receiving Pan	0.6	0.1	%	D422	1.0		00A 2C
% Gravel	0.0	0.1	%	PARTSIZE	1.0		00A 2C

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-31 Page 1
Sample ID: SA025B

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	90.8	0.1	%		1.0		0B 2D
% Silt	2.0	0.1	%		1.0		0B 2D
% Clay	6.3	0.1	%		1.0		0B 2D
% Organic Matter	0.2	0.1	%		1.0		1A22B
Part Size Sieve[A]							
4.75 mm	0.3	0.1	%	D422	1.0		00A 2D
2.0 mm	0.5	0.1	%	D422	1.0		00A 2D
1.4 mm	0.2	0.1	%	D422	1.0		00A 2D
500 µm	26	0.1	%	D422	1.0		00A 2D
250 µm	50	0.1	%	D422	1.0		00A 2D
106 µm	18	0.1	%	D422	1.0		00A 2D
75 µm	2.1	0.1	%	D422	1.0		00A 2D
45 µm	2.0	0.1	%	D422	1.0		00A 2D
Receiving Pan	1.3	0.1	%	D422	1.0		00A 2D
% Gravel	0.9	0.1	%	PARTSIZE	1.0		00A 2D

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-32 Page 1
Sample ID: SA025C

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	60.2	0.1	%		1.0		0B 2D
% Silt	5.8	0.1	%		1.0		0B 2D
% Clay	6.1	0.1	%		1.0		0B 2D
% Organic Matter	2.0	0.1	%		1.0		1A22B
Part Size Sieve[A]							
4.75 mm	16	0.1	%	D422	1.0		00A 2D
2.0 mm	11	0.1	%	D422	1.0		00A 2D
1.4 mm	1.5	0.1	%	D422	1.0		00A 2D
500 µm	22	0.1	%	D422	1.0		00A 2D
250 µm	30	0.1	%	D422	1.0		00A 2D
106 µm	15	0.1	%	D422	1.0		00A 2D
75 µm	1.7	0.1	%	D422	1.0		00A 2D
45 µm	2.0	0.1	%	D422	1.0		00A 2D
Receiving Pan	0.1	0.1	%	D422	1.0		00A 2D
% Gravel	27.9	0.1	%	PARTSIZE	1.0		00A 2D

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-33 Page 1
Sample ID: SA025D

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	62.9	0.1	%		1.0		0B 2D
% Silt	5.3	0.1	%		1.0		0B 2D
% Clay	7.9	0.1	%		1.0		0B 2D
% Organic Matter	2.4	0.1	%		1.0		1A22B
Part Size Sieve[A]							
4.75 mm	14	0.1	%	D422	1.0		00A 2D
2.0 mm	9.3	0.1	%	D422	1.0		00A 2D
1.4 mm	2.6	0.1	%	D422	1.0		00A 2D
500 µm	19	0.1	%	D422	1.0		00A 2D
250 µm	29	0.1	%	D422	1.0		00A 2D
106 µm	18	0.1	%	D422	1.0		00A 2D
75 µm	5.2	0.1	%	D422	1.0		00A 2D
45 µm	1.6	0.1	%	D422	1.0		00A 2D
Receiving Pan	1.2	0.1	%	D422	1.0		00A 2D
% Gravel	23.8	0.1	%	PARTSIZE	1.0		00A 2D

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-34 Page 1
Sample ID: SA025E

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	51.7	0.1	%		1.0		0B 2D
% Silt	6.3	0.1	%		1.0		0B 2D
% Clay	4.6	0.1	%		1.0		0B 2D
% Organic Matter	3.5	0.1	%		1.0		1A22B
Part Size Sieve[A]							
4.75 mm	26	0.1	%	D422	1.0		00A 2D
2.0 mm	12	0.1	%	D422	1.0		00A 2D
1.4 mm	1.6	0.1	%	D422	1.0		00A 2D
500 µm	13	0.1	%	D422	1.0		00A 2D
250 µm	24	0.1	%	D422	1.0		00A 2D
106 µm	15	0.1	%	D422	1.0		00A 2D
75 µm	2.8	0.1	%	D422	1.0		00A 2D
45 µm	5.3	0.1	%	D422	1.0		00A 2D
Receiving Pan	0.6	0.1	%	D422	1.0		00A 2D
% Gravel	37.4	0.1	%	PARTSIZE	1.0		00A 2D

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-35 Page 1
Sample ID: SA026

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	59.3	0.1	%		1.0		0B 2E
% Silt	8.3	0.1	%		1.0		0B 2E
% Clay	7.8	0.1	%		1.0		0B 2E
% Organic Matter	1.4	0.1	%		1.0		1A22B
Part Size Sieve[A]							
4.75 mm	16	0.1	%	D422	1.0		00A 2D
2.0 mm	8.1	0.1	%	D422	1.0		00A 2D
1.4 mm	1.9	0.1	%	D422	1.0		00A 2D
500 µm	13	0.1	%	D422	1.0		00A 2D
250 µm	29	0.1	%	D422	1.0		00A 2D
106 µm	16	0.1	%	D422	1.0		00A 2D
75 µm	11	0.1	%	D422	1.0		00A 2D
45 µm	4.1	0.1	%	D422	1.0		00A 2D
Receiving Pan	0.4	0.1	%	D422	1.0		00A 2D
% Gravel	24.6	0.1	%	PARTSIZE	1.0		00A 2D

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-36 Page 1
Sample ID: SA027

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	88.1	0.1	%		1.0		0B 2E
% Silt	1.0	0.1	%		1.0		0B 2E
% Clay	6.1	0.1	%		1.0		0B 2E
% Organic Matter	0.4	0.1	%		1.0		1A22B
Part Size Sieve[A]							
4.75 mm	3.8	0.1	%	D422	1.0		00A 2D
2.0 mm	1.0	0.1	%	D422	1.0		00A 2D
1.4 mm	0.3	0.1	%	D422	1.0		00A 2D
500 µm	23	0.1	%	D422	1.0		00A 2D
250 µm	27	0.1	%	D422	1.0		00A 2D
106 µm	41	0.1	%	D422	1.0		00A 2D
75 µm	2.5	0.1	%	D422	1.0		00A 2D
45 µm	1.0	0.1	%	D422	1.0		00A 2D
Receiving Pan	0.4	0.1	%	D422	1.0		00A 2D
% Gravel	4.8	0.1	%	PARTSIZE	1.0		00A 2D

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Ricardo Sandoval for

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

February 18, 1998

LAB No: SP 800750-01 Page 1
Sample ID: SA028

Sapphos Environmental
50 South DeLacey, Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 30, 1998
Received : February 02, 1998
Completed: February 04, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A,1]							
Saturation	25	0.1	%	ASA/UC	1.0		0B 2A
Nitrate Nitrogen	1.3	0.9	PPM		1.0		0B 2A
Phosphorous	14	3	PPM		1.0		0B 2A
Potassium Exch. + Sol.	58	0.1	PPM		1.0		0B22A
pH	8.4	---	units		1.0		0B12A
Soil Salinity (ec)	0.4	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	1.7	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	0.8	0.1	meq/l		1.0		0B12A
Sodium (Na)	2.6	0.1	meq/l		1.0		0B12A
SAR	2.4	0.1			1.0		0B12A
Boron (B)	0.10	0.02	PPM		1.0		0B12A
Chloride (Cl)	0.7	0.1	meq/l		1.0		0B 2A
Sulfate	1.5	0.1	meq/l		1.0		0B12A
Zinc (Zn)	0.6	0.2	PPM		1.0		0B 2A
Manganese (Mn)	3.0	0.2	PPM		1.0		0B 2A
Iron (Fe)	19	0.5	PPM		1.0		0B 2A
Copper (Cu)	0.8	0.1	PPM		1.0		0B 2A
CEC	16	0.1	meq/100g		1.0		0
Exchangable Calcium	13	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	2.6	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Potassium	0.1	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.4	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	62.8	0.1	%		1.0		0B 2A
% Silt	17.1	0.1	%		1.0		0B 2A
% Clay	15.2	0.1	%		1.0		0B 2A
% Organic Matter	0.8	0.1	%		1.0		0A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980203 Containers: (A) Bag Presevatives: (1) Cool 4°C

Table cont'd next page...

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Sapphos Environmental Sample ID: SA028

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A,1]							
4.75 mm	3.6	0.1	%	D422	1.0		00A 2A
2.0 mm	1.3	0.1	%	D422	1.0		00A 2A
1.4 mm	ND	0.1	%	D422	1.0		00A 2A
500 µm	3.1	0.1	%	D422	1.0		00A 2A
250 µm	27	0.1	%	D422	1.0		00A 2A
106 µm	24.3	0.1	%	D422	1.0		00A 2A
75 µm	28	0.1	%	D422	1.0		00A 2A
45 µm	4.6	0.1	%	D422	1.0		00A 2A
Receiving Pan	8.1	0.1	%	D422	1.0		00A 2A
% Gravel	4.9	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980203 Containers: (A) Bag Presevatives: (1) Cool 4°C

FRUIT GROWERS LABORATORY, INC.

Ricardo Sandoval For

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-40 Page 1
Sample ID: SA028

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 15, 1998

AG Permeability ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Permeability[A]							
Permeability (20°C)	0.00190	---	cm/s	D4511-92	1.0		00A 2B

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-37 Page 1
Sample ID: SA029

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
% Sand	65.9	0.1	%		1.0		0B 2E
% Silt	15.4	0.1	%		1.0		0B 2E
% Clay	14.8	0.1	%		1.0		0B 2E
% Organic Matter	0.5	0.1	%		1.0		1A22B
Part Size Sieve[A]							
4.75 mm	3.2	0.1	%	D422	1.0		00A 2D
2.0 mm	0.7	0.1	%	D422	1.0		00A 2D
1.4 mm	0.1	0.1	%	D422	1.0		00A 2D
500 µm	17	0.1	%	D422	1.0		00A 2D
250 µm	30	0.1	%	D422	1.0		00A 2D
106 µm	34	0.1	%	D422	1.0		00A 2D
75 µm	5.6	0.1	%	D422	1.0		00A 2D
45 µm	4.8	0.1	%	D422	1.0		00A 2D
Receiving Pan	5.1	0.1	%	D422	1.0		00A 2D
% Gravel	3.9	0.1	%	PARTSIZE	1.0		00A 2D

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-38 Page 1
Sample ID: SA030

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	17	0.1	%	ASA/UL	1.0		0B 2A
Saturation	25	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	ND	0.9	PPM		1.0		0B 2A
Phosphorous	14	3	PPM		1.0		0B 2A
Potassium Exch.+Sol.	49	0.1	PPM		1.0		0B22A
pH	8.0	---	units		1.0		0B12A
Soil Salinity (ec)	0.4	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	1.5	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	0.7	0.1	meq/l		1.0		0B12A
Sodium (Na)	1.6	0.1	meq/l		1.0		0B12A
SAR	1.5	0.1			1.0		0B12A
Boron (B)	0.17	0.02	PPM		1.0		0B12A
Chloride (Cl)	0.8	0.1	meq/l		1.0		0B 2A
Sulfate	1.0	0.1	meq/l		1.0		0B12A
Zinc (Zn)	1.0	0.2	PPM		1.0		0B 2A
Manganese (Mn)	12	0.2	PPM		1.0		0B 2A
Iron (Fe)	14	0.5	PPM		1.0		0B 2A
Copper (Cu)	1.0	0.1	PPM		1.0		0B 2A
CEC	8.3	0.1	meq/100g		1.0		0
Exchangable Calcium	6.2	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	1.8	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.2	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	68.4	0.1	%		1.0		0B 2B
% Silt	11.7	0.1	%		1.0		0B 2B
% Clay	14.6	0.1	%		1.0		0B 2B
% Organic Matter	0.8	0.1	%		1.0		1A22B
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)

FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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Sapphos Environmental Sample ID: SA030

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	2.1	0.1	%	D422	1.0		00A 2D
2.0 mm	3.2	0.1	%	D422	1.0		00A 2D
1.4 mm	0.1	0.1	%	D422	1.0		00A 2D
500 µm	15	0.1	%	D422	1.0		00A 2D
250 µm	33	0.1	%	D422	1.0		00A 2D
106 µm	29	0.1	%	D422	1.0		00A 2D
75 µm	7.2	0.1	%	D422	1.0		00A 2D
45 µm	8.8	0.1	%	D422	1.0		00A 2D
Receiving Pan	0.9	0.1	%	D422	1.0		00A 2D
% Gravel	5.3	0.1	%	PARTSIZE	1.0		00A 2D
Permeability[A]							
Permeability (20°C)	0.00932	---	cm/s	D4511-92	1.0		00A 2B

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

January 23, 1998

LAB No: SP 800241-39 Page 1
Sample ID: SA031

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 07, 1998
Received : January 08, 1998
Completed: January 21, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A]							
Moisture	33	0.1	%	ASA/UL	1.0		0B 2A
Saturation	39	0.1	%	ASA/UL	1.0		0B 2A
Nitrate Nitrogen	2.1	0.9	PPM		1.0		0B 2B
Phosphorous	25	3	PPM		1.0		0B 2A
Potassium Exch. + Sol.	140	0.1	PPM		1.0		0B22A
pH	6.7	---	units		1.0		0B12A
Soil Salinity (ec)	0.2	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	0.8	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	0.4	0.1	meq/l		1.0		0B12A
Sodium (Na)	1.0	0.1	meq/l		1.0		0B12A
SAR	1.2	0.1			1.0		0B12A
Boron (B)	0.15	0.02	PPM		1.0		0B12A
Chloride (Cl)	0.2	0.1	meq/l		1.0		0B 2A
Sulfate	0.5	0.1	meq/l		1.0		0B12A
Zinc (Zn)	2.7	0.2	PPM		1.0		0B 2A
Manganese (Mn)	8.3	0.2	PPM		1.0		0B 2A
Iron (Fe)	50	0.5	PPM		1.0		0B 2A
Copper (Cu)	2.3	0.1	PPM		1.0		0B 2A
CEC	18	0.1	meq/100g		1.0		0
Exchangable Calcium	12	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	5.5	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.3	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	15.9	0.1	%		1.0		0B 2B
% Silt	12.9	0.1	%		1.0		0B 2B
% Clay	23.9	0.1	%		1.0		0B 2B
% Organic Matter	1.6	0.1	%		1.0		1A22B
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

Table cont'd next page...

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Sapphos Environmental Sample ID: SA031

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A]							
4.75 mm	47	0.1	%	D422	1.0		00A 2D
2.0 mm	0.1	0.1	%	D422	1.0		00A 2D
1.4 mm	ND	0.1	%	D422	1.0		00A 2D
500 µm	3.0	0.1	%	D422	1.0		00A 2D
250 µm	20	0.1	%	D422	1.0		00A 2D
106 µm	9.1	0.1	%	D422	1.0		00A 2D
75 µm	6.1	0.1	%	D422	1.0		00A 2D
45 µm	12	0.1	%	D422	1.0		00A 2D
Receiving Pan	2.1	0.1	%	D422	1.0		00A 2D
% Gravel	47.3	0.1	%	PARTSIZE	1.0		00A 2D
Permeability[A]							
Permeability (20°C)	0.0166	---	cm/s	D4511-92	1.0		00A 2B

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980115 Containers: (A) Presevatives:Not Preserved

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

February 18, 1998

LAB No: SP 800750-02 Page 1
Sample ID: SA033A

Sapphos Environmental
50 South DeLacey, Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 30, 1998
Received : February 02, 1998
Completed: February 04, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A.1]							
% Sand	61.8	0.1	%		1.0		0B 2A
% Silt	13.1	0.1	%		1.0		0B 2A
% Clay	18.7	0.1	%		1.0		0B 2A
Part Size Sieve[A.1]							
4.75 mm	4.0	0.1	%	D422	1.0		00A 2A
2.0 mm	2.3	0.1	%	D422	1.0		00A 2A
1.4 mm	ND	0.1	%	D422	1.0		00A 2A
500 µm	ND	0.1	%	D422	1.0		00A 2A
250 µm	49	0.1	%	D422	1.0		00A 2A
106 µm	25	0.1	%	D422	1.0		00A 2A
75 µm	6.0	0.1	%	D422	1.0		00A 2A
45 µm	9.5	0.1	%	D422	1.0		00A 2A
Receiving Pan	4.9	0.1	%	D422	1.0		00A 2A
% Gravel	6.3	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980203 Containers: (A) Bag Presevatives: (1) Cool 4°C

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

February 18, 1998

LAB No: SP 800750-03 Page 1
Sample ID: SA033B

Sapphos Environmental
50 South DeLacey, Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 30, 1998
Received : February 02, 1998
Completed: February 04, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A.1]							
% Sand	69.7	0.1	%		1.0		0B 2A
% Silt	11.3	0.1	%		1.0		0B 2A
% Clay	13.2	0.1	%		1.0		0B 2A
Part Size Sieve[A.1]							
4.75 mm	4.6	0.1	%	D422	1.0		00A 2A
2.0 mm	1.1	0.1	%	D422	1.0		00A 2A
1.4 mm	0.2	0.1	%	D422	1.0		00A 2A
500 µm	0.1	0.1	%	D422	1.0		00A 2A
250 µm	36	0.1	%	D422	1.0		00A 2A
106 µm	18	0.1	%	D422	1.0		00A 2A
75 µm	31	0.1	%	D422	1.0		00A 2A
45 µm	8.5	0.1	%	D422	1.0		00A 2A
Receiving Pan	0.7	0.1	%	D422	1.0		00A 2A
% Gravel	5.7	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980203 Containers: (A) Bag Presevatives: (1) Cool 4°C

FRUIT GROWERS LABORATORY, INC.

Ricardo Sandoval For
Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

February 18, 1998

LAB No: SP 800750-04 Page 1
Sample ID: SA033C

Sapphos Environmental
50 South DeLacey, Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 30, 1998
Received : February 02, 1998
Completed: February 04, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A.1]							
% Sand	58.6	0.1	%		1.0		0B 2A
% Silt	12.8	0.1	%		1.0		0B 2A
% Clay	20.1	0.1	%		1.0		0B 2A
Part Size Sieve[A.1]							
4.75 mm	5.8	0.1	%	D422	1.0		00A 2A
2.0 mm	2.7	0.1	%	D422	1.0		00A 2A
1.4 mm	1.2	0.1	%	D422	1.0		00A 2A
500 µm	8.4	0.1	%	D422	1.0		00A 2A
250 µm	37	0.1	%	D422	1.0		00A 2A
106 µm	25	0.1	%	D422	1.0		00A 2A
75 µm	6.5	0.1	%	D422	1.0		00A 2A
45 µm	6.8	0.1	%	D422	1.0		00A 2A
Receiving Pan	6.5	0.1	%	D422	1.0		00A 2A
% Gravel	8.5	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980203 Containers: (A) Bag Presevatives: (1) Cool 4°C

FRUIT GROWERS LABORATORY, INC.

Ricardo Sandoval for

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

February 18, 1998

LAB No: SP 800750-08 Page 1
Sample ID: SA034

Sapphos Environmental
50 South DeLacey, Suite 210
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Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 30, 1998
Received : February 02, 1998
Completed: February 04, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A.1]							
Moisture	13	0.1	%	ASA/UC	1.0		0B 2A
Saturation	20	0.1	%	ASA/UC	1.0		0B 2A
Nitrate Nitrogen	1.9	0.9	PPM		1.0		0B 2A
Phosphorous	16	3	PPM		1.0		0B 2A
Potassium Exch. + Sol.	35	0.1	PPM		1.0		0B22A
pH	7.5	---	units		1.0		0B12A
Soil Salinity (ec)	1.5	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	2.1	0.20♦	meq/l		2.0		0B12A
Magnesium (Mg)	0.9	0.20♦	meq/l		2.0		0B12A
Sodium (Na)	13	0.20♦	meq/l		2.0		0B12A
SAR	10	0.20♦			2.0		0B12A
Boron (B)	0.82	0.040♦	PPM		4.0		0B12A
Chloride (Cl)	1.9	0.1	meq/l		1.0		0B 2A
Sulfate	10	0.20♦	meq/l		2.0		0B12A
Zinc (Zn)	2.4	0.2	PPM		1.0		0B 2A
Manganese (Mn)	6.7	0.2	PPM		1.0		0B 2A
Iron (Fe)	37	0.5	PPM		1.0		0B 2A
Copper (Cu)	1.1	0.1	PPM		1.0		0B 2A
CEC	6.2	0.1	meq/100g		1.0		0
Exchangable Calcium	4.0	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	1.2	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Potassium	ND	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	1.0	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	69.1	0.1	%		1.0		0B 2A
% Silt	13.4	0.1	%		1.0		0B 2A
% Clay	13.4	0.1	%		1.0		0B 2A
% Organic Matter	0.8	0.1	%		1.0		0A22A
Potassium	ND	0.20♦	meq/L		2.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)

♦ = > DLR adjusted because of dilutions, concentrations, dry weight reporting, or limited sample.

FGL ID = 19980203 Containers: (A) Bag, (B) Bag - Plastic Presevatives: (1) Cool 4°C

Table cont'd next page...

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Sapphos Environmental Sample ID: SA034

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A,1]							
4.75 mm	2.6	0.1	%	D422	1.0		00A 2A
2.0 mm	1.5	0.1	%	D422	1.0		00A 2A
1.4 mm	0.4	0.1	%	D422	1.0		00A 2A
500 µm	7.9	0.1	%	D422	1.0		00A 2A
250 µm	28	0.1	%	D422	1.0		00A 2A
106 µm	37	0.1	%	D422	1.0		00A 2A
75 µm	7.3	0.1	%	D422	1.0		00A 2A
45 µm	7.5	0.1	%	D422	1.0		00A 2A
Receiving Pan	8.1	0.1	%	D422	1.0		00A 2A
% Gravel	4.0	0.1	%	PARTSIZE	1.0		00A 2A
Special[A,B,1]							
Permeability (20°C)	2.44E-7	---	cm/s	D4511-92	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)

◆ => DLR adjusted because of dilutions, concentrations, dry weight reporting, or limited sample.

FGL ID = 19980203 Containers: (A) Bag, (B) Bag - Plastic Presevatives: (1) Cool 4°C

FRUIT GROWERS LABORATORY, INC.

Ricardo Landeros for

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

February 18, 1998

LAB No: SP 800750-05 Page 1
Sample ID: SA035

Sapphos Environmental
50 South DeLacey, Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 30, 1998
Received : February 02, 1998
Completed: February 04, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A,1]							
% Sand	66.9	0.1	%		1.0		0B 2A
% Silt	9.0	0.1	%		1.0		0B 2A
% Clay	14.5	0.1	%		1.0		0B 2A
Part Size Sieve[A,1]							
4.75 mm	7.5	0.1	%	D422	1.0		00A 2A
2.0 mm	2.1	0.1	%	D422	1.0		00A 2A
1.4 mm	ND	0.1	%	D422	1.0		00A 2A
500 µm	ND	0.1	%	D422	1.0		00A 2A
250 µm	36	0.1	%	D422	1.0		00A 2A
106 µm	28	0.1	%	D422	1.0		00A 2A
75 µm	6.1	0.1	%	D422	1.0		00A 2A
45 µm	7.6	0.1	%	D422	1.0		00A 2A
Receiving Pan	13	0.1	%	D422	1.0		00A 2A
% Gravel	9.6	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980203 Containers: (A) Bag Presevatives: (1) Cool 4°C

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

February 18, 1998

LAB No: SP 800750-09 Page 1
Sample ID: SA036

Sapphos Environmental
50 South DeLacey, Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 30, 1998
Received : February 02, 1998
Completed: February 04, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A,1]							
Moisture	8.0	0.1	%	ASA/UC	1.0		0B 2A
Saturation	26	0.1	%	ASA/UC	1.0		0B 2A
Nitrate Nitrogen	1.0	0.9	PPM		1.0		0B 2A
Phosphorous	8	3	PPM		1.0		0B 2A
Potassium Exch. + Sol.	23	0.1	PPM		1.0		0B22A
pH	7.1	---	units		1.0		0B12A
Soil Salinity (ec)	0.2	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	0.6	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	0.4	0.1	meq/l		1.0		0B12A
Sodium (Na)	0.6	0.1	meq/l		1.0		0B12A
SAR	0.9	0.1			1.0		0B12A
Boron (B)	0.08	0.02	PPM		1.0		0B12A
Chloride (Cl)	0.3	0.1	meq/l		1.0		0B 2A
Sulfate	0.3	0.1	meq/l		1.0		0B12A
Zinc (Zn)	1.4	0.2	PPM		1.0		0B 2A
Manganese (Mn)	2.8	0.2	PPM		1.0		0B 2A
Iron (Fe)	15	0.5	PPM		1.0		0B 2A
Copper (Cu)	1.1	0.1	PPM		1.0		0B 2A
CEC	2.9	0.1	meq/100g		1.0		0
Exchangable Calcium	1.9	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	1.0	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Potassium	ND	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	ND	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	92	0.1	%		1.0		0B 2A
% Silt	1.0	0.1	%		1.0		0B 2A
% Clay	7.0	0.1	%		1.0		0B 2A
% Organic Matter	0.4	0.1	%		1.0		0A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980203 Containers: (A) Bag, (B) Bag - Plastic Presevatives: (1) Cool 4°C

Table cont'd next page...

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Sapphos Environmental Sample ID: SA036

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A,1]							
4.75 mm	ND	0.1	%	D422	1.0		00A 2A
2.0 mm	ND	0.1	%	D422	1.0		00A 2A
1.4 mm	ND	0.1	%	D422	1.0		00A 2A
500 µm	ND	0.1	%	D422	1.0		00A 2A
250 µm	69	0.1	%	D422	1.0		00A 2A
106 µm	20	0.1	%	D422	1.0		00A 2A
75 µm	2.9	0.1	%	D422	1.0		00A 2A
45 µm	4.1	0.1	%	D422	1.0		00A 2A
Receiving Pan	4.0	0.1	%	D422	1.0		00A 2A
% Gravel	0.0	0.1	%	PARTSIZE	1.0		00A 2A
Special[A,B,1]							
Permeability (20°C)	9.02E-4	---	cm/s	D4511-92	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980203 Containers: (A) Bag, (B) Bag - Plastic Presevatives: (1) Cool 4°C

FRUIT GROWERS LABORATORY, INC.

Ricardo Loredo For

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

February 18, 1998

LAB No: SP 800750-10 Page 1
Sample ID: SA037

Sapphos Environmental
50 South DeLacey, Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 30, 1998
Received : February 02, 1998
Completed: February 04, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A,1]							
Moisture	8.3	0.1	%	ASA/UC	1.0		0B 2A
Saturation	25	0.1	%	ASA/UC	1.0		0B 2A
Nitrate Nitrogen	1.1	0.9	PPM		1.0		0B 2A
Phosphorous	8	3	PPM		1.0		0B 2A
Potassium Exch. + Sol.	46	0.1	PPM		1.0		0B22A
pH	7.3	---	units		1.0		0B12A
Soil Salinity (ec)	0.3	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	2.1	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	0.8	0.1	meq/l		1.0		0B12A
Sodium (Na)	0.7	0.1	meq/l		1.0		0B12A
SAR	0.6	0.1			1.0		0B12A
Boron (B)	0.07	0.02	PPM		1.0		0B12A
Chloride (Cl)	0.2	0.1	meq/l		1.0		0B 2A
Sulfate	0.6	0.1	meq/l		1.0		0B12A
Zinc (Zn)	1.9	0.2	PPM		1.0		0B 2A
Manganese (Mn)	4.3	0.2	PPM		1.0		0B 2A
Iron (Fe)	19	0.5	PPM		1.0		0B 2A
Copper (Cu)	1.0	0.1	PPM		1.0		0B 2A
CEC	6.3	0.1	meq/100g		1.0		0
Exchangable Calcium	4.9	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	1.3	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Potassium	0.1	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	ND	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	77.9	0.1	%		1.0		0B 2A
% Silt	8.8	0.1	%		1.0		0B 2A
% Clay	10.7	0.1	%		1.0		0B 2A
% Organic Matter	1.1	0.1	%		1.0		0A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980203 Containers: (A) Bag, (B) Bag - Plastic Presevatives: (1) Cool 4°C

Table cont'd next page...

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Sapphos Environmental Sample ID: SA037

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A,1]							
4.75 mm	2.3	0.1	%	D422	1.0		00A 2A
2.0 mm	0.4	0.1	%	D422	1.0		00A 2A
1.4 mm	ND	0.1	%	D422	1.0		00A 2A
500 µm	ND	0.1	%	D422	1.0		00A 2A
250 µm	59	0.1	%	D422	1.0		00A 2A
106 µm	21	0.1	%	D422	1.0		00A 2A
75 µm	5.3	0.1	%	D422	1.0		00A 2A
45 µm	11	0.1	%	D422	1.0		00A 2A
Receiving Pan	2.3	0.1	%	D422	1.0		00A 2A
% Gravel	2.6	0.1	%	PARTSIZE	1.0		00A 2A
Special[A,B,1]							
Permeability (20°C)	1.04E-5	---	cm/s	D4511-92	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980203 Containers: (A) Bag, (B) Bag - Plastic Presevatives: (1) Cool 4°C

FRUIT GROWERS LABORATORY, INC.

Ricardo Sandoval for

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

February 18, 1998

LAB No: SP 800750-06 Page 1
Sample ID: SA038

Sapphos Environmental
50 South DeLacey, Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 30, 1998
Received : February 02, 1998
Completed: February 04, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A,1]							
% Sand	57.1	0.1	%		1.0		0B 2A
% Silt	21.6	0.1	%		1.0		0B 2A
% Clay	19.7	0.1	%		1.0		0B 2A
Part Size Sieve[A,1]							
4.75 mm	1.3	0.1	%	D422	1.0		00A 2A
2.0 mm	0.2	0.1	%	D422	1.0		00A 2A
1.4 mm	ND	0.1	%	D422	1.0		00A 2A
500 µm	ND	0.1	%	D422	1.0		00A 2A
250 µm	43	0.1	%	D422	1.0		00A 2A
106 µm	26	0.1	%	D422	1.0		00A 2A
75 µm	9.5	0.1	%	D422	1.0		00A 2A
45 µm	17	0.1	%	D422	1.0		00A 2A
Receiving Pan	2.7	0.1	%	D422	1.0		00A 2A
% Gravel	1.6	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980203 Containers: (A) Bag Presevatives: (1) Cool 4°C

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

February 18, 1998

LAB No: SP 800750-07 Page 1
Sample ID: SA039

Sapphos Environmental
50 South DeLacey, Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 30, 1998
Received : February 02, 1998
Completed: February 04, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A,1]							
% Sand	57.4	0.1	%		1.0		0B 2B
% Silt	9.3	0.1	%		1.0		0B 2B
% Clay	18.2	0.1	%		1.0		0B 2B
Part Size Sieve[A,1]							
4.75 mm	14	0.1	%	D422	1.0		00A 2A
2.0 mm	0.7	0.1	%	D422	1.0		00A 2A
1.4 mm	0.1	0.1	%	D422	1.0		00A 2A
500 µm	ND	0.1	%	D422	1.0		00A 2A
250 µm	40	0.1	%	D422	1.0		00A 2A
106 µm	23	0.1	%	D422	1.0		00A 2A
75 µm	5.6	0.1	%	D422	1.0		00A 2A
45 µm	12	0.1	%	D422	1.0		00A 2A
Receiving Pan	4.9	0.1	%	D422	1.0		00A 2A
% Gravel	15.1	0.1	%	PARTSIZE	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980203 Containers: (A) Bag Presevatives: (1) Cool 4°C

FRUIT GROWERS LABORATORY, INC.

Ricardo Landaal For
Darrell H. Nelson, President

DHN/DHN:md

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FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

February 18, 1998

LAB No: SP 800750-11 Page 1
Sample ID: SA040

Sapphos Environmental
50 South DeLacey, Suite 210
Pasadena, CA 91105

Sampling Site Los Angeles International Airport
Sampled By : Sapphos Env.

Sampled : January 30, 1998
Received : February 02, 1998
Completed: February 04, 1998

AG Misc. Soils ANALYSIS

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Misc. Soils[A,1]							
Moisture	15	0.1	%	ASA/UC	1.0		0B 2A
Saturation	22	0.1	%	ASA/UC	1.0		0B 2A
Nitrate Nitrogen	1.1	0.9	PPM		1.0		0B 2A
Phosphorous	10	3	PPM		1.0		0B 2A
Potassium Exch.+Sol.	32	0.1	PPM		1.0		0B22A
pH	7.4	---	units		1.0		0B12A
Soil Salinity (ec)	0.5	0.1	mmhos/c		1.0		0B12A
Limestone	ND	0.1	%		1.0		0B12A
Lime Requirment	ND	0.1	Tons/AF		1.0		0B12A
Calcium (Ca)	1.2	0.1	meq/l		1.0		0B12A
Magnesium (Mg)	1.0	0.1	meq/l		1.0		0B12A
Sodium (Na)	2.7	0.1	meq/l		1.0		0B12A
SAR	2.6	0.1			1.0		0B12A
Boron (B)	0.13	0.02	PPM		1.0		0B12A
Chloride (Cl)	0.9	0.1	meq/l		1.0		0B 2A
Sulfate	1.0	0.1	meq/l		1.0		0B12A
Zinc (Zn)	0.4	0.2	PPM		1.0		0B 2A
Manganese (Mn)	5.4	0.2	PPM		1.0		0B 2A
Iron (Fe)	18	0.5	PPM		1.0		0B 2A
Copper (Cu)	0.5	0.1	PPM		1.0		0B 2A
CEC	4.5	0.1	meq/100g		1.0		0
Exchangable Calcium	2.3	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Magnesium	2.0	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Potassium	ND	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Sodium	0.2	0.1	meq/100g	CEC	1.0		0B22A
Exchangable Hydrogen	0.0	0.1	meq/100g		1.0		0B12A
% Sand	78.9	0.1	%		1.0		0B 2A
% Silt	5.7	0.1	%		1.0		0B 2A
% Clay	10.4	0.1	%		1.0		0B 2A
% Organic Matter	0.3	0.1	%		1.0		0A22A
Potassium	ND	0.1	meq/L		1.0		0B12A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980203 Containers: (A) Bag, (B) Bag - Plastic Presevatives: (1) Cool 4°C

Table cont'd next page...

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FAX 209/734-8435
Mobile 209/737-2399

Sapphos Environmental Sample ID: SA040

AG Misc. Soils ANALYSIS Cont'd

CONSTITUENTS	RESULTS	DLR	UNITS	METHOD	DILUTION	NOTES	BATCH ID
Part Size Sieve[A,1]							
4.75 mm	2.7	0.1	%	D422	1.0		00A 2B
2.0 mm	2.3	0.1	%	D422	1.0		00A 2B
1.4 mm	ND	0.1	%	D422	1.0		00A 2B
500 µm	ND	0.1	%	D422	1.0		00A 2B
250 µm	48	0.1	%	D422	1.0		00A 2B
106 µm	28	0.1	%	D422	1.0		00A 2B
75 µm	4.1	0.1	%	D422	1.0		00A 2B
45 µm	7.2	0.1	%	D422	1.0		00A 2B
Receiving Pan	7.8	0.1	%	D422	1.0		00A 2B
% Gravel	5.0	0.1	%	PARTSIZE	1.0		00A 2B
Special[A,B,1]							
Permeability (20°C)	1.11E-6	---	cm/s	D4511-92	1.0		00A 2A

DLR = Detection Limit for Reporting purposes (≡ PQL - Practical Quantitation Limit)
FGL ID = 19980203 Containers: (A) Bag, (B) Bag - Plastic Presevatives: (1) Cool 4°C

FRUIT GROWERS LABORATORY, INC.

Darrell H. Nelson, President

DHN/DHN:md

FRUIT GROWERS LABORATORY, INC.

Analytical Chemists

February 18, 1998

SOIL Quality Assurance Report for sample: 800750

Sapphos Environmental
50 South DeLacey, Suite 210
Pasadena , CA 91105

Constituent	BATCH ID	EPA Method	Units	BLANK QA/QC DLR	BLANK QA/QC Result	BLANK QA/QC NOTE	CALIBRATION QA/QC Type	Conc.	% REC	AR	NOTE	METHOD QA/QC Type	Conc.	% REC	% REC	AR	% DIF	MAV	NOTE
Nitrate-Nitrogen	02A		%	0.90	0.15		LCS	42.0	105	75-125		Dup	1.98	N/A	N/A	N/A	8.8	20.0	
Phosphorus	02A		PPM	3.0	ND		LCS	40.0	98.4	75-125		Dup	16.0	N/A	N/A	N/A	0.2	20.0	
Potassium (Exch)	02A	CEC	meq/100g	0.10	ND		LCS	0.789	106	75-125		Dup	0.0891	N/A	N/A	N/A	1.2	20.0	
Potassium (Sol)	02A		meq/l	0.10	ND		CCV	2.56	96.7	75-125		Dup	0.0445	N/A	N/A	N/A	12.1	20.0	
Calcium (Exch)	02A	CEC	meq/100g	0.10	0.03		LCS	13.2	101	75-125		Dup	4.13	N/A	N/A	N/A	6.8	20.0	
Calcium (Sol)	02A		meq/l	0.10	ND		CCV	4.99	102	75-125		Dup	2.16	N/A	N/A	N/A	2.3	20.0	
Magnesium (Exch)	02A	CEC	meq/100g	0.10	ND		LCS	2.69	99.8	75-125		Dup	1.20	N/A	N/A	N/A	3.9	20.0	
Magnesium (Sol)	02A		meq/l	0.10	ND		CCV	8.23	100	75-125		Dup	0.936	N/A	N/A	N/A	0.5	20.0	
Sodium (Exch)	02A	CEC	meq/100g	0.10	ND		LCS	0.202	94.3	75-125		Dup	1.04	N/A	N/A	N/A	3.0	20.0	
Sodium (Sol)	02A		meq/l	0.10	ND		CCV	4.35	98.3	75-125		Dup	12.8	N/A	N/A	N/A	3.0	20.0	
Sulfate	02A		meq/l	0.10	ND		CCV	2.08	99.8	75-125		Dup	10.1	N/A	N/A	N/A	2.6	20.0	
Zinc	02A		PPM	0.20	0.10		LCS	16.8	92.9	75-125		Dup	2.43	N/A	N/A	N/A	0.7	20.0	
Manganese	02A		PPM	0.20	ND		LCS	9.97	85.3	75-125		Dup	6.44	N/A	N/A	N/A	8.6	20.0	
Iron	02A		PPM	0.50	0.08		LCS	15.5	89.3	75-125		Dup	38.1	N/A	N/A	N/A	4.7	20.0	
Copper	02A		PPM	0.10	0.04		LCS	11.3	89.8	75-125		Dup	1.16	N/A	N/A	N/A	6.5	20.0	
Boron	02A		PPM	0.020	0.003		CCV	1.00	99.6	75-125		Dup	0.815	N/A	N/A	N/A	1.1	20.0	
Chloride	02A		meq/L	0.1	ND		CCV	2.82	101	75-125		MS	1.41	102	99.3	75-125	1.2	20.0	
CEC - Hydrogen	02A		units	---	ND		CCV	8.00	100	75-125		Dup	7.52	N/A	N/A	N/A	1.1	20.0	
Soil Salinity	02A		mmhos/cm2	0.1	ND		CCV	1.41	99.1	75-125		Dup	1.50	N/A	N/A	N/A	0.0	20.0	
Limestone	02A		%	0.1	ND				N/A			Dup	0.000	N/A	N/A	N/A	0.0	20.0	
Lime Requirement	02A		Tons/AF		N/A				N/A			Dup	0.000	N/A	N/A	N/A	0.0	20.0	

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Notes and comments continued next page .....

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February 18, 1998 **SOIL Quality Assurance** Report for sample: 800750

FGL ENVIRONMENTAL, INC.

DHN:md

Kurt Wilkinson, B.S., QA Director

FRUIT GROWERS LABORATORY, INC.

Analytical Chemists

January 23, 1998

SOIL Quality Assurance Report for sample: 800241

Sapphos Environmental
50 South DeLeacey Suite 210
Pasadena , CA 91105

Constituent	BATCH ID	EPA Method	Units	BLANK QA/QC DLR	BLANK QA/QC Result	BLANK QA/QC NOTE	CALIBRATION QA/QC Type	CALIBRATION QA/QC Conc.	CALIBRATION QA/QC % REC	CALIBRATION QA/QC AR	CALIBRATION QA/QC NOTE	METHOD QA/QC Type	METHOD QA/QC Conc.	METHOD QA/QC % REC	METHOD QA/QC % REC	METHOD QA/QC AR	METHOD QA/QC % DIF	METHOD QA/QC MAV	METHOD QA/QC NOTE
Nitrate-Nitrogen	02A		%	0.90	0.21		LCS	42.0	102	75-125		Dup	1.00	N/A	N/A	N/A	18.3	20.0	
	02B		%	0.90	ND		LCS	42.0	94.1	75-125		Dup	2.09	N/A	N/A	N/A	5.3	20.0	
Phosphorus	02A		PPM	3.0	1.0		LCS	9.50	94.1	75-125		Dup	7.48	N/A	N/A	N/A	13.6	20.0	
Potassium (Exch)	02A	CEC	meq/100g	0.10	ND		LCS	1.07	97.6	75-125		Dup	0.0609	N/A	N/A	N/A	3.3	20.0	
Potassium (Sol)	02A		meq/l	0.10	ND		CCV	2.56	100	75-125		Dup	0.0414	N/A	N/A	N/A	0.0	20.0	
Calcium (Exch)	02A	CEC	meq/100g	0.10	0.09		LCS	38.9	105	75-125		Dup	2.95	N/A	N/A	N/A	2.2	20.0	
Calcium (Sol)	02A		meq/l	0.10	0.03		CCV	4.99	104	75-125		Dup	1.05	N/A	N/A	N/A	1.4	20.0	
Magnesium (Exch)	02A	CEC	meq/100g	0.10	0.03		LCS	5.11	99.4	75-125		Dup	1.16	N/A	N/A	N/A	1.1	20.0	
Magnesium (Sol)	02A		meq/l	0.10	0.03		CCV	8.23	103	75-125		Dup	0.612	N/A	N/A	N/A	0.4	20.0	
Sodium (Exch)	02A	CEC	meq/100g	0.10	0.01		LCS	4.82	99.1	75-125		Dup	0.149	N/A	N/A	N/A	1.3	20.0	
Sodium (Sol)	02A		meq/l	0.10	0.02		CCV	4.35	96.2	75-125		Dup	1.58	N/A	N/A	N/A	0.5	20.0	
Sulfate	02A		meq/l	0.10	ND		CCV	2.08	101	75-125		Dup	0.507	N/A	N/A	N/A	2.9	20.0	
Zinc	02A		PPM	0.20	0.06		LCS	1.12	83.9	75-125		Dup	0.471	N/A	N/A	N/A	4.4	20.0	
Manganese	02A		PPM	0.20	0.06		LCS	9.59	82.7	75-125		Dup	9.00	N/A	N/A	N/A	2.1	20.0	
Iron	02A		PPM	0.50	0.19		LCS	9.64	75.9	75-125		Dup	22.4	N/A	N/A	N/A	3.1	20.0	
Copper	02A		PPM	0.10	0.05		LCS	1.97	89.5	75-125		Dup	0.555	N/A	N/A	N/A	7.1	20.0	
Boron	02A		PPM	0.020	0.008		CCV	1.00	101	75-125		Dup	0.0903	N/A	N/A	N/A	2.2	20.0	
Chloride	02A		meq/L	.1	ND		CCV	2.82	100	75-125		MS	1.41	103	103	75-125	0.0	20.0	
CEC - Hydrogen	02A		units	---	ND		CCV	8.00	100	75-125		Dup	7.70	N/A	N/A	N/A	1.0	20.0	
Soil Salinity	02A		mmhos/cm2	0.1	ND		CCV	1.41	99.1	75-125		Dup	0.300	N/A	N/A	N/A	0.0	20.0	
Limestone	02A		%	0.1	ND		N/A					Dup	0.000	N/A	N/A	N/A	0.0	20.0	

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Table continued next page .....

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January 23, 1998 **SOIL Quality Assurance** Report for sample: 800241

Quality Assurance Cont'd.

Constituent	BATCH ID	EPA Method	Units	BLANK QA/QC DLR	BLANK QA/QC Result	BLANK QA/QC NOTE	CALIBRATION QA/QC Type	CALIBRATION QA/QC Conc.	CALIBRATION QA/QC % REC	CALIBRATION QA/QC AR	CALIBRATION QA/QC NOTE	METHOD QA/QC Type	METHOD QA/QC Conc.	METHOD QA/QC % REC	METHOD QA/QC % REC	METHOD QA/QC AR	METHOD QA/QC % DIF	METHOD QA/QC MAV	METHOD QA/QC NOTE
Limestone	02A		%	0.2	0.02			N/A				Dup	0.546	N/A	N/A	N/A	8.3	20.0	
Lime Requirement	02A		Tons/AF	N/A				N/A				Dup	0.000	N/A	N/A	N/A	0.0	20.0	

FGL ID = 19980115 ND => Not Detected at ar above DLR. DLR => Detection Limit for Reporting purposes. N/A => Not Applicable NOTE => See note indicated below.

FGL ENVIRONMENTAL, INC.

DHN:md

Kurt Wilkinson, B.S., QA Director

Appendix E

RECON Report of Fairy Shrimp Survey at Los Angeles International Airport, July 1, 1998

FAIRY SHRIMP SURVEYS
AT
LOS ANGELES INTERNATIONAL AIRPORT

Prepared for

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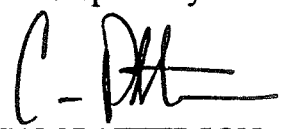
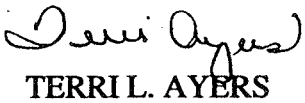


CAM PATTERSON
BIOLOGIST



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RECON NUMBER 2964C
JULY 1, 1998

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RECON
REGIONAL ENVIRONMENTAL CONSULTANTS

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Introduction

RECON was contracted by Sapphos Environmental to conduct directed surveys for listed vernal pool branchiopods (fairy shrimp) at Los Angeles International Airport in areas of vernal pool or other ephemeral aquatic habitat. These surveys were conducted according to the protocol developed by the U.S. Fish and Wildlife Service (USFWS 1996) for studying listed vernal pool branchiopods, which included dry-phase soil sampling of the pools and biweekly site visits during the wet season. RECON used global positioning systems (GPS) hardware and software to map the boundaries of the pools, and incorporated these data into a geographic information system (GIS). This report describes the survey methods and presents the results of the surveys.

A. Physical Setting

Los Angeles International Airport (LAX) is located within Los Angeles County, California, north of the city of El Segundo. The area surveyed for this project is situated at the northwestern end of LAX, just east of the El Segundo Dunes (Figure 1).

The lands within the LAX boundary have largely been developed to support airport operations. During the course of the wet season surveys, it was apparent that no vernal pool species associations occur in the study area. Therefore, this report refers to the habitats surveyed as "ephemeral aquatic pools." The open area around the runway where the pools are located was filled many years ago to eliminate topographic relief, and is currently disked and/or mowed regularly to remove vegetation for safety purposes. The routine disturbance of the soils and vegetation in and around the pools has altered the remnant pools' boundaries and reduced or eliminated the flora normally associated with vernal pools.

B. Fairy Shrimp

Fairy shrimp are freshwater crustaceans of the Order Anostraca. They inhabit temporary bodies of water (vernal pools), and are able to hatch, attain maturity, and reproduce within the short period of time the pools are inundated. Habitat loss has resulted in the decline of many species of fairy shrimp, resulting in their need for listing and protection under the federal Endangered Species Act (ESA) of 1973, as amended. There are four species of fairy shrimp found in California that are listed as endangered under the provisions of the ESA: Conservancy fairy shrimp (*Branchinecta conservatio*), longhorn fairy shrimp (*B. longiantenna*), San Diego fairy shrimp (*B. sandiegonensis*), and Riverside fairy shrimp (*Streptocephalus woottoni*). Vernal pool fairy shrimp (*B. lynchi*) are listed as threatened. Conservancy fairy shrimp and longhorn fairy shrimp are known from California's Central Valley, while San Diego fairy shrimp, vernal pool fairy shrimp,

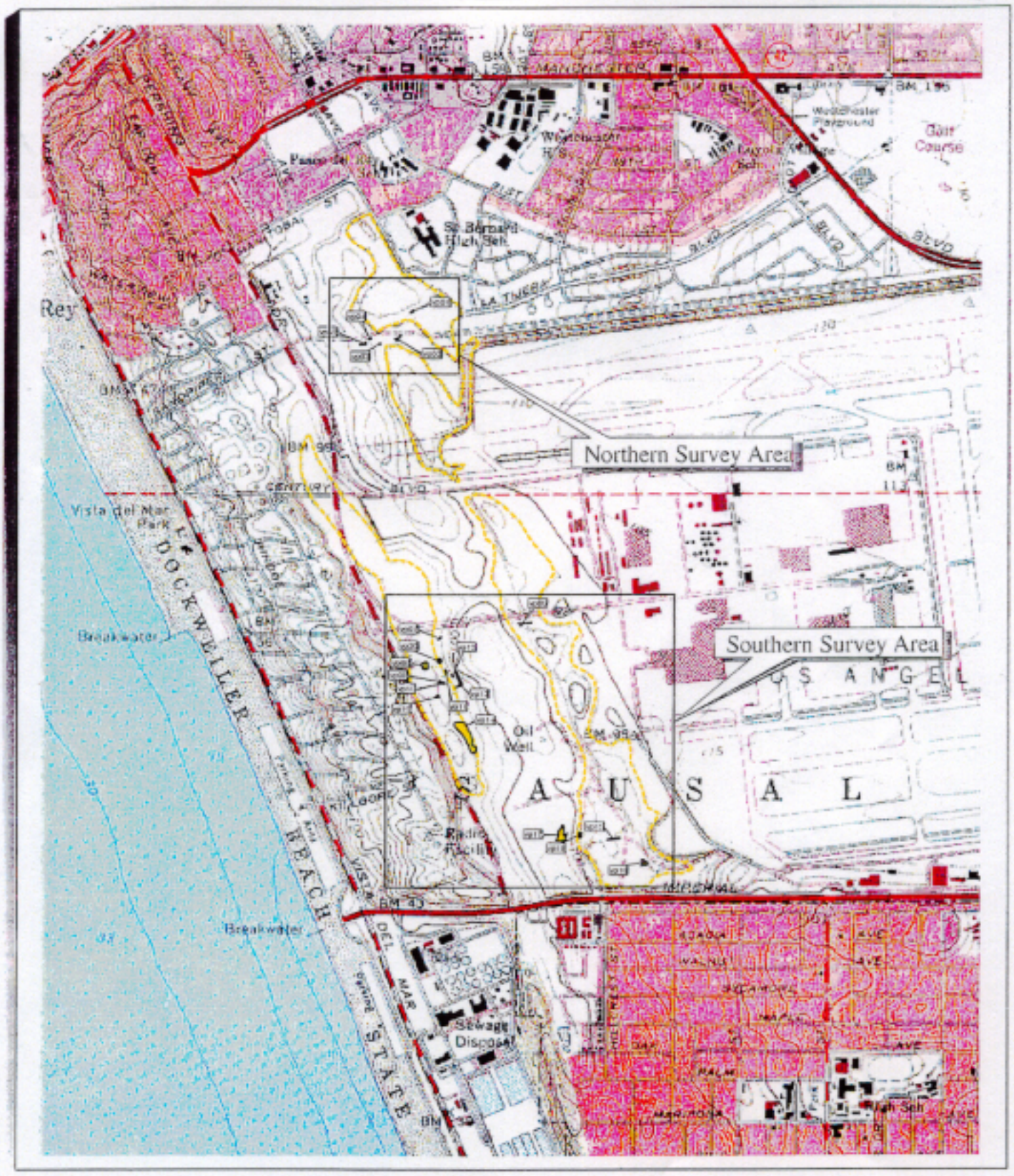


FIGURE 1

Regional Location of Ephemeral Aquatic Habitat at Los Angeles International Airport

RECON

and Riverside fairy shrimp are known to occur in southern California. Versatile fairy shrimp (*B. lindahli*) are commonly found in southern California vernal pools and are not listed for protection under the ESA.

Methods

A. Vernal Pool Mapping

RECON biologists, along with Dr. Irena Mendez of Sapphos Environmental, located potential vernal pools on the project site during fall 1997 based on field reconnaissance. Using a GPS receiver, the geographic coordinates of each pool perimeter were mapped by surveying a number of points around the edge of each pool basin adequate to record the size and location of the basin. The raw location data from the GPS were post-processed to submeter accuracy. These data were incorporated into the RECON GIS and processed to construct data layers of pool basin locations using the State Plane Coordinate System, North American Datum 1983 (NAD83). During the course of the 1998 wet season surveys for fairy shrimp, several additional pools were located and mapped with the GPS receiver.

B. Fairy Shrimp Surveys

USFWS guidelines (1996) for conducting fairy shrimp surveys specify that two years' data must be collected to determine the presence/absence of fairy shrimp species within vernal pools. In lieu of two separate years of wet season sampling, one season of dry soil sampling was substituted.

Dry season soil sampling for the presence of fairy shrimp cysts was conducted in conjunction with mapping the pools at LAX, in accordance with RECON's USFWS endangered species permit and the survey guidelines for vernal pool branchiopods (USFWS 1996). Samples of soil were collected from at least 10 locations within each pool basin and sent to Christopher Rogers of Jones and Stokes Associates, Inc. in Sacramento, California, for examination and cyst identification.

El Niño-influenced rainfall occurred early within the wet season of 1997-98, and resulted in the ponding of water for periods of sufficient duration to allow for the hatching of fairy shrimp in the pools at LAX. RECON biologists visited each pool and conducted sampling to determine the presence of fairy shrimp within the pools a number of times during the wet phase of the pools (Table 1).

TABLE 1
SURVEY DETAILS
LOS ANGELES INTERNATIONAL AIRPORT

Date	Personnel	Type of Survey
11/06/97	Cam Patterson, Terri Ayers	Dry season soil sampling
12/19/97	Cam Patterson, Terri Ayers	Wet season fairy shrimp survey
01/08/98	Cam Patterson	Wet season fairy shrimp survey
01/23/98	Cam Patterson	Wet season fairy shrimp survey
03/05/98	Cam Patterson	Wet season fairy shrimp survey
03/26/98	Cam Patterson	Wet season fairy shrimp survey
04/16/98	Cam Patterson	Wet season fairy shrimp survey

Within five to seven days of rain events, personnel from Sapphos Environmental were contacted by phone to ascertain if rainfall amounts were sufficient to fill the pool basins. If pools remained inundated for at least 10 days, fairy shrimp sampling was conducted by RECON personnel. All fairy shrimp surveys were conducted by personnel authorized under USFWS permit PRT-797665. Fairy shrimp were sampled by sweeping either a hand-held net or a pole-mounted net through the water column in the pool and examining the net for invertebrates. Mature fairy shrimp species were identified to the species level. Survey visits were timed to correspond with observed hatching of fairy shrimp at other sites throughout southern California being concurrently surveyed by RECON (March Air Reserve Base, Hemet, Camp Pendleton Marine Base, Marine Corps Air Station Miramar, and Otay Mesa).

Results

A. Pool Mapping

Sixteen ephemeral aquatic pools were located and mapped at LAX in the fall of 1997. Four additional pools were identified mid-way through the wet season surveys. Table 2 lists the dimensions and areas of these pool basins. All pools are illustrated in Figures 2 and 3.

B. Dry Season Soil Samples

A copy of the report prepared by C. Rogers of Jones and Stokes Associates detailing the results of the dry season vernal pool soil analysis is included as Attachment 1. Cysts from the genus *Branchinecta* were found in the soils samples from pools numbered 1, 2, 6, 8,

TABLE 2
POOL DIMENSIONS
LOS ANGELES INTERNATIONAL AIRPORT

Pool Number	Approximate Length and Width (feet)	Approximate Area ($feet^2$)
1	55 X 13	123
2	97 X 12	292
3	23 X 12	74
4	30 X 15	95
5	82 X 28	212
6	177 X 20	1,438
7	46 X 10	275
8	98 X 82	5,706
9	33 X 26	577
10	27 X 19	312
11	64 X 18	809
12	34 X 22	548
13	208 X 84	4,808
14	454 X 130	39,199
15	165 X 15	2,086
16	96 X 94	3,936
17	201 X 130	13,719
18	63 X 42	1,659
19	53 X 28	807
20	63 X 51	1,691

FIGURE 2

Ephemeral Aquatic Habitat at Los Angeles International Airport - Northern Survey Area

RECON

M:\JOBS\2964\VPOOLS.APR-FIGURE 2

FIGURE 3

Ephemeral Aquatic Habitat at Los Angeles International Airport - Southern Survey Area

14, 15, and 16. Cysts from the genus *Streptocephalus* were found in the soil samples from pools numbered 1, 2, 6, 9, and 12 through 16. As described in Roger's report, *Branchinecta* cysts are identifiable only to the genus level because of the overlapping characteristics of cysts from the various species. Cysts from *Streptocephalus woottoni* may resemble the cysts of other species of *Streptocephalus*, but no other species occur in the area; therefore, it was assumed that the cysts were those of *S. woottoni.*

C. Wet Season Fairy Shrimp Surveys

Versatile fairy shrimp (*B. lindahli*) were observed in pools numbered 1, 2, 8, and 12 through 19 (see Figure 1). This was the only species of fairy shrimp observed in the pools at LAX during the 1997-98 wet season. Pools numbered 3, 4, and 5 did not pool water at any time during the wet season for long enough to allow fairy shrimp cysts to hatch if they were present in the soil. Table 3 lists the combined results of the dry season soil sampling and wet season surveys.

Discussion

Ephemeral aquatic pools observed on the LAX survey area consist entirely of non-natural man-made depressions in highly disturbed soil conditions. A review of historical topographic maps and aerial photographs indicate that natural vernal pools and back-dune ponds were present on the airport property in the past. However, none of the ephemeral aquatic (temporarily ponded) sites observed during the course of the current survey were natural habitat. No typical vernal pool plant community exists in any of the habitat surveyed. Of the plant species present, all are typical of roadside ditches and disturbed wetlands and none were vernal pool endemics.

In the northern survey area (see Figure 2), the surveyed ponded areas were tire ruts in heavy soil. As shown on the USGS topographic map, this area was near the edge of a large depression that formerly existed near the western end of the northern runways 20 or more years ago. The dry samples in this area had low levels of Riverside fairy shrimp cysts, which probably indicates that this species formerly occupied these large ponds which are now filled. No habitat with water durations long enough (six to eight weeks minimum) to support Riverside fairy shrimp currently exists in this area. The only live fairy shrimp observed during the wet season surveys in this area were versatile fairy shrimp, a common and widespread species of all kinds of ephemeral aquatic water bodies including natural vernal pools and highly disturbed sites.

In the southern survey area (see Figure 3; Photograph Sheets 1-3), the surveyed ponded areas included road ruts and roadside ditches, compacted gravel road surfaces, a hazardous materials runoff containment pond, depressions on old artificial fill, and a earthen-bottom flood control basin. All of these areas were considered potential fairy

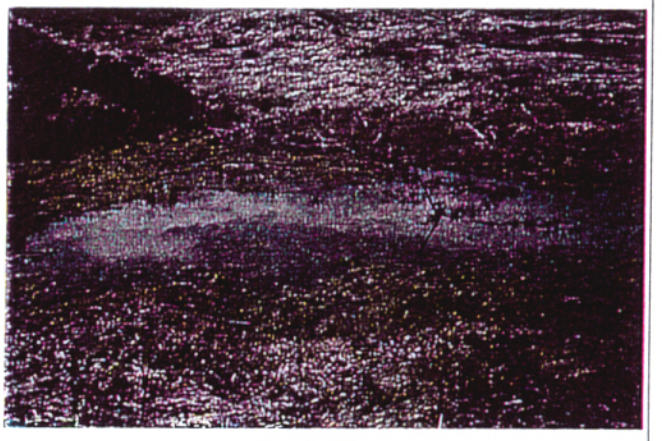
TABLE 3
FAIRY SHRIMP SURVEY RESULTS
LOS ANGELES INTERNATIONAL AIRPORT

Pool Number	Dry Season Soil Sampling	Wet Season Surveys
1	*Branchinecta* sp. *Streptocephalus woottoni*	*Branchinecta lindahli*
2	*Branchinecta* sp. *Streptocephalus woottoni*	*Branchinecta lindahli*
3		Water did not pond
4		Water did not pond
5		Water did not pond
6	*Branchinecta* sp. *Streptocephalus woottoni*	none
7		
8	*Branchinecta* sp.	*Branchinecta lindahli*
9	*Streptocephalus woottoni*	*Branchinecta lindahli*
10		*Branchinecta lindahli*
11		*Branchinecta lindahli*
12	*Streptocephalus woottoni*	*Branchinecta lindahli*
13	*Streptocephalus woottoni*	*Branchinecta lindahli*
14	*Branchinecta* sp. *Streptocephalus woottoni*	*Branchinecta lindahli*
15	*Branchinecta* sp. *Streptocephalus woottoni*	*Branchinecta lindahli*
16	*Branchinecta* sp. *Streptocephalus woottoni*	*Branchinecta lindahli*
17	Not sampled	*Branchinecta lindahli*
18	Not sampled	*Branchinecta lindahli*
19	Not sampled	*Branchinecta lindahli*
20	Not sampled	none

Pool 8

Pool 10

Pool 11

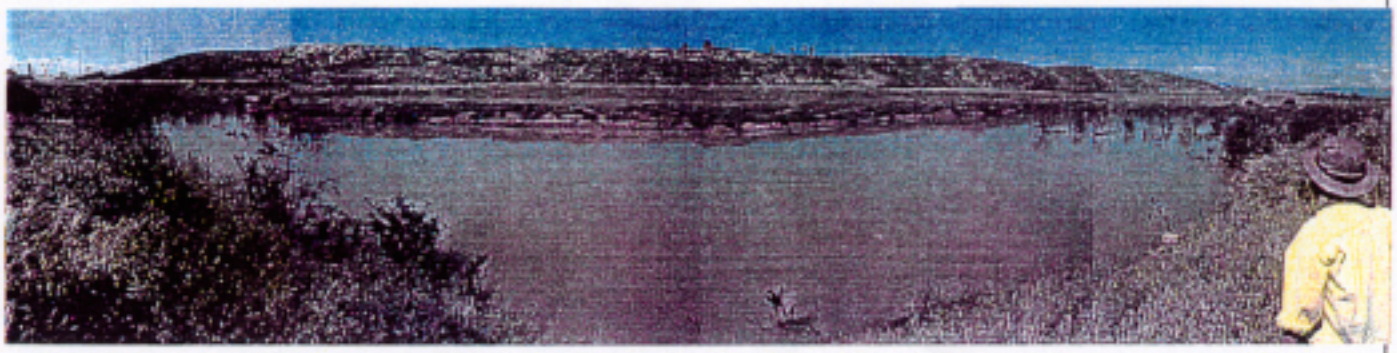


Pool 12

Pool 13

Photographs, Sheet 1

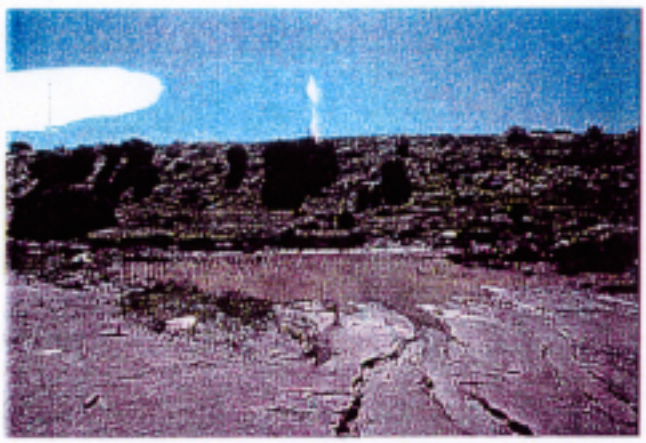
Vernal Pool Photographs



Pool 14

Pool 15

Pool 17



Pool 16

Photographs, Sheet 2

Vernal Pool Photographs

Pool 18

Pool 20

Pool 19

Photographs, Sheet 3

Vernal Pool Photographs

shrimp habitat because of potentially appropriate hydrologic conditions. As for the northern survey area, these sites are all on non-natural substrate with ponding caused by man-made factors. As shown on Figure 1, these areas were also formerly within a large system of depressions and temporary ponding located between the runway complex and the dunes to the west. Although Riverside fairy shrimp cysts were observed in dry season samples from several of these ponds, no live animals of this species were observed during intensive sampling of the habitat over the season. Only one location (pool 14) had appropriate water duration characteristics for this species. This pond had an intensive *B. lindahli* hatch, with animal densities throughout the large pond exceeding 100 animals per cubic meter early in the season. By late January, when *S. woottoni* were appearing in monitored pools elsewhere in southern California, no anostracans were present in pool 14. Spadefoot toads were observed in pools 8, 14, and 18.

The results of the 1998 surveys indicate that the ephemeral aquatic habitat remaining at LAX is of very poor quality, and does not appear to support any listed endangered or threatened vernal pool anostracans. The dry season sample results, which contained *S. woottoni* (Riverside fairy shrimp) cysts, indicate that vernal pool habitat which was formerly extensive on the western part of the airport property, did support this species in the past. Based on the condition and quality of habitat presently on the airport, and the favorable survey conditions during the 1998 season, we consider it likely that *S. woottoni* has been extirpated from the site (with the possible exception of pool 14). Because of the very favorable hydrologic conditions present during the survey season, we also consider it to be unlikely that either of the two potentially present listed branchinectids, *Branchinecta sandiegonensis,* or *B. lynchii* are present at LAX, but were missed during the survey. Both of these species were easily detected at other locations where they are present during surveys conducted on the same schedule.

If future impacts to these poor-quality ephemeral aquatic wetlands result in mitigation requirements, we recommend that the feasibility of a vernal pool habitat restoration program be considered. Although habitat restoration on the airport property is probably infeasible due to the attractiveness of wetlands to waterfowl and shorebirds, there may be other former vernal pool sites within Los Angeles County (such as in the Santa Clara River valley) which may be appropriate.

Reference Cited

U.S. Fish and Wildlife Service (USFWS)

1996 Interim survey guidelines to permittees for recovery permits under Section 10 (a)(1)(A) of the Endangered Species Act for the listed vernal pool branchiopods. Carlsbad Field Office, Carlsbad, California.

ATTACHMENT 1

RECEIVED
JUN 1 5 1998
RECON

June 11, 1998

Cameron Patterson
RECON
4241 Jutland Drive, Suite 201
San Diego, CA 92117-3653

SUBJECT: Analysis of Vernal Pool Soils from LAX to Determine the Potential Presence of Special-Status Shrimp Species.

Dear Cameron Patterson:

Jones & Stokes Associates conducted an analysis of 80 soil samples for RECON to determine the presence of special-status shrimp at LAX, Los Angeles County, California. The soil samples were collected by RECON, and were received by Jones & Stokes Associates on April 30, 1998. Jones & Stokes Associates assumes that RECON will submit this report and all other pertinent materials and information to the U.S. Fish and Wildlife Service (USFWS), the Natural History Museum of Los Angeles County and the California Department of Fish and Game, as required by the USFWS guidelines for a protocol-level survey.

DEFINITIONS

For the purpose of this report, special-status shrimp are defined to include shrimp species in the following categories:

- shrimp listed as threatened or endangered under the federal Endangered Species Act (50 CFR 17.11 for listed animals and various Federal Register notices for proposed species),
- other shrimp species meeting the definition of rare or endangered species under the California Environmental Quality Act (CEQA) (State CEQA Guidelines, Section 15380).

METHODS

Soil samples were prepared for examination in the laboratory by dissolving the clumps of soil in water and sieving the material through 500-, and 150-μm pore-size screens. The small size of

these screens ensured that the eggs from the shrimp species would be retained. The portion of each sample retained in the screens was dissolved in a brine solution to separate the organic material from the inorganic material. The organic fraction was then examined under a microscope.

Scanning electron micrographs and reference specimens were used to identify shrimp cysts to the lowest justifiable taxon. Cysts from the genus *Branchinecta* were identifiable only to genus level, because of the overlapping characters of the cysts among species, and the potential for two species, *B. lindahli* and *B. sandiegonensis*, to occur in this region. *B. lindahli* is a common species with no regulatory status, and *B. sandiegonensis* is federally listed as endangered (62 CFR 4925). *Streptocephalus wootoni* cysts may resemble those of other species of *Streptocephalus*; however, no other species of *Streptocephalus* occur in the survey region.

RESULTS

Shrimp cysts were identified in 35 of 80 samples. Cysts for the federally listed endangered species *Streptocephalus wootoni* were identified in 21 of the samples, and the cysts for the genus *Branchinecta* were identified in 32 of the samples. It cannot be determined from observation of the cysts if these samples contain *B. sandiegonensis*. Adult shrimp must be observed to make this determination. The specific findings are in Table 1.

If you have any questions please call me at (916)737-3000.

Sincerely,

D. Christopher Rogers
Invertebrate Ecologist

DCR/CR/clm

Table 1. Specific Findings

Pool Number	Branchinecta (cysts/liter)	Streptocephalus (cysts/liter)	Pool Number	Branchinecta (cysts/liter)	Streptocephalus (cysts/liter)
1-3	2,378	30	9-3	0	0
1-5	2,579	24	9-4	0	0
1-6	3,293	16	9-5	0	0
1-8	106	14	9-6	0	0
1-9	97	112	9-7	0	32
2-5	105	0	10-2	0	0
2-6	36	0	10-5	0	0
2-7	36	0	10-8	0	0
2-8	200	23	10-9	0	0
2-10	82	0	10-10	0	0
3-5	0	0	11-2	0	0
3-6	0	0	11-5	0	0
3-7	0	0	11-8	0	0
3-9	0	0	11-9	0	0
3-10	0	0	11-10	0	0
4-1	0	0	12-1	0	32
4-5	0	0	12-2	0	0
4-7	0	0	12-3	0	0
4-9	0	0	12-4	0	0
4-10	0	0	12-7	0	0
5-3	0	0	13-3	0	0
5-5	0	0	13-5	0	64
5-6	0	0	13-8	0	0
5-7	0	0	13-9	0	32
5-9	0	0	13-10	0	0
6-2	0	0	14-1	433	2
6-3	0	0	14-2	342	4
6-4	0	0	14-3	483	0
6-8	1	0	14-4	1,062	1
6-10	15	3	14-10	1,326	0
7-3	0	0	15-4	39	42
7-4	0	0	15-5	12	4
7-5	0	0	15-6	4	1
7-7	0	0	15-7	14	9
7-9	0	0	15-10	63	3
8-2	934	0	16-2	485	32
8-3	466	0	16-3	316	0
8-4	404	0	16-8	388	1
8-6	305	0	16-9	87	0
8-7	72	0	16-10	270	0