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POTENTIAL BACKGROUND CONSTITUENT LEVELS IN STORM WATER AT BOEING'S SANTA SUSANA FIELD LABORATORY

Prepared
for

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Executive Summary

The Boeing Santa Susana Field Laboratory (SSFL) is approximately 2850 acres in size and straddles the Simi Hills at the border of Ventura and Los Angeles Counties. Runoff from the SSFL eventually flows into both the Los Angeles River and Calleguas Creek Watersheds. The SSFL NPDES Permit (Order No. R4-2006-0008) include numeric limits for storm water discharges that are very low. Boeing has expressed concern about its ability to comply with these limits, particularly for metals and dioxins. As part of an evaluation of these concerns, this report presents information on sources of constituents that are regulated at the site.

The data detailed in this report describe the impacts of atmospheric deposition, erosion of native soils, and forest fires on storm water concentrations of metals and dioxin. In addition, concentrations of other regulated constituents, including metals and dioxin, in storm water runoff from the SSFL are compared to concentrations of these constituents in storm water flows and in receiving waters throughout the region. Major conclusions of this report are described below.

- **Atmospheric deposition.** Many of the metals and dioxins that are regulated in storm flows from the site are present in ambient air in southern California. The mass loading of these constituents deposited on land via dry deposition is large, and studies have shown that significant fractions of this atmospherically-deposited mass can be transmitted to receiving waters during storm events. Two studies performed by Sabin et al. (2004 and 2005) are particularly relevant. Sabin et al. (2004) demonstrated that dry deposition metals loads to the Los Angeles Region far exceeded mass loadings of metals in storm flows between October 2003 and April 2004 (storm flow mass loadings of metals were 9-43% of the annual atmospheric deposition load). Sabin et al. (2005) found that atmospheric deposition (both wet and dry) in one small, urbanized catchment accounted for as much as 57-100% of the annual trace metals load in storm water. Thus, a substantial portion of the metals concentrations and loads in storm water from the SSFL may derive from atmospheric deposition unrelated to site activities.

- **Ambient Precipitation**. Rainwater samples collected at the SSFL show reported dioxin concentrations in excess of SSFL permit limits for storm flows. Estimated concentrations of mercury in precipitation are at or near SSFL permit limits.

- **Wild fires.** Wildland fires release significant amounts of metals and dioxins, and storm water runoff following forest fire events has been observed to carry significantly higher concentrations and loads of these constituents (Sabin et al. (2005), Nestrick et al. (1983), Hinojosa et al. (2004b)). Atmospheric deposition rates of metals have been observed to rise several-fold during fires, and elevated atmospheric concentrations of dioxin have been observed during fires. Fires also leave behind ash and destroy vegetation, resulting in significant changes in the hydrologic response of watersheds, including higher runoff volumes, higher flow rates, and higher concentrations of total suspended solids (TSS), which in turn carry regulated constituents. These effects have been widely documented and have been observed at the SSFL site, 70% of which burned during the fall 2005 wild fires.

- **Native soils.** Samples of soils collected both at SSFL and off-site show the presence of regulated constituents. Soil concentrations off-site are similar, both in magnitude and variability, to concentrations measured on-site at the SSFL. Order-of-magnitude calculations show that erosion of native soils will contribute concentrations of regulated constituents to storm flows, often at levels that could approach or exceed SSFL permit limits.

- **Storm water runoff.** Concentrations of metals in storm water runoff from the SSFL are similar to (and often lower than) concentrations in storm water runoff from other open space, natural areas. These concentrations are also similar (and often lower than) those detected in storm water runoff from certain major land use types (light industry, transportation, and commercial) and in the Los Angeles River during storm events. Average concentrations of dioxin in storm water runoff from the SSFL are lower than average dioxin concentrations in wet weather samples collected in the Santa Monica Basin. They are also lower than the average dioxin concentrations in industrial process water discharges, storm water discharges, and in the Los Angeles River receiving water samples, as shown by data gathered by the Los Angeles Regional Water Quality Control Board ("Regional Board").

Boeing has also conducted extensive tests of materials considered for use in on-site best management practices (BMPs). These tests were conducted to facilitate the selection of "clean" materials and to determine the potential for materials introduced to the site to contribute to the presence of regulated constituents in storm water runoff. In general, the materials used in BMPs on the site are not expected to directly cause permit exceedances, although they will contribute small amounts of regulated constituents to storm flows. For some constituents, including antimony, copper, iron, lead, manganese, mercury, and dioxins, test results show that BMP materials could contribute to permit exceedances. These tests are described in this report and full test results are provided to the Regional Board in the hope that they will be useful to the Regional Board and to other dischargers considering similar type BMPs for the control of storm water flow quality.

1. INTRODUCTION

The Boeing Santa Susana Field Laboratory (SSFL) straddles the Santa Susana Mountains of southeastern Ventura County, and contributes runoff to both the Los Angeles River and Calleguas Creek Watersheds. Both of these waterbodies are listed as 303(d) impaired waters for certain constituents. Past and current NPDES waste discharge requirements for the SSFL have utilized a Reasonable Potential Analysis (RPA) to determine the likelihood that runoff containing certain constituents in storm water runoff could exceed a receiving water quality objective. Several analytes, including cadmium, copper, lead, mercury, and 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) toxic equivalent (TEQ)[1], were found by the Los Angeles Regional Board to have reasonable potential to exceed a receiving water quality objective at one or more of the designated outfalls.[2] However, storm water runoff from the site will contain significant concentrations and loads of these constituents from background sources not related to site activities, including:

- Atmospheric deposition, which may include:
  (a) urban atmospheric emissions
  (b) products of native soil erosion by wind

- Sediment loads from native soil erosion by runoff

- Combustion products, smoke, and ash from forest fires

Each of these sources contributes to the annual load and to concentrations of constituents of concern in storm water runoff. Available information regarding these background sources can be used to calculate order-of-magnitude estimates for ambient constituent loadings in surface water at the SSFL.

This report also presents the results of tests of materials, including sand and gravel, that were considered for use in best management practices (BMPs) at the site. In addition to these BMP materials, hydromulch materials were also evaluated. Several different types of tests were conducted to assess the potential for these materials to contribute regulated constituents to storm water runoff and to enable Boeing to select the cleanest materials available for use at the site.

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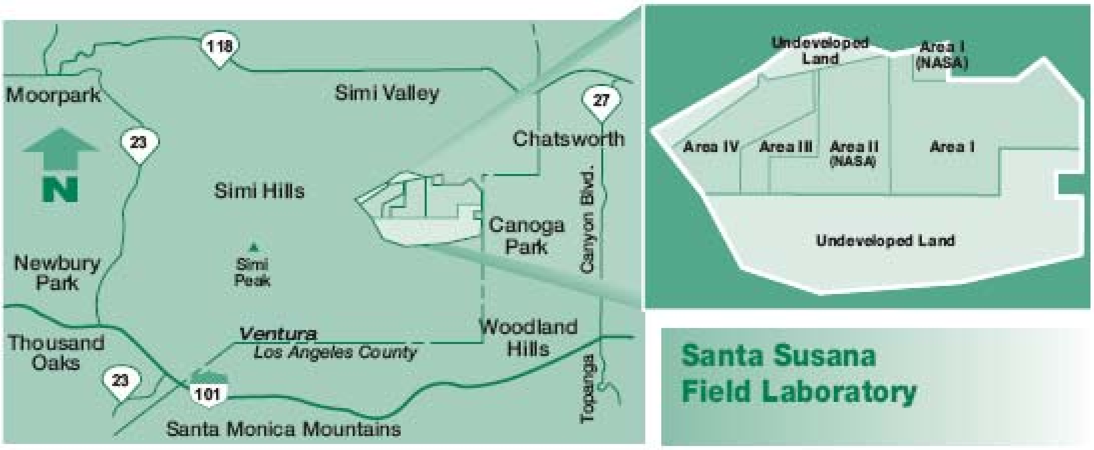
[1] The Regional Board requires measurement of dioxins as a 2,3,7,8-TCDD toxic equivalent (TEQ). This mass TEQ is equal to the sum of each dioxin-like congener's mass multiplied by a congener-specific toxicity equivalence factor determined by the EPA and World Health Organization.

[2] Los Angeles Regional Water Quality Control Board, Order No R4-2004-0111, Waste Discharge Requirements for the Boeing Company, July 1, 2004. pp. 25-26. Also Order R4-2006-0008, January 19, 2006. pp. 25-30, and Order R4-2006-0036, April 28, 2006. pp. 26-31. Note that comments on the reasonable potential analyses and interim and final numeric effluent limits calculated by the Regional Board have been provided separately by Boeing on December 30, 2005, and January 5, 2006. Reasonable potential analysis methodology is described in MWH and Flow Science, 2006.

Figure 1 –Location Map of Boeing SSFL



2. REGIONAL SOURCES FOR CONSTITUENTS OF CONCERN IN SOUTHERN CALIFORNIA STORMWATER RUNOFF

2. 1 Atmospheric Sources

Air quality in Southern California is regarded as some of the worst in the nation. Atmospheric emissions, concentrations, and deposition of metals, chlorinated dibenzo dioxins[3] and chlorinated dibenzo furans (herein "dioxin"), polycyclic aromatic hydrocarbons (PAHs), organochlorine and organophosphate pesticides, and polychlorinated biphenyls (PCBs) have been observed in the major air basins of southern California. Atmospheric deposition monitoring data from Southern California and from other areas with similar climates and levels of urban development have been reviewed to evaluate the importance of atmospheric deposition to storm water concentrations of regulated constituents in the Southern California Region.

2.1.1 Emissions of SSFL Runoff Constituents of Concern

The California Air Resources Board (CARB) recently released the State's toxics emissions data for 2004. These data include emissions estimates for stationary, area-wide, mobile, and natural sources for 33 toxic compounds, reported for the entire state and by region. Emissions estimates are based on modeled emissions factors, permit levels applied to emissions, and quality control emissions surveys, and do not include emissions from wildland or forest fires. Available CARB emissions estimates for Los Angeles and Ventura Counties are summarized below in Table 1 for analytes observed in storm water runoff from

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[3] The Environmental Protection Agency defines dioxins as "a group of chemical compounds that share certain chemical structures and biological characteristics. Several hundred of these compounds exist and are members of three closely related families: the chlorinated dibenzo-*p*-dioxins (CDDs), chlorinated dibenzofurans (CDFs) and certain polychlorinated biphenyls (PCBs). (Often times) the term dioxin is also used to refer to the most studied and one of the most toxic dioxins, 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD)." Definition found on line at http://www.epa.gov/ncea/dioxinqa.htm#g1.

the SSFL site at levels that exceed the NPDES permit limits. The SSFL site is located within two air basins, the South Central Coast Air Basin (including parts of San Luis Obispo, Santa Barbara, and Ventura Counties) and the South Coast Air Basin (including parts of Los Angeles, Orange, Riverside, and San Bernardino Counties). Primary emissions sources for metals and dioxins, including automobile and other transportation emissions, waste incineration, and residential waste burning (referred to as backyard barrel burning by CARB) are included in Table 1. Potentially large emissions from forest fires are not included in Table 1.

Table 1 – 2004 Estimated Air Basin Emissions for Key SSFL Constituents of Concern (Excluding Wildland Fires)[4]

Constituent of Concern	Los Angeles County (kg/yr)	Ventura County (kg/yr)
Cadmium	921	229
Chromium	5395	1791
Chromium, Hexavalent	281	1.9
Dioxins/Benzofurans*	0.024	0.000031
Lead	16664	3506
Manganese	58457	11473
Mercury	1290	157
Nickel	6413	682

Note: Dioxins/Benzofurans are listed as total mass in kg/yr, not in the World Health Organization's 2,3,7,8 TCDD toxicity equivalence scale (kg Toxicity Equivalence (TEQ)/yr).
* Note: Major transportation sources are not included in these estimates for dioxins and benzofuran emissions in Los Angeles and Ventura Counties.

2.1.2 Atmospheric Concentrations, Deposition Rates, and Storm Water Concentrations of Metals

Technical reports published by the Southern California Coastal Water Research Project (SCCWRP) have summarized atmospheric concentrations and deposition rates of metals in various Southern California watersheds. Table 2 summarizes estimated regional atmospheric concentrations, deposition fluxes, and a range of deposition estimates for the Los Angeles Air Basin as reported by SCCWRP for 2003.

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[4] California Air Resources Board, "2004 California Toxics Inventory by Air Basin". On line at http://www.arb.ca.gov/toxics/cti/cti.htm .

Table 2 – Atmospheric Concentrations and Deposition Fluxes of Metals within the Los Angeles Air Basin

Constituent	Average Concentrations (ng/m^3)*		Average Daily Deposition Flux (µg/m^2/day)		Estimated Deposition to Los Angeles Basin Watersheds (MT/yr)**	
	All Urban Sites	Non-Urban Site	All Urban Sites	Non-Urban Site	Total Basin Deposition	Range (95% Confidence)
Chromium	1.7	0.41	5.3	1.1	5.3	(3.3-7.5)
Copper	9.3	2.9	24	3.7	25.8	(16.9-34.6)
Lead	4.8	0.62	16	1.4	17.3	(8.0-26.5)
Nickel	2	0.84	5.9	1.3	6.2	(3.8-8.7)
Zinc	38	4.5	129	15	140.8	(82.1-205.5)

Source: Sabin et al. 2004. Similar results were obtained by Sabin et al. 2007.

* Concentrations for "all urban sites" were averaged from data collected at six Los Angeles Basin urban sites. The non-urban site is measured in the Malibu Creek Watershed, generally upwind of metropolitan Los Angeles.

** Estimated Deposition to Los Angeles Basin is the sum of estimated deposition mass fluxes for the Los Angeles River, Ballona Creek, Dominguez Channel, Lower Santa Ana River, and Malibu Creek watersheds.

Subsequent availability of trace metals from atmospheric deposition to storm water runoff is highly variable and dependent upon deposition surface characteristics, BMPs utilized (if any), metals re-suspension fluxes, rainfall intensity, and pH, among other factors. Sabin et al. (2005) reported that atmospheric deposition (both wet and dry) accounted for 57-100% of the annual trace metals load in storm water runoff from a small, highly urbanized catchment during October 2003 to April 2004 (i.e., "transmission efficiencies" of 57-100%). For the overall Los Angeles River watershed, Sabin et al. (2004) estimated transmission efficiencies of 9% to 43%, meaning that 9% to 43% of the metals masses deposited to the watershed via dry deposition became part of the metals load in storm water during the 2003 water year. Transmission efficiencies will vary with hydrologic conditions, and will be greater in wet years than in dry years. While transmission efficiencies may be lower for non-urbanized areas such as the SSFL, a substantial portion of storm water runoff metals loads may derive from atmospheric deposition.

The presence of metals in runoff from predominantly natural areas, such as the Sawpit Creek and Malibu Creek watersheds, lends support to this conclusion. Table 3 shows maximum observed metals concentrations (as reported by the Los Angeles County Department of Public Works (LACDPW)) for three watersheds with significant portions of natural areas. In addition, metals concentrations have been measured by LACDPW in runoff from additional land use types and in the region's receiving waters. These are discussed in greater detail in Section 3.4.

Table 3 – Maximum Observed Total Metals Concentrations for Storm Water from Watersheds with Significant Natural (Open Space) Areas

Watershed	%-Natural	Maximum Observed Storm Water Concentrations (µg/L)		
		Copper	Lead	Zinc
Sawpit Creek (November 1998 – March 2001)	98	51	5.05	229
Malibu Creek (November 2001 – March 2005)	80	91.6	21.5	102
Los Angeles River (at Wardlow) (October 1998 – January 2005)	44	805	1070	1235
Boeing SSFL 2006 NPDES Permit Daily Average Levels	---	13.5 -14.0	5.2	119

Source: "Los Angeles County 1994-2000 Integrated Receiving Water Impacts Report" and "Los Angeles County 1994-2005 Integrated Receiving Water Impacts Report", LACDPW.
Note: Concentrations are in terms of total metal, not dissolved metal.

Additional studies by SCCWRP and others are in the planning stages or currently underway. These studies are intended to help assess atmospheric deposition rates, to refine estimates of transmission efficiencies, particularly from natural areas, and to quantify the relative contribution of atmospheric deposition to storm water metals concentrations and loadings. Nonetheless, the data presented by Sabin et al. (2004 and 2005) and the analysis presented in this report indicate that atmospheric deposition is likely a significant source of metals in storm water.

2.1.3 Atmospheric Deposition of Dioxins

Global atmospheric deposition rates for dioxins have been estimated in multiple studies through a mass balance between emissions and deposition of dioxins measured in soils, surface water, and in plant uptake. Estimated global emissions of dioxins range from 1,800 (Baker and Hites, 2000) to 3,000 kg/yr (Brzuzy and Hites, 1996), but Wagrowski and Hites (2000) estimate atmospheric deposition of dioxins to be 5,500 kg/yr. Wagrowski and Hites (2000) reasoned that the discrepancy between emissions and deposition could be due to uncertainty in NO_x emission rates or dioxin deposition rates, while Baker and Hites (2000) found that the difference could be explained by the conversion of pentachlorophenol to dioxin congeners in the atmosphere. Wagrowski and Hites (2000) also studied emission sources and nearby localized deposition rates, and estimated that dioxin emissions travel through the atmosphere for relatively limited distances, roughly 60 to 125 miles, before depositing to the earth's surface. Once deposited, fate and transport of dioxins will depend upon surface, hydrologic, and atmospheric conditions. The Bay Area Air Quality Management District (BAAQMD) estimates total regional emissions for the Bay Area to be about 2.2 g TEQ/yr (BAAQMD 2000).

Wagrowski and Hites (2000) found that anthropogenic fluxes of nitrogen oxides (NO_x) correlated well with atmospheric deposition fluxes of dioxins and benzofurans, and developed a model for estimating atmospheric deposition of dioxins and benzofurans to soils based upon a logarithmic regression with regional emissions of NO_x. This is shown in the following equation.

$$\log(\text{dioxin and benzofuran flux}) = 0.512 + 0.401 (\log NO_x)$$

The mass of dioxins and benzofurans deposited from the atmosphere within Ventura and Los Angeles Counties has been estimated by Flow Science using this model, as shown in Table 4.

Table 4 – Estimated Atmospheric Deposition of Dioxins and Benzofurans to Los Angeles and Ventura Counties

Region	Area (m^2)	2005 NO_X Emissions (tons/yr)*	Estimated Dioxin and Benzofuran Deposition Rate** ($ng/m^2/yr$)	Deposition Estimated for Regional Area*** (g/yr)
Los Angeles County	$1.1x10^{10}$	$2.3x10^5$	340	3580
Ventura County	$4.8\ x10^9$	$2.3x10^4$	184	880
Los Angeles + Ventura County	$1.5\ x10^{10}$	$2.5x10^5$	304	4650

[*] Source: California Air Resources Board emissions inventory data for 2005.

[**] Calculations assume that the ratio of NO to NO_2 in area emissions is 0.9 to 0.1, with negligible contributions from other NO_x components.

[***] Dioxin deposition estimates in Table 4 are one to four orders of magnitude greater than dioxin emissions estimates in Table 1. It is important to note that emissions estimates for dioxins and benzofurans in Table 1 **do <u>not</u>** include emissions from transportation sources or wildland fires. Table 4 NO_x emission estimates **do** include transportation sources, but **do not** include wildland fire sources. These sources may produce the majority of dioxins and benzofurans in the southern Californian region.

2. 2 Forest Fire Impacts

2.2.1 Forest Fire Metals Deposition

Periodic forest fires throughout the southern California region have the potential to release significant amounts of metals and dioxins. Santa Ana winds, characteristic of weather patterns during the Southern California forest fire season, may distribute these atmospheric constituents across Southern California Air Basins. The relatively short-term nature of forest fires can lead to strong spikes in atmospheric deposition rates of trace metals and dioxins. Storm water runoff following forest fire events has been observed to carry significantly higher loads of these constituents, as discussed below.

Sabin et al. (2005) report that during the severe 2003 southern California forest fire season, which included the 2003 Piru and Simi Fires, atmospheric deposition rates for copper, lead, and zinc, went up by factors of four, eight, and six, respectively, at an unburned site[5] in the San Fernando Valley that was approximately 30 miles from the southeastern border of the Piru/Simi Fires. Table 5 shows average daily atmospheric trace metals deposition rates for 2004 and the increase in deposition rates that would result from forest fires. Figure 2 shows

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[5] Sabin et al. 2005 report this site as the Tillman Water Reclamation plant in the San Fernando Valley.

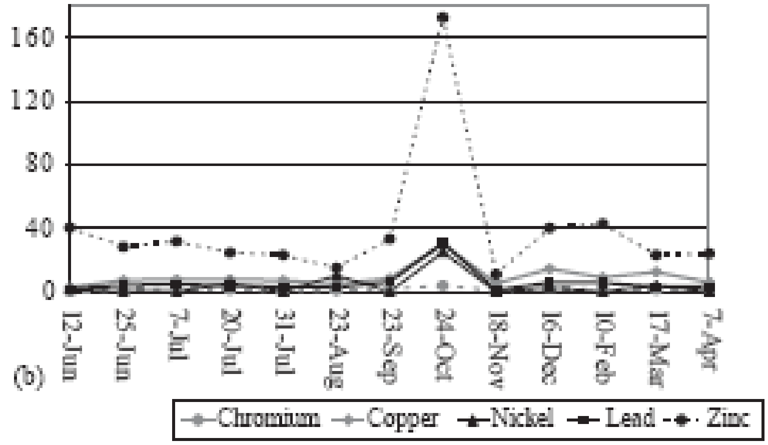
the increase in air concentrations of metals in the Los Angeles Air Basin during the 2003 forest fire season.

Table 5 – Potential Daily Atmospheric Deposition of Metals due to Off-site Forest Fire (approximately 30 miles from Piru/Simi Fire boundary)

Metal	Long-term Dry Deposition (Non-fire), San Fernando Valley (μg/m^2/day)		Forest Fire Factor Increase	Calculated Daily Deposition Rates during Fires (μg/m^2/day)
	Average	Measured Range		
Chromium	1.3	0.7-1.8	4	5
Copper	9.4	5.3 – 14	4	38
Lead	5.4	1.1 – 10	8	46
Nickel	3.7	0-8.0	13	48
Zinc	39	14 – 64	6	230

Source: Sabin et al., 2005.

Figure 2 – Atmospheric Concentrations of Trace Metals in the San Fernando Valley (Note the spike in concentrations during Southern California 2003 Forest Fire Season)



Atmospheric Concentration in ng/m^3 (MDL = 0.03) Based on Sampling Times/Air Volumes Collected.
Source: Sabin et al., 2005.

2.2.2 Forest Fire Dioxin Emissions

Forest fires are also a significant source of dioxin due to emissions, resuspension, and volatilization (Nestrick et al. (1983) and Sheffield et al. (1985)). Tashiro et al. (1990) and Clement and Tashiro (1991) reported increases in atmospheric concentrations of dioxins during forest fires in Ontario, Canada. Forest fires in Ontario produced estimated atmospheric concentrations ranging from 15 to 400 pg/m^3, with an approximated average of

20 pg/m^{3} (6), with before and after fire background atmospheric concentrations at non-detect levels. A recent memorandum published by the South Coast Air Quality Management District (SCAQMD) reported dioxin concentrations of 211 fg (femtograms, or 10^{-15} grams) TEQ/ m^{3} at the Chatsworth Park Elementary School on September 30, 2005, during the Chatsworth/ Topanga Fire (Liu 2005). (See Appendix Table A-7 for a discussion of units.) By contrast, average SCAQMD ambient concentrations for dioxin range from 9 to 59 fg TEQ/m^{3}, or a factor of 3.5 or more times lower than atmospheric dioxin concentrations during the Topanga fire. The SCAQMD concludes that the source of the increased dioxin levels "may be reflective of dioxins and furans…released during wildfire combustion (processes)." This conclusion is consistent with recent reports published by Gullet and Touati (2003) and Meyer et al. (2004). In the Bay Area, wood burning is estimated to release approximately 0.84 grams TEQ per year, greater than the estimated contribution from mobile sources (Connor et al., 2005).

An order of magnitude estimate for the mass equivalent of dioxins emitted by southern California forest fires may be made by assuming a dioxin emission rate similar to that measured from wood stoves. Based on residential wood stove studies performed in Europe by Schatowitz et al. (1993) and Vikelsoe et al. (1993), wood stoves release approximately 2 nanograms TEQ per kilogram of wood burned. Ward et al. (1976) estimated biomass consumption rates from forest fires at roughly 9.4 metric tons/acre. From these data and the area of forest fires in southern California, an estimate can be made of the mass of TEQs (dioxin-like substances) emitted due to fires. Because available biomass, biomass conversion rates, and dioxin emission rates may vary significantly, a range of TEQ mass emissions, utilizing the estimated dioxin emission level as the geometric mean with a factor of 10 between high and low range estimates, has been calculated. Table 6 summarizes Flow Science's estimated dioxin emissions for recent Southern California fires. These emission rates are of the same order as dioxin emission rates reported by the SCAQMD (see Table 1). Thus, it appears that forest fires are a significant source of dioxins, particularly for land areas located near the fires.

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[6] Note that these airborne concentrations of dioxins have not been converted into mass TEQ/volume units and cannot be compared to the SCAQMD air concentrations reported in TEQ/volume units.

Table 6 – Estimated Dioxin Total Equivalence (TEQ) Mass Emissions from Recent Southern California Forest Fire Events

Fire Event	Forest fire Area (acres)*	Biomass Consumption Forest Fire (kg)**	Estimated Total Dioxin Emissions (g TEQ)***	Range of Estimated Dioxin Emissions (g TEQ)
Topanga (2005)	24,000	2.3×10^8	0.45	0.14 – 1.4
Burbank (2005)	700	6.6×10^6	0.01	0.004 – 0.04
Cedar Fire (2003)	280,000	2.6×10^9	5.3	1.7 – 17
Total Southern California Fires (2003)****	744,000	7.0×10^9	14	4.4 – 44

*Forest fire acreage is reported by North County Times (2003), and City of Calabasas (2005).
** Ward et al. (1976) estimate that the biomass is consumed at a rate of 9.4 metric tons/acre.
*** Schatowitz et al. (1993) and Vickelsoe et al. (1993) estimate a dioxin emission rate of 2 ng TEQ/kg wood burned.
**** 2003 Southern California fires include Cedar, Mountain, Camp Pendleton, Dulzura, Grand Prix, Old, Padua, Paradise, Piru, Simi Valley, and Verdale Fires.

2.2.3 Forest Fire Impacts on Native Soils and Storm Water Loads

Forest fires can significantly change soil chemistry and runoff parameters in burn areas, thereby changing the availability of constituent loading via storm water runoff. An amplified and lower-duration hydrologic response is often observed in watersheds after wildfires (Meixner and Wohlegunth (2004), Bhoi and Qu (2005), Woodhouse (2004), SAWPA (2004)). Although the degree of hydrologic amplification and duration reduction is largely dependent upon fire intensity, fire duration, terrain and soil characteristics, and precipitation characteristics, fire-induced watershed changes can greatly increase the sediment load of the watershed. The Santa Ana Watershed Project Authority (SAWPA) estimated that storm flows could increase by as much as 5 times and sediment loads could increase by 30-50 times above average levels due to impacts from the Padua, Grand Prix, and Old Fires (SAWPA 2004). Significant increases in storm flow and sediment runoff will be associated with corresponding increases in loads and concentrations of naturally occurring nutrients, metals, and certain organic pollutants, including dioxins, that strongly sorb to sediments.

These conclusions are consistent with post-fire storm water monitoring conducted in other areas. The Los Alamos National Laboratory (LANL) has recently released reports summarizing the effects of the 2000 Cerro Grande Fire in New Mexico. That fire burned nearly 50,000 acres, including 7,000 acres of LANL lands. Hinojosa et al. (2004b) found that post-fire surface water concentrations for 28 analytes[7] were higher than pre-fire levels due to forest fire effects. Of these 28 constituents, roughly an order of magnitude increase in

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[7] Hinojosa et al. (2004b), p. 153, lists these 28 analytes as bicarbonate, calcium, cyanide, magnesium, nitrogen, phosphorus, potassium, aluminum, arsenic, barium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, nickel, selenium, strontium, vanadium, zinc, americium-241, cesium-137, plutonium-238, plutonium – 239, 240, strontium-90, and uranium.

storm water runoff concentrations was noticed for silver, arsenic, boron, cobalt, chromium, manganese, nickel, tin, strontium, thallium, vanadium, and zinc. Furthermore, Hinojosa et al. (2004a) report that the dioxin congeners OCDD and HpCDD were above reporting limits[8] in most post-fire soil samples, with the highest TCDD total equivalent measurement of 2.9×10^{-5} TEQ mg/kg. Hinojosa et al. (2004b) note that "although there are no pre-fire results to compare against, the detection of dioxin in the ash-rich sediment deposits upstream of LANL supports the possibility that dioxins were formed by the Cerro Grande fire." Likewise, no pre-fire measurements for dioxin-like compounds were taken for the Rio Grande River running through LANL, but post-fire TCDD equivalent concentrations were found in three of 24 water samples, ranging from 7×10^{-8}(TEQ µg/L) to 6.3×10^{-6}(TEQ µg/L). These values are five to 450 times greater than the California Toxics Rule value of 1.4×10^{-8} (µg/L) for human consumption of organisms, which is the basis for the 2006 NPDES permit limits for storm water at SSFL. A detailed summary of the Cerro Grand Fire impacts to water quality and stream flow near the LANL has been previously provided (Boeing, 2005; Boeing, 2006).

2.3 Native Soils Sources

Native soils in southern California contain copper, lead, mercury, zinc, dioxins, and other constituents. When mobilized in large storm events, sediments and soils from natural areas may contribute a significant quantity of these naturally-occurring compounds to storm water via natural sediment transport processes. As discussed below, site-specific background soils concentrations at SSFL can be used to estimate the concentration of metals in storm water as a result of the erosion of native sediments.

3. REGIONAL SOURCE DATA APPLIED TO THE BOEING SSFL SITE

3. 1 Atmospheric Deposition

3.1.1 Atmospheric Deposition of Metals at SSFL

Atmospheric deposition rates for metals at the SSFL site can be estimated using data from Sabin et al. (2004). Sabin et al. (2004) measured atmospheric deposition fluxes at Malibu Lagoon State Beach in the Malibu Creek watershed (generally upwind of urban areas) and in the Los Angeles River watershed at the Tillman Reclamation plant. These stations were the closest monitoring stations to the SSFL, so annual deposition rates of metals across the area of the SSFL (11.5 km^2) were calculated using the average of atmospheric deposition flux rates from these two locations. The estimated atmospheric deposition loads of various metals to the SSFL are shown in Table 7.

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[8] Hinojosa et al (2004a), p. 8, notes that OCDD and HpCDD were the only dioxin congeners detected above reporting limits in the soils analyzed. All other dioxin congener groups were below detection limits for the soil samples analyzed.

Table 7 – Metals Atmospheric Concentration and Deposition Data for SSFL

Metal	Average Air Concentration (ng/m^3)			Average Daily Atmospheric Deposition Flux (µg/m^2/day)			Estimated Annual Deposition to SSFL (Malibu to Tillman range shown in parenthesis) (kg/yr)
	Tillman Water Reclamation Plant	Malibu Creek	Estimated SSFL (Avg. of Malibu Creek & Tillman)	Tillman Water Reclamation Plant	Malibu Creek	Estimated SSFL (Avg. of Malibu Creek & Tillman)	
Chromium	1.1	0.41	0.755	3.2	1.1	2.15	9.1 (1.6-13.5)
Copper	5.2	2.9	4.05	11	3.7	7.35	30.9 (15.6-46.3)
Lead	2.2	0.62	1.41	8.3	1.4	4.85	20.4 (5.9-34.9)
Nickel	1.1	0.84	0.97	3.8	1.3	2.55	10.7 (5.5-16.0)
Zinc	19	4.5	11.75	69	15	42	177 (63.1-290.4)

Source: Sabin et al., 2004.

Storm water loading of constituents deposited from the atmosphere will depend upon many factors, including surface permeability, re-suspension fluxes, rainfall intensity, rainfall pH, and other hydrologic factors. As previously noted, Sabin et al. (2005) estimated that approximately 57%-100%[9] of storm water metals loads in a small predominantly impervious catchment resulted from background urban atmospheric deposition in the San Fernando Valley. This transmission efficiency may be lower for non-urban areas such as the SSFL site. Even if transmission efficiencies from natural areas are lower (say between 10% and 50%), atmospheric deposition will still be a dominant source of metals in storm flows. As noted previously in Table 3, storm flows from watersheds that are largely in natural (open space) areas (e.g., Sawpit Creek and Malibu Creek) experience high metals concentrations. Stolzenbach et al. (2001) measured and modeled atmospheric dry deposition of metals in the area tributary to Santa Monica Bay and found that peak metals deposition rates generally occurred just south of major mountain ranges (e.g., San Gabriel Mountains). Stolzenbach et al. (2001) also found that "about 35 to 45 percent of the emissions in the model domain are deposited locally…the rest of the trace metal emissions are dispersed to regional and larger scales through long-range transport," indicating that regional sources can cause deposition of metals even in natural, undeveloped areas not immediately proximate to emission sources. Atmospheric deposition and/or erosion of native soils are likely the dominant sources of metals in these watersheds.

Order-of-magnitude estimates of the average metals concentrations in storm water runoff at the SSFL resulting from atmospheric deposition can be made assuming that:

- The average storm water runoff at the SSFL is equal to an average year's rainfall at SSFL multiplied by a runoff coefficient.
- 10 % to 50 % of the metals deposited from the atmosphere at the SSFL are

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[9] Sabin et al. 2005 reports average ± one standard deviation concentrations (µg/L) for storm water at the Tillman Water Reclamation Plant during the 2003-2004 wet season as: Copper (27 ± 24), Lead (12 ± 10), and Zinc (160 ± 130), illustrating the high variability in metals concentrations in storm water.

transported in an average year's rainfall.

Table 8 compares the order-of-magnitude estimate for metals concentrations in storm water runoff at the SSFL due to atmospheric deposition with the NPDES permit limits that apply to storm water discharges from the SSFL. As shown in Table 8, the atmospheric deposition of copper, lead, and zinc may provide substantial contributions to permit exceedances at the site.

Table 8 – Estimated Average Metals Concentration in Storm Water Resulting from Atmospheric Deposition at SSFL

Constituents	Average Yearly Rainfall at SSFL (in/yr)	Average Volume of Rainfall at SSFL (L)[*]	Estimated Runoff Volume at SSFL (L)[**]	Estimated Average Annual Metals Concentration in Storm Water Runoff due to Atmospheric Deposition (% of 2006 NPDES Permit Level) (µg/L)[***]	2006 NPDES Permit Daily Limit (µg/L)	2006 NPDES Permit Monthly Limit (µg/L)
Chromium	18	5.3 x10^9	2.1x10^9	0.4 – 2.1 (3% - 13% Daily Max) (5% -27% Monthly Avg)	16.3	8.1
Copper				1.5 – 7.3 (11% - 52% Daily Max) (21% - 104% Monthly Avg)	14	7.1
Lead				1.0 – 4.8 (19% - 93% Daily Max) (37% - 186% Monthly Avg)	5.2	2.6
Nickel				0.5 – 2.5 (0.5% - 3% Daily Max) (1% - 7% Monthly Avg)	96	35
Zinc				8.4 – 42 (7% - 35% Daily Max) (16% - 78% Monthly Avg)	119	54

[*] Estimated rainfall volume was calculated by applying average rainfall rate of 18 in/yr across SSFL area, 2850 acres.

[**] An estimated Runoff Coefficient of 0.4 (Dunne and Leopold, 1978, p. 300) has been applied to the average annual rainfall volume to determine average annual runoff.

[***] Annual Atmospheric Deposition Rates were taken from Table 7. The transmission efficiency factor to storm water was assumed to range from 10% and 50% was applied to the annual load. This storm water mass load was then divided by Estimated Runoff Volume to estimate the annual metals concentration in storm water runoff from atmospheric deposition.

3.1.2 Atmospheric Deposition of Dioxins at SSFL

Long-term background atmospheric deposition rates for dioxins at the SSFL may be estimated by using the average of Los Angeles and Ventura County dioxin and benzofuran deposition rates found in Table 4. The mass of dioxins and benzofurans deposited to the SSFL site annually is estimated to be about 3.5 g/yr, as shown in Table 9. The estimates in Tables 4 and 9 do not include the effects of wild fires; data in these tables are presented in terms of annual dioxin mass, while permit limits for storm water discharges from the SSFL use units of TEQ (total dioxin equivalents). To convert dioxin mass to TEQ, a Toxicity

Equivalence Factor (TEF) of 0.0001 has been used. This is the TEF for Octachlorodibenzodioxins (OCDD), the most prevalent TCDD congener group (see Wagrowski and Hites (2000)). Using this conversion factor, annual dioxin deposition rates to the SSFL are estimated to be 3.5x10^{-4} TEQ (g/yr). Although no estimates of transmission efficiencies could be found for dioxins, a transmission efficiency of 8% applied to the annual mass of dioxin deposited to the SSFL from the atmosphere (and excluding any dioxin from fires) would result in storm water concentrations that exceed the monthly average TCDD (TEQ) NPDES permit limit for the estimated average storm water volume leaving the SSFL. Thus, even in the absence of fires, atmospheric deposition clearly has the potential to contribute significantly to both concentrations and loads of dioxin in storm water from the SSFL.

Table 9 - Atmospheric Deposition of Dioxins and Benzofurans to the SSFL

Estimated Dioxin and Benzofuran Deposition Rate to SSFL, 2005 (ng/m^2/yr)*	Estimated Range of Dioxin Deposition Rates to SSFL, 2005 (ng/m^2/yr)	SSFL Area (m^2)	Estimated 2005 Dioxin Deposition at SSFL (g/yr)	Estimated Range, 2005 (Applying LA and Ventura County as upper and lower limits.) (g/yr)
304	184-340	1.2x10^7	3.5	(2.1-3.9)

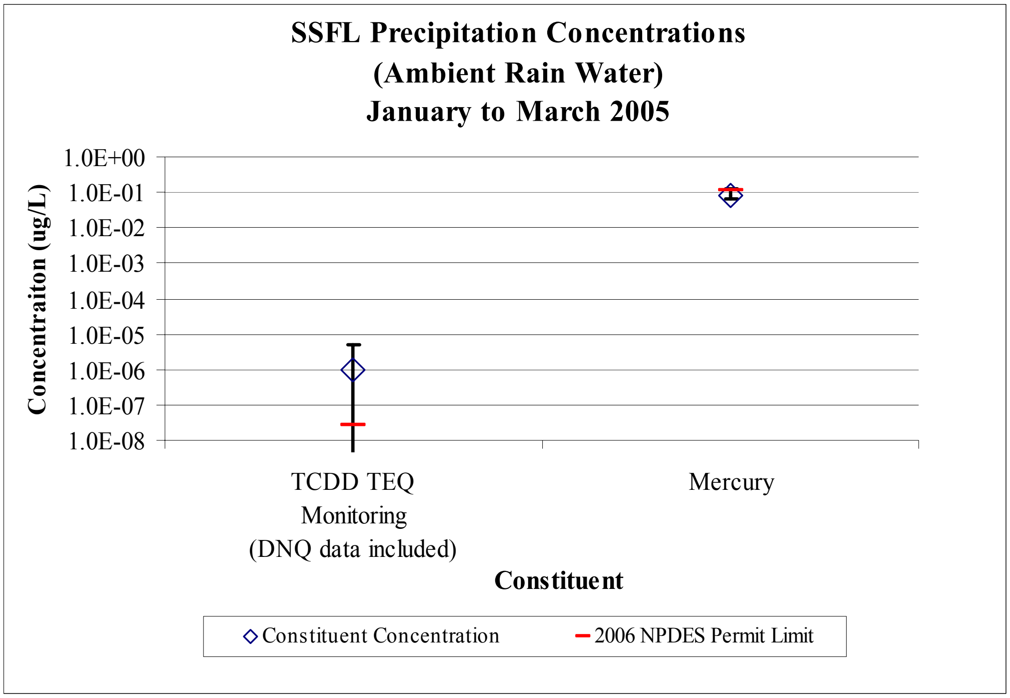
*See Table 4 for dioxin and benzofuran deposition rate of Los Angeles and Ventura County.

Note: Deposition rates are in total mass of dioxin and benzofurans and have not been converted into mass TEQ. These estimates do not include the effects of wild fires.

3.1.3 Ambient Precipitation Concentrations of Metals and Dioxins at the SSFL

Recent ambient rainwater sampling conducted by Boeing during five rainfall events (between January and March 2005) showed that rainwater contains significant concentrations of dioxins and mercury. Figure 3 shows the average concentrations of these constituents measured in rainwater collected at the SSFL with error bars indicating minimum and maximum observed values. These data show that dioxin concentrations in rain water at times exceed the permit limits that are applied to storm water from the SSFL site. In addition, mercury concentrations in precipitation may be at or near NPDES permit limits. (Concentrations of other metals were also measured, but were present at levels below NPDES permit limits and are not shown here.)

Figure 3 – SSFL Precipitation Constituent Concentrations



Sampling Notes:
1. Rainwater sampling occurred on 1/7/05, 2/11/05, 2/18/05, 3/4/05, 3/23/05. Only three of the five samples were analyzed for dioxins. Figure 3 was generated using the same data criteria and summation methods employed by the Regional Board in Reasonable Potential Analyses conducted for storm water runoff from the SSFL.
2. Four rainwater samples have been validated for mercury. Mercury concentrations represent laboratory estimated concentrations, and were reported with a J or U qualifier. One of the four estimated values was above the 2006 NPDES Permit Limit of 0.1 (µg/L). Estimated values for each of the four samples were >0.05 (µg/L). These data criteria and summation methods employed by the Regional Board in Reasonable Potential Analyses conducted for storm water runoff from the SSFL.

3. 2 Fire Impacts at the SSFL

The Chatsworth Topanga (Topanga) Fire of 2005 burned roughly 70% of the land area at the SSFL, completely destroying seven buildings and badly burning three other buildings. The overall fire area, both on-site and off-site, was about 24,000 acres. Following the fire, Boeing initiated a sampling effort to assess the impact of the fire on ambient conditions at the SSFL and in surrounding areas. Soil and ash samples were collected at previously sampled Department of Toxic Substances Control (DTSC)-approved soil background sample locations in October 2005. These samples were analyzed for fire-related chemicals for comparison to pre-fire ambient results. Approximately one week after the Topanga Fire, another fire occurred in Burbank, approximately 20 miles east of the SSFL. This latter fire is known as the Harvard Fire. Additional samples from undeveloped, ambient locations within and adjacent to the burn areas of both fires were collected soon after the Harvard Fire and analyzed for fire-related chemicals to provide regional post-fire data for reference and comparison purposes. Surface water runoff samples were collected during each storm event from October 2005 through May 2006 from those surface water drainages that had storm water discharges at the time of sampling.[10] All results validated to date are included in Appendix A of this report and are discussed in greater detail below. Sampling locations where storm water, soil and ash samples were collected are shown in Table A-5 and in Figures A-1 and A-2. Continued sampling and assessment of these ambient surface water drainages is planned.

3.2.1 Boeing Measurements of Soil and Ash Before and After the Topanga Fire

Prior to the Topanga and Harvard Fires in the Fall of 2005, Boeing characterized naturally occurring soil conditions at and surrounding the SSFL as part of the RCRA program being conducted under the regulatory oversight of the DTSC. The DTSC-approved soil background data and comparison levels established from metals and dioxins results obtained from 29 DTSC-approved background sample locations are provided in Tables A-1 and A-2 (MWH 2005, California DTSC 2005). Tables A-1 through A-4 in Appendix A provide metals and dioxins concentrations in ambient soils (pre- and post-fire) and in ash (post-fire) collected both from the SSFL and off-site.[11] These results are also summarized below.

Six soil samples were collected at six DTSC-approved soil background locations in or around the site, Four of these locations are onsite and within the burn area of the Topanga Fire. One location is onsite, but outside the Topanga Fire burn area. One location is offsite, but within the burn area. Ash samples were collected at four of the soil background locations within the burn area where ash was visible. The two locations not sampled for ash did not have visible ash deposits at the time of sampling, though they likely received ash fall due to their proximity to the Topanga Fire.

Onsite and offsite reference soil and ash samples were also collected in and around the vicinity of the SSFL and at the Harvard fire site. Two of the reference sample locations are upstream of NPDES outfalls, in drainages that are in the southern, undeveloped portion of the SSFL, and are within the onsite burn area. All other reference samples were collected from offsite undeveloped areas. Initial background and reference soil and ash samples were taken between September 30, 2005, and October 18, 2005. Additional soil and ash offsite reference samples were collected in February 2006. To date, post-Topanga Fire soil and ash results collected from DTSC-approved soil background locations show that the analytes barium, boron, cadmium, copper, lead, manganese, zinc, thallium, potassium, and sodium were detected at maximum concentrations above background levels approved by DTSC for the SSFL.

Table 10 summarizes the results to date for ash and soil concentrations of key constituents at off-site locations and DTSC-approved SSFL background locations. Average concentrations are shown with corresponding minimum and maximum observed concentrations in parenthesis. Pre-fire and post-fire metals concentrations have been characterized assuming

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[10] Initial data collected from October 2005 through early January 2006 from these locations were provided in Appendix A to Boeing's "Response to Tentative Cease and Desist Order R4-2006-0XXX" (January 5, 2006).

[11] Tables A-1 through A-4 were generated using the same data criteria and summation methods employed by the Regional Board in Reasonable Potential Analyses conducted for storm water runoff from the SSFL.

that non-detect values were equal to the detection limit. There is considerable variability in constituent concentrations at all locations, but concentrations are generally consistent between in off-site reference and background media.

Table 10 – Concentrations of Metals and Dioxin in Ash and Soil Samples Collected On-Site[12], Off-Site, and Background Samples

Constituent	Units	DTSC Pre Fire SSFL Soil Background Comparison Value	Post Fire Soil Concentrations from SSFL Background Sites: Average (Range)	Post Fire Soil Concentrations in Off-site Reference Samples: Average (Range)	Post Fire Ash Concentrations from SSFL Background Sites: Average (Range)	Post Fire Ash Concentrations in Off-site Reference Samples: Average (Range)
TCDD TEQ	(ng/kg)	0.98	0.53 (0.12-1.3)	0.17 (0.01-0.57)	1.6 (0.59-3.2)	3.0 (0.009-17.4)
Antimony	(mg/kg)	8.7	0.81 (0.81-0.81)	0.11 (0.04-0.19)	1.7 (1.6-1.7)	0.4 (0.12-0.7)
Arsenic	(mg/kg)	15	4.9 (2.7-11)	6.0 (0.9-13)	2.6 (1.2-3.9)	4.5 (0.6-10)
Barium	(mg/kg)	140	83 (59-110)	103 (43-230)	260 (130-360)	325 (140-630)
Beryllium	(mg/kg)	1.1	0.51 (0.45-0.62)	0.5 (0.2-0.8)	0.53 (0.4-0.88)	0.6 (0.2-1.1)
Boron	(mg/kg)	9.7	4.5 (1.0-6.6)	6.5 (1-14)	88 (48-160)	140 (10-330)
Cadmium	(mg/kg)	1	0.55 (0.47-0.62)	0.15 (0.03-0.52)	0.7 (0.4-1.1)	0.5 (0.08-1.5)
Chromium	(mg/kg)	36.8	16 (12-18)	13.5 (3.6-20)	10 (2.3-18)	15 (3.8-35)
Copper	(mg/kg)	29	10 (8-13)	15.0 (5.6-30)	34 (15-64)	47 (13-84)
Iron	(mg/kg)	28000	17200 (15000-19000)	18800 (11000-32000)	9600 (4200-17000)	17000 (8700-33000)
Lead	(mg/kg)	34	17 (9.5-27)	8.4 (2.4-14)	28 (5.2-64)	18 (9.4-42)
Manganese	(mg/kg)	495	320 (260-390)	480 (140-1700)	470 (220-610)	650 (270-1400)
Mercury	(mg/kg)	0.09	0.009 (0.003-0.017)	0.004 (0.003-0.006)	0.018 (0.003-0.058)	0.007 (0.003-0.029)
Nickel	(mg/kg)	29	14 (11-21)	10.4 (3.1-18)	15 (7-24)	18 (4.5-37)
Selenium	(mg/kg)	0.655	1.6 (1.0-2.2)	0.8 (0.2-3.2)	2.6 (2-4.4)	1.0 (0.2-3.8)
Silver	(mg/kg)	0.79	0.62 (0.4-0.87)	0.04 (0.02-0.06)	1.1 (0.8-1.8)	0.15 (0.06-0.23)
Thallium	(mg/kg)	0.46	2.8 (1.8-4.5)	0.3 (0.1-0.4)	2.5 (1.6-3.5)	0.21 (0.16-0.34)
Vanadium	(mg/kg)	62	29 (23-37)	34 (18-80)	21 (8.4-35)	37 (15-71)
Zinc	(mg/kg)	110	59 (51-67)	61 (29-100)	115 (57-190)	160 (58-350)

All samples were collected between October 2005 and February 2006.

These results show the variability of constituent concentrations in ash and soil following a wildfire event. Additionally, Table 10 illustrates that soil and ash constituent concentrations at SSFL following the Chatsworth Topanga Fire are very similar to post-fire off-site constituent concentrations. Furthermore, results to date show that the upper range of observed SSFL post-fire background and off-site soil concentrations for TCDD TEQ, barium, boron, copper, iron, manganese, selenium, silver, thallium, and vanadium exceed DTSC pre-fire background concentration comparison values. Likewise, results to date show

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[12] Boeing SSFL's post-fire background location soil sampling occurred at six DTSC-approved background locations. The DTSC pre-fire background comparison values were determined using samples from 29 locations on the SSFL determined to be representative of background conditions.

that the upper range for ash constituent concentrations at both background locations and regional off-site drainage locations are above DTSC pre-fire approved background concentrations for the constituents TCDD TEQ, barium, boron, cadmium, copper, iron, lead, manganese, nickel, selenium, silver, thallium, vanadium, and zinc.

3.2.2 Fire Impacts on Dioxin Emissions At or Near the SSFL

Dioxin emissions from the 2005 Topanga Fire can be estimated for both the portions of the SSFL site that burned and for the overall burn area. Table 11 applies the wood stove estimates developed in Table 6 to estimate the possible range of dioxin emissions from these areas and from other major southern California fires.

Table 11 – Estimated Dioxin Emissions From Various Fires At or Near the SSFL

Fire Location	**Fire Size (acres)**	**Estimated Dioxin Emitted by Forest Fire (g TEQ)**	**Potential Range in Dioxin Emitted by Forest Fire (g TEQ)**
SSFL 2005 Fire (Part of Topanga Fire)	2,000	0.04	(0.01-0.12)
Topanga, 2005	24,000	0.45	(0.14-1.4)
Burbank Fire, 2005	700	0.013	(0.0042-0.042)
Piru/Simi Valley, 2003	172,000	2.6	(0.82-8.2)
Total Southern California Fires (2003) *	744,000	14	(4.4-44)

*2003 Southern California Fires include Cedar, Mountain, Camp Pendleton, Dulzura, Grand Prix, Old, Padua, Paradise, Piru, Simi Valley, and Verdale Fires.

The methodology used in Table 8 can be used to provide an order of magnitude estimate of potential dioxin concentrations in storm water due to the Topanga Fire at SSFL. This order-of-magnitude calculation, as shown in Table 12, was made assuming that dioxins will have transmission efficiencies similar to metals, and indicates that average storm water concentrations due to dioxin emissions following the 2005 Topanga fire at the SSFL may be one to three orders of magnitude greater than the 2006 NPDES permit limit. The range of potential dioxin storm water concentrations presented in Table 13 also falls within the range of dioxin storm water concentrations measured at the SSFL in October and November of 2005, and presented in Figure 8 in Section 3.4.1.

Table 12 – Order of Magnitude Estimate for Dioxin Concentration in Storm Water Due to the 2005Topanga Fire

Average Volume of Rainfall at SSFL (L)[*]	Estimated Average Annual Runoff (L)[**]	Dioxin Emissions Resulting From Fires at SSFL[***] (g TEQ)	Storm Water Transmission Efficiency Factor	Estimated Average Storm Water Concentration and Range from SSFL during an Average Precipitation Year[****] (µg TEQ/L)	2006 Dioxin (TCDD) NPDES Permit Daily Max (µg TEQ/L)
$4.39\text{x}10^9$	$1.76\text{x}10^9$	0.04 (0.01-0.12)	10%	$1.9\text{x}10^{-6}$ ($4.7\text{x}10^{-7}$ to $6.64\text{x}10^{-6}$)	$2.8\text{x}10^{-8}$
			50%	$9.5\text{x}10^{-6}$ ($2.4\text{x}10^{-7}$ to $3.3\text{x}10^{-5}$)	

[*] Estimated rainfall volume was calculated by applying average rainfall rate of 18 in/yr across SSFL area, 2850 acres.

[**] An estimated Runoff Coefficient of 0.4 (Dunne and Leopold, p. 300) has been applied to the average annual rainfall volume to determine average annual runoff.

[***] See Table 11

[****] Assumes that 10% and 50% of dioxin emissions at SSFL from the Topanga Fire are transmitted to storm water runoff at SSFL over an average year.

3.3 Erosion of Native Soils at the SSFL

3.3.1 Erosion of Native Soils Contribution to SSFL Runoff

Because soils naturally contain metals and other constituents that are regulated at the SSFL, soil erosion has the potential to contribute to metals concentrations and loads in storm water runoff. Measured concentrations of these constituents in site soils and measured Total Suspended Solids (TSS) concentrations in storm water runoff from the site can be used to estimate the likely concentrations and loads in storm water runoff from the SSFL. To characterize the TSS concentrations and loads in storm water runoff from the site, drainages were grouped by slope and downstream receiving water. TSS data for Outfalls 001, 002, 008, 011, and 018 were pooled as representative of the south slope drainage into Bell Creek. TSS data for Outfalls 003-007, 009, and 010 were pooled as representative of the north slope drainages into the Arroyo Simi. Pre-fire and post-fire TSS concentrations have been characterized by calculating a geometric mean of all data points, assuming that non-detect values were equal to half of the detection limit (5 mg/L or 10 mg/L). TSS data for storm water runoff from the site, including maximum observed TSS values, have been compiled in Table 13.

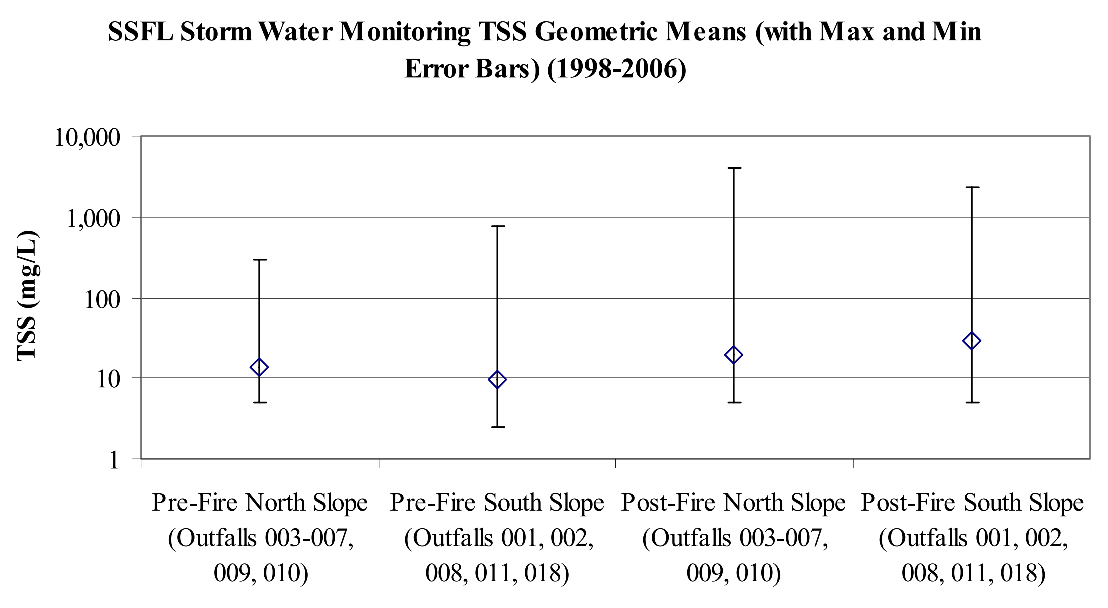
Table 13 shows that the geometric mean TSS concentrations in storm water runoff following the Topanga Fire are approximately 50-300% greater than the TSS concentrations in pre-fire runoff samples. This effect was most pronounced in storm water samples collected during the first three months after the fire. The TSS concentrations are more than one order of magnitude greater than the TSS concentrations in pre-fire runoff samples for both the north and south slopes of the SSFL.

Table 13 – Statistical Distribution of SSFL TSS Concentrations

	Pre Fire Data			Post Fire Data		
TSS Data Comparison	Pre Fire Geometric Mean (mg/L)	Pre Fire Max Observed (mg/L)	Data Size (# Detects / # Samples)	Post Fire Geometric Mean (mg/L)	Post Fire Max Observed (mg/L)	Data Size (# Detects / # Samples)
North Slope (Outfalls 003-007, 009, 010)	14	300	(55/98)	20	4000	(30/62)
South Slope (Outfalls 001,002, 008, 011,018)	9	760	(58/140)	30	2300	(23/32)

Note: Determination of the statistical distribution assumed that non-detect TSS loads were equal to half the detection limit of 10 mg/L. Monitoring data utilized are from October 1998 to May 2006.

Figure 4 – Statistical Distribution of TSS Concentrations at the SSFL



3.3.2 Contribution of Native Sediments and Ash to Surface Water Runoff Constituent Concentrations at the SSFL

Erosion of native soils at SSFL may contribute to both concentrations and loads of key constituents in storm water, particularly in runoff with high TSS loads. The concentrations of metals and dioxin in storm water associated with TSS in storm flows can be estimated using measured concentrations of trace elements in background soils at the SSFL. As presented in Section 3.2.1, soil samples have been taken from DTSC-approved background locations at the site. By assuming that the TSS load in storm water results from erosion of native soils, a range of potential background constituent loadings due to the erosion of native soils alone may be estimated by multiplying average pre-fire background soil concentrations (see Section 3.2.1) by the catchment-specific pre-fire TSS concentrations (see Section 3.3.1). The contribution of native soils to pre-fire storm water constituent concentrations is presented in Table 14a. Post-fire estimates were made using the average post-fire soil concentrations, average post-fire ash concentrations, and post-fire TSS concentrations, and are compared with pre-fire DTSC background soil comparison data, as shown in Table 14b. As presented in Table 11 and Appendix A, concentrations of regulated constituents are often higher in ash than they are in post-fire soils, although the post-fire soils data set is limited in size. Thus, the presence of ash in storm water runoff could result in even higher concentrations of regulated constituents than are presented in Tables 14a and 14b.

Table 14a – Estimated Storm Water Constituent Concentrations from Soil Erosion at the SSFL prior to the 2005 Topanga Fire

Metal	SSFL DTSC Pre-Fire Background Soil Comparison Concentration (mg/kg)	Pre-Fire SSFL TSS Associated Storm Water Concentration, North Slope [TSS 14 (5-300) (mg/L)] (µg/L)	Pre-Fire SSFL TSS Associated Storm Water Concentration, South Slope [TSS 9 (2.5-760) (mg/L)] (µg/L)	2006 NPDES Daily Maximum Permit Level (µg/L)	2006 NPDES Monthly Average Permit Limit (µg/L)
Antimony	8.7	0.12 (0.09-2.6)	0.1 (0.05-6.6)	6	--
Arsenic [*]	15	0.21 (0.15-4.5)	0.1 (0.1-11)	10	--
Barium	140	2.0 (1.4-42)	1.3 (0.8-110)	1000	--
Beryllium [*]	1.1	0.02 (0.01-0.3)	0.01 (0.01-0.8)	4	--
Boron	9.7	0.14 (0.10-2.9)	0.1 (0.06-7.4)	1000	--
Cadmium	1	0.01 (0.01-0.3)	0.01 (0.01-0.8)	3.1	2
Chromium [*]	36.8	0.5 (0.4-11)	0.4 (0.2-28)	16.3	8.1
Copper	29	0.4 (0.3-8.7)	0.3 (0.2-22)	14	7.1
Iron [*]	28000	390 (280-8400)	270 (170-21,300)	300	--
Lead	34	0.5 (0.3-10.2)	0.3 (0.2-26)	5.2	2.6
[*] Manganese	495	6.9 (5.0-150)	4.7 (3.0-380)	50	--
Mercury	0.09	0.001 (0.001-0.03)	0.001 (0.001-0.07)	0.1	0.05
Nickel [*]	29	0.4 (0.3-8.7)	0.3 (0.2-22)	96	35
Selenium [*]	0.655	0.01 (0.01 -0.2)	0.01 (0.004-0.5)	5.0	4.1
Silver [*]	0.79	0.01 (0.01 -0.2)	0.01 (0.005-0.6)	4.1	2
Thallium	0.46	0.01 (0.005-0.1)	0.01 (0.003-0.35)	2	--
Zinc [*]	110	1.5 (1.1-33)	1.1 (0.66-83.6)	119	54

[*] These constituents have permit limits for Outfalls 001, 002, 011, and 018 only.

[**] This constituent has a permit limit only at Outfalls 003-007, 008, and 010.

Referenced 2006 NPDES permit limits are the lowest limits for any given constituent in the SSFL NPDES permit.

Table 14b– Estimated Storm Water Constituent Concentrations from Soil Erosion at the SSFL Following the 2005 Topanga Fire

Metal	SSFL DTSC Pre-Fire Background Soil Comparison Concentration (mg/kg)	SSFL Background Location Post-Fire Soil Concentration Average (Range) (mg/kg)	Post-Fire SSFL TSS Associated Storm Water Concentration, North Slope [TSS 20 (5-4,000) mg/L] (µg/L)	Post-Fire SSFL TSS Associated Storm Water Concentration, South Slope [TSS 30 (5-2,300) mg/L] (µg/L)	2006 NPDES Daily Maximum Permit Level (µg/L)	2006 NPDES Monthly Average Permit Limit (µg/L)
Antimony	8.7	0.8 (0.8-0.8)	0.02 (0.004-3.2)	0.02 (0.004-1.9)	6	--
Arsenic*	15	4.9 (2.7-11)	.10 (0.02-20)	0.15 (0.02-11)	10	--
Barium	140	83 (59-110)	1.7 (0.41-330)	2.5 (0.41-190)	1000	--
Beryllium*	1.1	0.5 (0.5-0.6)	0.01 (0.002-2.1)	0.02 (0.002-1.2)	4	--
Boron	9.7	4.5 (1.0-6.6)	0.09 (0.02-18)	0.13 (0.02-10)	1000	--
Cadmium	1	0.5 (0.5-0.6)	0.01 (0.003-2.2)	0.02 (0.003-1.3)	3.1	2
Chromium*	36.8	16 (12-18)	0.32 (0.08-63)	0.48 (0.08-36)	16.3	8.1
Copper	29	10 (8-13)	0.21 (0.05-41)	0.31 (0.05-24)	14	7.1
Iron*	28000	17,200 (15,000-19,000)	340 (85-69,000)	515 (85-39,000)	300	--
Lead	34	16.6 (9.5-27)	0.33 (0.08-66)	0.50 (0.08-38)	5.2	2.6
Manganese*	495	320 (260-390)	6.4 (1.6-1280)	9.6 (1.6-740)	50	--
Mercury	0.09	0.009 (0.003-0.7)	0.0002 (0.00005-0.04)	0.0003 (0.00005-0.02)	0.1	0.05
Nickel*	29	14 (11-21)	0.27 (0.07-54)	0.41 (0.07-31)	96	35
Selenium*	0.655	1.6 (1.0-2.2)	0.03 (0.008-6.2)	0.05 (0.008-3.6)	5.0	4.1
Silver*	0.79	0.6 (0.4-0.9)	0.01 (0.003-2.5)	0.02 (0.003-1.4)	4.1	2
Thallium	0.46	2.8 (1.8-4.5)	0.05 (0.01-11)	0.09 (0.01-6.5)	2	--
Zinc*	110	59 (51-67)	1.2 (0.29-230)	1.8 (0.29-130)	119	54

[*] These constituents have permit limits for Outfalls 001, 002, 011, and 018 only.

[**] This constituent has a permit limit only at Outfalls 003-007, 008, and 010.

Referenced 2006 NPDES permit limits are the lowest limits for any given constituent in the SSFL NPDES permit.

As seen above in Table 14b, post-fire estimated storm water concentrations from the erosion of native soils at the SSFL may exceed the Metals Toxic Maximum Daily Load (TMDL) concentration-based waste load allocations for copper, lead, and zinc in the Los Angeles River at Wardlow and for selenium in Reach 6 of the Los Angeles River.[13] Again, the presence of ash in storm water runoff could result in even higher concentrations of these constituents than are shown in Table 14b.

Concentrations of dioxin in storm water that would result from the presence of soil in storm water can be estimated in a similar manner, as shown in Table 15. This estimate shows that even pre-fire, background soil dioxin concentrations could result in exceedances of monthly permit limits for dioxin. Post-fire, these concentrations would increase by about an order of magnitude. Measured dioxin concentrations in ash samples collected from DTSC background locations were greater than dioxin concentrations in post-fire soils (0.59 to 3.2

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[13] The Los Angeles River Metals TMDL wet weather concentration-based WLAs for the Los Angeles River at Wardlow are: cadmium= 3.1 (µg/L), copper = 17 (µg/L), lead = 62 (µg/L), and zinc = 159 (µg/L). The dry weather concentration-based WLA for selenium in Reach 6 of the Los Angeles River is 5 (µg/L). (Los Angeles Regional Water Quality Control Board, 2005).

ng (TEQ)/kg for ash). Thus, the presence of ash in storm water runoff from the site will increase dioxin concentrations above the levels present in background site soils. As discussed in Section 3.2.1, dioxin concentrations in post-fire on-site soils and ash are comparable to those measured in post-fire off-site soils and ash, indicating that this phenomenon is not unique to the SSFL site.

Table 15 – Estimated SSFL Native Soils Storm Water Dioxin Load

	TSS Distribution [Geometric mean] (Range)](mg/L)	SSFL Background Dioxin Soil Concentration (ng(TEQ)/kg)	Range of Dioxin TSS Associated Storm Water Concentrations (µg/L)	2006 NPDES Daily Maximum Permit Limit (µg/L)	2006 NPDES Monthly Average Permit Limit (µg/L)
Pre-Fire North Slope	14 (5-300)	0.29 (0-0.98)	Non Detect to $1.4\text{x}10^{-8}$	$2.8\text{x}10^{-8}$	$1.4\text{x}10^{-8}$
Pre-Fire South Slope	9 (2.5-760)	0.29 (0-0.98)	Non Detect to $8.8\text{x}10^{-9}$		
Post-Fire North Slope	20 (5-4000)	0.53 (0.12-1.3)	$2.4\text{x}10^{-9}$ to $2.6\text{x}10^{-8}$		
Post-Fire South Slope	30 (5-2300)	0.53 (0.12-1.3)	$3.6\text{x}10^{-9}$ to $3.9\text{x}10^{-8}$		

3.4 COMPARISON OF STORM WATER RUNOFF FROM SSFL WITH STORM WATER RUNOFF FROM VARIOUS LAND USE TYPES AND WITHIN RECEIVING WATERS IN THE LOS ANGELES REGION

3.4.1 Concentrations Of Metals in Storm Water Runoff from SSFL, from Various Land Use Type, and Within Receiving Waters in the Los Angeles Region

The concentrations of metals in storm water discharges from the SSFL can be compared to storm water runoff from regional catchments affected by wildfires, storm water discharges from other land use types, and from other facilities within the Region. For example, Figures 5, 6, and 7 provide a summary of measured copper, lead, and zinc concentrations in storm water, including the computed average and observed range in concentrations. Data sets were collected by Boeing and by the Los Angeles County Department of Public Works (LACDPW) and are described below.

Data shown in Figures 5, 6, and 7 are characterized as follows:

- **Boeing SSFL Storm Water Monitoring Data Set (blue diamond):** Storm water monitoring data from samples collected from September 2004 to May 2006 were divided into three representative data sets, as follows:
    - Pre-fire samples from Outfalls 003-007 (57 samples for copper, 57 samples for lead, and 5 samples for zinc from October 2004 to April 2005)
    - Post-fire samples from Outfalls 003-007 (45 samples for copper, 45 samples for lead, and 5 samples for zinc from October 2005 to May 2006)
    - Pre-fire samples from Outfalls 001 and 002 (40 samples for copper, 41 samples for lead, and 5 samples for zinc from October 2004 to April 2005).
    - Post-fire samples from Outfalls 001 and 002 (20 samples for copper, 18 samples for lead, and 3 samples for zinc from October 2005 to May 2006).

The results shown in these graphs include the average, minimum, and maximum measured concentrations.

- **LACDPW Land Use Storm Water Data Set (red square):** The LACDPW monitored storm water constituent concentrations in samples collected from various land use types from 1994 to 2000. Catchments representative of the eight dominant land use types within the County were used for these sampling events (see Los Angeles County, 2000). LACDPW reports the average and median concentrations and the coefficient of variation for each data set. Figures 5-7 presents the average concentration with error bars at plus or minus two standard deviations[14].
- **LACDPW Receiving Water Data (green triangle):** LACDPW collects storm water samples from the Los Angeles River at the Wardlow Gage Station (near the Los Angeles River estuary) and from Sawpit Creek, a catchment that is 98% open space and located in the foothills of the San Gabriel Mountains. The plot includes the average, minimum, and maximum measured concentrations for samples collected from October 1998 to February 2006 (Los Angeles River) and November 1998 to March 2001 (Sawpit Creek). Sampling data were taken from the LACDPW's annual storm water quality reports (on line at http://ladpw.org/wmd/NPDES/report_directory.cfm).
- **Boeing Post Topanga Fire- Regional Drainage Storm Water Monitoring (purple circle):** This data set is described in Section 3.2.1, and laboratory data can be found in Table A-3 in Appendix A. A total of 38 surface water wet weather samples were collected for copper, lead, and zinc at twelve sites from October 2005 to May 2006, following the Topanga and Harvard Fires.

  Analysis of the data discussed above assumed that non-detect values were half of the detection limit[15].

Note that a similar comparison could not be made for mercury. LACDPW data could not be included, as the LACDPW laboratory analysis method for mercury uses a detection limit of 1 (µg/L). Almost all LACDPW samples resulted in non-detect levels of mercury (i.e., concentrations below 1 (µg/L)). Mercury concentrations in samples collected from the SSFL from September 2004 to November 2005 were analyzed and reported at a limit of 0.20 (µg/L).

As seen in Figures 5, 6, and 7 average concentrations of total copper, total lead, and total zinc in storm water samples collected from the SSFL before the 2005 Topanga fire are lower than average concentrations in storm water samples collected from several land use types (light industrial, transportation, commercial, and multi-family residential) within the Los Angeles Region, and are significantly lower than average concentrations in the Los Angeles River following storm events. The figures also show that even the maximum observed concentrations of total copper, lead and zinc in pre-fire storm water runoff from the SSFL

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[14] The standard deviation was calculated as the product of the mean and the coefficient of variation.

[15] Detection limit for copper = 5 µg/L for LACDPW data, 0.25-0.5 µg/L for Boeing data; lead = 5 µg/L for LACDPW data, 0.04-0.16 µg/L for Boeing data; zinc = 50 µg/L for LACDPW data, 3.7-15 µg/L for Boeing data.

are lower than the average measured concentrations of these metals in storm water runoff from several land use types and lower than the average measured concentrations of these metals in samples collected from the Los Angeles River following storm events.

Figure 5– Total Copper Concentrations in Storm Water Runoff from the SSFL, from Various Land Use Types, and in Surface Water in the Los Angeles Region

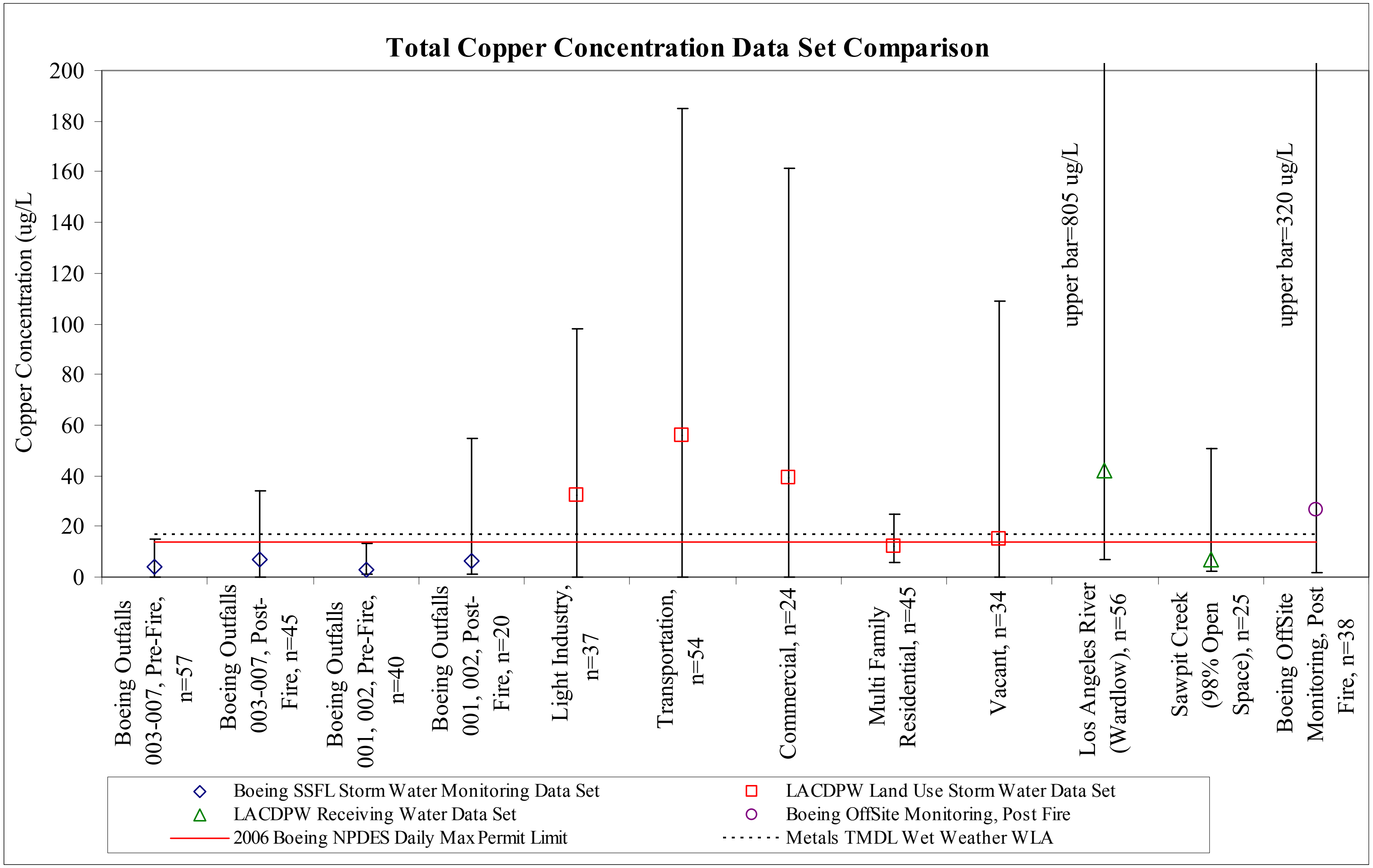
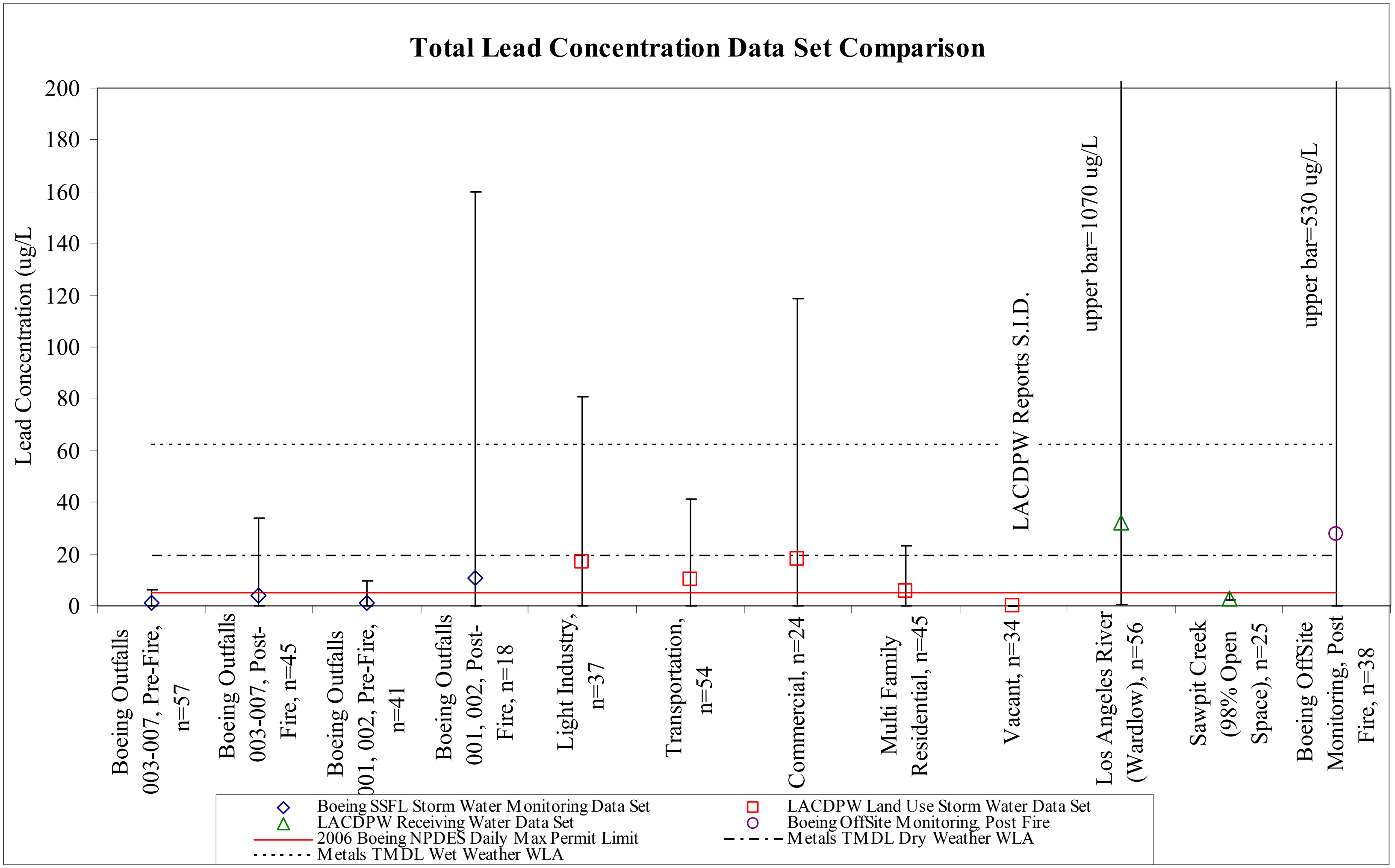
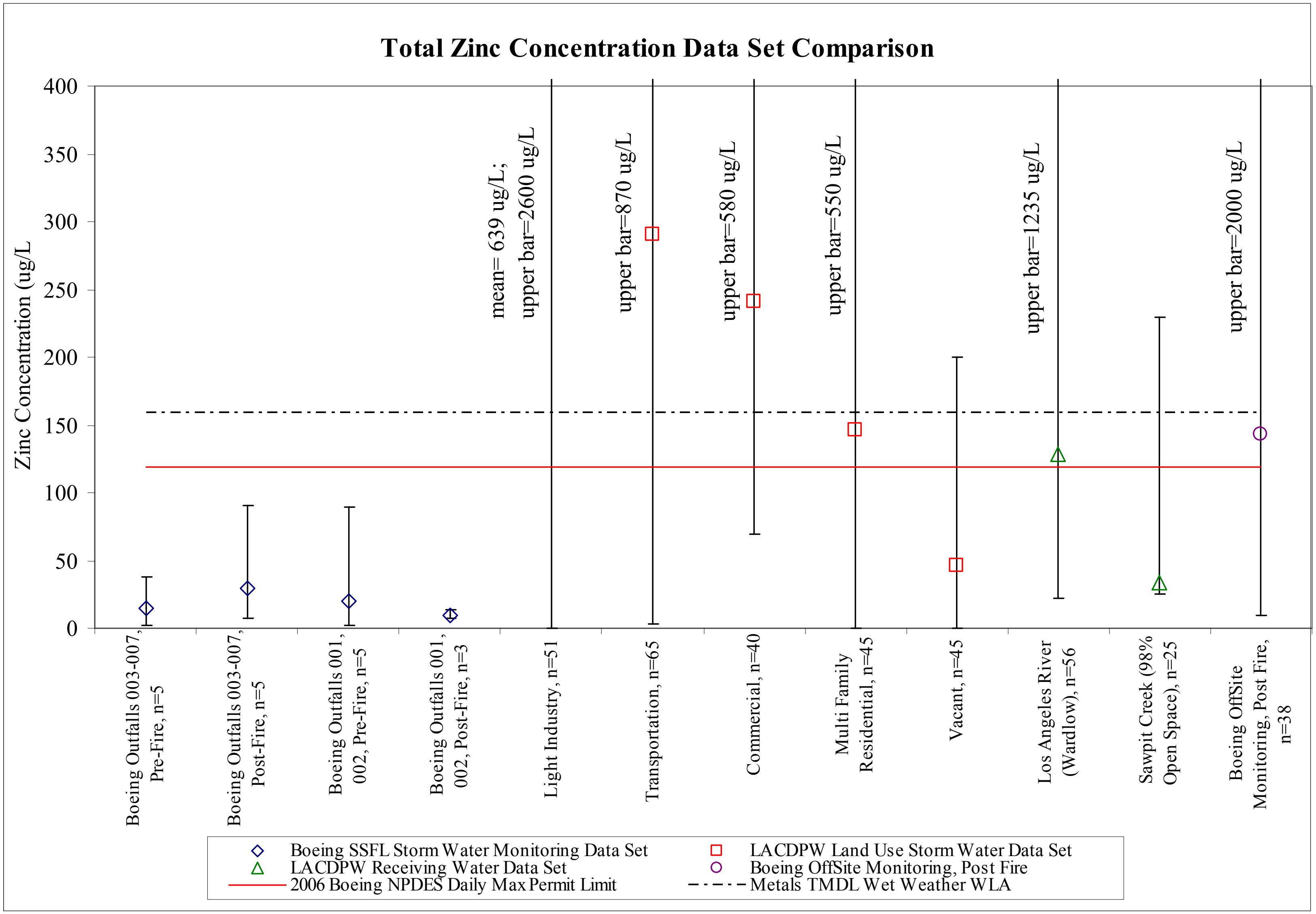


Figure 6 – Total Lead Concentrations in Storm Water Runoff from the SSFL, from Various Land Use Types, and in Surface Water in the Los Angeles Region



S.I.D. = Statistically Invalid Data, not enough data above detection limit collected

Figure 7– Total Zinc Concentrations in Storm Water Runoff from the SSFL, from Various Land Use Types, and in Surface Water in the Los Angeles Region



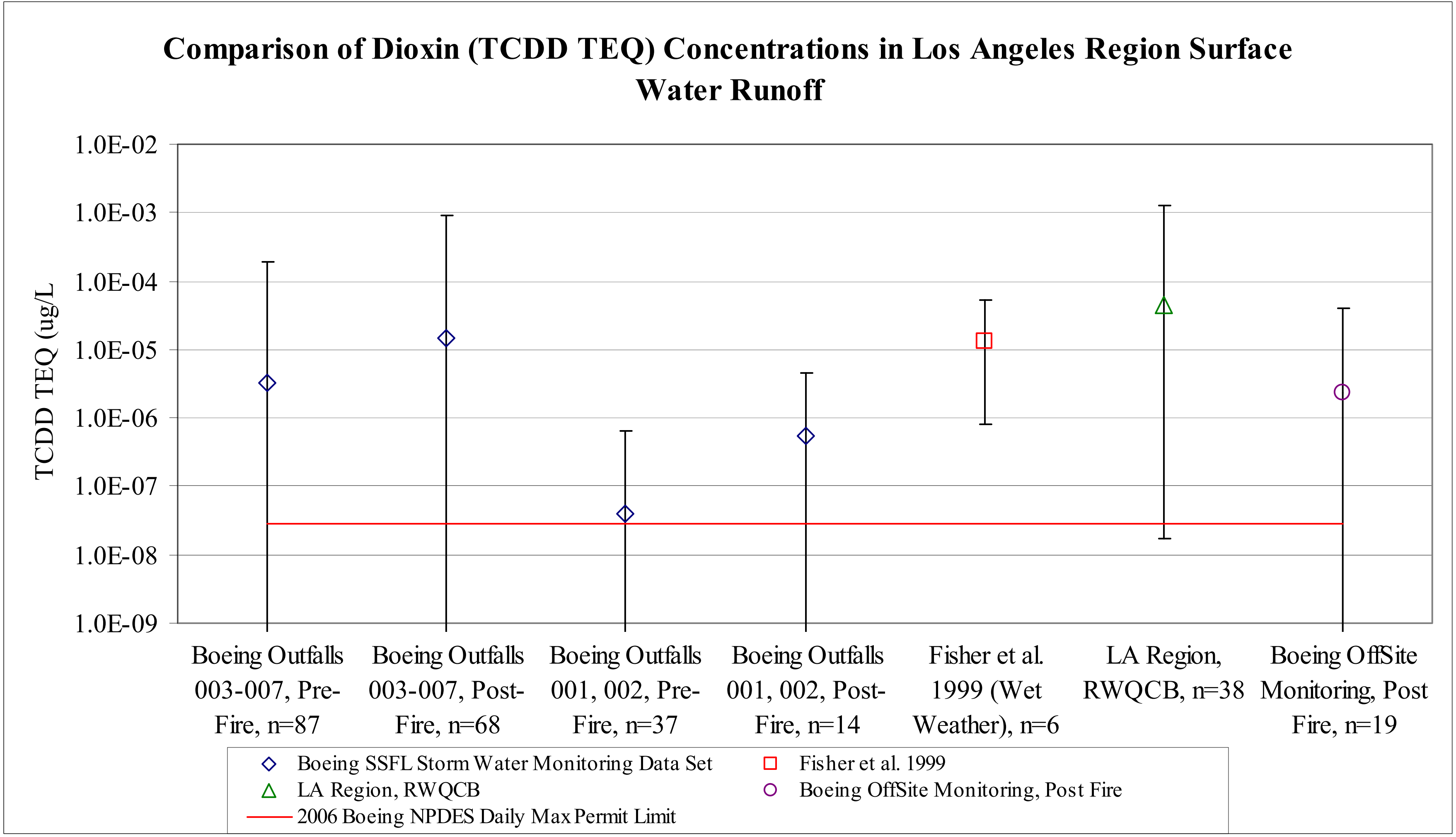
3.4.2 Concentrations of Dioxin in storm water runoff from SSFL, from Various Land Use Types, and Within Receiving Waters in the Los Angeles Region

Figure 8 summarizes available information on dioxin concentrations in storm flows from industrial facilities and in urban runoff throughout the Los Angeles Region and in runoff from the SSFL site. Data shown in Figure 8 can be characterized as follows:

- **Boeing SSFL Storm Water Monitoring Data Set (blue diamond):** Storm water monitoring data from samples collected from September 2004 to November 2005 were divided into three representative data sets, as follows:
  - Pre-fire samples from Outfalls 003-007 (87 samples from October 2004 to April 2005)
  - Post-fire samples from Outfalls 003-007 (68 samples from October 2005 to May 2006)
  - Pre-fire samples from Outfalls 001 and 002 (37 samples from October 2004 to May 2005).
  - Post-fire samples from Outfalls 001 and 002 (14 samples from October 2005 to May 2006).

  The results shown in these graphs include the average, minimum, and maximum measured concentrations.
- **Fisher et al., 1999, data set (red square):** Fisher et al. collected 18 samples, including 12 dry weather samples and six wet weather samples from four sampling sites in the Santa Monica Basin during 1988-1989. The average, minimum, and maximum TCDD (TEQ) concentrations from wet weather events are shown in this figure.
- **Los Angeles Regional Board data set (green triangle):** The Regional Board issued a Cal. Water Code §13267 request on August 3, 2001 asking for monitoring data for priority pollutants regulated pursuant to the California Toxics Rule, including TCDD (TEQ) ("dioxin"). Preliminary review of records received by the Regional Board for storm water samples collected by ten different permittees and at two non-permitted sites is shown in Figure 8. This plot shows the preliminary data analysis for the average, minimum, and maximum concentrations from 38 samples collected at 21 sites between September 2001 and March 2005. Samples were collected during both wet and dry weather conditions from industrial process water, storm flow runoff, and receiving waters. (Note that Boeing participated in this survey and submitted data on dioxin concentrations measured in storm water from the SSFL. Samples results from samples collected by Boeing were not included in the data represented by the green triangle.)
- **Boeing Post Topanga Fire Regional Drainage Storm Water Monitoring (purple circle):** This data set is outlined in Section 3.2.1 with accompanying Table A-3 in Appendix A. Post Topanga and Harvard Fires Sampling occurred at ten sites with a total of 19 surface water wet weather samples from October 2005 to January 2006.

Figure 8– Comparison of Dioxin [TCDD (TEQ)] Concentrations in Storm Water Runoff from the SSFL, from Los Angeles Region Land Use Types, and in Surface Water



As shown in Figure 8, dioxin concentrations in storm water runoff are highly variable (note the logarithmic scale), and average dioxin concentrations in storm water runoff from the SSFL site are lower than both average dioxin concentrations in wet weather samples collected in the Santa Monica Basin and Los Angeles River receiving water samples reported to the Los Angeles Regional Board pursuant to a Cal. Water Code § 13267 request.

4. RESULTS OF TESTS OF BMP AND HYDROMULCH MATERIALS

4.1 BMP AND HYDROMULCH MATERIALS TEST METHODOLOGY

Boeing conducted a series of tests in 2005 and 2006 to estimate the concentrations of regulated constituents in various best management practice (BMP) materials and to facilitate selection of materials that would minimize the potential for exceedances of permit limits in storm water runoff from the SSFL site. BMP materials are used to manage and filter storm water runoff at multiple locations on the SSFL site.

A wide range of BMP materials were tested, including several types of sand and gravel. Hydromulch materials considered for use following the 2005 Topanga fire were also tested. Several testing procedures were followed for each type of material. For the sands, 200-gram samples were either leached using 200 milliliters of de-ionized water for a certain time period (i.e., the sample was mixed with de-ionized water and continually agitated), or samples were simply combined with the water, stirred once, and set aside to soak for a certain time period, as specified in Table 16. Following either leaching or soaking, the water was decanted and analyzed for a range of metals (both total and dissolved) and dioxin toxicity equivalent (TEQ). In some cases, the sand was rinsed with de-ionized water prior to leaching or soaking.

For the gravels, 200-gram samples were soaked in 200 milliliters of de-ionized water and set aside for a certain time period, decanted, and the water was analyzed for metals and dioxin TEQ. In some cases, gravel samples were rinsed prior to soaking, and the decanted water was filtered prior to analysis, again leaving only dissolved constituents.

For hydromulch materials samples, generally, 50-gram samples of material were mixed with two liters of water and set aside to soak (for mercury analyses 10-gram samples were mixed with 200 milliliters of water, and for dissolved analyses 20-gram samples were mixed with two liters of water). After soaking, the solid and liquid were separated and each was analyzed individually. One hydromulch material—Soil Set—is a liquid and it was analyzed in its liquid state. Table 16 summarizes the specific materials tested and those testing procedures that varied from sample to sample. Table 17 summarizes the specific regulated constituents analyzed for each sample and corresponding SSFL 2006 NPDES Permit Limits.

Table 16 – BMP and Erosion Control Materials and Testing Procedures

Sample ID	BMP/ Erosion Control Material Group	BMP Material	Variable Testing Procedures
IOJ1924-01 DIWET	Sand	Colorado filter sand	Leached (1 hr.), filtered
IOJ1924-01RE1 DIWET	Sand	Colorado filter sand	Rinsed, leached (1 hr.), filtered
IOJ1924-02	Sand	Colorado filter sand	Rinsed, leached (1 hr.)
IOJ1924-03	Sand	Colorado filter sand	Rinsed, soaked (1 hr.)
IOJ1924-04	Sand	Colorado filter sand	Rinsed, soaked (15 min.)
IOJ1230-01 DIWET	Sand	Corona filter sand	Leached (24 hr.), filtered
IOJ1230-01RE1 DIWET	Sand	Corona filter sand	Leached (1 hr.), filtered
IOJ1230-01RE2 DIWET	Sand	Corona filter sand	Rinsed, leached (1 hr.), filtered
IOJ1230-02	Sand	Corona filter sand	Rinsed, leached (1 hr.)
IOJ1230-03	Sand	Corona filter sand	Rinsed, soaked (1 hr.)
IOJ1230-04	Sand	Corona filter sand	Material from IOJ1230-02 used, soaked (15 min.)
IPH2374-05	Sand	Moorpark filter sand	Leached (18 hrs.)
IPH2374-06	Sand	Irwindale filter sand	Leached (18 hrs.)
IPH2351-07	Sand	#8 Sand	Leached (18 hrs.)
IOK0111-01	Gravel	Road gravel	Rinsed, soaked (15 min.), filtered and unfiltered
IOK0111-02	Gravel	Pea bag gravel	Rinsed, soaked (15 min.), filtered and unfiltered
IOK0111-03	Gravel	Birds eye gravel	Rinsed, soaked (15 min.), filtered and unfiltered
IPH2351-08	Rock	Gabion rock	Crushed, leached (18 hrs.)
IPH2351-09	Rock	2”<Rock	Crushed, leached (18 hrs.)
IPH2351-10	Rock	Riprap	Leached (18 hrs.)
IOK1695-01	Hydromulch	Naka Hydroseed	Leached, soaked (15 min.), filtered and unfiltered
IOK0964-01	Hydromulch	Soil Set	Liquid material analysis
IOK0964-02	Hydromulch	StarTak 600	Water analysis, filtered and unfiltered
IOK0964-03	Hydromulch	Eco Fibre	Water analysis, filtered and unfiltered
IOK0964-04	Hydromulch	Eco Aegis	Water analysis, filtered and unfiltered
IOK0964-05	Hydromulch	Applegate N/D	Water analysis, filtered and unfiltered
IOK0964-06	Hydromulch	Applegate W/D	Water analysis, filtered and unfiltered
IOK0964-07	Hydromulch	Soil Guard	Water analysis, filtered and unfiltered
IOK0964-08	Hydromulch	Mat Fibre	Water analysis, filtered and unfiltered
IOK0964-09	Hydromulch	Eco Blend	Water analysis, filtered and unfiltered
IOK0964-10	Hydromulch	StarTak 600	Solid material analysis
IOK0964-11	Hydromulch	Eco Fibre	Solid material analysis
IOK0964-12	Hydromulch	Eco Aegis	Solid material analysis
IOK0964-13	Hydromulch	Applegate N/D	Solid material analysis
IOK0964-14	Hydromulch	Applegate W/D	Solid material analysis
IOK0964-15	Hydromulch	Soil Guard	Solid material analysis
IOK0964-16	Hydromulch	Mat Fibre	Solid material analysis
IOK0964-17	Hydromulch	Eco Blend	Solid material analysis
IPJ1500-02	Hydromulch	FlexTerra Hydromulch	Water analysis

Source: Boeing, 2005, 2006.

Table 17 – Regulated Constituents Analyzed During BMP and Erosion Control Materials

Constituent	SSFL 2006 NPDES Permit Limit (Daily Maximum)
Antimony	6.0 µg/l
Arsenic*	50 µg/l
Barium	1.0 mg/l
Beryllium	4.0 µg/l
Boron	1.0 µg/l
Cadmium	3.1 µg/l
Chromium*	16.3 µg/l
Copper	14.0 µg/l
Iron*	0.3 mg/l
Lead	5.2 µg/l
Manganese*	50 µg/l
Mercury	0.10 µg/l
Nickel*	96 µg/l
Selenium*	5.0 µg/l
Silver*	4.1 µg/l
Thallium	2.0 µg/l
Zinc*	119 µg/l
Dioxin TEQ	2.8 x 10^{-8} µg/l

Source: SSFL 2006 NPDES Permit (Order No. R4-2006-008).

* These constituents have permit limits for Outfalls 001, 002, 011, and 018 only.

4.2 BMP MATERIALS TESTING RESULTS

Given that, once in place, the BMP materials function as filters at the site, the passive soaking methodology best represents concentrations that would result from contact of storm water with BMP materials. Results presented in this section are a subset of the complete results of Boeing's BMP materials testing program as described above. (Complete results are presented in Appendix B.) The results summarized in Tables 18a through 18q include data from tests where BMP materials were soaked and the supernatant was not filtered. In the sand and gravel cases presented in Table 18, the materials were also rinsed before soaking, mimicking a steady-state, long-term condition of BMP materials at the site. Since SSFL 2004 NPDES Permit Limits are expressed in terms of total, not dissolved, metals, test results from unfiltered samples are presented.

Results for each permitted constituent are presented in Table 18, and include the ratio of the tested concentration to the permit limit for each constituent. Cases where this ratio is greater than 1.0—i.e., where the soak test result for a particular BMP material exceeded the permit limit—are in boldface. Note that as shown in Appendix B, several test methods (particularly the leaching method) produced constituent concentrations far higher than those shown in Table 18. Although these test results are not believed to be as representative of materials emplaced at the SSFL as the results presented in Table 18, they do indicate that the BMP materials themselves contain significant quantities of the constituents regulated in storm water runoff from the SSFL site.

After reviewing the results of these tests, Boeing selected the Corona filter sand and the Bird's eye gravel for use in the BMPs emplaced at the SSFL site. Hydromulch materials used at the site consisted of a mixture of the Applegate, Mat Fiber and Soil veg parts A and B[16].

Table 18a – Contributions to ANTIMONY Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (ug/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	0.18	6	0.03
Sand	Corona Filter Sand	0.24	6	0.04
Sand	Moorpark Filter Sand	1.4	6	0.23
Sand	Irwindale Filter Sand	0.19	6	0.03
Sand	#8 Sand	0.19	6	0.03
Gravel	Birds Eye Gravel	0.48	6	0.08
Gravel	Pea Bag Gravel	1.7	6	0.28
Gravel	Road Gravel	0.74	6	0.12
Rock	Gabion Rock	0.39	6	0.07
Rock	2"<Rock	0.2	6	0.03
Rock	Riprap	0.092	6	0.02
Hydroseed	Applegate N/D	76	6	**12.67**
Hydroseed	Applegate W/D	41	6	**6.83**
Hydroseed	Eco Aegis	17000	6	**2833.33**
Hydroseed	Eco Blend	4.4	6	0.73
Hydroseed	Eco Fibre	11	6	**1.83**
Hydroseed	Mat Fibre	5.2	6	0.87
Hydroseed	Naka Hydroseed	590	6	**98.33**
Hydroseed	Soil Guard	9.1	6	**1.52**
Hydroseed	Soil Set	0.68	6	0.11
Hydroseed	Star Tak	0.65	6	0.11
Hydromulch	FlexTerra	470	6	**78.33**

Source: Boeing, 2005, 2006.

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[16] No analytical results are available for Soil veg parts A and B.

Table 18b– Contributions to ARSENIC Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (ug/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	ND	50	0.00
Sand	Corona Filter Sand	14	50	0.28
Sand	Moorpark Filter Sand	ND	50	0.00
Sand	Irwindale Filter Sand	4.4	50	0.09
Sand	#8 Sand	ND	50	0.00
Gravel	Birds Eye Gravel	13	50	0.26
Gravel	Pea Bag Gravel	70	50	**1.40**
Gravel	Road Gravel	11	50	0.22
Rock	Gabion Rock	ND	50	0.00
Rock	2"<Rock	ND	50	0.00
Rock	Riprap	ND	50	0.00
Hydroseed	Applegate N/D	ND	50	0.00
Hydroseed	Applegate W/D	ND	50	0.00
Hydroseed	Eco Aegis	12	50	0.24
Hydroseed	Eco Blend	ND	50	0.00
Hydroseed	Eco Fibre	ND	50	0.00
Hydroseed	Mat Fibre	ND	50	0.00
Hydroseed	Naka Hydroseed	6.8	50	0.14
Hydroseed	Soil Guard	ND	50	0.00
Hydroseed	Soil Set	ND	50	0.00
Hydroseed	Star Tak	ND	50	0.00
Hydromulch	FlexTerra	5.4	50	0.11

Source: Boeing, 2005, 2006.

Table 18c – Contributions to BARIUM Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (mg/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	0.056	1	0.06
Sand	Corona Filter Sand	0.052	1	0.05
Sand	Moorpark Filter Sand	0.017	1	0.02
Sand	Irwindale Filter Sand	0.054	1	0.05
Sand	#8 Sand	0.014	1	0.01
Gravel	Birds Eye Gravel	0.32	1	0.32
Gravel	Pea Bag Gravel	0.78	1	0.78
Gravel	Road Gravel	0.23	1	0.23
Rock	Gabion Rock	ND	1	0.00
Rock	2"<Rock	ND	1	0.00
Rock	Riprap	ND	1	0.00
Hydroseed	Applegate N/D	0.024	1	0.02

Hydroseed	Applegate W/D	0.016	1	0.02
Hydroseed	Eco Aegis	0.017	1	0.02
Hydroseed	Eco Blend	0.022	1	0.02
Hydroseed	Eco Fibre	0.029	1	0.03
Hydroseed	Mat Fibre	0.014	1	0.01
Hydroseed	Naka Hydroseed	0.050	1	0.05
Hydroseed	Soil Guard	0.064	1	0.06
Hydroseed	Soil Set	0.028	1	0.03
Hydroseed	Star Tak	ND	1	0.00
Hydromulch	FlexTerra	ND	1	0.00

Source: Boeing, 2005, 2006.

Table 18d – Contributions to BERYLLIUM Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (ug/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	ND	4	0.00
Sand	Corona Filter Sand	2.8	4	0.70
Sand	Moorpark Filter Sand	ND	4	0.00
Sand	Irwindale Filter Sand	ND	4	0.00
Sand	#8 Sand	ND	4	0.00
Gravel	Birds Eye Gravel	ND	4	0.00
Gravel	Pea Bag Gravel	3.3	4	0.83
Gravel	Road Gravel	1.1	4	0.28
Rock	Gabion Rock	ND	4	0.00
Rock	2"<Rock	ND	4	0.00
Rock	Riprap	ND	4	0.00
Hydroseed	Applegate N/D	ND	4	0.00
Hydroseed	Applegate W/D	ND	4	0.00
Hydroseed	Eco Aegis	ND	4	0.00
Hydroseed	Eco Blend	ND	4	0.00
Hydroseed	Eco Fibre	ND	4	0.00
Hydroseed	Mat Fibre	ND	4	0.00
Hydroseed	Naka Hydroseed	ND	4	0.00
Hydroseed	Soil Guard	ND	4	0.00
Hydroseed	Soil Set	ND	4	0.00
Hydroseed	Star Tak	ND	4	0.00
Hydromulch	FlexTerra	ND	4	0.00

Source: Boeing, 2005, 2006.

Table 18e – Contributions to BORON Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (mg/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	ND	---	---
Sand	Corona Filter Sand	ND	---	---
Sand	Moorpark Filter Sand	0.026	---	---
Sand	Irwindale Filter Sand	0.095	---	---
Sand	#8 Sand	0.046	---	---
Gravel	Birds Eye Gravel	ND	---	---
Gravel	Pea Bag Gravel	0.064	---	---
Gravel	Road Gravel	0.010	---	---
Rock	Gabion Rock	0.089	---	---
Rock	2"<Rock	0.04	---	---
Rock	Riprap	0.032	---	---
Hydroseed	Applegate N/D	0.40	---	---
Hydroseed	Applegate W/D	0.17	---	---
Hydroseed	Eco Aegis	0.030	---	---
Hydroseed	Eco Blend	ND	---	---
Hydroseed	Eco Fibre	0.041	---	---
Hydroseed	Mat Fibre	ND	---	---
Hydroseed	Naka Hydroseed	0.057	---	---
Hydroseed	Soil Guard	0.012	---	---
Hydroseed	Soil Set	0.0084	---	---
Hydroseed	Star Tak	ND	---	---
Hydromulch	FlexTerra	0.44	---	---

Source: Boeing, 2005, 2006.

Table 18f – Contributions to CADMIUM Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (ug/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	0.15	3.1	0.05
Sand	Corona Filter Sand	0.045	3.1	0.01
Sand	Moorpark Filter Sand	ND	3.1	0.00
Sand	Irwindale Filter Sand	0.034	3.1	0.01
Sand	#8 Sand	ND	3.1	0.00
Gravel	Birds Eye Gravel	1.4	3.1	0.45
Gravel	Pea Bag Gravel	0.77	3.1	0.25
Gravel	Road Gravel	0.63	3.1	0.20
Rock	Gabion Rock	ND	3.1	0.00
Rock	2"<Rock	ND	3.1	0.00
Rock	Riprap	ND	3.1	0.00
Hydroseed	Applegate N/D	0.13	3.1	0.04

Hydroseed	Applegate W/D	0.15	3.1	0.05
Hydroseed	Eco Aegis	0.18	3.1	0.06
Hydroseed	Eco Blend	0.11	3.1	0.04
Hydroseed	Eco Fibre	0.24	3.1	0.08
Hydroseed	Mat Fibre	0.041	3.1	0.01
Hydroseed	Naka Hydroseed	0.31	3.1	0.10
Hydroseed	Soil Guard	0.47	3.1	0.15
Hydroseed	Soil Set	0.70	3.1	0.23
Hydroseed	Star Tak	ND	3.1	0.00
Hydromulch	FlexTerra	ND	3.1	0.00

Source: Boeing, 2005, 2006.

Table 18g – Contributions to CHROMIUM Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (ug/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	10	16.3	0.61
Sand	Corona Filter Sand	15	16.3	0.92
Sand	Moorpark Filter Sand	15	16.3	0.92
Sand	Irwindale Filter Sand	ND	16.3	0.00
Sand	#8 Sand	ND	16.3	0.00
Gravel	Birds Eye Gravel	58	16.3	**3.56**
Gravel	Pea Bag Gravel	100	16.3	**6.13**
Gravel	Road Gravel	38	16.3	**2.33**
Rock	Gabion Rock	ND	16.3	0.00
Rock	2"<Rock	ND	16.3	0.00
Rock	Riprap	ND	16.3	0.00
Hydroseed	Applegate N/D	2.0	16.3	0.12
Hydroseed	Applegate W/D	ND	16.3	0.00
Hydroseed	Eco Aegis	3.3	16.3	0.20
Hydroseed	Eco Blend	2.5	16.3	0.15
Hydroseed	Eco Fibre	4.0	16.3	0.25
Hydroseed	Mat Fibre	ND	16.3	0.00
Hydroseed	Naka Hydroseed	4.3	16.3	0.26
Hydroseed	Soil Guard	ND	16.3	0.00
Hydroseed	Soil Set	ND	16.3	0.00
Hydroseed	Star Tak	ND	16.3	0.00
Hydromulch	FlexTerra	ND	16.3	0.00

Source: Boeing, 2005, 2006.

Table 18h – Contributions to COPPER Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (ug/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	17	14	**1.21**
Sand	Corona Filter Sand	22	14	**1.57**
Sand	Moorpark Filter Sand	0.4	14	0.03
Sand	Irwindale Filter Sand	3.4	14	0.24
Sand	#8 Sand	0.35	14	0.03
Gravel	Birds Eye Gravel	32	14	**2.29**
Gravel	Pea Bag Gravel	86	14	**6.14**
Gravel	Road Gravel	25	14	**1.79**
Rock	Gabion Rock	0.27	14	0.02
Rock	2"<Rock	ND	14	0.00
Rock	Riprap	0.33	14	0.02
Hydroseed	Applegate N/D	7.1	14	0.51
Hydroseed	Applegate W/D	10	14	0.71
Hydroseed	Eco Aegis	8.4	14	0.60
Hydroseed	Eco Blend	4.2	14	0.30
Hydroseed	Eco Fibre	11	14	0.79
Hydroseed	Mat Fibre	2.8	14	0.20
Hydroseed	Naka Hydroseed	9.2	14	0.66
Hydroseed	Soil Guard	5.9	14	0.42
Hydroseed	Soil Set	140	14	**10.00**
Hydroseed	Star Tak	30	14	**2.14**
Hydromulch	FlexTerra	7.8	14	0.56

Source: Boeing, 2005, 2006.

Table 18i – Contributions to IRON Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (mg/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	7	0.3	**22.33**
Sand	Corona Filter Sand	15	0.3	**50.00**
Sand	Moorpark Filter Sand	ND	0.3	0.00
Sand	Irwindale Filter Sand	5.3	0.3	**17.67**
Sand	#8 Sand	0.41	0.3	**1.37**
Gravel	Birds Eye Gravel	35	0.3	**116.67**
Gravel	Pea Bag Gravel	160	0.3	**533.33**
Gravel	Road Gravel	35	0.3	**116.67**
Rock	Gabion Rock	0.41	0.3	**1.37**
Rock	2"<Rock	0.053	0.3	0.18
Rock	Riprap	0.12	0.3	0.40
Hydroseed	Applegate N/D	0.22	0.3	0.73
Hydroseed	Applegate W/D	0.15	0.3	0.50

Hydroseed	Eco Aegis	0.42	0.3	**1.40**
Hydroseed	Eco Blend	0.057	0.3	0.19
Hydroseed	Eco Fibre	0.38	0.3	**1.27**
Hydroseed	Mat Fibre	0.061	0.3	0.20
Hydroseed	Naka Hydroseed	2.6	0.3	**8.67**
Hydroseed	Soil Guard	0.11	0.3	0.37
Hydroseed	Soil Set	0.46	0.3	**1.53**
Hydroseed	Star Tak	0.11	0.3	0.37
Hydromulch	FlexTerra	0.034	0.3	0.11

Source: Boeing, 2005, 2006.

Table 18j – Contributions to LEAD Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (ug/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	6	5.2	**1.21**
Sand	Corona Filter Sand	2	5.2	0.29
Sand	Moorpark Filter Sand	ND	5.2	0.00
Sand	Irwindale Filter Sand	1.5	5.2	0.29
Sand	#8 Sand	0.13	5.2	0.03
Gravel	Birds Eye Gravel	8.1	5.2	**1.56**
Gravel	Pea Bag Gravel	87	5.2	**16.73**
Gravel	Road Gravel	19	5.2	**3.65**
Rock	Gabion Rock	0.7	5.2	0.13
Rock	2"<Rock	ND	5.2	0.00
Rock	Riprap	ND	5.2	0.00
Hydroseed	Applegate N/D	0.67	5.2	0.13
Hydroseed	Applegate W/D	0.56	5.2	0.11
Hydroseed	Eco Aegis	5.5	5.2	**1.06**
Hydroseed	Eco Blend	8.9	5.2	**1.71**
Hydroseed	Eco Fibre	2.9	5.2	0.56
Hydroseed	Mat Fibre	0.24	5.2	0.05
Hydroseed	Naka Hydroseed	3.7	5.2	0.71
Hydroseed	Soil Guard	0.40	5.2	0.08
Hydroseed	Soil Set	2.5	5.2	0.48
Hydroseed	Star Tak	0.32	5.2	0.06
Hydromulch	FlexTerra	ND	5.2	0.00

Source: Boeing, 2005, 2006.

Table 18k – Contributions to MANGANESE Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (ug/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	61	50	**1.22**

Sand	Corona Filter Sand	140	50	**2.80**
Sand	Moorpark Filter Sand	ND	50	0.00
Sand	Irwindale Filter Sand	52	50	**1.04**
Sand	#8 Sand	ND	50	0.00
Gravel	Birds Eye Gravel	400	50	**8.00**
Gravel	Pea Bag Gravel	3300	50	**66.00**
Gravel	Road Gravel	610	50	**12.20**
Rock	Gabion Rock	12	50	0.24
Rock	2"<Rock	ND	50	0.00
Rock	Riprap	ND	50	0.00
Hydroseed	Applegate N/D	65	50	**1.30**
Hydroseed	Applegate W/D	44	50	0.88
Hydroseed	Eco Aegis	300	50	**6.00**
Hydroseed	Eco Blend	63	50	**1.26**
Hydroseed	Eco Fibre	540	50	**10.80**
Hydroseed	Mat Fibre	67	50	**1.34**
Hydroseed	Naka Hydroseed	280	50	**5.60**
Hydroseed	Soil Guard	190	50	**3.80**
Hydroseed	Soil Set	33	50	0.66
Hydroseed	Star Tak	ND	50	0.00
Hydromulch	FlexTerra	ND	50	0.00

Source: Boeing, 2005, 2006.

Table 18l – Contributions to MERCURY Concentrations from BMP Materials

BMP/Erosion Control Material Type	**BMP Material**	**Concentration (ug/l)**	**SSFL 2006 NPDES Daily Max Permit Limit**	**Sample Result / Permit Limit**
Sand	Colorado Filter Sand	ND	0.1	0.00
Sand	Corona Filter Sand	ND	0.1	0.00
Sand	Moorpark Filter Sand	ND	0.1	0.00
Sand	Irwindale Filter Sand	ND	0.1	0.00
Sand	#8 Sand	ND	0.1	0.00
Gravel	Birds Eye Gravel	0.086	0.1	0.86
Gravel	Pea Bag Gravel	0.23	0.1	**2.30**
Gravel	Road Gravel	0.12	0.1	**1.20**
Rock	Gabion Rock	ND	0.1	0.00
Rock	2"<Rock	ND	0.1	0.00
Rock	Riprap	ND	0.1	0.00
Hydroseed	Applegate N/D	ND	0.1	0.00
Hydroseed	Applegate W/D	ND	0.1	0.00
Hydroseed	Eco Aegis	ND	0.1	0.00
Hydroseed	Eco Blend	ND	0.1	0.00
Hydroseed	Eco Fibre	ND	0.1	0.00
Hydroseed	Mat Fibre	ND	0.1	0.00
Hydroseed	Naka Hydroseed	ND	0.1	0.00
Hydroseed	Soil Guard	ND	0.1	0.00

Hydroseed	Soil Set	ND	0.1	0.00
Hydroseed	Star Tak	ND	0.1	0.00
Hydromulch	FlexTerra	ND	0.1	0.00

Source: Boeing, 2005, 2006.

Table 18m – Contributions to NICKEL Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (ug/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	4	96	0.05
Sand	Corona Filter Sand	12	96	0.13
Sand	Moorpark Filter Sand	ND	96	0.00
Sand	Irwindale Filter Sand	2.8	96	0.03
Sand	#8 Sand	ND	96	0.00
Gravel	Birds Eye Gravel	26	96	0.27
Gravel	Pea Bag Gravel	59	96	0.61
Gravel	Road Gravel	27	96	0.28
Rock	Gabion Rock	ND	96	0.00
Rock	2"<Rock	ND	96	0.00
Rock	Riprap	ND	96	0.00
Hydroseed	Applegate N/D	ND	96	0.00
Hydroseed	Applegate W/D	ND	96	0.00
Hydroseed	Eco Aegis	ND	96	0.00
Hydroseed	Eco Blend	ND	96	0.00
Hydroseed	Eco Fibre	2.2	96	0.02
Hydroseed	Mat Fibre	ND	96	0.00
Hydroseed	Naka Hydroseed	4.1	96	0.04
Hydroseed	Soil Guard	3.4	96	0.04
Hydroseed	Soil Set	7.2	96	0.08
Hydroseed	Star Tak	ND	96	0.00
Hydromulch	FlexTerra	ND	96	0.00

Source: Boeing, 2005, 2006.

Table 18n – Contributions to SELENIUM Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (ug/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	0.96	8.2	0.12
Sand	Corona Filter Sand	1.5	8.2	0.18
Sand	Moorpark Filter Sand	ND	8.2	0.00
Sand	Irwindale Filter Sand	ND	8.2	0.00
Sand	#8 Sand	4.1	8.2	0.50
Gravel	Birds Eye Gravel	12	8.2	**1.46**
Gravel	Pea Bag Gravel	ND	8.2	0.00

Gravel	Road Gravel	1.1	8.2	0.13
Rock	Gabion Rock	ND	8.2	0.00
Rock	2"<Rock	ND	8.2	0.00
Rock	Riprap	ND	8.2	0.00
Hydroseed	Applegate N/D	ND	8.2	0.00
Hydroseed	Applegate W/D	ND	8.2	0.00
Hydroseed	Eco Aegis	ND	8.2	0.00
Hydroseed	Eco Blend	ND	8.2	0.00
Hydroseed	Eco Fibre	ND	8.2	0.00
Hydroseed	Mat Fibre	ND	8.2	0.00
Hydroseed	Naka Hydroseed	0.51	8.2	0.06
Hydroseed	Soil Guard	ND	8.2	0.00
Hydroseed	Soil Set	1.9	8.2	0.23
Hydroseed	Star Tak	1.9	8.2	0.23
Hydromulch	FlexTerra	ND	8.2	0.00

Source: Boeing, 2005, 2006.

Table 18o – Contributions to SILVER Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (ug/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	0.05	4.1	0.01
Sand	Corona Filter Sand	ND	4.1	0.00
Sand	Moorpark Filter Sand	ND	4.1	0.00
Sand	Irwindale Filter Sand	ND	4.1	0.00
Sand	#8 Sand	ND	4.1	0.00
Gravel	Birds Eye Gravel	0.092	4.1	0.02
Gravel	Pea Bag Gravel	0.54	4.1	0.13
Gravel	Road Gravel	0.12	4.1	0.03
Rock	Gabion Rock	0.033	4.1	0.01
Rock	2"<Rock	ND	4.1	0.00
Rock	Riprap	ND	4.1	0.00
Hydroseed	Applegate N/D	0.039	4.1	0.01
Hydroseed	Applegate W/D	0.026	4.1	0.01
Hydroseed	Eco Aegis	0.042	4.1	0.01
Hydroseed	Eco Blend	ND	4.1	0.00
Hydroseed	Eco Fibre	0.038	4.1	0.01
Hydroseed	Mat Fibre	ND	4.1	0.00
Hydroseed	Naka Hydroseed	0.052	4.1	0.01
Hydroseed	Soil Guard	ND	4.1	0.00
Hydroseed	Soil Set	ND	4.1	0.00
Hydroseed	Star Tak	ND	4.1	0.00
Hydromulch	FlexTerra	ND	4.1	0.00

Source: Boeing, 2005, 2006.

Table 18p – Contributions to THALLIUM Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (ug/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	0.22	2	0.11
Sand	Corona Filter Sand	0.15	2	0.08
Sand	Moorpark Filter Sand	ND	2	0.00
Sand	Irwindale Filter Sand	ND	2	0.00
Sand	#8 Sand	ND	2	0.00
Gravel	Birds Eye Gravel	0.42	2	0.21
Gravel	Pea Bag Gravel	1.7	2	0.85
Gravel	Road Gravel	0.46	2	0.23
Rock	Gabion Rock	ND	2	0.00
Rock	2"<Rock	ND	2	0.00
Rock	Riprap	ND	2	0.00
Hydroseed	Applegate N/D	ND	2	0.00
Hydroseed	Applegate W/D	ND	2	0.00
Hydroseed	Eco Aegis	ND	2	0.00
Hydroseed	Eco Blend	ND	2	0.00
Hydroseed	Eco Fibre	ND	2	0.00
Hydroseed	Mat Fibre	ND	2	0.00
Hydroseed	Naka Hydroseed	ND	2	0.00
Hydroseed	Soil Guard	ND	2	0.00
Hydroseed	Soil Set	ND	2	0.00
Hydroseed	Star Tak	ND	2	0.00
Hydromulch	FlexTerra	ND	2	0.00

Source: Boeing, 2005, 2006.

Table 18q – Contributions to ZINC Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (ug/l)	SSFL 2006 NPDES Daily Max Permit Limit	Sample Result / Permit Limit
Sand	Colorado Filter Sand	38	119	0.32
Sand	Corona Filter Sand	88	119	0.74
Sand	Moorpark Filter Sand	ND	119	0.00
Sand	Irwindale Filter Sand	ND	119	0.00
Sand	#8 Sand	ND	119	0.00
Gravel	Birds Eye Gravel	83	119	0.70
Gravel	Pea Bag Gravel	590	119	**4.96**
Gravel	Road Gravel	110	119	0.92
Rock	Gabion Rock	ND	119	0.00
Rock	2"<Rock	ND	119	0.00
Rock	Riprap	ND	119	0.00
Hydroseed	Applegate N/D	48	119	0.40

Hydroseed	Applegate W/D	22	119	0.18
Hydroseed	Eco Aegis	32	119	0.27
Hydroseed	Eco Blend	26	119	0.22
Hydroseed	Eco Fibre	41	119	0.34
Hydroseed	Mat Fibre	15	119	0.13
Hydroseed	Naka Hydroseed	51	119	0.43
Hydroseed	Soil Guard	67	119	0.56
Hydroseed	Soil Set	54	119	0.45
Hydroseed	Star Tak	ND	119	0.00
Hydromulch	FlexTerra	ND	119	0.00

Source: Boeing, 2005, 2006.

Table 18r – Contributions to DIOXIN TEQ Concentrations from BMP Materials

BMP/Erosion Control Material Type	BMP Material	Concentration (µg/L)	SSFL 2006 NPDES Daily Maximum Permit Limit	Sample Result / Permit Limit
Hydromulch	Star Tak	0.000012	0.000000028	**429**
Hydromulch	Eco Fibre	0.0000013	0.000000028	**46**
Hydromulch	Eco Aegis	0.0000077	0.000000028	**275**
Hydromulch	Applegate N/D	0.0000012	0.000000028	**43**
Hydromulch	Applegate W/D	0.0000021	0.000000028	**75**
Hydromulch	Soil Guard	0.0000033	0.000000028	**118**
Hydromulch	Mat Fibre	0.00000027	0.000000028	**10**
Hydromulch	Eco Blend	0.0000018	0.000000028	**64**
Hydromulch	FlexTerra	0.0000000295	0.000000028	**1.1**

Source: Boeing, 2005, 2006.

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APPENDIX A
ANALYTICAL DATA SUMMARY

POTENTIAL BACKGROUND CONSTITUENT LEVELS IN STORM WATER AT BOEING'S SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Prepared For:

THE BOEING COMPANY

and

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May 2007

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APPENDIX A
Electronic Copy of Soil Background Laboratory Information and Validation Reports Readme File

This Readme file contains a summary of the contents of Appendix A of the *Potential Background Constituent Levels in Storm Water at Boeing's Santa Susana Laboratory* report (this report). Appendix A contains seven tables, three figures, and two folders containing sampling and analytical results for samples discussed in this report.

Tables

Included in this Appendix are the following tables in Microsoft Excel format:

- Table A-1 soil background metals data set
- Table A-2 soil background dioxins data set
- Table A-3 post-fire drainage results
- Table A-4 post-fire background results
- Table A-5 post-fire location & coordinates
- Table A-6 ambient rain water First Quarter 2005
- Table A-7 units conversion

Tables A-1 and A-2 present the soil background data sets and comparison values for the RCRA Facility Investigation (RFI) program at the Santa Susana Field Laboratory (SSFL) for metals and dioxins, respectively. These data are approved by the Department of Toxic Substances Control (DTSC).

Table A-3 presents the post-fire results for soil, ash, and surface water samples collected at on- and offsite drainage locations between October 6, 2005 and May 22, 2006. Table A-4 presents the post-fire results for soil and ash samples collected at DTSC-approved soil background locations on October 13th and October 14th, 2005. The sample location and coordinate information for the post-fire samples is presented in Table A-5.

Table A-6 presents the metals and dioxins results for rainwater sampling conducted at the SSFL between January and March 2005. Table A-7 provides a units conversion reference table for results referenced in the text, tables, and appendix of this report.

Figures

Figure A-1 presents the DTSC-approved soil background sample locations that were sampled for soil and/or ash in October 2005 after the Topanga Fire. Figure A-2 presents post-fire reference sample locations that were sampled for soil, ash, and/or surface water between October 6, 2005 and May 22, 2006.

Folders

The folders of this appendix also contain electronic copies of validation reports, chain-of-custody (COC) forms, and chain-of-custody analytical request change forms (Change Forms). These files are organized into two main folder types: **Chain of Custody Forms** and **Validation Reports (1-7)**.

Chain of Custody Forms
Chain of custody forms were generated in the field at the time of sample collection. Each chain of custody includes information pertaining to sample identification, sample depth, sample matrix, collection date/time, analysis requested, turn-around times, general project information, and other additional sampling information. The chain of custody forms accompanied the samples from the time of collection until analysis by the laboratory.

Change Forms are generated for samples subsequent to shipment to the laboratory. Generally, change forms were generated when a change or correction to a COC was needed (e.g., when additional analyses were requested for a sample).

The files are organized by Sample Delivery Group (SDG) number, a tracking number assigned by the laboratories upon receipt of the samples.

Validation Reports
Validation reports include laboratory results and data assessment forms completed by AMEC Earth and Environmental, Inc. (AMEC) data validators. The validation report summaries identify the laboratory method and target compounds for each sample, in addition, the report indicates whether each compound was detected, the concentration (or detection limit if not detected), and applicable laboratory and data validation qualifiers. With the exception of field QC samples (field blanks, equipment rinsates), all analytical data generated from background field samples were validated by AMEC. Data validation report PDFs are organized by chemical group (analytical method), with each folder containing validation reports specific to respective analytical method as shown above.

These reports are provided in seven folders. Data validation reports for rainwater sample results are limited to samples represented in this report. Each of these subfolders is organized by a validation report number that was assigned by AMEC.

Table A-1
Soil Background Metals Data Set
Santa Susana Field Laboratory

Page 1 of 2

SAMPLE ID	Depth (ft. bgs)	Aluminum		Antimony		Arsenic		Barium		Beryllium		Boron		Cadmium		Chromium		Cobalt		Copper		Fluoride		Iron		Lead		Lithium		Manganese		Mercury		Molybdenum		Nickel	
BGSS01S01	0.5	12,800		5.3	J	9.2		101		0.64		**3**		0.06	U	22.1		8.5		12.6		**3.1**	UJ	**18,000**		13.8		**20**	J	**190**		0.05	U	0.8	U	13.8	
BGSS02S01	0.5	7,380		3.1	J	3.3		50.7		0.41		**1.2**	UJ	0.06	U	8.8		2.9		4.5		**2.6**	UJ	**12,000**		5.3		**17**		**190**		0.05	U	0.78	U	5.9	
BGSS02S02	1	6,470		3.9	J	3.5		38.6		0.36		**1.2**	UJ	0.06	U	11.6		3		5.8		**2.2**	UJ	**14,000**		4.2		**20**	J	**230**		0.04	U	0.79	U	5.2	
BGSS03D01	0.5	12,200		7.4	J	2.4		91.8		0.59		**5**	UJ	0.06	U	17.3		5.8		8.7		**2.5**	J	**23,000**		7.5		**32**	J	**500**		0.05	U	0.95	UJ	12.1	
BGSS03S01	0.5	11,800		7	J	2.1		96.6		0.45		**5**	UJ	0.06	U	15.5		6.4		8.1		**2.3**	J	**23,000**		7.3		**31**	J	**490**		0.05	U	0.82	UJ	11	
BGSS03S02	1	12,400		6.5	J	2.5		93.2		0.62		**5.1**	UJ	0.06	U	17.4		5.5		9.2		**3.1**	J	**24,000**		5.6		**31**	J	**420**		0.05		0.78	U	11.8	
BGSS04S01	0.5	12,200		6.7	J	3.2		44.2		0.47		**7**	UJ	0.06	U	36.8		5.3		3.8		**1.8**	UJ	**25,000**		15.4		**29**	J	**290**		0.05	U	0.81	U	9.8	
BGSS06S01	0.5	9,960		6.7	J	4		62.7		0.54		**2.9**	UJ	0.06	U	16		4.4		6.2		**2.1**	J	**17,000**		7.9		**21**	J	**320**		0.04	U	0.76	U	10.4	
BGSS07S01	0.5	14,300		5.3	J	2.6		77		0.65		**4.5**	UJ	0.06	UJ	25		6.8		6.7		**2.4**	UJ	**19,000**		14		**29**	J	**310**		0.09		0.81	U	15.6	
BKND-1	0	**14,000**		1	U	3.9		54		0.28		**8**	J	0.25		28.3		6.1		7.3		**1.8**	UJ	**20,000**		18.6		**27**	J	**370**		0.1	U	0.4		9.7	
BKND-2	0	**10,000**		1.1	U	5.1		65.7		0.11	U	**5.5**	UJ	0.46		19.8		8		17		**1.4**	UJ	**18,000**		20.3		**19**	J	**230**		0.11	U	0.37		15.4	
BKND-3	0	**9,300**		1	U	4.3		69.8		0.43		**2.5**		0.21	U	14.3		5.6		8.2		**1.9**	UJ	**15,000**		11.2		**18**	J	**260**		0.1	U	0.36		9.9	
BKND-4	0	**10,000**		1	U	3.9		77.5		0.37		**3.9**	UJ	0.22		14		5.3		8.5		**1.7**	UJ	**17,000**		13.1		**19**	J	**300**		0.1	U	0.53		9.8	
BKND-5	0	**10,000**		1	U	3.2		77.2		0.34		**2.7**	UJ	0.25		13.9		5		8		**1.7**	UJ	**15,000**		21.5		**21**	J	**280**		0.1	U	0.38		9.9	
BKND-6	0	**8,500**		1.1	U	6.3		110		0.37		**2.7**		0.23		15.8		5.8		9.9		**1.8**	UJ	**15,000**		33.1		**20**	J	**370**		0.11	U	0.64		10.9	
BKND-7	0	**11,000**		1.1	U	3.9		109		0.48		**4.5**		0.4		21.9		10		17		**1.9**	UJ	**15,000**		8.9		**22**	J	**390**		0.11	U	0.35		15.4	
BZSS01D01	0.5	10,300		8.7	J	5.9		58.6		0.63		**2.7**		0.06	UJ	16.3		7.2		9.6		**1.9**	UJ	**17,000**		7.2		**21**	J	**320**		0.07		5.4		13.4	
BZSS01S01	0.5	10,700		6.4	J	5.8		62.8		0.59		**2.3**		0.06	UJ	16.7		7.5		8.7		**1.9**	UJ	**17,000**		8		**19**	J	**320**		0.07		5.2		13.8	
BZSS02S01	0.5	11,900		4.4	J	4.2		69.2		0.47		**1.2**	U	0.06	UJ	16.6		5.4		8.2		**2.3**	UJ	**17,000**		18		**16**	J	**210**		0.07		2.6		12	
BZSS03S01	0.5	15,800		7.4	J	8.4		103		0.85		**5.3**	UJ	0.06	UJ	23.2		7.5		14.5		**2.9**	UJ	**24,000**		14.4		**28**	J	**320**		0.07		1.1		16.6	
BZSS03S02	1	18,100		8.7	J	8.5		106		0.99		**6.2**	UJ	0.06	UJ	26.2		8.4		15.1		**4**	UJ	**28,000**		10.8		**34**	J	**330**		0.08		0.83	U	17.4	
BZSS04S01	0.5	14,500		6.3	J	3.2		91.8		0.63		**2.6**		0.06	UJ	18.8		6.2		8.9		**2**	UJ	**20,000**		14.3		**16**	J	**290**		0.09		0.77	U	11.9	
SGSS01S01	0	12,000		0.982	U	0.982	U	106		0.463		1.31	U	0.655	U	18.3		7.59		7.77		**1.7**	UJ	**18,000**		10.9		**23**	J	**320**		0.11	U	0.328	U	13.9	
BZSS06S01	0	12,400		1.03	U	1.03	U	90.4		0.468		1.37	U	0.685		18.4		8.1		7.99		**1.9**	UJ	**17,000**		12.8		**21**	J	**310**		0.115	U	0.343	U	12.2	
BZSS05S01	0	**10,000**		**0.66**	UJ	**4.1**		**66**		**0.48**		**3.6**	UJ	**0.39**		**15**		**4.9**		**11**		**2.6**	UJ	**14,000**		**14**		**15**	J	**310**		**0.02**		**0.62**		**11**	
BG01005	0 - 1	**12,000**		**0.47**	UJ	2.1	J	**75**		0.66		**0.97**	U	0.5	U	21		**5.4**		11		**3.2**	J	**20,000**		18		**16**	J	**260**		**0.027**		**0.62**		16	
BG01008	0 - 1	**13,000**		**0.48**	UJ	2.2	J	**72**		0.61		**0.98**	U	0.5	U	21		**6.9**		11		**2.6**	J	**13,000**		9.5		**15**	J	**310**		**0.029**		**0.69**		16	
BG01100	0 - 1	**12,000**		**0.49**	UJ	1.7	J	**69**		0.71		**1**	U	0.5	U	22		**5.4**		12		**3.1**	UJ	**20,000**		26		**18**	J	**300**		**0.026**		**0.7**		16	
BG02007	0 - 1	**9,600**		**0.5**	UJ	3.6	J	**71**		0.53		**8**	UJ	0.5	U	14		**4.7**		10		**2.4**	UJ	**19,000**		34		**19**	J	**300**		**0.031**		**0.94**		9.1	
BG02074	0 - 1	**9,500**		**0.5**	UJ	1.7	J	**76**		0.46		**5.2**	UJ	0.5	U	16		**21**		17		**3.3**	UJ	**15,000**		6.5		**18**	J	**350**		**0.039**		**0.82**		14	
BG02076	0 - 1	**9,200**		**0.55**	UJ	2.9	J	**68**		0.54		**4.6**	UJ	0.5	U	14		**4.5**		11		**3.2**	UJ	**14,000**		12		**16**	J	**270**		**0.029**		**0.8**		10	
BG04025	0 - 1	**20,000**		2.5	UJ	3.3	J	**92**		0.65		**9.7**	J	0.5	U	23		**9.3**		20		**3**	J	**28,000**		18		**37**	J	**380**		**0.034**		**0.41**		16	
BG04029	0 - 1	**14,000**		2.5	UJ	3	J	**84**		0.73		**8.5**	J	0.5	U	23		**8.3**		14		**2.6**	J	**26,000**		15		**33**	J	**350**		**0.031**		**0.47**		15	
BG04090	0 - 1	**13,000**		2.5	UJ	3	J	**80**		0.65		**8.6**	J	0.5	U	24		**8.1**		14		**2.4**	J	**26,000**		20		**35**	J	**340**		**0.04**		**0.47**		14	
BCSS09S01	0	5,600		**0.18**	UJ	9		36		0.5	U	**3**	UJ	1	U	9		4		6		2.2		**25,000**		7		**27**	J	**300**		**0.032**		**0.76**		7	
BCSS11S01	0	13,000		**0.46**	UJ	5	U	97		0.7		**5.9**	UJ	1		17		5		8		1.7		**20,000**		10		**12**	J	**410**		**0.048**		**4.4**		14	
BCSS12S01	0	11,000		**0.6**	UJ	6	U	82		0.7		**4**		1	U	16		6		9		4.3		**28,000**		14		**29**	J	**420**		**0.019**		**2**		12	
BCSS13S01	0	13,000	J	**0.38**	UJ	5	U	84	J	1.1		**6.6**	UJ	1	U	22		8		17		2.7		**23,000**		25		**29**	J	**370**		**0.054**		**0.93**		17	
BCBS09S01	0	18,000	J	--		14		140	J	1.1		--		1	U	29		12		28		6.7		--		29		--		--		--		--		29	
BCSS14S01	0	16,000	J	**0.56**	UJ	16		87	J	1		**5.6**		1	U	25		10		30		3.5		**27,000**		23		**31**	J	**390**		**0.023**		**0.73**	UJ	20	
BCSS14D01	0	16,000	J	**0.58**	UJ	14		91	J	1.1		**9**		1	U	26		11		28		4.2		**24,000**		26		**37**	J	**370**		**0.022**		**0.68**	UJ	23	
Comparison Value		20,000		8.7		15		140		1.1		9.7		1		36.8		21		29		6.7		28,000		34		37		495		0.09		5.3		29	

Notes

(a) Data set is for characterization and risk assessment evaluation of onsite investigational units for the SSFL RCRA Program.

All values in milligrams per kilogram (mg/kg) except pH units
"--" indicates sample was not collected (location inaccessible)
Bold indicates recent data collected in April 2005.
J = estimated value
U = non detect
UJ = estimated non detect
ft. bgs = feet below ground surface

Source of information in table:
MWH 2005. Standardized Risk Assessment Methodology (SRAM) Work Plan, Revision 2 - Final. September 2005. Appendix D; Soil Background Report, Final.

Example:

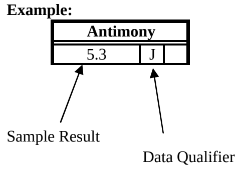

Table A-1
Soil Background Metals Data Set
Santa Susana Field Laboratory

Page 2 of 2

SAMPLE ID	Depth (ft. bgs)	Potassium		Selenium		Silver		Sodium		Thallium		Vanadium		Zinc		Zirconium		pH	
BGSS01S01	0.5	**3,100**		0.47	U	0.76	U	**100**	J	**0.21**	UJ	38.2		70.4		**1.9**	U	**6.82**	J
BGSS02S01	0.5	**1,800**		0.46	U	0.74	U	**50**		**0.19**	UJ	16.7		41.8		**1.7**	U	**7.27**	J
BGSS02S02	1	**2,000**		0.47	U	0.75	U	**45**		**0.16**	UJ	14.7		40.7		**1.6**	U	**7.07**	J
BGSS03D01	0.5	**4,300**		0.72		0.75	U	**63**	J	**0.31**		27.3		63.6		**3.1**	J	**8.25**	J
BGSS03S01	0.5	**3,900**		0.59		0.74	U	**57**	J	**0.31**		25.5		61.3		**3.3**	J	**8.08**	J
BGSS03S02	1	**3,900**		0.53		0.74	U	**66**	J	**0.29**	J	28.1		62.8		**3.2**	J	**7.8**	J
BGSS04S01	0.5	**4,000**		0.48	U	0.77	U	**88**	J	**0.3**		57.1		47.3		**6.6**	J	**7.4**	J
BGSS06S01	0.5	**3,200**		0.45	U	0.72	U	**61**	J	**0.25**	J	26.6		56.9		**5.7**	J	**7.35**	J
BGSS07S01	0.5	**3,800**		0.48	UJ	0.77	U	**65**	J	**0.28**	UJ	35.7		53.2		**2.8**	J	**6.98**	J
BKND-1	0	**3,500**		2.1	U	0.21	U	**66**	J	**0.33**		44.5		47.4		**3.7**	J	**8.86**	J
BKND-2	0	**2,100**		2.1	U	0.21	U	**74**	J	**0.13**	J	31.9		62.5		**5.8**	J	**7.68**	J
BKND-3	0	**3,600**		2.1	U	0.21	U	**54**	J	**0.17**	UJ	21.4		50.3		**1.6**	U	**7.21**	J
BKND-4	0	**3,600**		2	U	0.2	U	**48**	J	**0.46**		22.5		52.5		**1.8**	J	**6.78**	J
BKND-5	0	**3,200**		2.1	U	0.21	U	**51**	J	**0.36**		21.7		62.4		**5.9**	J	**6.95**	J
BKND-6	0	**3,100**		2.1	U	0.21	U	**51**	J	**0.19**	UJ	26.5		59.3		**1.7**	U	**7.08**	J
BKND-7	0	**3,000**		2.1	U	0.21	U	**51**	J	**0.24**	UJ	37.8		51.7		**1.9**	U	**7.08**	J
BZSS01D01	0.5	**4,000**		0.48	UJ	1.1		**78**	J	**0.23**	J	26.6		48.3		**1.6**		**7.2**	J
BZSS01S01	0.5	**3,600**		0.7	J	0.76	U	**72**	J	**0.23**	J	27.8		50.6		**1.9**		**6.98**	J
BZSS02S01	0.5	**2,500**		0.46	UJ	0.74	U	**47**		**0.23**	UJ	28.1		50.3		**1.9**	U	**6.88**	J
BZSS03S01	0.5	**4,000**		0.48	J	0.74	U	**83**		**0.045**	UJ	32.4		63.1		**3.3**		**7.75**	J
BZSS03S02	1	**3,700**		0.49	UJ	0.79		**110**		**0.44**	UJ	35.8		64.1		**4.2**		**7.5**	J
BZSS04S01	0.5	**3,800**		0.45	UJ	0.73	U	**100**	J	**0.25**	UJ	30.6		52.7		**1.9**		**7.21**	J
SGSS01S01	0	**3,800**		0.982	U	0.328	U	**53**	J	**0.2**	UJ	34.6		54.2		**3.2**	J	**6.15**	J
BZSS06S01	0	**2,700**		1.03	U	0.343	U	**65**	UJ	**0.29**	UJ	38.4		60.6		**2.3**	J	**6.17**	
BZSS05S01	0	**2,600**		**0.45**	UJ	**0.19**	U	**76**	UJ	**0.3**	UJ	**26**		**44**		**2.3**	J	**6.22**	
BG01005	0 - 1	**2,100**		**0.28**		1	U	**65**	J	**0.22**	UJ	**42**		48		**2**	J	**6.85**	
BG01008	0 - 1	**3,000**		**0.28**		1	U	**78**	J	**0.53**	UJ	**40**		45		**2.2**	J	**6.58**	
BG01100	0 - 1	**2,600**		**0.2**	U	1	U	**65**	J	**0.29**	UJ	**36**		51		**1.7**	J	**7.11**	
BG02007	0 - 1	**3,000**		**0.21**	U	1	U	**68**	J	**0.24**	UJ	**27**		48		**1.9**	J	**7.04**	
BG02074	0 - 1	**3,600**		**0.27**		1	U	**62**	J	**0.22**	UJ	**26**		55		**1.7**	J	**6.85**	
BG02076	0 - 1	**3,200**		**0.27**		1	U	**73**	J	**0.2**	UJ	**26**		49		**7.1**	J	**6.95**	
BG04025	0 - 1	**6,100**		**0.31**		1	U	**93**	J	**0.35**		**62**		69		**6**	J	**8.42**	J
BG04029	0 - 1	**6,400**		**0.25**		1	U	**81**	J	**0.33**		**56**		67		**5.5**	J	**7.89**	J
BG04090	0 - 1	**5,400**		**0.31**		1	U	**81**	J	**0.31**		**57**		70		**5.1**	J	**7.58**	J
BCSS09S01	0	**4,700**		**0.45**		1	U	**68**		**0.34**	UJ	19		35	J	**2.6**		**5.85**	J
BCSS11S01	0	**2,400**		**0.23**		1	U	**98**	J	**0.27**	UJ	28		32	J	**8.6**	J	**6.9**	J
BCSS12S01	0	**4,800**		**0.23**		1	U	**88**	J	**0.39**	J	30		56	J	**2.6**		**7.48**	J
BCSS13S01	0	**3,700**		**0.32**		1	U	**76**	J	**0.31**	UJ	43		78	J	**2.8**	J	**6.93**	J
BCBS09S01	0	--		--		1	U	--		--		54		110	J	--		--	
BCSS14S01	0	**3,600**		**0.22**		1	U	**96**	J	**0.27**	UJ	45		97	J	**7.2**		**7.48**	J
BCSS14D01	0	**3,300**		**0.19**		1	U	**78**	J	**0.27**	UJ	46		110	J	**4.3**		**8.2**	J
Comparison Value		6,400		0.655		0.79		110		0.46		62		110		8.6		9	

Notes

(a) Data set is for characterization and risk assessment evaluation of onsite investigational units for the SSFL RCRA Program.

All values in milligrams per kilogram (mg/kg) except pH units
"--" indicates sample was not collected (location inaccessible)
Bold indicates recent data collected in April 2005.
J = estimated value
U = non detect
UJ = estimated non detect
ft. bgs = feet below ground surface

Data Source Reference Documents
1 = Multi-Media Sampling Report for the BBI and the SMMC (McLaren/Hart 1993b)
2 = RFI Work Plan Addendum (Ogden 1996)
3 = FSDF Characterization Report (ICF 1997)
4 = Bell Canyon Area Soil Sampling Report (Ogden 1998b)
5 = SRAM Work Plan (Ogden 2000a)
6 = This report

Source of information in table:
MWH 2005. Standardized Risk Assessment Methodology (SRAM) Work Plan, Revision 2 - Final. September 2005. Appendix D; Soil Background Report, Final.

Table A-2
Soil Background Dioxins Data Set
Santa Susana Field Laboratory

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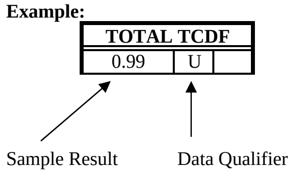
SAMPLE ID	Depth (feet bgs)	2,3,7,8-TCDD		2,3,7,8-TCDF		1,2,3,7,8-PeCDD		1,2,3,7,8-PeCDF		2,3,4,7,8-PeCDF		1,2,3,4,7,8-HxCDD		1,2,3,6,7,8-HxCDD		1,2,3,7,8,9-HxCDD		1,2,3,4,7,8-HxCDF		1,2,3,6,7,8-HxCDF		1,2,3,7,8,9-HxCDF		2,3,4,6,7,8-HxCDF		1,2,3,4,6,7,8-HpCDD		1,2,3,4,6,7,8-HpCDF	
BCBS09S01	0	2	U	2	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
BCSS09S01	0	0.99	U	0.99	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
BCSS11S01	0	1	U	1	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
BCSS12S01	0	0.99	U	0.99	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
BCSS13S01	0	1	U	1	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5	U	5.2	U
BCSS14D01	0	1.3	U	1.3	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6	U	6.4	U
BCSS14S01	0	1.4	U	1.4	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	7	U	6.8	U
BKND-1	0	0.57	U	0.72	J	0.12	J	0.21	J	0.33	UJ	0.41	U	0.43	J	0.48	J	0.35	J	0.44	U	0.23	U	5.1	U	7		1.7	UJ
BKND-2	0	0.66	U	1.1	J	0.26	UJ	0.4	J	0.38	J	0.27	J	0.63	J	0.77	J	0.48	J	0.58	U	0.21	U	5.4	U	8		1.6	UJ
BKND-3	0	0.78	U	0.45	UJ	0.44	U	0.48	U	0.17	J	0.2	UJ	0.49	UJ	0.69	J	0.23	UJ	0.62	U	0.33	UJ	5	U	9		1.6	J
BKND-4	0	0.44	U	0.29	J	0.24	U	0.32	U	0.12	U	0.13	UJ	0.57	J	0.63	J	0.28	J	0.43	U	0.27	UJ	5.1	U	8	J	1.7	J
BKND-5	0	0.52	U	1.4		0.46	U	0.45	J	0.44	J	0.18	J	0.74	J	0.7	J	0.57	UJ	0.71	U	0.1	J	5.2	U	9	J	2.4	UJ
BKND-6	0	0.84	U	1.8	J	0.76	U	0.59	J	0.64	J	0.75	U	0.95	J	1.1	J	0.73	J	1	U	0.43	J	5.3	U	11	J	3.6	UJ
BKND-7	0	0.6	U	1.3	UJ	0.18	J	0.34	U	0.5	J	0.2	J	0.76	UJ	0.81	J	0.56	J	0.69	U	0.21	U	5.3	U	9		2	UJ
BZSS05S01	0	0.16	U	0.15	U	0.4	U	0.18	U	0.16	U	0.13	U	0.84	J	1	J	0.16	U	0.16	U	0.1	U	0.14	U	4	UJ	0.8	J
BZSS06S01	0	0.15	U	0.18	U	0.31	U	0.31	U	0.28	U	0.21	U	0.22	U	0.2	U	0.11	U	0.11	U	0.088	U	0.09	U	2	UJ	0.49	
SGSS01S01	0	0.24	U	0.34	J	0.43	U	0.22	U	0.54		0.34	J	0.77	J	0.64	J	0.47		0.3		0.14	U	0.45		13		2.5	
Comparison Value		0.5 [(d)]		1.8		0.18		0.59		0.64		0.34		0.95		1.1		0.73		0.3		0.43		0.45		13		2.5	

(a) TEQ values were calculated using detected congener concentrations and WHO toxicity equivalency factors. For comparison, western United States dioxin TEQs typically range up to 2 pg/g or parts per trillion.
(b) TEQ values do not include total dioxin or total furan concentrations.
(c) Data set is for characterization and risk assessment evaluation of onsite investigational units for the SSFL RCRA Program.
(d) = values correspond to the representative soil reporting limit (as analyzed by Alta Analytical Laboratory).

Example:



All sample results in picograms per gram (pg/g)
bgs = below ground surface

Source of information in table:
MWH 2005. Standardized Risk Assessment Methodology (SRAM) Work Plan, Revision 2 - Final. September 2005. Appendix D; Soil Background Report, Final.

- - = Not Applicable

Table A-2
Soil Background Dioxins Data Set
Santa Susana Field Laboratory

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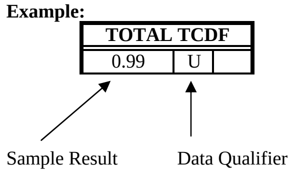
SAMPLE ID	Depth (feet bgs)	1,2,3,4,7,8,9-HpCDF		OCDD		OCDF		TOTAL TCDD		TOTAL TCDF		TOTAL PeCDD		TOTAL PeCDF		TOTAL HxCDD		TOTAL HxCDF		TOTAL HpCDD		TOTAL HpCDF		TEQ[a]
BCBS09S01	0	10	U	20	U	20	U	2	U	2	U	10	U	10	U	10	U	10	U	10	U	10	U	0
BCSS09S01	0	5	U	9.9	U	9.9	U	0.99	U	0.99	U	5	U	5	U	5	U	5	U	5	U	5	U	0
BCSS11S01	0	5	U	46	J	10	U	1	U	3.1	J	5	U	5	U	5	U	5	U	5	U	5	U	0.0046
BCSS12S01	0	5	U	17	J	9.9	U	0.99	U	0.99	U	5	U	5	U	5	U	5	U	5	U	5	U	0.0017
BCSS13S01	0	5.2	U	10	U	10	U	1	U	1	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	0
BCSS14D01	0	6.4	U	13	J	13	U	1.3	U	1.3	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	0.0013
BCSS14S01	0	6.8	U	14	U	14	U	1.4	U	1.4	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	0
BKND-1	0	0.19	UJ	74.6		3.2	J	1	U	22.3	U	5.1	U	15.5	U	5.2	J	6.6	U	16.4		3.4	J	0.41
BKND-2	0	0.21	UJ	44.7		1.7	J	1.1	U	44.1	U	5.4	U	24.3	U	6.8	J	8.9	U	15.5		2.9	J	0.62
BKND-3	0	2.2	U	76.2		3.9	J	1	U	7.7	U	5	U	8.5	U	5.4	J	8.7	U	17.7		3.8	J	0.27
BKND-4	0	0.19	J	83.1		3.7	J	1	U	6.6	U	5.1	U	6.6	U	5.3	J	5.8	U	18.2		3.9	J	0.28
BKND-5	0	1.3	U	110		3.9	J	1	U	28.3	U	5.2	U	18.3	U	7.3	J	10.2	U	26.3		4.5	J	0.65
BKND-6	0	1.3	U	138		7.9	J	1.6	UJ	54.9	U	5.3	U	32.3	U	10	J	14.8	U	31.5		6.8	J	0.98
BKND-7	0	1.3	U	108		3.4	J	1.1	U	41.9	U	5.3	U	24.4	U	7.9	J	10.8	U	25.1		3.9	J	0.69
BZSS05S01	0	0.086	U	25		1.4	J	0.16	U	0.5		0.4	U	1.7	J	4.2		1.1	J	8.4		1.5	J	0.19
BZSS06S01	0	0.062	U	15		0.96		0.15	U	0.95		0.31	U	2.5	J	0.91	J	0.97	J	4.2		0.49	J	0.0065
SGSS01S01	0	0.25	U	140		8.1		0.24	U	4		0.43	U	4.6		6.4		4.2		26		6.9		0.77
Comparison Value		0.19		140		8.1		- -		- -		- -		- -		- -		- -		- -		- -		- -

(a) TEQ values were calculated using detected congener concentrations and WHO toxicity equivalency factors. For comparison, western United States dioxin TEQs typically range up to 2 pg/g or parts per trillion.
(b) TEQ values do not include total dioxin or total furan concentrations.
(c) Data set is for characterization and risk assessment evaluation of onsite investigational units for the SSFL RCRA Program.
(d) = values correspond to the representative soil reporting limit (as analyzed by Alta Analytical Laboratory).

All sample results in picograms per gram (pg/g)
bgs = below ground surface

Example:



Qualifiers
U = non detect
J = estimated value
UJ = estimated non detect

TCDD = tetrachlorodibenzo-p-dioxin	HpCDD = heptachlorodibenzo-p-dioxin
TCDF = tetrachlorodibenzofuran	HpCDF = heptachlorodibenzofuran
PeCDD = pentachlorodibenzo-p-dioxin	OCDD = octachlorodibenzo-p-dioxin
PeCDF = pentachlorodibenzofuran	OCDF = octachlorodibenzofuran
HxCDD = hexachlorodibenzo-p-dioxin	
HxCDF = hexachlorodibenzofuran	TEQ = Toxicity Equivalent

Source of information in table:
MWH 2005. Standardized Risk Assessment Methodology (SRAM) Work Plan, Revision 2 - Final. September 2005. Appendix D; Soil Background Report, Final.

Table A-3
Post-Topanga Fire Soil, Ash, and Surface Water Drainage Results
Santa Susana Field Laboratory

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Sample Identification		CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1-D	CF-1-D	CRP-1	CRP-1	CRP-1
Sample Type		Soil	Ash	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Soil	Surface Water	Surface Water
Sampling Date		10/07/2005	10/07/2005	10/18/2005	01/01/2006	01/03/2006	01/14/2006	02/19/2006	02/28/2006	03/03/2006	03/11/2006	03/28/2006	04/04/2006	04/14/2006	05/22/2006	04/04/2006	02/28/2006	10/07/2005	01/02/2006	02/28/2006
Location		Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage
EPA Identification		WL008	WL009	WL033	WL038	WL044	WL050	WL053	WL062	WL067	WL070	WL074	WL079	WL086	WL090	WL080	WL063	WL007	WL040	WL059
Group	Constituent																			
DIOXIN	1,2,3,4,6,7,8-HpCDD	1.06 J	0.581 J	< 1.50E-06 U	< 1.02E-06 U	< 9.96E-07 U	< 2.93E-06 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	3.41	5.23E-05	- -
DIOXIN	1,2,3,4,6,7,8-HpCDF	< 0.0986 U	< 0.107 U	< 1.40E-06 U	< 1.48E-06 U	< 6.15E-07 U	< 1.17E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.36 UJ	2.80E-05	- -
DIOXIN	1,2,3,4,7,8,9-HpCDF	< 0.075 U	< 0.153 U	< 1.70E-06 U	< 1.35E-06 U	< 6.05E-07 U	< 1.12E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.0951 U	< 8.91E-06 U	- -
DIOXIN	1,2,3,4,7,8-HxCDD	< 0.106 U	< 0.419 U	< 1.30E-06 U	< 1.02E-06 U	< 1.37E-06 U	< 1.67E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.164 U	< 3.44E-06 U	- -
DIOXIN	1,2,3,4,7,8-HxCDF	< 0.0589 U	0.11 J	< 9.80E-07 U	< 6.24E-07 U	< 2.63E-07 U	< 5.53E-07 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.119 U	< 2.45E-06 U	- -
DIOXIN	1,2,3,6,7,8-HxCDD	0.178 J	< 0.421 U	< 1.30E-06 U	< 1.09E-06 U	< 1.38E-06 U	< 1.93E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.331 J	3.84E-06 J	- -
DIOXIN	1,2,3,6,7,8-HxCDF	0.102 J	< 0.0717 U	< 9.90E-07 U	< 6.86E-07 U	< 2.58E-07 U	< 5.20E-07 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.11 U	< 2.53E-06 U	- -
DIOXIN	1,2,3,7,8,9-HxCDD	0.148 J	< 0.422 U	< 1.30E-06 U	< 1.03E-06 U	< 1.34E-06 U	< 1.74E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.155 U	< 3.30E-06 UJ	- -
DIOXIN	1,2,3,7,8,9-HxCDF	< 0.082 U	< 0.112 U	< 1.30E-06 U	< 9.68E-07 U	< 4.36E-07 U	< 8.75E-07 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.198 U	< 3.35E-06 U	- -
DIOXIN	1,2,3,7,8-PeCDD	< 0.0699 U	< 0.154 U	< 1.60E-06 U	< 5.90E-07 U	< 7.65E-07 U	< 1.21E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.277 U	< 1.89E-06 U	- -
DIOXIN	1,2,3,7,8-PeCDF	< 0.157 UJ	< 0.231 U	< 1.80E-06 U	< 9.43E-07 U	< 8.24E-07 U	< 1.16E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.231 U	< 2.29E-06 U	- -
DIOXIN	2,3,4,6,7,8-HxCDF	< 0.0616 U	< 0.0764 U	< 1.10E-06 U	< 6.88E-07 U	< 2.99E-07 U	< 5.72E-07 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.128 U	< 2.58E-06 U	- -
DIOXIN	2,3,4,7,8-PeCDF	0.137 J	< 0.212 U	< 9.20E-07 U	< 7.63E-07 U	< 7.42E-07 U	< 1.15E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.215 U	< 2.60E-06 UJ	- -
DIOXIN	2,3,7,8-TCDD	< 0.0676 U	< 0.187 U	< 1.30E-06 U	< 6.46E-07 U	< 8.16E-07 U	< 1.28E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.185 U	< 1.45E-06 U	- -
DIOXIN	2,3,7,8-TCDF	0.381 J	< 0.189 U	< 1.20E-06 U	< 6.58E-07 U	< 8.09E-07 U	< 8.50E-07 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.213 J	< 1.66E-06 U	- -
DIOXIN	OCDD	5.59	3.64 J	1.50E-05 J	9.13E-06 J	< 3.10E-06 UJ	< 2.24E-05 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	14.8	3.35E-04	- -
DIOXIN	OCDF	0.331 J	< 0.441 U	< 6.90E-06 UJ	5.72E-06 J	< 2.20E-06 U	< 2.71E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.425 UJ	1.81E-04	- -
DIOXIN	TCDD TEQ (with DNQ)	0.16	0.017	1.50E-09	1.49E-09	0	0	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.08998	1.24E-06	- -
DIOXIN	TCDD TEQ (no DNQ)	- -	- -	0	0	0	0	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	8.55E-07	- -
DIOXIN	Total HpCDD	2.16	0.581	< 1.50E-06 U	1.53E-06	< 9.96E-07 U	< 2.93E-06 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	7.32	1.07E-04	- -
DIOXIN	Total HpCDF	0.174	< 0.127 U	< 1.50E-06 U	< 1.41E-06 U	< 6.09E-07 U	< 1.15E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.36	4.72E-05	- -
DIOXIN	Total HxCDD	1.23	< 0.421 U	< 1.30E-06 U	< 1.05E-06 U	< 1.37E-06 U	< 1.78E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	3.07	2.71E-05	- -
DIOXIN	Total HxCDF	0.301	0.11	< 1.10E-06 U	< 7.33E-07 U	< 3.07E-07 U	< 6.18E-07 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.39	1.64E-05	- -
DIOXIN	Total PeCDD	< 0.257 U	< 0.154 U	< 1.60E-06 U	< 5.90E-07 U	< 7.65E-07 U	< 1.21E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.277 U	2.45E-06	- -
DIOXIN	Total PeCDF	0.867	< 0.221 U	< 1.40E-06 U	< 8.47E-07 U	< 7.82E-07 U	< 1.15E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.664 U	1.91E-05	- -
DIOXIN	Total TCDD	0.464	< 0.187 U	< 1.30E-06 U	< 6.46E-07 U	< 8.16E-07 U	< 1.28E-06 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.519	< 1.45E-06 U	- -
DIOXIN	Total TCDF	3.57	< 0.189 U	< 1.20E-06 U	< 6.58E-07 U	< 8.09E-07 U	< 8.50E-07 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	1.65	1.09E-05	- -
METALS	Aluminum	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Antimony	0.19 J	0.69 J	0.0009 J	< 0.00093 UJ	0.00024 J	0.00017 J	- -	- -	- -	- -	0.00025 J	0.00019 J	< 0.00018 UJ	< 0.00014 UJ	0.00019 J	- -	0.18 J	< 0.00022 UJ	- -
METALS	Arsenic	8.4	5.4	< 0.005 U	0.0055	< 0.005 U	0.0097	- -	- -	- -	- -	< 0.011 UJ	0.0051	0.025	0.0047 J	< 0.005 U	- -	5.9	0.022	- -
METALS	Barium	99	630	0.21	0.072	0.079	0.075	- -	- -	- -	- -	0.1	0.057	0.083	0.083	0.056	- -	97	0.75	- -
METALS	Beryllium	0.66	< 0.8 U	< 0.002 U	< 0.002 U	< 0.002 U	< 0.002 U	- -	- -	- -	- -	< 0.002 U	< 0.002 U	< 0.002 U	< 0.002 U	< 0.002 U	- -	0.65	0.0052	- -
METALS	Boron	14	330	0.029 J	0.08	0.078	0.071 J	- -	- -	- -	- -	0.1	0.059 J	0.16	0.079 J	0.057 J	- -	11	0.033 J	- -
METALS	Cadmium	0.19	0.31	< 0.00023 UJ	0.00021 J	0.0005 J	< 0.001 UJ	- -	- -	- -	- -	0.000048 J	< 0.000077 UJ	0.00019 J	< 0.001 UJ	< 0.000076 UJ	- -	0.25	0.0011	- -
METALS	Chromium	19	19	< 0.01 UJ	< 0.0013 UJ	< 0.0015 UJ	< 0.002 UJ	- -	- -	- -	- -	0.0079	0.0041 J	0.006	< 0.005 U	0.004 J	- -	18	0.093	- -
METALS	Cobalt	8.6	7.7	0.0055 J	< 0.01 U	< 0.01 U	< 0.01 U	- -	- -	- -	- -	0.0041 J	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	- -	5.1	0.041	- -
METALS	Copper	16	78	0.011	0.013	0.0075 J	0.02	- -	- -	- -	- -	0.018	0.0064	0.013	0.0074	0.0061	- -	15	0.025	- -
METALS	Iron	23000	19000	10	1	1.1	0.19	- -	- -	- -	- -	9.1	4.1	0.19	< 0.04 U	4	- -	18000	83	- -
METALS	Lead	13	13	0.0074	0.0037	0.0011	0.00017 J	- -	- -	- -	- -	0.0053	0.0025	< 0.00026 UJ	< 0.001 UJ	0.0026	- -	14	0.031	- -
METALS	Lithium	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Manganese	550	1400	0.76	0.25	0.082	0.021	- -	- -	- -	- -	0.27	0.095	0.37	0.2	0.092	- -	290	2.3	- -
METALS	Mercury	< 0.0034 U	< 0.003 U	< 0.0002 U	< 0.0002 U	< 0.0002 UJ	< 0.0002 U	- -	- -	- -	- -	< 0.0002 UJ	< 0.0002 U	< 0.0002 U	< 0.0002 U	< 0.0002 U	- -	< 0.003 U	0.00008 J	- -
METALS	Molybdenum	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Nickel	16	37	< 0.021 UJ	0.0027 J	0.002 J	< 0.01 U	- -	- -	- -	- -	0.0089 J	0.0036 J	< 0.01 U	< 0.01 U	0.0034 J	- -	13	0.079	- -
METALS	Potassium	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Selenium	0.87 J	0.82 J	0.002	< 0.004 U	0.0011 J	0.0025	- -	- -	- -	- -	0.0012 J	0.00062 J	0.0037	0.00085 J	0.00082 J	- -	0.43 J	< 0.002 U	- -
METALS	Silver	0.055	0.22	< 0.001 U	< 0.002 U	< 0.001 U	< 0.001 UJ	- -	- -	- -	- -	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 UJ	< 0.001 U	- -	0.061 J	0.00034 J	- -
METALS	Sodium	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Thallium	0.39	0.17	< 0.00015 UJ	< 0.00018 UJ	< 0.001 U	< 0.001 U	- -	- -	- -	- -	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	- -	0.21	< 0.00018 UJ	- -
METALS	Vanadium	31	42	0.018	0.0039 J	0.0043 J	< 0.01 U	- -	- -	- -	- -	0.014	0.0078 J	< 0.01 U	< 0.01 U	0.0071 J	- -	29	0.16	- -
METALS	Zinc	90	350	0.046 J	< 0.02 U	< 0.02 U	< 0.02 U	- -	- -	- -	- -	0.045	< 0.02 U	0.015 J	< 0.02 U	< 0.02 U	- -	72	0.32	- -
METALS	Zirconium	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
PAH	1-Methylnaphthalene	55	12 J	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	25	- -	- -
PAH	2-Methylnaphthalene	64	17 J	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	33	- -	- -
PAH	Acenaphthene	< 23 U	110	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	- -	- -
PAH	Acenaphthylene	< 23 U	< 20 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	- -	- -
PAH	Anthracene	< 23 U	< 20 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	- -	- -
PAH	Benzo(a)anthracene	< 23 U	< 20 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	- -	- -
PAH	Benzo(a)pyrene	< 23 U	< 20 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	- -	- -
PAH	Benzo(b)fluoranthene	< 23 U	< 20 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	- -	- -
PAH	Benzo(g,h,i)perylene	< 23 UJ	< 20 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	- -	- -
PAH	Benzo(k)fluoranthene	< 23 U	< 20 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	- -	- -
PAH	Chrysene	< 23 U	22	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	- -	- -
PAH	Dibenzo(a,h)anthracene	< 23 UJ	< 20 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	- -	- -

Table A-3
Post-Topanga Fire Soil, Ash, and Surface Water Drainage Results
Santa Susana Field Laboratory

Sample Identification		CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1-D	CF-1-D	CRP-1	CRP-1	CRP-1
Sample Type		**Soil**	**Ash**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Soil**	**Surface Water**	**Surface Water**
Sampling Date		**10/07/2005**	**10/07/2005**	**10/18/2005**	**01/01/2006**	**01/03/2006**	**01/14/2006**	**02/19/2006**	**02/28/2006**	**03/03/2006**	**03/11/2006**	**03/28/2006**	**04/04/2006**	**04/14/2006**	**05/22/2006**	**04/04/2006**	**02/28/2006**	**10/07/2005**	**01/02/2006**	**02/28/2006**
Location		**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**
EPA Identification		**WL008**	**WL009**	**WL033**	**WL038**	**WL044**	**WL050**	**WL053**	**WL062**	**WL067**	**WL070**	**WL074**	**WL079**	**WL086**	**WL090**	**WL080**	**WL063**	**WL007**	**WL040**	**WL059**
Group	**Constituent**																			
PAH	Fluoranthene	< 23 U	22	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	10 J	- -	- -
PAH	Fluorene	9.2 J	< 20 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	- -	- -
PAH	Indeno(1,2,3-cd)pyrene	< 23 U	< 20 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	- -	- -
PAH	Naphthalene	280	130	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	270	- -	- -
PAH	Phenanthrene	32	110	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	50	- -	- -
PAH	Pyrene	12 J	19 J	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	9.6 J	- -	- -
SVOC	1,2,4-Trichlorobenzene	- -	- -	< 1 UJ	< 0.96 U	< 0.96 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 1 U	- -
SVOC	1,2-Dichlorobenzene	- -	- -	< 0.5 U	< 0.48 U	< 0.48 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	1,2-Diphenylhydrazine/Azobenzene	- -	- -	< 1 U	< 0.96 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 1 U	- -
SVOC	1,3-Dichlorobenzene	- -	- -	< 0.5 U	< 0.48 U	< 0.48 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	1,4-Dichlorobenzene	- -	- -	< 0.5 U	< 0.48 U	< 0.48 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	2,4,5-Trichlorophenol	- -	- -	< 2 U	< 1.9 U	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	2,4,6-Trichlorophenol	- -	- -	< 1 U	< 0.96 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 1 U	- -
SVOC	2,4-Dichlorophenol	- -	- -	< 2 U	< 1.9 U	< 1.9 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	2,4-Dimethylphenol	- -	- -	1.1 J	< 1.9 U	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	2,4-Dinitrophenol	- -	- -	< 5 UJ	2.8 J	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	2,4-Dinitrotoluene	- -	- -	< 5 U	< 4.8 U	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	2,6-Dinitrotoluene	- -	- -	< 5 U	< 4.8 U	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	2-Chloronaphthalene	- -	- -	< 0.5 U	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	2-Chlorophenol	- -	- -	< 1 U	< 0.96 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 1 U	- -
SVOC	2-Methylnaphthalene	- -	- -	< 1 U	< 0.96 U	< 0.96 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 1 U	- -
SVOC	2-Methylphenol	- -	- -	2.1	< 1.9 U	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	2-Nitroaniline	- -	- -	< 5 U	< 4.8 U	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	2-Nitrophenol	- -	- -	< 2 U	< 1.9 U	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	3,3-Dichlorobenzidine	- -	- -	< 5 U	< 4.8 U	< 4.8 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	3-Nitroaniline	- -	- -	< 5 U	< 4.8 U	< 4.8 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	4,6-Dinitro-2-methylphenol	- -	- -	< 5 U	< 4.8 U	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	4-Bromophenyl phenyl ether	- -	- -	< 1 U	< 0.96 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 1 U	- -
SVOC	4-Chloro-3-methylphenol	- -	- -	< 2 U	< 1.9 U	< 1.9 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	4-Chloroaniline	- -	- -	< 2 U	< 1.9 U	< 1.9 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	4-Chlorophenyl phenyl ether	- -	- -	< 0.5 U	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	4-Methylphenol	- -	- -	5	< 4.8 U	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.28 J	- -
SVOC	4-Nitroaniline	- -	- -	< 5 U	1.7 J	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	4-Nitrophenol	- -	- -	< 5 UJ	< 4.8 U	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	Acenaphthene	- -	- -	< 0.5 U	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	Acenaphthylene	- -	- -	< 0.5 U	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	Aniline	- -	- -	< 10 U	< 9.6 U	< 9.6 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 10 U	- -
SVOC	Anthracene	- -	- -	< 0.5 U	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	Benzidine	- -	- -	5 R	< 4.8 UJ	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 UJ	- -
SVOC	Benzo(a)anthracene	- -	- -	< 5 U	< 4.8 U	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	Benzo(a)pyrene	- -	- -	< 2 U	< 1.9 U	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	Benzo(b)fluoranthene	- -	- -	< 2 U	< 1.9 U	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	Benzo(g,h,i)perylene	- -	- -	< 5 U	< 4.8 U	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	Benzo(k)fluoranthene	- -	- -	< 0.5 U	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	Benzoic acid	- -	- -	19 J	6.9 J	< 19 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	9.5 J	- -
SVOC	Benzyl alcohol	- -	- -	11	< 4.8 U	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	1.6 J	- -
SVOC	Bis(2-chloroethoxy)methane	- -	- -	< 0.5 U	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	Bis(2-chloroethyl)ether	- -	- -	< 0.5 U	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	Bis(2-chloroisopropyl)ether	- -	- -	< 0.5 U	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	Bis(2-ethylhexyl)phthalate	- -	- -	< 5 U	< 4.8 U	< 4.8 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	Butyl benzyl phthalate	- -	- -	< 0.98 U	< 4.8 U	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	Chrysene	- -	- -	< 0.5 U	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	Dibenzo(a,h)anthracene	- -	- -	< 0.5 UJ	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	Dibenzofuran	- -	- -	< 0.5 U	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	Diethyl phthalate	- -	- -	< 1 U	< 0.96 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	5.9	- -
SVOC	Dimethyl phthalate	- -	- -	< 0.5 U	0.35 J	< 0.48 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.4 J	- -
SVOC	Di-n-butyl phthalate	- -	- -	< 2 U	< 1.9 U	< 1.9 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	Di-n-octyl phthalate	- -	- -	< 5 U	< 4.8 U	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	Fluoranthene	- -	- -	< 0.5 U	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	Fluorene	- -	- -	< 0.5 U	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	Hexachlorobenzene	- -	- -	< 1 U	< 0.96 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 1 U	- -
SVOC	Hexachlorobutadiene	- -	- -	< 2 UJ	< 1.9 U	< 1.9 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	Hexachlorocyclopentadiene	- -	- -	< 5 U	< 4.8 U	< 4.8 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 5 U	- -
SVOC	Hexachloroethane	- -	- -	< 3 UJ	< 2.9 U	< 2.9 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 3 U	- -

Table A-3
Post-Topanga Fire Soil, Ash, and Surface Water Drainage Results
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Sample Identification		CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1	CF-1-D	CF-1-D	CRP-1	CRP-1	CRP-1
Sample Type		**Soil**	**Ash**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Soil**	**Surface Water**	**Surface Water**
Sampling Date		**10/07/2005**	**10/07/2005**	**10/18/2005**	**01/01/2006**	**01/03/2006**	**01/14/2006**	**02/19/2006**	**02/28/2006**	**03/03/2006**	**03/11/2006**	**03/28/2006**	**04/04/2006**	**04/14/2006**	**05/22/2006**	**04/04/2006**	**02/28/2006**	**10/07/2005**	**01/02/2006**	**02/28/2006**
Location		**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**
EPA Identification		**WL008**	**WL009**	**WL033**	**WL038**	**WL044**	**WL050**	**WL053**	**WL062**	**WL067**	**WL070**	**WL074**	**WL079**	**WL086**	**WL090**	**WL080**	**WL063**	**WL007**	**WL040**	**WL059**
Group	**Constituent**																			
SVOC	Indeno(1,2,3-cd)pyrene	- -	- -	< 2 U	< 1.9 U	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	Isophorone	- -	- -	0.9 J	< 0.96 UJ	< 0.96 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.18 J	- -
SVOC	Naphthalene	- -	- -	< 1 U	< 0.96 U	< 0.96 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 1 U	- -
SVOC	Nitrobenzene	- -	- -	< 1 U	< 0.96 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 1 U	- -
SVOC	N-Nitrosodimethylamine	- -	- -	< 2 U	< 1.9 U	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	N-Nitroso-di-n-propylamine	- -	- -	< 2 U	< 1.9 U	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	N-Nitrosodiphenylamine	- -	- -	< 1 U	< 0.96 U	< 0.96 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 1 U	- -
SVOC	Pentachlorophenol	- -	- -	< 2 U	< 1.9 U	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 2 U	- -
SVOC	Phenanthrene	- -	- -	< 0.5 U	< 0.48 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
SVOC	Phenol	- -	- -	13	< 0.96 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 1 U	- -
SVOC	Pyrene	- -	- -	< 0.5 U	< 0.48 U	< 0.48 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 0.5 U	- -
WETCHEM	Ammonia-N	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.56 J	< 0.5 U	1.1	1.1 J	0.84	- -	- -	- -	- -
WETCHEM	Ammonia-NH3	< 6.8 U	< 6 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	30	- -	- -
WETCHEM	Nitrate/Nitrite-N	- -	- -	- -	- -	- -	- -	1.2	2	1.1	2.7	1.7	0.65	< 0.15 U	0.3	0.64	2.1	- -	- -	3.2
WETCHEM	Sulfate	4800	1100	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	1300	- -	- -
WETCHEM	Surfactants (MBAS)	3.6 J	1400 J	0.24	0.13 J	0.05 J	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.48 J	< 0.2 U	- -
WETCHEM	Total Cyanide	6.7	2.8	0.0058	< 0.005 U	0.0031 J	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	6.6	0.0037 J	- -
WETCHEM	pH	- -	- -	- -	- -	- -	- -	7.49	8.22	7.97	7.99	7.34	8.34	8.08	7.28	8.3	8.24	- -	- -	7.46
WETCHEM	Total Suspended Solids	- -	- -	- -	- -	- -	- -	130	380	150	100	1500	73	11	< 10 U	72	1200	- -	- -	80

Table A-3
Post-Topanga Fire Soil, Ash, and Surface Water Drainage Results
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Sample Identification		CRP-1	FC-1	FC-1	FC-1	FC-1	FC-1	FC-1	KD-1	LFBS54S01	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1
Sample Type		Surface Water	Soil	Ash	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Sediment	Soil	Ash	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Sampling Date		04/04/2006	02/23/2006	02/23/2006	03/03/2006	03/29/2006	04/04/2006	04/14/2006	01/03/2006	01/17/2006	10/07/2005	10/07/2005	10/18/2005	01/01/2006	01/03/2006	01/14/2006	02/19/2006	02/28/2006	03/03/2006
Location		Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage
EPA Identification		WL077	WL057	WL058	WL064	WL076	WL084	WL087	WL048	WL051	WL010	WL011	WL034	WL037	WL043	WL049	WL052	WL061	WL065
Group	Constituent																		
DIOXIN	1,2,3,4,6,7,8-HpCDD	- -	7.24	2.85 J	- -	- -	- -	- -	< 1.13E-06 U	19.5	0.355 J	0.833 J	3.00E-04	< 1.39E-06 U	< 1.30E-06 U	< 3.94E-06 U	- -	- -	- -
DIOXIN	1,2,3,4,6,7,8-HpCDF	- -	0.604 J	0.34 J	- -	- -	- -	- -	< 8.68E-07 U	3.5	< 0.112 U	< 0.15 U	3.20E-05 J	< 1.79E-06 U	< 6.18E-07 U	< 1.69E-06 U	- -	- -	- -
DIOXIN	1,2,3,4,7,8,9-HpCDF	- -	< 0.0438 U	< 0.0522 U	- -	- -	- -	- -	< 8.38E-07 U	0.263 J	< 0.138 U	< 0.174 U	< 2.60E-06 U	< 1.66E-06 U	< 5.83E-07 U	< 1.66E-06 U	- -	- -	- -
DIOXIN	1,2,3,4,7,8-HxCDD	- -	0.17 J	< 0.154 U	- -	- -	- -	- -	< 1.30E-06 U	0.389 J	< 0.253 U	< 0.404 U	< 3.20E-06 U	< 1.47E-06 U	< 1.23E-06 U	< 2.69E-06 U	- -	- -	- -
DIOXIN	1,2,3,4,7,8-HxCDF	- -	0.122 J	< 0.0377 U	- -	- -	- -	- -	< 5.33E-07 U	0.581 J	< 0.0561 U	< 0.088 U	5.00E-06 J	< 6.51E-07 U	< 3.23E-07 U	< 8.25E-07 U	- -	- -	- -
DIOXIN	1,2,3,6,7,8-HxCDD	- -	0.477 J	0.916 J	- -	- -	- -	- -	< 1.31E-06 U	1.23 J	< 0.259 U	< 0.397 U	< 1.70E-05 UJ	< 1.43E-06 U	< 1.24E-06 U	< 2.49E-06 U	- -	- -	- -
DIOXIN	1,2,3,6,7,8-HxCDF	- -	0.0953 J	0.318 J	- -	- -	- -	- -	< 5.24E-07 U	0.395 J	< 0.051 U	< 0.0836 U	< 2.70E-06 UJ	< 6.48E-07 U	< 3.05E-07 U	< 7.80E-07 U	- -	- -	- -
DIOXIN	1,2,3,7,8,9-HxCDD	- -	0.355 J	0.891 J	- -	- -	- -	- -	< 1.28E-06 U	1.07 J	< 0.257 U	< 0.402 U	< 2.70E-06 U	< 1.42E-06 U	< 1.21E-06 U	< 2.50E-06 U	- -	- -	- -
DIOXIN	1,2,3,7,8,9-HxCDF	- -	< 0.0365 U	< 0.0448 U	- -	- -	- -	- -	< 9.00E-07 U	< 0.0949 U	< 0.0875 U	< 0.13 U	2.80E-06 J	< 9.51E-07 U	< 5.20E-07 U	< 1.20E-06 U	- -	- -	- -
DIOXIN	1,2,3,7,8-PeCDD	- -	0.129 J	< 0.0916 U	- -	- -	- -	- -	< 1.17E-06 U	0.334 J	< 0.106 U	< 0.207 U	< 2.60E-06 U	< 8.67E-07 U	< 9.16E-07 U	< 1.61E-06 U	- -	- -	- -
DIOXIN	1,2,3,7,8-PeCDF	- -	0.0565 J	< 0.138 U	- -	- -	- -	- -	< 1.30E-06 U	0.391 J	< 0.142 U	< 0.225 U	< 3.50E-06 U	< 9.11E-07 U	< 1.46E-06 U	< 1.46E-06 U	- -	- -	- -
DIOXIN	2,3,4,6,7,8-HxCDF	- -	0.105 J	< 0.0298 U	- -	- -	- -	- -	< 5.85E-07 U	0.413 J	< 0.0596 U	< 0.104 U	< 2.30E-06 U	< 6.72E-07 U	< 3.56E-07 U	< 8.84E-07 U	- -	- -	- -
DIOXIN	2,3,4,7,8-PeCDF	- -	0.119 J	< 0.138 U	- -	- -	- -	- -	< 1.02E-06 U	0.513 J	< 0.131 U	< 0.191 U	2.50E-06 J	< 7.66E-07 U	< 1.10E-06 U	< 1.47E-06 U	- -	- -	- -
DIOXIN	2,3,7,8-TCDD	- -	< 0.0443 U	< 0.0888 U	- -	- -	- -	- -	< 7.96E-07 U	< 0.14 U	< 0.106 U	< 0.249 U	< 2.00E-06 U	< 7.99E-07 U	< 7.55E-07 U	< 1.31E-06 U	- -	- -	- -
DIOXIN	2,3,7,8-TCDF	- -	0.181 J	< 0.123 U	- -	- -	- -	- -	< 4.60E-07 U	0.637 J	0.151 J	< 0.199 U	< 2.40E-06 U	< 5.50E-07 U	< 8.34E-07 U	< 1.25E-06 U	- -	- -	- -
DIOXIN	OCDD	- -	41	152	- -	- -	- -	- -	< 3.70E-06 U	296	2.4 J	2.33 J	2.00E-03	< 4.95E-06 U	3.56E-06 J	< 2.97E-05 UJ	- -	- -	- -
DIOXIN	OCDF	- -	0.928 J	0.884 J	- -	- -	- -	- -	< 2.98E-06 U	15	< 0.358 U	< 0.504 U	6.60E-05 J	5.25E-06 J	< 2.05E-06 U	< 3.95E-06 U	- -	- -	- -
DIOXIN	TCDD TEQ (with DNQ)	- -	0.42	0.26	- -	- -	- -	- -	0	1.34528	0.019	0.0086	5.56E-06	5.25E-10	3.56E-10	0	- -	- -	- -
DIOXIN	TCDD TEQ (no DNQ)	- -	- -	- -	- -	- -	- -	- -	0	- -	- -	- -	3.20E-06	0	0	0	- -	- -	- -
DIOXIN	Total HpCDD	- -	15.5	7.27	- -	- -	- -	- -	< 1.13E-06 U	51.6	0.76	1.85	4.50E-04	< 1.39E-06 U	< 1.30E-06 U	< 2.90E-06 UJ	- -	- -	- -
DIOXIN	Total HpCDF	- -	1.18 J	0.754	- -	- -	- -	- -	< 8.52E-07 U	11.1	< 0.124 U	< 0.16 U	3.20E-05 J	< 1.73E-06 U	< 6.00E-07 U	< 1.67E-06 U	- -	- -	- -
DIOXIN	Total HxCDD	- -	4.46	2.29	- -	- -	- -	- -	< 1.30E-06 U	10.1	< 0.257 U	0.319	6.10E-06 J	< 1.44E-06 U	< 1.23E-06 U	< 2.55E-06 U	- -	- -	- -
DIOXIN	Total HxCDF	- -	1.16	0.855	- -	- -	- -	- -	< 6.20E-07 U	5.88	0.123	< 0.0999 U	3.10E-05 J	< 7.21E-07 U	< 3.67E-07 U	< 9.09E-07 U	- -	- -	- -
DIOXIN	Total PeCDD	- -	0.838	< 0.0916 U	- -	- -	- -	- -	< 1.17E-06 U	3.1	< 0.106 U	< 0.207 U	< 2.6E-06 U	< 8.67E-07 U	< 9.16E-07 U	< 1.61E-06 U	- -	- -	- -
DIOXIN	Total PeCDF	- -	1.27	0.465	- -	- -	- -	- -	< 1.15E-06 U	7.2	< 0.136 U	< 0.207 U	1.60E-05 J	< 8.35E-07 U	< 1.27E-06 U	< 1.47E-06 U	- -	- -	- -
DIOXIN	Total TCDD	- -	0.557	< 0.0888 U	- -	- -	- -	- -	< 7.96E-07 U	1.13	< 0.106 U	< 0.249 U	< 2.00E-06 U	< 7.99E-07 U	< 7.55E-07 U	< 1.31E-06 U	- -	- -	- -
DIOXIN	Total TCDF	- -	1.9	< 0.123 U	- -	- -	- -	- -	< 4.60E-07 U	7.24	0.387	< 0.199 U	< 2.40E-06 U	< 5.50E-07 U	< 8.34E-07 U	< 1.25E-06 U	- -	- -	- -
METALS	Aluminum	- -	- -	- -	- -	- -	- -	- -	- -	9200	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Antimony	0.00023 J	0.15 J	0.13 J	- -	0.00053 J	0.00017 J	< 0.00018 UJ	0.0011 J	< 1.1 U	0.15 J	0.36 J	0.00056 J	< 0.00059 UJ	< 0.004 U	0.00029 J	- -	- -	- -
METALS	Arsenic	0.011	4.9	5.5	- -	< 0.005 U	< 0.005 U	< 0.005 U	0.017	8	13	10	0.006	0.0039 J	0.0042 J	0.011	- -	- -	- -
METALS	Barium	0.13	43	140	- -	0.092	0.028	0.039	0.17	75	96	310	0.19	0.12	0.15	0.082	- -	- -	- -
METALS	Beryllium	0.0011 J	0.34	0.31	- -	< 0.002 U	< 0.002 U	< 0.002 U	< 0.002 U	0.45	0.8	1.1	< 0.002 U	< 0.002 U	< 0.002 U	< 0.002 U	- -	- -	- -
METALS	Boron	0.019 J	3.7	9.5	- -	0.022 J	0.029 J	< 0.025 UJ	0.93	3.7	12	240	0.047 J	0.2	0.18	0.2	- -	- -	- -
METALS	Cadmium	0.00025 J	0.027	0.18	- -	< 0.00024 UJ	0.00009 J	0.000056 J	0.00036 J	0.44	0.52	1.5	< 0.00034 UJ	0.00017 J	0.00032 J	0.00013 J	- -	- -	- -
METALS	Chromium	0.027	6.5	8.5	- -	< 0.005 U	< 0.005 U	< 0.005 U	0.0028 J	14	20	35	< 0.013 UJ	< 0.0021 UJ	< 0.0012 UJ	< 0.0029 UJ	- -	- -	- -
METALS	Cobalt	0.0073 J	2.8	2.9	- -	< 0.01 U	< 0.01 U	< 0.01 U	< 0.01 U	4.1	13	12	0.0066 J	0.0024 J	0.0023 J	< 0.01 U	- -	- -	- -
METALS	Copper	0.021	8.4	13	- -	0.0068	0.0018 J	0.0035	0.031	8.6	14	84	0.0095	< 0.005 UJ	< 0.0071 UJ	0.027	- -	- -	- -
METALS	Iron	27	14000	11000	- -	1.8	0.42	0.79	1.3	15000	27000	33000	12	2.4	1.4	0.57	- -	- -	- -
METALS	Lead	0.018	6	11	- -	0.011	0.00026 J	0.0015	0.0006 J	26	14	14	0.013	0.0012 J	0.0013 J	0.0017	- -	- -	- -
METALS	Lithium	- -	- -	- -	- -	- -	- -	- -	- -	17	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Manganese	0.38	140	300	- -	0.16	0.011 J	0.028	0.042	260	1700	1000	0.91	0.51	0.55	0.15	- -	- -	- -
METALS	Mercury	0.000058 J	0.005 J	0.029 J	- -	< 0.00011 UJ	< 0.0002 U	< 0.0002 UJ	< 0.0002 U	< 0.0041 U	< 0.003 U	0.0035	< 0.0002 U	< 0.0002 U	< 0.0002 UJ	< 0.0002 U	- -	- -	- -
METALS	Molybdenum	- -	- -	- -	- -	- -	- -	- -	- -	< 0.27 U	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Nickel	0.022	4.8	6.5	- -	0.0026 J	< 0.01 U	0.002 J	0.0063 J	11	18	34	< 0.02 UJ	0.0054 J	0.0043 J	< 0.01 U	- -	- -	- -
METALS	Potassium	- -	- -	- -	- -	- -	- -	- -	- -	3700	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Selenium	0.00043 J	< 0.72 UJ	< 0.22 UJ	- -	< 0.002 UJ	< 0.00063 UJ	< 0.002 U	0.084	< 1.4 U	3.2 J	3.8 J	0.0021	0.00091 J	0.011	0.19	- -	- -	- -
METALS	Silver	0.000099 J	0.041	0.059	- -	0.000042 J	< 0.001 U	< 0.001 U	< 0.004 U	< 0.55 U	0.045	0.14	< 0.001 U	< 0.002 U	< 0.002 U	< 0.001 UJ	- -	- -	- -
METALS	Sodium	- -	- -	- -	- -	- -	- -	- -	- -	< 53 UJ	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Thallium	0.00034 J	0.31	0.2	- -	< 0.001 U	< 0.001 U	< 0.001 U	0.00047 J	1.4	0.3	0.34	< 0.00012 UJ	< 0.00016 UJ	< 0.002 U	< 0.001 U	- -	- -	- -
METALS	Vanadium	0.046	19	15	- -	0.0037 J	< 0.01 U	< 0.01 U	0.0046 J	28	40	71	0.022	0.005 J	0.0036 J	< 0.01 U	- -	- -	- -
METALS	Zinc	0.082	29	58	- -	0.035	< 0.02 U	< 0.02 U	< 0.02 U	58	100	250	0.059 J	< 0.02 U	< 0.02 U	< 0.02 U	- -	- -	- -
METALS	Zirconium	- -	- -	- -	- -	- -	- -	- -	- -	2.2	- -	- -	- -	- -	- -	- -	- -	- -	- -
PAH	1-Methylnaphthalene	- -	- -	- -	- -	- -	- -	- -	- -	- -	19 J	19 J	- -	- -	- -	- -	- -	- -	- -
PAH	2-Methylnaphthalene	- -	- -	- -	- -	- -	- -	- -	- -	- -	25	26	- -	- -	- -	- -	- -	- -	- -
PAH	Acenaphthene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	- -	- -
PAH	Acenaphthylene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	- -	- -
PAH	Anthracene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	- -	- -
PAH	Benzo(a)anthracene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	- -	- -
PAH	Benzo(a)pyrene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	- -	- -
PAH	Benzo(b)fluoranthene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	- -	- -
PAH	Benzo(g,h,i)perylene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 UJ	< 20 UJ	- -	- -	- -	- -	- -	- -	- -
PAH	Benzo(k)fluoranthene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	- -	- -
PAH	Chrysene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	8.2 J	- -	- -	- -	- -	- -	- -	- -
PAH	Dibenzo(a,h)anthracene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	- -	- -

Table A-3
Post-Topanga Fire Soil, Ash, and Surface Water Drainage Results
Santa Susana Field Laboratory

Sample Identification		CRP-1	FC-1	FC-1	FC-1	FC-1	FC-1	FC-1	KD-1	LFBS54S01	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1
Sample Type		Surface Water	Soil	Ash	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Sediment	Soil	Ash	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Sampling Date		04/04/2006	02/23/2006	02/23/2006	03/03/2006	03/29/2006	04/04/2006	04/14/2006	01/03/2006	01/17/2006	10/07/2005	10/07/2005	10/18/2005	01/01/2006	01/03/2006	01/14/2006	02/19/2006	02/28/2006	03/03/2006
Location		Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage
EPA Identification		WL077	WL057	WL058	WL064	WL076	WL084	WL087	WL048	WL051	WL010	WL011	WL034	WL037	WL043	WL049	WL052	WL061	WL065
Group	Constituent																		
PAH	Fluoranthene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	- -	- -
PAH	Fluorene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	- -	- -
PAH	Indeno(1,2,3-cd)pyrene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	- -	- -
PAH	Naphthalene	- -	- -	- -	- -	- -	- -	- -	- -	- -	71	260	- -	- -	- -	- -	- -	- -	- -
PAH	Phenanthrene	- -	- -	- -	- -	- -	- -	- -	- -	- -	26	33	- -	- -	- -	- -	- -	- -	- -
PAH	Pyrene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	- -	- -
SVOC	1,2,4-Trichlorobenzene	- -	- -	- -	- -	- -	- -	- -	< 0.95 UJ	- -	- -	- -	< 4 UJ	< 1 U	< 0.96 UJ	- -	- -	- -	- -
SVOC	1,2-Dichlorobenzene	- -	- -	- -	- -	- -	- -	- -	< 0.48 UJ	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 U	- -	- -	- -	- -
SVOC	1,2-Diphenylhydrazine/Azobenzene	- -	- -	- -	- -	- -	- -	- -	< 0.95 U	- -	- -	- -	< 4 U	< 1 U	< 0.96 U	- -	- -	- -	- -
SVOC	1,3-Dichlorobenzene	- -	- -	- -	- -	- -	- -	- -	< 0.48 UJ	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 U	- -	- -	- -	- -
SVOC	1,4-Dichlorobenzene	- -	- -	- -	- -	- -	- -	- -	0.11 J	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 U	- -	- -	- -	- -
SVOC	2,4,5-Trichlorophenol	- -	- -	- -	- -	- -	- -	- -	0.19 J	- -	- -	- -	< 8 U	< 2 U	< 1.9 UJ	- -	- -	- -	- -
SVOC	2,4,6-Trichlorophenol	- -	- -	- -	- -	- -	- -	- -	< 0.95 U	- -	- -	- -	< 4 U	< 1 U	< 0.96 U	- -	- -	- -	- -
SVOC	2,4-Dichlorophenol	- -	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	< 8 U	< 2 U	< 1.9 U	- -	- -	- -	- -
SVOC	2,4-Dimethylphenol	- -	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	< 8 U	< 2 U	< 1.9 UJ	- -	- -	- -	- -
SVOC	2,4-Dinitrophenol	- -	- -	- -	- -	- -	- -	- -	< 4.8 UJ	- -	- -	- -	< 20 UJ	< 5 U	< 4.8 UJ	- -	- -	- -	- -
SVOC	2,4-Dinitrotoluene	- -	- -	- -	- -	- -	- -	- -	< 4.8 U	- -	- -	- -	< 20 U	< 5 U	< 4.8 UJ	- -	- -	- -	- -
SVOC	2,6-Dinitrotoluene	- -	- -	- -	- -	- -	- -	- -	< 4.8 U	- -	- -	- -	< 20 U	< 5 U	< 4.8 UJ	- -	- -	- -	- -
SVOC	2-Chloronaphthalene	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -
SVOC	2-Chlorophenol	- -	- -	- -	- -	- -	- -	- -	< 0.95 U	- -	- -	- -	< 4 U	< 1 U	< 0.96 U	- -	- -	- -	- -
SVOC	2-Methylnaphthalene	- -	- -	- -	- -	- -	- -	- -	< 0.95 U	- -	- -	- -	< 4 U	< 1 U	< 0.96 UJ	- -	- -	- -	- -
SVOC	2-Methylphenol	- -	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	2.6 J	< 2 U	< 1.9 UJ	- -	- -	- -	- -
SVOC	2-Nitroaniline	- -	- -	- -	- -	- -	- -	- -	< 4.8 U	- -	- -	- -	< 20 U	< 5 U	< 4.8 UJ	- -	- -	- -	- -
SVOC	2-Nitrophenol	- -	- -	- -	- -	- -	- -	- -	< 1.9 UJ	- -	- -	- -	< 8 U	< 2 U	< 1.9 UJ	- -	- -	- -	- -
SVOC	3,3-Dichlorobenzidine	- -	- -	- -	- -	- -	- -	- -	< 4.8 U	- -	- -	- -	< 20 U	< 5 U	< 4.8 U	- -	- -	- -	- -
SVOC	3-Nitroaniline	- -	- -	- -	- -	- -	- -	- -	< 4.8 U	- -	- -	- -	< 20 U	< 5 U	< 4.8 U	- -	- -	- -	- -
SVOC	4,6-Dinitro-2-methylphenol	- -	- -	- -	- -	- -	- -	- -	< 4.8 UJ	- -	- -	- -	< 20 U	< 5 U	< 4.8 UJ	- -	- -	- -	- -
SVOC	4-Bromophenyl phenyl ether	- -	- -	- -	- -	- -	- -	- -	< 0.95 U	- -	- -	- -	< 4 U	< 1 U	< 0.96 U	- -	- -	- -	- -
SVOC	4-Chloro-3-methylphenol	- -	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	< 8 U	< 2 U	< 1.9 U	- -	- -	- -	- -
SVOC	4-Chloroaniline	- -	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	< 8 U	< 2 U	< 1.9 U	- -	- -	- -	- -
SVOC	4-Chlorophenyl phenyl ether	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -
SVOC	4-Methylphenol	- -	- -	- -	- -	- -	- -	- -	< 4.8 U	- -	- -	- -	5.5 J	< 5 U	< 4.8 UJ	- -	- -	- -	- -
SVOC	4-Nitroaniline	- -	- -	- -	- -	- -	- -	- -	< 4.8 U	- -	- -	- -	< 20 U	< 5 U	< 4.8 UJ	- -	- -	- -	- -
SVOC	4-Nitrophenol	- -	- -	- -	- -	- -	- -	- -	< 4.8 UJ	- -	- -	- -	< 20 UJ	< 5 U	< 4.8 UJ	- -	- -	- -	- -
SVOC	Acenaphthene	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -
SVOC	Acenaphthylene	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -
SVOC	Aniline	- -	- -	- -	- -	- -	- -	- -	< 9.5 U	- -	- -	- -	< 40 U	< 10 U	< 9.6 U	- -	- -	- -	- -
SVOC	Anthracene	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -
SVOC	Benzidine	- -	- -	- -	- -	- -	- -	- -	< 4.8 UJ	- -	- -	- -	5 R	< 5 UJ	< 4.8 UJ	- -	- -	- -	- -
SVOC	Benzo(a)anthracene	- -	- -	- -	- -	- -	- -	- -	< 4.8 U	- -	- -	- -	< 20 U	0.32 J	< 4.8 UJ	- -	- -	- -	- -
SVOC	Benzo(a)pyrene	- -	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	< 8 U	< 2 U	< 1.9 U	- -	- -	- -	- -
SVOC	Benzo(b)fluoranthene	- -	- -	- -	- -	- -	- -	- -	0.74 J	- -	- -	- -	< 8 U	< 2 U	< 1.9 U	- -	- -	- -	- -
SVOC	Benzo(g,h,i)perylene	- -	- -	- -	- -	- -	- -	- -	0.17 J	- -	- -	- -	< 20 U	< 5 U	< 4.8 U	- -	- -	- -	- -
SVOC	Benzo(k)fluoranthene	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 U	- -	- -	- -	- -
SVOC	Benzoic acid	- -	- -	- -	- -	- -	- -	- -	4.2 J	- -	- -	- -	85 J	5 J	< 19 UJ	- -	- -	- -	- -
SVOC	Benzyl alcohol	- -	- -	- -	- -	- -	- -	- -	< 4.8 U	- -	- -	- -	27	< 5 U	< 4.8 UJ	- -	- -	- -	- -
SVOC	Bis(2-chloroethoxy)methane	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -
SVOC	Bis(2-chloroethyl)ether	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -
SVOC	Bis(2-chloroisopropyl)ether	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -
SVOC	Bis(2-ethylhexyl)phthalate	- -	- -	- -	- -	- -	- -	- -	< 4.8 U	- -	- -	- -	< 20 U	< 5 U	< 4.8 U	- -	- -	- -	- -
SVOC	Butyl benzyl phthalate	- -	- -	- -	- -	- -	- -	- -	0.32 J	- -	- -	- -	< 3.2 U	< 5 U	< 4.8 UJ	- -	- -	- -	- -
SVOC	Chrysene	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -
SVOC	Dibenzo(a,h)anthracene	- -	- -	- -	- -	- -	- -	- -	0.63	- -	- -	- -	< 2 UJ	< 0.5 U	< 0.48 U	- -	- -	- -	- -
SVOC	Dibenzofuran	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -
SVOC	Diethyl phthalate	- -	- -	- -	- -	- -	- -	- -	< 0.95 U	- -	- -	- -	< 4 U	< 1 U	< 0.96 U	- -	- -	- -	- -
SVOC	Dimethyl phthalate	- -	- -	- -	- -	- -	- -	- -	0.36 J	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 U	- -	- -	- -	- -
SVOC	Di-n-butyl phthalate	- -	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	< 8 U	0.48 J	< 1.9 U	- -	- -	- -	- -
SVOC	Di-n-octyl phthalate	- -	- -	- -	- -	- -	- -	- -	< 4.8 U	- -	- -	- -	< 20 U	< 5 U	< 4.8 UJ	- -	- -	- -	- -
SVOC	Fluoranthene	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -
SVOC	Fluorene	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -
SVOC	Hexachlorobenzene	- -	- -	- -	- -	- -	- -	- -	< 0.95 U	- -	- -	- -	< 4 U	< 1 U	< 0.96 U	- -	- -	- -	- -
SVOC	Hexachlorobutadiene	- -	- -	- -	- -	- -	- -	- -	< 1.9 UJ	- -	- -	- -	< 8 UJ	< 2 U	< 1.9 U	- -	- -	- -	- -
SVOC	Hexachlorocyclopentadiene	- -	- -	- -	- -	- -	- -	- -	< 4.8 U	- -	- -	- -	< 20 U	< 5 U	< 4.8 U	- -	- -	- -	- -
SVOC	Hexachloroethane	- -	- -	- -	- -	- -	- -	- -	< 2.9 UJ	- -	- -	- -	< 12 UJ	< 3 U	< 2.9 U	- -	- -	- -	- -

Table A-3
Post-Topanga Fire Soil, Ash, and Surface Water Drainage Results
Santa Susana Field Laboratory

Sample Identification		CRP-1	FC-1	FC-1	FC-1	FC-1	FC-1	FC-1	KD-1	LFBS54S01	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1	PCC-1
Sample Type		**Surface Water**	**Soil**	**Ash**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Sediment**	**Soil**	**Ash**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**
Sampling Date		**04/04/2006**	**02/23/2006**	**02/23/2006**	**03/03/2006**	**03/29/2006**	**04/04/2006**	**04/14/2006**	**01/03/2006**	**01/17/2006**	**10/07/2005**	**10/07/2005**	**10/18/2005**	**01/01/2006**	**01/03/2006**	**01/14/2006**	**02/19/2006**	**02/28/2006**	**03/03/2006**
Location		**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**
EPA Identification		**WL077**	**WL057**	**WL058**	**WL064**	**WL076**	**WL084**	**WL087**	**WL048**	**WL051**	**WL010**	**WL011**	**WL034**	**WL037**	**WL043**	**WL049**	**WL052**	**WL061**	**WL065**
Group	**Constituent**																		
SVOC	Indeno(1,2,3-cd)pyrene	- -	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	< 8 U	< 2 U	< 1.9 U	- -	- -	- -	- -
SVOC	Isophorone	- -	- -	- -	- -	- -	- -	- -	< 0.95 UJ	- -	- -	- -	< 4 U	< 1 UJ	< 0.96 UJ	- -	- -	- -	- -
SVOC	Naphthalene	- -	- -	- -	- -	- -	- -	- -	< 0.95 U	- -	- -	- -	< 4 U	< 1 U	< 0.96 UJ	- -	- -	- -	- -
SVOC	Nitrobenzene	- -	- -	- -	- -	- -	- -	- -	< 0.95 U	- -	- -	- -	< 4 U	< 1 U	< 0.96 U	- -	- -	- -	- -
SVOC	N-Nitrosodimethylamine	- -	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	< 8 U	< 2 U	< 1.9 UJ	- -	- -	- -	- -
SVOC	N-Nitroso-di-n-propylamine	- -	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	< 8 U	< 2 U	< 1.9 UJ	- -	- -	- -	- -
SVOC	N-Nitrosodiphenylamine	- -	- -	- -	- -	- -	- -	- -	< 0.95 U	- -	- -	- -	< 4 U	< 1 U	< 0.96 UJ	- -	- -	- -	- -
SVOC	Pentachlorophenol	- -	- -	- -	- -	- -	- -	- -	< 1.9 UJ	- -	- -	- -	< 8 U	< 2 U	< 1.9 UJ	- -	- -	- -	- -
SVOC	Phenanthrene	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -
SVOC	Phenol	- -	- -	- -	- -	- -	- -	- -	< 0.95 U	- -	- -	- -	14	< 1 U	< 0.96 U	- -	- -	- -	- -
SVOC	Pyrene	- -	- -	- -	- -	- -	- -	- -	< 0.48 U	- -	- -	- -	< 2 U	< 0.5 U	< 0.48 U	- -	- -	- -	- -
WETCHEM	Ammonia-N	0.84	2.8	7.1	- -	0.56 J	0.84	< 0.5 U	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
WETCHEM	Ammonia-NH3	- -	- -	- -	- -	- -	- -	- -	- -	- -	10	8.7	- -	- -	- -	- -	- -	- -	- -
WETCHEM	Nitrate/Nitrite-N	0.17	< 1.5 U	2.4	3.9	3.9	4.5	5.5	- -	- -	- -	- -	- -	- -	- -	- -	< 0.3 U	1.6	1.1
WETCHEM	Sulfate	- -	- -	- -	- -	- -	- -	- -	- -	- -	17000	6200	- -	- -	- -	- -	- -	- -	- -
WETCHEM	Surfactants (MBAS)	- -	- -	- -	- -	- -	- -	- -	0.13 J	- -	3.1 J	1.7 J	0.16	0.063 J	0.065 J	- -	- -	- -	- -
WETCHEM	Total Cyanide	- -	- -	- -	- -	- -	- -	- -	< 0.005 U	- -	1.4	3.9	0.0061	0.0023 J	0.0026 J	- -	- -	- -	- -
WETCHEM	pH	7.53	6.39	7.68	5.92	6.53	5.65	6.82	- -	- -	- -	- -	- -	- -	- -	- -	7.47	8.12	7.47
WETCHEM	Total Suspended Solids	290	- -	- -	37	63	< 10 U	85	- -	- -	- -	- -	- -	- -	- -	- -	61	190	26

Table A-3
Post-Topanga Fire Soil, Ash, and Surface Water Drainage Results
Santa Susana Field Laboratory

Sample Identification		PCC-1	PCC-1	PCC-1	PCC-1	PCC-1	RP-1	RP-1	RP-1	RP-1	SC-1	SC-1	SC-1	SC-1	SJBC-1	SJBC-2	SORP-1	SSM-1	SSM-1
Sample Type		Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Soil	Surface Water	Surface Water	Surface Water	Soil	Ash	Surface Water	Surface Water	Surface Water	Surface Water	Soil	Soil	Ash
Sampling Date		03/11/2006	03/28/2006	04/04/2006	04/14/2006	05/22/2006	10/06/2005	01/02/2006	03/28/2006	04/04/2006	10/10/2005	10/10/2005	01/02/2006	01/03/2006	01/03/2006	01/03/2006	02/23/2006	10/13/2005	10/13/2005
Location		Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage
EPA Identification		WL069	WL075	WL078	WL085	WL089	WL006	WL041	WL073	WL081	WL012	WL013	WL039	WL045	WL046	WL047	WL056	WL022	WL023
Group	**Constituent**																		
DIOXIN	1,2,3,4,6,7,8-HpCDD	- -	- -	- -	- -	- -	0.694 J	5.70E-05 J	- -	- -	0.957 J	2.88	4.51E-04	5.22E-05	< 1.08E-06 U	1.41E-05 J	- -	1.4 J	1.97 J
DIOXIN	1,2,3,4,6,7,8-HpCDF	- -	- -	- -	- -	- -	< 0.182 UJ	1.84E-05 J	- -	- -	< 0.234 UJ	< 0.412 UJ	1.23E-04	1.44E-05 J	< 9.43E-07 U	2.71E-06 J	- -	< 0.244 UJ	< 0.0913 U
DIOXIN	1,2,3,4,7,8,9-HpCDF	- -	- -	- -	- -	- -	< 0.0614 U	< 4.18E-06 U	- -	- -	< 0.0859 U	< 0.0675 U	8.22E-06 J	< 1.46E-06 U	< 8.25E-07 U	< 6.01E-07 U	- -	< 0.139 U	< 0.109 U
DIOXIN	1,2,3,4,7,8-HxCDD	- -	- -	- -	- -	- -	< 0.0826 U	< 5.54E-06 U	- -	- -	< 0.204 U	< 0.174 U	9.72E-06 J	1.50E-06 J	< 1.43E-06 U	< 1.69E-06 U	- -	< 0.286 U	< 0.242 U
DIOXIN	1,2,3,4,7,8-HxCDF	- -	- -	- -	- -	- -	< 0.0492 U	< 3.57E-06 U	- -	- -	< 0.0555 U	< 0.115 U	2.19E-05 J	< 1.96E-06 UJ	< 5.85E-07 U	9.18E-07 J	- -	0.079 J	< 0.0687 U
DIOXIN	1,2,3,6,7,8-HxCDD	- -	- -	- -	- -	- -	0.221 J	< 2.40E-05 UJ	- -	- -	< 0.201 U	< 0.367 U	2.59E-05	2.57E-06 J	< 1.40E-06 U	< 1.76E-06 U	- -	0.145 J	< 0.263 U
DIOXIN	1,2,3,6,7,8-HxCDF	- -	- -	- -	- -	- -	0.0668 J	< 3.22E-06 U	- -	- -	< 0.0517 U	< 0.107 U	2.31E-05 J	2.60E-06 J	< 5.48E-07 U	5.79E-07 J	- -	< 0.0674 U	< 0.0654 U
DIOXIN	1,2,3,7,8,9-HxCDD	- -	- -	- -	- -	- -	0.232 J	2.43E-05 J	- -	- -	< 0.191 U	< 0.266 UJ	2.09E-05 J	< 2.36E-06 UJ	< 1.39E-06 U	< 1.68E-06 U	- -	< 0.274 U	< 0.254 U
DIOXIN	1,2,3,7,8,9-HxCDF	- -	- -	- -	- -	- -	< 0.0433 U	< 4.28E-06 U	- -	- -	< 0.0893 U	< 0.195 U	5.88E-06 J	< 1.20E-06 U	< 8.97E-07 U	< 5.69E-07 U	- -	< 0.101 U	< 0.101 U
DIOXIN	1,2,3,7,8-PeCDD	- -	- -	- -	- -	- -	< 0.0869 U	< 6.29E-06 U	- -	- -	< 0.108 U	< 0.227 U	6.97E-06 J	< 8.73E-07 UJ	< 1.07E-06 U	< 1.09E-06 U	- -	< 0.0887 U	< 0.11 U
DIOXIN	1,2,3,7,8-PeCDF	- -	- -	- -	- -	- -	< 0.0942 U	< 6.96E-06 U	- -	- -	< 0.149 U	< 0.277 U	1.63E-05 J	1.96E-06 J	< 1.26E-06 U	< 9.10E-07 U	- -	< 0.145 U	< 0.159 U
DIOXIN	2,3,4,6,7,8-HxCDF	- -	- -	- -	- -	- -	< 0.0516 U	< 3.11E-06 U	- -	- -	< 0.0564 U	< 0.126 U	3.32E-05	3.64E-06 J	< 6.20E-07 U	8.52E-07 J	- -	< 0.063 UJ	< 0.0698 U
DIOXIN	2,3,4,7,8-PeCDF	- -	- -	- -	- -	- -	< 0.083 U	< 6.28E-06 U	- -	- -	< 0.141 U	< 0.248 U	4.83E-05	4.65E-06 J	< 1.08E-06 U	1.06E-06 J	- -	< 0.125 U	< 0.139 U
DIOXIN	2,3,7,8-TCDD	- -	- -	- -	- -	- -	< 0.0609 U	< 4.14E-06 U	- -	- -	< 0.129 U	< 0.208 U	1.66E-06 J	< 4.96E-07 U	< 1.13E-06 U	< 6.89E-07 U	- -	< 0.107 U	< 0.141 U
DIOXIN	2,3,7,8-TCDF	- -	- -	- -	- -	- -	< 0.0791 U	4.18E-06 J	- -	- -	< 0.13 UJ	< 0.162 U	3.22E-05	3.84E-06 J	< 7.93E-07 U	< 5.01E-07 U	- -	< 0.109 U	< 0.112 U
DIOXIN	OCDD	- -	- -	- -	- -	- -	4.81 J	3.62E-04	- -	- -	5.91	13.6	3.21E-03	3.78E-04	7.68E-06 J	1.10E-04	- -	8.65	9.52
DIOXIN	OCDF	- -	- -	- -	- -	- -	< 0.595 U	3.62E-05 J	- -	- -	< 0.545 U	< 0.709 UJ	1.71E-04	4.69E-05 J	< 2.41E-06 U	7.70E-06 J	- -	< 0.527 U	< 0.47 U
DIOXIN	TCDD TEQ (with DNQ)	- -	- -	- -	- -	- -	0.059	3.64E-06	- -	- -	0.01	0.03016	5.70E-05	4.55E-06	7.68E-10	9.45E-07	- -	0.037	0.021
DIOXIN	TCDD TEQ (no DNQ)	- -	- -	- -	- -	- -	- -	3.62E-08	- -	- -	- -	- -	3.94E-05	5.60E-07	0	1.10E-08	- -	- -	- -
DIOXIN	Total HpCDD	- -	- -	- -	- -	- -	1.5	1.19E-04	- -	- -	2.31	6.38	9.70E-04	1.15E-04	< 1.08E-06 U	2.84E-05	- -	3.01	3.72
DIOXIN	Total HpCDF	- -	- -	- -	- -	- -	< 0.182 U	3.08E-05	- -	- -	< 0.553 U	0.84	2.51E-04	2.75E-05	< 8.81E-07 U	7.01E-06	- -	< 0.491 U	< 0.0994 U
DIOXIN	Total HxCDD	- -	- -	- -	- -	- -	0.602	5.04E-05	- -	- -	0.25	2.47	2.64E-04	2.74E-05	< 1.41E-06 U	2.78E-06	- -	0.942	0.966
DIOXIN	Total HxCDF	- -	- -	- -	- -	- -	0.176 J	2.05E-05	- -	- -	0.551	0.23	4.20E-04	3.99E-05	< 6.49E-07 U	3.39E-06	- -	0.251	< 0.0755 U
DIOXIN	Total PeCDD	- -	- -	- -	- -	- -	< 0.0869 U	< 6.29E-06 U	- -	- -	< 0.108 U	0.607	7.63E-05	4.83E-06	< 1.07E-06 U	< 1.09E-06 U	- -	< 0.133 U	< 0.121 U
DIOXIN	Total PeCDF	- -	- -	- -	- -	- -	0.0916	1.22E-05	- -	- -	< 0.493 U	0.3	6.69E-04	6.09E-05	< 1.17E-06 U	1.06E-06	- -	0.119	< 0.148 U
DIOXIN	Total TCDD	- -	- -	- -	- -	- -	< 0.0609 U	< 4.14E-06 U	- -	- -	< 0.129 U	0.408	3.24E-05	1.34E-06	< 1.13E-06 U	6.03E-06	- -	< 0.107 U	0.179
DIOXIN	Total TCDF	- -	- -	- -	- -	- -	< 0.0791 U	1.73E-05	- -	- -	< 0.13 U	1.14	5.52E-04 J	4.99E-05	< 7.93E-07 U	8.65E-07	- -	0.287	< 0.112 U
METALS	Aluminum	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Antimony	- -	0.000062 J	0.00037 J	< 0.00024 UJ	< 0.00012 UJ	0.037	< 0.00022 UJ	0.00022 J	< 0.004 UJ	0.056 J	0.5 J	< 0.00028 UJ	0.00074 J	< 0.004 U	0.00039 J	- -	0.053 J	0.12 J
METALS	Arsenic	- -	< 0.0057 UJ	0.023	0.02	< 0.005 U	4	0.045	0.031	0.024	5.5	< 2.4 U	0.13	0.027	0.0095	0.013	- -	5.1	3.1
METALS	Barium	- -	0.059	0.21	0.29	0.073	58	2	0.49	0.5	230	370	6.9	0.95	0.056	0.081	- -	48	180
METALS	Beryllium	- -	< 0.002 U	0.002	0.0024	< 0.002 U	0.39	0.013	0.0038	0.0032	< 0.81 U	< 0.81 U	0.0099 J	0.0014 J	< 0.002 U	< 0.002 U	- -	0.34	0.41
METALS	Boron	- -	0.16	0.057 J	< 0.037 UJ	0.15 J	< 1 U	< 0.11 UJ	0.026 J	0.044 J	< 4 U	120	0.24 J	0.088	0.42	0.47	- -	< 1 U	77
METALS	Cadmium	- -	< 0.001 UJ	0.00053 J	0.00052 J	0.00029 J	0.063 J	0.002	0.00041 J	0.00062 J	0.046	0.12	0.0046	0.0011	0.00025 J	0.00038 J	- -	0.072	0.65
METALS	Chromium	- -	< 0.005 U	0.044	0.077	< 0.005 U	17	0.43	0.16	0.11	14	13	0.35	0.04	0.0073	0.017	- -	9.7	13
METALS	Cobalt	- -	< 0.01 U	0.015	0.028	< 0.01 U	4.8	0.12	0.036	0.03	12	7	0.32	0.038	0.0021 J	0.0046 J	- -	3.3	3.3
METALS	Copper	- -	0.0086	0.026	0.018	0.0049	7.3	0.058	0.033	0.035	24	38	0.32	0.11	0.022	0.028	- -	5.6	27
METALS	Iron	- -	1.1	49	67	0.5	14000	300	110	90	32000	19000	460	62	3.7	12	- -	11000	11000
METALS	Lead	- -	0.00061 J	0.037	0.021	0.00031 J	6	0.092	0.034	0.047	6.4	42	0.53	0.12	0.0013 J	0.004	- -	5.3	16
METALS	Lithium	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Manganese	- -	0.22	1.1	1.6	0.58	220	6.4	1.8	1.5	500	670	17	2.2	0.057	0.12	- -	190	270
METALS	Mercury	- -	< 0.0002 UJ	0.000083 J	< 0.0002 U	< 0.0002 U	< 0.0063 UJ	0.00036	< 0.0002 UJ	0.00012 J	< 0.003 U	< 0.003 U	0.0012	0.00019 J	< 0.0002 U	< 0.0002 U	- -	< 0.003 U	< 0.0031 U
METALS	Molybdenum	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Nickel	- -	0.0036 J	0.035	0.046	0.0031 J	11	0.29	0.12	0.071	9.7	11	0.33	0.043	0.006 J	0.015	- -	7.8	15
METALS	Potassium	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Selenium	- -	0.0021 J	0.0012 J	0.00061 J	0.0023	0.26	0.00088 J	< 0.002 UJ	0.00092 J	< 0.2 UJ	0.25 J	0.0029	0.0016 J	0.057	0.073	- -	< 0.29 UJ	< 0.63 UJ
METALS	Silver	- -	< 0.001 U	0.00014 J	0.000097 J	< 0.001 UJ	< 0.02 U	0.00097 J	0.00024 J	0.00026 J	0.043 J	0.23 J	0.0022	0.00048 J	< 0.002 U	< 0.001 U	- -	0.029 J	0.11 J
METALS	Sodium	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Thallium	- -	< 0.001 U	0.00048 J	0.00021 J	< 0.001 U	0.21	0.0012	0.0005 J	0.00092 J	0.42	0.18	0.0014	< 0.00048 UJ	< 0.002 U	0.000096 J	- -	0.18	0.22
METALS	Vanadium	- -	< 0.01 U	0.077	0.1	< 0.01 U	28	0.65	0.25	0.19	80	49	1.2	0.17	0.009 J	0.028	- -	18	23
METALS	Zinc	- -	< 0.02 U	0.16	0.19	< 0.02 U	44	0.93	0.3	0.25	87	120	2	0.26	0.01 J	0.045	- -	33	110
METALS	Zirconium	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
PAH	1-Methylnaphthalene	- -	- -	- -	- -	- -	16 J	- -	- -	- -	< 20 U	23	- -	- -	- -	- -	- -	24	21
PAH	2-Methylnaphthalene	- -	- -	- -	- -	- -	18 J	- -	- -	- -	9.6 J	31	- -	- -	- -	- -	- -	31	30
PAH	Acenaphthene	- -	- -	- -	- -	- -	< 20 U	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	< 21 U	< 21 U
PAH	Acenaphthylene	- -	- -	- -	- -	- -	< 20 U	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	< 21 U	< 21 U
PAH	Anthracene	- -	- -	- -	- -	- -	< 20 U	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	< 21 U	< 21 U
PAH	Benzo(a)anthracene	- -	- -	- -	- -	- -	< 20 U	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	< 21 U	< 21 U
PAH	Benzo(a)pyrene	- -	- -	- -	- -	- -	< 20 U	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	< 21 U	< 21 U
PAH	Benzo(b)fluoranthene	- -	- -	- -	- -	- -	< 20 U	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	< 21 U	< 21 U
PAH	Benzo(g,h,i)perylene	- -	- -	- -	- -	- -	< 20 U	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	< 21 U	< 21 U
PAH	Benzo(k)fluoranthene	- -	- -	- -	- -	- -	< 20 U	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	< 21 U	< 21 U
PAH	Chrysene	- -	- -	- -	- -	- -	< 20 U	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	< 21 U	34
PAH	Dibenzo(a,h)anthracene	- -	- -	- -	- -	- -	< 20 U	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	< 21 U	< 21 U

Table A-3
Post-Topanga Fire Soil, Ash, and Surface Water Drainage Results
Santa Susana Field Laboratory

Sample Identification		PCC-1	PCC-1	PCC-1	PCC-1	PCC-1	RP-1	RP-1	RP-1	RP-1	SC-1	SC-1	SC-1	SC-1	SJBC-1	SJBC-2	SORP-1	SSM-1	SSM-1
Sample Type		**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Soil**	**Surface Water**	**Surface Water**	**Surface Water**	**Soil**	**Ash**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Soil**	**Soil**	**Ash**
Sampling Date		**03/11/2006**	**03/28/2006**	**04/04/2006**	**04/14/2006**	**05/22/2006**	**10/06/2005**	**01/02/2006**	**03/28/2006**	**04/04/2006**	**10/10/2005**	**10/10/2005**	**01/02/2006**	**01/03/2006**	**01/03/2006**	**01/03/2006**	**02/23/2006**	**10/13/2005**	**10/13/2005**
Location		**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**
EPA Identification		**WL069**	**WL075**	**WL078**	**WL085**	**WL089**	**WL006**	**WL041**	**WL073**	**WL081**	**WL012**	**WL013**	**WL039**	**WL045**	**WL046**	**WL047**	**WL056**	**WL022**	**WL023**
Group	**Constituent**																		
PAH	Fluoranthene	- -	- -	- -	- -	- -	11 J	- -	- -	- -	8.2 J	12 J	- -	- -	- -	- -	- -	13 J	32
PAH	Fluorene	- -	- -	- -	- -	- -	< 20 U	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	9 J	< 21 U
PAH	Indeno(1,2,3-cd)pyrene	- -	- -	- -	- -	- -	< 20 U	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	- -	< 21 U	< 21 U
PAH	Naphthalene	- -	- -	- -	- -	- -	41	- -	- -	- -	34	250	- -	- -	- -	- -	- -	100	580
PAH	Phenanthrene	- -	- -	- -	- -	- -	19 J	- -	- -	- -	21	57	- -	- -	- -	- -	- -	39	220
PAH	Pyrene	- -	- -	- -	- -	- -	8.5 J	- -	- -	- -	< 20 U	9.9 J	- -	- -	- -	- -	- -	17 J	14 J
SVOC	1,2,4-Trichlorobenzene	- -	- -	- -	- -	- -	- -	< 0.97 U	- -	- -	- -	- -	< 1 U	< 0.94 UJ	< 0.95 UJ	< 1.1 UJ	- -	- -	- -
SVOC	1,2-Dichlorobenzene	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 U	< 0.48 UJ	< 0.53 UJ	- -	- -	- -
SVOC	1,2-Diphenylhydrazine/Azobenzene	- -	- -	- -	- -	- -	- -	< 0.97 U	- -	- -	- -	- -	< 1 U	< 0.94 U	< 0.95 U	< 1.1 U	- -	- -	- -
SVOC	1,3-Dichlorobenzene	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 U	< 0.48 UJ	< 0.53 UJ	- -	- -	- -
SVOC	1,4-Dichlorobenzene	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 U	0.11 J	0.17 J	- -	- -	- -
SVOC	2,4,5-Trichlorophenol	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	< 1.9 UJ	< 1.9 U	< 2.1 U	- -	- -	- -
SVOC	2,4,6-Trichlorophenol	- -	- -	- -	- -	- -	- -	< 0.97 U	- -	- -	- -	- -	< 1 U	< 0.94 U	< 0.95 UJ	< 1.1 UJ	- -	- -	- -
SVOC	2,4-Dichlorophenol	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	< 1.9 U	< 1.9 U	< 2.1 U	- -	- -	- -
SVOC	2,4-Dimethylphenol	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	< 1.9 UJ	< 1.9 U	< 2.1 U	- -	- -	- -
SVOC	2,4-Dinitrophenol	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	< 4.7 UJ	< 4.8 UJ	< 5.3 UJ	- -	- -	- -
SVOC	2,4-Dinitrotoluene	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	< 4.7 UJ	< 4.8 U	< 5.3 U	- -	- -	- -
SVOC	2,6-Dinitrotoluene	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	< 4.7 UJ	< 4.8 U	< 5.3 U	- -	- -	- -
SVOC	2-Chloronaphthalene	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 UJ	< 0.48 U	< 0.53 U	- -	- -	- -
SVOC	2-Chlorophenol	- -	- -	- -	- -	- -	- -	< 0.97 U	- -	- -	- -	- -	< 1 U	< 0.94 U	< 0.95 U	< 1.1 U	- -	- -	- -
SVOC	2-Methylnaphthalene	- -	- -	- -	- -	- -	- -	< 0.97 U	- -	- -	- -	- -	< 1 U	< 0.94 UJ	< 0.95 U	< 1.1 U	- -	- -	- -
SVOC	2-Methylphenol	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	< 1.9 UJ	< 1.9 U	< 2.1 U	- -	- -	- -
SVOC	2-Nitroaniline	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	< 4.7 UJ	< 4.8 U	< 5.3 U	- -	- -	- -
SVOC	2-Nitrophenol	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	< 1.9 UJ	< 1.9 UJ	< 2.1 UJ	- -	- -	- -
SVOC	3,3-Dichlorobenzidine	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	< 4.7 U	< 4.8 U	< 5.3 U	- -	- -	- -
SVOC	3-Nitroaniline	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	< 4.7 U	< 4.8 U	< 5.3 U	- -	- -	- -
SVOC	4,6-Dinitro-2-methylphenol	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	< 4.7 UJ	< 4.8 UJ	< 5.3 UJ	- -	- -	- -
SVOC	4-Bromophenyl phenyl ether	- -	- -	- -	- -	- -	- -	< 0.97 U	- -	- -	- -	- -	< 1 U	< 0.94 U	< 0.95 U	< 1.1 U	- -	- -	- -
SVOC	4-Chloro-3-methylphenol	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	< 1.9 U	< 1.9 U	< 2.1 U	- -	- -	- -
SVOC	4-Chloroaniline	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	< 1.9 U	< 1.9 U	< 2.1 U	- -	- -	- -
SVOC	4-Chlorophenyl phenyl ether	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 UJ	< 0.48 U	< 0.53 U	- -	- -	- -
SVOC	4-Methylphenol	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	0.28 J	< 4.8 U	< 5.3 U	- -	- -	- -
SVOC	4-Nitroaniline	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	< 4.7 UJ	< 4.8 U	< 5.3 U	- -	- -	- -
SVOC	4-Nitrophenol	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	< 4.7 UJ	< 4.8 UJ	< 5.3 UJ	- -	- -	- -
SVOC	Acenaphthene	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 UJ	< 0.48 U	< 0.53 U	- -	- -	- -
SVOC	Acenaphthylene	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 UJ	< 0.48 U	< 0.53 U	- -	- -	- -
SVOC	Aniline	- -	- -	- -	- -	- -	- -	< 9.7 U	- -	- -	- -	- -	< 10 U	< 9.4 U	< 9.5 U	< 11 U	- -	- -	- -
SVOC	Anthracene	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 UJ	< 0.48 U	< 0.53 U	- -	- -	- -
SVOC	Benzidine	- -	- -	- -	- -	- -	- -	< 4.9 UJ	- -	- -	- -	- -	< 5 UJ	< 4.7 UJ	< 4.8 UJ	< 5.3 UJ	- -	- -	- -
SVOC	Benzo(a)anthracene	- -	- -	- -	- -	- -	- -	0.31 J	- -	- -	- -	- -	< 5 U	0.4 J	< 4.8 U	< 5.3 U	- -	- -	- -
SVOC	Benzo(a)pyrene	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	0.25 J	0.21 J	< 2.1 U	- -	- -	- -
SVOC	Benzo(b)fluoranthene	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	< 1.9 U	0.82 J	< 2.1 U	- -	- -	- -
SVOC	Benzo(g,h,i)perylene	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	< 4.7 U	0.57 J	< 5.3 U	- -	- -	- -
SVOC	Benzo(k)fluoranthene	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 U	< 0.48 U	< 0.53 U	- -	- -	- -
SVOC	Benzoic acid	- -	- -	- -	- -	- -	- -	4.9 J	- -	- -	- -	- -	4.5 J	29 J	4.8 J	5.5 J	- -	- -	- -
SVOC	Benzyl alcohol	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	5.2 J	< 4.8 U	< 5.3 U	- -	- -	- -
SVOC	Bis(2-chloroethoxy)methane	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 UJ	< 0.48 U	< 0.53 U	- -	- -	- -
SVOC	Bis(2-chloroethyl)ether	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 UJ	< 0.48 U	< 0.53 U	- -	- -	- -
SVOC	Bis(2-chloroisopropyl)ether	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 UJ	< 0.48 U	< 0.53 U	- -	- -	- -
SVOC	Bis(2-ethylhexyl)phthalate	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	< 4.7 U	< 4.8 U	< 5.3 U	- -	- -	- -
SVOC	Butyl benzyl phthalate	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	< 4.7 UJ	< 4.8 U	< 5.3 U	- -	- -	- -
SVOC	Chrysene	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 UJ	< 0.48 U	< 0.53 U	- -	- -	- -
SVOC	Dibenzo(a,h)anthracene	- -	- -	- -	- -	- -	- -	< 0.56 UJ	- -	- -	- -	- -	< 0.58 UJ	< 0.47 UJ	0.93	< 0.53 U	- -	- -	- -
SVOC	Dibenzofuran	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 UJ	< 0.48 U	< 0.53 U	- -	- -	- -
SVOC	Diethyl phthalate	- -	- -	- -	- -	- -	- -	< 0.97 U	- -	- -	- -	- -	< 1 U	< 0.94 U	< 0.95 U	< 1.4 UJ	- -	- -	- -
SVOC	Dimethyl phthalate	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	0.36 J	< 0.47 U	0.34 J	0.4 J	- -	- -	- -
SVOC	Di-n-butyl phthalate	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	0.26 J	< 1.9 U	0.51 J	- -	- -	- -
SVOC	Di-n-octyl phthalate	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	0.47 J	< 4.8 U	< 5.3 U	- -	- -	- -
SVOC	Fluoranthene	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 UJ	< 0.48 U	< 0.53 U	- -	- -	- -
SVOC	Fluorene	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 UJ	< 0.48 U	< 0.53 U	- -	- -	- -
SVOC	Hexachlorobenzene	- -	- -	- -	- -	- -	- -	< 0.97 U	- -	- -	- -	- -	< 1 U	< 0.94 U	< 0.95 U	< 1.1 U	- -	- -	- -
SVOC	Hexachlorobutadiene	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	< 1.9 U	< 1.9 UJ	< 2.1 UJ	- -	- -	- -
SVOC	Hexachlorocyclopentadiene	- -	- -	- -	- -	- -	- -	< 4.9 U	- -	- -	- -	- -	< 5 U	< 4.7 U	< 4.8 U	< 5.3 U	- -	- -	- -
SVOC	Hexachloroethane	- -	- -	- -	- -	- -	- -	< 2.9 U	- -	- -	- -	- -	< 3 U	< 2.8 U	< 2.9 UJ	< 3.2 UJ	- -	- -	- -

Table A-3
Post-Topanga Fire Soil, Ash, and Surface Water Drainage Results
Santa Susana Field Laboratory

Sample Identification		**PCC-1**	**PCC-1**	**PCC-1**	**PCC-1**	**PCC-1**	**RP-1**	**RP-1**	**RP-1**	**RP-1**	**SC-1**	**SC-1**	**SC-1**	**SC-1**	**SJBC-1**	**SJBC-2**	**SORP-1**	**SSM-1**	**SSM-1**
Sample Type		**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Soil**	**Surface Water**	**Surface Water**	**Surface Water**	**Soil**	**Ash**	**Surface Water**	**Surface Water**	**Surface Water**	**Surface Water**	**Soil**	**Soil**	**Ash**
Sampling Date		**03/11/2006**	**03/28/2006**	**04/04/2006**	**04/14/2006**	**05/22/2006**	**10/06/2005**	**01/02/2006**	**03/28/2006**	**04/04/2006**	**10/10/2005**	**10/10/2005**	**01/02/2006**	**01/03/2006**	**01/03/2006**	**01/03/2006**	**02/23/2006**	**10/13/2005**	**10/13/2005**
Location		**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**	**Drainage**
EPA Identification		**WL069**	**WL075**	**WL078**	**WL085**	**WL089**	**WL006**	**WL041**	**WL073**	**WL081**	**WL012**	**WL013**	**WL039**	**WL045**	**WL046**	**WL047**	**WL056**	**WL022**	**WL023**
Group	**Constituent**																		
SVOC	Indeno(1,2,3-cd)pyrene	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	0.58 J	0.4 J	< 2.1 U	- -	- -	- -
SVOC	Isophorone	- -	- -	- -	- -	- -	- -	< 0.97 UJ	- -	- -	- -	- -	< 1 UJ	0.36 J	0.095 J	0.13 J	- -	- -	- -
SVOC	Naphthalene	- -	- -	- -	- -	- -	- -	< 0.97 U	- -	- -	- -	- -	< 1 U	< 0.94 UJ	< 0.95 U	< 1.1 U	- -	- -	- -
SVOC	Nitrobenzene	- -	- -	- -	- -	- -	- -	< 0.97 U	- -	- -	- -	- -	< 1 U	< 0.94 U	< 0.95 U	< 1.1 U	- -	- -	- -
SVOC	N-Nitrosodimethylamine	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	< 1.9 UJ	< 1.9 U	< 2.1 U	- -	- -	- -
SVOC	N-Nitroso-di-n-propylamine	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	< 1.9 UJ	< 1.9 U	< 2.1 U	- -	- -	- -
SVOC	N-Nitrosodiphenylamine	- -	- -	- -	- -	- -	- -	< 0.97 U	- -	- -	- -	- -	< 1 U	< 0.94 UJ	< 0.95 U	< 1.1 U	- -	- -	- -
SVOC	Pentachlorophenol	- -	- -	- -	- -	- -	- -	< 1.9 U	- -	- -	- -	- -	< 2 U	< 1.9 UJ	< 1.9 UJ	< 2.1 UJ	- -	- -	- -
SVOC	Phenanthrene	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 UJ	< 0.48 U	< 0.53 U	- -	- -	- -
SVOC	Phenol	- -	- -	- -	- -	- -	- -	< 0.97 U	- -	- -	- -	- -	< 1 U	0.77 J	< 0.95 U	< 1.1 U	- -	- -	- -
SVOC	Pyrene	- -	- -	- -	- -	- -	- -	< 0.49 U	- -	- -	- -	- -	< 0.5 U	< 0.47 U	< 0.48 U	< 0.53 U	- -	- -	- -
WETCHEM	Ammonia-N	- -	0.56 J	< 0.5 U	< 0.5 U	< 0.5 U	- -	- -	< 0.5 U	0.56	- -	- -	- -	- -	- -	- -	- -	- -	- -
WETCHEM	Ammonia-NH3	- -	- -	- -	- -	- -	2.1	- -	- -	- -	8.7	14	- -	- -	- -	- -	- -	3.5	23
WETCHEM	Nitrate/Nitrite-N	0.53	< 0.75 U	0.86	0.16	0.11 J	- -	- -	0.68	0.2	- -	- -	- -	- -	- -	- -	2.8	- -	- -
WETCHEM	Sulfate	- -	- -	- -	- -	- -	150	- -	- -	- -	170	3700	- -	- -	- -	- -	- -	140	2400
WETCHEM	Surfactants (MBAS)	- -	- -	- -	- -	- -	< 5 UJ	< 1 U	- -	- -	4.8 J	30 J	0.088 J	< 0.1 U	0.29 J	< 0.5 UJ	- -	< 5.1 UJ	3.2 J
WETCHEM	Total Cyanide	- -	- -	- -	- -	- -	0.64	0.003 J	- -	- -	< 0.5 U	2.9	0.015	0.0063	0.0046 J	0.0046 J	- -	0.73	2.4
WETCHEM	pH	7.92	7.43	8.15	8.09	7.61	- -	- -	6.97	7.51	- -	- -	- -	- -	- -	- -	8.61	- -	- -
WETCHEM	Total Suspended Solids	15	240	990	1400	< 10 U	- -	- -	3900	2100	- -	- -	- -	- -	- -	- -	- -	- -	- -

Table A-3
Post-Topanga Fire Soil, Ash, and Surface Water Drainage Results
Santa Susana Field Laboratory

Sample Identification		SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	WC-1	WC-1	WC-1	WCWP-1	WCWP-1	WCWP-1	Upstream-001	Upstream-001	Upstream-002	Upstream-002
Sample Type		Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Soil	Ash	Surface Water	Soil	Surface Water	Surface Water	Soil	Ash	Soil	Ash
Sampling Date		10/18/2005	01/01/2006	01/03/2006	02/28/2006	03/03/2006	03/11/2006	03/28/2006	04/04/2006	05/22/2006	10/10/2005	10/10/2005	10/18/2005	02/23/2006	03/03/2006	04/05/2006	10/06/2005	10/06/2005	10/06/2005	10/06/2005
Location		Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage
EPA Identification		WL032	WL036	WL042	WL060	WL066	WL071	WL072	WL082	WL088	WL015	WL014	WL035	WL055	WL068	WL083	WL002	WL001	WL004	WL005
Group	**Constituent**																			
DIOXIN	1,2,3,4,6,7,8-HpCDD	3.50E-05 J	5.76E-06 J	3.96E-05	- -	- -	- -	- -	- -	- -	5.27	95.1	6.40E-05	- -	- -	- -	2.71	2.33 J	2.46 J	48.5
DIOXIN	1,2,3,4,6,7,8-HpCDF	5.00E-06 J	3.92E-06 J	3.94E-06 J	- -	- -	- -	- -	- -	- -	< 0.0661 U	1.83 J	< 2.10E-05 UJ	- -	- -	- -	0.431 J	0.365 J	0.324 J	1.65 J
DIOXIN	1,2,3,4,7,8,9-HpCDF	< 2.20E-06 U	< 1.49E-06 U	< 5.19E-07 U	- -	- -	- -	- -	- -	- -	< 0.0708 U	< 0.22 U	< 2.30E-06 U	- -	- -	- -	< 0.123 U	< 0.118 U	< 0.0838 U	< 0.167 UJ
DIOXIN	1,2,3,4,7,8-HxCDD	< 1.40E-06 U	< 1.31E-06 U	< 1.46E-06 U	- -	- -	- -	- -	- -	- -	0.286 J	6.67	< 1.70E-06 UJ	- -	- -	- -	< 0.138 U	0.129 J	< 0.158 U	0.846 J
DIOXIN	1,2,3,4,7,8-HxCDF	< 1.60E-06 UJ	< 5.33E-07 U	< 3.97E-07 U	- -	- -	- -	- -	- -	- -	< 0.0598 U	0.357 J	< 2.10E-06 UJ	- -	- -	- -	< 0.126 U	< 0.101 UJ	< 0.0823 UJ	0.286 J
DIOXIN	1,2,3,6,7,8-HxCDD	2.30E-06 J	< 1.32E-06 U	3.06E-06 J	- -	- -	- -	- -	- -	- -	0.535 J	10.2	5.90E-06 J	- -	- -	- -	0.159 J	0.264 J	0.207 J	2.11 J
DIOXIN	1,2,3,6,7,8-HxCDF	< 1.40E-06 U	< 5.13E-07 U	< 3.84E-07 U	- -	- -	- -	- -	- -	- -	< 0.056 U	0.379 J	< 2.40E-06 UJ	- -	- -	- -	< 0.0945 U	< 0.0777 UJ	< 0.0719 UJ	0.243 J
DIOXIN	1,2,3,7,8,9-HxCDD	< 1.80E-06 U	< 1.29E-06 U	< 1.45E-06 U	- -	- -	- -	- -	- -	- -	0.565 J	12.4	< 1.70E-06 UJ	- -	- -	- -	< 0.133 UJ	0.262 J	0.245 J	1.6 J
DIOXIN	1,2,3,7,8,9-HxCDF	< 2.30E-06 U	< 7.92E-07 U	< 6.13E-07 U	- -	- -	- -	- -	- -	- -	< 0.0895 U	< 0.307 U	< 1.00E-06 U	- -	- -	- -	< 0.0694 U	< 0.0707 U	< 0.079 U	0.125 J
DIOXIN	1,2,3,7,8-PeCDD	< 2.40E-06 U	< 7.63E-07 U	< 8.02E-07 U	- -	- -	- -	- -	- -	- -	0.379 J	9.61	< 2.10E-06 U	- -	- -	- -	< 0.149 U	0.235 J	< 0.0947 UJ	1.02 J
DIOXIN	1,2,3,7,8-PeCDF	< 1.90E-06 U	< 9.94E-07 U	< 1.01E-06 U	- -	- -	- -	- -	- -	- -	< 0.0934 U	0.198 J	< 1.90E-06 U	- -	- -	- -	< 0.0886 U	< 0.0948 UJ	< 0.0709 U	0.209 J
DIOXIN	2,3,4,6,7,8-HxCDF	< 1.80E-06 U	< 5.80E-07 U	< 4.37E-07 U	- -	- -	- -	- -	- -	- -	< 0.063 U	0.433 J	< 1.60E-06 UJ	- -	- -	- -	< 0.126 U	0.0883 J	0.0752 J	< 0.265 UJ
DIOXIN	2,3,4,7,8-PeCDF	< 1.40E-06 U	< 9.34E-07 U	< 9.92E-07 U	- -	- -	- -	- -	- -	- -	< 0.0863 U	0.306 J	< 1.70E-06 UJ	- -	- -	- -	< 0.0805 U	0.173 J	0.0852 J	< 0.231 UJ
DIOXIN	2,3,7,8-TCDD	< 1.70E-0 U	< 6.95E-07 U	< 6.08E-07 U	- -	- -	- -	- -	- -	- -	< 0.179 UJ	3.57 J	< 2.00E-06 U	- -	- -	- -	< 0.133 U	< 0.155 U	< 0.151 U	0.303 J
DIOXIN	2,3,7,8-TCDF	< 1.50E-06 U	< 6.12E-07 U	< 7.95E-07 U	- -	- -	- -	- -	- -	- -	< 0.0895 U	< 0.173 UJ	< 9.60E-07 U	- -	- -	- -	< 0.112 U	0.361 J	< 0.109 U	< 0.165 UJ
DIOXIN	OCDD	1.90E-04	3.66E-05 J	1.27E-03	- -	- -	- -	- -	- -	- -	20.6	232	4.40E-04 J	- -	- -	- -	18.9	10.4	18.3	230
DIOXIN	OCDF	< 1.40E-05 UJ	1.90E-05 J	2.24E-05 J	- -	- -	- -	- -	- -	- -	< 0.413 U	2.28 J	2.40E-05 J	- -	- -	- -	0.98 J	< 0.499 UJ	0.59 J	4.63 J
DIOXIN	TCDD TEQ (with DNQ)	6.49E-07	1.02E-07	8.71E-07	- -	- -	- -	- -	- -	- -	0.57	17.4	1.28E-06	- -	- -	- -	0.049	0.46	0.13	2.4
DIOXIN	TCDD TEQ (no DNQ)	1.90E-08	0.00E+00	5.23E-07	- -	- -	- -	- -	- -	- -	- -	- -	6.84E-07	- -	- -	- -	- -	- -	- -	- -
DIOXIN	Total HpCDD	4.90E-05 J	1.30E-05	1.44E-04	- -	- -	- -	- -	- -	- -	13.4	253	1.10E-04	- -	- -	- -	8.14	5.73	6.59	98.2
DIOXIN	Total HpCDF	1.10E-05 J	3.92E-06	1.33E-05	- -	- -	- -	- -	- -	- -	< 0.068 U	4.93	< 2.10E-06 U	- -	- -	- -	1.34	0.629	0.727	4.25
DIOXIN	Total HxCDD	2.30E-06 J	3.56E-06	1.32E-05	- -	- -	- -	- -	- -	- -	8.62	196	1.80E-05 J	- -	- -	- -	2.67	4.84	3.55	33.7
DIOXIN	Total HxCDF	2.70E-06 J	1.77E-06	8.03E-06	- -	- -	- -	- -	- -	- -	< 0.0659 U	6.27	9.10E-06 J	- -	- -	- -	0.651	0.281	0.566	3.13 J
DIOXIN	Total PeCDD	< 2.40E-06 U	< 7.63E-07 U	< 8.02E-07 U	- -	- -	- -	- -	- -	- -	3.66	117	< 2.10E-06 U	- -	- -	- -	1	2.72	1.45	18.1
DIOXIN	Total PeCDF	< 1.60E-06 U	< 9.63E-07 U	1.58E-06	- -	- -	- -	- -	- -	- -	0.124	4.52	< 1.50E-06 U	- -	- -	- -	0.188	0.727	0.462	3.4
DIOXIN	Total TCDD	< 1.70E-06 U	< 6.95E-07 U	< 6.08E-07 U	- -	- -	- -	- -	- -	- -	2.52	74.5	< 2.00E-06 U	- -	- -	- -	< 0.123 U	1.04	0.107	10.7
DIOXIN	Total TCDF	< 1.50E-06 U	< 6.12E-07 U	< 7.95E-07 U	- -	- -	- -	- -	- -	- -	< 0.276 U	8.97	< 9.60E-07 U	- -	- -	- -	0.211	1.69	0.375	3.99
METALS	Aluminum	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Antimony	< 0.004 U	< 0.00083 UJ	0.00054 J	- -	- -	- -	0.00076 J	0.00036 J	< 0.0002 UJ	0.087 J	0.48 J	0.00042 J	- -	- -	< 0.00026 UJ	0.03	0.064	< 0.061 U	0.085
METALS	Arsenic	< 0.005 U	0.0045 J	< 0.005 U	- -	- -	- -	< 0.0092 UJ	0.007	< 0.005 U	0.89	< 0.61 U	0.012	- -	- -	0.0065	3.3	< 1.2 U	7.8	2.3
METALS	Barium	0.079	0.045	0.071	- -	- -	- -	0.075	0.083	0.012	150	320	0.48	- -	- -	0.12	42	220	84	240
METALS	Beryllium	< 0.002 U	< 0.002 U	< 0.002 U	- -	- -	- -	< 0.002 U	< 0.002 U	< 0.002 U	0.2	< 0.2 U	0.0015 J	- -	- -	0.00097 J	0.27	< 0.4 U	0.64	0.51
METALS	Boron	< 0.05 UJ	0.07	0.075	- -	- -	- -	0.055 J	0.04 J	0.016 J	5.5	76	< 0.055 UJ	- -	- -	0.055 J	1.8	58	6	87
METALS	Cadmium	< 0.000098 UJ	0.00006 J	0.00017 J	- -	- -	- -	0.00013 J	0.00021 J	< 0.001 UJ	0.033	0.079	< 0.0002 UJ	- -	- -	0.0015	0.066 J	0.25 J	0.12	0.15 J
METALS	Chromium	< 0.0063 UJ	< 0.0026 UJ	< 0.0024 UJ	- -	- -	- -	0.0082	0.014	< 0.005 U	3.6	3.8	0.092	- -	- -	0.0094	7	5.3	23	14
METALS	Cobalt	0.0035 J	< 0.01 U	0.0022 J	- -	- -	- -	0.0033 J	0.0036 J	< 0.01 U	4	3.5	0.033	- -	- -	0.008 J	3.1	1.6	11	4
METALS	Copper	0.0099	0.013	0.011	- -	- -	- -	0.01	0.015	0.0028	30	39	0.034	- -	- -	0.015	4.7	21	13	34
METALS	Iron	4.3	1.9	1.5	- -	- -	- -	7.6	12	0.2	11000	8700	51	- -	- -	8.5	9300	5700	28000	12000
METALS	Lead	0.0066	0.0034	0.0097	- -	- -	- -	0.011	0.01	0.00022 J	2.4	9.4	0.019	- -	- -	0.0085	5.1	18	12	15
METALS	Lithium	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Manganese	0.27	0.077	0.14	- -	- -	- -	0.19	0.19	0.015 J	210	270	1.8	- -	- -	1	180	310	490	440
METALS	Mercury	< 0.0002 U	< 0.0002 U	< 0.0002 UJ	- -	- -	- -	< 0.0002 UJ	0.000061 J	< 0.0002 U	< 0.003 U	< 0.003 U	< 0.0002 U	- -	- -	< 0.0002 U	< 0.0063 UJ	0.032 J	0.012 J	0.025 J
METALS	Molybdenum	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Nickel	< 0.027 UJ	0.0033 J	0.0039 J	- -	- -	- -	0.0093 J	0.013	< 0.01 U	3.1	4.5	0.083	- -	- -	0.034	< 5.4 UJ	8.6	15	13
METALS	Potassium	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Selenium	< 0.004 U	< 0.002 U	< 0.002 U	- -	- -	- -	0.00048 J	0.00049 J	< 0.002 U	0.37 J	0.34 J	0.00075 J	- -	- -	0.0012 J	0.23	0.4	0.54	0.77
METALS	Silver	< 0.002 U	< 0.001 U	< 0.001 U	- -	- -	- -	0.00004 J	0.000074 J	< 0.001 UJ	0.041	0.14	< 0.001 U	- -	- -	0.000045 J	< 0.02 U	0.075	0.041	0.075
METALS	Sodium	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
METALS	Thallium	< 0.002 U	< 0.001 U	< 0.00012 UJ	- -	- -	- -	< 0.001 U	0.00015 J	< 0.001 U	0.14	0.16	0.00032 J	- -	- -	< 0.001 U	0.13	0.17	0.44	0.18
METALS	Vanadium	0.0099 J	0.0066 J	0.0059 J	- -	- -	- -	0.015	0.023	< 0.01 U	25	21	0.11	- -	- -	0.027	14	11	44	28
METALS	Zinc	0.063 J	< 0.016 UJ	0.019 J	- -	- -	- -	0.041	0.045	< 0.02 U	35	77	0.18	- -	- -	0.046	30	47	74	140
METALS	Zirconium	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
PAH	1-Methylnaphthalene	- -	- -	- -	- -	- -	- -	- -	- -	- -	40	75	- -	- -	- -	- -	8.1 J	24	18 J	110
PAH	2-Methylnaphthalene	- -	- -	- -	- -	- -	- -	- -	- -	- -	54	110	- -	- -	- -	- -	12 J	37	24	130
PAH	Acenaphthene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	22	- -	- -	- -	- -	< 20 U	< 20 U	< 20 U	< 100 U
PAH	Acenaphthylene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	10 J	- -	- -	- -	- -	< 20 U	< 20 U	13 J	< 100 U
PAH	Anthracene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	22	- -	- -	- -	- -	< 20 U	14 J	< 20 U	< 100 U
PAH	Benzo(a)anthracene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	15 J	17 J	< 20 U	< 100 U
PAH	Benzo(a)pyrene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	< 20 U	13 J	< 20 U	< 100 U
PAH	Benzo(b)fluoranthene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	8.6 J	14 J	< 20 U	< 100 U
PAH	Benzo(g,h,i)perylene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	< 20 U	< 20 U	< 20 U	< 100 U
PAH	Benzo(k)fluoranthene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	< 20 U	< 20 U	< 20 U	< 100 U
PAH	Chrysene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	10 J	- -	- -	- -	- -	21	88	< 20 U	< 100 U
PAH	Dibenzo(a,h)anthracene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	< 20 UJ	< 20 UJ	< 20 UJ	< 100 U

Table A-3
Post-Topanga Fire Soil, Ash, and Surface Water Drainage Results
Santa Susana Field Laboratory

Sample Identification		SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	WC-1	WC-1	WC-1	WCWP-1	WCWP-1	WCWP-1	Upstream-001	Upstream-001	Upstream-002	Upstream-002
Sample Type		Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Soil	Ash	Surface Water	Soil	Surface Water	Surface Water	Soil	Ash	Soil	Ash
Sampling Date		10/18/2005	01/01/2006	01/03/2006	02/28/2006	03/03/2006	03/11/2006	03/28/2006	04/04/2006	05/22/2006	10/10/2005	10/10/2005	10/18/2005	02/23/2006	03/03/2006	04/05/2006	10/06/2005	10/06/2005	10/06/2005	10/06/2005
Location		Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage
EPA Identification		WL032	WL036	WL042	WL060	WL066	WL071	WL072	WL082	WL088	WL015	WL014	WL035	WL055	WL068	WL083	WL002	WL001	WL004	WL005
Group	Constituent																			
PAH	Fluoranthene	- -	- -	- -	- -	- -	- -	- -	- -	- -	17 J	72	- -	- -	- -	- -	36	76	14 J	< 100 U
PAH	Fluorene	- -	- -	- -	- -	- -	- -	- -	- -	- -	9.7 J	16 J	- -	- -	- -	- -	< 20 U	< 20 U	13 J	< 100 U
PAH	Indeno(1,2,3-cd)pyrene	- -	- -	- -	- -	- -	- -	- -	- -	- -	< 20 U	< 20 U	- -	- -	- -	- -	< 20 UJ	< 20 UJ	< 20 UJ	< 100 U
PAH	Naphthalene	- -	- -	- -	- -	- -	- -	- -	- -	- -	170	390	- -	- -	- -	- -	23	270	57	2300
PAH	Phenanthrene	- -	- -	- -	- -	- -	- -	- -	- -	- -	56	240	- -	- -	- -	- -	38	240	41	160
PAH	Pyrene	- -	- -	- -	- -	- -	- -	- -	- -	- -	15 J	39	- -	- -	- -	- -	35	40	14 J	< 100 UJ
SVOC	1,2,4-Trichlorobenzene	< 5 UJ	< 1 UJ	< 0.96 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 1.2 UJ	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	1,2-Dichlorobenzene	< 2.5 U	< 0.5 U	< 0.48 U	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	1,2-Diphenylhydrazine/Azobenzene	< 5 U	< 1 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	< 1.2 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	1,3-Dichlorobenzene	< 2.5 U	< 0.5 U	< 0.48 U	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	1,4-Dichlorobenzene	< 2.5 U	0.1 J	< 0.48 U	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	2,4,5-Trichlorophenol	< 10 U	< 2 UJ	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 2.5 U	- -	- -	- -	< 330 U	980 R	< 340 U	990 R
SVOC	2,4,6-Trichlorophenol	< 5 U	< 1 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	< 1.2 U	- -	- -	- -	< 330 U	980 R	< 340 U	990 R
SVOC	2,4-Dichlorophenol	< 10 U	< 2 U	< 1.9 U	- -	- -	- -	- -	- -	- -	- -	- -	< 2.5 U	- -	- -	- -	< 330 U	980 R	< 340 U	990 R
SVOC	2,4-Dimethylphenol	< 10 U	< 2 UJ	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 2.5 U	- -	- -	- -	< 330 U	980 R	< 340 U	990 R
SVOC	2,4-Dinitrophenol	< 25 UJ	< 5 UJ	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 UJ	- -	- -	- -	< 660 UJ	2000 R	< 670 UJ	2000 R
SVOC	2,4-Dinitrotoluene	< 25 U	< 5 UJ	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	2,6-Dinitrotoluene	< 25 U	< 5 UJ	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	2-Chloronaphthalene	< 2.5 U	< 0.5 UJ	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	2-Chlorophenol	< 5 U	< 1 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	< 1.2 U	- -	- -	- -	< 330 U	980 R	< 340 U	990 R
SVOC	2-Methylnaphthalene	< 5 U	< 1 UJ	< 0.96 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 1.2 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	2-Methylphenol	< 10 U	< 2 UJ	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 2.5 U	- -	- -	- -	< 330 U	980 R	< 340 U	990 R
SVOC	2-Nitroaniline	< 25 U	< 5 UJ	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	2-Nitrophenol	< 10 U	< 2 UJ	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 2.5 U	- -	- -	- -	< 330 U	980 R	< 340 U	990 R
SVOC	3,3-Dichlorobenzidine	< 25 U	< 5 U	< 4.8 U	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 U	- -	- -	- -	< 830 U	< 2500 U	< 840 U	< 2500 U
SVOC	3-Nitroaniline	< 25 U	< 5 U	< 4.8 U	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	4,6-Dinitro-2-methylphenol	< 25 U	< 5 UJ	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 U	- -	- -	- -	< 420 UJ	1200 R	< 430 UJ	1300 R
SVOC	4-Bromophenyl phenyl ether	< 5 U	< 1 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	< 1.2 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	4-Chloro-3-methylphenol	< 10 U	< 2 U	< 1.9 U	- -	- -	- -	- -	- -	- -	- -	- -	< 2.5 U	- -	- -	- -	< 330 U	980 R	< 340 U	990 R
SVOC	4-Chloroaniline	< 10 U	< 2 U	< 1.9 U	- -	- -	- -	- -	- -	- -	- -	- -	< 2.5 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	4-Chlorophenyl phenyl ether	< 2.5 U	< 0.5 UJ	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	4-Methylphenol	2.1 J	0.24 J	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 U	- -	- -	- -	< 330 U	980 R	290 J	990 R
SVOC	4-Nitroaniline	< 25 U	< 5 UJ	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 U	- -	- -	- -	< 830 U	< 2500 U	< 840 U	< 2500 U
SVOC	4-Nitrophenol	< 25 UJ	0.76 J	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 UJ	- -	- -	- -	< 830 U	2500 R	< 840 U	2500 R
SVOC	Acenaphthene	< 2.5 U	< 0.5 UJ	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Acenaphthylene	< 2.5 U	< 0.5 UJ	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Aniline	< 50 U	< 10 U	< 9.6 U	- -	- -	- -	- -	- -	- -	- -	- -	< 12 U	- -	- -	- -	< 420 U	< 1200 U	< 430 U	< 1300 U
SVOC	Anthracene	< 2.5 U	< 0.5 UJ	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Benzidine	5 R	< 5 UJ	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	6.2 R	- -	- -	- -	< 660 U	< 2000 U	< 670 U	< 2000 U
SVOC	Benzo(a)anthracene	< 25 U	< 5 UJ	0.33 J	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Benzo(a)pyrene	< 10 U	< 2 U	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 2.5 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Benzo(b)fluoranthene	< 10 U	< 2 U	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 2.5 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Benzo(g,h,i)perylene	< 25 U	< 5 U	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 U	- -	- -	- -	< 330 UJ	< 980 UJ	< 340 UJ	< 990 UJ
SVOC	Benzo(k)fluoranthene	< 2.5 U	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Benzoic acid	66 J	< 20 UJ	< 19 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 25 UJ	- -	- -	- -	< 830 U	2500 R	< 840 U	2500 R
SVOC	Benzyl alcohol	< 25 U	0.24 J	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 U	- -	- -	- -	< 330 U	< 980 U	120 J	< 990 U
SVOC	Bis(2-chloroethoxy)methane	< 2.5 U	< 0.5 UJ	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Bis(2-chloroethyl)ether	< 2.5 U	< 0.5 UJ	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 170 U	< 510 U	< 170 U	< 510 U
SVOC	Bis(2-chloroisopropyl)ether	< 2.5 U	< 0.5 UJ	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Bis(2-ethylhexyl)phthalate	< 25 U	< 5 U	< 4.8 U	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Butyl benzyl phthalate	< 3.4 U	< 5 UJ	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 1.3 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Chrysene	< 2.5 U	< 0.5 UJ	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Dibenzo(a,h)anthracene	< 2.5 UJ	< 0.5 U	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 UJ	- -	- -	- -	< 420 UJ	< 1200 UJ	< 430 UJ	< 1300 UJ
SVOC	Dibenzofuran	< 2.5 U	< 0.5 UJ	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Diethyl phthalate	< 5 U	< 1 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	0.2 J	- -	- -	- -	< 330 U	< 980 U	< 340 U	270 J
SVOC	Dimethyl phthalate	< 2.5 U	< 0.5 U	< 0.48 U	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Di-n-butyl phthalate	< 10 U	< 2 U	< 1.9 U	- -	- -	- -	- -	- -	- -	- -	- -	0.32 J	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Di-n-octyl phthalate	< 25 U	< 5 UJ	< 4.8 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Fluoranthene	< 2.5 U	< 0.5 UJ	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Fluorene	< 2.5 U	< 0.5 UJ	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Hexachlorobenzene	< 5 U	< 1 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	< 1.2 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Hexachlorobutadiene	< 10 UJ	< 2 U	< 1.9 U	- -	- -	- -	- -	- -	- -	- -	- -	< 2.5 UJ	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Hexachlorocyclopentadiene	< 25 U	< 5 U	< 4.8 U	- -	- -	- -	- -	- -	- -	- -	- -	< 6.2 U	- -	- -	- -	< 830 U	< 2500 U	< 840 U	< 2500 U
SVOC	Hexachloroethane	< 15 UJ	< 3 U	< 2.9 U	- -	- -	- -	- -	- -	- -	- -	- -	< 3.8 UJ	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U

Table A-3
Post-Topanga Fire Soil, Ash, and Surface Water Drainage Results
Santa Susana Field Laboratory

Sample Identification		SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	SSM-1	WC-1	WC-1	WC-1	WCWP-1	WCWP-1	WCWP-1	Upstream-001	Upstream-001	Upstream-002	Upstream-002
Sample Type		Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Soil	Ash	Surface Water	Soil	Surface Water	Surface Water	Soil	Ash	Soil	Ash
Sampling Date		10/18/2005	01/01/2006	01/03/2006	02/28/2006	03/03/2006	03/11/2006	03/28/2006	04/04/2006	05/22/2006	10/10/2005	10/10/2005	10/18/2005	02/23/2006	03/03/2006	04/05/2006	10/06/2005	10/06/2005	10/06/2005	10/06/2005
Location		Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage	Drainage
EPA Identification		WL032	WL036	WL042	WL060	WL066	WL071	WL072	WL082	WL088	WL015	WL014	WL035	WL055	WL068	WL083	WL002	WL001	WL004	WL005
Group	**Constituent**																			
SVOC	Indeno(1,2,3-cd)pyrene	< 10 U	< 2 U	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 2.5 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Isophorone	0.67 J	0.2 J	0.13 J	- -	- -	- -	- -	- -	- -	- -	- -	0.35 J	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Naphthalene	< 5 U	< 1 UJ	< 0.96 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 1.2 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Nitrobenzene	< 5 U	< 1 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	< 1.2 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	N-Nitrosodimethylamine	< 10 U	< 2 UJ	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 2.5 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	N-Nitroso-di-n-propylamine	< 10 U	< 2 UJ	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 2.5 U	- -	- -	- -	< 250 U	< 740 U	< 250 U	< 750 U
SVOC	N-Nitrosodiphenylamine	< 5 U	< 1 UJ	< 0.96 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 1.2 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Pentachlorophenol	< 10 U	< 2 UJ	< 1.9 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 2.5 U	- -	- -	- -	< 830 UJ	2500 R	< 840 UJ	2500 R
SVOC	Phenanthrene	< 2.5 U	< 0.5 UJ	< 0.48 UJ	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
SVOC	Phenol	4 J	< 1 U	< 0.96 U	- -	- -	- -	- -	- -	- -	- -	- -	< 1.2 U	- -	- -	- -	170 J	980 R	930	580 J
SVOC	Pyrene	< 2.5 U	< 0.5 U	< 0.48 U	- -	- -	- -	- -	- -	- -	- -	- -	< 0.62 U	- -	- -	- -	< 330 U	< 980 U	< 340 U	< 990 U
WETCHEM	Ammonia-N	- -	- -	- -	- -	- -	- -	< 0.5 U	0.56	< 0.5 U	- -	- -	- -	- -	- -	1.1 J	- -	- -	- -	- -
WETCHEM	Ammonia-NH3	- -	- -	- -	- -	- -	- -	- -	- -	- -	4.9	3.3	- -	- -	- -	- -	5.1	12	6.8	8.2
WETCHEM	Nitrate/Nitrite-N	- -	- -	- -	3.7	5.7	5.5	2.5	1.7	0.25	- -	- -	- -	4.3	0.35	0.84	- -	- -	- -	- -
WETCHEM	Sulfate	- -	- -	- -	- -	- -	- -	- -	- -	- -	480	3800	- -	- -	- -	- -	190	4400	690	7600
WETCHEM	Surfactants (MBAS)	0.24 J	0.071 J	0.054 J	- -	- -	- -	- -	- -	- -	1.4 J	1.3 J	0.11	- -	- -	- -	< 1 UJ	1.4 J	0.69 J	2 J
WETCHEM	Total Cyanide	0.0064	0.0037 J	0.0046 J	- -	- -	- -	- -	- -	- -	0.58	5.2	0.0046 J	- -	- -	- -	0.6	3.3	1.1	5.7
WETCHEM	pH	- -	- -	- -	7.6	7.76	7.5	7.45	7.82	6.88	- -	- -	- -	6.12	7.53	6.86	- -	- -	- -	- -
WETCHEM	Total Suspended Solids	- -	- -	- -	25	< 10 U	32	160	250	< 10 U	- -	- -	- -	- -	1700	890	- -	- -	- -	- -

Notes:

Soil samples – Samples were collected from the upper 2 to 3 inches of soil, after removal of any charred vegetation from the ground surface.
Ash samples – Samples were collected where sufficient ash accumulation was present near the corresponding soil sample location.
Surface water - storm water runoff at location of corresponding soil sample in drainage.

No ash samples were collected at sample locations CF-1, CRP-1, KD-1, LFBS54, RP-1, SJBC-1, SJBC-2, SORP-1, and WCWP-1.
Sample locations SC-1 and WC-1are located within the burn area of the Burbank "Harvard" Fire, in Burbank, California, approximately 20 miles east of the Santa Susana Field Laboratory (SSFL). Sample location FC-1 is located within the burn area of the Sierra Fire, in Orange County, California, approximately 65 miles southeast of the SSFL. Sample locations KD-1, SJBC-1, SJBC-2, WCWP-1, and SORP-1 are located offsite and are not within the footprint of any recent fires.

Sample ID Key

Sample Id	Location
CF-1	China Flats
CRP-1	Chatsworth Reservoir Park
FC-1	Fremont Canyon
KD-1	Kalorama Drive
LFBS54S01	LETF/CTL-I
PCC-1	Palo Camado Canyon
RP-1	Rocky Peak
SC-1	Stough Canyon
SJBC-1	San John Barrana Canyon
SJBC-2	San John Barrana Canyon
SORP-1	Santiago Oaks Regional Park
SSM-1	Santa Susana Mountains
WC-1	Wildwood Canyon
WCWP-1	Weir Canyon Wilderness Park
Upstream-001	upstream of Outfall 001
Upstream-002	upstream of Outfall 002

Data qualifiers:

U = Not detected
J = Estimated value
B = Blank contamination
R = Rejected data

Units of measure by analyte/matrix

group	MATRIX - units
DIOXIN	Soil or Ash = ng/kg (nanograms per kilogram)
DIOXIN	Surface Water = µg/L (micrograms per liter)
METALS	Soil or Ash = mg/kg (milligrams per kilogram)
METALS	Surface Water = mg/L (milligrams per liter)
PAH	Soil or Ash = µg/kg (micrograms per kilogram)
SVOC	Soil or Ash = µg/kg (micrograms per kilogram)
SVOC	Surface Water = µg/L (micrograms per liter)
WETCHEM	Soil or Ash = mg/kg (milligrams per kilogram)
WETCHEM	Soil or Ash = mg/L (milligrams per liter)

Sample Identification = RFI site and sample identifier code
EPA Identication = Unique identifier used for reporting purposes

TCDD TEQ = Tetrachlorodibenzo-p-dioxin Toxic Equivalence Quotient
TEQ values were calculated using detected congener concentrations and WHO/97 Toxicity Equivalency Factors (TEFs). For comparison, western United States dioxin TEQs typically range up to 2 pg/g or parts per trillion.

DIOXIN = Dioxins and Furans by USEPA method 1613B
METALS = Metals by USEPA method 6010B, 6020 and 7471A
PAH = Polyaromatic Hydrocarbons by USEPA method 8270C SIM (selective ion monitoring)
SVOC = Semi-Volatile Organic Compounds by USEPA method 8270 and 625
WETCHEM = Ammonia-NH3 by method 350.3 Modified
Ammonia-N by methods 350.2 and 350.3 modified
Nitrate/Nitrite-N by 300.0
pH by 9045C and 150.1
Sulfate by method 300.0
Surfactants by methylene blue active substances (MBAS) method SM5540-C
Total Cyanide by method 9014
Total Suspended Solids by 160.2

Table A-4
Post-Topanga Fire
Soil and Ash Background Sample Results
Santa Susana Field Laboratory

Sample Identification		**SGSS01S01**	**SGSS01S01**	**BKND-5**	**BKND-5**	**BKND-1**	**BCSS09S01**	**BCSS09S01**	**BZSS05S01**	**BZSS05S01**	**BZSS06S01**
Sample matrix		**Soil**	**Ash**	**Soil**	**Ash**	**Soil**	**Soil**	**Ash**	**Soil**	**Ash**	**Soil**
Collection date		**10/13/2005**	**10/13/2005**	**10/13/2005**	**10/13/2005**	**10/13/2005**	**10/14/2005**	**10/14/2005**	**10/14/2005**	**10/14/2005**	**10/14/2005**
Location		**Background**	**Background**	**Background**	**Background**	**Background**	**Background**	**Background**	**Background**	**Background**	**Background**
EPA Identification		**WL016**	**WL017**	**WL018**	**WL019**	**WL021**	**WL025**	**WL024**	**WL026**	**WL028**	**WL027**
Sample depth (ft bgs)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
group	**Constituent**										
DIOXIN	1,2,3,4,6,7,8-HpCDD	23	5.87	20.4	100	3.4	< 0.686 UJ	3.27	2.47	2.55 J	2.53
DIOXIN	1,2,3,4,6,7,8-HpCDF	3.73	0.485 J	3.16	3.45 J	0.561 J	< 0.147 UJ	0.32 J	0.804 J	3.06	0.738 J
DIOXIN	1,2,3,4,7,8,9-HpCDF	0.308 J	< 0.218 U	0.331 J	0.491 J	< 0.0839 U	< 0.0864 U	< 0.152 U	< 0.116 U	< 0.537 U	< 0.168 U
DIOXIN	1,2,3,4,7,8-HxCDD	0.607 J	< 0.596 U	0.449 J	0.916 J	0.192 J	< 0.118 U	< 0.328 U	< 0.309 U	< 0.233 U	< 0.169 U
DIOXIN	1,2,3,4,7,8-HxCDF	0.375 J	0.268 J	< 0.287 UJ	< 0.241 UJ	0.135 J	0.154 J	0.167 J	0.234 J	1.4 J	0.177 J
DIOXIN	1,2,3,6,7,8-HxCDD	1.29 J	< 0.613 U	0.95 J	5.57	0.174 J	< 0.115 U	< 0.303 U	< 0.316 U	0.622 J	0.275 J
DIOXIN	1,2,3,6,7,8-HxCDF	0.382 J	0.184 J	0.27 J	< 0.195 UJ	0.0912 J	0.133 J	0.148 J	0.177 J	0.964 J	0.144 J
DIOXIN	1,2,3,7,8,9-HxCDD	1.2 J	0.562 J	0.888 J	3.35 J	< 0.0894 U	< 0.117 U	0.378 J	< 0.314 U	0.519 J	0.284 J
DIOXIN	1,2,3,7,8,9-HxCDF	< 0.0918 U	< 0.148 U	< 0.13 UJ	< 0.0764 U	< 0.0588 U	< 0.0905 U	< 0.0797 U	0.216 J	< 0.377 U	0.175 J
DIOXIN	1,2,3,7,8-PeCDD	0.334 J	0.288 J	0.279 J	0.749 J	< 0.0646 U	< 0.0826 U	0.289 J	0.0958 J	0.424 J	< 0.118 UJ
DIOXIN	1,2,3,7,8-PeCDF	0.275 J	< 0.295 U	0.178 J	< 0.159 U	< 0.0811 UJ	< 0.291 UJ	0.206 J	< 0.125 UJ	1.07 J	0.118 J
DIOXIN	2,3,4,6,7,8-HxCDF	0.42 J	< 0.109 U	0.337 J	0.281 J	< 0.0852 UJ	< 0.0588 U	0.115 J	0.2 J	0.835 J	0.201 J
DIOXIN	2,3,4,7,8-PeCDF	0.418 J	0.286 J	0.293 J	< 0.139 U	< 0.137 UJ	0.197 J	< 0.174 UJ	0.249 J	1.08 J	0.226 J
DIOXIN	2,3,7,8-TCDD	< 0.138 U	< 0.175 U	< 0.087 U	0.363 J	< 0.0622 U	< 0.109 U	0.134 J	< 0.113 U	0.23 J	< 0.106 U
DIOXIN	2,3,7,8-TCDF	0.284 J	0.212 J	< 0.301 UJ	< 0.114 U	0.163 J	0.279 J	0.389 J	0.159 J	0.727 J	< 0.0831 U
DIOXIN	OCDD	168	23.8	211	470	48	4.23 J	9.35	19	10.2	18.7
DIOXIN	OCDF	8.37	< 0.661 UJ	9.83	17	0.97 J	< 0.325 U	< 0.469 U	< 0.83 U	1.67 J	1.16 J
DIOXIN	TCDD TEQ (ND = 0)	1.3	0.62	0.98	3.2	0.12	0.16	0.59	0.35	1.8	0.28
DIOXIN	Total HpCDD	46.5	16	42.8	171	9.59	1.02	7.28	5.8	5.6	6.04
DIOXIN	Total HpCDF	9.09	1.03	8.59	12.1	1.27	< 0.147 U	0.32	1.47	4.17	1.35
DIOXIN	Total HxCDD	12.7	7.42	9.75	42.7	1.3	0.279	5.54	1.35	7.18	1.86
DIOXIN	Total HxCDF	6.19	1.36	4.17	2.76	1.03	0.689	0.661	2.12	10	2.01
DIOXIN	Total PeCDD	3.21	3.55	2.48	12.5	0.149	< 0.0826 U	4.15	0.751	12.7	0.604
DIOXIN	Total PeCDF	5.08	1.46	3.83	0.986	1.02	2.2	1.2	2.57	16.3	2.4
DIOXIN	Total TCDD	1.19	< 0.22 U	0.774	7.1	< 0.0622 U	< 0.109 U	2.72	0.232	47.6	< 0.106 U
DIOXIN	Total TCDF	5.23	2.16	3.13	0.481	0.163	2.53	4.37	1.31	18.6	1.18
METALS	Aluminum	11000 J	12000 J	9800 J	3400 J	12000 J	9900	13000	11000	4400	12000
METALS	Antimony	1.6 R	1.6 R	1.7 R	3.5 R	1.7 R	< 0.81 U	< 1.7 U	< 0.81 U	< 1.6 U	< 0.81 U
METALS	Arsenic	2.7	2.6 J	3.9	< 2.7 U	3.4	11	3.9	4.9	< 1.2 U	3.6
METALS	Barium	110	240	76	360	59	69	300	100	130	82
METALS	Beryllium	0.45	0.41	0.47	< 0.88 U	0.54	0.54	< 0.41 U	0.62	< 0.4 U	0.45
METALS	Boron	6.4	57	6	85	6.6	3.5	160	3.2	48	< 1 U
METALS	Cadmium	0.59	1.1	0.48	< 0.88 U	0.57	0.47	< 0.41 U	0.62	< 0.4 U	0.54
METALS	Chromium	17	18	12	2.3	16	15	15	17	6.1	18
METALS	Cobalt	4.9	5.4	4.1	1.6	6.3	4.5	4.5	5.3	1.6	5.4
METALS	Copper	11	30	8	25	12	9.2	64	13	15	8.9
METALS	Iron	17000	17000	15000	4200	19000	16000	12000	17000	5300	19000
METALS	Lead	24	64	27	5.2	9.5	10	9.7	17	33	12
METALS	Lithium	20	16	19	9.4	18	17	14	20	7.6	28
METALS	Manganese	310	540	270	610	390	260	520	340	220	350
METALS	Mercury	0.017	0.058	0.0091	0.0053	0.011	< 0.003 UJ	0.0038	0.0031	< 0.003 U	0.011
METALS	Molybdenum	0.54	1	< 0.44 U	< 0.88 U	< 0.41 U	0.42	1.7	0.34	< 0.4 U	0.27
METALS	Nickel	21 J	21 J	11 J	7 J	14 J	11	24	12	9.3	12
METALS	Potassium	4300	9400	3300	58000	3400	3700	53000	5400	17000	3900
METALS	Selenium	< 2 U	< 2 U	< 2.2 U	< 4.4 U	< 2.1 U	< 1 U	< 2.1 U	< 1 U	< 2 U	< 1 U
METALS	Silver	< 0.81 U	< 0.81 U	< 0.87 U	< 1.8 U	< 0.83 U	< 0.4 U	< 0.83 U	< 0.4 U	< 0.8 U	< 0.41 U
METALS	Sodium	110	430	69	1000	64	150	3100	180	1200	86
METALS	Thallium	4.5	3.2	3.3	< 3.5 U	3.3	1.9	< 1.7 U	1.8	< 1.6 U	2.2
METALS	Vanadium	30	35	23	8.4	27	27	28	32	11	37
METALS	Zinc	64	190	55	64	51	53	150	67	57	61
METALS	Zirconium	1.6	2.8	1.7	< 3.3 U	< 1.6 U	1.6	4.1	< 1.5 U	< 3 U	2.4

Table A-4
Post-Topanga Fire
Soil and Ash Background Sample Results
Santa Susana Field Laboratory

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Sample Identification		**SGSS01S01**	**SGSS01S01**	**BKND-5**	**BKND-5**	**BKND-1**	**BCSS09S01**	**BCSS09S01**	**BZSS05S01**	**BZSS05S01**	**BZSS06S01**
Sample matrix		**Soil**	**Ash**	**Soil**	**Ash**	**Soil**	**Soil**	**Ash**	**Soil**	**Ash**	**Soil**
Collection date		**10/13/2005**	**10/13/2005**	**10/13/2005**	**10/13/2005**	**10/13/2005**	**10/14/2005**	**10/14/2005**	**10/14/2005**	**10/14/2005**	**10/14/2005**
Location		**Background**	**Background**	**Background**	**Background**	**Background**	**Background**	**Background**	**Background**	**Background**	**Background**
EPA Identification		**WL016**	**WL017**	**WL018**	**WL019**	**WL021**	**WL025**	**WL024**	**WL026**	**WL028**	**WL027**
Sample depth (ft bgs)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
group	**Constituent**										
PAH	1-Methylnaphthalene	24 J	22 J	42	41 J	< 20 U	17 J	94	11 J	31	< 21 U
PAH	2-Methylnaphthalene	33 J	33 J	51	57 J	< 20 U	22	140	15 J	45	< 21 U
PAH	Acenaphthene	12 J	< 20 U	12 J	< 22 U	< 20 U	< 20 U	< 21 U	< 20 U	< 20 U	< 21 U
PAH	Acenaphthylene	9.9 J	< 20 U	< 22 U	< 22 U	< 20 U	< 20 U	13 J	< 20 U	< 20 U	< 21 U
PAH	Anthracene	< 20 U	< 20 U	< 22 U	< 22 U	< 20 U	< 20 U	22	< 20 U	< 20 U	< 21 U
PAH	Benzo(a)anthracene	9.3 J	< 20 U	< 22 U	< 22 U	< 20 U	< 20 U	16 J	< 20 U	19 J	< 21 U
PAH	Benzo(a)pyrene	< 20 U	< 20 U	< 22 U	< 22 U	< 20 U	< 20 U	30	< 20 U	70	< 21 U
PAH	Benzo(b)fluoranthene	< 20 U	< 20 U	< 22 U	< 22 U	< 20 U	< 20 U	25	< 20 U	46 J	< 21 U
PAH	Benzo(g,h,i)perylene	9 J	< 20 UJ	< 22 UJ	< 22 UJ	< 20 UJ	< 20 U	12 J	< 20 U	25 J	< 21 U
PAH	Benzo(k)fluoranthene	< 20 U	< 20 U	< 22 U	< 22 U	< 20 U	< 20 U	< 21 U	< 20 U	< 20 UJ	< 21 U
PAH	Chrysene	17 J	11 J	8.7 J	9.1 J	< 20 U	< 20 U	100	< 20 U	180	< 21 U
PAH	Dibenzo(a,h)anthracene	< 20 U	< 20 U	< 22 UJ	< 22 U	< 20 UJ	< 20 U	< 21 U	< 20 U	< 20 UJ	< 21 U
PAH	Fluoranthene	19 J	12 J	9.8 J	13 J	< 20 U	< 20 U	57	8.3 J	59	< 21 U
PAH	Fluorene	20 J	< 20 U	15 J	< 22 U	< 20 U	< 20 U	11 J	8.3 J	< 20 U	< 21 U
PAH	Indeno(1,2,3-cd)pyrene	< 20 U	< 20 U	< 22 U	< 22 U	< 20 U	< 20 U	< 21 U	< 20 U	< 20 U	< 21 U
PAH	Naphthalene	64 J	300 J	140	320 J	< 20 U	70	930	31	480	11 J
PAH	Phenanthrene	38 J	54 J	34	60 J	< 20 U	21	240	21	150	11 J
PAH	Pyrene	23 J	11 J	14 J	14 J	9.4 J	< 20 U	53	10 J	56	< 21 U
WETCHEM	Ammonia-NH3	17	14	32	8.6	< 6.2 U	27	13	16	7.6	5.1 J
WETCHEM	Sulfate	130	5800	180	4000	12	440	6800	340	4000	37
WETCHEM	Surfactants (MBAS)	< 1 UJ	1.8 J	< 5.4 UJ	2.2 J	< 5.2 UJ	3 J	4.5 J	< 5 UJ	6.6 J	< 5.1 UJ
WETCHEM	Total Cyanide	1.3	4.9	1.7	8.6	< 0.51 U	1.5	1.9	< 0.5 U	5.6	< 0.51 U

Notes:

Soil samples – Samples were collected from the upper 2 to 3 inches of soil, after removal of any charred vegetation from the ground surface.

Ash samples – Samples were collected where sufficient ash accumulation was present near the corresponding soil sample location.

Background samples - Samples were recollected after the Topanga Fire at DTSC-approved background locations, and represent local ambient soil conditions unimpacted by site activities. With the exception of BKND-1, all sample locations are located within the Topanga Fire perimeter

Sample ID Key

Sample Identification	Location
BCSS09S01	Bell Canyon
BKND-1	Background
BKND-5	Background
BZSS05S01	Background-Buffer
BZSS06S01	Background-Buffer
SGSS01S01	Sage Ranch

Units of measure by analyte/matrix

group	MATRIX - units
DIOXIN	Soil or Ash = ng/kg (nanograms per kilogram)
METALS	Soil or Ash = mg/kg (milligrams per kilogram)
PAH	Soil or Ash = µg/kg (micrograms per kilogram)
WETCHEM	Soil or Ash = mg/kg (milligrams per kilogram)

DIOXIN = Dioxins and Furans by USEPA method 1613B
METALS = Metals by USEPA method 6010B, 6020 and 7471A
PAH = Polyaromatic Hydrocarbons by USEPA method 8270C SIM (selective ion monitoring)
WETCHEM = Ammonia-NH3 by method 350.3 Modified
Sulfate by method 300.0
Surfactants by methylene blue active substances (MBAS) method SM5540-C
Total Cyanide by method 9014

Sample Identification = RFI site and sample identifier code
EPA Identication = Unique identifier used for reporting purposes

Data qualifiers:
U = not detected
J = estimated value
R = rejected data

TCDD TEQ (ND = 0) = Tetrachlorodibenzo-p-dioxin Toxic Equivalence Quotient (Not Detected = 0)

TEQ values were calculated using detected congener concentrations and WHO/97 Toxicity Equivalency Factors (TEFs). For comparison, western United States dioxin TEQs typically range up to 2 pg/g or parts per trillion.

Table A-5
Post-Topanga Fire Sample Locations and Coordinates

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Sample ID	Northing	Easting
BKND-1	265758	1782330
BKND-5	263776	1787630
BCSS09	261455	1792980
BZSS05	264261	1796440
BZSS06	269756	1788400
SGSS01	270853	1796080
RP-1	280335	1807240
CRP-1	270608	1810160
SSM-1	277839	1811361
CF-1	254631	1765620
PCC-1	250619	1774856
SC-1	260356	1907364
WC-1	258856	1912225
Upstream 001	262292	1791830
Upstream 002	263095	1786570
FC-1	126431	2106313
KD-1	289046	1612156
LFBS54	267205	1794155
SJBC-1	288950	1617040
SJBC-2	290829	1617053
SORP-1	117940	2073123
WCWP-1	125104	2081898

All coordinates in State Plane NAD 27, Zone 5

Table A-6
SSFL Precipitation Concentrations
(Ambient Rain Water)
January to March 2005

			Collection Dates				
Group	**Constituent**	**units**	**01/07/2005**	**02/11/2005**	**02/18/2005**	**03/04/2005**	**03/23/2005**
DIOXIN	1,2,3,4,6,7,8-HpCDD	µg/L	< 5.00E-05 UJ	- -	< 6.23E-06 U	- -	2.39E-04
DIOXIN	1,2,3,4,6,7,8-HpCDF	µg/L	5.50E-06 J	- -	< 3.08E-06 U	- -	3.45E-05 J
DIOXIN	1,2,3,4,7,8,9-HpCDF	µg/L	< 2.40E-06 U	- -	< 3.63E-06 U	- -	< 4.13E-06 U
DIOXIN	1,2,3,4,7,8-HxCDD	µg/L	< 1.90E-06 U	- -	< 4.74E-06 U	- -	< 3.60E-06 U
DIOXIN	1,2,3,4,7,8-HxCDF	µg/L	< 1.60E-06 U	- -	< 1.86E-06 U	- -	2.38E-06 J
DIOXIN	1,2,3,6,7,8-HxCDD	µg/L	< 1.60E-06 U	- -	< 4.84E-06 U	- -	6.60E-06 J
DIOXIN	1,2,3,6,7,8-HxCDF	µg/L	< 1.50E-06 U	- -	< 1.78E-06 U	- -	2.28E-06 J
DIOXIN	1,2,3,7,8,9-HxCDD	µg/L	< 1.60E-06 U	- -	< 4.78E-06 U	- -	5.72E-06 J
DIOXIN	1,2,3,7,8,9-HxCDF	µg/L	< 2.10E-06 U	- -	< 3.08E-06 U	- -	< 1.87E-06 U
DIOXIN	1,2,3,7,8-PeCDD	µg/L	< 2.90E-06 U	- -	< 2.34E-06 U	- -	< 1.32E-06 U
DIOXIN	1,2,3,7,8-PeCDF	µg/L	< 1.80E-06 U	- -	< 4.99E-06 U	- -	< 2.08E-06 U
DIOXIN	2,3,4,6,7,8-HxCDF	µg/L	< 1.20E-06 U	- -	< 1.95E-06 U	- -	2.24E-06 J
DIOXIN	2,3,4,7,8-PeCDF	µg/L	< 2.00E-06 U	- -	< 4.62E-06 U	- -	< 1.89E-06 U
DIOXIN	2,3,7,8-TCDD	µg/L	< 3.50E-06 U	- -	< 2.69E-06 U	- -	< 1.78E-06 U
DIOXIN	2,3,7,8-TCDF	µg/L	< 3.40E-06 U	- -	< 3.02E-06 U	- -	< 1.57E-06 U
DIOXIN	OCDD	µg/L	< 1.00E-04 UJ	- -	< 1.27E-05 U	- -	3.42E-03
DIOXIN	OCDF	µg/L	< 1.00E-04 UJ	- -	< 1.02E-05 U	- -	4.49E-05 J
DIOXIN	TCDD TEQ_with DNQ	µg/L	5.50E-08	- -	0	- -	5.00E-06
DIOXIN	TCDD TEQ_no DNQ	µg/L	0	- -	0	- -	2.73E-06
DIOXIN	Total HpCDD	µg/L	2.00E-05 J	- -	< 6.23E-06 U	- -	8.36E-04
DIOXIN	Total HpCDF	µg/L	1.50E-05 J	- -	< 3.32E-06 U	- -	8.58E-05 J
DIOXIN	Total HxCDD	µg/L	2.40E-06 J	- -	< 4.79E-06 U	- -	5.51E-05 J
DIOXIN	Total HxCDF	µg/L	< 1.60E-06 U	- -	< 2.11E-06 U	- -	6.90E-05 J
DIOXIN	Total PeCDD	µg/L	< 2.90E-06 U	- -	< 2.34E-06 U	- -	< 1.32E-06 U
DIOXIN	Total PeCDF	µg/L	< 1.90E-06 U	- -	< 4.80E-06 U	- -	9.17E-06 J
DIOXIN	Total TCDD	µg/L	< 3.50E-06 U	- -	< 2.69E-06 U	- -	< 1.78E-06 U
DIOXIN	Total TCDF	µg/L	< 3.40E-06 U	- -	< 3.02E-06 U	- -	< 1.57E-06 U
METALS	Antimony	mg/L	- -	< 0.002 UJ	< 0.00018 U	< 0.001 UJ	< 0.002 UJ
METALS	Arsenic	mg/L	- -	< 0.0038 U	< 0.0038 U	< 0.0038 U	< 0.0038 U
METALS	Barium	mg/L	- -	< 0.0028 U	< 0.0028 U	< 0.0028 U	< 0.0028 U
METALS	Beryllium	mg/L	- -	< 0.00062 U	< 0.00062 U	< 0.00062 U	< 0.00062 U
METALS	Boron	mg/L	- -	< 0.0074 U	< 0.0074 U	< 0.0074 U	< 0.0074 U
METALS	Cadmium	mg/L	- -	< 0.000015 U	< 0.000015 U	< 0.000015 U	0.000033 J
METALS	Chromium	mg/L	- -	0.0007 J	< 0.00068 U	0.0007 J	0.0011 J
METALS	Cobalt	mg/L	- -	< 0.00089 U	< 0.00089 U	< 0.00089 U	< 0.00089 U
METALS	Copper	mg/L	- -	< 0.00049 U	< 0.00049 U	0.00065 J	0.00072 J
METALS	Iron	mg/L	- -	< 0.0088 U	< 0.0088 U	0.015 J	0.039 J
METALS	Lead	mg/L	- -	< 0.00013 U	< 0.00013 U	0.00026 J	0.00019 J
METALS	Manganese	mg/L	- -	< 0.0032 U	< 0.0032 U	< 0.0032 U	< 0.0032 U
METALS	Mercury	mg/L	- -	0.00012 J	< 0.000063 U	< 0.000063 U	< 0.000063 U
METALS	Nickel	mg/L	- -	< 0.002 U	< 0.002 U	0.0025 J	< 0.002 U
METALS	Selenium	mg/L	- -	< 0.00036 U	< 0.00036 U	< 0.00036 U	< 0.00036 U
METALS	Silver	mg/L	- -	< 0.000089 UJ	< 0.000089 U	< 0.000089 U	< 0.000089 UJ
METALS	Thallium	mg/L	- -	< 0.000075 UJ	< 0.000075 U	< 0.000075 U	< 0.000075 U
METALS	Vanadium	mg/L	- -	< 0.0014 U	< 0.0014 U	< 0.0014 U	< 0.0014 U
METALS	Zinc	mg/L	- -	< 0.0037 U	< 0.0037 U	< 0.0037 U	0.0058 J

U = not detected J = estimated value

Note:

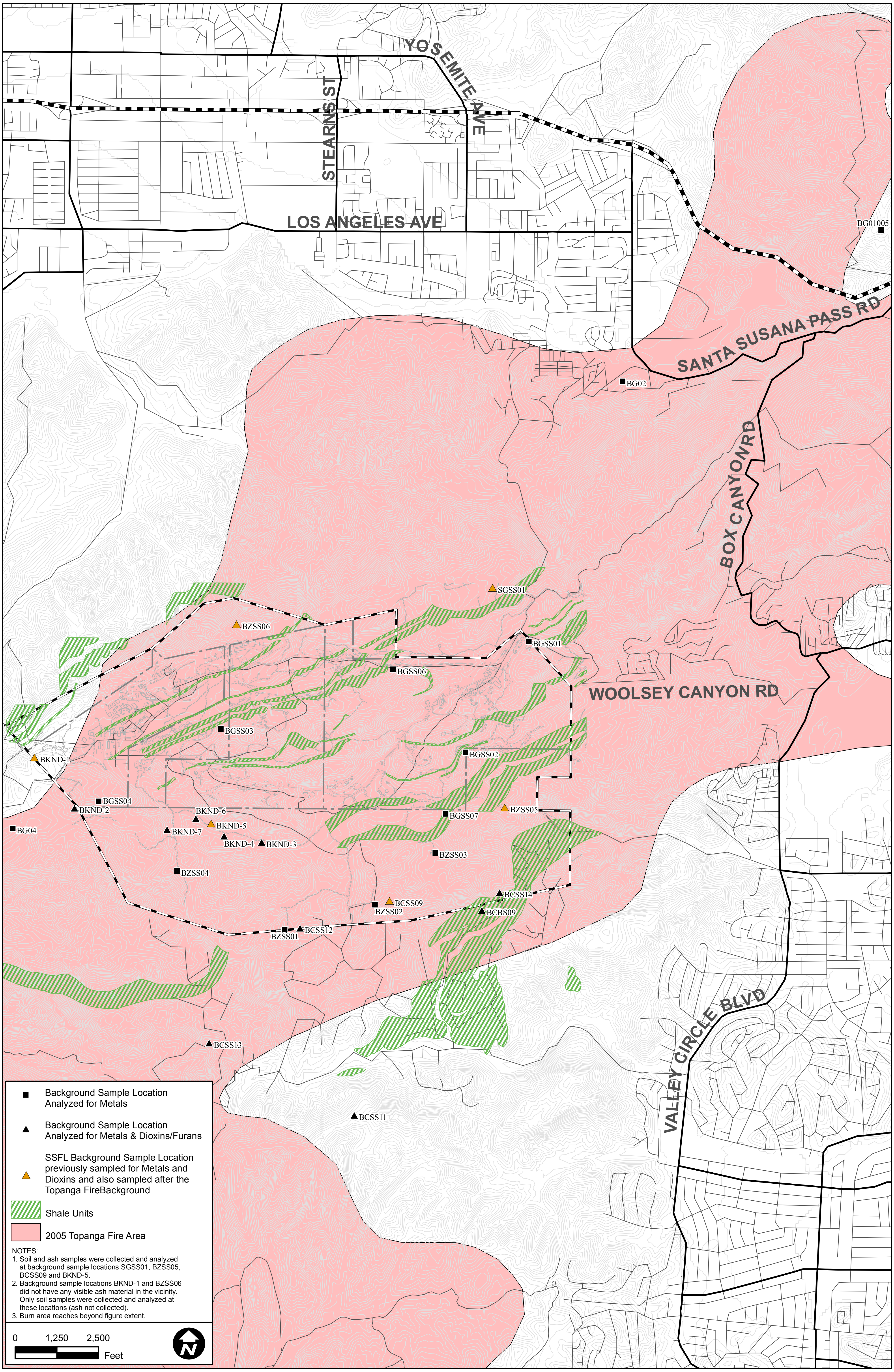
Results qualified as non-detected due to blank contamination are reported as non-detected at the laboratory RL rather than the laboratory MDL
In some cases, the RL has been elevated due to the blank contamination, as determined by the data validators.

Table A-7

Units Conversion Table

Page 1 of 1

Units From:	Multiplication Factor to grams
Metric Ton (MT)	1,000,000
Kilograms (kg)	1,000
Grams (g)	1
Milligrams (mg)	1.0E-03
Micrograms (µg)	1.0E-06
Nanograms (ng)	1.0E-09
Picograms (pg)	1.0E-12
Femtograms (fg)	1.0E-15



NOTES:
1. Soil and ash samples were collected and analyzed at background sample locations SGSS01, BZSS05, BCSS09 and BKND-5.
2. Background sample locations BKND-1 and BZSS06 did not have any visible ash material in the vicinity. Only soil samples were collected and analyzed at these locations (ash not collected).
3. Burn area reaches beyond figure extent.

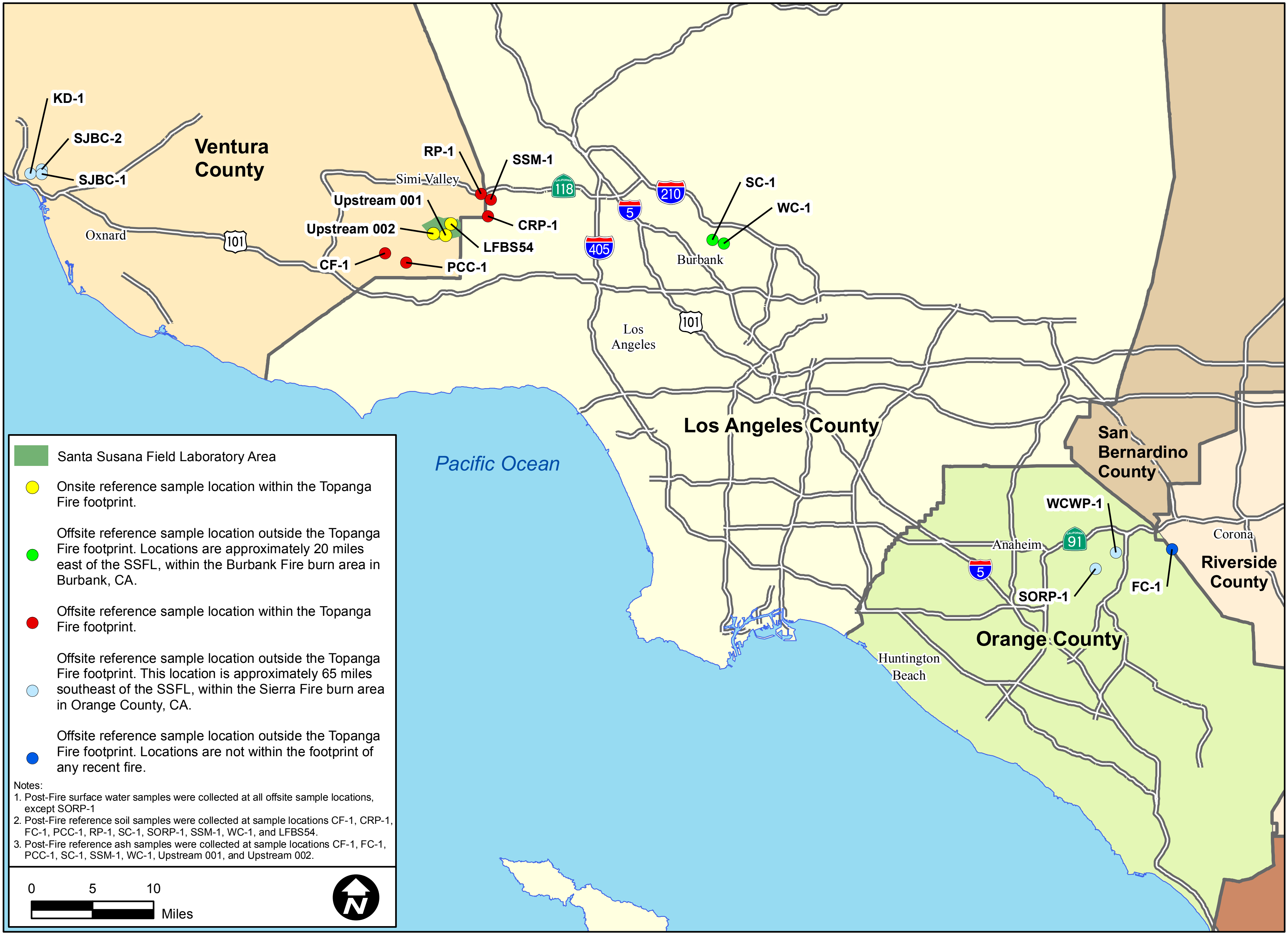
SANTA SUSANA FIELD LABORATORY

MWH

Post-Topanga Fire Background Sample Locations **Figure A-1**

T:projects/rock/plots/arcmap/sram_background_addendum.mxd

Date: Apr 24, 2007



Notes:
1. Post-Fire surface water samples were collected at all offsite sample locations, except SORP-1
2. Post-Fire reference soil samples were collected at sample locations CF-1, CRP-1, FC-1, PCC-1, RP-1, SC-1, SORP-1, SSM-1, WC-1, and LFBS54.
3. Post-Fire reference ash samples were collected at sample locations CF-1, FC-1, PCC-1, SC-1, SSM-1, WC-1, Upstream 001, and Upstream 002.

SANTA SUSANA FIELD LABORATORY **MWH** **Post-Fire Reference Sample Locations** **Figure A-2**

T:projects/rock/plots/arcmap/Attorney Client Presentation.mxd

Date: Apr 25, 2007

APPENDIX B
BMP AND EROSION CONTROL MATERIALS TESTING LABORATORY REPORTS

POTENTIAL BACKGROUND CONSTITUENT LEVELS IN STORM WATER AT BOEING'S SANTA SUSANA FIELD LABORATORY VENTURA COUNTY, CALIFORNIA