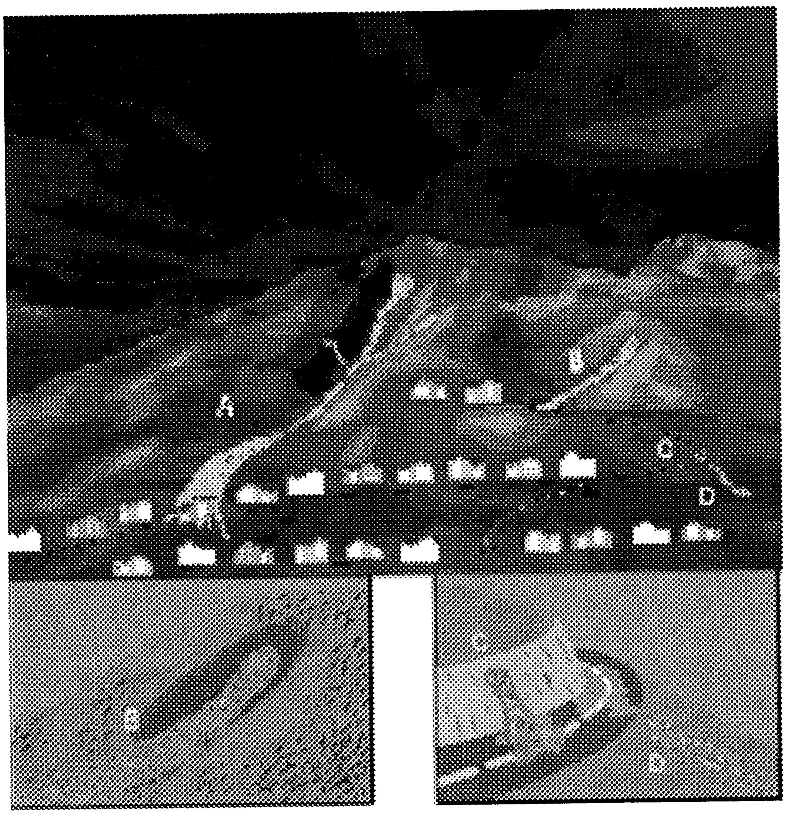
From the same USGS publication which is also referred to as U.S. Geological Survey Fact Sheet 176-97, we have put some other excerpts from this guide.

Hazardous Areas

Debris flows start on steep slopes-slopes steep enough to make walking difficult. Once started, however, debris flows can travel even over gently sloping ground. The most hazardous areas are canyon bottoms, stream channels, areas near the outlets of canyons, and slopes excavated for buildings and roads.



A: Canyon bottoms, stream channels, and areas near the outlets of canyons or channels are particularly hazardous. Multiple debris flows that start high in canyons commonly funnel into channels. There, they merge, gain volume, and travel long distances from their sources.

B: Debris flows commonly begin in swales (depressions) on steep slopes, making areas downslope from swales particularly hazardous.

C: Roadcuts and other altered or excavated areas of slopes are particularly susceptible to debris flows. Debris flows and other landslides onto roadways are common during rainstorms, and often occur during milder rainfall conditions than those needed for debris flows on natural slopes.

D: Areas where surface runoff is channeled, such as along roadways and below culverts, are common sites of debris flows and other landslides.

Wildfires and Debris Flows

Wildfires can also lead to destructive debris-flow activity. In July 1994, a severe wildfire swept Storm King Mountain west of Glenwood Springs, Colorado, denuding the slopes of vegetation. Heavy rains on the mountain in September resulted in numerous debris flows, one of which blocked Interstate 70 and threatened to dam the Colorado River. A 3-mile length of the highway was inundated with tons of rock, mud, and burned trees. The closure of Interstate 70 imposed costly delays on this major transcontinental highway. Here, as in other areas, the USGS assisted in analyzing the debris-flow threat and installing monitoring and warning systems to alert local safety officials when high-intensity rainfall occurred or debris flows passed through a susceptible canyon. Similar types of debris flows threaten transportation corridors and other development throughout the West in and near fire-ravaged hillsides."

Hazards of debris flow after fires have been well documented. A discussion of these must be included in the EIR and how the project may be impacted by such flows. I have included tables from studies done on debris flows or floods that have occurred after on set of wildfires. The effects of debris flow can be more acute after wildfires because resins in the burned vegetation melt into the soil, forming a waxy layer that impedes water absorption.

Glendora, CA (1968)	**Basin Area (km^2)**	**Relief Ratio (%)**	**% Burn**	**Discharge (m^3/s) or Volume of Deposits (m^3)**	**Reported Rainfall Conditions**	**Reported Flow Process**
Glencoe Hts.	0.31	24	80	>10^6 m^3	Storm date: Jan 18-27, 1969, 33 mm in 1 hr at peak of storm (75+ year recurrence interval)	debris flow
Rainbow Drive	0.23	32	80	>10^6 m^3	Storm date: Jan 18-27, 1969, 33 mm in 1 hr at peak of storm (75+ year recurrence interval)	debris flow
East Hook Cyn	0.47	43	80	19,152 m^3	Storm date: Jan 18-27, 1969, 33 mm in 1 hr at peak of storm (75+ year recurrence interval)	debris flow
East Hook Cyn	0.47	43	80	11,354 m^3	Event occurred during a storm from Feb 22-25, 1969	debris flow
Harrow Cyn	1.11	38	80	39,867 m^3	Storm date: Jan 18-27, 1969, 33 mm in 1 hr at peak of storm (75+ year recurrence interval)	debris flow
Harrow Cyn	1.11	38	80	8,235 m^3	Event occurred during a storm from Feb 22-25, 1969	debris flow
Englewild Cyn	1.04	24	80	34,048 m^3	Storm date: Jan 18-27, 1969, 33 mm in 1 hr at peak of storm (75+ year recurrence interval)	debris flow
Englewild Cyn	1.04	24	80	11,612 m^3	Event occurred during a storm from Feb 22-25, 1969	debris flow

Reference: Scott (1971)- Scott, K.M., 1971, Origin and Sedimentology of 1969 Debris Flows near Glendora, California: U.S. Geological Survey Professional Paper 750-C: C242-C247.

Hidden Springs, CA (1977)	**Basin Area (km^2)**	**Relief Ratio (%)**	**% Burn**	**Discharge (m^3/s) or Volume of Deposits (m^3)**	**Reported Rainfall Conditions**	**Reported Flow Process**

M.F. Mill Creek	12	8	100	255 m^3/s 300,000 m^3	Storm Date: February 9th, 1978, 250 mm rain in 24 hr	debris flow

Reference: **Wells (1987)** - Wells, H.G., 1987, The effects of fire on the generation of debris flows in southern California. *in* Debris Flows/Avalanches: Process, Recognition, and Mitigation, Costa JE, Wieczorek GF (eds): Geological Society of America, Reviews in Engineering Geology VII, pp. 105-114.

Sierra Madre, CA (1978)	**Basin Area (km^2)**	**Relief Ratio (%)**	**% Burn**	**Discharge (m^3/s) or Volume of Deposits (m^3)**	**Reported Rainfall Conditions**	**Reported Flow Process**
Carter Canyon *(Bailey Canyon)*	0.31	?	100	600 m^3/s	Storm Date: Nov. 11th, 1978	debris flow

Reference: **Wells (1981)**- Wells, H.G., 1981, Some Effects of Brushfires on Erosion Processes in coastal Southern California, *in* Davies TRH, Pearce AJ (eds): Erosion and sediment transport in Pacific Rim steeplands: International Association of Hydrological Sciences Publication 132, pp. 305-342.

Wheeler Fire **Ventura Cty, CA (1985)**	**Basin Area (km^2)**	**Relief Ratio (%)**	**% Burn**	**Discharge (m^3/s) or Volume of Deposits (m^3)**	**Reported Rainfall Conditions**	**Reported Flow Process**
North Fork of Matilija Creek	2.14	40	100	550 m^3	Storm Date: Jan. 30-31st, 1986, Max rainfall intensity: 20 mm/hr < 2 year recurrence interval	streamflow transported and deposited well-sorted gravel from tributaries and hillslopes

Reference: **Florsheim and others (1991)** - Florsheim, J.L., Keller, E.A., Best, D.W., 1991, Fluvial Sediment Transport in response to moderate storm flows following chaparral wildfire, Ventura County, southern California: Geological Society of America Bulletin, v. 103, p. 504-511.

Old Topanga Fire (1993)	**Basin Area (km^2)**	**Relief Ratio (%)**	**% Burn**	**Discharge (m^3/s) or Volume of Deposits (m^3)**	**Reported Rainfall Conditions**	**Reported Flow Process**
Las Flores Creek	13	11	100	3,000 m^3	Storm Date: Feb. 20th, 1994, 66 mm of rain fell at an average intensity of 25 mm/hr	mud and debris torrents collected sediment from tributaries

Reference: **Booker (1998)**- Booker, F.A., 1998, Landscape Management Response to Wildfires in California: MS Thesis, University of California, Berkeley, California, 436 p.

Laguna Beach Fire	**Basin Area**	**Relief Ratio (%)**	**% Burn**	**Discharge (m^3/s) or Volume of Deposits (m^3)**	**Reported Rainfall Conditions**	**Reported Flow Process**

(1993)	**(km^2)**					
Laguna Canyon	21.4	1	85	257,000 m^3	Storm Date: Jan. 4th, 1995	flood
Laguna Canyon	21.4	1	85	463,000 m^3	Storm Date: Jan 10th, 1995	flood

Reference: **Booker (1998)** - Booker, F.A., 1998, Landscape Management Response to Wildfires in California: MS Thesis, University of California, Berkeley, California, 436 p.

The EIR does not address debris flows, mudflows or landslides that might occur as a result of a severe weather phenomenon or natural disaster such as a wildfire. The EIR must discuss the consequences of such problems and recommend suitable mitigation measures. If suitable mitigation measures cannot be recommended, then the impact of geology and soils on this project will remain significant.

The EIR must list the likely frequency that earthquakes of maximum magnitude from the different earthquake faults that may occur. The public information that the consultant derives his earthquake information from should indicate the frequency of a maximum magnitude earthquake on each fault.

The EIR must also incorporate in the mitigation measures, that any graded or exposed slope that would impact developed property to be stabilized in the event of the maximum expected earthquake to occur in the area. The California Department of Conservation Seismic Hazard Map shows that much if not most of the project area where land will be graded is subject to earthquake induced landslides. That is why it is imperative to incorporate these mitigation measures to reduce this known hazard below the threshold of significance. The EIR must also discuss if the bridges built in Project Area B across the La Tuna Canyon Wash will suffer impacts due to earthquakes or debris flow as they will be built in or near alluvium.

I question that the mitigation measures undertaken to prevent erosion will reduce erosion to a less than significant level if the construction period for infrastructure improvement and construction of homes takes a long time. There is a good chance that a Q50 storm will impact the area if the construction will occur over a 20-year period as we believe. That will mean that even if grading were only allowed in the dry season that there would be significant sediment and debris flow from the graded, open, and unstabilized areas that are not contained effectively.

There must be a discussion of pollutant runoff from this urban development. This includes runoff that might be produced by the households in the development and chemicals that will runoff from the project landscaping that is done in other areas. This may be a significant impact from the development despite the current mitigation recommendations. Additional mitigation measures may be required to minimize pollutant runoff.

I believe that as an additional mitigation measure, residences, retaining walls and other structures should be supported on footings founded either entirely in bedrock or in compacted fill. Also, as another mitigation measure, construction work must not be performed during times of inclement weather. This includes times of moderate or severe rain, winds in excess of 20 miles per hour, or other weather conditions that would pose a hazard to the construction site, construction workers, or nearby residents. The construction site must have monitoring equipment to determine when winds exceed 20 miles per hour.

Also, it must be discussed in the EIR if crib walls will be used to stabilize any cut slopes. Use of crib walls are common in hillside projects where there are steep cuts or steep slopes involved. In the Duke Development, also known as Hillview Estates, crib walls were planned to be used throughout the project to stabilize slopes. This planned project is next to this development. The topography of the Duke land and Canyon Hills land is similar. Crib walls will probably be used to stabilize cuts for roads, lots, and other land form improvements. If crib walls are used, they also must be shown in the photosimulations in the Aesthetics section of the EIR. The locations of these crib walls must be discussed in the EIR.

It is a very terrible omission that the location of crib walls and other stabilization techniques are not discussed in the EIR. All planned cuts, fills, and stabilization techniques such as use of crib walls must be discussed in the EIR. Their location is important because we must be able to evaluate whether all these landform alterations and mitigation measures are adequate to mitigate potential floods, mudslides, and other debris flows caused by natural catastrophes like excessive rain, earthquakes, and any other event that might produce a disaster or problem. This omission indicates that the development plan is very incomplete. Until the EIR more definitively defines important impacts of the project, it remains inadequate and incomplete. All these omissions and material errors necessitate that they be corrected and a new draft EIR be released for public review.

Additionally, as a mitigation measure, all crib walls or other retaining walls must be provided with a standard surface backdrain system. All drainage must be conducted to the street or drain system in an acceptable manner and designed to be non-erosive. Also, any subdrainage systems must be designed to prevent possible hydrostatic pressure behind these crib walls.

Another mitigation measure that must be done is to have a representative of the project engineering geologist and geotechnical engineer inspect and approve the bottom excavations before placement of any compacted fill. Also, the project engineering geologist and geotechnical engineer must post a notice on the job site for the Los Angeles City Grading Inspector stating that the soil inspected meets the conditions of the report and that the Los Angeles City Grading Inspector inspect and approve the bottom excavations before any fill is placed in them. Also, a written certification must be filed with the City of Los Angeles Public Works Department upon completion of the work.

Also, grading activities must cease when a first stage smog alert or worse air quality conditions occur. This must occur to safeguard area residents and construction workers health from worse air pollution.

The EIR discussion in this section must make sure that the provisions in the Los Angeles Municipal Code concerning the disclosure of information in the EIR are followed. We have pasted some relevant sections of LAMC in this discussion.

91.7006.3.1. Soils Engineering Report. The soils engineering report required by Section 91.7006.2 shall include data regarding the nature, distribution and strength of existing soils, conclusions and recommendations for grading procedures and design criteria for corrective measures, including buttress fills, when necessary, and opinion on adequacy for the intended use of sites to be developed by the proposed grading as affected by soils engineering factors, including the stability of slopes.

91.7006.3.2. Engineering Geology Report. The engineering geology report required by Section 91.7006.2 shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and opinion on the adequacy for the intended use of sites to be developed by the proposed grading, as affected by geologic factors.

In addition, all soils engineering and engineering geology reports for grading work in hillside areas shall also comply with rules and standards established by the Department.

91.7006.4. Hillside Exploratory Work. Surface and subsurface exploratory work shall be performed by a soils engineer and an engineering geologist on all hillside grading work. This exploratory work shall conform to the rules and regulations for hillside exploratory work established by the general manager of the Department. The Department may waive this requirement when it determines from the application and site conditions that the proposed grading will conform to the provisions of the Code.

No person shall conduct any grading operation for the access of exploration equipment unless the Department has approved a plan signed by the soils engineer and/or geologist showing the extent of access grading and how the site is to be restored after exploration.

The EIR must discuss the impacts of debris flows, mudflows, and landslides in all situations mentioned in this comment letter. These situations have occurred repeatedly in Southern California and the likelihood that they will impact this development is inevitable. The EIR must recommend mitigation measures to insure that these impacts will be less than significant or if this is not possible state that these impacts remain significant even after mitigation. The EIR must incorporate additional mitigation measures and discuss additional topics.

Section IV. B AIR QUALITY

The DEIR needs to identify all sensitive receptors in the area. No specific receptors were actually identified. Wind current information should be gathered and models developed to show the full impact of these pollutants on the surrounding areas.

There is no discussion about significant impacts on health due to air pollution from freeways. This must be discussed in the EIR as these health hazards will be a significant impact to the residents of this development that will be built so close to the Foothill Freeway. Data must be collected about air quality in the area from the freeway that will produce the health hazards that we will discuss in our response. If this is not done, the EIR must make a finding that residents of this project will be significantly impacted from freeway air pollution.

Air pollution from busy roads linked to shorter life spans for nearby residents

Dutch researchers looked at the effects of long-term exposure to traffic-related air pollutants on 5,000 adults. They found that people who lived near a main road were almost twice as likely to die from heart or lung disease and 1.4 times as likely to die from any cause compared with those who lived in less-trafficked areas. Researchers say these results are similar to those seen in previous US studies on the effects of long-term exposure to traffic-related air pollution. The authors say traffic emissions contain many pollutants that might be responsible for the health risks, such as ultrafine particles, diesel soot, and nitrogen oxides, which have been linked to cardiovascular and respiratory problems.

Hoek, Brunekreef, Goldbohn, Fischer, van den Brandt. (2002). Association between mortality and indicators of traffic-related air pollution in the Netherlands: a cohort study. Lancet, *360 (9341): 1203-9.*

Truck traffic linked to childhood asthma hospitalizations

A study in Erie County, New York (excluding the city of Buffalo) found that children living in neighborhoods with heavy truck traffic within 200 meters of their homes had increased risks of asthma hospitalization. The study examined hospital admission for asthma amongst children ages 0-14, and residential proximity to roads with heavy traffic.

Lin, Munsie, Hwang, Fitzgerald, and Cayo. (2002). Childhood Asthma Hospitalization and Residential Exposure to State Route Traffic. Environmental Research*, Section A, Vol. 88, pp. 73-81.*

Pregnant women who live near high traffic areas more likely to have premature and low birth weight babies

Researchers observed an approximately 10-20% increase in the risk of premature birth and low birth weight for infants born to women living near high traffic areas in Los Angeles County. In particular, the researchers found that for each one part per million increase in annual average carbon monoxide concentrations where the women lived, there was a 19% and 11% increase in risk for low birth weight and premature births, respectively.

Wilhelm, Ritz. (2002). Residential Proximity to Traffic and Adverse Birth Outcomes in Los Angeles County, California, 1994-1996. Environmental Health Perspectives. *doi: 10.1289/ehp.5688.*

Traffic-related air pollution associated with respiratory symptoms in two year old children

This cohort study found that two year old children who are exposed to higher levels of traffic-related air pollution are more likely to have self-reported respiratory illnesses, including wheezing, ear/nose/throat infections, and reporting of physician-diagnosed asthma, flu or serious cold.

Brauer et al. (2002). Air Pollution from Traffic and the Development of Respiratory Infections and Asthmatic and Allergic Symptoms in Children. Am J Respiratory and Critical Care Medicine. *Vol. 166 pp 1092-1098.*

People who live near freeways exposed to 25 times more particle pollution

Studies conducted in the vicinity of Interstates 405 and 710 in Southern California found that the number of ultrafine particles in the air was approximately 25 times more concentrated near the freeways and that pollution levels gradually decrease back to normal (background) levels around 300 meters, or 990 feet, downwind from the freeway. The researchers note that motor vehicles are the most significant source of ultrafine particles, which have been linked to increases in mortality and morbidity. Recent research concludes that ultrafine particles are more toxic than larger particles with the same chemical composition. Moreover, the researchers found considerably higher concentrations of carbon monoxide pollution near the freeways.

Zhu, Hinds, Kim, Sioutas. Concentration and size distribution of ultrafine particles near a major highway. Journal of the Air and Waste Management Association. *September 2002. Zhu, Hinds, Kim, Shen, Sioutas. Study of ultrafine particles near a major highway with heavy-duty diesel traffic.* Atmospheric Environment. *36(2002), 4323-4335.*

Asthma more common for children living near freeways.

A study of nearly 10,000 children in England found that wheezing illness, including asthma, was more likely with increasing proximity of a child's home to main roads. The risk was greatest for children living within 90 meters of the road.

Venn et al. (2001). Living Near A Main Road and the Risk of Wheezing Illness in Children. American Journal of Respiratory and Critical Care Medicine. *Vol. 164, pp 2177-2180.*

A study of 1,068 Dutch children found that asthma, wheeze, cough, and runny nose were significantly more common in children living within 100 meters of freeways.

Increasing density of truck traffic was also associated with significantly higher asthma levels - particularly in girls.

van Vliet et al. (1997). Motor exhaust and chronic respiratory symptoms in children living near freeways. Environmental Research. *74:12-132.*

Children living near busy roads more likely to develop cancer

A 2000 Denver study showed that children living within 250 yards of streets or highways with 20,000 vehicles per day are six times more likely to develop all types of cancer and eight times more likely to get leukemia. The study looked at associations between traffic density, power lines, and all childhood cancers with measurements obtained in 1979 and 1990. It found a weak association from power lines, but a strong association with highways. It suggested that benzene pollution might be the cancer promoter causing the problem.

Pearson et al. (2000). Distance-weighted traffic density in proximity to a home is a risk factor for leukemia and other childhood cancers. Journal of Air and Waste Management Association *50:175-180.*

Emissions from motor vehicles dominate cancer risk

The most comprehensive study of urban toxic air pollution ever undertaken shows that motor vehicles and other mobile sources of air pollution are the predominant source of cancer-causing air pollutants in Southern California. Overall, the study showed that motor vehicles and other mobile sources accounted for about 90% of the cancer risk from toxic air pollution, most of which is from diesel soot (70% of the cancer risk). Industries and other stationary sources accounted for the remaining 10%. The study showed that the highest risk is in urban areas where there is heavy traffic and high concentrations of population and industry.

South Coast Air Quality Management District. Multiple Air Toxics Exposure Study-II. *March 2000.*

Cancer risk higher near major sources of air pollution, including highways

A 1997 English study found a cancer corridor within three miles of highways, airports, power plants, and other major polluters. The study examined children who died of leukemia or other cancers from the years 1953-1980, where they were born and where they died. It found that the greatest danger lies a few hundred yards from the highway or pollution facility and decreases as you get away from the facility.

Knox and Gilman (1997). Hazard proximities of childhood cancers in Great Britain from 1953-1980. Journal of Epidemiology and Community Health. *51: 151-159.*

Proximity of a child's residence to major roads linked to hospital admissions for asthma

A study in Birmingham, United Kingdom, determined that living near major roads was associated with the risk of hospital admission for asthma in children younger than 5 years of age. The area of residence and traffic flow patterns were compared for children admitted to the hospital for asthma, children admitted for nonrespiratory reasons, and a random sample of children from the community. Children admitted with an asthma diagnosis were significantly more likely to live in an area with high traffic flow (> 24,000 vehicles/ 24 hours) located along the nearest segment of main road than were children admitted for nonrespiratory reasons or children form the community.

Edwards, J., S. Walters, et al. (1994). Hospital admissions for asthma in preschool children: relationship to major roads in Birmingham, United Kingdom. Archives of Environmental Health. *49(4): 223-7.*

Exposure to carcinogenic benzene higher for children living near high traffic areas

German researchers compared forty-eight children who lived in a central urban area with high traffic density with seventy-two children who lived in a small city with low traffic density. They found that the blood levels of benzene in children who lived in the high-traffic-density area were 71% higher than those of children who lived in the low-traffic-density area. Blood levels of toluene and carboxyhemoglobin (formed after breathing carbon monoxide) were also significantly elevated (56% and 33% higher, respectively) among children regularly exposed to vehicle emissions. Aplastic anemia and leukemia are associated with excessive exposure to benzene.

Jermann E, Hajimiragha H, Brockhaus A, Freier I, Ewers U, Roscovanu A: Exposure of children to benzene and other motor vehicle emissions. Zentralblatt fur Hygiene und Umweltmedizin *189:50-61, 1989.*

Freeway Exhaust May Accelerate Lung Conditions

Vehicle emissions are responsible for a great deal of urban air pollution, but their effects on chronic lung diseases are not as widely understood. Michael Kleinman, a community and environmental health and medicine researcher, is discovering how environmental exposures in close proximity to sources of vehicle exhaust from heavily trafficked freeways accelerate lung conditions including asthma. Kleinman uses the nation's most busy freeway interchange, located just south of downtown Los Angeles, for his tests, where he places mice already exposed to asthma-like allergens in specially developed exposure chambers next to the freeway traffic. He also tests exposures at distances progressively further away, 100 and 500 meters downwind from the interchange. He has found that the closer the mice are to traffic, the more prone they are to suffer from lung-based allergic reactions from pre-existing conditions. "Ultrafine particulate matter from the exhaust is 10 times higher next to the freeway than at other testing sites," Kleinman says. "And since diesel trucks make up 20 to 30 percent of the traffic, there may be a correlation, especially since these trucks do not face the same exhaust standards in California that cars do." –University of Irvine public release August 22, 2002 on findings by its researchers.

With all the studies that have been conducted on the impacts of air pollution on residents that live close to a freeway or major roadway, this EIR must have some discussion on this issue and the significance of this impact on this project's residents.

Also because of the greatly increased health risk from air pollution to residents living near freeways, we recommend the following mitigation measures. **All prospective property residents must be given information that cite studies and discuss the potential health hazards from residing close to freeways as we have done above.** The health hazard impacts of freeway air pollution on residents are severe. **Another mitigation measure that should be included in the EIR is that no dwelling or outside pad area that will be utilized by residents shall be within 250 yards of the edge of the Freeway.** This buffer zone will greatly diminish the project residents health hazards from air pollution. The health hazard impacts decrease as residents reside further from the freeway.

No air pollution data was gathered in the area. Data for the report was gathered from reporting stations miles away that may not have similar conditions to the site area. The project site is in a canyon that may concentrate pollutants at higher levels than in open areas. Therefore, data should be gathered on air pollution in the Sunland Tujunga La Tuna Canyon area.

Pollutant levels for Peak Hour AM and PM traffic in the area must be discussed for other pollutants besides CO concentrations. The Peak Hour Pollutants may exceed significant thresholds for all the pollutant categories for the project and the alternatives. Mitigation measures must be recommended to try to protect the sensitive receptors from this effect.

The impacts of construction impact include potential impacts from PM10 generated from earthmoving and grading. However, it does not include the impact of expected increases in PM10 due to blasting of areas. Blasting will significantly increase the amount of dirt that becomes airborne. Thus this event will substantially increase the PM10 generated from the development. Also construction impacts do not include the use of trash trucks to haul away debris generated during the grading and site improvement process. The number of these additional trucks and the impact on the site and surrounding area must be discussed. These additional vehicle trips will increase the amount of air pollution in the surrounding areas.

The air pollution created from the construction activities will be significantly greater than discussed in the EIR if more equipment is needed to accomplish the grading and landform alterations as we have discussed in other sections. This may mean that the construction activities may have a significant impact on Carbon Monoxide, Volatile Organic Compounds, and Sulfur Oxides than was previously discussed. If more construction vehicles are actually needed to accomplish the work in the planned timeframe, the EIR must be modified to reflect the increases in different types of pollution generated by the construction activities.

As there will be a significant impact from PM10 generated during the construction activities, I believe that the developer as a mitigation measure be allowed to grade no more than 10 acres per day between both Development Areas A and B. The developer must devise more ways to mitigate the construction impacts to air pollution, noise, and all other areas that the development will impact our community.

Also, the impacts of vehicle trips on the surrounding local area (outside the project area) made by residents of the development after it is completed must be discussed. The air pollution generated by their activity may increase pollution levels to significant impact in the surrounding areas. This impact could not be mitigated and would remain significant to the community.

This section should include a discussion of the impact of the loss of trees to air quality. The loss of trees is significant and will probably have a significant impact on air quality. A discussion of the benefit of trees is found on the California Air Resources Board Website.

California Air Resources Board

HOME SEARCH SITE MAP SOFTWARE CONTACT US

Trees and Air Quality

This page updated July 17, 2001.

TREES & AIR QUALITY

The right tree can improve air quality as well as provide other benefits such as shade and beauty. However, some trees can have adverse effects on air quality and, because of their pollens, can even affect people's ability to breathe. This site provides an introduction to the effects of trees on air quality and identifies some websites that provide additional information.

BENEFITS OF TREES ON AIR QUALITY

Trees deliver air quality benefits by the cooling effect of their shade and by removing certain pollutants.

COOLING

By cooling, trees reduce evaporative emissions from vehicles and other fuel storage. By cooling homes and offices, trees reduce power generation emissions. General cooling also reduces the speed of chemical reactions that lead to the formation of ozone and particulate matter. By using models at ARB or at the Federal EPA, we can predict how well cooling by trees helps improve air quality.

***Sacramento Shade** provides an excellent website to learn about the savings in energy and air quality, as well as the real estate enhancements that trees can provide. The site is located at: http://www.smud.org/sacshade/index.html*

POLLUTANT REMOVAL OR DEPOSITION

Leaves and needles have surface area that can allow for removal (deposition) of ozone, nitrogen dioxide, and to a lesser extent particulate matter. Several different factors affect pollutant removal. These factors include how long a parcel of air is in contact with the leaf, the amount of leaf area, as well as the specific pollutant of interest. Because deposition has an affect on air quality, the Air Resources Board (ARB) is interested in this phenomenon. For example, the ARB support a study to evaluate how well agricultural crops remove ozone. For more on the California Ozone Deposition Experiment (CODE) please refer to: http://blg.oce.orst.edu/code91/twinotter/description/synopsis.html

*In addition, an excellent discussion of the impact of trees on ozone removal can be found for **Blodgett Forest** at: http://www.cnr.berkeley.edu/forestry/bs_14.html*

The DEIR must include a more inclusive discussion of the impacts of air pollution that have been detailed in this response.

Section IV. C HYDROLOGY AND WATER QUALITY

The EIR should be discussing possible water flows due to a 100 year storm rather than a 50 year storm. Weather phenomena like El Nino have made the possibility of more severe storms.

The EIR also does not address floods or debris flows after wildfires. Please refer to our discussion in the geology and soils section. The EIR must discuss these impacts and the significance on the project and surrounding areas. This can be a real problem.

I have included an article from the Los Angeles Times November 4, 2003 edition of the paper titled "**Fires Bring Hazard of Landslides**".

Flood control experts fear that wildfires have created potentially