Comment Letter No. 148

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To: Ms. Maya E. Zaitzevsky
Project Coordinator
Department of City Planning
City of Los Angeles
200 North Spring Street
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Los Angeles, CA 90012

Re: Comments on the Canyon Hills Project Draft Environmental Impact Report (ENV-2002-2481-EIR, SCH #2002091018) and Geotechnical Evaluation

Date: 29 December 2003

Dear Ms. Zaitzevsky,

I am a Registered California Geologist (Reg #4171) with a consulting practice in the Los Angeles area. I have reviewed the Canyon Hills Draft Environmental Impact Report (C.A. Joseph & Associates, 2003) and associated Geotechnical Evaluation (Zeiser Kling Consultants, Inc., 2003). In my opinion both of these reports (jointly referred to here as DEIR) are inadequate in several areas that are presented below: 148-1

1) **Earthquake surface rupture:** The likelihood of a future strong earthquake occurring beneath or very close to the project site and producing surface rupture and strong shaking at the site is understated. The project site is located along the north side of the Verdugo Mountains and just south of the San Gabriel Range front. The Sierra Madre fault zone that produced the 1971 San Fernando earthquake is actively uplifting the latter mountain front. A complicated and wide band of surface fault rupture occurred along the San Fernando segment of the Sierra Madre fault zone during the earthquake (CDMG, 1975), and a portion of this zone projects eastward towards the project site. This surface rupture terminated near the Tujunga Wash about 2 miles northwest of the project site but the segment of the Sierra Madre fault closest to the project site has not moved during historic time. It is not unreasonable to assume that the fault segment, closest to the site, will move at some time during the life of the proposed project as the entire San Gabriel Mountain front is being actively uplifted. The detailed location of the Sierra Madre fault east of Tujunga Wash is unclear and given the change in the overall structural geometry of the area east of Tujunga Wash it is likely that the fault continues eastward as several strands along the foot of the San Gabriel Mountains and along the north side of the Verdugo Mountains. For example, Dibblee (1991) shows a large bedrock fault just southwest of the 210 Freeway that projects into the western portion of the project area. This unnamed fault has characteristics similar to the active Sierra Madre fault zone such as strike and structural style. Another example of a bedrock fault that projects into 148-2

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the project site is also shown on Dibblee (1991). Other geologists have referred to this fault as the Stough Canyon fault. The Stough Canyon fault splays off the Verdugo fault and cuts across the Verdugo Mountains towards the Sierra Madre fault. The Stough Canyon fault is of unknown activity but it should be considered potentially active as it connects with the active Verdugo fault and strikes towards the active Sierra Madre fault. The fault also has good geomorphic expression and should have been recognized and discussed during the examination of aerial photographs by the project geologists. Neither the unnamed fault mapped by Dibbleee (1991) or the Stough Canyon fault is discussed in the DEIR. 148-2

I believe the entire project site should be continuously trenched from north to south and from east to west given the possibility of future surface rupture at the site. The trench walls should be logged by a geologist to determine the presence of potentially active faults within the bedrock. If any active or potentially active faults are identified then proper set-back for future construction should be integrated into the project plan.

2) **Earthquake-Induced Landsliding:** Extensive earthquake-induced landsliding and debris fall occurred in the hilly areas just northwest of the project site during the 1971 San Fernando earthquake (Barrows, et al., 1974). It is important to note that most of the earthquake-induced landslide were not identified on earlier geologic surface maps. Consequently one cannot rely on earlier mapping, as done in this DEIR, as a key to future earthquake-induced landsliding. The DEIR needs to identify in detail areas of potential landsliding and rock fall based on slope stability analyses of the natural slopes and all artificial slopes. 148-3

It is likely that a future earthquake of similar size to the 1971 San Fernando earthquake, occurring under or near the project site, would produce an equivalent density of landsliding and debris fall through the project site given its rugged location. During 1971 very few homes and other structures were present in the hilly areas and damage and injury were limited. The proposed project will increase the probability of damage and injury from earthquake-induced landslides and debris fall during a future strong earthquake. The DEIR does mention these hazards but fails to discuss in any detailed manner their likelihood of occurrence, extent, and the limitations to the mitigation methods proposed.

3) **Artificial Fill from the 210 Freeway:** Construction of the 210 Freeway produced extensive areas of artificial fill up to 200 feet thick. Such areas are prone to earthquake-induced ground movement and debris flow activity during periods of heavy rain. The DEIR does not adequately discuss the suitability of this material for future construction or the possibility that this material may present a slope stability problem within the project site. 148-4

4) **Proposed Cut and Fill:** The project plans call for extensive cut and fill with some 100 feet high 1.5:1 cut slopes and fill areas up to 200 feet thick. The DEIR does not adequately discuss the downside risk of this scale of cut and fill activity and the negative visible impact. The bedrock at the site is highly fractured crystalline rock and cutting such high and steep slopes will increase the possibility of slope failure during periods of heavy rain or during an earthquake. Given the weak nature of the bedrock it is likely that deep and extensive cuts will be necessary to reach suitable hard bedrock. These cuts will produce additional cuts of weak bedrock that will be 148-5

susceptible to failure and will result in highly visible scars across the hillsides. It is unclear whether the developer intends to remove all the weakened bedrock from around the building sites or allow significant cuts of weakened bedrock to remain adjacent to the development. If the intention is to remove all of the weakened rock then the hillside scarring from this activity will be truly spectacular and highly visible from the 210 Freeway and surrounding communities. On the other hand if the weakened bedrock cuts are allowed to remain adjacent to the development then the likelihood of future slope failure will be increased and areas upslope and downslope of the development could be negatively impacted. 148-5

The thick artificial fill deposits called for in the project plan will be susceptible to slope failure during heavy rains or nearby earthquakes. The impact of such failures, especially downslope to outside communities, is not discussed in the DEIR.

If you have questions or comments on my comments please feel free to contact me by phone or email.

Best Regards,

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References Cited:

Barrows, A.G. et al., 1974, Surface Effects Map of the San Fernando Earthquake Area, in San Fernando, California Earthquake of 9 February 1971, California Division of Mines and Geology, Bulletin 196, Plate 3, 1:24,000 scale.

CDMG, 1974, San Fernando, California Earthquake of 9 February 1971, California Division of Mines and Geology, Bulletin 196.

Dibblee, T.W. Jr., 1991, Geologic Map of the Sunland and Burbank (North 1/2) Quadrangles, Dibblee Geological Foundation, Santa Barbara, CA, DF Map –32, 1:24,000 scale