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M E M O

Date: February 26, 2010
To: Sara Morton, Project Planner, Impact Sciences, Inc.
E-Mail: smorton@impactsciences.com
From: Richard B. Rodkin, PE
SUBJECT: CRT Refined Construction Noise Analysis

This memo presents the results of a refined construction noise analysis for the CRT project proposed at Lawrence Berkeley National Laboratory. The analysis updates and refines previous analyses provided by our firm during preparation of the Environmental Noise Report for the subject project dated 2007. The 2007 report utilized generic construction noise data typically used in an environmental impact report when detailed phase-by-phase information is not available for the numbers and types of pieces of equipment expected at the construction site. Typically, and purposely, such analyses represent a credible worst-case assessment of the potential environmental impact. When detailed information is available for construction equipment expected at a construction site a refined analysis can be completed that still provides a credible worst-case assessment, but one based on a more accurate forecast of expected construction noise levels.

Information on the numbers and types of equipment expected at the construction site during each phase was supplied by LBNL, as well as the number of days that the equipment would be present on the construction site. The analysis assumed equipment would operate for an entire 8-hour day. These data were input into the Federal Highway Administration Construction Noise Model. This model includes an up-to-date database of noise levels associated with construction equipment. Noise levels were calculated at the two noise receiver locations identified in the EIR as being the most affected receivers, the Foothill Student Housing complex located about 685 feet west of the project site and the Nyingma Institute located about 790 feet west of the project site. The effect of topographical shielding was also evaluated. The site is on a hillside over 200 feet above the elevation of the noise receiver locations. There are intervening undulations in the topography. The shielding analysis indicated that there would be a direct line-of-sight between the Nyingma Institute and the CRT construction site, so no acoustical shielding was assumed. Topographical shielding would attenuate noise in the direction of the Foothill Housing for noise sources at or near the ground. Five dBA of noise attenuation was calculated for sources at or near the ground. No attenuation was assumed for sources above the ground, such as the tower crane.

The results of the analysis are shown in Table 1. Received noise levels are shown at a theoretical reference distance of 50 feet from all operating noise sources, at the Foothill Student Housing, and at the Nyingma Institute. Projected noise levels represent the maximum noise levels expected on a workday when all pieces of equipment anticipated for that construction phase are operating simultaneously. During times of the day or during days when all equipment is not operating, noise levels would be lower than the noise levels shown in Table 1.

Table 1

Construction Phase	**Received Noise Level (dBA)**		
	Reference (at 50 Ft.)	**Foothill Student Housing**	**Nyingma Institute**
Excavation/Site Work	87	59	63
Foundation	85	58	61
Building Erection	88	61	64
Exterior Finishes	90	62	66

The generic noise analysis prepared for the EIR estimated noise levels would range from 60 to 70 dBA at the Foothill Student Housing complex and the Nyingma Institute. The refined analysis shows noise levels would range from 58 to 62 dBA at the Foothill Housing project and from 61 to 66 dBA at the Nyingma Institute. Noise from vehicular traffic on Cyclotron Road near Foothill Student Housing was measured at an average typical daytime level of 57 dBA. Noise levels typically ranged from 49 to 67 dBA as a result of vehicles passing by. Construction noise levels would not substantially exceed existing noise levels at Foothill Student Housing. The Berkeley Noise Ordinance would set a noise limit of 65 dBA for construction noise at multi-family residential developments. Noise from CRT construction activities is not calculated to exceed Berkeley Noise Ordinance limits at Foothill Student Housing. The Nyingma Institute adjoins Hearst Avenue. The south and east facades of the building and outdoor areas on the south and east sides of the building would be oriented towards the construction site and are also oriented towards Hearst Avenue. The EIR reported ambient noise measurements on the north side of the Institute, away from Hearst Avenue traffic noise, at 48 dBA L_{eq}, with levels ranging from 46 to 57 dBA. Ambient noise measurements along Hearst Avenue at Highland Place near the Nyingma Institute show an average noise level of 64 dBA with noise levels ranging from 57 to 80 dBA as vehicle traffic fluctuates. These data better represent the existing levels in areas that would be exposed to CRT construction noise. Construction noise levels would not substantially exceed existing hourly average noise levels and would fall within the range of existing traffic noise levels in the area. The Berkeley Noise Ordinance allows up to 70 dBA for commercial uses and up to 65 dBA for multi-family residential uses. Because noise levels would fall within the range of existing ambient levels, and the range of noise ordinance limits for this

use, this is not considered to be an adverse effect. The nearest single-family residences are located more than 1000 feet to the northwest of the project site. These residences are afforded substantial shielding due to topography and Building 88. Noise attenuation due to topographical shielding and the additional distance between the construction site and the single-family residences receive noise levels of less than 60 dBA at the nearest single-family residences. The refined construction noise analysis, therefore, concludes that construction noise levels are not calculated to exceed the Berkeley Noise Ordinance limits or substantially exceed existing noise levels at the most affected receptors or other more distant receptors. The short-term noise levels that would occur during the construction period would not cause a significant adverse effect.

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