



Michael Brandman Associates

ENVIRONMENTAL SERVICES • PLANNING • NATURAL RESOURCES MANAGEMENT

November 30, 2007

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San Bernardino, CA 92518-0001

**Subject: University Hills Specific Plan – Draft Noise Impact Assessment Report**

Dear Ms. Rahhal:

This letter serves as a revised noise impact analysis summary for the University Hills Specific Plan (UHSP) project (Project). This analysis presents a discussion of sound measurement and noise rating scales and presents City of San Bernardino (City) standards that apply to the proposed construction and occupancy of the UHSP Project. Existing conditions and noise impacts related to operational and construction activities are evaluated and mitigation measures are suggested to ensure noise impacts resulting from Project implementation are less than significant. Traffic information from the Project Traffic Impact Analysis prepared by Kunzman Associates on October 5, 2007 was used as the basis for the assessment of operational noise from the Project. For brevity, a discussion of the science and measurement of noise is not included in this report, but will be included in the EIR section addressing noise impacts to provide more information of the layperson on these topics.

## **1. Project Description and Setting**

The Project is located on currently undeveloped land in the foothills of the San Bernardino Mountains in the northern end of the City of San Bernardino. The project is located north of the California State University San Bernardino (CSUSB) campus, east of Northpark Boulevard, and north of the extension of Little Mountain Drive (see Exhibits 1 and 2). The property was formerly known as Paradise Hills. The City approved the Paradise Hills Specific Plan in 1993 but the Project was never built. The developer has submitted a new specific plan, called the University Hills Specific Plan, which increases the number of units but clusters the units in the southern portion of the site (i.e., on an alluvial terrace) rather than in the biologically sensitive Badger Canyon which bisects the site.

The UHSP Project proposes 980 units on 170 acres with 235 acres dedicated as permanent open space. This open space will be transferred to the nearby CSUSB campus as a "land laboratory" for teaching and research. The site is currently vacant with only dirt roads present. Access to the site is proposed by extending Campus Parkway east across Northpark Boulevard to create a loop road that will tie into the northern extension of Little Mountain Drive along the east side of the CSUSB campus.

There are no improved land uses, freeways, roads, railroad lines, etc. across or immediately adjacent to the site. There are no public airports or private airstrips within 2 miles of the site. The closest airport is the San Bernardino International Airport (SBIA), formerly the Norton Air Force Base, which was closed in 1992. The site is not within any noise or safety zones of the SBIA. The Andy Jackson Airpark is

located immediately west of the site, however, this facility is for hang-gliding and para-sailing which do not generate aircraft noise.

## **2. Existing Noise**

The Project site is vacant at present and experiences very low levels of noise. The only noise source in the immediate area is activity on the nearby Cal State San Bernardino campus, including vehicular traffic, as well as vehicular traffic on the I-215 Freeway approximately 1.5 miles southwest of the site. However, line of sight between the freeway and the UHSP Project site is blocked in many locations by the low Kendall Hills that run parallel to and north of Kendall Drive about 0.9 miles southwest of the site. Existing noise levels onsite are quite low and estimated to be between 40 dBA CNEL to 45.2 dBA CNEL, as measured by MBA personnel, depending upon the location of the measurement.

### **2.1 Sensitive Receptors**

Sensitive receptors are facilities or uses that contain persons who may be abnormally sensitive to noise impacts such as the elderly, children, persons who are sick, etc. Sensitive receptors include residences, schools, hospitals, child care centers, and senior centers. The nearest sensitive receptors to the Project site are residents living in the neighborhood along North I Street approximately 600 feet south of the eastern portion of the site (Planning Areas 16-20). The homes are built on individual lots with block walls in some locations and mature vegetation that may serve as noise barriers from construction and operation of the Project. The western portion of the Project site abuts vacant land, and the site is separated from the CSUSB campus by several large flood control/debris basins maintained by the San Bernardino County Flood Control District.

## **3. Project Noise**

The following assessment of noise includes relatively short-term impacts from grading and construction, and long-term impacts from project occupancy.

### **3.1 Construction Noise**

Construction noise represents a short-term increase in ambient noise levels. Noise impacts from construction activities associated with the proposed Project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities.

Short-term noise impacts could occur during construction activities either from the noise impacts created from the transport of workers and movement of construction materials to and from the Project site, or from the noise generated onsite during demolition, ground clearing, excavation, grading, and construction activities. Table 1 lists typical construction equipment noise levels for equipment that would be used during construction of the proposed Project. Construction activities are carried out in discrete steps, each of which has a unique mix of equipment and, consequently, unique noise characteristics. These various sequential phases would change the character of the noise levels surrounding the construction site as work progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow noise ranges to be categorized by work phase.

As discussed above under Sensitive Receptors, the residential land uses to the west of the Project site are the sensitive receptors of most concern as they relate to Project construction noise, based on their proximity to the Project site. Table 2 provides the estimated maximum noise levels the sensitive receptors would be expected to experience during construction. Note that construction noise often varies

significantly on a day-to-day basis, and the noise levels shown in the table represent a worst-case scenario.

Maximum construction noise levels are estimated to be a maximum of 69 dB at the nearest residence. Actual maximum noise levels are expected to be lower than this because most construction activities will be located further away from these residences, and construction noise would be attenuated by existing block walls, elevation differences, and mature vegetation at the residential properties. Construction noise would last the duration of construction, although it would be the most noticeable during the initial months of intensive grading and building construction. Grading and site preparation are expected to take approximately 3 to 6 months, followed by or in concert with construction of backbone infrastructure (e.g., roads, utility lines, etc.). After the site has been mass graded, groups of houses would be constructed in various Planning Areas depending on market conditions. The central and western portions of the site are relatively isolated, only the far eastern portion of the site is proximate to existing housing. Therefore, the evaluation of noise impacts in this area (i.e., south of Planning Areas 16-20) would constitute “worst case” conditions for this analysis.

**Table 1: Construction Equipment Noise Levels**

Construction Activity / Equipment	Maximum Noise Levels Measured (dBA at 50 feet)
Grading	89
Backhoe	90
Pneumatic tools	88
Air compressor	86
Crane	83
Plate compactor	89
Concrete vibrator	85
Trucks	87
Source: Federal Transit Administration, 1995	

**Table 2: Estimated Construction Noise Levels at Sensitive Receptors**

Receptor	Distance From Project Site (feet)	Maximum Noise Levels (L <sub>max</sub> , dB)
Residences along North I Street	600	69
Noise levels based on construction noise at 90 dB measured at 50 feet from project site; assumes a 6-dB reduction for each doubling of distance. Noise levels in this table depict peak levels and do not predict the 24-hour weighted average (CNEL). Due to the distance from project (Planning Areas 16-20) and anticipated project construction schedule, CNEL values are not expected to exceed these maximum estimated noise levels.		
Source: Michael Brandman Associates, 2007.		

### 3.2 Operation Noise

Long-term noise generated from the Project is related primarily to the increase in vehicle traffic on the surrounding roadways and stationary noise associated with operation of the Project. Future peak hour

traffic noise levels were modeled using the Federal Highway Administration Noise Prediction Model (FHWA-RD-77-108), which calculates noise levels for varying traffic volumes, mixes, and speeds. The results of the noise modeling are summarized below in Table 3. Data shown in Table 3 was based on the Traffic Impact Analysis prepared for the project by Kunzman Associates on October 5, 2007 and Table 2 from the Traffic Analysis Summary, Appendix 14, of the City of San Bernardino General Plan.

**Table 3: Projected Offsite Noise Impacts (dBA)**

Roadway/Segment	Existing Traffic (ADT)	Lanes/ LOS	Project Traffic (%/ADT)	Existing Noise Levels @ 50 feet from centerline	Noise Level Change from Project Traffic	Significant Change?
Kendall Drive South of University Pkwy.	18,752	4/A	14%-860	68.0 dB	+0.2 dB	No
University Parkway West of Northpark Blvd.	28,400	4/C	54% - 3,316	69.8 dB	+0.4 dB	No
Northpark Boulevard North of University Pkwy.	8,342	4/A	60% - 3,684	64.4 dB	+1.6 dB	No
Little Mountain Drive North of Northpark Blvd.	4,000 (estim.)	2/A	20% - 1,228	61.3 dB	+1.1 dB	No
Source: traffic data from General Plan Appendix 14, Traffic Analysis Summary, Table 2						
<b>Notes:</b> existing traffic data from 2002-2003 from General Plan Circulation Element. A 4-lane arterial roadway is expected to carry up to 40,000 vehicles per day. LOS = Level of Service based on Highway Capacity Manual methodology. Traffic volume for Little Mountain Drive estimated – data not available from General Plan or project TIA. LOS for Little Mountain Drive estimated based on 24-hour operation and may not reflect temporary congestion from CSUSB traffic. Project traffic ADTs estimated from trip distribution percentages in Kunzman Assoc. traffic study without flyover ramp connections (i.e., worst case conditions).						

Table 3 estimates potential noise impacts from the UHSP Project site. There are no improved roads on the Project site. Assuming an existing noise level of 45 dB on vacant land, future traffic through the Project site (i.e., on the extension of Campus Parkway) would generate 6,140 average daily vehicular trips and a potential noise increase of 17.9 dB based on the FHWA noise model. While this noise increase is substantial, the project is designed to minimize potential noise impacts by the placement of block walls along the main access roadway (see Exhibit 4).

**Exhibit 4: UHSP Wall Plan**

#### **4. Regulatory Setting**

The following regulations govern noise at the federal, state, and local level and are applicable to the project:

- U.S. Department of Housing and Urban Development Goals
- Federal Noise Control Act
- Office of Noise Control Standards
- Caltrans Vibration Guidance
- City of San Bernardino Land Use Compatibility Noise Standards
- City of San Bernardino Municipal Code

#### **5. Thresholds of Significance**

According to the Initial Study checklist in Appendix G of the State Guidelines of the California Environmental Quality Act (CEQA) of 1970, as amended, a significant impact would occur if the Proposed Project:

- a) Would expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- b) Would expose persons to or generate excessive groundborne vibration or groundborne noise levels;
- c) Would produce a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- d) Would produce a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- e) Was located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels; or
- f) Was within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

“Substantial” is not defined within the CEQA guidelines as a quantitative measure, nor is it defined by the City of San Bernardino. A change of 1 dBA or less is generally not detectable by the human ear, while a change of 3 dBA, under ambient conditions, may be noticeable to some people. A change of 5 dBA is readily noticeable, and a change of 10 dBA is perceived by the human ear as a doubling of sound.

The San Bernardino City General Plan Noise Element establishes goals and policies related to noise control. San Bernardino County has adopted the noise standards shown in Figure N-1 from the General Plan Noise Element. The most stringent noise standards are associated with residential land uses. The General Plan limits “normally acceptable” outdoor noise to 60 dBA CNEL and interior noise levels to 45 dBA CNEL. The General Plan allows exterior noise levels up to 70 dBA CNEL at residences where noise levels have been substantially mitigated using reasonable application of the best available noise reduction technology and interior noise levels do not exceed 45 dBA CNEL (i.e., conditionally acceptable). Noise levels over 70 dB are considered “normally unacceptable” and noise levels above 75 dB are considered “clearly unacceptable” (CSB 2005).

The California Department of Transportation provides guidance that can be used to define substantial changes in noise levels that may be caused by a project. The thresholds below generally apply to transportation noise that is usually expressed in terms of average noise exposure during a 24-hour period, such as the Day/Night Average Level ( $L_{dn}$ ) or CNEL. Project-generated increases in noise levels that exceed those outlined in the thresholds below and that affect existing noise sensitive land uses (receptors) are considered substantial and, therefore, would constitute a significant noise impact. For the purpose of this evaluation, noise impacts would be considered significant if the UHSP Project increased sound levels by 3 dBA and if: 1) the existing noise levels already exceeded 70 dBA CNEL at an existing residence, or 2) the Project increased noise levels from below 70 dBA CNEL to above 70 dBA CNEL. 70 dBA is based on the noise standard for residential development in the City of San Bernardino General Plan Noise Element.

In addition, the Caltrans Transportation- and Construction-Induced Vibration Guidance Manual provides thresholds of 0.5 PPV for construction and 1.0 PPV for construction.

## 6. Potential Impacts

The potential noise impacts of the UHSP Project will be compared to those thresholds (a-f) identified in Section 5, as well as the City Noise Element guidelines, to determine if these impacts are considered significant under CEQA.

*a) Would the project expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*

**Analysis:** The analysis in Section 4 concludes that offsite noise impacts from Project-related traffic would be less than significant (i.e., a maximum of 1.6 dB increase compared to a significance threshold of 3 dB). The analysis also indicates that noise levels onsite would increase substantially as the UHSP Project is developed. It is estimated that onsite noise would increase from 45.2 dB at present (vacant) to 63.1 dB CNEL (60 feet from centerline of Campus Parkway) once the project is built out and the extension of Campus Parkway through the project results in 6,140 ADT. While this represents a substantial increase in ambient noise levels, project residents are not expected to be exposed to noise levels in excess of City standards. Therefore, project noise impacts would be **less than significant**.

*b) Would the project expose persons to or generate excessive groundborne vibration or groundborne noise levels?*

**Analysis:** The soils underlying the project site are relatively deep alluvium with extensive cobbles and boulders. Some earthwork may cause vibration as rocky materials are encountered and removed. However, extensive earthwork is not proposed in areas with exposed bedrock which would require blasting or large ripping activities. Operation of the Project would produce vibration during truck deliveries. However, based on operation of similar projects, vibration is not expected to exceed the Caltrans thresholds of 0.5 peak particle velocity (PPV) during construction or 1.0 PPV during operations. Therefore, impacts from ground-borne vibration and ground-borne noise would be **less than significant**.

*c) Would the project produce a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?*

**Analysis:** Long-term occupancy of the project would result in a substantial temporary or periodic increase in ambient noise levels (i.e., from 45.2 to 63.1 dB at buildout). This represents a **potentially**

*significant impact.* However, implementation of the mitigation measures listed below would reduce impacts to *less than significant.*

d) Would the project produce a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

**Analysis:** As outlined in Section 4, grading and construction of the UHSP Project is not expected to generate significant noise impacts on surrounding uses due to its distance from existing uses. Long-term occupancy of the project would result in a substantial temporary or periodic increase in ambient noise levels within the project site (i.e., from 45.2 to 63.1 dB at buildout). This represents a *potentially significant impact.* However, implementation of the mitigation measures listed below would reduce impacts to *less than significant.*

e) *Is the project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport and would the project expose people residing or working in the project area to excessive noise levels?*

**Analysis:** The UHSP Project site is not located within an airport land use plan or within two miles of an airport, therefore, this impact is *less than significant.*

f) *Is the project located within the vicinity of a private airstrip and would it expose people residing or working in the project area to excessive noise levels?*

**Analysis:** The Project is located adjacent to a private airstrip (i.e., Andy Jackson Skypark). The developer has designed the northwest corner of the project to be compatible with the skypark. The passive park (Planning Area 1) would protect the approach/landing path for the airpark to minimize conflicts with that use. It should be noted that the airpark only allows hang-gliding, para-sailing, and other non-motorized methods of flight, so there would be no noise impacts from the airpark onto the UHSP Project site. Therefore, these impacts would be *less than significant.*

## 7. Mitigation Measures

The project would be required to comply with the noise limits (e.g., hours of operation) in the City Municipal Code (Noise Control, Section 8.54.050) of 8:00 a.m. to 8:00 p.m., Monday through Saturday. In addition, the following additional measures are proposed to assure that potential noise impacts of the UHSP Project would be reduced to less than significant levels:

### Construction (Short-Term) Noise

**Noise 1** At the time the grading permit application is submitted, the Project applicant shall submit a Construction Noise Mitigation Plan to the City for review and approval. The plan shall depict the location of construction equipment and describe how noise would be mitigated through methods such as, but not limited to, locating stationary noise-generating equipment (such as pumps and generators), as far as possible from nearby noise-sensitive receptors (i.e., homes south of Planning Areas 16-20). Where practicable, noise-generating equipment shall be shielded from nearby noise-sensitive receptors by noise-attenuating buffers such as structures or haul truck trailers. Onsite noise sources located less than 200 feet from noise-sensitive receptors shall be equipped with noise-reducing engine housings. Portable acoustic barriers able to attenuate at least 6 dB will be placed around noise-generating equipment located in the “East Village” portion of the project

site. Water tanks and equipment storage, staging, and warm-up areas will be located as far from noise-sensitive receptors as possible.

**Noise 2** All construction equipment shall utilize noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

### **Project Occupancy (Long-Term) Noise**

**Noise 3** Prior to approval of any subsequent tentative tract maps, the developer shall submit noise studies as appropriate for any residences abutting the main access road (i.e., extension of Campus Parkway) through the project to assure that exterior and interior noise levels meet City noise standards based on actual final floor elevations, actual roadway cross sections and elevations, onsite topography after grading, etc. Walls or other attenuating improvements shall be installed as needed based on the results of these studies to assure onsite residences meet the City's noise regulations.

### **8. Impact After Mitigation**

With implementation of the recommended mitigation measures, potential noise impacts of construction and occupancy of the UHSP Project would be reduced to less than significant levels.