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# **CANYON HILLS**

## **Lighting Analysis**

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### Introduction

The following discussion of lighting is derived from the Illuminating Engineering Society (IES) Handbook, 9<sup>th</sup> Edition.

**Glare** is the sensation produced by a bright source within the visual field that is sufficiently brighter than the level to which the eyes are adapted to cause annoyance, discomfort or loss in visual performance and visibility (*i.e.*, blinding light). Disability glare is caused by stray light scattered within the eye, which reduces the contrast of the retinal image. Streetlights, pedestrian lights, floodlights, and landscape lights as well as bright reflectors, can contribute to disability glare. Discomfort glare is caused by high contrast or a non-uniform distribution of luminance in the field of view. Discomfort glare can be reduced by decreasing the luminance of the light source, by increasing the background luminance around the source, or by adjusting the aiming angle of the source. Nuisance, or annoyance, glare occurs when light appears where it does not belong.

**Brightness** is what an individual sees or perceives largely as a result of the luminance of the source or surface. The luminance of a source or surface is the intensity of the source or surface in the direction of an observer.

**Illuminance** is the amount of light that falls onto a surface and is measured in footcandles (fc) in the United States.<sup>1</sup>

**Light Pollution.** Light pollution is defined as the artificial nighttime skylight generated by electric lighting. The illumination of the night sky is caused by exterior lighting systems and light emitting from buildings that is reflected off particles in the atmosphere generating a glowing effect in the nighttime sky. Sky glow is affected by several factors. For example, overcast or cloudy nights reflect more light from the environment than clear nights. The percentage of clear nights in the vicinity of the project site is low due to the ever-present pollution, haze, and "marine layer" in the Los Angeles area. The cycle of the moon also affects sky glow. The light from the moon shines on the particles in the environment and increases the already present sky glow. The fuller the moon, the more

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<sup>1</sup> A footcandle is a unit of measure of the intensity of light falling on a surface, equal to one lumen per square foot and originally defined with reference to a standardized candle burning at one foot from a given surface. Source: The American Heritage® Dictionary of the English Language, Fourth Edition Copyright © 2000 by Houghton Mifflin Company.

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it increases sky glow. Not only does the moon affect sky glow, it directly illuminates the project site.

**Light Trespass.** The topic of light trespass is somewhat subjective because it often relates to immeasurable and indefinable factors. Light trespass usually falls into one of two categories: unwanted light received in adjacent properties (high illuminance levels), and excessive brightness occurring in the normal field of vision (nuisance glare).

### ***PROPOSED PROJECT AND ENVIRONMENTAL SETTING***

The Canyon Hills project site consists of approximately 887 acres of undeveloped land located in the City of Los Angeles, near the Sunland and Tujunga communities. The project site is bordered on the north and east by an existing residential community and open space, bordered on the south by La Tuna Canyon Road, and bordered on the west primarily by open space. Interstate 210 (Foothill Freeway) bisects the project site in an east-west direction. Approximately 194 acres of the project site will be developed and approximately 693 acres will remain undeveloped and preserved as open space. The portion of the project site that will be developed is broken into two areas. "Development Area A" is located north of Interstate 210 and includes approximately 176.8 acres of land. "Development Area B" is located south of Interstate 210 and includes approximately 65 acres of land. There are also several homes located west of the project site on both sides of La Tuna Canyon Road. The site plan for the proposed project is shown on Exhibit 1.

### ***EXISTING LIGHTING AND NIGHTTIME VIEWS***

Currently, there are no sources of lighting on the project site. The project site does have a low level of nighttime presence due to the surrounding "sky glow" or "light pollution". The sources of the sky glow that illuminate the project site include existing lighting from the Sunland and Tujunga communities, the San Fernando Valley and City of Los Angeles. It should be noted, however, that while the roadway and residential lighting in these communities contribute to the sky-glow condition, they do not contribute direct lighting onto either Development Area. From the project site, sky glow is seen in all directions. Though sky glow is more dominant on overcast nights, it is observable even on the clearest of nights with a new moon.

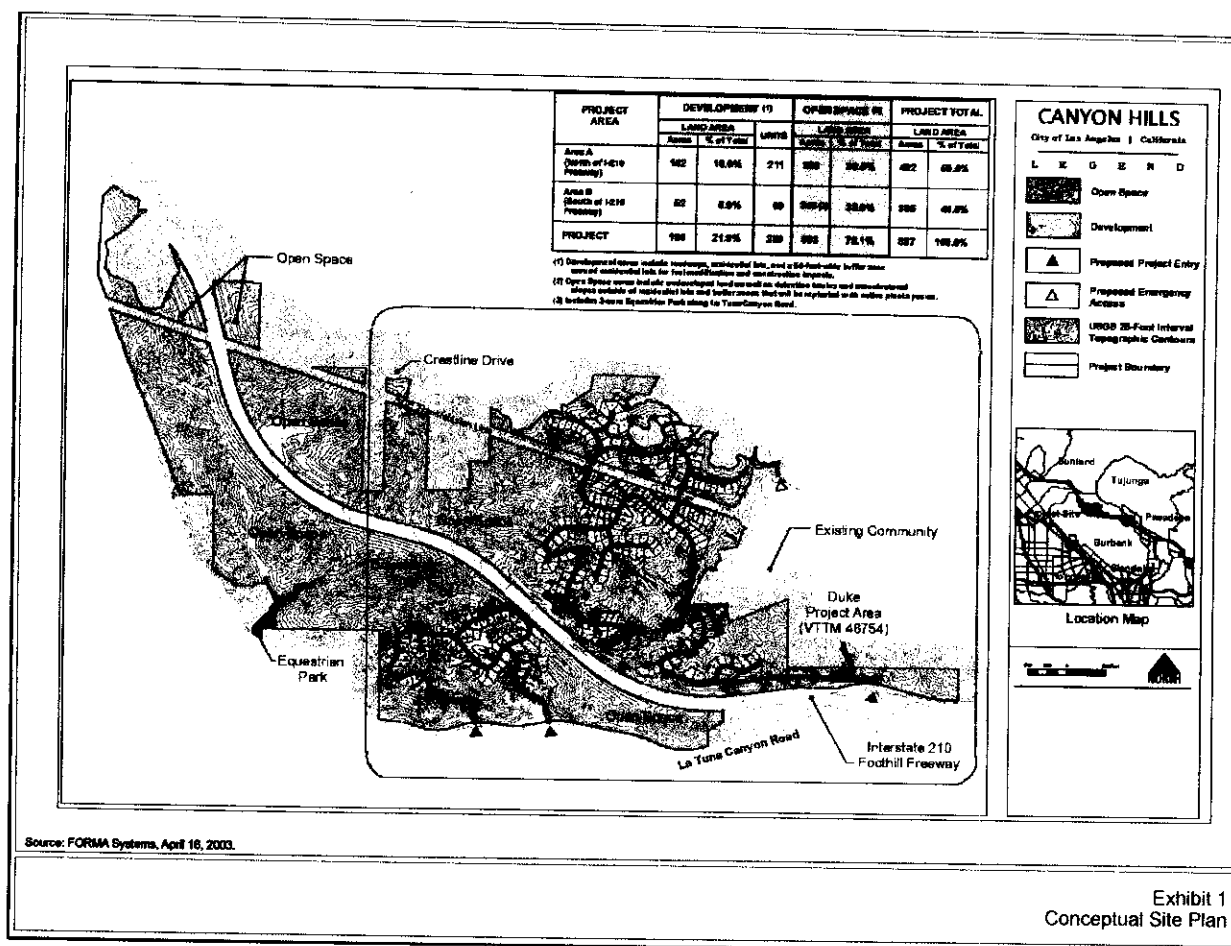
The project site is affected by other existing sources of lighting, primarily along the project site perimeter. The Interstate 210 lighting at the La Tuna Canyon Road on- and off-ramps contributes some direct illumination onto the freeway frontage portion of Development Area A. Headlights from the vehicles on Interstate 210 also illuminate adjacent edges of the

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Development Areas, while headlights along La Tuna Canyon Road contribute lighting to the edges of Development Area B.

The project site and, in particular, the proposed Development Areas, can be viewed at night from three primary locations, which include the existing residential community located north and east of Development Area A, Interstate 210 and La Tuna Canyon Road.<sup>3</sup> The existing lighting at those locations, as well as the existing nighttime views of the Development Areas from those locations, are discussed below.

## EXHIBIT 1 – Site Place



<sup>3</sup> While the project site is also visible from hiking trails in the Verdugo Mountains to the south of La Tuna Canyon Road, it is unlikely that material numbers of the public hike those hillsides at night.

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### Interstate 210 Westbound

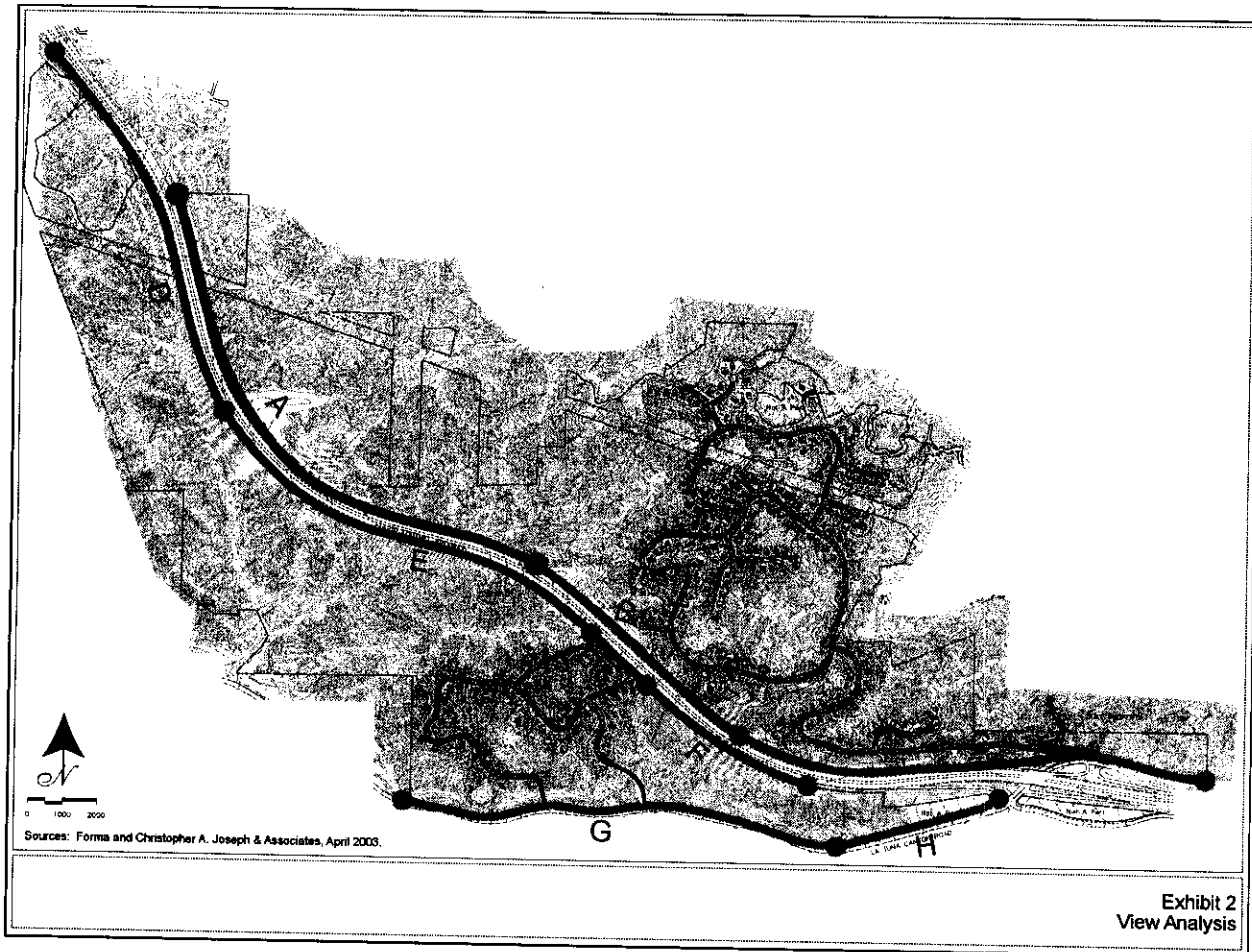
The only street lights associated with Interstate 210 in the vicinity of the project site are located at the La Tuna Canyon Road interchange. The poles are 30 feet tall and are spaced approximately 80 feet on center; the fixtures consist of 400-watt high pressure sodium lamps. The levels of lighting at this interchange range from 0.1 footcandle (fc) to 2.5 fc. Each fixture provides 2.49 fc directly under the fixture head, and 2.18 fc at the base of the pole. Lighting levels decrease with distance from the lighting fixture. For example, in the third travel lane from the shoulder, lighting levels are typically 1.49 fc. A minimum level of lighting of approximately 0.1 fc is maintained between lighting fixtures. The lighting fixtures continue for approximately one-quarter mile west of the interchange. When that sequence of fixtures ends for vehicles traveling westbound on Interstate 210, the illumination of the freeway decreases considerably, but some lighting remains. The combination of sky-glow conditions and vehicle lights contribute a constant low level of illumination.

The project site has approximately 2.7 miles of frontage on the north side of Interstate 210. At 65 mph, it takes a westbound vehicle approximately two minutes thirty seconds to traverse the length of that northern subarea. As previously described, proposed development of Development Area A on the north side of Interstate 210 will only occupy the eastern portion of the project site (approximately 1.4 miles of freeway frontage). Traveling at 65 mph, it takes approximately 77 seconds to traverse the Development Area A freeway frontage. However, currently, little of Development Area A is discernible at night due to the lack of on-site lighting. On the darkest of nights, Development Area A and the adjacent hillsides appear little more than dark silhouettes against a slightly lighter sky line. On such nights, even major topographic features are difficult to make out. During a full moon, the major topographic features of Development Area A can be visible, although the prevailing darkness continues to mask the details of the terrain. Exhibit 2 indicates those portions of the freeway frontage from which the project site can be viewed. Sections B and C on Exhibit 2 indicate the portion of the freeway from which Development Area A can be viewed from westbound traffic.

Currently, the major indication that the nighttime traveler is passing Development Area A is the view of lights emanating from some of the existing homes along Tranquil Drive, Reverie Drive, Inspiration Way, Glen O Peace and Verdugo Crestline Drive that can be seen beyond Development Area A. Lighting from these existing residential areas can be seen along a 3,000-foot stretch of Interstate 210 (Section B, Exhibit 2). Traveling at 65 mph, this existing hillside lighting is visible from to westbound vehicles for approximately 32 seconds.

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### EXHIBIT 2 – View Analysis



Most of Development Area B (approximately 80 percent) is at an elevation below the adjacent freeway grade, and therefore is not visible to travelers on the freeway either during the night or day. However, the highest elevations of Development Area B rise above the freeway grade and the eastern portion of the Development Area B Prominent Ridgeline (designated in the Draft San Gabriel/Verdugo Mountains Scenic Preservation Specific Plan) is visible for a distance of approximately 2,400 feet to westbound travelers (Exhibit 2, Section F). At 65 mph, the Development Area B Prominent Ridgeline is visible for approximately 25 seconds. During this viewing period, lights from the San Fernando Valley can also be seen in the distance, including grids of street lighting, residential lighting and corresponding sky glow. Currently, there is no lighting in Development Area B. Other than the slight illumination from sky glow, moon, and spillover lighting from vehicle headlights on the freeway, little of the Development Area B is discernible at night. On the darkest of nights, Development Area B appears little more than a dark silhouette against the slightly lighter skyline. During a full moon, the major topographic

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features of the Development Area B Prominent Ridgeline are visible, although the darkness continues to mask the details of the terrain.

Several other factors should be mentioned with respect to existing nighttime views of the project site and surrounding area from Interstate 210. First, the views of vehicle occupants are generally limited by the vehicle structure itself, which normally includes limited window space through which to view the surrounding environment. Second, the driver of the vehicle is presumably focusing his attention on navigation and surrounding traffic, rather than surrounding nighttime views. Third, the existing project site is perceived as darker than it truly is because the eye is adapting from a high nighttime freeway illumination to a much lower illumination level on the project site, and then back again for the freeway. These factors apply with equal force to vehicular travel on eastbound Interstate 210 and La Tuna Canyon Road, which are discussed below.

### Interstate 210 Eastbound

For eastbound travelers on Interstate 210, the nighttime environment changes dramatically as the freeway transitions from the flat lands of Sunland into the Verdugo Mountains. Whereas a suburban level of illumination is prevalent along the freeway as it traverses Sunland, the Verdugo Mountains are dark and there is no freeway illumination other than vehicle lights. As a result, eastbound nighttime views into the northern portion of the project site tend to be of vague impressions of western and southern facing hillsides and silhouetted ridgelines. Due to line-of-sight constraints and intervening ridges, there are no views of Development Area A from eastbound traffic along the westerly 1.3 miles of the project site's freeway frontage (see Exhibit 2, Section A). When Development Area A comes into view, it is to the driver's left and is not the main focus of attention because the freeway is running parallel to Development Area A during the viewing period. Views into the central portion of Development Area A are available from a stretch of freeway of about 3,000 feet (see Section B, Exhibit 2). While views of Development Area A consist largely of dark hillsides, lights from existing residences along Tranquil Drive, Reverie Drive, Inspiration Way, Glen O Peace and Verdugo Crestline Drive are currently visible in the hills behind Development Area A. For vehicles traveling at 65 mph, views of Development Area A's darker central portion lasts about 32 seconds. Along the easterly 0.9 mile of the project site's freeway frontage, views are again of darkened hillsides and freeway slopes (see Exhibit 2, Section C).

Much of the southern portion of the project site is below the freeway grade and is not visible from eastbound vehicles. Hillside slopes in the western portion of the project site rise above the freeway grade and are seen as formless masses on the darkest of nights. On nights with bright moonlight, the hillsides take shape but details of the topography remain difficult to perceive. Development Area B is located on the south and east sides of the Prominent Ridgeline that rises above the freeway grade in the south central portion of the project site. Eastbound

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vehicles travel approximately 0.8 miles of project site freeway frontage before the Development Area B Prominent Ridgeline comes into view (see Exhibit 2, Section D). The Prominent Ridgeline then remains in view for a distance of approximately 0.9 mile (see Exhibit 2, Section E). The actual view of Development Area B last only about 4-5 seconds.

### La Tuna Canyon Road

La Tuna Canyon Road is the southerly boundary of the project site and borders Development Area B for approximately one mile. Along this segment of the road, the number of lanes increases from two lanes to four lanes in an easterly direction. The maximum speed limit is 50 MPH. La Tuna Canyon Road is used to access Interstate 210 and as a thoroughfare to and from Burbank. There are no existing homes on the segment of La Tuna Canyon Road adjacent to Development Area B.

The existing lighting conditions with respect to La Tuna Canyon Road are somewhat different from Interstate 210. While both are illuminated by sky glow, there are currently no streetlights along the portion of La Tuna Canyon Road adjacent to the project site's southern boundary, including Development Area B. In addition, there is substantially less traffic on La Tuna Canyon Road, and therefore fewer vehicle lights. The existing homes along La Tuna Canyon Road west of Development Area B have exterior lighting, but that lighting does not significantly affect the existing low-level illumination. The exterior lighting at these residences consists of exterior-mounted fixtures on homes and driveway gates, and limited landscape lighting. Approximately 50 percent of these existing residential fixtures are not well shielded and can be seen from a distance along La Tuna Canyon Road. However, these fixtures do not contribute direct lighting onto Development Area B.

La Tuna Canyon Road sits below Interstate 210. Past Development Area B, Tuna Canyon Road gradually descends toward the San Fernando Valley (to the west). Interstate 210 is not visible from La Tuna Canyon Road at night. However, the presence of the freeway can be inferred from La Tuna Canyon Road by the visibility of running lights on the tops of tall trucks driving in the outside eastbound lane. These truck running lights are visible on the east side of Development Area B for a distance of approximately 1,000 feet. However, the headlights and taillights from cars and smaller trucks cannot be seen from La Tuna Canyon Road (see Photograph 1). Because of the absence of street lights and residences, La Tuna Canyon Road currently experiences a level of darkness at night that is more consistent with a rural environment.

For westbound vehicles on La Tuna Canyon Road, nighttime views toward Development Area B first occur approximately 2,000 feet westerly of the Interstate 210 underpass. Intermittent views of the Development Area B – partially blocked by stands of dense vegetation – occur for the next 0.8 miles (see Exhibit 2, Section G). There is no existing illumination on or adjacent to



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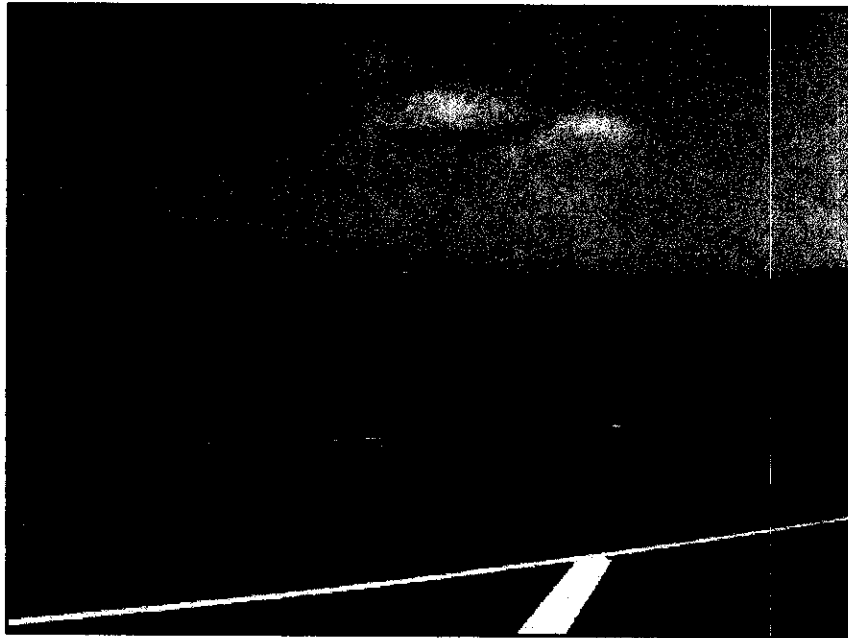
Development Area B. On moonless nights Development Area B is very dark and difficult to see. The development area is more visible in bright moonlight, but due to patches of dense intervening vegetation along La Tuna Canyon Road, full nighttime views of Development Area B remain partially obscured. For westbound traffic traveling at 50 mph on La Tuna Canyon Road, Development Area B is more or less visible for a period of approximately 58 seconds. For eastbound traffic on La Tuna Canyon Road, the higher elevations of Development Area B first become perceptible in the vicinity on the project's proposed equestrian park (see Photograph 2). Portions of Development Area B remain visible, particularly on nights of bright moonlight, for a distance of approximately 1.0 mile, or 72 seconds at 50 mph (see Exhibit 2, Section G).

For the most part, Development Area A is not visible from La Tuna Canyon Road. Due to topographic restrictions in the lines-of-sight, only the highest elevations of the prominent east-west trending ridge on the northern portion of the project site can be seen from La Tuna Canyon Road during the daytime (see Photograph 1). At night, this ridgeline is imperceptible. However, as a vehicle on La Tuna Canyon Road approaches Interstate 210 underpass (see Exhibit 2, Section H), the dark silhouette of the northern portion of the project site becomes increasingly visible.

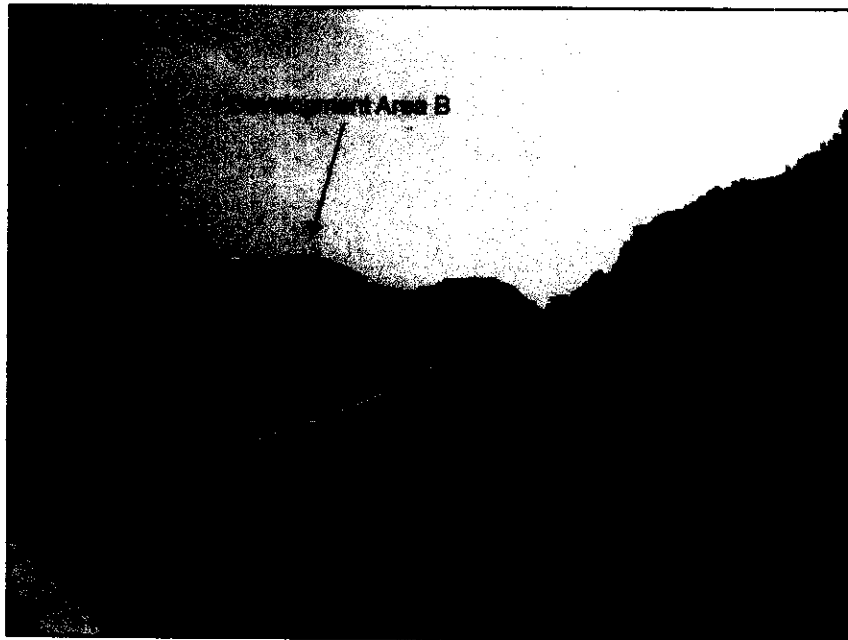
### Existing Residential Community on La Tuna Canyon Road

There are a handful of residences located along La Tuna Canyon Road to the west of the project site. Due to line-of-sight constraints, none of these residences have views of Development Area A. Furthermore, due to intervening topography and dense vegetation, it is unlikely that any of these residences have substantial views of the Development Area B.

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**Photo 1: View looking north toward Interstate 210 from La Tuna Canyon Road.**



**Photo 2: View looking northeast along La Tuna Canyon Road toward Development Area B.**

Photographs 1 and 2

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### Existing Residential Community to the North and Northeast of Development Area A

The existing residential area located north and northeast of Development Area A includes numerous residential streets, although nighttime views of the project site are largely restricted to Tranquil Drive, Reverie Drive, Inspiration Way, Glen O Peace Parkway, and Verdugo Crestline Drive. Along these residential streets, street lighting is almost entirely absent. A few randomly spaced streetlights occur on other nearby residential streets, such as Hillhaven Avenue. There are additional sources of lighting in the existing residential area, including glowing windows, and landscape and driveway lighting. Where driveway lighting fixtures exist, they are usually house-mounted and aimed toward the driveway and street, creating minor glare for drivers. In general, there is a low level of night lighting in the adjacent residential area that creates a semi-rural nighttime ambiance.

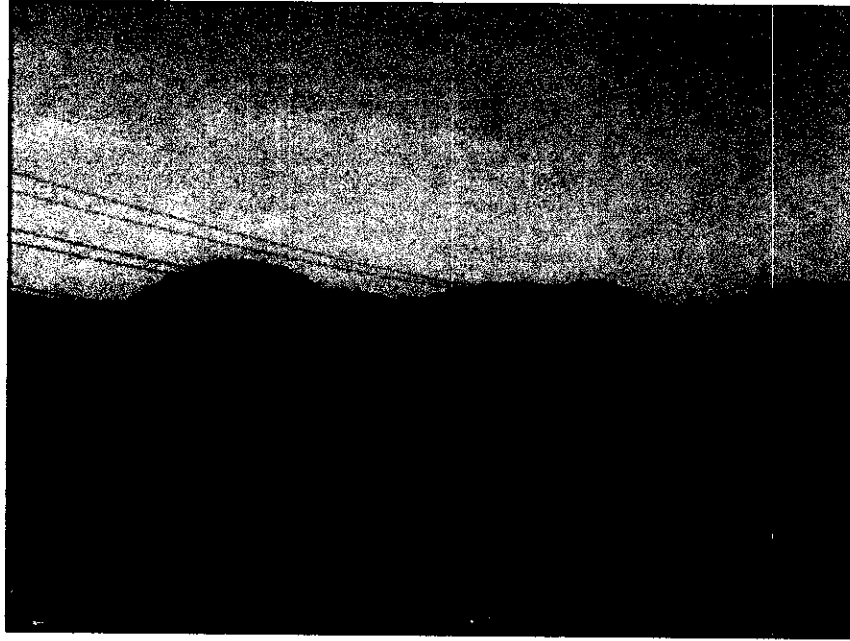
Residents who live on Tranquil and Reverie Drives have an unrestricted field of vision into Development Area A that extends in an arc from northwest to southeast. Residents along Inspiration Way and Glen O Peace Parkway generally have views of Development Area A that extend from the northwest to the south, while residents along Verdugo Crestline Drive look down into Development Area A in a field of vision that extends from the west to the south. It is estimated that there are roughly 50± residences along these roadways that have views of Development Area A.<sup>4</sup> Currently these nighttime views consist of dark hillsides. Photographs 3 and 4, which provide typical daytime views of Development Area A, suggest the extent to which the darkened hillside may be seen from these residential areas. As can be seen from these sample views, the terrain is complex and not all portions of Development Area A can be seen from any one vantage point, even in the daytime. Development Area B is not visible from this existing residential area due to intervening terrain and line-of-sight constraints.

In addition to the dark hillsides of the project site, some existing residences to the north and northeast also have limited nighttime views of Interstate 210, which is an additional source of background illumination. The extent to which the freeway is visible from the existing adjacent residential area is indicated in Photographs 5 and 6, which provide typical daytime views of the freeway from the vicinity of Tranquil/Reverie Drives and Inspiration Way, respectively. It should be noted that the Verdugo Mountains on the south side of Interstate 210 effectively block all views from this existing residential area into Burbank.

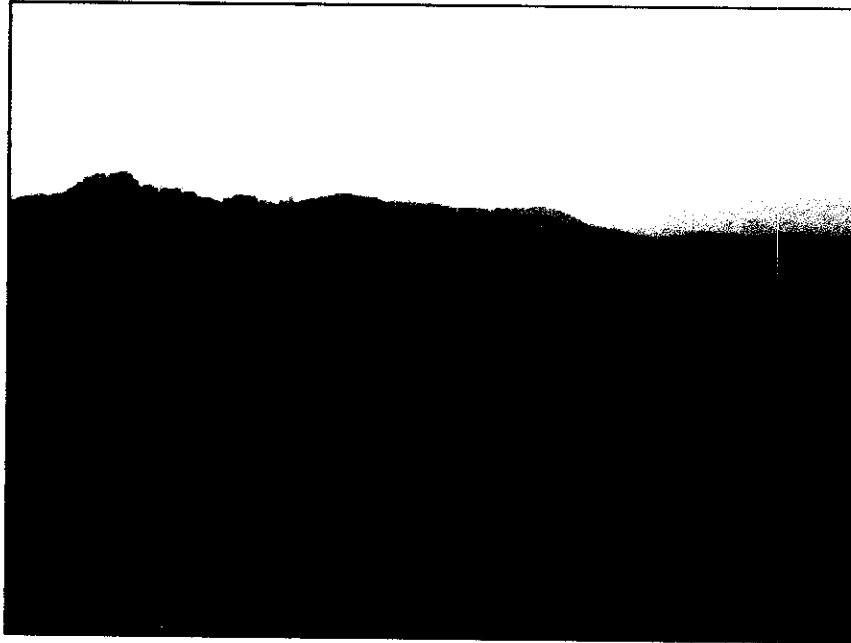
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<sup>4</sup> *Residents who live north of Verdugo Crestline Drive and easterly of Tranquil Drive, Reverie Drive, Glen O Peace Parkway, and Inspiration Way do not have nighttime views of the project site due to a combination of intervening terrain, structures and vegetation.*

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**Photo 3: Typical southwesterly view of Development Area A from Inspiration Way.**



**Photo 4: Typical easterly view of Development Area A with existing adjacent residential area visible in the background viewed from Verdugo Crestline Drive.**

Photographs 3 and 4

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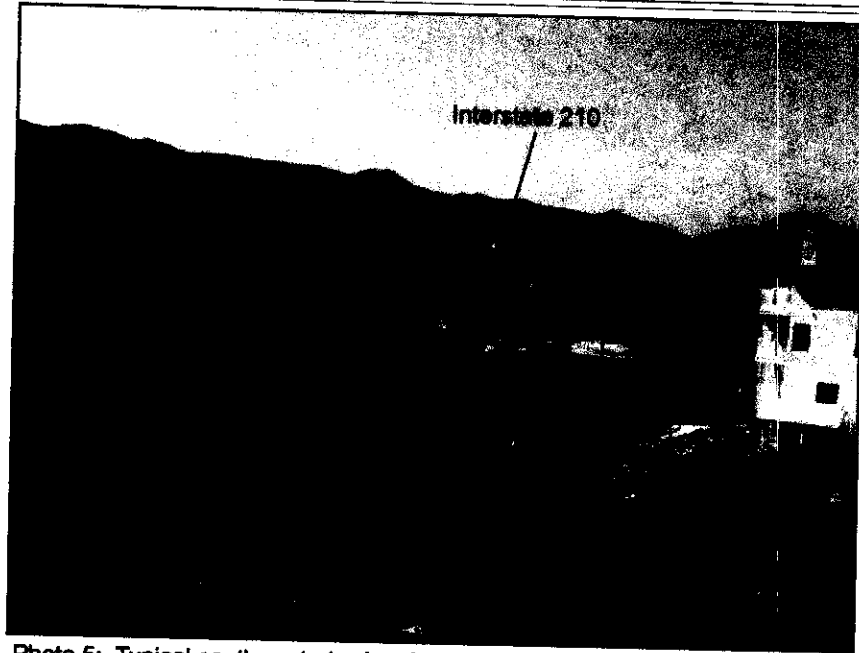


Photo 5: Typical southwesterly view from Tranquil Drive toward Interstate 210.

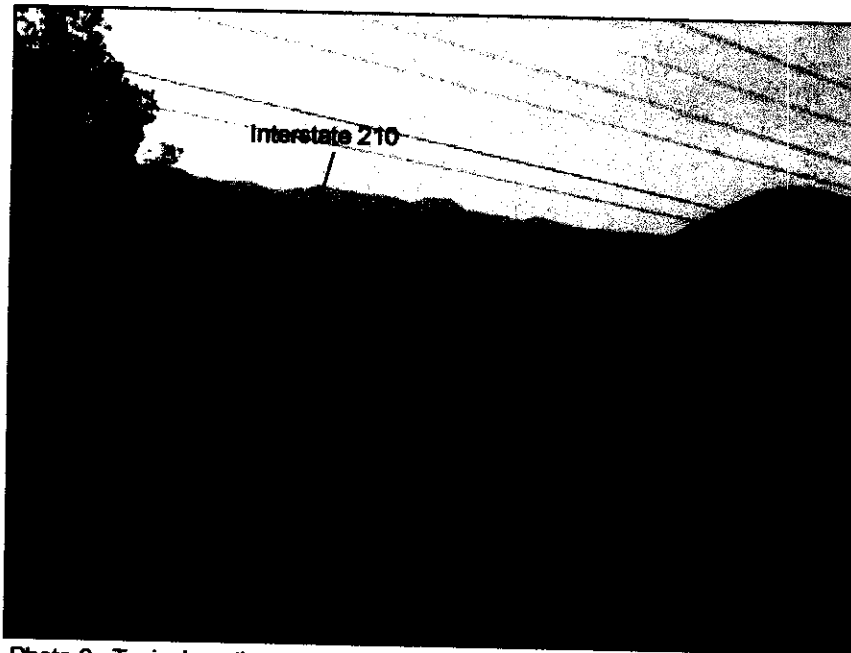


Photo 6: Typical southwesterly view from Inspiration Way toward Interstate 210.

Photographs 5 and 6

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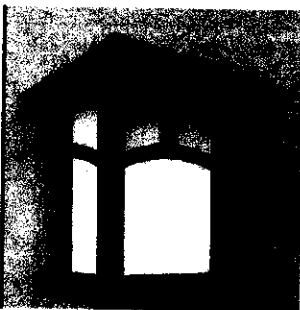
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It is reemphasized that, while portions of the dark hillsides of Development Area A are visible from the adjacent residences along Tranquil Drive, Reverie Drive, Inspiration Way, Glen O Peace Parkway, and Verdugo Crestline Drive, the existing residential area is not as dark as the project site. Glowing windows, and landscape and driveway lighting all contribute to a low level of ambient lighting throughout the adjacent residential area.

### ***PROPOSED LIGHTING FOR PROJECT SITE***

As discussed above, Development Areas A and B are not pristine dark environments, but the low levels of existing lighting will be increased with the proposed development of the project site. The proposed project will be designed to minimize lighting impacts on the nighttime environment.

The two primary sources of lighting associated with the development of the proposed project will be (1) the interior and exterior lighting of the proposed homes and (2) roadway lighting. To the extent feasible, the 280 lots have been configured to use the natural topography to baffle and limit views into both Development Areas. This is the most effective approach for minimizing nighttime presence of the development. The homes that are visible from offsite locations will be perceived primarily by the interior glow visible through windows. This window lighting will be set against the relatively dark exteriors of the homes and the relatively dark hillsides between the homes. The brightness from these glowing windows will be visible from offsite locations, but will not create glare. Exterior residential lighting could also be visible from offsite locations. However, the use of exterior lighting will be limited by the CC&Rs for the project. Specifically, the CC&Rs will prohibit the use of all exterior uplighting fixtures for building facades and trees, limit the amount of landscape lighting per foot, require a downlight component for all exterior-building mounted fixtures, and prohibit "glowing" fixtures that would be visible from existing communities or public roads. A glowing fixture is a lantern style fixture, or any fixture that allows light through its vertical components (see Exhibit 3).



***An example of a "glowing" fixture that would not be acceptable.***

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**An example of a "non-glowing" fixture. The face of the fixtures does not have presence in the nighttime environment.**

### Exhibit 3. Typical Glowing Fixture

The CC&Rs will also specify that night lighting on private property located on any lot located within 100 feet of the Interstate 210 rights-of-way, as shown on the vesting tentative tract map, shall be permitted, provided it is low-height, low illumination safety lighting of a color similar to incandescent light which is shielded and directed onto the property. Additionally, the CC&Rs will specify that all roofs visible from Interstate 210 and/or La Tuna Canyon Road should be surfaced with non-reflective materials.

The other primary source of illumination with regard to the proposed project is street lighting. The City of Los Angeles' Bureau of Street Lighting follows the Recommended Practice for Roadway Lighting (RP-8) established by the Illuminating Engineering Society of North America (IESNA). The IESNA is the governing body that establishes "Standards of Practice" illuminance levels within the United States. Illuminance is the amount of light that falls onto a surface and is measured in footcandles (fc) in the United States.

The normal code-light levels for different kinds of residential projects are set forth in Table 1, below. Table 1 is an excerpt from the IESNA Roadway Lighting guidelines that outline horizontal illumination requirements for different roadway types and conditions.<sup>5</sup> The Roadway Lighting guidelines also defines the various terms used in Table 1, including the following:

*Local – Local streets are used primarily for direct access to residential, commercial, industrial, or other abutting property. They make up a large percentage of the total street system but carry a small proportion of the vehicular traffic.*

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<sup>5</sup> Source: Illuminating Engineering Society of North America, American National Standard Practice for Roadway Lighting, June 2000.

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*Low* – Areas with very low volumes of night pedestrian usage. These can occur in any of the cited roadway classifications but may be typified by suburban single family streets, very low density residential development, and rural or semi-rural areas.

*R4* – Asphalt road surface with very smooth texture.

Table 2: Illuminance Method - Recommended Values

Road and Pedestrian Conflict Area		Pavement Classification (Minimum Maintained Average Values)			Uniformity Ratio $E_{avg}/E_{min}$	Veiling Luminance Ratio $L_{vmax}/L_{avg}$
Road	Pedestrian Conflict Area	R1 lux/ftc	R2 & R3 lux/ftc	R4 lux/ftc		
Freeway Class A		6.0/0.6	9.0/0.9	8.0/0.8	3.0	0.3
Freeway Class B		4.0/0.4	6.0/0.6	5.0/0.5	3.0	0.3
Expressway	High	10.0/1.0	14.0/1.4	13.0/1.3	3.0	0.3
	Medium	8.0/0.8	12.0/1.2	10.0/1.0	3.0	0.3
	Low	6.0/0.6	9.0/0.9	8.0/0.8	3.0	0.3
Major	High	12.0/1.2	17.0/1.7	15.0/1.5	3.0	0.3
	Medium	9.0/0.9	13.0/1.3	11.0/1.1	3.0	0.3
	Low	6.0/0.6	9.0/0.9	8.0/0.8	3.0	0.3
Collector	High	8.0/0.8	12.0/1.2	10.0/1.0	4.0	0.4
	Medium	6.0/0.6	9.0/0.9	8.0/0.8	4.0	0.4
	Low	4.0/0.4	6.0/0.6	5.0/0.5	4.0	0.4
Local	High	6.0/0.6	9.0/0.9	8.0/0.8	6.0	0.4
	Medium	5.0/0.5	7.0/0.7	6.0/0.6	6.0	0.4
	Low	3.0/0.3	4.0/0.4	4.0/0.4	6.0	0.4

TABLE 1: Horizontal Illuminance Level Requirements, IESNA Recommended Practice for Roadway Lighting (RP-8), dated June 27, 2000.

Based on the definitions set forth above, the proposed roads on the project site qualify as "Local" roads in a "Low" Pedestrian Conflict Area. The Pavement Classification is "R4" because the project roads will be covered with a smooth asphalt surface. Therefore, based on Table 1, the recommended illuminance value for the project roads would be 0.4fc, which is the minimum maintained average value. "Maintained average illuminance" means the density of illuminance in an area calculated on a horizontal plane; it is the average flux density over the surface area. The IES requirements are met by exceeding this minimum value.



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The standards set forth above apply with respect to public roads. However, the proposed roads on the project site will not be public roads owned by the City, but instead will be private roads owned by the homeowners' association that will be established to maintain the common areas in the development. According to the City of Los Angeles Bureau of Street Lighting – Private Development Division, there are no City codes or standards governing light levels on private streets. This provides the project applicant with the opportunity to design a street light system with a substantially lower level of illumination that minimizes the lighting impacts on the existing residential areas and vehicle occupants on Interstate 210 and La Tuna Canyon Road, but provides sufficient illumination for pedestrian and vehicle safety and emergency vehicle response. According to the Los Angeles Fire Department – New Construction Division, the Fire Department also has no codes or standards governing street lighting. The Fire Department utilized vehicles equipped with floodlights that provide the necessary illumination in areas of low or no lighting.<sup>6</sup>

For the Canyon Hills project, the minimum maintained average illuminance level will be reduced from 0.4fc to 0.2fc by reducing the wattage of the street lighting fixtures, while maintaining the IES recommended uniformity ratio of 6:1 minimum to average fc (see Uniformity Ratio column presented in Table 1). Uniformity is important because it allows the eye to maintain a consistent level of adaptation. If the eye is continually working at adapting to high and low light levels as it moves through a space (i.e., driving down a street), this can cause eye fatigue and, potentially, decreased visibility during the time that it takes the eye to readapt to the new light level (it takes longer for the eye to adapt to a decrease in light levels than an increase in light levels). In general, the eye can see well under a low illumination level with a high uniformity that allows it to maintain a constant level of adaptation.

As discussed below, metal halide lamps are recommended for the street lighting luminaries. Metal halide lamps are available with high CRIs (Color Rendering Index) in the range of 82-89. This means that the identification of potential hazards (people, cars, animals, buildings) is much easier, which speeds up the reaction time to potential obstacles and hazards faster. Both uniformity and color are also important to pedestrians in order to maintain a level of personal security.

In addition, the proposed lighting system will be designed to reduce further the light and glare visible from the existing residential area adjacent to Development Area A, Interstate 210 and La Tuna Canyon Road. The lighting fixtures will use full cut-off street lighting luminaries with metal halide lamps. Full-cut luminaries are fully shielded, which means that they are designed to emit no light above the 90° (i.e., horizontal) plane of the fixture, which prevents any direct-beam illumination into the nighttime sky. With the use of fully-shielded fixtures, the only

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<sup>6</sup> *Personal communication between Lisa Fischer, Patrick B. Quigley & Associates and the Los Angeles Fire Department – New Construction Division, April, 23, 2003.*

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potential contribution to the sky-glow condition would be the reflection of street lights off the roads themselves. However, the contribution to sky-glow conditions will be limited because the roadways will be covered with asphalt and low wattage street lighting fixtures will be used, as discussed above.

Finally, the configuration of the proposed homes will also limit the street lighting visible from offsite locations. Where project roads are double-loaded with homes, the homes themselves could block the view of the street lighting from offsite locations. Where the project roads are single-loaded or no homes are proposed, fixtures will be used primarily at intersections and bends in the road. In such cases, vegetation could be used to shield the fixtures from offsite views.

### ***THRESHOLD of SIGNIFICANCE***

According to Appendix G of the CEQA Guidelines, the proposed project would have a significant impact if it created a new source of substantial light or glare which would adversely affect nighttime views in the project area.

### ***LIGHTING IMPACTS***

This section of the report addresses the proposed project's potential lighting impacts on the three primary public areas from which portions of the Development Areas will be visible at night. For purposes of this analysis, it is assumed that (1) the street lighting system is consistent with the standards described above and (2) the CC&Rs for the project will include the restrictions on exterior residential lighting discussed above.

#### **Interstate 210 Westbound**

At night, light from Development Area A will be visible from westbound vehicles traveling at approximately 65 mph on Interstate 210 for a period of approximately 77 seconds. Night lighting will be visible from a variety of sources, including streetlights, window glow from residences, landscape and driveway illumination. Additionally, existing lighting from the adjacent residential areas to the north and northeast of Development Area will continue to be visible. Non-illuminated landscaping and open spaces within the development area will remain obscured by the darkness. This is particularly so on moonless nights, but even during the full moon the details of Development Area A will not be readily perceptible.

As discussed above, because Development Area A consists of complex topography, views into the development area from moving vehicles are constantly evolving, with new views coming into sight while older views move out of sight. Initial views of Development Area A lighting will consist of the street lighting on the proposed access road that runs parallel to Interstate 210 for

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a distance of approximately 3,300 feet. Headlights from occasional vehicles on the access road may also be visible. Due to an intervening ridgeline, views into the central portion of Development Area A do not occur until westbound vehicles enter the area designated as Section B on Exhibit 2. As vehicles enter into Section B, a greater variety of lighting from residences as well as street lighting will become visible. The homes that are visible will be perceived primarily by the interior glow visible through windows. This window lighting will be set against the relatively dark exteriors of the homes and the relatively dark hillsides between the homes. While the brightness from these light sources will be visible, they will not create glare conditions. As discussed above, the nighttime view into the central portion of Development Area A (i.e., Exhibit 2, Section B) lasts approximately 32 seconds for vehicles traveling 65 mph on Interstate 210. Exhibit 4 indicates the extent of views into Development Area A from one point within Section B.

The visible portion of Development Area A will be partially illuminated due to the baseline sky-glow condition, so that the ridgelines will be visible against the sky. In addition, roadway lighting and window lighting will be visible. The project lighting in Development Area A will not make any measurable contribution to the already-present sky glow. The infrequent and sporadic car headlights on the visible portions of the Development Area A roads will have virtually no impact on views from Interstate 210. The view of Development Area A by vehicle occupants is further limited by the vehicle's roof and other vehicle components, oncoming headlights from vehicles traveling eastbound and the taillights of vehicles traveling westbound. While lighting from Development Area A will be visible, based on the ameliorating effects of the existing sky glow, the distance of the freeway from the visible homes, the relatively short-duration that Development Area A will be visible, the low-level of proposed street lighting, and the proposed CC&R restrictions on exterior lighting, it is not expected that Development Area A will create a substantial new source of light or glare that would adversely affect nighttime views from Interstate 210. Therefore, the night lighting impacts from Development Area A to occupants of westbound vehicles on Interstate 210 are anticipated to be less than significant.

With respect to Development Area B, traveling westbound at night on Interstate 210 at approximately 65 MPH, the freeway gradually rises for approximately one mile to the east of the project site and Development Area B first becomes visible approximately one-half mile east of the La Tuna Canyon Road interchange. At that point, the eastern portion of Development Area B slowly rises into view. However, only approximately 25-30 percent of the Development Area B houses will be visible at maximum exposure, while the other approximately 70-75% will be blocked from view by intervening topography. As discussed above, this limited view of Development Area B will last for approximately 25 seconds for vehicle occupants. During this viewing period, the lights from the San Fernando Valley also become visible. The ridgelines in Development Area B are also prominent due to the baseline sky-glow condition. The project lighting in Development Area B will not make any measurable contribution to the already-present sky glow. The infrequent and sporadic car headlights on the visible portions of

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Development Area B roads will have virtually no impact on views from Interstate 210. In this short time frame, window glare and street lighting will be the most distinctive sources of lighting and will appear to be of comparable brightness. As a result of the existing sky glow, the low-level street lighting and distance of the freeway from the visible homes window glow will create brightness, but not glare. In other words, light from Development Area B is not expected to be bright enough to cause annoyance, discomfort or loss in visual performance and visibility. Based on all of the limiting factors described in the preceding paragraph, as well as the existing lighting from the San Fernando Valley, Development Area B is not expected to create a substantial new source of light or glare that would adversely affect nighttime views from Interstate 210. Therefore, the night lighting impacts from Development Area B to occupants of westbound vehicles on Interstate 210 are anticipated to be less than significant.

### Interstate 210 Eastbound

For the occupants of eastbound vehicles on Interstate 210, the northwestern portion of the project site (approximately 1.3 miles of the project site's freeway frontage) will remain undeveloped and dark following project development. For vehicles traveling at 65 mph, nighttime views into the central portion of Development Area A will last for approximately 32 seconds. During this interval Development Area A will be partially illuminated due to the baseline sky-glow condition, so that the ridgelines will be visible against the sky. New night lighting will be visible from a variety of sources including streetlights, window glow from residences, landscape and driveway illumination. Additionally, existing lighting from the adjacent residential areas to the north and northeast of Development Area will continue to be visible. Non-illuminated landscaping and open spaces within the development area will remain obscured by the darkness. This is particularly so on moonless nights, but even during the full moon the details of Development Area A will not be readily perceptible. The homes that will be visible will be perceived primarily by the interior glow visible through windows. This window lighting will be set against the relatively dark exteriors of the homes and the relatively dark hillsides between the homes. The project lighting in Development Area A will not make any measurable contribution to the already-present sky glow. The infrequent and sporadic car headlights on the visible portions of the Development Area A roads will have virtually no impact on views from Interstate 210. As previously noted, due to an intervening ridgeline, the house and street lighting within the central portion of Development Area A will not be visible along the easterly 0.9 mile of the project site's freeway frontage. In this area, views of project lighting (lasting approximately 50 seconds) will be restricted to streetlights along the proposed access road and occasional vehicle headlights (see Exhibit 2, Section C).

While lighting from Development Area A will be visible, based on the ameliorating factors discussed in the preceding section, it is not expected that Development Area A would will create a substantial new source of light or glare that will adversely affect nighttime views from

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Interstate 210. Therefore, the night lighting impacts from Development Area A on occupants of eastbound vehicles on Interstate 210 are anticipated to be less than significant.

Much of the southern portion of the project site is below the freeway grade and will not be visible from eastbound vehicles. Hillside slopes in the southwestern portion of the project site will remain undeveloped and dark following project construction. As previously discussed, Development Area B is located on the Prominent Ridgeline that partially rises above the freeway grade in the south-central portion of the project site. Eastbound vehicles travel approximately 0.8 miles of project site freeway frontage before the Prominent Ridgeline comes into view (see Exhibit 2, Section D). The Prominent Ridgeline then remains in view for a distance of approximately 0.9 mile (see Exhibit 2, Section E). However, Development Area B will be located on the south and east sides of the Prominent Ridgeline and will not be visible from the west. Traveling eastbound at night at approximately 65 MPH on Interstate 210, there is only a 4-5 second view of Development Area B. During that brief nighttime viewing period, approximately 25-30 percent of the Development Area B homes will be visible, while the others will be below the line-of-site. The visible portion of Development Area B will consist of a few homes and short segments of street lighting near the top of the western ridge of the Development Area, which will be difficult to see because the vehicle roof will obstruct that elevated view. The new roadway and window lighting will not make any measurable contribution to the already-present sky glow. The infrequent and sporadic car headlights on the visible portions of the Development Area B roads will have virtually no impact on views from the Interstate 210. In the short time frame that Development Area B will be visible to eastbound vehicles, window and street lighting will be the most prominent sources of light. The glow from Development Area B will create new brightness, but not glare (i.e., annoyance, discomfort or loss in visual performance and visibility). Based on all of these limiting factors and others discussed in the preceding section, it is expected that light from Development Area B would not create a substantial new source of light or glare that would adversely affect nighttime views from Interstate 210. Therefore, the night lighting impacts from Development Area B to occupants of eastbound vehicles on the 210-Freeway are anticipated to be less than significant.

### La Tuna Canyon Road

As previously discussed, the Interstate 210 forms a line-of-sight barrier that effectively blocks virtually all views of the northern portion of the project site – including Development Area A – from the portion of La Tuna Canyon Road adjacent to the project site. Therefore, the introduction of new sources of light within Development Area A will have little effect on occupants in vehicles traveling either eastbound or westbound on La Tuna Canyon Road.

However, a substantial portion of Development Area B will be viewed by vehicle occupants traveling in either direction on La Tuna Canyon Road. For westbound vehicles on La Tuna Canyon Road, nighttime views of Development Area B first occur approximately 3,000 feet

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westerly of the Interstate 210 underpass. Intermittent views of the Development Area B – partially blocked by stands of dense vegetation – occur for the next 0.8 miles (see Exhibit 2, Section G). Traveling at a speed of approximately 50 mph on La Tuna Canyon Road, Development Area B is more or less visible for a period of approximately 58 seconds. During this time frame, new light from windows, streetlights, exterior lighting, and vehicle headlights will be visible. As discussed in previous sections, there are a number of factors that will limit the lighting impacts associated with Development Area B. Development Area B is already partially illuminated at night due to the baseline sky-glow condition, so that the existing ridgelines in Development Area B are already visible against the sky. While roadway lighting and window lighting from Development Area B will be visible, that lighting will not make any measurable contribution to the already-present sky glow. The infrequent and sporadic car headlights on the visible portions of the Development Area B roads will have virtually no impact on views from La Tuna Canyon Road, particularly given the relatively small number of homes (69) proposed there. Also, the proposed homes in Development Area B have substantial setbacks from La Tuna Canyon Road – the closest home is almost 600 feet from the road. As a result of the combined effects of existing sky glow, the low-level of proposed street lighting, the distance between the proposed homes and the road, and the proposed CC&R restrictions on exterior lighting, the glow from Development Area B will not create any glare problems (i.e., annoyance, discomfort or loss in visual performance and visibility). It should also be noted that the view of Development Area B by vehicle occupants is further limited by the roof and other vehicle components, oncoming headlights from vehicles traveling in the opposite direction, and taillights from traffic moving in the same direction.

For eastbound traffic on La Tuna Canyon Road, the higher elevations of Development Area B will first become perceptible in the vicinity on the project's proposed equestrian park. Portions of Development Area B will remain visible for a distance of approximately 1.0 mile, or 72 seconds at 50 mph (see Section G, Exhibit 2). During this time frame, views of Development Area B from eastbound vehicles La Tuna Canyon Road will be very similar to that previously described for westbound vehicles.

Notwithstanding these limiting factors, however, the lighting associated with Development Area B would introduce a substantial new light source into an area that currently experiences a low level of illumination and has a rural character.<sup>7</sup> The resulting effect would be the significant compromise of the rural nighttime ambiance of La Tuna Canyon Road in the vicinity of Development Area B. In addition to the above-mentioned new light sources within Development

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<sup>7</sup> *The proposed equestrian park will not include any light sources and therefore will not impact the nighttime environment.*

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Area B, vehicle occupants on La Tuna Canyon Road will also be briefly exposed to single lighting fixtures located at each of the two access points for Development Area B on La Tuna Canyon Road. These fixtures are required to permit safe access in and out of Development Area B. In addition, Development Area B will be visible to vehicle occupants traveling at slower speeds on La Tuna Canyon Road than are typical of the freeway, which will afford a longer period to view the development area. Furthermore, the alignment of La Tuna Canyon Road provides head-on views of Development Area B, whereas the both Development Areas A and B are largely viewed through side widows from the freeway. For these reasons, the proposed project would have a significant lighting impact in relation to nighttime views of Development Area B from vehicles traveling on La Tuna Canyon Road. Mitigation measures are proposed that would reduce the lighting impact of Development Area B on La Tuna Canyon Road to the extent feasible.

East of the Interstate 210/La Tuna Canyon Road interchange, La Tuna Canyon Road runs adjacent and parallel to the steep hillside slopes on the north side of the freeway. For westbound vehicles east of that intersection, views of Development Area A will be restricted to the new lighting along the new access road. Beyond the freeway underpass there are no further views of Development Area A from westbound La Tuna Canyon Road. Conversely, for eastbound vehicles on La Tuna Canyon Road, there are no views of Development Area A until the vehicle approaches the freeway underpass. At this point, there is a brief glimpse of the Development Area A access road street lighting. Given the existing lighting at Interstate 210/La Tuna Canyon Road interchange, the addition of new lighting along the access road would not create substantial light or glare which would adversely affect nighttime views from this portion of La Tuna Canyon Road.

### Existing Residential Community

As previously described, nighttime views of the project site are largely restricted to approximately 50± homes located along Tranquil Drive, Reverie Drive, Inspiration Way, Glen O Peace Parkway, and Verdugo Crestline Drive. While there are numerous other residential streets farther north and east than these five streets, by and large homes along those other streets do not have views of the project site due to intervening topography, structures, and/or vegetation. Homes to the east along Tranquil Drive, Reverie Drive, Inspiration Way, and Glen O Peace Parkway generally have a field of vision looking into Development Area A of approximately 90 degrees, which extends in an arc from northwest to southeast. Views to the west beyond Development A are not available, due to intervening ridgelines. Views toward the south generally follow view corridors created by the drainages between roughly parallel north-south trending ridges. While the higher elevations of the slopes of the Verdugo Mountains on the south side of La Tuna Canyon are occasionally visible, there are no views of Development Area B from these homes, due to intervening topography and line-of-sight constraints. In contrast, there are a few homes located along Verdugo Crestline Drive that have southerly

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views into Development Area A. For these existing homes, views into the proposed open space to the west of Development Area A and the southerly portion of the project site, including Development Area B, are largely non-existent.

As Development Area A is built out, nighttime views of Development Area A from approximately 50 existing homes along Tranquil Drive, Reverie Drive, Inspiration Way, Glen O Peace Parkway, and Verdugo Crestline Drive would change from dark hillsides to that of a residential community with low-levels of lighting. The existing homes at the end of Tranquil and Reverie Roads will be immediately adjacent to the proposed homes in Development Area A. A few homes (3 or 4) along Verdugo Crestline Drive will also be immediately adjacent to the new development. As much as 75 percent of the existing views from these homes are of Development Area A. Street lighting will be seen but will not have a significant impact because the homes in Development Area A will mostly block it, as they will mostly block car headlights. Window glare will be the most imposing lighting impact due to the close proximity of the existing and proposed homes (see Figure IV.N-14). There will be CC&R restrictions to limit the quantity of exterior and landscape lighting, but again the close proximity to the existing homes will make any landscape lighting more prominent. Homes along Inspiration Way and Glen O Peace Parkway are separated from the proposed Development Area A by a swath of open space, which will help to attenuate the effects of the new lighting.

While the project has incorporated numerous design features to reduce the effects of new lighting (e.g., low level street lighting and CC&R restrictions on exterior lighting), the new community will still be more brightly illuminated than the existing community. As previously discussed, there is almost no street lighting along Tranquil Drive, Reverie Drive, Inspiration Way, Glen O Peace Parkway, and Verdugo Crestline Drive. In contrast, Development Area A will provide street lights to ensure a more safe and secure environment than is found on these existing roads. While street lighting would be designed to the lowest safe level, the lighting will increase the overall brightness within Development Area A. Other factors will also contribute to the overall brighter presence of Development Area A, compared to the existing adjacent community. For example, the existing residences tend to be small, single-story structures that have relatively few windows and small yards. In contrast, the proposed homes will generally be larger (averaging 4,000 square feet and two-stories in height), with many windows and fairly large yards.

In summary, Development Area A would include substantial new sources of light that would adversely affect nighttime views in the project area from established residential areas along Tranquil Drive, Reverie Drive, Inspiration Way, Glen O Peace, and Verdugo Crestline Drive. This adverse impact would be somewhat reduced by the numerous design features discussed above that substantially reduce lighting and its visibility from offsite locations. In addition, project lighting would only be visible from a relatively small number of homes and public viewing areas in the existing residential areas. However, on balance, it is concluded that the impact of



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new lighting within Development Area A on the adjacent residential community would be significant.

### Wildlife

Some wildlife species are relatively tolerant of human presence and would be unaffected by the intrusion of lighting from the development areas into adjacent habitat. Examples of these species include coyote, mule deer, skunks, and raccoons. On the other hand, a number of wildlife species are likely to experience confusion of day/night activity patterns and/or loss of prey base. Most affected would be nocturnal species that rely on the cover of darkness to hunt, or are otherwise shy around human activity. Examples of these species include great horned owl, barn owl, ringtail, and several bat species. Some bats, however, would benefit from the lighting as it may attract and concentrate insects.

The project's preservation of approximately 693 acres of open space would provide substantial remaining habitat and ample opportunity for those light-sensitive wildlife species to withdraw to unaffected portions of the project site. Hence, there should be no significant impact to nocturnal wild life associated with the introduction of night lighting within the Development Area. However, impacts from night-lighting on wildlife in neighboring habitats would be further reduced through shielding and/or directing lights away from adjacent open space.

### **MITIGATION MEASURES**

The following mitigation measures are recommended to reduce lighting impacts:

1. The proposed project should include CC&Rs that prohibit the use of all exterior uplighting fixtures for building facades and trees, establish design limits on the amount of landscape lighting per foot, permit only downlighting for all exterior-building mounted fixtures, and prohibit "glowing" fixtures that would be visible from existing communities or public roads.
2. The CC&Rs should specify that night lighting on private property located on any lot located within 100 feet of Interstate 210 rights-of-way, as shown on the vesting tentative tract map, shall be permitted, provided it is low-height, low illumination safety lighting of a color similar to incandescent light which is shielded and directed onto the property.
3. For internal street lighting, the minimum maintained average illuminance level shall be reduced from 0.4 fc to 0.2 fc by reducing the wattage of the street lighting fixtures while maintaining the IES recommended uniformity ratio of 6:1 minimum to average fc.

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4. Roadway light fixtures shall be full cut-off, well-shielded fixtures that will allow no direct beam illumination into the night sky or into adjacent open space areas.
5. Exterior buildings finishes will be non-reflective and use natural subdued tones.
6. All roofs visible from the Interstate 210 and/or La Tuna Canyon Road shall be surfaced with non-reflective materials.

### **CONCLUSION**

The proposed project has been designed to use the natural topography to baffle and limit views into both Development Areas. The homes that are visible from offsite locations will be perceived primarily by the interior glow visible through windows. Exterior residential lighting could also be visible from offsite locations. However, limits on the use of exterior lighting will be established by the CC&Rs for the project. Additionally, the proposed roads on the project site will be private roads owned and maintained by the homeowners' association(s). This provides the project applicant with the opportunity to design a street light system with a substantially lower level of illumination that minimizes the lighting impacts on existing residential areas and vehicle occupants on the Interstate 210 and La Tuna Canyon Road, but provides sufficient illumination for pedestrian and vehicle safety and emergency vehicle response.

With the incorporation of the project's design features, the resulting illumination would have less than significant impacts on nighttime views from Interstate 210. Implementation of the mitigation measures would further reduce that impact. However, even with the implementation of the mitigation measures suggested above, the change in the semi-rural character along La Tuna Canyon Road caused by the increase in night illumination would constitute a significant impact on views from that road. Similarly, even with the implementation of the mitigation measures suggested above, the change in nighttime lighting for existing homes along Tranquil Drive, Reverie Drive, Inspiration Way, Glen O Peace and Verdugo Crestline Drive would also constitute a significant impact.