APPENDIX A

Noise and Outdoor Lighting Assessment

This Page Intentionally Left Blank

DUDEK

CORPORATE OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 8, 2010 5457-01

Mr. Jim Watts
San Diego Unified School District
Facilities Management Division
4860 Ruffner Street
San Diego, California 92111

Subject ***University City High School Athletic Facilities Improvement Project, Noise and Outdoor Lighting Assessment***

Dear Mr. Watts:

This report contains our assessment of the noise and lighting associated with the University City High School Athletic Facilities Improvement project located in the City of San Diego. In summary, the proposed project would provide improvements at the existing football field and track. The improvements would include the installation of an artificial turf on the football field, a synthetic track surface, stadium lighting, a new scoreboard, and an upgraded sound system. The closest existing residences are located south and east of the project site.

Construction noise impacts associated with the project-related construction activities would comply with the City's noise criteria. However, although the proposed project will reduce the noise associated with the football field, the noise may still exceed the City's noise ordinance criteria at the residential properties located south of the site. To minimize the noise impact, the existing Public Address (PA) system would be replaced with a new PA system that has directional speakers to direct the sound away from the southern and eastern property lines, or is designed such that the speakers are closer to the spectators, allowing the speakers to be operated at a sound level approximately 10 to 15 dB less than would be required if the speakers are mounted on light poles. A four-channel amplifier would also allow for turndown of individual speakers. However, even with implementation of these design features to minimize the noise associated with the existing football events, the project may still exceed the City's Noise Ordinance standards during both the daytime and evening football events if the stadium is at maximum capacity.

Based on a review of the site plan and conceptual lighting information, the project could increase the light level at the existing residences. Without mitigation, the proposed project would result in significant light impacts at existing adjacent residences. To mitigate the impact would require

that the lighting vendor guarantee that the illumination level shall not exceed exceed 0.8 foot-candles of light trespass at the homes located south of the site. When final lighting plans are prepared, the design shall ensure that the light reflector shields extend to a level at or below the lowest edge of the light source at a distance sufficient to block the light source from the view of any adjacent existing residential use. Lights shall be shielded within the proposed project site by the location, mounting, and aiming of luminaries; the use of shielding; and/or the use of cutoff reflectors and refractors. Adjustments to the facility lighting shall be made once lighting is in place to address potential glare effects. Alterations shall include the installation of glare shields or readjusting and fine tuning of the aiming or position of the luminaries.

INTRODUCTION AND PROJECT DESCRIPTION

This report evaluates the potential noise and lighting impacts associated with the proposed University City High School Athletic Facilities Improvement Project located in the City of San Diego *(*Figures 1 and 2). University City High School is located at 6949 Genesee Avenue. The school is bound on the north by Rose Canyon, on the west by Genesee Avenue, and on the south and east by existing residential development. Interstate 805 is located approximately 1 mile east of the project site, and Interstate 5 is 1.5 miles to the west. The closest existing residences are located south and east of the site.

The project is located at the existing track and football field in the southern portion of the University City High School site. The project includes the installation of artificial turf within the stadium to accommodate football, soccer, and field hockey; and would replace the existing track surface with a synthetic track (Figure 3). Stadium lighting, a scoreboard, and an upgraded sound system are also proposed as improvements to the facility.

The addition of stadium lighting would allow for sporting events to be played during the nighttime. It is anticipated that approximately 15 night events would be held at the stadium each school year. The majority of night events held at the stadium would be related to competitive school athletics including football, soccer, and field hockey. The San Diego Unified School District (District) notes that due to routine practices and the potential for unforeseen events, such as playoff games, a few more events may occur. Competitive school events would be held on Friday nights. It is anticipated that field lighting would be dimmed at the conclusion of the event and after all patrons have safely exited the facility (estimated at 9:00 p.m.). Subsequently, the field would be cleaned and the field lights would be completely extinguished by approximately 10:00 p.m.

NOISE CRITERIA

The District does not have specific quantitative noise standards. The project is located in the City of San Diego; therefore, the City of San Diego's noise ordinance criteria is used for this project. The City's noise ordinance criteria are contained within the City's Municipal Code Chapter 5 Article 9.5 Noise Abatement and Control (City of San Diego 2010).

City Noise Ordinance

The City's noise limits are in terms of a one-hour average sound level. The allowable noise limits vary according to the land use and time of day. The City's allowable sound level limits for different land uses and time periods are depicted in Table 1. The project site and the land uses south and east of the site are zoned single family residential. Thus, the applicable noise level limits at the adjacent single family residential land uses are 50 dB between the hours of 7 a.m. to 7 p.m. (daytime), 45 dB between the hours of 7 p.m. to 10 p.m. (evening) and 40 dB between the hours of 10 p.m. and 7 a.m. (nighttime).

Section 59.5.0404 of the City's noise ordinance restricts the allowable hours of construction activities to 7:00 a.m. through 7:00 p.m., Monday through Saturday excluding legal holidays. Further, the construction noise level is not to exceed an average sound level greater than 75 dB during the 12-hour period between 7:00 a.m. to 7:00 p.m. at residentially zoned property.

Significance Determination Thresholds

Table 1 summarizes the allowable sound levels in the City's noise ordinance.

Table 1
Allowable Sound Level Limits

Land Use	Time of Day	Applicable Limit One-Hour Average Sound Level (Decibels)
Single Family Residential	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45 40
Multi-Family Residential (Up to a maximum density of 1/2000)	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	55 50 45
All other Residential	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55 50

Table 1 (Continued)

Land Use	Time of Day	Applicable Limit One-Hour Average Sound Level (Decibels)
Commercial	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	65 60 60
Industrial or Agricultural	Anytime	75

Source: City of San Diego Municipal Code 2010

LIGHTING CRITERIA

The City and District do not have applicable quantitative lighting standards. However, the District and City's goal is to minimize spill light at adjacent light sensitive areas and streets. This is generally accomplished by ensuring that no light or glare is transmitted or reflected in such concentration or intensity as to be detrimental or harmful to persons, or to interfere with the use of surrounding properties or streets.

Light trespass varies based on the surrounding environment. For example, urbanized areas have a large number of existing artificial lighting sources and are less susceptible to adverse effects associated with new artificial lighting sources as compared to rural areas. Thus, different lighting standards are applied which vary according to the amount and intensity of existing lighting sources in the area. The project site is located within an urban residential area which is characteristic of medium ambient brightness.

For purposes of analysis of this report, light trespass will be evaluated based on recommendations established by the Illuminating Engineering Society of North America (IESNA 1999). Based on the environmental characteristic of the surrounding area (i.e., medium ambient brightness) the applicable threshold to limit light trespass onto adjacent residential properties is 0.8 foot-candles as measured on the vertical and horizontal planes, at any adjacent home during the proposed hours of operation.

The County of San Diego provides guidance regarding the preservation of dark skies in accordance with the Outdoor Light Control Ordinance (No. 7155) (County of San Diego 2005). These regulations only apply to land uses and properties within the unincorporated portions of San Diego County. Therefore, they are not requirements for the proposed project. However, in consideration of potential regional influences of lighting effects, these regulations are presented in this analysis and provide guidance for the analysis of potential effects to dark skies.

Specifically, Palomar Mountain and Mount Laguna have been identified by the County of San Diego as important dark sky resources. Special provisions are provided in the County of San Diego Outdoor Light Control Ordinance for the preservation of dark skies surrounding these resources within a 15-mile radius.

EXISTING CONDITIONS

Noise

Noise sources in the vicinity of the project site include traffic along Genesee Avenue and nearby local residential streets, and military aircraft from MCAS Miramar located approximately 1.5 miles east of the site. Noise is also generated by students and activities at University City High School. Existing noise sensitive receptors in the area consist of single family residences located south and east of the site, as well as students at University City High School.

Ambient Noise Level

Two noise measurements were conducted at the site to determine the approximate typical daytime ambient noise level at the properties of the closest homes adjacent to the site. The noise measurements were made between the hours of 12:00 p.m. and 2:00 p.m. on January 2, 2009. The noise measurement locations are on the south and east sides of the site adjacent to the existing homes. The measurement locations are depicted as Sites 1 and 2 in Figure 4.

The measured background noise level, with minimal student activity outside and without aircraft flyovers from MCAS Miramar was 41 dB at Site 1 and 43 dB at Site 2. The noise resulted from distant background noise sources such as traffic and birds. These noise levels will vary by several dB higher and lower during the daytime and evening hours. The measured outdoor noise levels are considered quite as indicated in Table 2. The background noise level will substantially increase when aircraft from MCAS Miramar flyover the area. The noise level associated with aircraft from MCAS Miramar ranges from 60 to 65 dB CNEL at the site (MCAS Miramar 2004).

Table 2
Typical Sound Levels Measured in the Environment and Industry

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		

Table 2 (Continued)

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: Caltrans 1998.

Lighting

Existing light sources in the immediate project vicinity include adjacent street lights, residential lighting, and University City High School campus. Excluding street lights and other focused lighting, the ambient light level in low to medium density residential areas typically range from approximately 0.5 to 1 foot-candle. For reference purposes, a full moon at night emits approximately 0.01 foot-candle of incident illumination and street lighting ranges from approximately 2 to 10 foot-candles. The ambient light level will fluctuate depending on the existing lighting conditions, time of day, cloud cover, moon phase, etc. Definitions of lighting terms used in this report are included in Attachment 2.

IMPACT ANALYSIS

Noise

Noise associated with the proposed project would include short-term construction noise, as well as noise from the sporting activities.

Short-Term Construction Activities

Project construction would last for approximately 4 to 5 months. Approximately 10 to 15 workers would be employed during the grading phase, and equipment would consist of blades, forklifts, backhoes, and water trucks. Leveling of the field may be necessary as well as potential export of soil.

Turf installation would require approximately 6 workers and would consist of a combination of machine and handwork. Track installation would also require approximately 6 workers and would require field spreaders, forklifts, and backhoes.

Construction noise is difficult to quantify because of the many variables involved including the size of equipment used, percentage of time and number of pieces of equipment which will actually operate on the site. However, maximum construction noise levels at 50 feet would range from approximately 75 to 85 dB for the type of equipment expected to be used for this project. The maximum noise levels associated with various pieces of construction equipment are depicted in Figure 5. Construction noise in a well defined area typically attenuates at approximately 6 dB per doubling of distance. Thus, the maximum noise level would be approximately 69 to 79 dB at 100 feet. The hourly average noise levels would vary, but construction noise levels of approximately 60 to 75 dB at 50 feet are typical for this type of construction activity.

All construction activity would comply with the City's allowable hours for construction. During this time period the construction equipment would generate a 12-hour average noise level of up to approximately 60 dB or less at the closest existing residences to the south and east of the site. The construction noise level is anticipated to comply with the City's 75 dB 12-hour average sound level criterion. Thus, the noise impact would be less than significant.

Sporting Activity Noise

It is anticipated that approximately 15 night events would be held at the stadium each school year. The majority of night events held at the stadium would be related to competitive school

athletics including football, soccer, and field hockey. However, there is the potential for additional events such as playoff games.

At any one location, the hourly average sound level associated with recreational noise is difficult to predict due to the many variables involved. These factors include the number of players and spectators, the location of people and the amount and level of conversation and cheering. However, to determine the approximate noise level that would be generated at the football field and predict potential noise impacts, the District requested that noise source data utilized by ISE be used for this noise analysis. Noise data collected by ISE indicates that the noise level associated with a group of 50 people at outdoor sporting activities generate an hourly average sound level of 75 dB at a reference distance of 3 feet. The PA system has not been designed. For the purposes of this noise assessment it is assumed that speakers would be installed on each lighting pole. The public address system is assumed to generate a sound level of 90 dB at a distance of 3 feet. The input and output data are included in Attachment 3.

At full capacity events (assumes 2,000 spectators), noise associated with the football field may result in a one-hour average noise level of approximately 57 to 62 dB along the southern property line and 50 dB along the eastern property line. The noise level along the southern property line would be lower directly behind the visitor stands because the stands would function as a noise barrier. A minimum five dB of noise attenuation results when the line-of-sight from the source to receiver is obstructed by a solid barrier. However, the homes to the south and east are located approximately 60 to 90 feet above the football field and would not be shielded by the stands. The one-hour average noise level would range up to approximately 57 dB at the closest homes to the south and 50 dB at the closest homes to the east. Although the upgraded sounds system will minimize noise levels associated with football events, the noise levels may exceed the City's noise ordinance criteria during both the daytime and evening hours at the homes located to the south and during the evening hours at the homes located to the east. The calculated noise level at various locations is depicted in Figure 6.

Lighting

A lighting plan has not been prepared. However, the District has provided preliminary lighting design information. Based on the preliminary lighting design specifications, it is anticipated that the sports field lighting would most likely be Musco Lighting Model Light-Structure Green. In addition, the lighting consists of the following design characteristics:

1500-watt metal halide lamps would be located on pole fixtures. Each lamp would produce a maximum of 155,000 lumens. The pole locations, mounting heights and the number of

luminaries per pole have not been determined. However, there would most likely be four poles located just beyond the 4 corners of the field. Reflectors would be provided on the light fixtures to reduce off-site spill light. The manufacturer shall determine the pole mounting heights that allow conformance with the light spill/glare criteria.

Light trespass, the spilling of light beyond the boundary of the property or area being lit, may cause nuisance to others. Based on the preliminary lighting design information the incident illumination levels (the light falling on a surface) could exceed 0.8 vertical foot-candles at the homes located along the southern property boundary. Light trespass of more than 0.8 foot candles at the windows of homes within urban residential areas during the proposed evening hours of operation is generally undesirable. These unmitigated project light levels could result in a significant lighting impact to the existing residences located south of the site.

Recognized dark sky resources in San Diego County are Palomar Mountain and Mount Laguna. The project site is more than 30 miles from both Palomar Mountain and Mount Laguna. Therefore, because the project site is more than 15 miles from either of these locations, lighting from the project would not have the potential to negatively affect dark skies surrounding these regional resources. Thus, the proposed project would not impact regional dark sky resources.

MITIGATION

Noise

To minimize the noise impact, it is recommended that the PA system have either directional speakers to direct the sound away from the southern and eastern property lines, or is designed so that the speakers are closer to the spectators allowing the speakers to be operated at a sound level approximately 10 to 15 dB less than would be required if the speakers are at the light poles. However, even with implementation of this measure the noise level would exceed 50 dB at the homes located south of the football field due to the noise associated with the spectators. Thus, with the design features, the project may still exceed the City's Noise Ordinance standards during both the daytime and evening football events.

Lighting

Based on conceptual lighting information, the proposed project would result in significant light impacts at existing residences located south of the site. To ensure that significant light trespass and discomfort glare do not occur on adjacent properties as a result of lighting, the following measures shall be implemented:

a. When final lighting plans are prepared the design shall ensure that the light reflector shields extend to a level at or below the lowest edge of the light source at a distance sufficient to block the light source from the view of any adjacent existing residential use. Lights shall be shielded within the proposed project site by the location, mounting, and aiming of luminaries; the use of shielding; and/or the use of cutoff reflectors and refractors.

b. The lighting vendor should guarantee that the illumination level shall not exceed 0.8 foot-candles at the homes located south of the site, due to the stadium facility lighting.

c. Adjustments to the facility lighting shall be made once lighting is in place to address potential glare effects. Alterations shall include the installation of glare shields or readjusting and fine tuning of the aiming or position of the luminaries.

This concludes our noise and lighting assessment. If you have any questions, please call me.

Sincerely,

Mike J. Komula
Senior Environmental Analyst

Att: Figures 1–6
Attachments 1–3

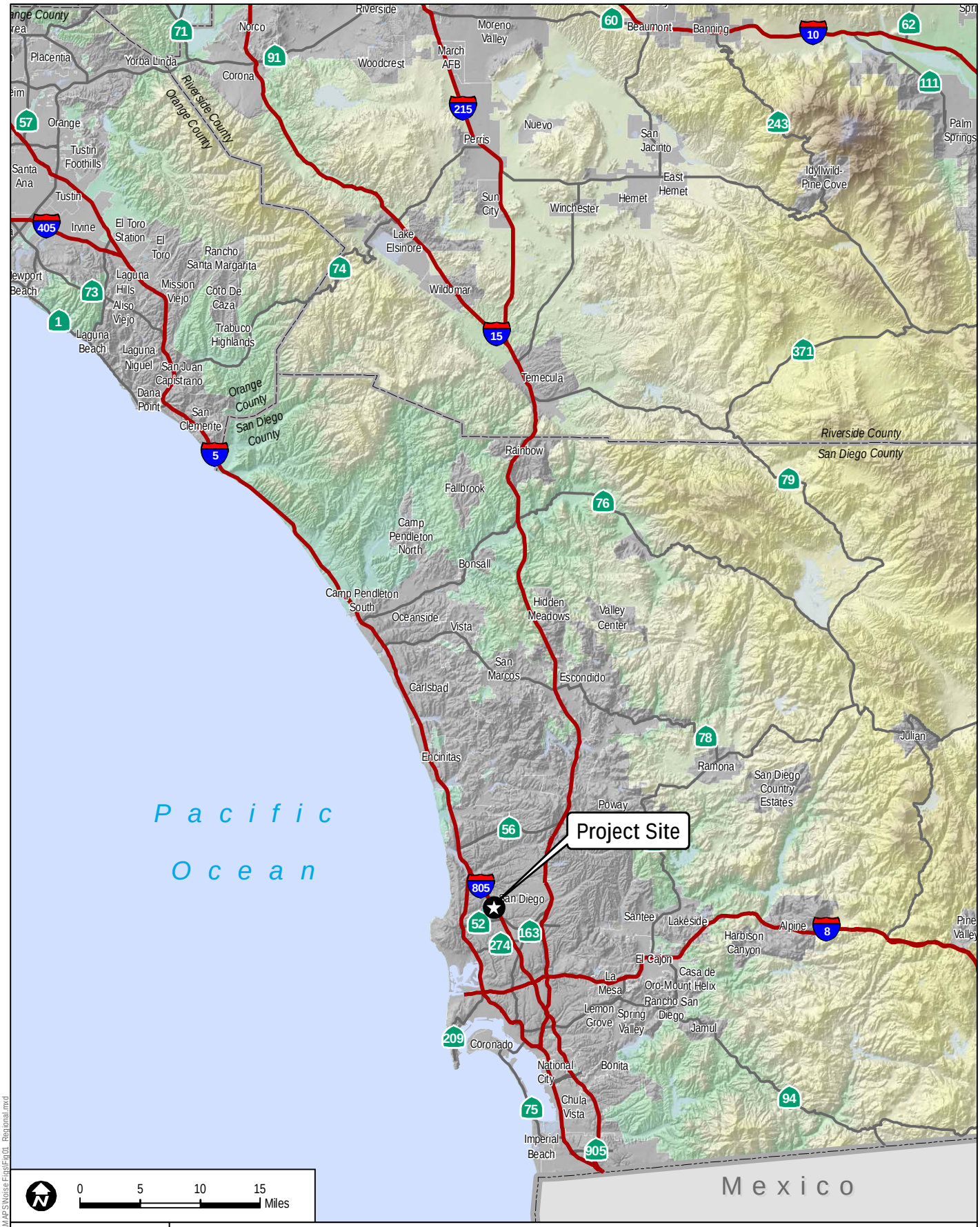
REFERENCES

Caltrans (California Department of Transportation). 1998. Technical Noise Supplement to the Traffic Noise Analysis Protocol. October. Accessed via: http://www.dot.ca.gov/hq/env/noise/pub/Technical%20Noise%20Supplement.pdf.

City of San Diego. 2010. *City of San Diego Municipal Code, Chapter 5 Article 9.5: Noise Abatement and Control.*

Illuminating Engineering Society of North America. 1999. *Lighting for Exterior Environment*s (RP-33-99).

MCAS Miramar. December, 2004. Marine Corps Air Station, Miramar AICUZ Update (Revised March 2005).



DUDEK

5457-01

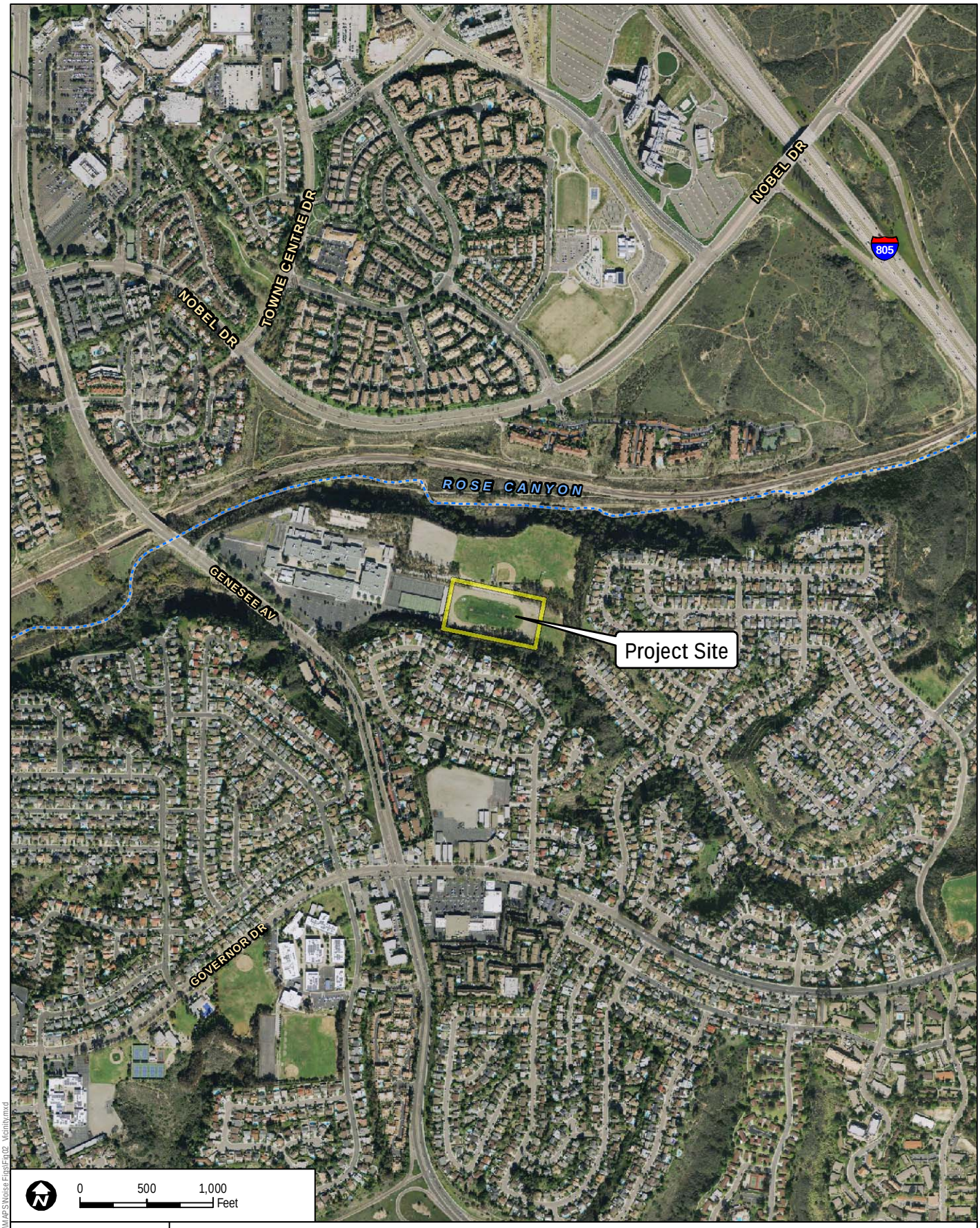
JUNE 2010

FIGURE 1

Regional Location

University City High School Athletic Facilities Improvement Project - Noise and Outdoor Lighting Assessment

Z:\Projects\5457\01\MAP\DOC\MAPS\Noise Fins\Fig01_Regional.mxd



DUDEK

5457-01

JUNE 2010

AERIAL SOURCE: DIGITALGLOBE 2008

FIGURE 2

Project Vicinity

University City High School Athletic Facilities Improvement Project - Noise and Outdoor Lighting Assessment

Z:\Projects\5457701\MAP\DOC\MAPS\Noise Fins\Fig02_Vicinity.mxd

DUDEK

5457-01

JUNE 2010

AERIAL SOURCE: DIGITALGLOBE 2008

FIGURE 3

Project Site

University City High School Athletic Facilities Improvement Project - Noise and Outdoor Lighting Assessment

Z:\Projects\5457\01\MAPDOC\MAPS\Noise Figs\Fig03_site.mxd

DUDEK

5457-01

JUNE 2010

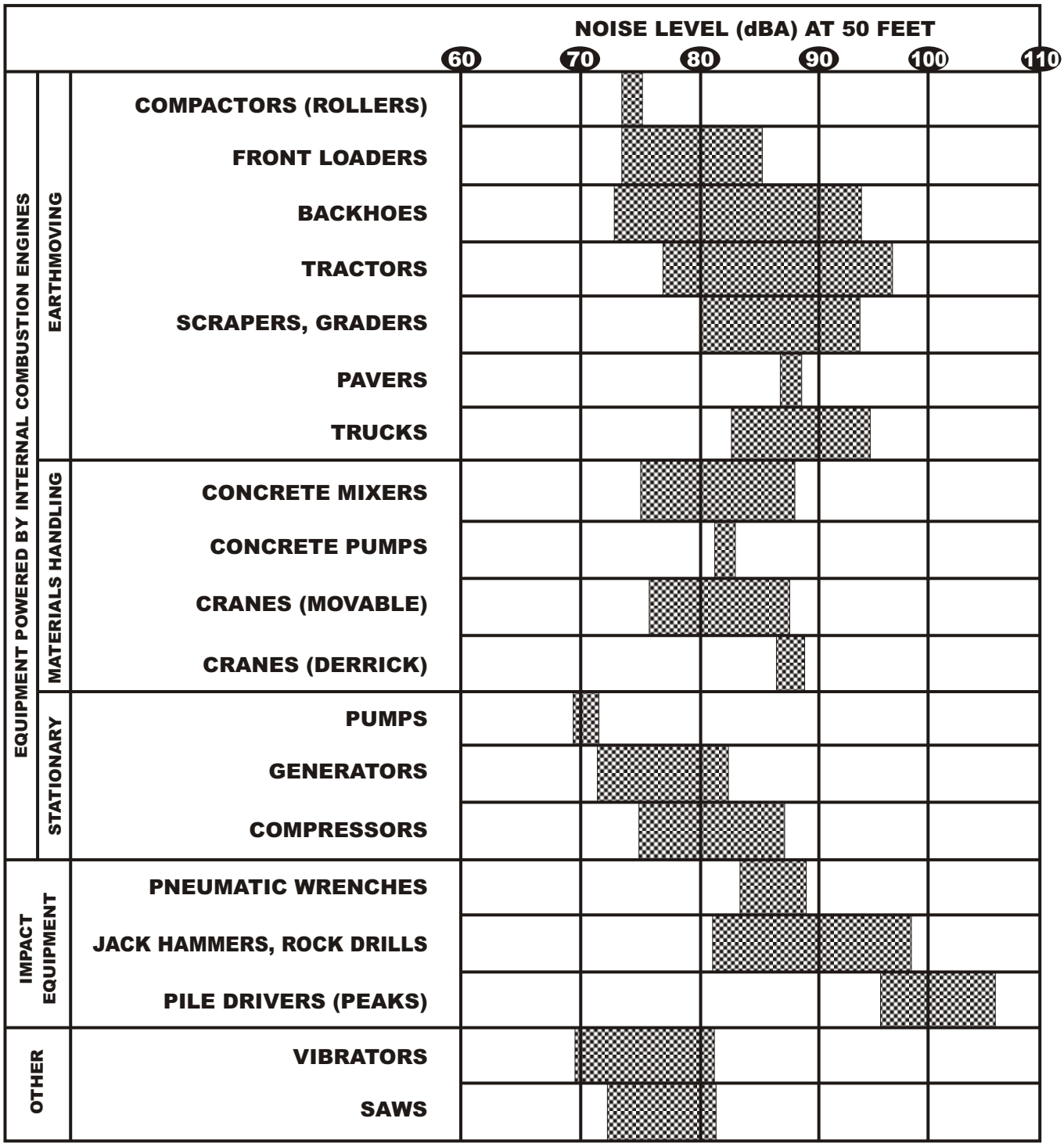
AERIAL SOURCE: DIGITALGLOBE 2008

FIGURE 4

Noise Measurement Locations

University City High School Athletic Facilities Improvement Project - Noise and Outdoor Lighting Assessment

Z:\Projects\5457\01\MAPDOC\MAPS\Noise Figs\Fig03_site.mxd



NOTE: Based on limited available data samples.

SOURCE: EPA PB 206717, Environmental Protection Agency, Dec. 31, 1971, "Noise from Construction Equipment & Operations"

DUDEK

5457-01

JUNE 2010

FIGURE 5

Typical Construction Equipment Noise Generation Levels

University City High School Athletic Facilities Improvement Project - Noise and Outdoor Lighting Assessment

Z:\Projects\j5457\01\MAPDOC\MAPS\Noise Figs

DUDEK

5457-01

JUNE 2010

AERIAL SOURCE: DIGITALGLOBE 2008

FIGURE 6

Modeled Noise Levels

University City High School Athletic Facilities Improvement Project - Noise and Outdoor Lighting Assessment

Z:\Projects\5457\01\MAPDOC\MAPS\Noise Figs\Fig06_modeled_noise_lvls.mxd

ATTACHMENT 1
Acoustical Definitions

Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
A-Weighted Sound Level	The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Day Night Average Sound Level	The Day-Night Average Sound Level (Ldn) is the A-weighted equivalent continuous sound exposure level for a 24-hour period with a ten dB adjustment added to sound levels occurring during nighttime hours (10 pm to 7 am).
Decibel	The decibel (dB) is a unit for measuring sound pressure level and is equal to 10 times the logarithm to the base 10 of the ratio of the measured sound pressure squared to a reference pressure, which is 20 micropascals.
Equivalent Continuous Sound Level	The equivalent continuous sound level (Leq) is the sound level corresponding to a steady state level containing the same total energy as a time varying signal over a given sample period. L_{eq} is designed to average all of the loud and quiet sound levels occurring over a time period.

ATTACHMENT 2
Lighting Definitions

Term	Definition
Foot-candle	A unit of measurement in the English system used to gauge the amount of light falling on a surface; the number of lumens that incident on each square foot of work surface.
Glare	The sensation produced by luminance within the visual field that are sufficiently greater than the luminance to which the eyes are adapted to cause annoyance, discomfort, or loss in visual performance or visibility. Note: The magnitude of the sensation of glare depends upon such factors as the size, position and luminance of a source, the number of sources and the luminance to which the eyes are adapted.
Direct Glare	Glare resulting from high luminance or insufficiently shielded light sources in the field of view. It usually is associated with bright areas, such as luminaries, ceilings, and windows that are outside the visual task or region being viewed.
Reflected Glare	Glare resulting from reflections of high luminance in polished or glossy surfaces in the field of view. It usually is associated with reflections from within a visual task or areas in close proximity to the region being viewed.
Illuminance	The light falling on a surface; measured in foot-candles or lux.
Light Loss Factor	The design factor that accounts for atmosphere dirt depreciation, normal degrading of lamp lumens over the life of the lamp and other factors that add to the fact that less light is available over time.
Light Trespass	The shining of light produced by a light source beyond the boundaries of the property on which it is located.
Luminaire	A complete lighting unit consisting of a lamp(s) and ballast(s) (when applicable) together with the parts designed to distribute the light, to position and protect the lamps and to connect the lamps to the power supply. Also called a light fixture.
Luminance	The emitted or reflected light from a surface measured in footlamberts (commonly "brightness").

ATTACHMENT 3
Input/Output Noise Data

Receiver: Homes South of Stands

				180	-90	359								
Receiver Coordinates		Location	Leq (h) at 50'	Receiver Elevation	Source Elevation	Source to Receiver	Source to Barrier	Receiver to Barrier	Barrier (base)	Barrier Height	Fresnel No. @ 1000 Hz	Barrier Attenuation	Lp(A) w/o Barrier	Lp(A) w/Barrier
X	Y			(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)		(dBA)	(dBA)	(dBA)
180	-90	FBhome1	51	364	289	537	537	0	0	0.0	Line of Sight	0	30.0	30
180	-90	FBhome2	51	364	289	533	533	0	0	0.0	Line of Sight	0	30.0	30
180	-90	FBhome3	51	364	289	530	530	0	0	0.0	Line of Sight	0	30.1	30
180	-90	FBhome4	51	364	289	526	526	0	0	0.0	Line of Sight	0	30.2	30
180	-90	FBhome5	51	364	289	523	523	0	0	0.0	Line of Sight	0	30.2	30
180	-90	FBhome6	51	364	289	521	521	0	0	0.0	Line of Sight	0	30.2	30
180	-90	FBhome7	51	364	289	518	518	0	0	0.0	Line of Sight	0	30.3	30
180	-90	FBhome8	51	364	289	516	516	0	0	0.0	Line of Sight	0	30.3	30
180	-90	FBhome9	51	364	289	514	514	0	0	0.0	Line of Sight	0	30.4	30
180	-90	FBhome10	51	364	289	512	512	0	0	0.0	Line of Sight	0	30.4	30
180	-90	FBhome11	51	364	289	511	511	0	0	0.0	Line of Sight	0	30.4	30
180	-90	FBhome12	51	364	289	510	510	0	0	0.0	Line of Sight	0	30.4	30
180	-90	FBhome13	51	364	289	509	509	0	0	0.0	Line of Sight	0	30.4	30
180	-90	FBhome14	51	364	289	508	508	0	0	0.0	Line of Sight	0	30.5	30
180	-90	FBhome15	51	364	289	508	508	0	0	0.0	Line of Sight	0	30.5	30
180	-90	FBhome16	51	364	289	508	508	0	0	0.0	Line of Sight	0	30.5	30
180	-90	FBhome17	51	364	289	508	508	0	0	0.0	Line of Sight	0	30.5	30
180	-90	FBhome18	51	364	289	509	509	0	0	0.0	Line of Sight	0	30.4	30
180	-90	FBhome19	51	364	289	510	510	0	0	0.0	Line of Sight	0	30.4	30
180	-90	FBhome20	51	364	289	511	511	0	0	0.0	Line of Sight	0	30.4	30
180	-90	FBhome21	51	364	289	512	512	0	0	0.0	Line of Sight	0	30.4	30
180	-90	FBhome22	51	364	289	514	514	0	0	0.0	Line of Sight	0	30.4	30
180	-90	FBhome23	51	364	289	516	516	0	0	0.0	Line of Sight	0	30.3	30
180	-90	FBhome24	51	364	289	518	518	0	0	0.0	Line of Sight	0	30.3	30
180	-90	FBhome25	51	364	289	521	521	0	0	0.0	Line of Sight	0	30.2	30
180	-90	FBhome26	51	364	289	523	523	0	0	0.0	Line of Sight	0	30.2	30
180	-90	FBvis1	51	364	295	209	10	199	280	15.0	Line of Sight	0	38.2	38
180	-90	FBvis2	51	364	295	201	10	191	280	15.0	Line of Sight	0	38.5	38
180	-90	FBvis3	51	364	295	195	10	185	280	15.0	Line of Sight	0	38.8	39
180	-90	FBvis4	51	364	295	188	10	178	280	15.0	Line of Sight	0	39.1	39
180	-90	FBvis5	51	364	295	183	10	173	280	15.0	Line of Sight	0	39.3	39
180	-90	FBvis6	51	364	295	178	10	168	280	15.0	Line of Sight	0	39.6	40
180	-90	FBvis7	51	364	295	173	10	163	280	15.0	Line of Sight	0	39.8	40
180	-90	FBvis8	51	364	295	170	10	160	280	15.0	Line of Sight	0	40.0	40
180	-90	FBvis9	51	364	295	167	10	157	280	15.0	Line of Sight	0	40.1	40
180	-90	FBvis10	51	364	295	165	10	155	280	15.0	Line of Sight	0	40.2	40
180	-90	FBvis11	51	364	295	164	10	154	280	15.0	Line of Sight	0	40.3	40
180	-90	FBvis12	51	364	295	163	10	153	280	15.0	Line of Sight	0	40.3	40
180	-90	FBvis13	51	364	295	164	10	154	280	15.0	Line of Sight	0	40.3	40
180	-90	FBvis14	51	364	295	165	10	155	280	15.0	Line of Sight	0	40.2	40
180	-90	Speaker 1	66	364	307	285	285	0	0	0.0	Line of Sight	0	50.5	50
180	-90	Speaker 2	66	364	307	270	270	0	0	0.0	Line of Sight	0	51.0	51
180	-90	Speaker 3	66	364	308	512	512	0	0	0.0	Line of Sight	0	45.4	45
180	-90	Speaker 4	66	364	308	503	503	0	0	0.0	Line of Sight	0	45.5	46
													57	57 dB Leq

Receiver: Homes at Eastern Boundary
875 500 338

Receiver Coordinates X	Y	Location	Leq (h) at 50'	Receiver Elevation (feet)	Source Elevation (feet)	Source to Receiver (feet)	Source to Barrier (feet)	Receiver to Barrier (feet)	Barrier (base) (feet)	Barrier Height (feet)	Fresnel No. @ 1000 Hz	Barrier Attenuation (dBA)	Lp(A) w/o Barrier (dBA)	Lp(A) w/Barrier (dBA)
875	500	FBhome1	51	343	289	876	876	0	0	0.0	Line of Sight	0	25.7	26
875	500	FBhome2	51	343	289	864	864	0	0	0.0	Line of Sight	0	25.8	26
875	500	FBhome3	51	343	289	853	853	0	0	0.0	Line of Sight	0	26.0	26
875	500	FBhome4	51	343	289	841	841	0	0	0.0	Line of Sight	0	26.1	26
875	500	FBhome5	51	343	289	829	829	0	0	0.0	Line of Sight	0	26.2	26
875	500	FBhome6	51	343	289	817	817	0	0	0.0	Line of Sight	0	26.3	26
875	500	FBhome7	51	343	289	805	805	0	0	0.0	Line of Sight	0	26.5	26
875	500	FBhome8	51	343	289	793	793	0	0	0.0	Line of Sight	0	26.6	27
875	500	FBhome9	51	343	289	781	781	0	0	0.0	Line of Sight	0	26.7	27
875	500	FBhome10	51	343	289	769	769	0	0	0.0	Line of Sight	0	26.9	27
875	500	FBhome11	51	343	289	758	758	0	0	0.0	Line of Sight	0	27.0	27
875	500	FBhome12	51	343	289	746	746	0	0	0.0	Line of Sight	0	27.1	27
875	500	FBhome13	51	343	289	734	734	0	0	0.0	Line of Sight	0	27.3	27
875	500	FBhome14	51	343	289	722	722	0	0	0.0	Line of Sight	0	27.4	27
875	500	FBhome15	51	343	289	710	710	0	0	0.0	Line of Sight	0	27.6	28
875	500	FBhome16	51	343	289	698	698	0	0	0.0	Line of Sight	0	27.7	28
875	500	FBhome17	51	343	289	686	686	0	0	0.0	Line of Sight	0	27.8	28
875	500	FBhome18	51	343	289	675	675	0	0	0.0	Line of Sight	0	28.0	28
875	500	FBhome19	51	343	289	663	663	0	0	0.0	Line of Sight	0	28.2	28
875	500	FBhome20	51	343	289	651	651	0	0	0.0	Line of Sight	0	28.3	28
875	500	FBhome21	51	343	289	639	639	0	0	0.0	Line of Sight	0	28.5	28
875	500	FBhome22	51	343	289	627	627	0	0	0.0	Line of Sight	0	28.6	29
875	500	FBhome23	51	343	289	616	616	0	0	0.0	Line of Sight	0	28.8	29
875	500	FBhome24	51	343	289	604	604	0	0	0.0	Line of Sight	0	29.0	29
875	500	FBhome25	51	343	289	592	592	0	0	0.0	Line of Sight	0	29.1	29
875	500	FBhome26	51	343	289	580	580	0	0	0.0	Line of Sight	0	29.3	29
875	500	FBvis1	51	343	295	942	942	0	0	0.0	Line of Sight	0	25.1	25
875	500	FBvis2	51	343	295	931	931	0	0	0.0	Line of Sight	0	25.2	25
875	500	FBvis3	51	343	295	921	921	0	0	0.0	Line of Sight	0	25.3	25
875	500	FBvis4	51	343	295	910	910	0	0	0.0	Line of Sight	0	25.4	25
875	500	FBvis5	51	343	295	900	900	0	0	0.0	Line of Sight	0	25.5	25
875	500	FBvis6	51	343	295	890	890	0	0	0.0	Line of Sight	0	25.6	26
875	500	FBvis7	51	343	295	879	879	0	0	0.0	Line of Sight	0	25.7	26
875	500	FBvis8	51	343	295	869	869	0	0	0.0	Line of Sight	0	25.8	26
875	500	FBvis9	51	343	295	859	859	0	0	0.0	Line of Sight	0	25.9	26
875	500	FBvis10	51	343	295	849	849	0	0	0.0	Line of Sight	0	26.0	26
875	500	FBvis11	51	343	295	839	839	0	0	0.0	Line of Sight	0	26.1	26
875	500	FBvis12	51	343	295	829	829	0	0	0.0	Line of Sight	0	26.2	26
875	500	FBvis13	51	343	295	819	819	0	0	0.0	Line of Sight	0	26.3	26
875	500	FBvis14	51	343	295	809	809	0	0	0.0	Line of Sight	0	26.4	26
875	500	Speaker 1	66	343	307	1000	1000	0	0	0.0	Line of Sight	0	39.6	40
875	500	Speaker 2	66	343	307	662	662	0	0	0.0	Line of Sight	0	43.2	43
875	500	Speaker 3	66	343	308	917	917	0	0	0.0	Line of Sight	0	40.3	40
875	500	Speaker 4	66	343	308	529	529	0	0	0.0	Line of Sight	0	45.1	45

50 50 dB Leq

This Page Intentionally Left Blank

APPENDIX B

Air Quality Technical Report

This Page Intentionally Left Blank

DRAFT

AIR QUALITY TECHNICAL REPORT

UNIVERSITY CITY HIGH SCHOOL ATHLETIC FACILITIES IMPROVEMENTS PROJECT

CITY OF SAN DIEGO, CALIFORNIA

Prepared for:

San Diego Unified School District
Facilities Planning and Construction
4860 Ruffner Street
San Diego, California 92111

Prepared by:

DUDEK

605 Third Street
Encinitas, CA 92024
(800) 450-1818

February 2009

This Page Intentionally Left Blank

TABLE OF CONTENTS

Executive Summary
1.0 Introduction 1
1.1 Purpose 1
1.2 Project Background and Location 1
1.3 Project Description 1
2.0 Existing Conditions 2
2.1 Climate and Topography 2
2.2 Air Pollution Climatology 2
2.3 Sensitive Receptors 3
3.0 Pollutants and Effects 4
4.0 Regulatory Setting… 6
5.0 Background Air Quality 10
5.1 San Diego County Attainment Designation 10
5.2 Air Quality Monitoring Data 11
6.0 Thresholds of Significance 12
7.0 Impacts… 14
7.1 Construction Impacts 15
7.2 Operational Impacts 17
7.3 Toxic Air Pollutants 18
7.4 Odors 18
7.5 Consistency with the Regional Air Quality Strategy 19
8.0 Cumulative Impacts 19
9.0 Global Climate Change 21
10.0 Summary and Conclusions 27
11.0 References 28

Tables

1.0 Sources of Emissions in the San Diego Region 3
2.0 Agencies Involved in Air Quality Management in SDC 7
3.0 Ambient Air Quality Standards.....9
4.0 San Diego County's Attainment Status.....11
5.0 Ambient Background Concentrations 12
6.0 Screening-Level Criteria for Air Quality Impacts.....13
7.0 Estimated Daily Maximum Construction Emissions.....15
8.0 San Diego Citywide Greenhouse Gas Emissions Overview.....24

Figures

1 Site Plan
2 Regional Location

Appendices

A URBEMIS2007 Version 9.2.4 Modeling and Estimated Emissions
B Construction Coating VOC Emissions Calculations

Executive Summary

The proposed project is Phase I of the San Diego Unified School District's multi-phase improvement project on the University City High School campus. It entails the installation of artificial turf on the existing field within the stadium, the replacement of the existing track surface with a synthetic track, and the installation of stadium lighting, a scoreboard, and an upgraded sound system. No increase in student capacity at the high school is associated with this project, and all improvements would be conducted within the existing development footprint of the campus.

Project construction would result in a temporary increase in emissions of air pollutants. Construction activities, such as grading and paving, would create dust and combustion mobile source emissions. Fugitive dust emissions (PM_{10}) would be minimized with the incorporation of standard construction measures. These measures would also reduce the project's potential to contribute to regional air quality problems. Due to the size and duration of the proposed construction activities, traffic-related air emissions from construction activities would be less than significant. The proposed project is intended to serve the existing University City High School students and staff and would not incrementally increase demand on the school facilities or generate additional vehicular traffic trips. As such, long-term operation of the UCHS athletic field with the proposed improvements would not result in an increase of air pollutant emissions of criteria pollutants or concentrations in excess of existing conditions. Potential sensitive receptor exposure to non-criteria pollutants, toxic air contaminants (TACs) and/or odors, during construction would be minimal and short-term. Impacts to Air Quality resulting from the implementation of the proposed project would be less than significant. The proposed project's contribution to regional air quality problems would not be cumulatively considerable. Given the scale of the project and its consistency with the City General Plan and RAQS, it would not result in a cumulatively considerable net increase in air pollutants; and, therefore, would not violate any air quality standard or significantly contribute to an existing or projected air quality violation either during construction or operation due to the small size of the project.

This Page Intentionally Left Blank

1.0 Introduction

1.1 Purpose

The purpose of this report is to evaluate the potential air quality impacts during construction and operation of the proposed University City High School Athletic Facilities Improvements Project.

1.2 Project Background and Location

The San Diego Unified School District maintains and operates the University City High School, located in San Diego, California. The District has proposed a multi-phase improvement project consisting of athletic facilities improvements and the construction of new parking areas to serve these facilities. Funding is currently available for the first phase of this project, which entails the installation of artificial turf within the stadium, a synthetic track, stadium lighting, a scoreboard, and an upgraded sound system. No increase in student capacity at the high school is associated with this project, and all improvements would be conducted within the existing development footprint of the campus.

University City High School is located at 6949 Genesee Avenue, San Diego, California 92122. The school is bound on the north by Rose Canyon, on the west by Genesee Avenue, and on the south and east by existing residential development. Interstate 805 is located approximately 1 mile east of the project site, and Interstate 5 is 1.5 miles to the west. Local access to the school is provided by Centurion Square off of Genesee Avenue. The proposed project is located in the southern portion of the school site. Figure 1 illustrates the proposed project location on a regional scale.

1.3 Project Description

The proposed project is Phase I of the multi-phase improvement project proposed by the District. Phase I entails the installation of artificial turf within the 4.62 acre stadium to accommodate football, soccer, and field hockey events. In addition, the project proposes to replace the existing track surface with a synthetic track. Stadium lighting, a scoreboard, and an upgraded sound system are also proposed as improvements to the facility. Figure 2 illustrates some of these project components.

The artificial turf field would consist of a vertical draining, porous base underneath a complete synthetic grass system. The end zone areas would be made from specified color fiber, and the center field logo would be painted or inlaid according to artwork submitted by the District. The synthetic track surface would consist of a polyurethane bound impermeable Styrene Butadiene Rubber (SBR) base mat surface with a colored polyurethane structural spray finish. The stadium lighting systems would consist of a steel pole and steel crossarm assembly, wire harness, and electrical component enclosure. Each pole would be supported by a pre-stressed concrete base. The

scoreboard would be forest green in color and no greater than 20 feet in length by 10 feet 6 inches in height by 8 inches in depth.

2.0 Existing Conditions

2.1 Climate and Topography[1]

The weather of the San Diego region, as in most of southern California, is influenced by the Pacific Ocean and its semi-permanent high-pressure systems that result in dry, warm summers and mild, occasionally wet winters. The average temperature ranges from the mid 40s to the high 90s. Most of the county's precipitation falls from November to April, with infrequent (approximately ten percent) precipitation during the summer. The average seasonal precipitation along the coast is approximately ten inches; the amount increases with elevation as moist air is lifted over the mountains (University of CA, 1970).

The topography in the San Diego region varies greatly, from beaches on the west to mountains and desert on the east; along with local meteorology, it influences the dispersal and movement of pollutants in the basin. The mountains to the east prohibit dispersal of pollutants in that direction and help trap them in inversion layers.

The interaction of ocean, land, and the Pacific High Pressure Zone maintains clear skies for much of the year and influences the direction of prevailing winds (westerly to northwesterly). Local terrain is often the dominant factor inland, and winds in inland mountainous areas tend to blow through the valleys during the day and down the hills and valleys at night.

2.2 Air Pollution Climatology

The project site is located within the San Diego Air Basin (SDAB). The SDAB lies in the southwest corner of California and comprises the entire San Diego region, covering 4,260 square miles, and is an area of high air pollution potential. This Basin experiences warm summers, mild winters, infrequent rainfalls, light winds, and moderate humidity. This usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

The Basin experiences frequent temperature inversions. Subsidence inversions occur during the warmer months as descending air associated with the Pacific high pressure cell comes into contact with cool marine air. The boundary between the two layers of air creates a temperature inversion that traps pollutants. The other type of inversion, a radiation inversion, develops on winter nights when air near the ground cools by heat radiation and air aloft remains warm. The shallow inversion layer formed between these

[1] Subsection 2.1 is based on the information provided in the City of San Diego *Draft General Plan Final PEIR* Section 3.2. September 2007.

two air masses also can trap pollutants. As the pollutants become more concentrated in the atmosphere, photochemical reactions occur that produce ozone, commonly known as smog.

Light and daytime winds, predominantly from the west, further aggravate the condition by driving air pollutants inland, toward the mountains. During the fall and winter, air quality problems are created due to carbon monoxide (CO) and nitrogen dioxide (NO_2) emissions. CO concentrations are generally higher in the morning and late evening. In the morning, CO levels are relatively high due to cold temperatures and the large number of cars traveling. High CO levels during the late evenings are a result of stagnant atmospheric conditions trapping CO in the area. Since CO is produced almost entirely from automobiles, the highest CO concentrations in the Basin are associated with heavy traffic. NO_2 levels are also generally higher during fall and winter days

Under certain conditions, atmospheric oscillation results in the offshore transport of air from the Los Angeles region to San Diego County. This often produces high O_3 concentrations, as measured at air pollutant monitoring stations within the County. The transport of air pollutants from Los Angeles to San Diego has also occurred within the stable layer of the elevated subsidence inversion, where high levels of O_3 are transported.

Table 1 illustrates the main sources of pollution within the San Diego Air Basin.

Table 1
Sources of Emissions in the San Diego Region

Source	***Percentage***
Motor Vehicles (cars, trucks, buses)	42%
Industry and Commerce (which includes power plants)	11%*
Other Mobile (trains, planes, ships, agricultural equipment)	37%
Home Products	9%
Agriculture	1%

Source: San Diego County Air Pollution Control District, 2007.
(As included in the City of San Diego General Plan, Conservation Element, March 2008.)
** This percentage includes emissions generated by power plants producing electricity in the San Diego region. Local fossil-fuel based power plants produce about 2500 megawatts (MW) of electricity. During peak periods, the San Diego region imports about another 1500 MW of power, the generation of which affects skies outside our region.*

2.3 Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution, as identified by CARB, include children under 14, the elderly over 65 years of age, athletes, and people with cardiovascular and chronic respiratory diseases. Sensitive receptors include residences, schools, playgrounds, child care

centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes.

Existing sensitive receptors in close proximity to the project site consist of single family residences located south and east of the site, as well as students and staff at University City High School.

3.0 Pollutants and Effects

Criteria air pollutants are defined as pollutants for which the federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The federal and State standards have been set at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include: CO, ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), particulate matter less than 10 microns in diameter (PM_{10}), and lead (Pb). These pollutants are discussed below[2].

Carbon Monoxide. CO is a colorless and odorless gas formed by the incomplete combustion of fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas such as the project location, automobile exhaust accounts for the majority of CO emissions. CO is a non-reactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions; primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, a typical situation at dusk in urban areas between November and February. The highest levels of CO typically occur during the colder months of the year when inversion conditions are more frequent. In terms of health, CO competes with oxygen, often replacing it in the blood, thus reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can be dizziness, fatigue, and impairment of central nervous system functions.

Ozone. O_3 is a colorless gas that is formed in the atmosphere when volatile organic compounds (VOC) (sometimes classified as reactive organic gases [ROG]) and NO_X react in the presence of ultraviolet sunlight. O_3 is not a primary pollutant; it is a secondary pollutant formed by complex interactions of two pollutants directly emitted into the atmosphere. The primary sources of VOC and NO_X, the components of O_3, are automobile exhaust and industrial sources. Meteorology and terrain play major roles in

[2] The following descriptions of health effects for each of the criteria air pollutants associated with project construction and operations are based on the EPA *Six Common Air Pollutants* (EPA 2008c) and the California Air Resources Board *Glossary of Air Pollutant Terms* (CARB 2008c) published information.

O_3 formation and ideal conditions occur during summer and early autumn, on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. Short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes.

Nitrogen Dioxide. NO_2, like O_3, is not directly emitted into the atmosphere but is formed by an atmospheric chemical reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as NO_X and are major contributors to O_3 formation. High concentrations of NO_2 can cause breathing difficulties and result in a brownish-red cast to the atmosphere with reduced visibility. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis and some increase in bronchitis in children (two and three years old) has also been observed at concentrations below 0.3 ppm.

Sulfur Dioxide. SO_2 is a colorless, pungent gas formed primarily by the combustion of sulfur containing fossil fuels. Main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels. SO_2 is an irritant gas that attacks the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. SO_2 can also yellow plant leaves and erode iron and steel.

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Fine particulate matter, or $PM_{2.5}$, is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g. motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as SO_2, NO_X, and VOC. Inhalable particulate matter, or PM_{10}, is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning, industrial sources, windblown dust from open lands; and atmospheric chemical and photochemical reactions.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances, such as lead, sulfates, and nitrates, can cause lung damage directly or be absorbed into the blood

stream, causing damage elsewhere in the body. Additionally, these substances can transport absorbed gases, such as chlorides or ammonium, into the lungs, also causing injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, as well as produce haze and reduce regional visibility.

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline, the manufacturing of batteries, paint, ink, ceramics, and ammunition and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phase-out of leaded gasoline reduced the overall inventory of airborne lead by nearly 95 percent. With the phase-out of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emission sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance including intelligence quotient performance, psychomotor performance, reaction time, and growth.

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans. A toxic substance released into the air is considered a toxic air contaminant (TAC). TACs are identified by federal and State agencies based on a review of available scientific evidence. In the State of California, TACs are identified through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics “Hot Spots” Information and Assessment Act, Assembly Bill 2588 was enacted by the Legislature in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emission sources, location of resulting “hot spots,” notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over five years.

4.0 Regulatory Setting

Air quality is defined by ambient air concentrations of specific pollutants identified by the United States Environmental Protection Agency (EPA) to be of concern with respect to health and welfare of the general public. The EPA is responsible for enforcing the Federal Clean Air Act (CAA) of 1970 and its 1977 and 1990 Amendments. The CAA

required the EPA to establish National Ambient Air Quality Standards (NAAQS), which identify concentrations of pollutants in the ambient air below which no adverse effects on the public health and welfare are anticipated. In response, the EPA established both primary and secondary standards for several pollutants (called "criteria" pollutants). Primary standards are designed to protect human health with an adequate margin of safety. Secondary standards are designed to protect property and the public welfare from air pollutants in the atmosphere.

The CAA allows states to adopt ambient air quality standards and other regulations provided they are as stringent as federal standards. The California Air Resources Board (ARB) has established the more stringent California Ambient Air Quality Standards (CAAQS) for the six criteria pollutants through the California Clean Air Act of 1988, and also has established CAAQS for additional pollutants, including sulfates, hydrogen sulfide, vinyl chloride and visibility-reducing particles

The California Air Resources Board (CARB) is the state regulatory agency with authority to enforce regulations to both achieve and maintain the NAAQS and CAAQS. CARB is responsible for the development, adoption, and enforcement of the state's motor vehicle emissions program, as well as the adoption of the CAAQS. CARB also reviews operations and programs of the local air districts, and requires each air district with jurisdiction over a nonattainment area to develop its own strategy for achieving the NAAQS and CAAQS. The local air district has the primary responsibility for the development and implementation of rules and regulations designed to attain the NAAQS and CAAQS, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations. The SDAPCD is the local agency responsible for the administration and enforcement of air quality regulations for San Diego County.

Table 2 summarizes the role and responsibilities of agencies that set and enforce policies applicable to the regional location of the proposed project.

Table 2
Summary of Agencies Involved in Air Quality Management in San Diego County

Agency	***Roles and Responsibilities***
U.S. Environmental Protection Agency (EPA)	*Federal agency* - Sets national clean air policies under the federal CAA; promulgates the NAAQS; reviews and approves SIPs.
California Air Resources Board (CARB)	*State agency* - Establishes state-wide clean air policies and rules; promulgates the CAAQS; regulates mobile sources (i.e. motor vehicles) of emissions; and conducts ambient air monitoring throughout California. Also involved in the preparation of the SIP. (Located and headquartered in Sacramento.)
San Diego County Air Pollution Control District	*Local agency* – Enforces federal and state air quality regulations county-wide; plans, implements, and enforces

Table 2
Summary of Agencies Involved in Air Quality Management in San Diego County

Agency	*Roles and Responsibilities*
(SDAPCD)	attainment and/or maintenance programs; permits stationary sources of emissions; conducts air monitoring; and is involved with SANDAG in preparation of the SIP for San Diego County. (Located in San Diego.)

Source: KB Environmental Sciences, Inc., 2007.
NAAQS= National Ambient Air Quality Standards *CAA = Clean Air Act*
CAAQS= California Ambient Air Quality Standards *SANDAG=San Diego Council of Governments*
SIP = State Implementation Plan

The SDAPCD and the San Diego Association of Governments (SANDAG) are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The San Diego County Regional Air Quality Strategy (RAQS) was initially adopted in 1991, and is updated on a triennial basis; most recently in 2004. The RAQS outlines SDAPCD's plans and control measures designed to attain the state air quality standards for O_3. The SDAPCD has also developed the air basin's input to the State Implementation Plan (SIP), which is required under the Federal Clean Air Act for areas that are in nonattainment of air quality standards. The SIP includes the APCD's plans and control measures for attaining the O_3 NAAQS and is also updated on a triennial basis.

The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in the County, to project future emissions and then determine from that the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population, vehicle trends, and land use plans developed by the cities and by the County as part of the development of the County's General Plan. As such, projects that propose development that is consistent with, or less dense than, the growth anticipated by the general plans would be consistent with the RAQS. However, if a project proposes development that is greater than that anticipated in the general plan and SANDAG's growth projections, the project might be in conflict with the RAQS and SIP, and might have a potentially significant impact on air quality.

The SIP relies on the same information from SANDAG to develop emission inventories and emission reduction strategies that are included in the attainment demonstration for the air basin. The SIP also includes rules and regulations that have been adopted by the SDAPCD to control emissions from stationary sources. These SIP-approved rules may be used as a guideline to determine whether a project's emissions would have the potential to conflict with the SIP and thereby hinder attainment of the NAAQS for O_3.

Table 3 presents a summary of the ambient air quality standards adopted by the federal and California Clean Air Acts.

Table 3
Ambient Air Quality Standards

POLLUTANT	AVERAGE TIME	CALIFORNIA STANDARDS[1]		NATIONAL STANDARDS[2]		
		Concentration[3]	*Method*[4]	*Primary*[3,5]	*Secondary*[3,6]	*Method*[7]
Ozone (O3)	1 hour	0.09 ppm (180 μg/m^3)	Ultraviolet Photometry	--	Same as Primary Standard	Ultraviolet Photometry
	8 hour	0.070 ppm (137 μg/m^3)		0.075 ppm (147 μg/m^3)		
Carbon Monoxide (CO)	8 hours	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Spectroscopy (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Spectroscopy (NDIR)
	1 hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)	Gas Phase Chem-iluminescence	0.053 ppm (100 μg/m^3)	Same as Primary Standard	Gas Phase Chemi-luminescence
	1 hour	0.18 ppm (339 μg/m^3)		--		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	--	Ultraviolet Fluorescence	0.030 ppm (80 μg/m^3)	--	Spectrophoto-metry (Pararosaniline Method)
	24 hours	0.04 ppm (105 μg/m^3)		0.14 ppm (365 μg/m^3)	--	
	3 hours	--		--	0.5 ppm (1300 μg/m^3)	
	1 hour	0.25 ppm (655 μg/m^3)		--	--	--
Respirable Particulate Matter (PM_{10})	24 hours	50 μg/m^3	Gravimetric or Beta Attenuation	150 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 μg/m^3		--		
Fine Particulate Matter ($PM_{2.5}$)	24 hours	No Separate State Standard		35 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 μg/m^3	Gravimetric or Beta Attenuation	15 μg/m^3		
Lead[8]	30-day Average	1.5 μg/m^3	Atomic Absorption	--	--	Atomic Absorption
	Calendar Quarter	--		1.5 μg/m^3	Same as Primary Standard	
	Rolling 3-Month Average[9]	--		0.15 μg/m3		High Volume Sampler and Atomic Absorption

ppm= parts per million
μg/m^3 = micrograms per cubic meter
mg/m^3= milligrams per cubic meter
Source: California Air Resources Board , 11/17/08. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf
1. California standards for ozone, carbon monoxide, sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in

Table 3
Ambient Air Quality Standards

POLLUTANT	AVERAGE TIME	CALIFORNIA STANDARDS[1]		NATIONAL STANDARDS[2]		
		Concentration[3]	*Method*[4]	*Primary*[3,5]	*Secondary*[3,6]	*Method*[7]

the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
Contact U.S. EPA for further clarification and current federal policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr.
Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.
8. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
9. National lead standard, rolling 3-month average: final rule signed October 15, 2008.

5.0 Background Air Quality

5.1 San Diego County Attainment Designation

An area is designated in attainment when it is in compliance with the National and/or California Ambient Air Quality Standards. These standards are set by the EPA or CARB for the maximum level of a given air pollutant which can exist in the outdoor air without unacceptable effects on human health or the public welfare.

As of July 2008, the SDAB was designated non-attainment for the eight-hour NAAQS for O_3. The SDAB was designated in attainment for all other criteria pollutants under the NAAQS with the exception of PM_{10}, which was determined to be unclassifiable. The SDAB is currently designated non-attainment for O_3, both one-hour and eight-hour, and particulate matter, PM_{10} and $PM_{2.5}$, under the CAAQS. It is designated attainment for CO, NO_2, SO_2, lead, and sulfates.

Table 4 summarizes the San Diego County's federal and state attainment designations for each of the criteria pollutants.

Table 4
San Diego County's Attainment Status

Criteria Pollutant	*Federal Designation*	*State Designation*
Ozone (one hour)	Attainment*	Nonattainment
Ozone (eight hour)	Nonattainment	Nonattainment
Carbon Monoxide	Attainment	Attainment
PM_{10}	Unclassifiable**	Nonattainment
$PM_{2.5}$	Attainment	Nonattainment
Nitrogen Dioxide	Attainment	Attainment
Sulfur Dioxide	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	(no federal standard)	Attainment
Hydrogen Sulfide	(no federal standard)	Unclassified
Visibility	(no federal standard)	Unclassified

Source: SDAPCD 2007.
** The federal 1-hour standard of 12 pphm was in effect from 1979 through June 15, 2005. The revoked standard is referenced here because it was employed for such a long period and because this benchmark is addressed in State Implementation Plans.*
*** At the time of designation, if the available data does not support a designation of attainment or nonattainment, the area is designated as unclassifiable.*

For nonattainment pollutants (ozone, with ozone precursors NO_X and VOCs) and particulate matter, if emissions exceed the thresholds shown in Table 4, the project could have the potential to result in a cumulatively considerable net increase in these pollutants and thus could have a significant impact on the ambient air quality.

5.2 Air Quality Monitoring Data

The SDAPCD operates a network of ambient air monitoring stations throughout San Diego County, which measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The SDAPCD monitors air quality conditions at ten locations throughout the Basin. The nearest ambient monitoring stations to the project site are the Del Mar-Mira Costa station (which measures ozone), the Camp Pendleton station (which is the closest station that measures NO_2), the Escondido East Valley Parkway station (which is the closest station that measures particulate matter and CO), and the San Diego 12th Avenue and Beardsley Avenue stations (which are the closest stations that measure SO_2).

The federal 8-hour ozone standard, which was formally adopted in 2001, was exceeded at the Del Mar monitoring station three times in 2004. The SDAB was classified as nonattainment for the 8-hour NAAQS for O_3. The Escondido monitoring station measured one exceedance of the 24-hour CAAQS for PM10 in 2004, and one exceedance of the previous 24-hour NAAQS of 65 µg/m3 for PM2.5 in 2004. The data

from the monitoring stations indicate that air quality is in attainment of all other federal standards.

Ambient concentrations of pollutants over the last three years are presented in Table 5.

Table 5
Ambient Background Concentrations
(ppm unless otherwise indicated)

Pollutant	*Averaging Time*	*2004*	*2005*	*2006*	*2007*	*Most Stringent Ambient Air Quality Standard*	*Monitoring Station*
Ozone	8 hour	0.095	0.070	0.074	0.079	0.070	Del Mar
	1 hour	0.129	0.082	0.086	0.110	0.09	
PM_{10}	Annual	27.5 µg/m^3	23.9 µg/m^3	22.9 µg/m^3	24 µg/m^3	20 µg/m^3	Escondido
	24 hour	57 µg/m^3	42 µg/m^3	52 µg/m^3	68 µg/m^3	50 µg/m^3	
$PM_{2.5}$	Annual	14.1 µg/m^3	12.3 µg/m^3	11.5 µg/m^3	13.31 µg/m^3	12 µg/m^3	Escondido
	24 hour	67.3 µg/m^3	43.1 µg/m^3	40.6 µg/m^3	151.0 µg/m^3	35 µg/m^3	
NO_2	Annual	0.012	0.012	0.011	0.068	0.030	Camp Pendleton
	1 hour	0.099	0.077	0.081	0.011	0.18	
CO	8 hour	3.61	3.10	3.61	3.19/0	9.0	Escondido
	1 hour	6.3	5.9	5.7	5.2/0	20	
SO_2	Annual	0.004	0.002	0.004	0.003	0.03	San Diego
	24 hour	0.008	0.007	0.009	0.006	0.04	
	3 hour	0.020	0.019	0.026	0.10	0.5	
	1 hour	0.042	0.040	0.036	0.018	0.25	

Locations of the Monitoring Stations can be found within the City of San Diego General Plan PEIR, available at http://www.sandiego.gov/planning/genplan/pdf/generalplan/peir311thru321.pdf
Source: CARB 2009 *(1-hour and 8-hour Ozone, 8-hour CO, and PM_{10} and $PM_{2.5}$ 24-hour)* and EPA 2009 *(SO_2, 1-hour CO, NO_2, and PM_{10} and $PM_{2.5}$ annual).*

6.0 Thresholds of Significance

The State of California has developed guidelines to address the significance of air quality impacts based on Appendix G of the State CEQA Guidelines which provides guidance that a project would have a significant environmental impact if it would:

1. Conflict or obstruct the implementation of the San Diego Regional Air Quality Strategy (RAQS) or applicable portions of the State Implementation Plan (SIP);
2. Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation;
3. Result in a cumulatively considerable net increase of PM_{10} or exceed quantitative thresholds for O_3 precursors, oxides of nitrogen (NO_X) and volatile organic compounds (VOCs);

4. Expose sensitive receptors (including, but not limited to, schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations; or
5. Create objectionable odors affecting a substantial number of people.

To determine whether a project would (a) result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation; or (b) result in a cumulatively considerable net increase of PM_{10} or exceed quantitative thresholds for O_3 precursors, oxides of nitrogen (NO_X) and volatile organic compounds (VOCs), project emissions may be evaluated based on the quantitative emission thresholds established by the San Diego APCD. As part of its air quality permitting process, the APCD has established thresholds in Rule 20.2 for the preparation of Air Quality Impact Assessments (AQIA).

For CEQA purposes, these screening criteria can be used as numeric methods to demonstrate that a project's total emissions would not result in a significant impact to air quality. Since APCD does not have AQIA thresholds for emissions of VOCs, the use of the threshold for VOCs from the City of San Diego's Significance Thresholds, is appropriate. The screening thresholds are included in the Table 6, below.

Table 6
Screening-Level Criteria for Air Quality Impacts

Construction Emissions			
Pollutant	***Total Emissions (Lb. per Day)***		
Respirable Particulate Matter (PM_{10})	100		
Fine Particulate Matter ($PM_{2.5}$)	100		
Oxides of Nitrogen (NO_X)	250		
Oxides of Sulfur (SO_X)	250		
Carbon Monoxide (CO)	550		
Volatile Organic Compounds (VOC)	137***		
Operational Emissions			
Pollutant	***Total Emissions***		
	Lb. Per Hour	***Lb. per Day***	***Tons per Year***
Respirable Particulate Matter (PM_{10})	---	100	15
Fine Particulate Matter ($PM_{2.5}$)	---	100	15
Oxides of Nitrogen (NO_X)	25	250	40
Oxides of Sulfur (SO_X)*	25	250	40
Carbon Monoxide (CO)	100	550	100
Lead and Lead Compounds**	---	3.2	0.6
Volatile Organic Compounds (VOC)	---	137***	15

Table 6
Screening-Level Criteria for Air Quality Impacts

Source: SDAPCD 1999, Rule 1501, 20.2(d)(2)
**San Diego Air Basin has been in attainment of SOx standard due to sulfur-free natural gas for electricity generation and lack of heavy industrial/manufacturing uses in the region.*
***Lead emissions have steadily declined due to catalytic converters and increased use of lead-free gasoline. San Diego is no longer required to monitor for lead.*
****VOC threshold based on SCAQMD levels per South Coast Air Quality Management District SDAPCD (9/01) and the Monterey Bay APCD (MBAPCD) which has similar federal and state attainment status as San Diego.*

The thresholds listed in Table 6 represent screening-level thresholds that can be used to evaluate whether project-related emissions could cause a significant impact on air quality. Emissions below the screening-level thresholds would not cause a significant impact. In the event that emissions exceed these thresholds, modeling would be required to demonstrate that the project's total air quality impacts result in ground-level concentrations that are below the State and Federal Ambient Air Quality Standards, including appropriate background levels. For nonattainment pollutants (ozone, with ozone precursors NOx and VOCs, and PM_{10}), if emissions exceed the thresholds shown in Table 6, the project could have the potential to result in a cumulatively considerable net increase in these pollutants and thus could have a significant impact on the ambient air quality.

In addition to impacts from criteria pollutants, project impacts may include emissions of pollutants identified by the state and federal government as toxic air contaminants (TACs) or Hazardous Air Pollutants (HAPs). In San Diego County, APCD Regulation XII establishes acceptable risk levels and emission control requirements for new and modified facilities that may emit additional TACs. Under Rule 1210, emissions of TACs that result in a cancer risk of 10 in 1 million or less and a health hazard index of one or less would not be required to notify the public of potential health risks. If a project has the potential to result in emissions of any TAC or HAP which result in a cancer risk of greater than 10 in 1 million, the project would be deemed to have a potentially significant impact.

APCD Rule 51 (Public Nuisance) also prohibits emission of any material which causes nuisance to a considerable number of persons or endangers the comfort, health or safety of any person. A project that proposes a use which would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of offsite receptors.

7.0 Impacts

The significance criteria described in Section 6.0, above, was used to evaluate impacts associated with the construction and operation of the proposed project.

7.1 Construction Impacts

Construction of the proposed project would result in a temporary addition of pollutants to the local airshed caused by soil disturbance dust emissions and combustion pollutants from on-site construction equipment, as well as from off-site trucks hauling dirt or other field or track materials. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation and, for dust, the prevailing weather conditions. Therefore, such emission levels can only be approximately estimated with a corresponding uncertainty in precise ambient air quality impacts. Fugitive dust emissions would primarily result from grading and site preparation activities. NO_X emissions would primarily result from the use of construction equipment. During the finishing phase, paving operations and the application of the polyurethane spray finish, considered architectural coatings (e.g., paints) would release VOCs.

Emissions from the construction phase of the project were estimated through the use of emission factors from the URBEMIS2007 (version 9.2.4) computer model (see Appendix A). As model defaults were not available for the SDAB, the model was run based on the South Coast AQMD defaults, which were determined to be the most similar in characteristics to the SDAB and generally representative of the Southern California area. The model was run using a combination of default construction assumptions contained in the model and information specific to the proposed athletic field improvements. A reasonable worst-case construction schedule was assumed at a five-month construction time frame, where site preparation and installment of the artificial turf would occur during the first 12 weeks of construction (see Appendix A for further details). The equipment mix anticipated for construction activity was based off of typical artificial turf and synthetic track installation construction practices. Table 7 shows the estimated maximum unmitigated daily construction emissions associated with the installation of the artificial field, the replacement of the dirt track with synthetic track, and the installation of stadium lighting, a scoreboard, and an upgraded sound system.

Table 7
Estimated Daily Maximum Construction Emissions
(lbs/day unmitigated)

	VOC	***NO_X***	***CO***	***SO_2***	***PM_{10}***	***$PM_{2.5}$***
Proposed Project	81.01*	48.38	26.59	0.01	25.88	7.31
Pollutant Threshold	*137*	*250*	*550*	*250*	*100*	*100*
Threshold Exceeded?	No	No	No	No	No	No

Source: URBEMIS2007 Version 9.2.4. See Appendix A for complete results
**Maximum VOC from vehicular emissions during construction (equipment operation and worker trips), as determined by URBEMIS, would be 6.12 lb/day. The architectural coating construction phase would generate a total of approximately 375 lb of VOC, or ~75 ld/day over a 5-day application timeline. See calculations in Appendix B.*

As shown, daily construction regional emissions would not exceed the thresholds for VOC, CO, SO_X, $PM_{2.5}$, or PM_{10}. The proposed project would be required to comply with

SDAPCD Rule 67 (Architectural Coatings), and, as shown in Table 7, above, construction emissions would result in a less-than significant VOC impact. As such, the proposed project would be consistent with Rule 67 and architectural coating emissions would result in a less-than-significant impact.

The project would be required to comply with City grading ordinance provisions that require dust control (Municipal Code 23.24.00). In addition, recommended mitigation measures would include dust suppression methods, such as watering roads and staging areas, to minimize airborne particulate matter that would be created during construction activities. Additionally, all construction equipment and vehicles will be required to be kept in good operating condition to minimize exhaust emissions. Standard construction practices would be used to control fugitive dust during the construction phases of the proposed project.

Sensitive receptors that could be potentially affected by the implementation of the proposed athletic field improvements include University City High School students, faculty, and visitors within the immediate vicinity of the school stadium, where construction would occur. The proposed project would be required to comply with the City of San Diego Municipal Code, limiting construction to the hours between 7:00 a.m. and 7:00 p.m. on weekdays; therefore, construction activity would occur during school hours. However, construction would be temporary, lasting approximately two months. As the proposed project would not generate substantial pollutant emissions or concentrations and as construction impacts would be short-term, potential impacts to sensitive receptors would be less than significant.

Recommended Mitigation Measures

To further reduce less than significant impacts, the following mitigation measures are recommended:

- On-road trucks and other mobile equipment should be properly tuned and maintained to manufacturers' specifications to ensure minimum emissions under normal operations.
- Vehicle speeds should be limited to 15 mph on unpaved (no gravel or similar surfacing material) roads.
- Apply water or chemical dust suppressants to unstabilized disturbed areas and/or unpaved roadways in sufficient quantity and frequency to maintain a stabilized surface.
- All clearing and grading activities should cease during periods of high wind (greater than 20 mph averaged over 1 hour).
- Exposed stockpiles of soil and other excavated materials should be contained within perimeter silt fencing, watered, treated with soil binders, or covered as necessary.
- The developer should require the use of particulate filters on diesel construction equipment if use of such filters is demonstrated to be cost-competitive for use on this project.

- To the extent feasible, unnecessary construction vehicle and idling time should be minimized.
- The construction contractor should utilize as much as possible pre-coated/natural colored building materials. Water-based or low VOC coatings with a VOC content of 100 grams per liter or less should be used. Spray equipment with high transfer efficiency, such as the electrostatic spray gun method, or manual coatings application such as paint brush hand roller, trowel, spatula, dauber, rag, or sponge, shall be used to reduce VOC emissions, where practical.

7.2 Operational Impacts

The proposed project would entail the installation of artificial turf within the stadium, a synthetic track, stadium lighting, a scoreboard, and an upgraded sound system. The project consists of improvements to exciting facilities and does not involve new development or would it facilitate new development. As described in Section 2, Project Overview, no increase in student capacity at the high school is associated with this project, and all improvements would be conducted within the existing development footprint of the campus. Operational emissions are typically classified under two categories: area sources, which are stationary, and vehicular sources, which are mobile. Motor vehicles associated with new development typically generate the highest emissions of air pollutants. As the proposed athletic improvements would neither increase student capacity nor necessitate additional school staff, no increase in vehicular trips are associated with the proposed project. Continued use of the football field by current students would still generate long-term emissions from vehicle trips, yet no increase in emissions would occur with the implementation of the proposed field improvements. Accordingly, there would be no project-generated operational impacts associated with vehicular sources.

As artificial turf would replace natural grass, the project would result in a long-term benefit as a lawn mower or tractor would not have to be employed to constantly maintain the planted field. The U.S. Environmental Protection Agency has calculated that standard maintenance of 1000 acres of lawn would result in the emission of 18 tons of VOCs per year (EPA 2008b); therefore, as the standard American football field is 1.3 acres[3], it is anticipated that maintenance of the existing field would result in approximately 0.0234 tons, or ~52 lbs, of VOC per year. The proposed artificial turf would not require landscaping maintenance that would result in the release of air quality pollutants.

Terrestrial carbon sequestration is the process through which carbon dioxide (CO_2) from the atmosphere is absorbed by trees, plants and crops through photosynthesis, and stored as carbon in biomass (tree trunks, branches, foliage and roots) and soils (EPA 2006). There are many different factors that determine the total carbon storage potential of biomass as carbon sequestration rates vary by tree species, soil type, regional climate, topography, and management practice. The type of perennial grass

[3] 360ft length x 160 ft width = 57,600 square feet. 1 acre = 43,560 square foot.

that currently is planted on the football field does not have a high carbon sequestration potential; the grass is short and frequently disturbed during athletic activities. Above all, the area of natural grass that would be replaced with artificial turf is minimal, less than 1.5 acres. The loss of natural grass that would be capable of sequestering CO_2 would be minimal and incalculable.

7.3 Toxic Air Contaminants

The greatest potential for TAC emissions during construction would be diesel particulate emissions associated with heavy equipment operations. Health effects from carcinogenic air toxics are usually described in terms of individual cancer risk. "Individual Cancer Risk" is the likelihood that a person continuously exposed to concentrations of TACs over a 70-year lifetime will contract cancer based on the use of standard risk-assessment methodology. Given the short-term construction schedule of approximately two months, and that the project would not require the extensive use of heavy-duty construction equipment, the proposed project would not result in a long-term (i.e., 70 years) source of TAC emissions. No residual emissions and corresponding individual cancer risk are anticipated after construction. As such, project-related TAC emission impacts during construction would be less than significant.

7.4 Odors

Construction Odor Impacts. Potential sources that may emit odors during construction activities include equipment exhaust and coatings, which include the finishing of the scoreboard and the polyurethane sealant of the track. Odors from these sources would be localized and generally confined to the project site. The proposed project would utilize typical construction techniques, and the odors would be typical of most construction sites. Additionally, the odors would be temporary. As such, proposed project construction would not cause an odor nuisance, and odor impacts would be less than significant.

Operational Odor Impacts. Land uses and industrial operations that are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies and fiberglass molding. The propose project entails improvements to the existing UCHS athletic facilities located on school property and would not result in a change in land use. The existing facilities, including the stadium field and track, currently do not create objectionable odors and the utilization of those facilities with the incorporation of the proposed improvements would also not generate odors. Therefore, project operations would result in a less-than-significant odor impact.

7.5 Consistency with the Regional Air Quality Strategy

The SDAPCD is responsible for the overall development and implementation of the RAQS. The RAQS control measures focus on emission sources under the SDAPCD's authority, specifically stationary emission sources and some areawide sources.

However, the emission inventories and emission projections in the RAQS reflect the impact of all emission sources and all control measures, including those under the jurisdiction of the CARB (e.g., on-road motor vehicles, offroad vehicles and equipment, and consumer products) and the EPA (e.g., aircraft, ships, trains, and pre-empted off-road equipment). Thus, while legal authority to control different pollution sources is separated, the SDAPCD is responsible for reflecting federal, State, and local measures in a single plan to achieve ambient air quality standards in San Diego County. Achieving ambient air quality standards requires a cooperative partnership of governmental agencies at the federal, State, and local levels.

The RAQS relies on information from SANDAG, including projected growth in the County, to forecast future emissions in the Basin. Thus, it is imperative that proposed projects are consistent with the population, housing, and employment assumptions that were used in the development of the RAQS. The proposed athletic facilities improvements would not result in a change of zoning or land use of the project site and would therefore be consistent with the General Plan Land Use Designations.

SANDAG growth projections are identified in its Regional Comprehensive Plan (RCP).12 The proposed project would neither include residential development nor would it facilitate new development. The proposed project would not include a commercial component and would not increase employment in San Diego County. The proposed project would not result in housing, population, or employment growth and therefore would not exceed the growth forecasts for the County of San Diego as adopted by SANDAG. As such, the proposed project would be consistent with growth assumptions included in the RCP and consistent with the RAQS.

8.0 Cumulative Impacts

In analyzing cumulative impacts from a proposed project, the analysis must specifically evaluate a project's contribution to the cumulative increase in pollutants for which the SDAB is listed as non-attainment for the State AAQS. The project would have a cumulatively considerable impact if project-generated emissions would exceed thresholds for PM_{10}, NO_X and/or VOCs. If the proposed project does not exceed thresholds and is determined to have less than significant project-specific impacts, it may still have a cumulatively considerable impact on air quality if the emissions from the project, in combination with the emissions from other proposed or reasonably foreseeable future projects, are in excess established thresholds. However, the project would only be considered to have a cumulative impact if the project's contribution accounts for a significant proportion of the cumulative total emissions.

Background ambient air quality, as measured at the monitoring stations maintained and operated by the APCD, measures the concentrations of pollutants from existing sources; therefore, past and present project impacts are included in the background ambient air quality data.

PM_{10} and $PM_{2.5}$ emissions associated with construction generally result in near-field impacts. As discussed Section 9.1, Project Construction Impacts, the emissions of all criteria pollutants, including PM_{10} and $PM_{2.5}$, would be below the significance levels. Construction would be short-term and consistent with the size and scale of the proposed athletic field improvements. Construction activities required for the implementation of the proposed project would be considered minor and not intensive. It is unlikely that construction would be conducted for the University City High School Athletic Facilities Improvements project at the same time and in the same general vicinity as other major construction projects within San Diego; therefore, project construction is not anticipated to result in a cumulatively significant impact on air quality.

With regard to cumulative impacts associated with ozone precursors, in general, if a project is consistent with the community and general plans, it has been accounted for in the ozone attainment demonstration contained within the State Implementation Plan. As such, it would not cause a cumulatively significant impact on the ambient air quality for ozone. The University City High School Athletic Facilities Improvements project does not represent an increase in projected traffic over the current conditions; emissions of ozone precursors (VOCs and NO_X) would be well below the screening-level thresholds during construction and would not result in any calculable increase of O_3 precursors during operation. Thus the proposed project would not result in a cumulatively significant impact on ozone concentrations.

All projects within the City of San Diego that may exceed established daily construction emissions standards would be required to incorporate Best Available Control (BAC) Measures to reduce construction emissions to below thresholds. Project proponents must prepare and implement a Construction Management Plan that includes appropriate BAC measures that are determined on a project-by-project basis, and are specific to the pollutant for which the daily threshold may be exceeded. Control measures may include:

- Minimizing simultaneous operation of multiple construction equipment units;
- Use of low pollutant emitting equipment;
- Use of catalytic reduction for gasoline-powered equipment;
- Watering the construction area to minimize fugitive dust; and
- Minimizing idling time by construction vehicles.

As all projects would be required to implement measures to reduce their individual contribution to cumulative impacts, the projects contribution, in combination with other projects within the San Diego Air Basin, would be less than cumulatively considerable.

9.0 Global Climate Change

Climate change refers to any significant change in measures of climate, such as temperature, precipitation or wind, lasting for an extended period (decades or longer) (EPA 2008a).

The Greenhouse Effect and Greenhouse Gases (GHGs)

Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs). The greenhouse effect traps heat in the troposphere through a three-fold process as follows: Short-wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; and GHGs in the upper atmosphere absorb this long-wave radiation and emit this long-wave radiation into space and toward the Earth. This ”trapping” of the long-wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect. Principal GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and water vapor (H_2O). Some greenhouse gases, such as CO_2, CH_4, and N_2O, occur naturally and are emitted to the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Man-made GHGs, which have a much greater heat-absorption potential than CO_2, include fluorinated gases, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6), which are byproducts of certain industrial processes (CalEPA 2006). California emitted 484 million metric tons of GHGs in 2004 (CARB 2008b).

The greenhouse effect is a natural process that contributes to regulating the earth’s temperature. Without it, the temperature of the Earth would be about zero degrees F (-18°C) instead of its present 57°F (14°C). Global climate change concerns are focused on whether human activities are leading to an enhancement of the greenhouse effect (NCDC 2008).

The effect each GHG has on climate change is measured as a combination of the volume of its emissions and the potential of a gas or aerosol to trap heat in the atmosphere, known as its global warming potential (GWP). The GWP varies between GHGs; for example, the GWP of methane is 21, and the GWP of nitrous oxide is 310. Total GHG emissions are expressed as a function of how much warming would be caused by the same mass of CO_2. Thus, GHG gas emissions are typically measured in terms of pounds or tons of “CO_2 equivalents” (CO_2E).

According to CARB, some of the potential impacts in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (CARB 2006). Several recent studies have attempted to explore the possible negative consequences that climate change, left unchecked, could have in California. These reports acknowledge that climate scientists’ understanding of the complex global climate system, and the interplay of the various internal and external factors that affect climate change, remains too limited to yield scientifically valid conclusions on such a localized scale. Substantial work has been done at the international and national level to evaluate climatic impacts, but far less information is available on regional and local impacts.

The primary effect of global climate change has been a rise in average global tropospheric temperature of 0.2° Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005. Climate change modeling using 2000 emission rates shows that further warming would occur, which would induce further changes in the global climate system during the current century. Changes to the global climate system and ecosystems and to California would include, but would not be limited to:

- The loss of sea ice and mountain snow pack resulting in higher sea levels and higher sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures (IPCC 2007);
- Rise in global average sea level primarily due to thermal expansion and melting of glaciers and ice caps, the Greenland and Antarctic ice sheets (IPCC 2007);
- Changes in weather that includes, widespread changes in precipitation, ocean salinity, and wind patterns, and more energetic and aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones (IPCC 2007);
- Decline of Sierra snowpack, which accounts for approximately half of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years (CalEPA 2006);
- Increase in the number of days conducive to ozone formation by 25 to 85 percent (depending on the future temperature scenario) in high ozone areas of Los Angeles and the San Joaquin Valley by the end of the 21st century (CalEPA 2006); and
- High potential for erosion of California's coastlines and sea water intrusion into the Delta and levee systems due to the rise in sea level (CalEPA 2006).

Regulatory Setting

In response to growing scientific and political concern with global climate change, California recently adopted a series of laws to reduce emissions of GHGs to the atmosphere from commercial and private activities within the State. In September 2002, Governor Gray Davis signed Assembly Bill (AB) 1493, requiring the development and adoption of regulations to achieve "the maximum feasible reduction of greenhouse gases" emitted by noncommercial passenger vehicles, light-duty trucks, and other vehicles used primarily for personal transportation in the State.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order (EO) S-3-05, establishing statewide GHG emissions reduction targets. This EO provides that by 2010, emissions shall be reduced to 2000 levels; by 2020, emissions shall be reduced to 1990 levels; and by 2050, emissions shall be reduced to 80 percent of 1990 levels (Governor's Office, 2005). In response to the Executive Order, the Secretary of the

California Environmental Protection Agency (CalEPA) created the Climate Action Team (CAT), which, in March 2006, published the Climate Action Team Report to Governor Schwarzenegger and the Legislature (the "2006 CAT Report"). The 2006 CAT Report identifies a recommended list of strategies that the State could pursue to reduce climate change greenhouse gas emissions.

In September 2006, Governor Arnold Schwarzenegger signed the California Global Warming Solutions Act of 2006, Assembly Bill 32 (AB 32), into law. AB 32 commits the State to achieving 1990 levels of GHGs by 2020, which CARB has established at 427 million metric tons of CO_2 equivalent emissions. To achieve this goal, AB 32 mandates that CARB establish a quantified emissions cap, institute a schedule to meet the cap, implement regulations to reduce statewide GHG emissions from stationary sources, and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved. Governor Schwarzenegger, just two days after signing AB 32, strengthened California's commitment to reducing GHGs by signing SB 1368. SB 1368 requires the CEC to develop and adopt regulations for GHG emissions performance standards for the long-term procurement of electricity by local publicly-owned utilities. These standards must be consistent with the standards adopted by the Public Utilities Commission. This effort will help to protect energy customers from financial risks associated with investments in carbon-intensive generation by allowing new capital investments in power plants whose GHG emissions are as low or lower than new combined-cycle natural gas plants, by requiring imported electricity to meet GHG performance standards in California and requiring that the standards be developed and adopted in a public process.

Global Climate Change in San Diego

The City of San Diego faces many of the same challenges as those for the nation and state. More specifically, the following characteristics of the San Diego region make it vulnerable to climate change:

- Increasing population
- 52 miles of shoreline
- Reliance on imported energy and water
- Urban sprawl
- Vulnerable economic sectors—agriculture and tourism

The City of San Diego developed a Climate Protection Action Plan (CPAP) that was finalized in July 2005. The Plan acknowledged that investing in actions and institutionalizing policies to reduce greenhouse gas (GHG) emissions would have collateral benefits for San Diego, including economic vitality; public health and safety; natural resource protection; and infrastructure stability. Many of the recommendations of the Sustainable Community Program, approved in January 2002, were implemented in the CPAP. Table 8, below, illustrates the GHG projection in 2010 if no action is taken to curb emissions; the GHG emission reductions due to City of San Diego actions

implemented between 1990 and 2003; and the GHG reductions needed by 2010 to achieve 15% reduction.

Table 8
San Diego Citywide Greenhouse Gas Emissions Overview

Milestone	***Total Tons of GHG per year***
1990 Baseline	15,547,000
2010 "No Action" Projection (Status Quo)	22,517,000
2010 CCP Projection (Goal)	13,215,000
Difference Between Status Quo and Goal	9,302,000
Reduction Achieved from 1990 – 2003*	3,814,000**
Remaining Reduction Needed by 2010	5,488,000

Source: City of San Diego, Climate Protection Action Plan, July 2005. http://www.sandiego.gov/environmental-services/sustainable/pdf/action_plan_07_05.pdf
** Through a combination of increasing energy efficiency, retrofitting transit infrastructure, recycling, and recovering landfill gas, the City has reduced GHG emissions by more than 800,000 tons per year. This saves the City over $15 million dollars annually.*
***The cumulative reductions from 1990 – 2003 have eliminated the listed tonnage of GHG and thus can be assumed to prevent this same amount from accumulating on a per year basis going forward.*

The City of San Diego has been active in implementing strategies to reach its 2010 GHG reduction goal of 15% and to reduce its cumulative generation of greenhouse gases and contribution to global climate change. The CPAP has identified strategies that potentially reduce emissions associated with transportation, energy, waste, urban heat island effect, and environmentally preferable purchasing. Additionally, the City of San Diego has a number of existing policies, resolutions and initiatives that serve to advance the reduction of greenhouse gas emissions and will continue to contribute to the success of the Action Plan (San Diego 2005).

GHG Emissions and CEQA

GHG emissions contributing to global climate change have only recently been addressed in California Environmental Quality Act (CEQA) documents, such that CEQA and case law do not provide much guidance relative to their assessment. Quantitative significance thresholds for this topic have not been adopted by the State of California, or any particular air pollution control district, including the City of San Diego. CEQA does, however, provide guidance regarding topics such as climate change in Guidelines Section 15144, Forecasting. Section 15144 notes that preparation of an environmental impact analysis document necessarily involves some degree of forecasting. While forecasting the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can.

As stated above, currently, neither the State of California or the SDAB have established CEQA significance thresholds for greenhouse gas emissions. However, the California

Office of Planning & Research (OPR) has issued a Technical Advisory titled *CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review* in June 19, 2008. This advisory provides guidance to land use agencies in the interim period, until the state CEQA Guidelines are revised. The advisory states on page 4, in the third paragraph, *"Public agencies are encouraged but not required to adopt thresholds of significance for environmental impacts. Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from CEQA projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact."* Furthermore, the advisory document indicates in the third bullet item on page 6 that *"in the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a 'significant impact', individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice."*

Environmental Setting

The proposed project is located on the University City High School campus, which is currently developed with associated school and athletic facilities. The project would involve improvements to the existing athletic stadium. On a continuous basis, there is no existing measurable level of greenhouse gas emissions associated with the use of the athletic fields.

Construction Impacts

Greenhouse gas emissions would be associated with the construction phase of the proposed project through the use of heavy equipment and vehicle trips. Emissions of greenhouse gases would be short-term.

Operational Impacts: Project Energy Use and Vehicle Emissions

The proposed project would entail improvements to the exciting stadium facilities and would not result in new development or an increase in student capacity. No increase in air pollutant emissions in excess of existing operational emissions created by regular use of the athletic facilities, are anticipated to result from the implementation of the proposed project.

Project Cumulative Impacts

While global climate change is, by definition, a cumulative environmental impact and the impacts of climate change on California human and natural systems would also be substantial, there currently is no agreed-upon methodology to adequately identify, under CEQA, when project-level GHG emissions contribute considerably to this cumulative impact.

As a result of global fossil fuel consumption for 2005, CO_2 global emissions are estimated at 7,985 million metric tons, a 3.8% increase from CO_2 emissions resulting from global fossil fuel consumption in 2004 (Marland 2008). Unfortunately, scientific and factual data are not sufficiently available to judge, without undo speculation, whether projects with relatively small, incremental contributions to global GHG emission totals are cumulatively significant or insignificant. CEQA Guidelines §15145 states, *"If, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact."* Although the direct output of greenhouse gases from a project can theoretically be estimated (provided valid methodologies are developed), the emission of GHGs associated with implementation of any one development project would not necessarily result in any discernable direct impact globally or locally on climate, water availability, plant or wildlife species, populations, habitats, or ecosystems. Therefore, until such time that 1) sufficient scientific basis exists to accurately measure GHG emissions and project future climate trends, and 2) guidance is provided by regulatory agencies to evaluate thresholds of significance and control of GHG emissions, the significance of the proposed project's contribution to global GHG emissions and thereby climate change, pursuant to CEQA, cannot be judged and such an evaluation would be speculative.

The proposed project would not result in long-term operational impacts, but would result in temporary construction impacts. The air pollutant emissions generated from construction activity would be short term and less than significant. While no significant impacts have been identified due to the speculative nature of greenhouse gas impact assessment, standard City of San Diego and SDAPCD measures would reduce the amount of GHG emissions generated during construction.

At this time, there are no adopted thresholds of significance for GHG emissions and the methodology of analysis is evolving. The project-specific and cumulative contribution to impacts associated with GHG emissions is considered less than significant in the absence of an adopted threshold and given that climatic change is global in scale.

10.0 Summary and Conclusions

The air quality impact analysis evaluated the potential for adverse impacts to the ambient air quality due to construction and operational emissions. Construction emissions would include emissions associated with fugitive dust, heavy construction equipment and construction workers commuting to and from the site. The emissions associated with construction would be below the significance criteria and would be temporary. Dust control measures that would be incorporated into the project description to reduce emissions associated with PM_{10} during construction.

Project construction would employ those dust control measures specified above and would therefore be in compliance with strategies in the RAQS and SIP for attaining and maintaining the air quality standards. Therefore, project construction would not conflict

with or obstruct the implementation of the RAQS or applicable portions of the SIP. No emissions are anticipated to result from the operation of the proposed project as the project would entail improvements to existing athletic facilities and would result in an increase of student capacity. As no operational emissions are anticipated, the project would therefore not conflict with the SIP and would be consistent with the control measures and policies implemented in the RAQS.

As such, the proposed project would not result in significant emissions of air pollutants for either the construction phase or operational phase of the project.

11.0 References

California Air Resources Board. *Ambient Air Quality Standards.* November 17, 2008. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. (CARB 2008a).

California Air Resources Board. CARB, 2004, 2005, 2006, & 2007 *Annual Air Quality Data Summaries*. Available at http://www.arb.ca.gov/adam/, Accessed January 2009 (CARB 2009).

California Air Resources Board. *Climate Change Draft Scoping Plan a framework for change,* June 2008. (CARB 2008b)

California Air Resources Board. *Glossary of Air Pollutant Terms*. Last Reviewed June 2008. http://www.arb.ca.gov/html/gloss.htm (CARB 2008c).

California Air Resources Board. *Public Workshop to Discuss Establishing the 1990 Emissions Level and the California 2020 Limit and Developing Regulations to Require Reporting of Greenhouse Gas Emissions*. Sacramento, CA. December 1, 2006. (CARB 2006).

California Environmental Protection Agency. Final *2006 Climate Action Team Report to the Governor and Legislature.* Sacramento, CA. April 3, 2006. (CalEPA 2006).

City of San Diego, *Climate Protection Action Plan.* July 2005. http://www.sandiego.gov/environmental-services/sustainable/pdf/action_plan_07_05.pdf (San Diego 2005).

City of San Diego. *Draft General Plan Final PEIR*, Section 3.2. September 2007. (San Diego 2007).

City of San Diego. General Plan. *Conservation Element*. March 2008. http://www.sandiego.gov/planning/genplan/pdf/generalplan/adoptedconserelem4en.pdf (San Diego 2008).

Intergovernmental Panel on Climate Change (IPCC). *Climate Change 2007: The Physical Science Basis*, Summary for Policymakers. 2007. http://ipcc-wg1.ucar.edu/wg1/docs/ WG1AR4_SPM_PlenaryApproved.pdf

KB Environmental Sciences, Inc. *Summary of Agencies Involved in Air Quality Management in San Diego County*. 2007.

Marland, G., T.A. Boden, and R.J. Andres. Global, Regional, and National CO_2 Emissions. In *Trends: A Compendium of Data on Global Change*. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tenn., U.S.A. 2008. Available at http://cdiac.esd.ornl.gov/trends/emis/tre_glob.html

National Climatic Data Center (NCDC). Global Warming Frequently Asked Questions. Asheville, N.C. 2008. http://lwf.ncdc.noaa.gov/oa/climate/globalwarming.html

San Diego County Air Pollution Control District. *Fact Sheet: Attainment Status.* July, 2007. (SDAPCD 2007).

San Diego County Air Pollution Control District. *Screening-Level Criteria for Air Quality Impacts.* Rule 1501, 20.2(d)(2). Adopted 3/7/95: EPA Approval Effective 6/22/99 (SDAPCD 1999).

United States Environmental Protection Agency. *Ambient Background Concentrations*. http://www.epa.gov/air/data/monvals.html. Accessed January 2009. (EPA 2009).

United States Environmental Protection Agency. *Carbon Sequestration in Agriculture and Forestry.* Last updated October 2006. http://www.epa.gov/sequestration/faq.html (EPA 2006).

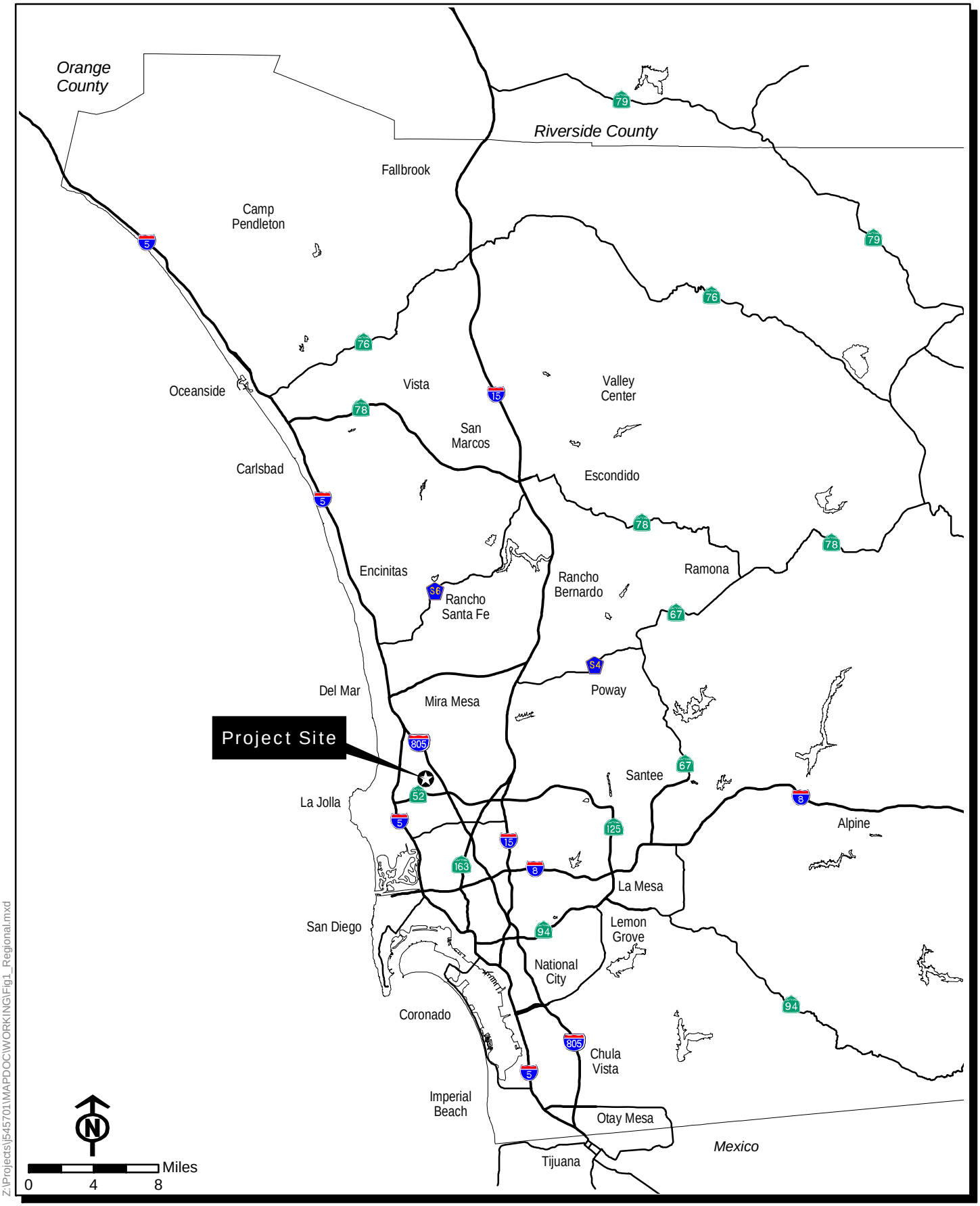
United States Environmental Protection Agency. *Glossary of Climate Change Terms*. 2008. http://www.epa.gov /climatechange/glossary.html#Climate_change (EPA 2008a).

United States Environmental Protection Agency. Green Landscaping: Greenacres. *Air Quality Impacts.* Last updated November 2008. http://www.epa.gov/greenacres/conf12_04/conf_knwldge.html (EPA 2008b)

United States Environmental Protection Agency. *Six Common Air Pollutants*. Last Updated April 2008. http://www.epa.gov/air/urbanair/6poll.html (EPA 2008c).

University of California. Climates of San Diego County. *Agricultural Extension Service.* November 1970.

This Page Intentionally Left Blank



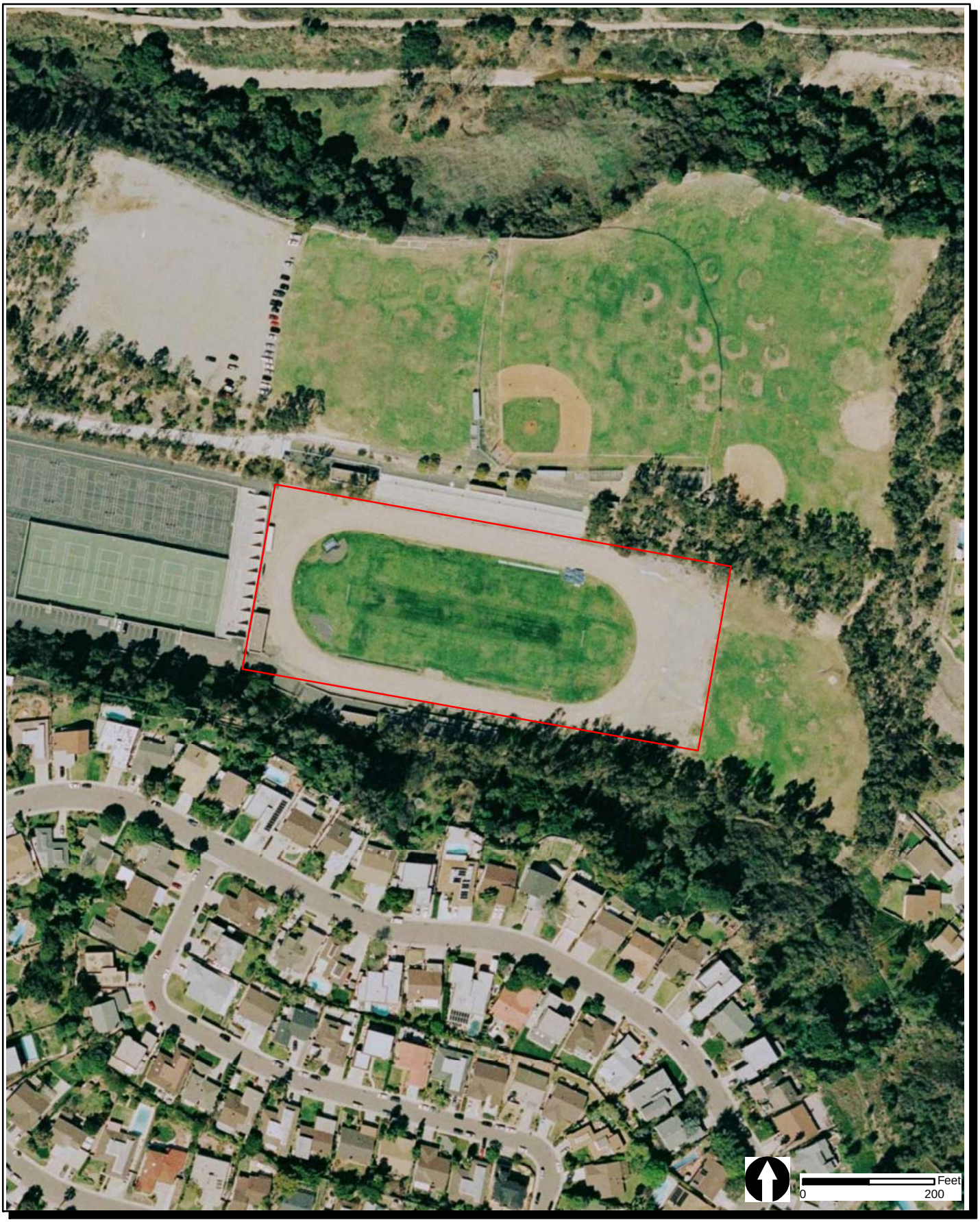
Z:\Projects\j545701\MAPDOC\WORKING\Fig1_Regional.mxd

University City High School Athletic Field Improvement Project

Regional Map

FIGURE 1

This Page Intentionally Left Blank



Z:\Projects\j5457011\MAPDOC\WORKING\Fig3_SitePlan.mxd

University City High School Athletic Field Improvement Project

Site Plan

FIGURE
2

This Page Intentionally Left Blank

Appendix A

URBEMIS2007 Version 9.2.4
Modeling and Emission Estimates

This Page Intentionally Left Blank

February 2009

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

Project Name: University City HS Athletic Field Improvement Project

Project Location: South Coast AQMD*

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (lbs/day unmitigated)	6.12	48.38	26.59	0.01	23.21	2.67	25.88	4.85	2.46	7.31	4,318.27

*The modeled project is located within the San Diego Air Basin under the jursidiction of the San Diego Air Pollution Control District. However, as the neither the Basin or District is available for modeling purposes, the South Coast Air Quality Management District, which was determined to be the most similar in characteristics to the SDAB and generally representative of the Southern California area, was utilized.

February 2009

Urbemis 2007 Version 9.2.4

Detail Report for Summer Construction Unmitigated Emissions (Pounds/Day)

Project Name: University City High School Athletic Field Improvements Project

Project Location: South Coast AQMD*

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10 Total	PM2.5 Dust	PM2.5 Exhaust	PM2.5 Total	CO2
Time Slice 4/1/2009-5/29/2009 Active Days: 43	**6.12**	**48.38**	**26.59**	0.00	**23.21**	**2.67**	**25.88**	**4.85**	**2.46**	**7.31**	**4,318.27**
Mass Grading 04/01/2009-05/29/2009	6.12	48.38	26.59	0.00	23.21	2.67	25.88	4.85	2.46	7.31	4,318.27
Mass Grading Dust	0.00	0.00	0.00	0.00	23.20	0.00	23.20	4.85	0.00	4.85	0.00
Mass Grading Off Road Diesel	6.05	48.15	24.57	0.00	0.00	2.66	2.66	0.00	2.45	2.45	4,086.06
Mass Grading On Road Diesel	0.01	0.12	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	14.46
Mass Grading Worker Trips	0.06	0.12	1.97	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.75
Time Slice 6/1/2009-6/30/2009 Active Days: 22	4.02	29.03	14.92	0.00	0.01	1.81	1.82	0.00	1.66	1.67	2,740.38
Asphalt 06/01/2009-06/30/2009	4.02	29.03	14.92	0.00	0.01	1.81	1.82	0.00	1.66	1.67	2,740.38
Paving Off-Gas	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.77	28.26	12.69	0.00	0.00	1.78	1.78	0.00	1.63	1.63	2,442.41
Paving On Road Diesel	0.05	0.65	0.25	0.00	0.00	0.03	0.03	0.00	0.02	0.03	80.22
Paving Worker Trips	0.06	0.12	1.97	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.75
Time Slice 7/1/2009-7/31/2009 Active Days: 23	4.01	29.00	14.90	0.00	0.01	1.81	1.82	0.00	1.66	1.67	2,736.89
Asphalt 07/01/2009-08/01/2009	4.01	29.00	14.90	0.00	0.01	1.81	1.82	0.00	1.66	1.67	2,736.89
Paving Off-Gas	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.77	28.26	12.69	0.00	0.00	1.78	1.78	0.00	1.63	1.63	2,442.41
Paving On Road Diesel	0.05	0.62	0.24	0.00	0.00	0.03	0.03	0.00	0.02	0.02	76.73
Paving Worker Trips	0.06	0.12	1.97	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.75
Time Slice 8/3/2009-8/14/2009 Active Days: 10	3.83	18.18	20.30	**0.01**	0.05	1.23	1.28	0.02	1.13	1.15	2,701.06
Building 08/02/2009-08/15/2009	3.83	18.18	20.30	0.01	0.05	1.23	1.28	0.02	1.13	1.15	2,701.06
Building Off Road Diesel	3.53	17.61	10.77	0.00	0.00	1.21	1.21	0.00	1.11	1.11	1,649.33
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.31	0.57	9.53	0.01	0.05	0.03	0.08	0.02	0.02	0.04	1,051.74

Phase Assumptions

Phase: Mass Grading 4/1/2009 - 5/29/2009 - Site Grading and Preparation

Total Acres Disturbed: 4.62

Maximum Daily Acreage Disturbed: 1.16

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

February 2009

On Road Truck Travel (VMT): 3.41

Off-Road Equipment:

1 Crushing/Processing Equip (142 hp) operating at a 0.78 load factor for 8 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 6/1/2009 - 6/30/2009 - Installation of Artificial Turf Field

Acres to be Paved: 1.16

Off-Road Equipment:

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Surfacing Eqipment (362 hp) operating at a 0.45 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 7/1/2009 - 8/1/2009 - Installation of Synthetic Track Surface

Acres to be Paved: 1.16

Off-Road Equipment:

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Surfacing Eqipment (362 hp) operating at a 0.45 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 8/2/2009 - 8/15/2009 - Installation of Stadium Lighting & Scoreboard

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

*The modeled project is located within the San Diego Air Basin under the jursidiction of the San Diego Air Pollution Control District. However, as the neither the Basin or District is available for modeling purposes, the South Coast Air Quality Management District, which was determined to be the most similar in characteristics to the SDAB and generally representative of the Southern California area, was utilized.

This Page Intentionally Left Blank

Appendix B

Construction Coating
VOC Emissions Calculations

This Page Intentionally Left Blank

Introduction

The proposed University City High School Athletic Field Improvements Project includes the replacement of existing dirt track with synthetic track. After installation of the proposed track is complete, the surface of the track would be sprayed with a polyurethane finish. The following methodology was used to calculate estimated emissions resulting from the application of polyurethane coating to the proposed synthetic track during the construction phase of the project.

Methodology*

URBEMIS72007 estimates ROG emissions resulting from the evaporation of solvents contained in paints, varnishes, primers, and other surface coatings. Separate procedures are used to estimate evaporative emissions from application of residential and nonresidential architectural coatings.

Emission estimates are divided into four categories: residential interior, residential exterior, non-residential interior, and non-residential exterior. For each of these four categories, each air district has specified an average VOC content. These VOC content limits may change as district rules become more stringent. The user cannot alter these VOC content limits as they have been specified by each air district. The statewide average is assumed to be 250 grams VOC per liter of paint. For each category of paint, VOC content is converted to an emission factor in pounds VOC per square feet of paint applied by assuming a coating coverage of 180 square feet per gallon. The following equation is estimated for each of the four categories to obtain an emission factor in pounds of VOC (or ROG) per square foot:

ROG (pounds / square feet) = (grams VOC per liter paint / 454 grams per pound x 3.785 liters per gallon / 180 square feet per gallon).

Assumptions

The regulation size of a high school track is 400 yards or 440 meters. The average lane size is 42 inches. A 7-lane track would therefore have a surface area of approximately 32,340 square feet. (1,320 ft x 3.5 ft x 7 = 32,340 sq ft)

It is assumed that the VOC content of the track coating would be at a maximum of 250 grams per liter (g/L). VOC 250 g/L = 0.55066 lb/L

Application of the polyurethane coating would occur over 5 days.

Equation

ROG lb/sq.ft. = [(VOC g/L)/ (454 g/lb)] x [(3.785 L/gal) / (180 sq ft/gal)]

Calculations

ROG lb/sq ft = 0.55066 lb/L x 0.021028 L/sq ft
ROG = 0.01159 lb/sq ft
0.01159 lb/sq ft x 32,340 sq ft = 374.47 lb
374.47 lb / 5 days = 74.89 lb/day

Conclusion

Application of the polyurethane spray finish to the proposed synthetic track would result in VOC emissions of ~75 pounds per day over a construction phase timeline of 5 days.

Notes

in: inch	ft: feet	yd: yard	sq ft: square feet
g: gram	lb: pound	L: liter	gal: gallon

*Source:

Rimpo and Associates, Inc. URBEMIS. Environmental Management Software. *Windows Version of URBEMIS2007.*
http://www.urbemis.com/software/URBEMIS2007v9_2Help.htm

APPENDIX C

Notice of Intent

This Page Intentionally Left Blank

San Diego Unified
SCHOOL DISTRICT

PROP. S
REPAIR, RENOVATE, & REVITALIZE
OUR SCHOOLS

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

UNIVERSITY CITY HIGH SCHOOL
ATHLETIC FIELD IMPROVEMENT PROJECT

June 18, 2010

NOTICE IS HEREBY GIVEN that the San Diego Unified School District (SDUSD), as lead agency, is circulating for public review a Draft Mitigated Negative Declaration (MND) in accordance with the California Environmental Quality Act (CEQA) for the University City High School Athletic Field Improvement Project.

Project Title: University City High School Athletic Field Improvement Project

Project Location: University City High School is located at 6949 Genesee Avenue, San Diego, California 92122. The school is bound on the north by Rose Canyon, on the west by Genesee Avenue, and on the south and east by existing residential development. Interstate 805 is located approximately 1 mile east of the project site, and Interstate 5 is 1.5 miles to the west. Local access to the school is provided by Centurion Square off of Genesee Avenue. The proposed project is located in the southeastern portion of the school site. The project site has a General Plan designation of Institutional & Public and Semi-Public Facilities and is zoned Residential – Single Unit (RS).

Project Description: The proposed project is Phase I of the multi-phase improvement project proposed by the District. Phase I entails the installation of artificial turf within the approximately 4.5-acre stadium to accommodate football, soccer, and field hockey events. This artificial turf would replace the existing grass field. In addition, the project proposes to replace the existing dirt track surface with a synthetic track. Stadium lighting, a scoreboard, and a sound system are also proposed as improvements to the facility.

Availability: The Draft MND can be reviewed at the following locations:

- City of San Diego Library, University Community Branch, 4155 Governor Drive, San Diego, CA 92122-2501
- University City High School, 6949 Genesee Avenue, San Diego, CA 92122
- San Diego Unified School District, 4860 Ruffner Street, San Diego, CA 92111 (Physical Plant Operations Annex)

Comments: Written comments regarding the Draft MND should be directed to Brian Grover, Dudek, 605 Third Street, Encinitas, CA 92024 and must be received no later than **July 18, 2010** (**public review period June 18, 2010 – July 18, 2010**). A Final MND incorporating public input will be prepared for consideration by the SDUSD Board of Education at a future public hearing.

This Page Intentionally Left Blank

APPENDIX D

Mitigation Monitoring and Reporting Program

This Page Intentionally Left Blank

MITIGATION MONITORING AND REPORTING PROGRAM
for the
UNIVERSITY CITY HIGH SCHOOL ATHLETIC FACILITIES IMPROVEMENT PROJECT

Prepared for:

San Diego Unified
SCHOOL DISTRICT

Facilities Planning and Construction
4860 Ruffner Street
San Diego, California 92111

AUGUST 2010

Prepared by:

DUDEK
605 Third Street
Encinitas, California 92024

Printed on 30% post-consumer recycled material.

MITIGATION MONITORING AND REPORTING PROGRAM

The Mitigation Monitoring and Reporting Program (MMRP) will be used by the San Diego Unified School (District) as Lead Agency to ensure compliance with adopted mitigation measures and project design features associated with the development of the proposed project. The District, as Lead Agency pursuant to the State CEQA Guidelines, will ensure that all mitigation measures and project design features are carried out.

The MMRP consists of a checklist that identifies the mitigation measures and project design features associated with the proposed project. The table identifies the mitigation monitoring and reporting requirements, including the person(s) responsible for verifying implementation of the mitigation measure/project design feature, timing of verification (prior to, during, or after construction) and responsible party. Space is provided for sign-off following completion/implementation of the design feature or mitigation measure.

INTENTIONALLY LEFT BLANK

Mitigation Measure/PDF No.	Mitigation Measures/ Design Features	Method of Verification	Timing of Verification			Responsible Party	Completed		Comments
			Pre Const.	During Const.	Post Const.		Initials	Date	
Aesthetics									
M-AES-1	When final lighting plans are prepared, the design shall ensure that the light reflector shields extend to a level at or below the lowest edge of the light source at a distance sufficient to block the light source from the view of any adjacent existing residential use. Lights shall be shielded within the proposed project site by the location, mounting, and aiming of luminaries; the use of shielding; and/or the use of cutoff reflectors and refractors.	Environmental Monitor (District)	X			District			
M-AES-2	The lighting vendor shall guarantee that the illumination level shall not exceed 0.8 foot-candles of light trespass at the homes located south of the site, due to the stadium facility lighting.	Environmental Monitor (District)			X	District			
M-AES-3	Adjustments to the facility lighting shall be made once lighting is in place to address potential glare effects. Alterations shall include the installation of glare shields or readjusting of the aiming or position of the luminaries.	Environmental Monitor (District)		X	X	District			
Air Quality									
PDF-AQ-1	To further reduce less than significant impacts to air quality, the following standard construction measures would be implemented as part of the proposed project: • On-road trucks and other mobile equipment shall be properly tuned and maintained to manufacturers' specifications to ensure minimum emissions under normal operations. • Vehicle speeds shall be limited to 15 miles per hour (mph) on unpaved (no gravel or similar surfacing material) roads. • Apply water or chemical dust suppressants to unstabilized disturbed areas and/or unpaved roadways in sufficient quantity and frequency to maintain a stabilized surface. • All clearing and grading activities shall cease during periods of high wind (greater than 20 mph averaged over 1 hour). • Exposed stockpiles of soil and other excavated materials shall be contained within perimeter silt fencing, watered, treated	Environmental Monitor (District)	X	X		District			

Mitigation Measure/PDF No.	Mitigation Measures/ Design Features	Method of Verification	Timing of Verification			Responsible Party	Completed		Comments
			Pre Const.	During Const.	Post Const.		Initials	Date	
	with soil binders, or covered as necessary. • The developer shall require the use of particulate filters on diesel construction equipment if use of such filters is demonstrated to be cost-competitive for use on this project. • To the extent feasible, unnecessary construction vehicle and idling time shall be minimized. • The construction contractor shall utilize as much as possible pre-coated/natural colored building materials. Water-based or low VOC coatings with a VOC content of 100 grams per liter or less shall be used. Spray equipment with high transfer efficiency, such as the electrostatic spray gun method, or manual coatings application such as paint brush hand roller, trowel, spatula, dauber, rag, or sponge, shall be used to reduce VOC emissions, where practical.								
Hydrology and Water Quality									
PDF-WQ-1	To reduce impacts to hydrology and water quality, the following construction measures would be implemented as part of the proposed project: • Best Management Practices (BMPs) would be employed to ensure that the project complies with all state and local water quality standards. • Soil stockpiles shall be covered with plastic sheeting during inclement weather conditions. • Drainage control devices would be constructed to direct surface water runoff away from slopes and waterways. Runoff would be directed toward existing storm drain systems and treated, as necessary, to remove sediments and pollutants. • Construction during periods of inclement weather will be avoided. • A light spray of water would be applied to graded areas during construction to control fugitive dust.	Environmental Monitor (District)	X	X		District			
Noise									

Mitigation Measure/PDF No.	Mitigation Measures/ Design Features	Method of Verification	Timing of Verification			Responsible Party	Completed		Comments
			Pre Const.	During Const.	Post Const.		Initials	Date	
PDF-NOI-1	The PA system would consist of directional speakers to direct the sound away from the southern and eastern property lines adjacent to the project site. The speakers would have the ability to be adjusted individually during evening hours to reduce noise levels.	Environmental Monitor (District)			X	District			
Transportation/Traffic									
M-TR-1	Prior to construction, a traffic control plan would be developed by the District's contractor in accordance with the City of San Diego traffic control guidelines and would specifically address construction traffic during periods of supply delivery or heavy equipment transport. The traffic control plan would address construction traffic at the affected intersections, and would specify access and traffic safety requirements during hours of operation. The traffic control plan would include signage and a flagger when necessary to allow heavy equipment transport along residential and local streets, and would also include parking and laydown areas for construction equipment and construction worker vehicles.	Environmental Monitor (District)	X	X		District			