Localized Significance Thresholds Analysis

VISTA CANYON RANCH

SPECIFIC PLAN PROJECT

Construction
Localized Significance Threshold Analysis

Prepared for:

City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, California 91355

Prepared by:

Impact Sciences, Inc.
803 Camarillo Springs Road, Suite A
Santa Clarita, California 93012

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SUMMARY

The proposed Vista Canyon Specific Plan project would develop the approximately 182.8 acre Vista Canyon project site with single-family and multi-family residential uses (approximately 105 single family residential lots, 579 apartment units and 433 attached for-sale units) and up to 950,000 square feet of commercial and medical office, retail, theater, restaurant, and hotel uses within four Planning Areas (PAs). The South Coast Air Quality Management District (SCAQMD) recommends the evaluation of localized emissions of nitrogen dioxide (NO_2), carbon monoxide (CO), respirable particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$) as a result of on-site construction activities to assess the impacts on sensitive receptors in the vicinity of the project site. This analysis assesses the ambient air quality impacts on sensitive receptors within approximately two kilometers of the project site due to on-site construction emissions (fugitive dust and motor vehicle and equipment exhaust) on the day with the highest estimated on-site daily mass emissions of oxides of nitrogen (NO_X), CO, PM_{10}, and $PM_{2.5}$.

This study is based on certain assumptions regarding construction activities provided by the project applicant. Construction of the proposed project is expected to begin in 2012 and last until 2015. Construction would involve grading, street paving, building construction, and architectural coating. This Localized Significance Threshold (LST) analysis evaluated construction scenarios that would result in reasonable worst-case impacts to local air quality over the course of the construction period. The ambient air quality impacts were compared to thresholds established by the SCAQMD.

The analysis showed that the maximum 24-hour PM_{10} and $PM_{2.5}$ concentrations due to construction of the proposed project would potentially exceed the thresholds of significance at nearby sensitive receptors The maximum 1-hour NO_2 concentrations due to construction of the proposed project would potentially exceed the thresholds of significance at nearby sensitive receptors. Maximum concentrations of CO would not exceed the significance thresholds at any sensitive receptor.

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1.0 GENERAL

1.1 Purpose

The proposed Vista Canyon Specific Plan project would develop the approximately 182.8 acre Vista Canyon project site with single-family and multi-family residential uses (approximately 105 single family residential lots, 579 apartment units and 433 attached for-sale units) and up to 950,000 square feet of commercial and medical office, retail, theater, restaurant, and hotel uses within four Planning Areas (PAs). A residential overlay over the corporate office campus site within PA-2 would allow for a conversion of up to 250,000 square feet of office floor area to 233 attached residential units. If implemented this conversion would permit a maximum of 1,350 residential units and 700,000 square feet of commercial floor area.

The project site is located in unincorporated Los Angeles County and the Santa Clarita Valley Planning Area. The Santa Clarita Valley Planning Area is generally surrounded by the Los Padres and Angeles National Forest areas to the north; Agua Dulce and the Angeles National Forest to the east; the major ridgeline of the Santa Susana Mountains, which separates Santa Clarita Valley from the San Fernando and Simi Valleys to the south; and the County of Ventura to the west. The project site is located immediately south of SR-14, west of La Veda Avenue, north of the Metrolink rail line and east of the Colony Townhome community. The site includes a portion of the Santa Clara River.

Construction for the project would begin in 2012 and be complete by 2015 and would occur in four major phases, each lasting about one year. Construction would include activities such as grading and building construction that would generate criteria pollutant emissions. The SCAQMD recommends the evaluation of localized emissions of nitrogen dioxide (NO_2), carbon monoxide (CO), respirable particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$) as a result of on-site construction activities to assess the impacts on sensitive receptors in the vicinity of the project site. This analysis determines the ambient air quality impacts due to construction activities on the day with the highest estimated on-site daily mass emissions of NO_X, CO, PM_{10}, and $PM_{2.5}$.

Sources utilized in the localized significance threshold (LST) analysis for the project include the South Coast Air Quality Management District's (SCAQMD) *California Environmental Quality Act (CEQA) Air Quality Handbook* ("CEQA Handbook") and *Final Localized Significance Threshold Methodology* ("LST Methodology"), air quality data from the California Air Resources Board (CARB), and the URBEMIS2007 Environmental Management Software. Air quality modeling conducted for the analysis was conducted using the AERMOD air quality dispersion model, which is a Gaussian dispersion model and is approved for use in air quality analyses by the U.S. Environmental Protection Agency (EPA) and the SCAQMD.

1.2 Regional Air Quality Setting

The project is located in the South Coast Air Basin ("Basin" or "SoCAB") portion of Los Angeles County, which is under the jurisdiction of the SCAQMD with respect to local air quality planning. Air basins in California are designated by the U.S. EPA as being in attainment or nonattainment of the National Ambient Air Quality Standards (NAAQS) and by CARB as being in attainment or nonattainment of the California Ambient Air Quality Standards (CAAQS). The status of Los Angeles County portion of the SoCAB with respect to attainment with the NAAQS and CAAQS is summarized in **Table 2, Ambient Air Quality Standard Designations – South Coast Air Basin (Los Angeles County)** below.

Table 1
Ambient Air Quality Standard Designations
South Coast Air Basin (Los Angeles County)

Pollutant	Designation/Classification NAAQS[1]	CAAQS[2]
Ozone (O_3)	Nonattainment/Extreme	Nonattainment
Carbon Monoxide (CO)	Attainment/Maintenance	Attainment
Nitrogen Dioxide (NO_2)	Attainment/Maintenance	Nonattainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Respirable Particulate Matter (PM10)	Nonattainment/Serious	Nonattainment
Fine Particulate Matter (PM2.5)	Nonattainment	Nonattainment
Lead (Pb)	Attainment	Nonattainment
Sulfates (SO_4^{2-})	No federal standard	Attainment
Hydrogen Sulfide (H_2S)	No federal standard	Unclassified
Vinyl Chloride	No federal standard	Unclassified
Visibility-Reducing Particles	No federal standard	Unclassified

Sources:
1 *U.S. Environmental Protection Agency, "Region 9: Air Programs, Air Quality Maps," http://www.epa.gov/region9/air/maps/maps_top.html. 2010.*
2 *California Air Resources Board, "Area Designations Maps/State and National," http://www.arb.ca.gov/desig/adm/adm.htm. 2010.*

2.0 THRESHOLDS OF SIGNIFICANCE

The SCAQMD's recommended thresholds for the evaluation of localized air quality impacts are based on the difference between the maximum monitored ambient pollutant concentrations in the area and the more stringent of the CAAQS or NAAQS. Therefore, the thresholds depend upon the concentrations of pollutants monitored locally with respect to a project site. For pollutants that already exceed the CAAQS or NAAQS (e.g., PM_{10} and $PM_{2.5}$), the thresholds are based on standards established by the SCAQMD in the *Final Localized Significance Threshold Methodology*.[1] This evaluation requires that anticipated ambient air concentrations, determined using a computer-based air quality dispersion model, be compared to localized significance thresholds for PM_{10}, $PM_{2.5}$, NO_2, and CO. The significance threshold for PM_{10} represents compliance with Rule 403 (Fugitive Dust) and Rule 1303 (New Source Review Requirements), while the thresholds for NO_2 and CO represent the allowable increase in concentrations above background levels in the vicinity of the project that would not cause or contribute to an exceedance of the relevant ambient air quality standards. The significance thresholds for $PM_{2.5}$ are intended to constrain emissions so as to aid in the progress toward attainment of the ambient air quality standards.[2] The applicable thresholds are shown below in **Table 2**, **Localized Significance Thresholds for Source Receptor Area 13.**

Table 2
Localized Significance Thresholds for Source Receptor Area 13

Construction LST	Pollutant (concentration)							
	NO_2 1-hour		CO 1-hour		CO 8-hours		PM_{10} 24-hours	$PM_{2.5}$ 24-hours
	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	µg/m³
CAAQS/NAAQS[1]	188	0.100	23,000	20	10,000	9.0	10.4	10.4
Peak Background[2]	115	0.061	2,300	2	1,444	1.3	NA	NA
LSTs[3]	**73**	**0.039**	**20,700**	**18**	**8,556**	**7.7**	**10.4**	**10.4**

NA = not applicable
Source: South Coast Air Quality Management District, Final Localized Significance Threshold Methodology, (2008).
1 *California has not adopted a 24-hour standard for $PM_{2.5}$; the 24-hour $PM_{2.5}$ standard shown is the national standard. The U.S. EPA adopted a 1-hour standard for NO_2 that is lower than the California standard; therefore, the national standard is used for NO_2. All other standards are the California standards*
2 *The peak background concentration for NO_2 is based on the 3-year average of the 98th-percentile of the annual distribution of daily maximum 1-hour concentrations for 2006 through 2008. All other peak background concentrations are based on the maximum 1-hour concentrations between 2006 and 2008.*
2 *LSTs for NO_2 and CO are the differences between the more stringent of the CAAQS or NAAQS and the peak background concentration.*

3.0 CALCULATION OF EMISSIONS

The proposed Vista Canyon Ranch Specific Plan project consists of the development of single-family and multi-family residences, commercial and medical offices, and retail, theater, restaurant, and hotel uses. The proposed project also includes facilities and infrastructure proposed to support the project, including

1 South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology*, (2008).
2 South Coast Air Quality Management District, *Final Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds*, (2006).

roads, trails, drainage improvements, water and sewer systems, and dry utility systems. Total development is anticipated to occur over approximately four years. Construction would involve various activities, such as grading, street paving, building construction, and architectural coating.

The URBEMIS2007 Environmental Management Software was used to estimate the emissions associated with construction of the proposed project. URBEMIS2007 is a land use and transportation based computer model designed to estimate regional air emissions from new land use development projects. The model accounts for certain meteorological conditions that characterize specific air basins in California. The model was developed by CARB and is approved for use by the SCAQMD. A number of variables are input into the model, including the construction schedule, the type of construction equipment required to build the project, emission factors for each piece of equipment, grading amounts, soil hauling amounts, and asphalt paving amounts. The analysis is based on the most accurate and reasonable data that is available. In cases where specific information is not available, the SCAQMD and CARB have recommended that default variables and assumptions be used in the URBEMIS2007 model.

Construction of the proposed project is expected to begin in 2012 and last until 2015. Construction of the proposed project would occur in four phases, and each phase would involve several subphases including grading and excavation, sub-grade construction, building construction, asphalt paving, and architectural coating. The total amount of soil to be cut from the project site is estimated at 590,000 cubic yards (cy). The total amount of fill is estimated at 830,000 cy, requiring a minimum import of approximately 240,000 cy. This cut and fill grading would be in addition to 1.7 million cubic yards of remedial grading. Estimated shrinkage associated with the remedial grading would require the import of an additional 260,000 cy, resulting in a total project import of 500,000 cy.[3] Grading and excavation of the project site is assumed to occur during the first construction phase.

The emission calculations assume the use of standard construction practices, such as compliance with SCAQMD Rule 403 (Fugitive Dust), to minimize the generation of fugitive dust. Compliance with Rule 403 is mandatory for all construction projects. In the URBEMIS2007 model, the emission calculations take into account compliance with Rule 403 by incorporating the following measures:

- Watering of exposed surfaces and unpaved roads three times daily, which is estimated to reduce fugitive dust emissions from this source (both PM_{10} and $PM_{2.5}$) by 61 percent, per guidance from the SCAQMD;

- Use of soil stabilization measures during equipment loading and unloading, which is estimated to reduce fugitive dust emissions from this source (both PM_{10} and $PM_{2.5}$) by 69 percent, per guidance from the SCAQMD;

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3 Cut and fill amounts are based on data provided by the project applicant, contractor, and/or architect.

- Limiting the speed of travel on unpaved roads to 15 miles per hour, which is estimated to reduce fugitive dust emissions from this source (both PM_{10} and $PM_{2.5}$) by 44 percent, per guidance from the SCAQMD; and

- Use of soil stabilization measures on inactive areas, which is estimated to reduce fugitive dust emissions from this source (both PM_{10} and $PM_{2.5}$) by 84 percent, per guidance from the SCAQMD.

The last two measures listed above are generally required for projects of this size. Rule 403 contains other best available control measures to minimize fugitive dust emissions; however, they are not accounted for in the URBEMIS2007 model. The following presents additional details for each of the four project construction phases. The information provided below in **Table 3, Construction Phase Detail**, describes the activity amounts for excavation, building construction, grading, and asphalt paving for each phase of construction.

Table 3
Construction Phase Detail

Phase/Subphase	Level of Activity
Phase 1	
Grading	1.7 million cy remedial; 590,000 cy cut; 830,000 cy fill; 500,000 cy import; 185.3 total acres disturbed; 46.3 daily acres disturbed; equipment mix based on a similar sized project.
Utilities Trenching	URBEMIS2007 default equipment mix.
Building Construction	680 multi-family dwelling units; 25,000 square feet retail commercial space; 0.79 acre of park space; water reclamation facility; URBEMIS2007 default equipment mix.
Asphalt Paving	2.13 acres paved; URBEMIS2007 equipment mix.
Architectural Coating	Emissions based on compliance with SCAQMD coating rules.
Phase 2	
Utilities Trenching	URBEMIS2007 default equipment mix.
Building Construction	341 multi-family dwelling units; 96 single-family dwelling units; Oak Park; Vista Canyon Road Bridge; URBEMIS2007 default equipment mix with an additional 2 cranes and 4 general construction equipment for bridge construction.
Asphalt Paving	6.4 acres paved; URBEMIS2007 default equipment mix.
Architectural Coating	Emissions based on compliance with SCAQMD coating rules.
Phase 3	
Utilities Trenching	URBEMIS2007 default equipment mix.
Building Construction	56,000 square feet of retail commercial space; 150,000 square feet of office space; 91,476 square feet of parking structure; Metrolink station and associated parking; URBEMIS2007 default equipment mix.
Asphalt Paving	3.13 acres paved; URBEMIS2007 default equipment mix.

Phase/Subphase	Level of Activity
Architectural Coating	Emissions based on compliance with SCAQMD coating rules.
Phase 4	
Utilities Trenching	URBEMIS2007 default equipment mix.
Building Construction	200-room hotel (140,000 square feet); 490,000 square feet of office space; 83,000 square feet of commercial space (including retail, restaurant and theater); 2,500 square feet for the River Education Center; 91,476 square feet of parking structure; URBEMIS2007 default equipment mix.
Asphalt Paving	2.13 acres paved; URBEMIS2007 default paving area and equipment mix.
Architectural Coating	Emissions based on compliance with SCAQMD coating rules.

Source: Impact Sciences, Inc., (2010).

As per the SCAQMD LST Methodology, only emissions from on-site equipment and activity were considered in this analysis.[4] Standard fugitive dust control practices were taken into account. **Table 4, Estimated On-Site Construction Emissions**, presents the estimated on-site construction emissions for NO_X, CO, PM_{10}, and $PM_{2.5}$. As shown, the maximum on-site emissions are associated with Phase 1.

Table 4
Estimated On-Site Construction Emissions

	Maximum Daily Emissions (Pounds per Day)							
Construction Phase	**NO_X**	**CO**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10} Total**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Total**
Phase 1	764.64	351.70	114.56	33.45	148.01	23.92	30.77	54.69
Phase 2	55.08	27.44	Negl.	2.97	2.97	Negl.	2.73	2.73
Phase 3	27.53	19.79	Negl.	2.03	2.03	Negl.	1.87	1.87
Phase 4	24.91	18.83	Negl.	1.78	1.78	Negl.	1.63	1.63
Maximum Emissions	764.64	351.70	114.56	33.45	148.01	23.92	30.77	54.69

Negl. = Negligible
Source: Impact Sciences, Inc. Emissions calculations are provided in ***Appendix 4.4*** *of the Draft EIR.*
Totals in the table may not appear to add exactly due to rounding in the computer model calculations.

4 South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology*, (2008). According to the Preface, "[t]he LST methodology and associated mass rates are not designed to evaluate localized impacts from mobile sources traveling over the roadways."

4.0 LOCALIZED SIGNIFICANCE THRESHOLD ANALYSIS

4.1 Modeling Approach

Per the recommendation of the SCAQMD, ambient NO_X, CO, PM_{10}, and $PM_{2.5}$ concentrations due to the construction of the proposed project were analyzed using methods described in its LST Methodology. The U.S. EPA and SCAQMD-approved dispersion model, AERMOD,[5] was used to model the air quality impacts of NO_X, CO, PM_{10}, and $PM_{2.5}$ emissions. AERMOD can estimate the air quality impacts of single or multiple point, area, or volume sources using historical meteorological conditions. Volume sources were used to represent the emissions from trucks and heavy-duty construction equipment. Volume sources are three-dimensional sources of emissions that can be used to model releases from a variety of industrial uses, including moving diesel trucks and equipment.[6] Area sources were used to model fugitive dust emissions of PM_{10} and $PM_{2.5}$. Area sources are two-dimensional surface-based sources of emissions that can be used to model releases from emissions that occur over a wide area, such a fugitive dust. For the purpose of the dispersion modeling, the maximum daily emissions that could occur due to construction activities from any construction phase were selected for the LST analysis. It was assumed that an average workday was 8 hours. Therefore, the maximum daily emissions were divided by 8 to obtain maximum emission rates in units of pounds per hour.

4.2 Modeled Scenarios

Construction activity could take place at any location on the Vista Canyon Specific Plan project site. In order to model the worst-case impacts to off-site receptors, several modeling scenarios were defined. The first defined modeling scenario represents construction activity within the southwest area of the site. This scenario was chosen because it is directly adjacent to the residential neighborhood south of Jakes Way and east of SR-14. Emission sources (area and volume sources) were evenly spaced throughout a 45.7 acre rectangular shaped area representing construction activity in the southwest portion of the project site, south of the Santa Clara River.

A second scenario was defined to model maximum impacts to the north of the project site. The second defined modeling scenario represents construction activity within the northeastern area of the site. This scenario was chosen because it is closest to the residential areas north of SR-14. Emission sources (area and volume sources) were evenly spaced throughout a 45.7 acre rectangular shaped area representing

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5 Lakes Environmental, ISC-AERMOD VIEW Software.

6 California Air Resources Board, *ARB Health Risk Assessment Guidance for Rail Yards and Intermodal Facilities*, (2006) 3.

construction activity in the northeast portion of the project site, which includes the commercial center just south of SR-14.

A third scenario was defined to model maximum impacts to the east and south of the project site. The nearest school receptor to the site is the Sulphur Springs Elementary School on Lost Canyon Road just east of the project site. The third defined modeling scenario represents construction activity within the southeastern area the site. This scenario was chosen because it is directly adjacent to the residential community on the eastern side of the site as well as Sulphur Springs Elementary School. It is also closest to the planned residential areas south of the project site. Emission sources (area and volume sources) were evenly spaced throughout a 45.7 acre rectangular shaped area representing construction activity in the southeast portion of the project site.

4.3 Source Characteristics and Receptors

Volume sources were used to represent emissions from construction equipment. The volume sources for each scenario covered approximately 45.7-acres, corresponding to the maximum daily disturbed area. An area source was co-located with the volume sources to model fugitive dust emissions of PM_{10} and $PM_{2.5}$. The area source for each scenario also covered 45.7 acres. Emissions from heavy-duty vehicles and construction equipment, modeled as volume sources, were given a 5-meter release height, 4.65-meter initial horizontal dimension, and 1.16-meter initial vertical direction. Fugitive dust emissions from grading activities, modeled as area sources, were given a ground-level release height and a 1-meter initial vertical dimension. Emission rate calculations for the volume and area sources are presented in **Appendix A**.

Discrete Cartesian receptors were used to determine air quality impacts in the vicinity of the project site. Near-field receptors were placed at 50-meter intervals outside the boundary of the project site out to 300 meters. Extended-field receptors were spaced 100 meters apart, out to approximately 1.0 kilometers. Due to the size of the project site and the number of model runs required, this receptor grid was determined to provide a balanced approach with respect to receptor coverage and model run times. This receptor grid is also consistent with SCAQMD recommended guidance for AERMOD.[7]

4.4 Meteorological Data

The meteorological data from the monitoring station located in Source Receptor Area 13 was used in the analysis. The meteorological data were obtained from the SCAQMD website and have been preprocessed

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7 Refer to the SCAQMD AERMOD modeling guidance website: http://www.aqmd.gov/smog/metdata/AERMOD_ModelingGuidance.html

using AERMET.[8] AERMET is a meteorological preprocessor for organizing available meteorological data into a format suitable for use in AERMOD air quality dispersion model.[9] These files were also developed by the SCAQMD using site specific surface characteristics (i.e., surface albedo, surface roughness, and Bowen ratio) obtained using AERSURFACE. AERSURFACE is a tool that provides realistic and reproducible surface characteristic values, including albedo, Bowen ratio, and surface roughness length, for input into AERMET.[10] The surface wind directions are presented graphically in a polar diagram generated by the Wind Rose software. This diagram is shown in **Figure 1, Wind Rose for the Santa Clarita Monitoring Station**. The SCAQMD provides three years of meteorological data files for use in AERMOD (from 2005-2007), which is representative of typical meteorological conditions in the project area.

4.5 Terrain Data

According to the U.S. EPA *AERMOD Implementation Guide*,[11] for cases in which receptor elevations are lower than the base elevation of the source, AERMOD will predict concentrations that are less than what would be estimated from an otherwise identical flat terrain situation. While this is appropriate and realistic in most cases, for cases of down-sloping terrain where the plume is terrain-following, AERMOD will tend to underestimate concentrations when terrain effects are taken into account. This situation is potentially applicable to the project site since the surrounding region contains numerous hills and elevation changes and surrounding receptors may be located at higher and lower elevations than the emission sources. Therefore, in order to avoid underestimating concentrations in such situations, the SCAQMD recommends that AERMOD should be run twice – once using the elevated terrain option and a second time using the flat terrain option. The maximum ground-level concentration from both runs should be reported. Therefore, additional modeling runs for NO_X, CO, PM_{10}, and $PM_{2.5}$ were set up for both terrain options for each of the three meteorological data years.

Terrain heights were derived from digital terrain elevations developed by the U.S. Geological Survey (USGS) by using its Digital Elevation Model (DEM). The DEM data provides terrain elevations with 1-meter vertical resolution and 10-meter or 30-meter horizontal resolution based on a Universal Transverse Mercator (UTM) coordinate system. The UTM coordinates are referenced to an appropriate map

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8 South Coast Air Quality Management District, "AQMD Meteorological Data for AERMOD," http://www.aqmd.gov/smog/metdata/AERMOD.html. 2010.

9 U.S. Environmental Protection Agency, *User's Guide for the AERMOD Meteorological Preprocessor* (AERMET), (2004) iv.

10 U.S. Environmental Protection Agency, *AERSURFACE User's Guide*, (2008) 1.

11 U.S. Environmental Protection Agency, *AERMOD Implementation Guide*, (2009).

projection as needed (e.g., North American Datum of 1927 (NAD 27), NAD 83, or World Geodetic System of 1984 (WGS 84)).

4.5.1 Model Options

The SCAQMD requires that AERMOD be run using U.S. EPA regulatory default options, unless non-default options are justified. AERMOD was run using U.S. EPA regulatory default options. As noted above, both flat and elevated terrain options were modeled. Additional modeling options are listed below:

- Urban dispersion (Los Angeles County population of 9,862,049, as per SCAQMD guidance);[12]
- Averaging periods: 1-hour (CO and NO_X), 8-hour (CO), 24-hour (PM_{10} and $PM_{2.5}$);
- Flagpole receptor height: 0 meter (corresponding to ground-level concentrations); and
- No building downwash (no point sources modeled).

AERMOD contains the ozone limiting method (OLM) and Plume Volume Molar Ratio Method (PVMRM) options, which are used to model the conversion of NO_X to NO_2.[13] The SCAQMD recommends that the PVMRM option be used until the U.S. EPA releases an updated version of AERMOD which corrects a known bug with the OLM. The SCAQMD provides hourly ozone data for modeling conversion of NO_X to NO_2 using the PVMRM option. In addition, the SCAQMD recommends the following default values when using the PVMRM option, which were used in the analysis:

- Ambient Equilibrium NO_2/NO_X Ratio: 0.90
- In-stack NO_2/NO_X Ratio: 0.10
- Default Ozone Value: 40 parts per billion

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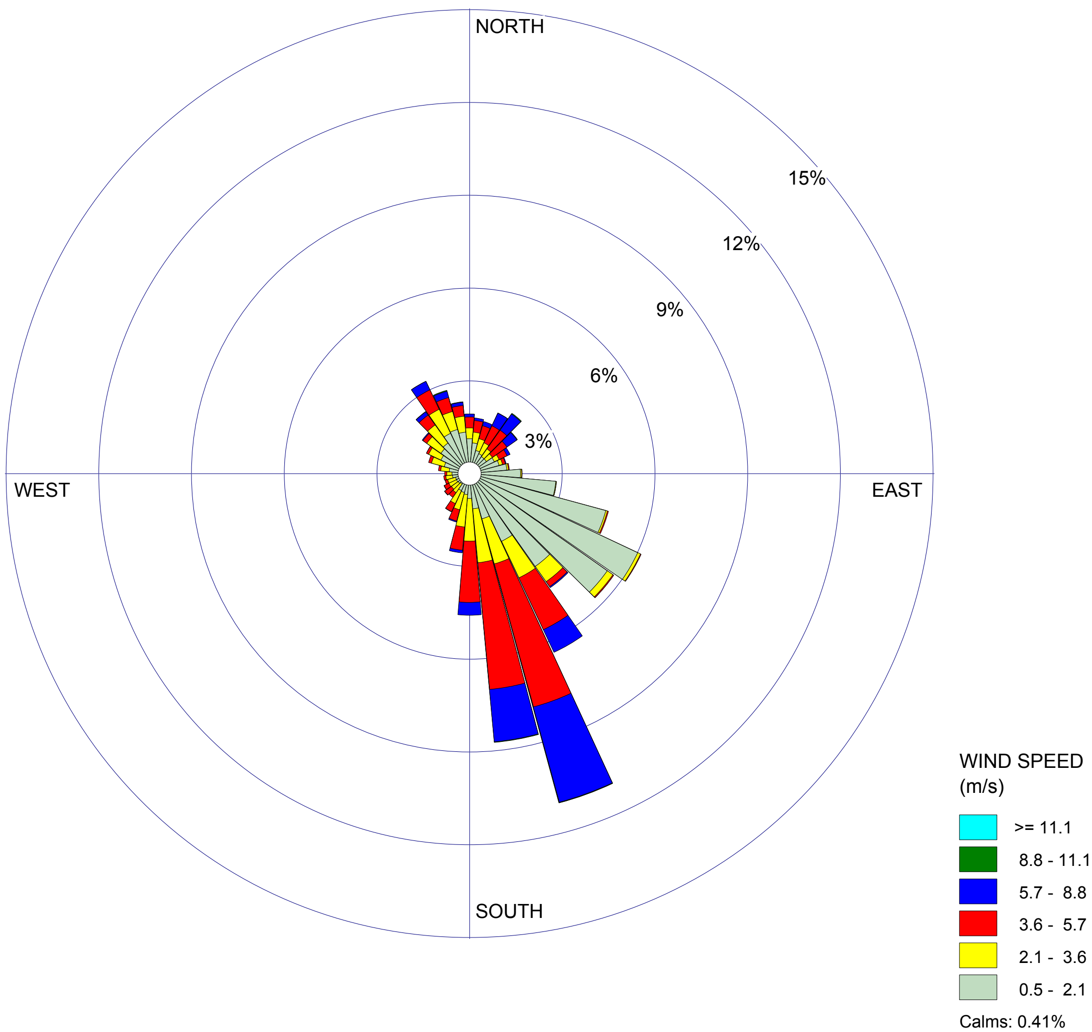
12 Refer to the SCAQMD AERMOD modeling guidance website: http://www.aqmd.gov/smog/metdata/AERMOD_ModelingGuidance.html

13 For a technical description of the PVMRM and OLM algorithms, please see the Addendum to the AERMOD Model Formulation Document (MFD) available in the U.S. EPA SCRAM web site: http://www.epa.gov/scram001/dispersion_prefrec.htm#aermod.

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:

Meteorological Data File from the South Coast Air Quality Management District

DATA PERIOD:

2005-2007
Jan 1 - Dec 31
00:00 - 23:00

COMPANY NAME:

Impact Sciences, Inc.

CALM WINDS:

0.41%

TOTAL COUNT:

26197 hrs.

AVG. WIND SPEED:

2.76 m/s

DATE:

5/17/2010

SOURCE: Impact Sciences, Inc. – May 2010

FIGURE **1**

Wind Rose for the Santa Clarita Monitoring Station

112-024•10/10

4.6 Modeling Results

The results of the LST dispersion modeling are presented below in **Table 5, Localized Significance Threshold Analysis**. The modeling results presented below are based on conservative assumptions for the construction emissions that do not fully take into account emissions reductions that would occur from CARB regulations that are scheduled to be implemented over the coming years. In addition, impacts were modeled assuming the maximum on-site emissions would occur on land proposed for development that is closest to sensitive receptors and that the emission sources would be concentrated in a contiguous 45.7-acre parcel.[14]

As shown in **Table 5,** construction of the project would not generate on-site emissions in excess of the site-specific localized significance thresholds for CO. Construction of the project would generate on-site emissions in excess of the threshold for NO_2, PM_{10}, and $PM_{2.5}$ at sensitive receptors adjacent to the project site. Based on this assessment, the localized impacts for NO_2, PM_{10}, and $PM_{2.5}$ would be potentially significant during construction when construction activity is taking place near sensitive receptors. On-site emissions of these pollutants drop off significantly after Phase 1 as heavy grading activities are expected to be completed. Therefore, impacts during Phases 2, 3 and 4 would be substantially lower than the modeled concentrations shown in **Table 5**.

Table 5
Localized Significance Threshold Analysis

Construction LST	Maximum Modeled Concentrations (micrograms per cubic meter; parts per million)							
	NO_2 1-hour		CO 1-hour		CO 8-hour		PM_{10} 24-hour	$PM_{2.5}$ 24-hour
	μg/m³	ppm	μg/m³	ppm	μg/m³	ppm	μg/m³	μg/m³
LSTs[1]	73	0.039	20,700	18	8,556	7.7	10.4	10.4
Modeling Results	320	0.170	677	< 1	173	0.2	43.8	12.8
Exceeds Threshold?	**YES**		NO		NO		**YES**	**YES**

Source: Impact Sciences, Inc. Modeling results are provided in ***Appendix A*** *of this report.*
[1] *South Coast Air Quality Management District,* Final Localized Significance Threshold Methodology, *(2008).*

14 The maximum daily acreage to be disturbed is 45.7 acres.

5.0 CONCLUSIONS

The LST analysis was conducted to estimate worst-case ambient air quality impacts during construction at the Vista Canyon Ranch Specific Plan project site. As shown in **Table 4,** construction of the proposed project would not generate on-site emissions in excess of the site-specific LST for CO. Construction of the proposed project would generate on-site emissions that would potentially exceed the LST criteria for NO_2, PM_{10}, and $PM_{2.5}$ for nearby sensitive receptors. Therefore, based on this assessment, the localized impacts for NO_2, PM_{10}, and $PM_{2.5}$ would be potentially significant during the construction of the proposed project. It should be noted that the results presented above are based on data that was known at the time this analysis was conducted as well as reasonable and conservative assumptions. Actual impacts during project construction may be different depending on several factors including the actual level of construction activity and actual meteorological conditions.

APPENDIX A

LST Model Calculations

Vista Canyon Ranch
AERMOD Dispersion Model
SCAQMD Localized Significance Threshold Modeling

Table LST-1
Maximum On-Site Emissions

Construction Phase	NO_X (lbs/day)	CO (lbs/day)	PM10 Dust (lbs/day)	PM10 Exh (lbs/day)	PM10 (lbs/day)	PM2.5 Dust (lbs/day)	PM2.5 Exh (lbs/day)	PM2.5 (lbs/day)
Phase 1								
Asphalt Paving Off-Road Diesel	14.35	8.99	-	1.24	1.24	-	1.14	1.14
Building Off-Road Diesel	14.81	10.52	-	1.04	1.04	-	0.95	0.95
Mass Grading Dust	-	-	114.56	-	114.56	23.92	-	23.92
Mass Grading Off-Road Diesel	735.48	332.19	-	31.17	31.17	-	28.68	28.68
Subtotal	764.64	351.70	114.56	33.45	148.01	23.92	30.77	54.69
Phase 2								
Asphalt Paving Off-Road Diesel	12.84	8.03	-	1.09	1.09	-	1.00	1.00
Building Off-Road Diesel	42.24	19.41	-	1.88	1.88	-	1.73	1.73
Subtotal	55.08	27.44	-	2.97	2.97	-	2.73	2.73
Phase 3								
Asphalt Paving Off-Road Diesel	14.56	9.90	-	1.21	1.21	-	1.11	1.11
Building Off-Road Diesel	12.97	9.89	-	0.82	0.82	-	0.76	0.76
Subtotal	27.53	19.79	-	2.03	2.03	-	1.87	1.87
Phase 4								
Asphalt Paving Off-Road Diesel	12.07	8.78	-	0.98	0.98	-	0.90	0.90
Building Off-Road Diesel	12.84	10.05	-	0.80	0.80	-	0.73	0.73
Subtotal	24.91	18.83	-	1.78	1.78	-	1.63	1.63
Maximum Emissions	764.64	351.70	114.56	33.45	148.01	23.92	30.77	54.69

Source:
1. Emission estimates from URBEMIS2007, Version 9.2.4

Vista Canyon Ranch
AERMOD Dispersion Model
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Table LST-2
AERMOD Source Characteristics

Emission Source	Source Type	Release Height (m)	Length of Side (m)	Initial Vertical (m)	Initial Lateral (m)	Initial Vertical (m)	Exit Temperature (F)	Inside Diameter (ft)	Exit Flow Rate (ft^3/s)
Construction Off-Road	Volume	5.00	100.00	1.16	23.26	n/a	n/a	n/a	n/a
Construction Fugitive Dust	Area	-	n/a	n/a	n/a	1.00	n/a	n/a	n/a

Vista Canyon Ranch
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Table LST-3
Calculated AERMOD Source Emission Rates

Emissions Source	Model Source Group	Source ID	Source Type	Number of Sources	Averaging Period (hours/day)	Modeled Emission Rates											
						NO_X		CO		PM10 (Dust)		PM10 (Exh)		PM2.5 (Dust)		PM2.5 (Exh)	
						(lbs/day)	(g/s)	(lbs/day)	(g/s)	(lbs/day)	(g/s)	(lbs/day)	(g/s)	(lbs/day)	(g/s)	(lbs/day)	(g/s)
Construction Off-Road	West	VOL01-15	Volume	15	8	764.64	8.03E-01	351.70	3.69E-01	-	0.00E+00	33.45	3.51E-02	-	0.00E+00	30.77	3.23E-02
Construction Fugitive Dust	West	AREA1	Area	1	8	-	0.00E+00	-	0.00E+00	114.56	1.80E+00	-	0.00E+00	23.92	3.77E-01	-	0.00E+00
Construction Off-Road	North East	VOL29-41	Volume	13	8	764.64	9.26E-01	351.70	4.26E-01	-	0.00E+00	33.45	4.05E-02	-	0.00E+00	30.77	3.73E-02
Construction Fugitive Dust	North East	PAREA2	Area	1	8	-	0.00E+00	-	0.00E+00	114.56	1.80E+00	-	0.00E+00	23.92	3.77E-01	-	0.00E+00
Construction Off-Road	South East	VOL16-28	Volume	13	8	764.64	9.26E-01	351.70	4.26E-01	-	0.00E+00	33.45	4.05E-02	-	0.00E+00	30.77	3.73E-02
Construction Fugitive Dust	South East	PAREA1	Area	1	8	-	0.00E+00	-	0.00E+00	114.56	1.80E+00	-	0.00E+00	23.92	3.77E-01	-	0.00E+00

Vista Canyon Ranch
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Table LST-4
NO_2 1-hour Daily Average
Design value for all station , 2005-2008
(average of the 98th percentile value in a 3-year period)

Stn #	City	Design Value 2005-2007	Design Value 2006-2008	98th percentile, ppb 2005	2006	2007	2008
60	AZUS	83	84	77	84	87	82
69	BURK	75	76	79	72	74	83
72	LGBH	74	78	76	69	77	88
74	RESE	60	60	64	57	59	63
75	POMA	80	83	77	84	78	87
84	LYNN	79	79	81	85	71	82
85	PICO**	84	87	75	88	88	85
87	CELA	84	84	81	83	87	82
88	PASA	73	73	75	73	71	74
90	**SCLR**	**61**	**61**	**61**	**60**	**63**	**60**
91	WSLA	63	64	63	62	64	66
591	GLEN	78	76	75	79	79	71
820	HAWT	71	72	71	72	69	76
3176	ANAH	66	67	70	68	61	73
3177	LAHB	73	73	73	77	70	73
3195	CSTA	62	62	63	62	60	64
4137	PLSP	50	49	49	50	51	45
4144	RIVR	64	65	66	64	63	67
4158	ELSI	53	52	53	54	51	50
4164	BNAP	65	63	65	66	64	58
5175	UPLA	83	77	86	88	74	69
5197	FONT	80	77	88	80	72	79
5203	SNBO	71	69	70	73	69	64
5212	MLOM	69	73	66	70	70	79
5214	MRLM	51	61	35	61	58	64

Source:
1. South Coast Air Quality Management District, (2010).

Notes:
** Incomplete data for 2005 and 2006.

Vista Canyon Ranch
AERMOD Dispersion Model
SCAQMD Localized Significance Threshold Modeling

Table LST-5
Maximum Modeled Impacts at Sensitive Receptors

Construction Area	Model Source Group	Receptor Type	Maximum Modeled Impacts							
			CO				NO_2		PM10	PM2.5
			1-Hr		8-Hr		1-Hr		24-Hr	24-Hr
			μg/m³	ppm	μg/m³	ppm	μg/m³	ppm	μg/m³	μg/m³
Elevated Terrain / Meteorological Data Year: 2005										
West	West	Residential	667.42	0.58	139.27	0.12	175.98	0.09	30.60	9.38
Northeast	NE	Residential	320.33	0.28	89.09	0.08	133.57	0.07	14.67	5.07
Southeast	SE	Residential	543.39	0.47	169.73	0.15	277.52	0.15	31.52	10.02
Elevated Terrain / Meteorological Data Year: 2006										
West	West	Residential	307.57	0.27	99.87	0.09	199.95	0.11	21.33	6.54
Northeast	NE	Residential	169.82	0.15	75.49	0.07	121.08	0.06	13.00	4.42
Southeast	SE	Residential	381.78	0.33	154.56	0.14	319.91	0.17	31.52	9.53
Elevated Terrain / Meteorological Data Year: 2007										
West	West	Residential	463.45	0.40	98.56	0.09	169.57	0.09	20.16	6.33
Northeast	NE	Residential	217.43	0.19	74.44	0.07	117.39	0.06	12.80	4.33
Southeast	SE	Residential	506.76	0.44	162.57	0.14	255.76	0.14	33.59	10.41
Flat Terrain / Meteorological Data Year: 2005										
West	West	Residential	677.02	0.59	140.49	0.12	178.02	0.09	30.98	9.49
Northeast	NE	Residential	305.14	0.27	88.79	0.08	103.36	0.05	14.64	5.06
Southeast	SE	Residential	537.70	0.47	172.73	0.15	271.47	0.14	39.81	11.88
Flat Terrain / Meteorological Data Year: 2006										
West	West	Residential	309.24	0.27	100.27	0.09	203.11	0.11	21.47	6.58
Northeast	NE	Residential	167.19	0.15	76.30	0.07	119.77	0.06	13.03	4.44
Southeast	SE	Residential	393.11	0.34	155.41	0.14	307.32	0.16	38.58	11.36
Flat Terrain / Meteorological Data Year: 2007										
West	West	Residential	467.40	0.41	98.50	0.09	172.65	0.09	20.25	6.39
Northeast	NE	Residential	214.20	0.19	76.77	0.07	101.06	0.05	12.91	4.43
Southeast	SE	Residential	510.91	0.45	164.48	0.14	240.73	0.13	43.79	12.76
Maximum			677.02	0.59	172.73	0.15	319.91	0.170	43.79	12.76

Source: Lakes-Environmental, ISC-AERMOD View, Version 6.2.1, (2010).

APPENDIX B

AERMOD Dispersion Modeling Files
(Available electronically upon request)