COUNTY of SAN BERNARDINO
CALIFORNIA

AIR QUALITY IMPACT ANALYSIS

FOR

ALTAMIRA COMMUNITY
TENTATIVE TRACT MAP 18255

Prepared For

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DOCUMENTS REFERENCED

1. "CEQA Air Quality Handbook," prepared by South Coast Air Quality Management District, April 1993.

2. "Final 2007 Air Quality Management Plan," prepared by South Coast Air Quality Management District, June 2007.

3. "Mojave Desert Air Quality Management District Rule Book," prepared by the Mojave Desert Air Quality Management District, September 2005.

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AIR QUALITY IMPACT ANALYSIS
ALTAMIRA PDP & TTM 18255

SECTION I. INTRODUCTION & PROJECT DESCRIPTION

A. Introduction

The purpose of this report is to discuss the existing air quality in the project vicinity, identify the potential air quality impacts of the proposed project, and provide the mitigation measures necessary to limit impacts to levels that are less than significant. A significant effect on the environment is defined as a "substantial, or potentially substantial, adverse change to the environment" (California Public Resources Code Section 21068).

B. Project Description

Tentative Tract Map (TTM) 18255 proposes the subdivision of 105± acres into 259 single family lots of at least 10,000 square feet, as well as associated roadways, recreation open space and retention/detention basins. In addition, approximately 0.88 acres will be used for the proposed onsite package plant, which will treat all wastewater generated onsite to tertiary levels. The project site is located at the northeast corner of Sherwood Road and Alta Loma Drive, in the community of Joshua Tree, an unincorporated portion of San Bernardino County, California. The parcel can also be described as a portion of the south half of Section 34, Township 1 North, Range 6 East, San Bernardino Base Meridian.

The TTM 18255 is expected to be implemented in ten phases of development. For the purposes of this air quality report, construction and operational impacts associated with implementation of Tentative Tract Map 18255 is analyzed. The subdivision will eventually result in the construction of 259 homes, construction of which is projected to be completed by 2018.

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SECTION II. EXISTING CONDITIONS

Introduction

The air quality of a particular locale is based on the amount of emitted and dispersed pollutants, and upon climatic conditions that may reduce or enhance the formation of pollutants. Although air quality in the Morongo Basin has deteriorated over the past several decades due to increased development and local and regional emissions from traffic and other sources, it is apparent that although air pollution is emitted from various sources, some of the degradation of air quality can be attributed to sources outside of the area, including Los Angeles and other air basins to the west and southwest.

A. Climatic Conditions and Air Quality

The project area is influenced by moderate coastal influences, though it is far enough inland that temperatures can reach well over 100° F during the summer and drop into the 20s F during the winter. Wind patterns in the area are dominated by on-shore westerly winds controlled and channeled along the intervening mountains during the day, and by off-shore easterly winds in the evenings and at night. During fall and winter months climatic conditions associated with high pressure systems from the north can conflict with low pressure systems to the south and create a condition known as the Santa Ana winds, which can blow for multiple days at high speeds. These strong winds can sweep up, suspend and transport large quantities of sand and dust, reducing visibility, damaging property and constituting a significant health threat.

The Mojave Desert Air Basin and the community of Joshua Tree are susceptible to air inversions, which trap a layer of stagnant air near the ground where it can be further loaded with pollutants. Due to local climactic conditions, inversions generally occur 6,000 to 8,000 feet above the desert surface. These occasional inversions create conditions of haziness caused by moisture, suspended dust and a variety of chemical aerosols emitted by trucks and automobiles, furnaces and other sources. During the past few decades, the region has experienced a decline in air quality as a result of increasing local and regional development and population growth, traffic, construction activity and various site disturbances.

B. Air Quality Management and Regulation

Federal and state governments have established air quality standards for a variety of pollutants. In 1971, the Environmental Protection Agency (EPA) established the National Ambient Air Quality Standards (NAAQS). The California Clean Air Act (CCAA) became effective on January 1, 1989 and mandated health-based air quality standards at the state level. The California Air Resources Board (CARB) developed these state standards, which are generally more stringent than federal standards. State Implementation Plans (SIP) may also be prepared to help regional air quality management districts meet the federal and state ambient air quality standards by the deadlines specified in the federal Clean Air Act (CAA) and emission reduction targets of the California Clean Air Act.

Regional and local agencies have assumed some responsibility for assuring that state and federal air quality standards are achieved. The community of Joshua Tree is located within the Mojave Desert Air Basin (MDAB). The Mojave Desert Air Quality Management District (MDAQMD) is responsible for establishing air quality measurement criteria and relevant management policies for the air basin.

The community of Joshua Tree is subject to the provisions of the MDAQMD Rule Book[1], which sets forth policies and other measures designed to help the District achieve federal and state ambient air quality standards. These rules, along with the MDAQMD CEQA and Federal Conformity Guidelines[2], are intended to satisfy the planning requirements of both the federal and state Clean Air Acts. The MDAQMD also monitors daily pollutant levels and meteorological conditions throughout the District.

The South Coast Air Quality Management District (SCAQMD) regulates air basins adjacent to the MDAB. As one of the largest air quality districts in southern California, SCAQMD has established several policy and management level documents that are applicable to regional air basins. MDAQMD has established basin wide specific thresholds to determine air quality impacts and has adopted SCAQMD factors as set forth in the CEQA Air Quality Handbook in order to quantify air quality impacts and determine whether significance thresholds will be exceeded.

C. Primary and Secondary Pollutants

Pollutants are generally classified in two categories, primary and secondary. Primary pollutants are primarily a direct consequence of energy production and utilization, typically affect only local areas and do not undergo chemical modification or further dispersion. Primary sources and their pollutants are mostly a direct consequence of the combustion of petroleum and other fuels resulting in the production of oxides of carbon, sulphur, nitrogen and a number of reactive hydrocarbons and suspended particulates.

1 "Mojave Desert Air Quality Management District Rule Book," prepared by the Mojave Desert Air Quality Management District, September 2005.

2 "Mojave Desert Air Quality Management District California Environmental Quality Act and Federal Conformity Guidelines," prepared by the Mojave Desert Air Quality Management District, June 2007.

Secondary pollutants are those that undergo chemical changes after emission. Secondary pollutants disperse and undergo chemical changes under conditions of high ambient temperatures and high rates of solar insolation. Principal secondary pollutants are termed oxidants and include ozone (O_3), peroxynitrates, nitrogen dioxide (NO_2) and chemical aerosols.

Ozone (O_3), commonly known as smog, is formed primarily when byproducts of combustion react in the presence of ultraviolet sunlight. This process takes place in the atmosphere where oxides of nitrogen combine with reactive organic gases, such as hydrocarbons, in the presence of sunlight. Ozone is a pungent, colorless, toxic gas, and a common component of photochemical smog. Most ozone pollutants are transported inland by coastal winds from the Los Angeles and Riverside/San Bernardino air basins, thereby contributing to occasionally high ozone concentrations in the area.

Exposure to ozone can result in diminished breathing capacity, increased sensitivity to infections, and inflammation of the lung tissue. Children and people with pre-existing lung disease are most susceptible to the effects of ozone. Ozone can also cause extensive damage to vegetation. Studies have indicated that leaf drop, stunted growth, burnt tissues, and fewer seeds produced are defects directly resulting from the ozone pollutant.

Particulate Matter (PM_{10} and $PM_{2.5}$) consists of fine suspended particles of ten microns or smaller in diameter, which are byproducts of road dust, sand, diesel soot, wind storms, and the abrasion of tires and brakes. Fine particulate matter poses a significant threat to public health. The elderly, children and adults with pre-existing respiratory or cardiovascular disease are most susceptible to the effects of particulate matter. More than half the smallest suspended particles can be inhaled and deposited in the lungs, resulting in permanent lung damage. Elevated PM_{10} and $PM_{2.5}$ levels are also associated with an increase in mortality rates, respiratory infections, occurrences and severity of asthma attacks and hospital admissions.

D. Air Quality Standards

State and federal ambient air quality standards for ozone, particulate matter and other primary and secondary pollutants are shown in Table 1. State standards are generally more restrictive than federal standards.

Table 1
State and Federal Ambient Air Quality Standards

Pollutant	State Standard Averaging Time	State Standard Concentration	Federal Standard Averaging Time	Federal Standard Concentration
Ozone (O_3)	1 hour	0.09 ppm	1 hour	0.09 ppm
	8 hour	0.07 ppm	8 hour	0.075 ppm
Carbon Monoxide (CO)	1 hour	20.0 ppm	1 hour	35 ppm
	8 hours	9.0 ppm	8 hours	9.0 ppm
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm	N/A	N/A
	AAM	0.03 ppm	AAM	0.053 ppm
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm	AAM	0.03 ppm
	24 hours	0.04 ppm	24 hours	0.14 ppm
Particulate Matter (PM_{10})	24 hours	50 $\mu g/m^3$	24 hours	150 $\mu g/m^3$
	AAM	20 $\mu g/m^3$	N/A	N/A
Particulate Matter ($PM_{2.5}$)	24 hours	N/A	24 hours	35 $\mu g/m^3$
	AAM	12 $\mu g/m^3$	AAM	15 $\mu g/m^3$
Lead (Pb)	30 Days	1.5 $\mu g/m^3$	N/A	N/A
	3 month Avg.	N/A	8 hours	0.15 $\mu g/m^3$
Sulfates (SO_4)	24 hours	25 $\mu g/m^3$	N/A	N/A
Hydrogen Sulfide	1 hour	0.03 ppm	N/A	N/A
Vinyl Chloride	24 hours	0.01 ppm	N/A	N/A

Source: California Air Resource Board, November 17, 2008.
Notes: ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter of air; AAM = Annual Arithmetic Mean

E. Regional Pollutants of Concern

The Mojave Desert Air Basin covers 21,480 square miles, including portions of desert areas of San Bernardino County, Riverside County, Los Angeles County and Kern County. Air in the Mojave Desert Basin (which includes the Morongo Basin and the community of Joshua Tree) exceeds state and federal standards for fugitive dust, and the area is considered to be in extreme non-attainment for ozone. However, air quality in the area of the proposed project does not exceed state and federal standards related to carbon monoxide, nitrogen oxides, and sulfur dioxide.

The MDAQMD operates and maintains regional air quality monitoring stations at six locations throughout its jurisdiction. The closest monitoring stations which monitors comprehensively in the area is at the 29 Palms Marine Base. Table 2 shows the maximum concentration of PM_{10}, and the number of days exceeding state standards from 2002 through 2005.

Table 2
Ambient Air Quality Monitoring Data

29 Palms (Marine Base) Monitoring Station

Carbon Monoxide	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
State 1-hour ≥ 20.0 ppm	0	0	0	0	0	0	0	0
State 8-hour ≥ 9.0 ppm	0	0	0	0	0	0	0	0
Federal 1-hour ≥ 35.0 ppm	0	0	0	0	0	0	0	0
Federal 8-hour ≥ 9.0 ppm	0	0	0	0	0	0	0	0
Max. 1-hour Conc. ppm	1.0	1.0	1.5	1.0	0.7	0.6	inc	inc
Max. 8-hour Conc. ppm	0.5	0.5	0.5	0.6	0.3	0.5	inc	inc
Nitrogen Dioxide	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
State 1-hour ≥ 0.18 ppm	0	0	0	0	0	0	inc	inc
Max. 1-hour Conc. ppm	0.03	.03	0.031	0.028	0.058	0.025	inc	inc
Ozone	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
State 1-hour ≥ 0.09 ppm	5	5	1	1	1	4	4	0
Federal 1-hour ≥ 0.12 ppm	0	0	0	0	0	0	0	0
Federal 8-hour ≥ 0.08 ppm	1	1	4	0	0	5	0	0
Max.1-hour Conc. ppm	0.108	0.108	0.097	0.111	0.095	0.106	0.10	0.094
Max. 8-hour Conc. ppm	0.101	0.101	0.091	0.079	0.083	0.09	0.084	0.083
Sulfur Dioxide	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
State 1-hour ≥ 0.25 ppm	0	0	0	0	0	0	0	0
State 24-hour ≥ 0.04 ppm	0	0	0	0	0	0	0	0
Max. 1-hour Conc. ppm	0.005	.005	0.003	0.02	0.005	0.006	inc	inc
Max. 24-hour Conc. ppm	0.003	.003	0.001	0.003	0.002	0.002	inc	inc
PM10	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
State 24-hour ≥ 50 $\mu g/m^3$	1	2	3	3	0	2	n/a	n/a
Federal 24-hour ≥ 150 $\mu g/m^3$	0	0	0	0	0	0	n/a	n/a
Max. Conc.	62	84	56	70	43	58	n/a	n/a

Source: 29 Palms Marine Base Monitoring Station, Mojave Desert Air Quality Management District, 2002 – 2007. Note that the 29 Palms station closed in September 2005.

Of those pollutants described above, ozone, PM_{10}, and $PM_{2.5}$ are the most prevalent in the project area and the Morongo Basin. Air pollution in the project area generally results from a mixture of regional activities, which may include grading, construction and vehicular traffic, as well as heating, cooling, and ventilation equipment.

In addition, a considerable amount of pollution in the vicinity is attributable to local geographic and climatic conditions. The County of San Bernardino, including Joshua Tree, is in non-attainment for ozone and particulate matter. In order to meet the requirements, the MDAQMD established attainment plans for O_3 and PM_{10}.

PM10 Emissions

Natural sand formation and migration is a major erosive process in the desert environment. As erosion breaks down and sorts rock into boulders, rocks, gravels and sands, the finer materials, including sand and silt, can be picked up and transported by the wind. These wind-transported materials are referred to as "blowsand". PM_{10} particles associated with blowsand are of two types: (1) natural PM_{10} produced by direct particle erosion and fragmentation, and (2) secondary PM_{10} whereby sand deposited on roadways is further pulverized by motor vehicles and then re-suspended in the air by those vehicles. The subject property is located in a PM_{10} non-attainment area for both federal and state standards.

Historically, PM_{10} levels in the MDAB are elevated due to fugitive dust emissions from grading and construction activities, agricultural practices, and strong wind. MDAQMD adopted the "List and Implementation Schedule for District Measures to Reduce PM Pursuant to Health & Safety Code §39614(d)," which identifies the most readily available, feasible, and cost-effective control measures that could reduce particulate matter in the District. The document identifies measures that are currently being employed to reduce particulate matter in the District, sets forth new measures that could further reduce particulate matter, and lists those new measures that need further evaluation prior to implementation. In additions, applicable state code and AQMD Rules, including Rule 403 (Fugitive Dust), enforce fugitive dust compliance.

PM2.5 Emissions

Federal and state standards have been developed to regulate fine particulate matter smaller than 2.5 microns in diameter. To achieve federal attainment, a jurisdiction must provide the Environmental Protection Agency (EPA) with air quality monitoring data that does not violate the fine particle standards over a three-year period. In March of 2007 the EPA issued the Clean Air Fine Particle Implementation Rule, which describes the framework and requirements that state and local governments must achieve in developing their $PM_{2.5}$ implementation plans. The Rule requires that states meet the $PM_{2.5}$ standards by 2010, but may grant attainment extensions of up to 5 years. Therefore, the 2007 Rule requires that all states meet federal standards for attainment no later than 2015.

The MDAB is classified as being in non-attainment for $PM_{2.5}$, based on the 2007 State Area Designations. Although the Basin is classified as being in non-attainment for the state standard, the region is classified as being in attainment/unclassifiable for the national standard.

Ozone Emissions

Although MDAB has a history of exceeding regulatory ozone standards, the number of days and months in exceedance of the federal one-hour standard has dropped steadily over the past three decades. Under the Federal Clean Air Act, the MDAB is classified as a "moderate" ozone non-attainment area for the 8-hour state standard, which means that the region must come into compliance with Federal ozone standards by June 2010.

As previously noted, studies indicate that most ozone in the Morongo Basin is transported to the region by coastal winds from metropolitan air basins to the west. It is difficult to quantify the amount of ozone contributed from these regions; however, improved air quality in the project area depends upon reduced ozone emissions in the South Coast Air Basin.

It should be noted that ozone concentrations have declined over the past 30 years from a maximum of 0.45 ppm in 1979 down to 0.094 ppm in 2007. In addition, the frequency of exceedance of state and federal standards has also declined from the peaks set in the late 1970's.

F. Other Air Pollutants

Other pollutants are monitored by federal, state and local agencies, including the EPA, ARB, and MDAQMD. These pollutants include carbon monoxide, nitrogen dioxide and sulfur dioxide, which are primarily emitted by on-road motor vehicles. In general, with the exception of PM_{10}, the emission levels for all pollutants in the SCAB have been decreasing since 1985, and these decreases are predominantly attributed to motor vehicle controls and reductions in evaporative emissions.[3]

Toxic Air Contaminants (TAC) are also monitored to assure that adverse impacts from exposure are avoided. Pursuant to Assembly Bill 1807, which was enacted in 1983, TACs include substances such as asbestos, benzene, beryllium, inorganic arsenic, mercury, vinyl chloride, and any other contaminants not addressed by the national ambient air pollution program. TACs are required to be inventoried on a statewide level. There are a number of processes and facilities within the state that generate TACs, including electroplating and anodizing operations, gasoline distribution facilities, petroleum refineries, and others. TAC generation and emissions are regulated by the Toxic Air Contamination Control Program. The primary health concern associated with TACs is from mobile sources of particulate matter, which are known for their carcinogenic potential. Approximately 70 percent of the risk is attributed to diesel particulate emissions, and about 20 percent to other toxics associated with mobile sources.

G. Air Quality and Climate Change

Air quality has become an increasing concern because of its effects on human health and because air pollutants are thought to be contributing to global warming and climate change. The primary contributor to air pollution is the burning of fossil fuels through the use of automobiles, power and heat generators, and industrial processes. The byproduct from the combustion of fossil fuels can contain a number air polluting substances. Emissions from the combustion of fossil fuels are responsible for the poor air quality that is evident in industrial centers worldwide. Some air polluting agents are also greenhouse gases, such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases (hydrolflourocarbons, perflourocarbons, and sulfur hexafluoride), which are released into the atmosphere through natural processes and human activities. These gases are termed greenhouse gases due to their shared characteristic of trapping heat, and are responsible for the global average increase in surface temperatures of 0.7-1.5 °F that were observed during the 20th century.[4]

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3 "The California Almanac of Emissions and Air Quality, 2006 Edition," California Air Resources Board, Planning and Technical Support Division, March 2006.

4 "Climate Change 2007: The Physical Science Basis," Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, edited by S. Solomon, D. Qin, and M. Manning, April 2007.

The quantity of greenhouse gases in the atmosphere has increased drastically over a relatively short period. Between the beginning of the industrialized era and 2005, the atmospheric concentration of CO_2 had increased by 35%, methane by 151%, and nitrous oxide by 18%.

Carbon dioxide is the primary greenhouse gas that has raised the alarm of atmospheric scientists due to current and projected levels and the highly correlated temperature regression curve that has been observed, predicting a future path of rising carbon dioxide levels. Currently, carbon dioxide concentrations in the atmosphere are around 379 parts per million (ppm). Comparatively, prior to the Industrial Revolution, about 250 years ago, CO_2 levels were 278 ppm. Over the past 650,000 years carbon dioxide levels have fluctuated between 180 and 300 ppm, making present day atmospheric CO_2 levels substantially greater than at any point in the past 650,000 years.[5]

In 2004, the State of California generated 492 million metric tons of carbon dioxide equivalent (gross). Although the state's population grew by 16 percent between 1990 and 2004 GHG emissions were reduced by 9.7 percent. GHG emission reductions are attributed to energy conservation measures such as use of energy efficient appliances and building materials that are prescribed under Title 24 of the California Building Code.

There is much debate over what the effects of climate change will be, but there is a general consensus that the levels of GHG emissions need to be reduced in order to minimize air pollution and limit the amount of carbon dioxide and other pollutants that are released into the atmosphere. Carbon dioxide levels are projected to increase to at least 540 ppm and possibly as high as 970 ppm by the year 2100.[6] Currently, there are limited incentives for reducing emission and few laws that require reductions, however some regulations have been adopted and additional regulation are forthcoming from federal, state and/or local governments.

Greenhouse Gasses

For the purpose of this analysis emission of carbon dioxide, methane, and nitrous oxide are evaluated.

Carbon Dioxide (CO_2) is an odorless and colorless gas that is emitted from natural sources such as the decomposition of dead organic matter, respiration of bacteria, plants, animals and fungus, evaporation from oceans, and volcanic out gassing. Manmade sources of CO_2 include the combustion of coal, oil, natural gas, and wood. Carbon dioxide is naturally removed from the air by photosynthesis, dissolution into ocean water, transfer to soils and ice caps, and chemical weathering of carbonate rocks.

Methane (CH_4) is released naturally as part of biological processes such as in low oxygen environments like swamplands, bogs, or in rice production (at the roots of the plants) and in cattle raising. Mining of coal, the combustion of fossil fuels and biomass also generate methane emissions. Methane is a more efficient absorber of radiation compared to CO_2, however its atmospheric concentration is less than carbon dioxide.

[5] "Working Group III Contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report, Climate Change 2007: Mitigation of Climate Change," prepared by the Intergovernmental Panel on Climate Change, May 2007.

[6] Ibid.

Nitrous Oxide (N_2O) is more commonly known as laughing gas and is a colorless greenhouse gas that in small doses can cause dizziness, euphoria, and sometimes slight hallucinations. However, prolonged exposure to heavy concentrations of N_2O can cause Olney's Lesions (brain damage). Nitrous oxide is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. Some industrial processes (fossil fuel fired power plants, nylon production, nitric acid production, and vehicle emissions) also generate N_2O emissions. It is used as an aerosol spray propellant such as whipped cream bottles, in potato chip bags to keep chips fresh, and in rocket engines and race cars.

Nitrous oxide can be transported into the stratosphere, be deposited on the Earth's surface, and be converted to other compounds by chemical reaction. Nitrous oxide combines with oxygen in the presence of reactive hydrocarbons and sunlight to form nitrogen dioxide and ozone. Oxides of nitrogen are contributors to other air pollution problems including high levels of fine particulate matter, poor visibility, and acid deposition.

Climate Change Regulation

California was the first state to establish regulations that require emission reductions from motor vehicles. On September 24, 2004, the California Air Resources Board adopted a bill that requires all 2009 and later vehicles to reduce their greenhouse gas emissions by about 30% by the year 2016.[7] In addition, the California Global Warming Solutions Act of 2006 (AB 32) has been passed in order to comprehensively limit greenhouse gas emissions (GHG) at the state level by establishing an annual reporting program of GHG emissions for significant sources and sets limits to cut the state's GHG emissions to 1990 levels by 2020.

On June 1, 2005 Governor Arnold Schwarzenegger issued executive order S-3-05, which calls for reduction in GHG emission to 1990 levels by 2020 and for an 80 percent reduction below 1990 levels by 2050.

The California Global Warming Solutions Act (AB 32) was adopted by the state legislature in 2006. It sets forth a program to achieve 1990 emission levels by 2020 and requires CARB to proclaim 1990 GHG emissions and develop a Scoping Plan that can be implemented by January 1, 2012. CARB has reported that 1990 GHG levels were 427 million metric tons (MMT) for the state of California and adopted the scoping plan on December 11, 2008. The Scoping Plan includes measures like a cap and trade program, green building strategies, recycling and waste reduction, and Voluntary Early Actions and Reductions. CARB must adopt necessary regulation to implement the plan by January 1, 2011 so that measures can be implemented by the 2012 deadline.

In August of 2007, SB 97 was adopted by the State Legislature. SB 97 requires the California Office of Planning and Research (OPR) to adopt CEQA guidelines for GHG emissions and mitigation by January 1, 2010. Preliminary CEQA guidelines were released in 2009 and hold that lead agencies shall have final discretion to determine weather GHG analysis should be qualitative or quantitative. OPR's GHG CEQA guidelines do not establish thresholds of significance, rather they call for "good-faith effort, based on available information . . ."

7 http://www.ucsusa.org/clean_vehicles/vehicles_health/californias-global-warming-vehicle-law.html

California SB 375 was signed by the Governor in September 2008 and is intended to at least in part implement greenhouse gas reduction targets in AB 32. The bill encourages regional land use planning to reduce vehicle miles traveled and requires jurisdictions to adopt a sustainable communities strategy.

Thresholds of Significance for GHGs

To date the California ARB, state Environmental Protection Agency (EPA) and other regulatory agencies have not adopted thresholds against which to analyze project level impacts on climate change. It should be noted that on October 24, 2008 CARB released the "Preliminary Draft Staff Proposal for Setting Interim Significance Thresholds." In the absence of adopted CEQA thresholds for emissions of greenhouse gases, impacts would be considered significant if it were determined that the project interferes with the goals of AB 32.

The Global Warming Solutions Act (AB 32) requires the state to cut GHG emission to 1990 levels by the year 2020. Therefore, the project would have a significant impacts if GHG's emitted by the project interfere with the ability of AB 32 to achieve the intended reductions by 2020.

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SECTION III. PROJECT IMPACTS

The development of the Altamira residential project will result in the direct and indirect generation and emission of air pollutants both locally and regionally. Emissions will contribute to regional air quality degradation in San Bernardino County. The most significant impacts are expected to come from the emission of pollutants generated by vehicular traffic.

Other important sources of pollutants will be emissions generated during site preparation activities, including fugitive dust from site disturbance and other construction activities, and from project operations. The utilization of natural gas and electricity will also contribute to the degradation of air quality. The following discussion describes the major sources of air pollutants associated with the development of the Altamira project and calculates the potential emissions.

The analysis below assumes that the project site will be built out in ten phases, as shown in the preliminary phasing plan. For purposes of this analysis, the phase that has the greatest potential to impact air quality has been analyzed for construction purposes.

A. Fugitive Dust

Fugitive dust generation is associated with the grubbing, grading, excavation and other ground disturbance on an assumed maximum 17± acres disturbance area at any one time on the project site. The formula for estimating fugitive dust generation associated with the project, and its direct application to project acreage, is presented below.

Table 3
Calculations of Fugitive Dust Potential

Area to be Disturbed	Fugitive Dust Factor	Potential Dust Generation
17 acres	20 lbs per acre	340 lbs per day
Mitigated Fugitive Dust		**76.37 lbs per day**
Source: URBEMIS 2007 version 9.2.4.		

These emissions estimates are predictors of potential maximum short-term impacts during the site grading and site preparation period. The MDAQMD has established thresholds of significance for PM_{10} emissions at 82 pounds per day. With the implementation of mitigation measures to limit fugitive dust emissions, impacts can be reduced to levels that are less than significant. Therefore, if an average of approximately 17 acres are graded during any given day and mitigation measures are implemented then impacts from the generation of fugitive dust will be less than significant. It should be noted that the above figure includes mitigation measures such as watering exposed surfaces three (3) times daily, application of soil stabilizers, and replacing ground cover.

In order to assure that impacts associated with fugitive dust are minimized the project shall adhere to Rule 403 and other applicable regulations, as well as those mitigation measures set forth below.

B. Construction Related Emissions

Local air quality will be temporarily impacted during construction activities, which include site preparation/grading, trenching for the installation of utilities, roadway paving, application of architectural coating, and building construction. Emissions will be generated by the operation of construction equipment, delivery of materials, off-gassing from asphalt and architectural coating, as well as vehicles transporting workers to and from the project site.

The following table summarizes all projected daily emissions associated with construction. For detailed information on the type of equipment analyzed, hours of operation, and duration of construction, please see Appendix A. As shown in Table 4, construction activity on the project site will not exceed any of the established MDAQMD thresholds of significance.

Table 4
Construction Emission Summary
(pounds per day)

	CO	ROG	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Equip. Emissions 2010[1]	64.42	10.32	82.89	0.07	4.43	4.07	9,040.29
Equip. Emissions 2011[2]	61.65	35.91	28.90	0.08	1.56	1.42	9,242.44
MDAQMD Threshold	548.00	137.00	137.00	137.00	82.00	N/A	N/A

Note that emission projections for summer and winter are equivalent.

To account for assembly of the planned onsite sewage treatment package plant, related earthwork and other associated activities additional construction equipment was considered. The URBEMIS model was augmented to include a building construction phase of short duration to account for site prep, delivery, and assembly of the plant. To account for drainage improvements and channelization work, additional construction equipment was added to the trenching and building construction activities. As mentioned above, Appendix A provides a detailed breakout of construction equipment utilized in the URBEMIS model.

The table above shows that no threshold criteria are projected to be exceeded during construction activities. Construction emissions were calculated based upon the daily use of different types of construction equipment that will be utilized throughout the entire period. It should be noted that not all equipment will be used every day and various construction activities generate different quantities of emissions. The Construction Emission Summary, above, is the average daily emission across all construction activities. It should be noted that construction related air quality impacts are short-term and will occur only during the construction phase of the project.

C. Operational Emissions

At buildout of the proposed project, onsite operation (including the on-site package plant and occupation of 259 single-family homes) will result in the emission of air quality pollutants that have the potential to impact air quality. The following table summarizes projected maximum daily emissions in pounds per day from the operation of the TTM 18255, which includes area source emissions such as combustion of fuels, landscaping maintenance, use of consumer products, and application of architectural coatings, as well as emissions from moving sources.

A traffic impact analysis was prepared in order to evaluate the potential traffic and circulation impacts associated with buildout of the project. According to the traffic study, project buildout is expected to result in 2,584 passenger vehicle trips per day.[8]

The following table summarizes the potential generation and emission of pollutants associated with day-to-day operations of the proposed project at buildout. As shown in Table 5, operation of the proposed project will not exceed any of the established MDAQMD thresholds of significance.

Table 5
Operational Emission Summary
(pounds per day

	CO	ROG	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Summer							
Area Source Emissions	13.36	16.65	4.35	0.00	0.04	0.04	5404.41
Operational Emissions	352.81	28.54	49.4	0.38	60.99	12.28	37,339.50
Summer Emissions	**366.17**	**45.19**	**53.75**	**0.38**	**61.03**	**12.32**	**42,743.91**
Winter							
Area Source Emissions	114.44	55.16	7.97	0.32	17.48	16.83	10,314.27
Operational Emissions	338.00	32.14	58.46	0.32	60.99	12.28	34,052.77
Winter Emissions	**452.44**	**87.30**	**66.37**	**0.64**	**78.47**	**29.11**	**44,367.04**
MDAQMD Threshold	**548.00**	**137.00**	**137.00**	**137.00**	**82.00**	**N/A**	**N/A**

8 "Yucca Valley 105 Traffic Impact Analysis," prepared by Kunzman Associated, July 12, 2007. Project trip generation was revised downward to 2,479 ADT in the January 22, 2010 traffic response to comments letter. Therefore, the trip based analysis is slightly conservative.

The table below shows the potential emissions associated with annual electricity consumption by development on the project site. Electricity usage is estimated by applying the electrical power usage rates to anticipated development on a per unit basis. Figures are multiplied by the emission generation factors set forth in the South Coast Air Quality Management District (SCAQMD) CEQA Handbook.[9] Although pollutants associated with the onsite use of electricity will not be emitted in the project vicinity, air pollutants will be generated offsite as a result of the project's increase in overall energy demand. No provision is made for the use of on-site solar photovoltaic systems, which could significantly reduce the amount of electricity used at the site that is generated by polluting sources.

Table 6 show the emission of criteria pollutants that are projected to be emitted from the use of 2,673 megawatts, which is the project's estimated annual energy demand as indicated in Table 8 below and summarized in the following table.

Table 6
Off-site Electricity Production Emissions
(pounds per day)

	CO	ROG	NOx	SO_2	PM_{10}
Project Energy Demand (mw/yr)	2,673	2,673	2,673	2,673	2,673
SCAQMD Factor (lbs/mw/hr)	0.2	0.01	1.15	0.12	0.04
Lbs./Year	534.5	35.9	3073.6	320.7	106.9
Lbs./Day	**1.46**	**0.10**	**8.42**	**0.88**	**0.29**

Based on per unit usage and emissions factors provided in Tables A9-11-A and A9-11-B, "CEQA Air Quality Handbook," prepared by the South Coast Air Quality Management District, April 1993 and Table 8 below. Assumes continued availability and use of natural gas in power plants and an average contribution from hydro-electric sources. Represents total pounds emitted per year by all development at buildout.

As seen in Table 6 onsite energy production and associated emissions will not generate significant concentrations of criteria pollutants and are well below established thresholds. Therefore, air quality emissions associated with the operation of the proposed project are expected to be less than significant.

Potential Odors

The proposed project is not expected to generate objectionable odors at project buildout. The sewage package plant will not include aeration ponds, which can be an odor source associated with wastewater treatment. Rather, aeration basins that are part of the package plant are planned. In addition, the proposed package plant does not provide primary treatment, which eliminates the potential odors generated by primary clarification treatment. The planned Modified Ludzack-Ettinger Process provides partial nitrogen removal and assures that despite the presence of nitrate there are no objectionable odors. The package plant's influent channel system will be enclosed as an odor control measure. Therefore, impacts from objectionable odors are expected to be less than significant. Also see Appendix B, which contains detailed information regarding the proposed package plant.

9 Table A9-11-A, "CEQA Air Quality Handbook," prepared by the South Coast Air Quality Management District, April 1993.

D. Cumulative Impacts

The proposed project will result in the development of 259 single-family residential dwelling units, which have the potential to house approximately 648 people. The subject lands are surrounded on three sides by development and the site constitutes an "infilling" of the already established development pattern. The Altamira residential development is also located in proximity to the Joshua Tree Highway 62 commercial and business district, which is located one-half mile to the north and east. The Altamira project is also a more efficient use of residential lands and thereby reduces the energy use per household.

Population growth resulting from the development of the project will not surpass that predicted by the 2007 General Plan EIR. The General Plan EIR considers development on the proposed project site in an intensity equivalent to that being proposed by TTM 18255 and has identified the impacts associated with build-out of the General Plan.

The project is not expected to be growth inducing beyond the direct increase in population from the development of the 259 residential units proposed. As demonstrated in the tables above, the proposed project will result in relatively modest and less than significant emissions of criteria pollutants. These potential emissions are not a cumulatively significant net increase of any criteria pollutants. Development of the proposed project is not expected to result in cumulatively considerable impacts.

E. Greenhouse Gas Emissions

Air quality has become an increasing concern because of human health issues, and because air pollutants are thought to be contributing to global warming and climate change. The proposed project has the potential to incrementally emit greenhouse gasses, primarily through the consumption of fossil fuels through vehicular transportation. Site development and construction of the project will also generate greenhouse gas emissions.

Construction GHG Emissions

Construction activities will generate short-term GHG emissions during site grading, trenching, paving, building construction, and application of architectural coatings. The following table summarizes estimated GHG emissions from the construction portion of the project.

Table 7
Greenhouse Gas Construction Emission Summary
(pounds of CO2e)

Construction Activity[1]	Days of Activity	CO2 (lbs/day)	CO2 (totals)[2]	CH4 (totals)[3]	CO2e Emissions[4]
Mass Grading	27	4,218.65	113,903.55	455.61	123,471.45
Fine Grading	22	4,218.65	92,810.30	371.24	100,606.37
Trenching	15	4,100.95	61,514.25	246.06	66,681.45
Paving	8	5,116.10	40,928.80	163.72	44,366.82
Building	178	9,040.29	1,609,171.62	6,436.69	1,744,342.04
Arc Coating	111	206.19	22,887.09	91.55	24,809.61
Subtotal			1,941,215.61	7764.86	
Total Pounds of Carbon Dioxide Equivalent Emissions for Construction					**2,104,277.72**

1 Construction activity, days of activity and CO2 pounds per day are taken from the URBEMIS output tables.
2 To quantify total CO2 emissions for all construction, each construction activity's CO2 emissions per day was multiplied by the total days of activity.
3 Based on EMFAC 2007 (version 2.3) On-road construction equipment for delivery trucks weighing >8500 pounds the CO2 and CH4 emission factors used are 2.72 and 0.0001 pounds per mile, respectively, and for equipment weighing between 33,000 and 60,000 pounds the emission factors used are 4.21 (CO2) and 0.00015 (CH4) pounds per mile. Therefore, it was assumed that 0.004 percent of CO2 emissions would equate to the emissions of CH4. EMFAC does not provide emission factors for N2O.
4 Note that CH4 is weighted by a factor of 21 in order to determine CO2e.

Table 7 shows that greenhouse gas emissions from construction of the proposed project are projected to be 2.1 million pounds or 954.39 metric tons at project buildout. Based on these estimates and implementation of mitigation and project design features, construction activities are not expected to interfere with the objectives of AB 32. Therefore, GHG emissions from construction of the proposed project are expected to be less than significant.

Operational GHG Emissions

The proposed project will result in the emission of greenhouse gasses primarily through the combustion of fossil fuels associated with use of automobiles. The production and use of electricity and natural gas, and energy use associated with the transportation of water also contribute to operational emission of GHG's.

The table below shows potential power plant emissions associated with annual electricity consumption from the 259 single-family homes and the sewage treatment plant. Electricity usage is estimated by applying the electrical power usage rate as set forth in the South Coast Air Quality Management District (SCAQMD) CEQA Handbook[10].

Table 8
Estimated Electrical Usage

Land Use Type	Usage Rate[1]	Unit Type	Units	Annual kwh
Single Family Residential[2]	5,626.5	kwh/unit/year	259	1,457,264
Package Plant[3]	12	kwh/cubic meter	101,288	1,215,450
Total				**2,672,714**

kwh= Kilowatt Hour
Source: "Preliminary Development Plan for Altamira Tentative Tract Map 18255," prepared by Terra Nova Planning and Research Inc., January 2010.
1) The usage rate for residential is taken from Table A9-11-A Electricity Usage Rate, "CEQA Air Quality Handbook," prepared by the South Coast Air Quality Management District, April 1993.
2) The project proposes development of 259 single family dwelling units.
3) Based on the "Joshua Basin Tract 18255 Wastewater Alternatives-Preliminary Analysis," prepared May 19, 2008, an estimated 75,000 gallons per day or 101,288 cubic feet per year of wastewater are projected to be generated. The Total Annual Electric Usage Rate is determined by utilizing the estimated energy demand generated by operation of a sewage treatment plant of 12 kwh per cubic meter of treated effluent, as set forth by Water & Wastewater Engineering PTY. LTD.

10 Table A9-11-A, "CEQA Air Quality Handbook," prepared by the South Coast Air Quality Management District, April 1993.

At buildout of the proposed project, the annual CO_2 equivalent emission associated with electricity use is estimated to be 976.72 metric tons as shown in Table 9.

Table 9
GHG Emissions from Electricity Use

Electricity Use[1]	**kwh per year**	**2,672,714**	**mwh per year**	**2,673**
Emissions	**Emission Factor (Lbs/MWh)**[2]	**Projected Emissions (Lbs/Year)**	**Projected Emissions (Tons/Year)**	**Metric Tons per Year**
Carbon Dioxide (CO_2)	804.54	2,150,305	1,075	975.16
Methane (CH_4)	0.0067	18	0.0090	0.01
Nitrous Oxide (N_2O)	0.0037	10	0.0049	0.00
Total		**2,150,333**	**1,075**	**975.18**
			CO_2 Equivalent per Year[3]	**976.72**

1 Electricity Use is estimated using SCAQMD CEQA Handbook, Table A9-11-A, 1993.
2 Emission factors from "California Climate Action Registry General Reporting Protocol: Tables E.1, C5 and C6," version 3.0 prepared by California Climate Action Registry, April 2008.
3 CO_2 Equivalent is based on SAR (1996) global warming potential of 21 for CH_4 and 310 for N_20.
Note that electricity consumption does not consider the transport of water.

Natural gas emissions are calculated using the average monthly consumption factor established by SCAQMD. Table 10 shows the estimated natural gas usage rate at buildout of the proposed project. It is assumed that the proposed sewage treatment package plant does not utilize natural gas.

Table 10
Natural Gas Usage Rates

Land Use	**Natural Gas Factor**		**Units**	**Cubic Feet per month**
Residential	6,665	cubic feet/unit/month	259	1,726,235

Source: "Preliminary Development Plan for Altamira Tentative Tract Map 18255," prepared by Terra Nova Planning and Research Inc., January 2010.
1) The usage rate is taken from the hotel/motel land use factor, Table A9-12-A, "CEQA Air Quality Handbook," prepared by the South Coast Air Quality Management District, April 1993.
2) Residential land use captures all proposed development onsite.

As shown in the table below, natural gas usage onsite is expected to generate approximately 1,134 metric tons of CO_2 equivalent per year.

Table 11
GHG Emissions from Natural Gas Use

Natural Gas Use[1]	**cubic feet per day**		**56,753**	**cubic feet per year**	**20,714,820**
			MMBtu[2]		**21,295**
Emissions	**Emission Factor**	**Unit**	**Projected Emissions (kg/Year)**	**Projected Emissions (Tons/Year)**	**Metric Tons per Year**
Carbon Dioxide (CO_2)[3]	0.0546	kg CO2/ cubic foot	1,131,029	1,247	1,130.79
Methane (CH_4)[4]	0.0059	kg CH4/ MMBtu	126	0.14	0.13
Nitrous Oxide (N_2O)[4]	0.0001	kg CH4/ MMBtu	2	0.00	0.00
		Total	**1,131,157**	**1,246.87**	**1,130.9**
			CO_2 Equivalent per Year[5]		**1,134.1**

1 Natural Usage rate is estimated using SCAQMD CEQA Handbook, Table A9-12, 1993.
2 Btu assumes 1,028 Btu per cubic foot. "Table A4 Approximate Heat Content of Natural Gas 1949-2007," energy information administration.
3 "Calculations and References," of the Greenhouse Gas Equivalencies Calculator, prepared by EPA and last updated on August 4, 2008.
4 Emission factors from "California Climate Action Registry General Reporting Protocol: Equations III.8d," version 3.0 prepared by California Climate Action Registry, April 2008.
5 CO2 Equivalent is based on SAR (1996) global warming potential of 21 for CH4 and 310 for N20.

As seen in Table 12 below, greenhouse gas emissions from moving sources are estimated to be 5,887 metric tons of carbon dioxide equivalent per year.

Table 12
GHG Emissions from Moving Sources

Vehicle Type	Miles Per Day[1]	Miles Per Year	Gallons Per Year[2]
Passenger Car	34,250	12,501,143	634,576
Heavy Duty Truck	699	255,125	12,951
Total	**34,949**	**12,756,268**	**647,526**

Emission Type	Passenger Car[5]	Heavy Duty Truck[6]	Unit[3]	Metric Tons per Year	CO2 Equivalent per Year[7]
Carbon Dioxide CO2)[3]	0.00881	0.00881	metric tons / gallon	5,705	5,705
Methane (CH4)[4]	0.04	0.12	Grams/mile	0.53	11
Nitrous Oxide (N2O)[4]	0.04	0.2	Grams/mile	0.55	171
			Total	**5,706**	**5,887**

1 Miles per day are based on the URBEMIS 2007 version 9.2.4 output data included in Appendix A. The mix of vehicles assumes 98 percent of total miles traveled are passenger cars and 2 percent are heavy-duty trucks.
2 To quantify the estimated gallons of gasoline that the project will use per year for the Moving Source component, 19.7 miles per gallon was assumed.
3 Emission factor for CO2 is from "Calculations and References," of the Greenhouse Gas Equivalencies Calculator, prepared by EPA and last updated on August 4, 2008. Note that the factor is intended for use of cars and light trucks.
4 Emission factors from "California Climate Action Registry General Reporting Protocol: Tables C5 and C6," version 3.0 prepared by California Climate Action Registry, April 2008.
5 Passenger cars are based on factors given for the use of gasoline and are based on model year 2000 to present.
6 Heavy-duty trucks assume the use of gasoline and are based on model year 1996 to present. Note that heavy-duty trucks often use diesel, which has much lower emission factors for CH4 (.06) and N2O (.05).
7 CO2 Equivalent is based on SAR (1996) global warming potential of 21 for CH4 and 310 for N20.

Southern California imports water from northern California and the Colorado River to supplement local sources and to assure sufficient water supplies to meet demand. Water transportation requires the use of energy for conveyance, treatment, and distribution. In addition, wastewater collection, treatment, and discharge also require the use of energy.

Water conveyance to southern California using the State Water Project is estimated to represents approximately 3 percent of all the energy used in the State per year. This is primarily due to the distance the water has to travel and the pumping associated with delivering the water supply. The California Energy Commission (CEC) has established factors to quantify energy demand per million gallons of water. Based on these factors and the projected onsite water use identified, the following table has been prepared, which quantifies the total projected greenhouse gas emission associated with transport of water.

Table 13
GHG from Energy Demand for Onsite Water Use

Acre/feet per year[1]	**Million gallons per year**	**Energy Factor for Water Use (kwh/MG)**	**Energy Demand for Water Use (kwh)[2]**	
82.86	27.00	13,022.00	351,594.64	
Electricity Use	**mwh per year**	**200**		
Emissions	**Factor (Lbs/MWh)[3]**	**Emissions (Lbs/Year)**	**Emissions (Tons/Year)**	**Metric Tons per Year**
Carbon Dioxide (CO2)	804.54	282,872	141	128
Methane (CH4)	0.0067	2	0.00	0.00
Nitrous Oxide (N2O)	0.0037	1	0.00	0.00
Total		**282,876**	**141**	**128**
		CO2 Equivalent per Year[4]		**129**

1 Based on calculations for water demand as described in the "Preliminary Development Plan for Altamira Tentative Tract Map 18255," prepared by Terra Nova Planning and Research Inc., January 2010.
2 Electricity use is based on an average energy demand for the conveyance, treatment, and distribution of water in Southern California per the "Refining Estimates of Water-Related Energy Use in California," prepared by the California Energy Commission, Public Interest Energy Research Program. CEC-500-2006-118. December 2006.
3 Emission factors from "California Climate Action Registry General Reporting Protocol: Tables C5 and C6," version 3.0 prepared by California Climate Action Registry, April 2008.
4 CO2 Equivalent is based on SAR (1996) global warming potential of 21 for CH4 and 310 for N20.

Table 14 summarizes the total unmitigated potential GHG generation that could result from construction and long-term occupancy of the Altamira subdivision. On-going occupancy (operation) for the subdivision could generate up to 0.008 million (8,000) metric tons of carbon dioxide equivalent per year. Based on these estimates, project design features, and implementation of mitigation measures, operation of the subdivision is not expected to interfere with the objectives of AB 32. Therefore, GHG emissions from the operation of the proposed project are expected to be less than significant.

Table 14
Annual GHG Summary

Emission Source	CO2 Equivalent Metric Tons	CO2 Equivalent Million Metric Tons
Electricity	976.72	0.001
Water Use	128.51	0.000
Natural Gas	1,134.09	0.001
Moving Source	5,886.68	0.006
Total	**8,126.01**	**0.008**

In comparison, the total carbon dioxide equivalent emissions in California for the year 1990 was estimated to be 427 million metric tons. At buildout the project will contribute approximately 0.002% of the total California emissions limit for 2020 as established by ARB. In 2005 the total carbon dioxide equivalent emissions for the United States was estimated at 7,260.4 million metric tons. The project represents 0.0001% of the total emissions for the US as estimated in year 2005.

In order to assure that the project does not interfere with the objectives of AB 32, project proponents shall adhere to those mitigation measures set forth below. With implementation of the following measures, the project will have a less than significant impact on climate change.

AIR QUALITY IMPACT ANALYSIS
ALTAMIRA PDP & TTM 18255

SECTION IV. MITIGATION MEASURES

A. General Control Measures

Due to the proposed scope of the Altamira residential Tentative Tract Map 18255, none of the air quality thresholds established for criteria pollutants are projected to be exceeded by development and occupation of the project, and impacts to air quality are expected to be less than significant. Although mitigation measures are not required since no thresholds exceed established standards and/or thresholds, the following techniques and mitigation measures described below will further limit air quality emissions.

A. Active grading and site disturbance shall be limited to a maximum of 17 acres per day, and all exposed surfaces shall be watered a minimum of 3 times daily.

B. The following design recommendations will reduce reliance on automobiles for transportation, reduce vehicle miles traveled, and to reduce emissions per mile:

   1. Provide interconnecting pedestrian and bicycle paths within the project that can be joined via a community pedestrian and bicycle path system to the nearby school and commercial/business district, as well as recreational areas;

   2. Establish accessible public transit routes that provide seated shaded areas within walking distance of the project site (It should be noted that MBTA Bus Route No. 1 along the State Highway 62 mainline serves the vicinity of the Altamira project.); and

   3. Promote the use of electric and hybrid vehicles, as well as other alternative modes of transportation, and provide safe and convenient vehicle and bicycle parking.

C. The design recommendations listed below will encourage operational efficiency and sustainability:

   1. Design onsite structures to be energy efficient and achieve LEED standard equivalence;

2. Select home appliances and fixtures that are water efficient;

3. Install light colored “cool” roofs and cool pavement to reduce heat island effects;

4. Incorporate the use of solar energy technologies for onsite renewable energy production, including solar hot water heaters and photovoltaic power;

5. Install water efficient irrigation systems and ET-based timer devices;

6. Utilize xeriscape/desert landscaping techniques, including native and other drought-tolerant plants and use of boulders and gravel to minimize water demand; and

7. Coordinate with solid waste hauler Waste Management, Inc and promote and facilitate recycling by providing bins for curbside programs for all organic and inorganic wastes composting green waste.

D. In order to minimize the impacts from fugitive dust emissions, the following mitigation measures shall be implemented.

1. The applicant shall prepare a dust control plan to conform with AQMD Rule 403, which shall be approved by the MDAQMD and the County. The dust control plan may include but are not limited to the following measures:

   - chemically treat soil where activity will cease for at least four consecutive days;
   - pave on-site construction access roads as they are developed; extend paving at least 120 feet from roadway into construction site and clean roadways at the end of each working day;
   - restore vegetative ground cover as soon as construction activities have been completed;
   - chemically treat unpaved roads that carry 20 vehicle trips per day or more;
   - all construction grading operations and earth moving operations shall cease when winds exceed 25 miles per hour;
   - water site and equipment morning and evening and during all earth-moving operations;
   - operate street-sweepers on paved roads adjacent to site; and/or
   - re-establish ground cover on construction site through seeding and watering or other appropriate means;
   - establish and strictly enforce limits of grading for each phase of development

- stabilize and re-vegetate areas of temporary disturbance needed to accomplish each phase of development.

2. To reduce fugitive dust during construction activities trucks leaving the sites shall be washed off; haul trucks shall maintain 2 feet of freeboard or be fully covered; and low sulfur fuels should be used for construction equipment.

3. The grading contractor shall certify in writing that all construction equipment is properly serviced and maintained in good operating conditions. Certification shall be provided to Planning for review and approval.

B. Air Quality and Climate Change Mitigation

The follow mitigation measures are derived from consensus recommendations including the Attorney General for reducing global warming and air pollution and are intended to limit the project's contribution to greenhouse gas emissions:

1. Landscaping designs shall consider the use of trees and other vegetation to maximize the shading of buildings in summer and providing solar access in winter in order to reduce conventional energy requirements for heating and cooling.

2. Building designs affecting energy use shall result in a reduction in demand that exceeds Title 24 requirements by 20%.

3. To the extent feasible, the developer shall utilize building materials that are sustainably sourced.

4. Developers shall be encouraged to equip project homes and the community center with solar water heaters to reduce the reliance upon non-renewable energy sources for domestic hot water, pool heating and other appropriate applications of solar thermal systems.

5. All residential dwelling units shall be equipped with energy efficient and water conserving appliances and fixtures that are EnergyStar certified or better in performance rating.

6. Building design shall optimize natural lighting and ventilation to the greatest extent feasible.

7. Project proponents shall coordinate with the local solid waste disposal provider to assure that measures are in place to encourage waste reduction, and to facilitate recycling and composting programs.

APPENDIX A

URBEMIS Emissions Reports

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\Olivia\Application Data\Urbemis\Version9a\Projects\YV105.urb924

Project Name: YV 105

Project Location: San Bernadino County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	10.32	82.89	64.42	0.07	340.03	4.43	344.45	71.01	4.07	75.09	9,040.29
2010 TOTALS (lbs/day mitigated)	10.32	82.89	64.42	0.07	76.36	4.43	80.79	15.95	4.07	20.02	9,040.29
2011 TOTALS (lbs/day unmitigated)	35.91	28.90	61.65	0.08	0.33	1.56	1.89	0.12	1.42	1.54	9,242.44
2011 TOTALS (lbs/day mitigated)	35.91	28.90	61.65	0.08	0.33	1.56	1.89	0.12	1.42	1.54	9,242.44

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	16.65	4.35	13.36	0.00	0.04	0.04	5,404.41
TOTALS (lbs/day, mitigated)	16.48	3.51	13.00	0.00	0.04	0.04	4,327.24
Percent Reduction	1.02	19.31	2.69	NaN	0.00	0.00	19.93

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OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	28.54	49.40	352.81	0.38	60.99	12.28	37,339.50
TOTALS (lbs/day, mitigated)	28.54	49.40	352.81	0.38	60.99	12.28	37,339.50
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	45.19	53.75	366.17	0.38	61.03	12.32	42,743.91
TOTALS (lbs/day, mitigated)	45.02	52.91	365.81	0.38	61.03	12.32	41,666.74
Percent Reduction	0.38	1.56	0.10	0.00	0.00	0.00	2.52

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 8/25/2010-9/30/2010 Active Days: 27	5.66	43.72	25.84	0.00	340.01	2.53	342.54	71.01	2.32	73.33	4,218.65
Mass Grading 08/25/2010-09/30/2010	5.66	43.72	25.84	0.00	340.01	2.53	342.54	71.01	2.32	73.33	4,218.65
Mass Grading Dust	0.00	0.00	0.00	0.00	340.00	0.00	340.00	71.01	0.00	71.01	0.00
Mass Grading Off Road Diesel	5.59	43.59	23.62	0.00	0.00	2.52	2.52	0.00	2.32	2.32	3,963.89
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.07	0.13	2.21	0.00	0.01	0.01	0.02	0.00	0.01	0.01	254.76

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Time Slice 10/1/2010-10/22/2010 Active Days: 16	5.66	43.72	25.84	0.00	340.01	2.53	342.54	71.01	2.32	73.33	4,218.65
Fine Grading 10/01/2010-11/01/2010	5.66	43.72	25.84	0.00	340.01	2.53	342.54	71.01	2.32	73.33	4,218.65
Fine Grading Dust	0.00	0.00	0.00	0.00	340.00	0.00	340.00	71.01	0.00	71.01	0.00
Fine Grading Off Road Diesel	5.59	43.59	23.62	0.00	0.00	2.52	2.52	0.00	2.32	2.32	3,963.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.13	2.21	0.00	0.01	0.01	0.02	0.00	0.01	0.01	254.76
Time Slice 10/25/2010-11/1/2010 Active Days: 6	10.32	**82.89**	45.84	0.01	**340.03**	**4.43**	**344.45**	**71.01**	**4.07**	**75.09**	8,319.59
Fine Grading 10/01/2010-11/01/2010	5.66	43.72	25.84	0.00	340.01	2.53	342.54	71.01	2.32	73.33	4,218.65
Fine Grading Dust	0.00	0.00	0.00	0.00	340.00	0.00	340.00	71.01	0.00	71.01	0.00
Fine Grading Off Road Diesel	5.59	43.59	23.62	0.00	0.00	2.52	2.52	0.00	2.32	2.32	3,963.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.13	2.21	0.00	0.01	0.01	0.02	0.00	0.01	0.01	254.76
Trenching 10/25/2010-11/12/2010	4.66	39.17	20.00	0.00	0.01	1.90	1.92	0.01	1.75	1.75	4,100.95
Trenching Off Road Diesel	4.58	39.02	17.47	0.00	0.00	1.89	1.89	0.00	1.74	1.74	3,809.80
Trenching Worker Trips	0.08	0.15	2.53	0.00	0.01	0.01	0.02	0.01	0.01	0.01	291.15
Time Slice 11/2/2010-11/12/2010 Active Days: 9	4.66	39.17	20.00	0.00	0.01	1.90	1.92	0.01	1.75	1.75	4,100.95
Trenching 10/25/2010-11/12/2010	4.66	39.17	20.00	0.00	0.01	1.90	1.92	0.01	1.75	1.75	4,100.95
Trenching Off Road Diesel	4.58	39.02	17.47	0.00	0.00	1.89	1.89	0.00	1.74	1.74	3,809.80
Trenching Worker Trips	0.08	0.15	2.53	0.00	0.01	0.01	0.02	0.01	0.01	0.01	291.15

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Time Slice 11/15/2010-11/23/2010 Active Days: 7	5.41	31.17	**64.42**	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building 11/15/2010-11/23/2010	5.41	31.17	64.42	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building Off Road Diesel	3.22	19.15	10.21	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,888.90
Building Vendor Trips	0.76	9.21	7.06	0.02	0.06	0.37	0.43	0.02	0.34	0.36	1,722.02
Building Worker Trips	1.43	2.81	47.15	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,429.37
Time Slice 11/24/2010-12/3/2010 Active Days: 8	9.29	43.76	20.64	0.04	0.13	2.56	2.69	0.04	2.35	2.39	5,116.10
Asphalt 11/24/2010-12/03/2010	9.29	43.76	20.64	0.04	0.13	2.56	2.69	0.04	2.35	2.39	5,116.10
Paving Off-Gas	4.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.86	17.13	9.38	0.00	0.00	1.50	1.50	0.00	1.38	1.38	1,272.41
Paving On Road Diesel	1.94	26.54	9.68	0.03	0.12	1.05	1.17	0.04	0.96	1.00	3,661.72
Paving Worker Trips	0.05	0.09	1.58	0.00	0.01	0.01	0.01	0.00	0.00	0.01	181.97
Time Slice 12/6/2010-12/31/2010 Active Days: 20	5.41	31.17	**64.42**	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building 12/06/2010-08/01/2011	5.41	31.17	64.42	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building Off Road Diesel	3.22	19.15	10.21	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,888.90
Building Vendor Trips	0.76	9.21	7.06	0.02	0.06	0.37	0.43	0.02	0.34	0.36	1,722.02
Building Worker Trips	1.43	2.81	47.15	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,429.37
Time Slice 1/3/2011-4/1/2011 Active Days: 65	5.00	28.80	60.00	0.07	0.32	1.55	1.87	0.11	1.42	1.53	9,036.25
Building 12/06/2010-08/01/2011	5.00	28.80	60.00	0.07	0.32	1.55	1.87	0.11	1.42	1.53	9,036.25
Building Off Road Diesel	3.00	17.95	9.91	0.00	0.00	1.05	1.05	0.00	0.97	0.97	1,888.90
Building Vendor Trips	0.70	8.29	6.52	0.02	0.06	0.33	0.39	0.02	0.31	0.33	1,722.15
Building Worker Trips	1.30	2.55	43.56	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,425.20

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Time Slice 4/4/2011-8/1/2011 Active Days: 86	**35.91**	28.90	61.65	**0.08**	0.33	1.56	1.89	0.12	1.42	1.54	**9,242.44**
Building 12/06/2010-08/01/2011	5.00	28.80	60.00	0.07	0.32	1.55	1.87	0.11	1.42	1.53	9,036.25
Building Off Road Diesel	3.00	17.95	9.91	0.00	0.00	1.05	1.05	0.00	0.97	0.97	1,888.90
Building Vendor Trips	0.70	8.29	6.52	0.02	0.06	0.33	0.39	0.02	0.31	0.33	1,722.15
Building Worker Trips	1.30	2.55	43.56	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,425.20
Coating 04/04/2011-09/05/2011	30.91	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Architectural Coating	30.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.05	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Time Slice 8/2/2011-9/5/2011 Active Days: 25	30.91	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Coating 04/04/2011-09/05/2011	30.91	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Architectural Coating	30.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.05	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19

Phase Assumptions

Phase: Fine Grading 10/1/2010 - 11/1/2010 - Default Fine Site Grading/Excavation Description

Total Acres Disturbed: 105

Maximum Daily Acreage Disturbed: 17

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 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

3 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

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Phase: Mass Grading 8/25/2010 - 9/30/2010 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 105

Maximum Daily Acreage Disturbed: 17

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 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

3 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: Trenching 10/25/2010 - 11/12/2010 - Default Trenching Description

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 4 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 4 hours per day

Phase: Paving 11/24/2010 - 12/3/2010 - Default Paving Description

Acres to be Paved: 13.6

Off-Road Equipment:

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

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 6 hours per day

Phase: Building Construction 11/15/2010 - 11/23/2010 - Accounts for assembly of the proposed seweage package plant.

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 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 Graders (174 hp) operating at a 0.61 load factor for 4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4 hours per day

1 Welders (45 hp) operating at a 0.45 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 12/6/2010 - 8/1/2011 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 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 Graders (174 hp) operating at a 0.61 load factor for 4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4 hours per day

1 Welders (45 hp) operating at a 0.45 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: Architectural Coating 4/4/2011 - 9/5/2011 - Type Your Description Here

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 8/25/2010-9/30/2010 Active Days: 27	5.66	43.72	25.84	0.00	76.35	2.53	78.88	15.95	2.32	18.27	4,218.65
Mass Grading 08/25/2010-09/30/2010	5.66	43.72	25.84	0.00	76.35	2.53	78.88	15.95	2.32	18.27	4,218.65
Mass Grading Dust	0.00	0.00	0.00	0.00	76.34	0.00	76.34	15.94	0.00	15.94	0.00
Mass Grading Off Road Diesel	5.59	43.59	23.62	0.00	0.00	2.52	2.52	0.00	2.32	2.32	3,963.89
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.07	0.13	2.21	0.00	0.01	0.01	0.02	0.00	0.01	0.01	254.76
Time Slice 10/1/2010-10/22/2010 Active Days: 16	5.66	43.72	25.84	0.00	76.35	2.53	78.88	15.95	2.32	18.27	4,218.65
Fine Grading 10/01/2010-11/01/2010	5.66	43.72	25.84	0.00	76.35	2.53	78.88	15.95	2.32	18.27	4,218.65
Fine Grading Dust	0.00	0.00	0.00	0.00	76.34	0.00	76.34	15.94	0.00	15.94	0.00
Fine Grading Off Road Diesel	5.59	43.59	23.62	0.00	0.00	2.52	2.52	0.00	2.32	2.32	3,963.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.13	2.21	0.00	0.01	0.01	0.02	0.00	0.01	0.01	254.76

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Time Slice 10/25/2010-11/1/2010 Active Days: 6	10.32	**82.89**	45.84	0.01	76.36	**4.43**	80.79	15.95	**4.07**	20.02	8,319.59
Fine Grading 10/01/2010-11/01/2010	5.66	43.72	25.84	0.00	76.35	2.53	78.88	15.95	2.32	18.27	4,218.65
Fine Grading Dust	0.00	0.00	0.00	0.00	76.34	0.00	76.34	15.94	0.00	15.94	0.00
Fine Grading Off Road Diesel	5.59	43.59	23.62	0.00	0.00	2.52	2.52	0.00	2.32	2.32	3,963.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.13	2.21	0.00	0.01	0.01	0.02	0.00	0.01	0.01	254.76
Trenching 10/25/2010-11/12/2010	4.66	39.17	20.00	0.00	0.01	1.90	1.92	0.01	1.75	1.75	4,100.95
Trenching Off Road Diesel	4.58	39.02	17.47	0.00	0.00	1.89	1.89	0.00	1.74	1.74	3,809.80
Trenching Worker Trips	0.08	0.15	2.53	0.00	0.01	0.01	0.02	0.01	0.01	0.01	291.15
Time Slice 11/2/2010-11/12/2010 Active Days: 9	4.66	39.17	20.00	0.00	0.01	1.90	1.92	0.01	1.75	1.75	4,100.95
Trenching 10/25/2010-11/12/2010	4.66	39.17	20.00	0.00	0.01	1.90	1.92	0.01	1.75	1.75	4,100.95
Trenching Off Road Diesel	4.58	39.02	17.47	0.00	0.00	1.89	1.89	0.00	1.74	1.74	3,809.80
Trenching Worker Trips	0.08	0.15	2.53	0.00	0.01	0.01	0.02	0.01	0.01	0.01	291.15
Time Slice 11/15/2010-11/23/2010 Active Days: 7	5.41	31.17	**64.42**	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building 11/15/2010-11/23/2010	5.41	31.17	64.42	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building Off Road Diesel	3.22	19.15	10.21	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,888.90
Building Vendor Trips	0.76	9.21	7.06	0.02	0.06	0.37	0.43	0.02	0.34	0.36	1,722.02
Building Worker Trips	1.43	2.81	47.15	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,429.37

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Time Slice 11/24/2010-12/3/2010 Active Days: 8	9.29	43.76	20.64	0.04	0.13	2.56	2.69	0.04	2.35	2.39	5,116.10
Asphalt 11/24/2010-12/03/2010	9.29	43.76	20.64	0.04	0.13	2.56	2.69	0.04	2.35	2.39	5,116.10
Paving Off-Gas	4.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.86	17.13	9.38	0.00	0.00	1.50	1.50	0.00	1.38	1.38	1,272.41
Paving On Road Diesel	1.94	26.54	9.68	0.03	0.12	1.05	1.17	0.04	0.96	1.00	3,661.72
Paving Worker Trips	0.05	0.09	1.58	0.00	0.01	0.01	0.01	0.00	0.00	0.01	181.97
Time Slice 12/6/2010-12/31/2010 Active Days: 20	5.41	31.17	**64.42**	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building 12/06/2010-08/01/2011	5.41	31.17	64.42	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building Off Road Diesel	3.22	19.15	10.21	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,888.90
Building Vendor Trips	0.76	9.21	7.06	0.02	0.06	0.37	0.43	0.02	0.34	0.36	1,722.02
Building Worker Trips	1.43	2.81	47.15	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,429.37
Time Slice 1/3/2011-4/1/2011 Active Days: 65	5.00	28.80	60.00	0.07	0.32	1.55	1.87	0.11	1.42	1.53	9,036.25
Building 12/06/2010-08/01/2011	5.00	28.80	60.00	0.07	0.32	1.55	1.87	0.11	1.42	1.53	9,036.25
Building Off Road Diesel	3.00	17.95	9.91	0.00	0.00	1.05	1.05	0.00	0.97	0.97	1,888.90
Building Vendor Trips	0.70	8.29	6.52	0.02	0.06	0.33	0.39	0.02	0.31	0.33	1,722.15
Building Worker Trips	1.30	2.55	43.56	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,425.20

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Time Slice 4/4/2011-8/1/2011 Active Days: 86	**35.91**	28.90	61.65	**0.08**	0.33	1.56	1.89	0.12	1.42	1.54	**9,242.44**
Building 12/06/2010-08/01/2011	5.00	28.80	60.00	0.07	0.32	1.55	1.87	0.11	1.42	1.53	9,036.25
Building Off Road Diesel	3.00	17.95	9.91	0.00	0.00	1.05	1.05	0.00	0.97	0.97	1,888.90
Building Vendor Trips	0.70	8.29	6.52	0.02	0.06	0.33	0.39	0.02	0.31	0.33	1,722.15
Building Worker Trips	1.30	2.55	43.56	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,425.20
Coating 04/04/2011-09/05/2011	30.91	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Architectural Coating	30.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.05	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Time Slice 8/2/2011-9/5/2011 Active Days: 25	30.91	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Coating 04/04/2011-09/05/2011	30.91	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Architectural Coating	30.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.05	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 10/1/2010 - 11/1/2010 - Default Fine Site Grading/Excavation Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

The following mitigation measures apply to Phase: Mass Grading 8/25/2010 - 9/30/2010 - Default Mass Site Grading/Excavation Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

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For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.33	4.22	1.80	0.00	0.01	0.01	5,385.85
Hearth - No Summer Emissions							
Landscape	2.09	0.13	11.56	0.00	0.03	0.03	18.56
Consumer Products	13.29						
Architectural Coatings	0.94						
TOTALS (lbs/day, unmitigated)	16.65	4.35	13.36	0.00	0.04	0.04	5,404.41

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Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.26	3.38	1.44	0.00	0.01	0.01	4,308.68
Hearth - No Summer Emissions							
Landscape	2.09	0.13	11.56	0.00	0.03	0.03	18.56
Consumer Products	13.29						
Architectural Coatings	0.84						
TOTALS (lbs/day, mitigated)	16.48	3.51	13.00	0.00	0.04	0.04	4,327.24

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction
Residential Increase Energy Efficiency Beyond Title 24	20.00
For Residential Interior Use Low VOC Coating	10.00
For Residential Exterior Use Low VOC Coating	10.00
For Nonresidential Interior Use Low VOC Coating	10.00
For Nonresidential Exterior Use Low VOC Coating	10.00

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	28.54	49.40	352.81	0.38	60.99	12.28	37,339.50
TOTALS (lbs/day, unmitigated)	28.54	49.40	352.81	0.38	60.99	12.28	37,339.50

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Operational Mitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	28.54	49.40	352.81	0.38	60.99	12.28	37,339.50
TOTALS (lbs/day, mitigated)	28.54	49.40	352.81	0.38	60.99	12.28	37,339.50

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 0% (calculated as a % of 9.57 trips/day)))

Note that the above percent is applied to a baseline of 9.57 and that product is

subtracted from the Unmitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Nonresidential Mitigation Measures

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2011 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	105.00	9.57	dwelling units	259.00	2,478.63	34,948.68
					2,478.63	34,948.68

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	47.0	0.9	98.9	0.2
Light Truck < 3750 lbs	10.0	2.0	94.0	4.0
Light Truck 3751-5750 lbs	20.7	0.5	99.5	0.0
Med Truck 5751-8500 lbs	11.2	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.0	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.7	0.0	42.9	57.1
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	1.8	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.1	63.4	36.6	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	0.0	92.3	7.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	15.0	10.0	15.0	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Operational Changes to Defaults

The urban/rural selection has been changed from Urban to Rural

Home-based work rural trip length changed from 17.6 miles to 15 miles

Home-based shop rural trip length changed from 12.1 miles to 10 miles

Home-based other rural trip length changed from 14.9 miles to 15 miles

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\Olivia\Application Data\Urbemis\Version9a\Projects\YV105.urb924

Project Name: YV 105

Project Location: San Bernadino County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	10.32	82.89	64.42	0.07	340.03	4.43	344.45	71.01	4.07	75.09	9,040.29
2010 TOTALS (lbs/day mitigated)	10.32	82.89	64.42	0.07	76.36	4.43	80.79	15.95	4.07	20.02	9,040.29
2011 TOTALS (lbs/day unmitigated)	35.91	28.90	61.65	0.08	0.33	1.56	1.89	0.12	1.42	1.54	9,242.44
2011 TOTALS (lbs/day mitigated)	35.91	28.90	61.65	0.08	0.33	1.56	1.89	0.12	1.42	1.54	9,242.44

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	55.16	7.91	114.44	0.32	17.48	16.83	10,314.27
TOTALS (lbs/day, mitigated)	54.99	7.07	114.08	0.32	17.48	16.83	9,237.10
Percent Reduction	0.31	10.62	0.31	0.00	0.00	0.00	10.44

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OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	32.14	58.46	338.00	0.32	60.99	12.28	34,052.77
TOTALS (lbs/day, mitigated)	32.14	58.46	338.00	0.32	60.99	12.28	34,052.77
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	87.30	66.37	452.44	0.64	78.47	29.11	44,367.04
TOTALS (lbs/day, mitigated)	87.13	65.53	452.08	0.64	78.47	29.11	43,289.87
Percent Reduction	0.19	1.27	0.08	0.00	0.00	0.00	2.43

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 8/25/2010-9/30/2010 Active Days: 27	5.66	43.72	25.84	0.00	340.01	2.53	342.54	71.01	2.32	73.33	4,218.65
Mass Grading 08/25/2010-09/30/2010	5.66	43.72	25.84	0.00	340.01	2.53	342.54	71.01	2.32	73.33	4,218.65
Mass Grading Dust	0.00	0.00	0.00	0.00	340.00	0.00	340.00	71.01	0.00	71.01	0.00
Mass Grading Off Road Diesel	5.59	43.59	23.62	0.00	0.00	2.52	2.52	0.00	2.32	2.32	3,963.89
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.07	0.13	2.21	0.00	0.01	0.01	0.02	0.00	0.01	0.01	254.76

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Time Slice 10/1/2010-10/22/2010 Active Days: 16	5.66	43.72	25.84	0.00	340.01	2.53	342.54	71.01	2.32	73.33	4,218.65
Fine Grading 10/01/2010-11/01/2010	5.66	43.72	25.84	0.00	340.01	2.53	342.54	71.01	2.32	73.33	4,218.65
Fine Grading Dust	0.00	0.00	0.00	0.00	340.00	0.00	340.00	71.01	0.00	71.01	0.00
Fine Grading Off Road Diesel	5.59	43.59	23.62	0.00	0.00	2.52	2.52	0.00	2.32	2.32	3,963.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.13	2.21	0.00	0.01	0.01	0.02	0.00	0.01	0.01	254.76
Time Slice 10/25/2010-11/1/2010 Active Days: 6	10.32	**82.89**	45.84	0.01	**340.03**	**4.43**	**344.45**	**71.01**	**4.07**	**75.09**	8,319.59
Fine Grading 10/01/2010-11/01/2010	5.66	43.72	25.84	0.00	340.01	2.53	342.54	71.01	2.32	73.33	4,218.65
Fine Grading Dust	0.00	0.00	0.00	0.00	340.00	0.00	340.00	71.01	0.00	71.01	0.00
Fine Grading Off Road Diesel	5.59	43.59	23.62	0.00	0.00	2.52	2.52	0.00	2.32	2.32	3,963.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.13	2.21	0.00	0.01	0.01	0.02	0.00	0.01	0.01	254.76
Trenching 10/25/2010-11/12/2010	4.66	39.17	20.00	0.00	0.01	1.90	1.92	0.01	1.75	1.75	4,100.95
Trenching Off Road Diesel	4.58	39.02	17.47	0.00	0.00	1.89	1.89	0.00	1.74	1.74	3,809.80
Trenching Worker Trips	0.08	0.15	2.53	0.00	0.01	0.01	0.02	0.01	0.01	0.01	291.15
Time Slice 11/2/2010-11/12/2010 Active Days: 9	4.66	39.17	20.00	0.00	0.01	1.90	1.92	0.01	1.75	1.75	4,100.95
Trenching 10/25/2010-11/12/2010	4.66	39.17	20.00	0.00	0.01	1.90	1.92	0.01	1.75	1.75	4,100.95
Trenching Off Road Diesel	4.58	39.02	17.47	0.00	0.00	1.89	1.89	0.00	1.74	1.74	3,809.80
Trenching Worker Trips	0.08	0.15	2.53	0.00	0.01	0.01	0.02	0.01	0.01	0.01	291.15

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Time Slice 11/15/2010-11/23/2010 Active Days: 7	5.41	31.17	**64.42**	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building 11/15/2010-11/23/2010	5.41	31.17	64.42	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building Off Road Diesel	3.22	19.15	10.21	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,888.90
Building Vendor Trips	0.76	9.21	7.06	0.02	0.06	0.37	0.43	0.02	0.34	0.36	1,722.02
Building Worker Trips	1.43	2.81	47.15	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,429.37
Time Slice 11/24/2010-12/3/2010 Active Days: 8	9.29	43.76	20.64	0.04	0.13	2.56	2.69	0.04	2.35	2.39	5,116.10
Asphalt 11/24/2010-12/03/2010	9.29	43.76	20.64	0.04	0.13	2.56	2.69	0.04	2.35	2.39	5,116.10
Paving Off-Gas	4.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.86	17.13	9.38	0.00	0.00	1.50	1.50	0.00	1.38	1.38	1,272.41
Paving On Road Diesel	1.94	26.54	9.68	0.03	0.12	1.05	1.17	0.04	0.96	1.00	3,661.72
Paving Worker Trips	0.05	0.09	1.58	0.00	0.01	0.01	0.01	0.00	0.00	0.01	181.97
Time Slice 12/6/2010-12/31/2010 Active Days: 20	5.41	31.17	**64.42**	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building 12/06/2010-08/01/2011	5.41	31.17	64.42	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building Off Road Diesel	3.22	19.15	10.21	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,888.90
Building Vendor Trips	0.76	9.21	7.06	0.02	0.06	0.37	0.43	0.02	0.34	0.36	1,722.02
Building Worker Trips	1.43	2.81	47.15	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,429.37
Time Slice 1/3/2011-4/1/2011 Active Days: 65	5.00	28.80	60.00	0.07	0.32	1.55	1.87	0.11	1.42	1.53	9,036.25
Building 12/06/2010-08/01/2011	5.00	28.80	60.00	0.07	0.32	1.55	1.87	0.11	1.42	1.53	9,036.25
Building Off Road Diesel	3.00	17.95	9.91	0.00	0.00	1.05	1.05	0.00	0.97	0.97	1,888.90
Building Vendor Trips	0.70	8.29	6.52	0.02	0.06	0.33	0.39	0.02	0.31	0.33	1,722.15
Building Worker Trips	1.30	2.55	43.56	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,425.20

Time Slice 4/4/2011-8/1/2011 Active Days: 86	**35.91**	28.90	61.65	**0.08**	0.33	1.56	1.89	0.12	1.42	1.54	**9,242.44**
Building 12/06/2010-08/01/2011	5.00	28.80	60.00	0.07	0.32	1.55	1.87	0.11	1.42	1.53	9,036.25
Building Off Road Diesel	3.00	17.95	9.91	0.00	0.00	1.05	1.05	0.00	0.97	0.97	1,888.90
Building Vendor Trips	0.70	8.29	6.52	0.02	0.06	0.33	0.39	0.02	0.31	0.33	1,722.15
Building Worker Trips	1.30	2.55	43.56	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,425.20
Coating 04/04/2011-09/05/2011	30.91	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Architectural Coating	30.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.05	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Time Slice 8/2/2011-9/5/2011 Active Days: 25	30.91	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Coating 04/04/2011-09/05/2011	30.91	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Architectural Coating	30.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.05	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19

Phase Assumptions

Phase: Fine Grading 10/1/2010 - 11/1/2010 - Default Fine Site Grading/Excavation Description

Total Acres Disturbed: 105

Maximum Daily Acreage Disturbed: 17

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 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

3 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

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Phase: Mass Grading 8/25/2010 - 9/30/2010 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 105

Maximum Daily Acreage Disturbed: 17

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 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

3 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: Trenching 10/25/2010 - 11/12/2010 - Default Trenching Description

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 4 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 4 hours per day

Phase: Paving 11/24/2010 - 12/3/2010 - Default Paving Description

Acres to be Paved: 13.6

Off-Road Equipment:

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

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 6 hours per day

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Phase: Building Construction 11/15/2010 - 11/23/2010 - Accounts for assembly of the proposed seweage package plant.

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 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 Graders (174 hp) operating at a 0.61 load factor for 4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4 hours per day

1 Welders (45 hp) operating at a 0.45 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 12/6/2010 - 8/1/2011 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 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 Graders (174 hp) operating at a 0.61 load factor for 4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4 hours per day

1 Welders (45 hp) operating at a 0.45 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: Architectural Coating 4/4/2011 - 9/5/2011 - Type Your Description Here

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 8/25/2010-9/30/2010 Active Days: 27	5.66	43.72	25.84	0.00	76.35	2.53	78.88	15.95	2.32	18.27	4,218.65
Mass Grading 08/25/2010-09/30/2010	5.66	43.72	25.84	0.00	76.35	2.53	78.88	15.95	2.32	18.27	4,218.65
Mass Grading Dust	0.00	0.00	0.00	0.00	76.34	0.00	76.34	15.94	0.00	15.94	0.00
Mass Grading Off Road Diesel	5.59	43.59	23.62	0.00	0.00	2.52	2.52	0.00	2.32	2.32	3,963.89
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.07	0.13	2.21	0.00	0.01	0.01	0.02	0.00	0.01	0.01	254.76
Time Slice 10/1/2010-10/22/2010 Active Days: 16	5.66	43.72	25.84	0.00	76.35	2.53	78.88	15.95	2.32	18.27	4,218.65
Fine Grading 10/01/2010-11/01/2010	5.66	43.72	25.84	0.00	76.35	2.53	78.88	15.95	2.32	18.27	4,218.65
Fine Grading Dust	0.00	0.00	0.00	0.00	76.34	0.00	76.34	15.94	0.00	15.94	0.00
Fine Grading Off Road Diesel	5.59	43.59	23.62	0.00	0.00	2.52	2.52	0.00	2.32	2.32	3,963.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.13	2.21	0.00	0.01	0.01	0.02	0.00	0.01	0.01	254.76

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Time Slice 10/25/2010-11/1/2010 Active Days: 6	10.32	**82.89**	45.84	0.01	76.36	**4.43**	80.79	15.95	**4.07**	20.02	8,319.59
Fine Grading 10/01/2010-11/01/2010	5.66	43.72	25.84	0.00	76.35	2.53	78.88	15.95	2.32	18.27	4,218.65
Fine Grading Dust	0.00	0.00	0.00	0.00	76.34	0.00	76.34	15.94	0.00	15.94	0.00
Fine Grading Off Road Diesel	5.59	43.59	23.62	0.00	0.00	2.52	2.52	0.00	2.32	2.32	3,963.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.13	2.21	0.00	0.01	0.01	0.02	0.00	0.01	0.01	254.76
Trenching 10/25/2010-11/12/2010	4.66	39.17	20.00	0.00	0.01	1.90	1.92	0.01	1.75	1.75	4,100.95
Trenching Off Road Diesel	4.58	39.02	17.47	0.00	0.00	1.89	1.89	0.00	1.74	1.74	3,809.80
Trenching Worker Trips	0.08	0.15	2.53	0.00	0.01	0.01	0.02	0.01	0.01	0.01	291.15
Time Slice 11/2/2010-11/12/2010 Active Days: 9	4.66	39.17	20.00	0.00	0.01	1.90	1.92	0.01	1.75	1.75	4,100.95
Trenching 10/25/2010-11/12/2010	4.66	39.17	20.00	0.00	0.01	1.90	1.92	0.01	1.75	1.75	4,100.95
Trenching Off Road Diesel	4.58	39.02	17.47	0.00	0.00	1.89	1.89	0.00	1.74	1.74	3,809.80
Trenching Worker Trips	0.08	0.15	2.53	0.00	0.01	0.01	0.02	0.01	0.01	0.01	291.15
Time Slice 11/15/2010-11/23/2010 Active Days: 7	5.41	31.17	**64.42**	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building 11/15/2010-11/23/2010	5.41	31.17	64.42	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building Off Road Diesel	3.22	19.15	10.21	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,888.90
Building Vendor Trips	0.76	9.21	7.06	0.02	0.06	0.37	0.43	0.02	0.34	0.36	1,722.02
Building Worker Trips	1.43	2.81	47.15	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,429.37

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Time Slice 11/24/2010-12/3/2010 Active Days: 8	9.29	43.76	20.64	0.04	0.13	2.56	2.69	0.04	2.35	2.39	5,116.10
Asphalt 11/24/2010-12/03/2010	9.29	43.76	20.64	0.04	0.13	2.56	2.69	0.04	2.35	2.39	5,116.10
Paving Off-Gas	4.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.86	17.13	9.38	0.00	0.00	1.50	1.50	0.00	1.38	1.38	1,272.41
Paving On Road Diesel	1.94	26.54	9.68	0.03	0.12	1.05	1.17	0.04	0.96	1.00	3,661.72
Paving Worker Trips	0.05	0.09	1.58	0.00	0.01	0.01	0.01	0.00	0.00	0.01	181.97
Time Slice 12/6/2010-12/31/2010 Active Days: 20	5.41	31.17	**64.42**	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building 12/06/2010-08/01/2011	5.41	31.17	64.42	0.07	0.32	1.65	1.97	0.11	1.51	1.62	9,040.29
Building Off Road Diesel	3.22	19.15	10.21	0.00	0.00	1.11	1.11	0.00	1.02	1.02	1,888.90
Building Vendor Trips	0.76	9.21	7.06	0.02	0.06	0.37	0.43	0.02	0.34	0.36	1,722.02
Building Worker Trips	1.43	2.81	47.15	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,429.37
Time Slice 1/3/2011-4/1/2011 Active Days: 65	5.00	28.80	60.00	0.07	0.32	1.55	1.87	0.11	1.42	1.53	9,036.25
Building 12/06/2010-08/01/2011	5.00	28.80	60.00	0.07	0.32	1.55	1.87	0.11	1.42	1.53	9,036.25
Building Off Road Diesel	3.00	17.95	9.91	0.00	0.00	1.05	1.05	0.00	0.97	0.97	1,888.90
Building Vendor Trips	0.70	8.29	6.52	0.02	0.06	0.33	0.39	0.02	0.31	0.33	1,722.15
Building Worker Trips	1.30	2.55	43.56	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,425.20

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Time Slice 4/4/2011-8/1/2011 Active Days: 86	**35.91**	28.90	61.65	**0.08**	0.33	1.56	1.89	0.12	1.42	1.54	**9,242.44**
Building 12/06/2010-08/01/2011	5.00	28.80	60.00	0.07	0.32	1.55	1.87	0.11	1.42	1.53	9,036.25
Building Off Road Diesel	3.00	17.95	9.91	0.00	0.00	1.05	1.05	0.00	0.97	0.97	1,888.90
Building Vendor Trips	0.70	8.29	6.52	0.02	0.06	0.33	0.39	0.02	0.31	0.33	1,722.15
Building Worker Trips	1.30	2.55	43.56	0.06	0.26	0.17	0.43	0.09	0.14	0.24	5,425.20
Coating 04/04/2011-09/05/2011	30.91	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Architectural Coating	30.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.05	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Time Slice 8/2/2011-9/5/2011 Active Days: 25	30.91	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Coating 04/04/2011-09/05/2011	30.91	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19
Architectural Coating	30.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.05	0.10	1.66	0.00	0.01	0.01	0.02	0.00	0.01	0.01	206.19

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 10/1/2010 - 11/1/2010 - Default Fine Site Grading/Excavation Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

The following mitigation measures apply to Phase: Mass Grading 8/25/2010 - 9/30/2010 - Default Mass Site Grading/Excavation Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

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For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.33	4.22	1.80	0.00	0.01	0.01	5,385.85
Hearth	40.60	3.69	112.64	0.32	17.47	16.82	4,928.42
Landscaping - No Winter Emissions							
Consumer Products	13.29						
Architectural Coatings	0.94						
TOTALS (lbs/day, unmitigated)	55.16	7.91	114.44	0.32	17.48	16.83	10,314.27

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Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.26	3.38	1.44	0.00	0.01	0.01	4,308.68
Hearth	40.60	3.69	112.64	0.32	17.47	16.82	4,928.42
Landscaping - No Winter Emissions							
Consumer Products	13.29						
Architectural Coatings	0.84						
TOTALS (lbs/day, mitigated)	54.99	7.07	114.08	0.32	17.48	16.83	9,237.10

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction
Residential Increase Energy Efficiency Beyond Title 24	20.00
For Residential Interior Use Low VOC Coating	10.00
For Residential Exterior Use Low VOC Coating	10.00
For Nonresidential Interior Use Low VOC Coating	10.00
For Nonresidential Exterior Use Low VOC Coating	10.00

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	32.14	58.46	338.00	0.32	60.99	12.28	34,052.77
TOTALS (lbs/day, unmitigated)	32.14	58.46	338.00	0.32	60.99	12.28	34,052.77

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Operational Mitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	32.14	58.46	338.00	0.32	60.99	12.28	34,052.77
TOTALS (lbs/day, mitigated)	32.14	58.46	338.00	0.32	60.99	12.28	34,052.77

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 0% (calculated as a % of 9.57 trips/day)))

Note that the above percent is applied to a baseline of 9.57 and that product is

subtracted from the Unmitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Nonresidential Mitigation Measures

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2011 Temperature (F): 60 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	105.00	9.57	dwelling units	259.00	2,478.63	34,948.68
					2,478.63	34,948.68

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	47.0	0.9	98.9	0.2
Light Truck < 3750 lbs	10.0	2.0	94.0	4.0
Light Truck 3751-5750 lbs	20.7	0.5	99.5	0.0
Med Truck 5751-8500 lbs	11.2	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.0	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.7	0.0	42.9	57.1
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	1.8	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.1	63.4	36.6	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	0.0	92.3	7.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	15.0	10.0	15.0	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Operational Changes to Defaults

The urban/rural selection has been changed from Urban to Rural

Home-based work rural trip length changed from 17.6 miles to 15 miles

Home-based shop rural trip length changed from 12.1 miles to 10 miles

Home-based other rural trip length changed from 14.9 miles to 15 miles

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\Olivia\Application Data\Urbemis\Version9a\Projects\YV105.urb924

Project Name: YV 105

Project Location: San Bernadino County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (tons/year unmitigated)	0.28	1.96	1.74	0.00	8.34	0.11	8.44	1.74	0.10	1.84	276.62
2010 TOTALS (tons/year mitigated)	0.28	1.96	1.74	0.00	1.88	0.11	1.98	0.39	0.10	0.49	276.62
Percent Reduction	0.00	0.00	0.00	0.00	77.50	0.00	76.50	77.47	0.00	73.26	0.00
2011 TOTALS (tons/year unmitigated)	2.09	2.18	4.62	0.01	0.02	0.12	0.14	0.01	0.11	0.12	693.68
2011 TOTALS (tons/year mitigated)	2.09	2.18	4.62	0.01	0.02	0.12	0.14	0.01	0.11	0.12	693.68
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	3.54	0.81	3.84	0.00	0.23	0.22	1,019.94
TOTALS (tons/year, mitigated)	3.51	0.66	3.77	0.00	0.23	0.22	823.35
Percent Reduction	0.85	18.52	1.82	NaN	0.00	0.00	19.27

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OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	5.43	9.57	63.49	0.07	11.13	2.24	6,614.52
TOTALS (tons/year, mitigated)	5.43	9.57	63.49	0.07	11.13	2.24	6,614.52
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	8.97	10.38	67.33	0.07	11.36	2.46	7,634.46
TOTALS (tons/year, mitigated)	8.94	10.23	67.26	0.07	11.36	2.46	7,437.87
Percent Reduction	0.33	1.45	0.10	0.00	0.00	0.00	2.58

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010	0.28	1.96	1.74	0.00	8.34	0.11	8.44	1.74	0.10	1.84	276.62
Mass Grading 08/25/2010-09/30/2010	0.08	0.59	0.35	0.00	4.59	0.03	4.62	0.96	0.03	0.99	56.95
Mass Grading Dust	0.00	0.00	0.00	0.00	4.59	0.00	4.59	0.96	0.00	0.96	0.00
Mass Grading Off Road Diesel	0.08	0.59	0.32	0.00	0.00	0.03	0.03	0.00	0.03	0.03	53.51
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.44

Fine Grading 10/01/2010-11/01/2010	0.06	0.48	0.28	0.00	3.74	0.03	3.77	0.78	0.03	0.81	46.41
Fine Grading Dust	0.00	0.00	0.00	0.00	3.74	0.00	3.74	0.78	0.00	0.78	0.00
Fine Grading Off Road Diesel	0.06	0.48	0.26	0.00	0.00	0.03	0.03	0.00	0.03	0.03	43.60
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.80
Trenching 10/25/2010-11/12/2010	0.03	0.29	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	30.76
Trenching Off Road Diesel	0.03	0.29	0.13	0.00	0.00	0.01	0.01	0.00	0.01	0.01	28.57
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.18
Building 11/15/2010-11/23/2010	0.02	0.11	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	31.64
Building Off Road Diesel	0.01	0.07	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
Building Vendor Trips	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.03
Building Worker Trips	0.01	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.00
Asphalt 11/24/2010-12/03/2010	0.04	0.18	0.08	0.00	0.00	0.01	0.01	0.00	0.01	0.01	20.46
Paving Off-Gas	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.01	0.07	0.04	0.00	0.00	0.01	0.01	0.00	0.01	0.01	5.09
Paving On Road Diesel	0.01	0.11	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.65
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73
Building 12/06/2010-08/01/2011	0.05	0.31	0.64	0.00	0.00	0.02	0.02	0.00	0.02	0.02	90.40
Building Off Road Diesel	0.03	0.19	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	18.89
Building Vendor Trips	0.01	0.09	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.22
Building Worker Trips	0.01	0.03	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	54.29

2011	2.09	2.18	4.62	0.01	0.02	0.12	0.14	0.01	0.11	0.12	693.68
Building 12/06/2010-08/01/2011	0.38	2.17	4.53	0.01	0.02	0.12	0.14	0.01	0.11	0.12	682.24
Building Off Road Diesel	0.23	1.36	0.75	0.00	0.00	0.08	0.08	0.00	0.07	0.07	142.61
Building Vendor Trips	0.05	0.63	0.49	0.00	0.00	0.03	0.03	0.00	0.02	0.02	130.02
Building Worker Trips	0.10	0.19	3.29	0.00	0.02	0.01	0.03	0.01	0.01	0.02	409.60
Coating 04/04/2011-09/05/2011	1.72	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.44
Architectural Coating	1.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.44

Phase Assumptions

Phase: Fine Grading 10/1/2010 - 11/1/2010 - Default Fine Site Grading/Excavation Description

Total Acres Disturbed: 105

Maximum Daily Acreage Disturbed: 17

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 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

3 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: Mass Grading 8/25/2010 - 9/30/2010 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 105

Maximum Daily Acreage Disturbed: 17

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

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On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 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

3 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: Trenching 10/25/2010 - 11/12/2010 - Default Trenching Description

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 4 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 4 hours per day

Phase: Paving 11/24/2010 - 12/3/2010 - Default Paving Description

Acres to be Paved: 13.6

Off-Road Equipment:

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

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 6 hours per day

Phase: Building Construction 11/15/2010 - 11/23/2010 - Accounts for assembly of the proposed seweage package plant.

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 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

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1 Graders (174 hp) operating at a 0.61 load factor for 4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4 hours per day

1 Welders (45 hp) operating at a 0.45 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 12/6/2010 - 8/1/2011 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 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 Graders (174 hp) operating at a 0.61 load factor for 4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4 hours per day

1 Welders (45 hp) operating at a 0.45 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: Architectural Coating 4/4/2011 - 9/5/2011 - Type Your Description Here

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010	0.28	1.96	1.74	0.00	1.88	0.11	1.98	0.39	0.10	0.49	276.62

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Mass Grading 08/25/2010-09/30/2010	0.08	0.59	0.35	0.00	1.03	0.03	1.06	0.22	0.03	0.25	56.95
Mass Grading Dust	0.00	0.00	0.00	0.00	1.03	0.00	1.03	0.22	0.00	0.22	0.00
Mass Grading Off Road Diesel	0.08	0.59	0.32	0.00	0.00	0.03	0.03	0.00	0.03	0.03	53.51
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.44
Fine Grading 10/01/2010-11/01/2010	0.06	0.48	0.28	0.00	0.84	0.03	0.87	0.18	0.03	0.20	46.41
Fine Grading Dust	0.00	0.00	0.00	0.00	0.84	0.00	0.84	0.18	0.00	0.18	0.00
Fine Grading Off Road Diesel	0.06	0.48	0.26	0.00	0.00	0.03	0.03	0.00	0.03	0.03	43.60
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.80
Trenching 10/25/2010-11/12/2010	0.03	0.29	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	30.76
Trenching Off Road Diesel	0.03	0.29	0.13	0.00	0.00	0.01	0.01	0.00	0.01	0.01	28.57
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.18
Building 11/15/2010-11/23/2010	0.02	0.11	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	31.64
Building Off Road Diesel	0.01	0.07	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
Building Vendor Trips	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.03
Building Worker Trips	0.01	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.00
Asphalt 11/24/2010-12/03/2010	0.04	0.18	0.08	0.00	0.00	0.01	0.01	0.00	0.01	0.01	20.46
Paving Off-Gas	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.01	0.07	0.04	0.00	0.00	0.01	0.01	0.00	0.01	0.01	5.09
Paving On Road Diesel	0.01	0.11	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.65
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73

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Building 12/06/2010-08/01/2011	0.05	0.31	0.64	0.00	0.00	0.02	0.02	0.00	0.02	0.02	90.40
Building Off Road Diesel	0.03	0.19	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	18.89
Building Vendor Trips	0.01	0.09	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.22
Building Worker Trips	0.01	0.03	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	54.29
2011	2.09	2.18	4.62	0.01	0.02	0.12	0.14	0.01	0.11	0.12	693.68
Building 12/06/2010-08/01/2011	0.38	2.17	4.53	0.01	0.02	0.12	0.14	0.01	0.11	0.12	682.24
Building Off Road Diesel	0.23	1.36	0.75	0.00	0.00	0.08	0.08	0.00	0.07	0.07	142.61
Building Vendor Trips	0.05	0.63	0.49	0.00	0.00	0.03	0.03	0.00	0.02	0.02	130.02
Building Worker Trips	0.10	0.19	3.29	0.00	0.02	0.01	0.03	0.01	0.01	0.02	409.60
Coating 04/04/2011-09/05/2011	1.72	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.44
Architectural Coating	1.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.44

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 10/1/2010 - 11/1/2010 - Default Fine Site Grading/Excavation Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

The following mitigation measures apply to Phase: Mass Grading 8/25/2010 - 9/30/2010 - Default Mass Site Grading/Excavation Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

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PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.06	0.77	0.33	0.00	0.00	0.00	982.92
Hearth	0.51	0.02	1.40	0.00	0.22	0.21	33.63
Landscape	0.38	0.02	2.11	0.00	0.01	0.01	3.39
Consumer Products	2.42						
Architectural Coatings	0.17						
TOTALS (tons/year, unmitigated)	3.54	0.81	3.84	0.00	0.23	0.22	1,019.94

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Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.05	0.62	0.26	0.00	0.00	0.00	786.33
Hearth	0.51	0.02	1.40	0.00	0.22	0.21	33.63
Landscape	0.38	0.02	2.11	0.00	0.01	0.01	3.39
Consumer Products	2.42						
Architectural Coatings	0.15						
TOTALS (tons/year, mitigated)	3.51	0.66	3.77	0.00	0.23	0.22	823.35

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction
Residential Increase Energy Efficiency Beyond Title 24	20.00
For Residential Interior Use Low VOC Coating	10.00
For Residential Exterior Use Low VOC Coating	10.00
For Nonresidential Interior Use Low VOC Coating	10.00
For Nonresidential Exterior Use Low VOC Coating	10.00

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	5.43	9.57	63.49	0.07	11.13	2.24	6,614.52
TOTALS (tons/year, unmitigated)	5.43	9.57	63.49	0.07	11.13	2.24	6,614.52

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Operational Mitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Mitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	5.43	9.57	63.49	0.07	11.13	2.24	6,614.52
TOTALS (tons/year, mitigated)	5.43	9.57	63.49	0.07	11.13	2.24	6,614.52

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 0% (calculated as a % of 9.57 trips/day)))

Note that the above percent is applied to a baseline of 9.57 and that product is

subtracted from the Unmitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Nonresidential Mitigation Measures

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2011 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	105.00	9.57	dwelling units	259.00	2,478.63	34,948.68
					2,478.63	34,948.68

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	47.0	0.9	98.9	0.2
Light Truck < 3750 lbs	10.0	2.0	94.0	4.0
Light Truck 3751-5750 lbs	20.7	0.5	99.5	0.0
Med Truck 5751-8500 lbs	11.2	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.0	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.7	0.0	42.9	57.1
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	1.8	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.1	63.4	36.6	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	0.0	92.3	7.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	15.0	10.0	15.0	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Operational Changes to Defaults

The urban/rural selection has been changed from Urban to Rural

Home-based work rural trip length changed from 17.6 miles to 15 miles

Home-based shop rural trip length changed from 12.1 miles to 10 miles

Home-based other rural trip length changed from 14.9 miles to 15 miles

APPENDIX B

Treatment Package Plant Memo

Joseph C. Reichenberger P.E., BCEE

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MEMORANDUM

November 21, 2009

To: Tom Levy
Levy Consulting

From: J. C. Reichenberger

Subject: YV 105 Altamira Tract 18255
Response to County Comments 2

Tom, in a series of emails from John Cristie (Terra Nova) and Lourdes Juarez (County of San Bernardino there were some questions that County staff asked relative to the wastewater treatment and disposal system. The requested information is:

Waste Water Package Treatment Plant

Staff would like additional information on the package plant envisioned for the site. We should provide more technical information, including 1) whether aeration ponds will be needed and if not why, 2) estimated depth of treated water re-injection wells, 3) reference to geotechnical report and/or other info citing on-site soil conditions.

The technical analysis must be prepared by a firm with experience in this field. In addition to what John C. listed, the analysis shall also state which pollutants will be removed and which will remain in the water recharge, including the level of concentration of these pollutants. While the WQMP will address the quality of water runoff, this engineered analysis for the wastewater plant will address the quality of underground water.

Aeration Ponds

Aeration ponds are not proposed. The wastewater treatment plant, however, will include aeration basins (reactors, tanks) which will be part of the package treatment plant. The activated sludge process without primary treatment is proposed. Small plants typically do not provide primary treatment; rather the wastewater is introduced directly into the aeration basins. This avoids the cost, odors and operational issues related to primary clarification and the handling and stabilizing of primary sludge.

In the activated sludge process, a mixture of wastewater and microorganisms called the "mixed liquor" is aerated in a reactor tank for a sufficient time to allow the microorganisms to stabilize (oxidize) the organics in the sewage. The process is aerobic, i.e., maintained in the presence of oxygen by bubbling compressed air into the mixed liquor. The microorganisms form flocs which are colonies of various microorganisms. The mixed liquor flows to a clarifier where the microorganism flocs are separated from mixed liquor leaving a relatively clear and stabilized secondary treated effluent. This effluent will be percolated to the groundwater through seepage pits. The microorganisms which settled in the clarifier, now hungry having been away from the food source for a while, will be returned to the aeration basin. This is called "return activated sludge (RAS)." Because we have created an environment with food and oxygen they will grow and multiply. As a result, some of the microorganisms will need to be removed from the process or they will take over. This is called "waste activated sludge (WAS)." In the aeration basin the organic nitrogen and ammonia nitrogen will be oxidized to nitrate nitrogen. This is called nitrification which is a nitrogen transformation process. Nitrification does not actually remove nitrogen, it merely changes its form.

Since this plant is to provide partial nitrogen removal, a modification of the conventional activated sludge process called the "Modified Ludzack Ettinger Process" will be used. This process uses an "anoxic zone" (basically an unaerated zone) immediately upstream of the aeration basin. By maintaining this zone free of dissolved oxygen, the microorganisms will use the oxygen from the nitrate ion and in the process release nitrogen gas into the atmosphere thereby removing nitrogen from the wastewater stream. The nitrate nitrogen in the return activated sludge will be returned to the anoxic zone where the nitrate will be converted to nitrogen gas. To improve the nitrogen removal, an internal recycle stream is also included wherein a significant portion of the nitrate-rich mixed liquor from the end of the aeration basin is pumped back to the anoxic zone. Even though the anoxic zone is kept free of dissolved oxygen, there is no objectionable odor due to the presence of nitrate.

A flow schematic is shown in Figure 1. However, "Screened Wastewater" should be substituted for "Primary Effluent" and the unmarked arrow on the right should be labeled "Effluent"

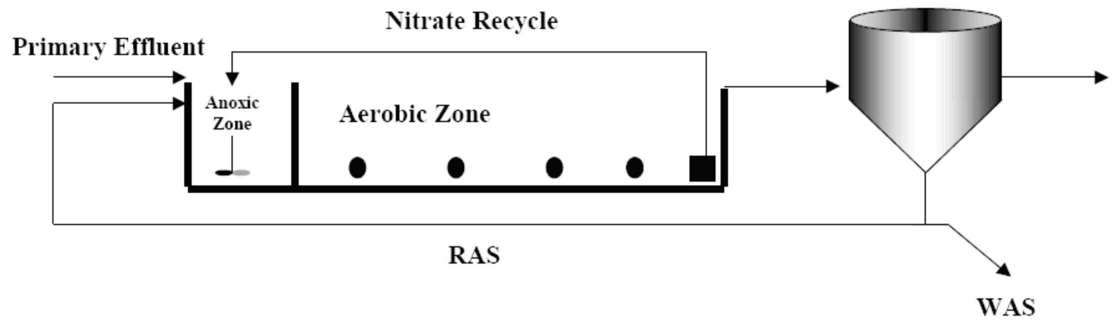

Figure 1
Flow schematic of the Modified Ludzack-Ettinger Process

Seepage Pits for Effluent Disposal

"Re-injection wells" though sometimes used for effluent disposal or groundwater recharge, are not proposed for Tract 18255. Injection wells are used when the aquifer is confined, i.e., there is an impermeable layer (or layers) between the ground surface and the aquifer. In order to recharge the aquifer when confining layers are present, it is necessary to penetrate (punch through) these impermeable zones. The aquifer underlying the site and the Joshua Tree Groundwater Basin is unconfined, i.e., any water which accumulates on the surface will percolate downward eventually reaching the groundwater table. For effluent disposal and groundwater recharge, the options are a percolation pond, subsurface leach lines or seepage pits. Percolation ponds would be used if the quantity of effluent to be recharged is substantial. This is not the case for Tract 18255. Leach lines are used with septic tanks where the flows are very low, i.e., individual homes, hence the decision to use seepage pits

Seepage pits are proposed for effluent disposal for Tract 18255 as the most cost effective and practical means of effluent recharge. The seepage pits are holes augured into the ground and filled with coarse gravel. A vertical perforated pipe typically extends the full depth of the seepage pit to distribute the effluent throughout the gravel fill.

The "Geotechnical Investigation, Proposed Single-Family Residential Development, APN's 0601-211-009 & 003, Yucca Valley, California" prepared for the project by Landmark Engineering August 25, 2006 includes design recommendations for wastewater disposal. The geotechnical report explored the subsurface using backhoe pits dug to about 10 ft below ground surface. The soil encountered was silty sand with some gravel and caliche. Ideally it would have been good to have several borings extended to significant depth to determine if there was a layer of soil which would interfere with the subsurface percolation. However, review of the geotechnical report for Tract 17633 (Burnt Mountain Haciendas) about 3 miles away which had one boring that extended to a depth of 50 ft and 3 borings which extended to 30 ft depth showed a consistent soil profile with depth. We would expect the same to occur at the Tract 18255 site.

However, prior to final design, additional deep borings at the site are recommended to confirm the assumption.

The geotechnical report for Tract 18255, also presented the results of 4 percolation pits that were dug and tested according to County standards. The results showed percolation rates from 15 minutes/inch (2.49 gallons/hr/sq ft) to 11.57 minutes/inch (3.23 gallons/hr/sq ft). The average was 2.83 gallons/hr/sq ft with a recommendation by the geotechnical engineer to use 2.50 gallons/hr/sq ft. This rate was used in the design of the seepage pits. In the design of seepage pits, the vertical (cylindrical) surface is used for percolation, not the bottom. A summary of the design is presented in Table 1. The design conforms to San Bernardino County on-site wastewater disposal system standards.

Groundwater Depth

The project overlies the Joshua Tree Groundwater Basin. According the Department of Water Resources' Bulletin 118, "California Groundwater," the basin occupies an area of 53.8 sq mi., so it is quite extensive. Groundwater is unconfined as stated above. The DWR estimates the groundwater in storage in the basin is over 2.5 million acre-ft. Natural recharge is estimated to be 975 acre-ft per year. Groundwater quality from public water supply wells shows an average total dissolved solids (mineral content or TDS) of 159 mg/L with a range of 117 to 185 mg/L. This is excellent water quality.

Table 1
Seepage Pit Design Criteria

Average Daily Flow, gal/day	75,000
Peak Flow, gal/hr	8400
Percolation rate, gal/hr/sq ft	2.5
Percolation area required, sq ft	3360 sq ft
Number of seepage pits	7
Diameter, ft	5
Percolation area, sq ft/foot depth	15.7
Depth, ft	35
Total percolation area provided, sq ft	3847

A report prepared by the USGS entitled "Evaluation of Geohydrologic Framework, Recharge Estimates, and Groundwater Flow of the Joshua Tree Area, San Bernardino County, California, Scientific Investigations Report 2004-5267", provides information on the groundwater hydrology and groundwater levels in the Joshua Tree Basin project area. Groundwater beneath the site is believed to move in a northeasterly direction following the topography then easterly. Figure 2 shows the location of water wells relative to the proposed seepage pits. The nearest well is about ½ to ¾ mile away.

Table 2 shows the characteristics of the nearby wells based on the above referenced USGS Report. Table 2 shows that the groundwater table in the area is quite deep. Based on the USGS Report, the water level depth below the ground surface in the vicinity of the site ranges from 445 to 525 ft. This means that the effluent which is percolated in the seepage pits will travel a significant vertical distance to reach the groundwater table. This ensures the removal of any pathogens. Once it reaches the groundwater table, it must travel considerable “horizontal” distance to reach any of the wells. Table 2 also shows that the wells are perforated very deep, generally near the bottom of the wells. This means that even when the effluent reaches the well it will be well blended with the native groundwater as it is drawn into the wells.

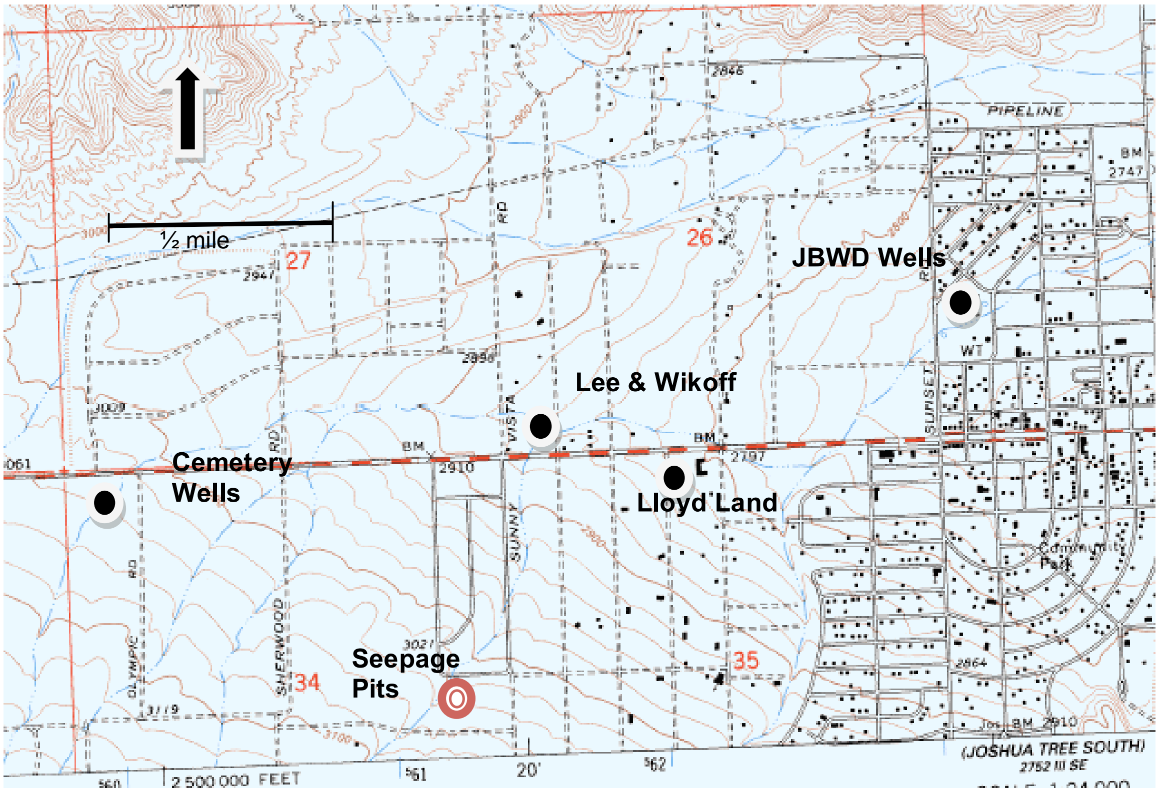

Figure 2
Location of Water Wells in the Area

Table 2
Characteristics of Wells in the Area

State Well No	Name	Depth BGS, ft	Perforations, BGS, ft	Ground surface EL	Water Level	Groundwater Depth, BGS, ft
1N/6E-25M1	JBWD #1	500	400-500	2714	--	--
1N/6E-25M2	JBWD #2	500	200-500	2724	2277 (1999)	447
1N/6E-25M3	JBWD #10	704	452-704	2720	2275 (2002)	445
1N/6E-25M4	JBWD #3	Unknown	Unknown	2720	--	--
1N/6E-26N1	Lee & Wikoff	610	545-610	2853	--	--
1N/6E-34D3	Cemetery	999	979-999	3030	2511 (1999)	519
1N/6E-34D4	Cemetery	920	900-920	3030	2505 (2002)	525
1N/6E-34D5	Cemetery	820	780-820	3030	--	--
1N/6E-35C1	Lloyd Land	630	518-630	2830	--	--

BGS = Below Ground Surface
Water levels and ground surface elevations are relative to mean sea level; year shown in parenthesis

Influent Wastewater Characteristics

The influent wastewater characteristics are, to a large degree, a reflection of the drinking water supply plus the mineral and organic pickup through use. The source water supply quality was obtained from the Joshua Basin Water District 2008 Consumer Confidence Report (often called the "annual water quality report").

Table 3
Projected Influent Wastewater Characteristics

Parameter	Concentration in Water Supply, mg/L	Increment Through Use, mg/L	Projected Influent Concentration, mg/L
TDS	170 – 320 (230)	225	455
Sulfate, SO_4	14-130 (56)	20	76 (say 80)
Chloride, Cl	12-16 (14)	35	49 (say 50)
Sodium, Na	33-61 (46)	50	96 (say 100)
Fluoride, F	ND – 0.77 (0.6)	0.3	0.9 (say 1.0)
5-day Biochemical Oxygen Demand	--	325	325
Total Suspended Solids	--	350	350
Total Nitrogen	--	50	50
Total Phosphorus	--	12	12

Average shown in parenthesis

The wastewater will be more mineralized than drinking water supply because of the constituents added as the water is used and our waste products are added. The wastewater is characterized as residential wastewater and as such the biochemical oxygen demand (BOD_5), total suspended solids (TSS), total nitrogen and total phosphorus are slightly higher than typical municipal wastewater. The influence of low water using appliances and the new sewer system (no infiltration of groundwater) makes for a more concentrated sewage.

Because the wastewater is 100 percent residential, the concentration of toxics organics and metals would be very low. These constituents are typically introduced into the sewer system as a result of commercial and industrial facilities. However, it is very difficult to control what the homeowner dumps into the sewer system, so it is possible to see traces of toxic constituents from time to time. In addition, it would not be surprising to find pharmaceuticals and personal care products in the wastewater. If found, these are in such low concentrations (in the nanogram/L range, i.e., parts per trillion) that they are of no concern. A portion of these will be removed in the wastewater treatment process.

Treated Effluent Characteristics

Table 4 provides an estimate of the wastewater effluent characteristics.

Table 4
Projected Effluent (Treated) Wastewater Characteristics

Parameter	Projected Effluent Concentration, mg/L
TDS	455
Sulfate, SO_4	80
Chloride, Cl	50
Sodium, Na	100
Fluoride, F	1
5-day Biochemical Oxygen Demand	<30
Total Suspended Solids	<30
Total Nitrogen	8
Total Phosphorus	9

The wastewater treatment facility will be designed to provide nitrogen reduction as is required by the Regional Board. It is anticipated that the Regional Board will require nitrogen to be removed to 10 mg/L. The maximum contaminant level (MCL) for nitrogen as nitrogen in public water supplies is 10 mg/L (45 mg/L as nitrate). The treatment plant will be designed to provide an effluent of 8 mg/L total nitrogen. This will consist of about 3 mg/L of organic nitrogen and 5 mg/L of nitrate-nitrogen.

There will be no limits for phosphorus removal; typically phosphorus is only an issue in surface water discharges. Phosphorus is removed in the soil column by precipitation and ion exchange with the soil particles. It is expect the BOD_5 and TSS will be less than the concentrations in Table 4 on a routine basis. The mineral parameters (TDS, sulfate, etc.) are the same as the influent as these are not removed in the treatment process. Since no chemicals are anticipated to be added to the wastewater during the treatment, the constituents will not increase in concentration.

In terms of toxics and trace organics, the Regional Board will require that the effluent meet the Department of Public Health (DPH) drinking water standards for inorganic chemicals, nitrate and nitrite, perchlorate, fluoride, radioactivity, and regulated organic chemicals. This should not be a problem since the wastewater, which is to be treated, is all residential. But as mentioned previously, there is no way to control what the individual homeowner dumps down his/her drain. The waste discharge permit, which is issued by the Regional Board, will contain monitoring, sampling and analysis requirements for the DPH regulated constituents.

Total trihalomethanes and other disinfection by-products will not be present, since disinfection of the effluent is not planned.

Wastewater Treatment Process

A preliminary process flow diagram for the proposed waste water treatment plant is shown in Figure 3. It should be noted that the final arrangement and configuration will depend on which package treatment system is used for the project. There are a number of suppliers and each has their own proprietary flow schemes, so there might be some minor modifications. For instance, one supplier uses an equalization/surge basin ahead of the anoxic basin to smooth out the peak flows. This allows the supplier to reduce the dimensions for the other downstream processes since they do not have to accommodate the peak flow.

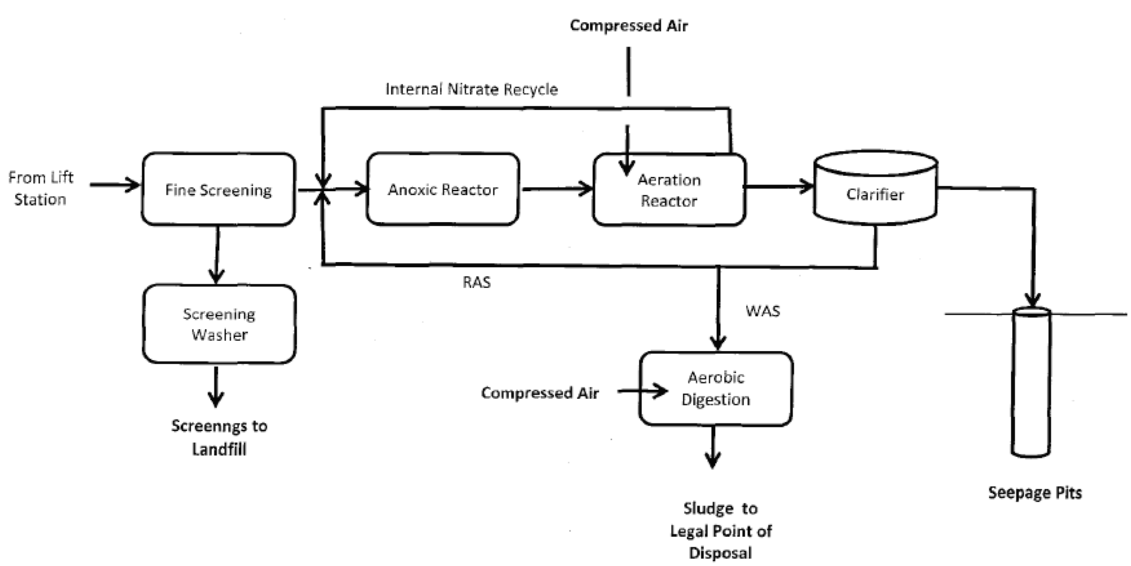

Figure 3

Preliminary Wastewater Treatment Plant Process Flow Diagram

Wastewater will be lifted into the treatment plant and will pass through a fine screening process. For this size plant a rotating drum screen is envisioned. A by-pass bar screen will be provided to allow maintenance on the drum screen. The screenings will be passed through a washer compactor which reduces the volume of the screenings. The screenings typically consist of rags, cloth diapers, "depends", "flushable toilet scrubbers," and various hygiene products. The compacted screenings will be discharged to a dumpster or trash can and they will be periodically hauled away to a landfill. The influent channel system will be enclosed to control odors.

The screened wastewater will then flow to the anoxic reactor where it will be blended with the return activated sludge (RAS) and the internal nitrate recycle (IR). The wastewater organic matter provides the carbon source for microorganism growth; since the microorganisms are deprived of free oxygen, the microorganisms reduce the nitrate in the RAS and IR to nitrogen gas where it is released into the atmosphere. (Note that the atmosphere contains 78% nitrogen so the nitrogen is not a pollutant, nor is it a greenhouse gas.) The wastewater, reduced in organic strength to some degree, enters the aeration basin where the remaining carbonaceous material (BOD_5) and the organic nitrogen and ammonia nitrogen in the wastewater are oxidized. The latter two are oxidized to nitrate nitrogen by the microorganisms in the aeration tank in a process called nitrification. Oxygen is required for this process and it is supplied by bubbling compressed air into the aeration basin (diffused aeration). The liquid in the aeration basin flows by gravity to a clarfier where the biological floc solids are separated and concentrated. The relatively clear supernatant flows over the clarifier weirs and to the seepage pits for percolation to the groundwater table. A distribution box will distribute the flow evenly to each of the seepage pits. The anoxic zone and the aeration basin do not emit offensive odors. The typical odor is that of moist earth which is not objectionable to most people. Even so, this odor is detected only directly adjacent to the tanks.

The concentrated solids from the bottom of the clarifier will be pumped back (RAS) to the anoxic basin to keep the process going. A portion of the biological solids will have to be wasted (WAS) otherwise they will take over. These biological solids will need to be stabilized since they still have significant amounts of biodegradable cell material. This is done in an aerobic digester. The aerobic digester is similar to the aeration tank in operation in that compressed air provides the oxygen needed for the microorganisms. The aerobic digester is maintained in a "starved" condition so the microorganisms eventually die of starvation and the living microorganisms feed on the remains. This reduces the volume of the solids that need to be disposed of and reduce the organic matter in the solids.

Periodically the solids from the aerobic digester will need to be disposed of. A thickening centrifuge or belt thickener could be installed on site; but considering the small volume of solids that are generated, offsite disposal is more practical. The contents from the aerobic digester can be hauled off to a legal point of disposal via a septage hauler. This could be taken to any treatment facility that can accommodate septage. Again, the aerobic digester is not a source of offensive odors; the odor is that of moist earth similar to the aeration basin.

To accommodate the growth in flow rate over time, the wastewater treatment plant will have up to 4 "process trains" running in parallel. As presented in previous memos, the treatment plant will have an ultimate capacity of 75,000 gallons per day and will be constructed in two 37,500 gallon per day phases. Each 37,500 gallon per day phases will have two 18,750 gallon per day process trains to provide flexibility to accommodate the projected growth in flow over time.

Table 5 presents preliminary sizing of the various unit processes. Keep in mind these are only preliminary and will likely change slightly depending on the package plant supplier and their proprietary process and process guarantees. The design in Table 5 is very conservative.

Impacts on Basin Water Quality

The Regional Board will set discharge limits to protect the beneficial uses of the groundwater. The wastewater treatment process will remove nitrogen in the wastewater to below the drinking water MCL. The wastewater will be blended with the natural groundwater over time and the impact of the percolated water on the groundwater will be minimal.

Table 5
Preliminary Process Sizing

Unit Process or Equipment	Total in Phase I	Total After Phase II
Average Flow, gal/day	37,500	75,000
Peak Hourly Flow, gal/day	112,500	225,000
Fine Screen	1@ 225,000 gpd	1@ 225,000 gpd
Screening Compactor	1	1
Amount of screenings	0.5 cu ft/day	1 cu ft/day
Activated Sludge Process Operating Parameters		
Solids Residence Time, days	12	12
MLSS, mg/L	3000	3000
MLVSS, mg/L	2100	2100
VSS produced/lb BOD5 Removed, lb/lb	0.85	0.85
Anoxic Basin	2	4
Hydraulic Residence Time, hr	3	3

Volume each, gal	2350	2350
Aeration Basin	2	4
Hydraulic Residence Time, hr	35	35
Volume each, gal	27,500	27,500
Air flow rate each, cfm	75	75

Table 5 (Cont'd)
Preliminary Process Sizing

Unit Process or Equipment	Total in Phase I	Total After Phase II
Clarifier	2	4
Surface area each, sq ft	100	100
Underflow concentration, mg/L	8,000	8,000
RAS/Influent Flow Ratio	0.6	0.6
Surface Overflow Rate, ave,, gal/d/sq ft	200	200
Solids Loading Rate, peak, lb/sq ft/hr	0.8	0.8
Aerobic Digester		
Number	1	2
Volume, each, gal	27,500	27,500
SRT, days	40	40
MLSS, mg/L	20,000	20,000
Air Requirement, cfm	75	75
Waste Digested Solids, gal/d	480	960

There will be some additional rainfall runoff generated from the development. This will be captured in the stormwater basins and percolated into the ground. The mineral content of the rainwater is low and when percolated will offset some of the mineral increase resulting from the percolated wastewater. A rough calculation of the added runoff from the 105 acres, assuming it is 30 percent impervious and further assuming 4 inches of rainfall per year, the TDS of the blend of rainwater and effluent as it percolated through the ground will be about 407 mg/L – a reduction from the 455 mg/L estimated in the wastewater.

The impact of toxic organics and pharmaceuticals and personal care products will be minimized by the wastewater treatment process. Recent research has shown that wastewater treatment facilities with long sludge ages (long SRT) tend to adsorb these toxics and/or have sufficient time to biodegrade them at least partially.

Qualifications of the Author

Mr. Reichenberger PE is a Board Certified Environmental Engineer with over 45 years of experience in the design of water and wastewater treatment facilities. He is a registered professional engineer in CA and four other western states. He is currently Professor of Civil Engineering and Environmental Science at Loyola Marymount University and teaches graduate and undergraduate courses in water quality management, water and wastewater treatment, biological processes and treatment plant design.