6.2 AIR QUALITY

This section describes the existing air quality for the project site, potential environmental impacts, recommended mitigation measures to help reduce or avoid impacts, and the level of significance impacts after mitigation. The discussion of air quality in this section was summarized from the *Air Quality and Climate Change Technical Report for the Scholl Canyon Landfill Expansion Project* (AECOM, October 2012). This report is included as Appendix F of the Draft Environmental Impact Report (DEIR).

6.2.1 EXISTING CONDITIONS

6.2.1.1 Regulatory Setting

The Scholl Canyon Landfill (SCLF) is located at 3001 Scholl Canyon Road, in Glendale, California, north of the Ventura Freeway (State Route 134) at the Figueroa Street exit to Scholl Canyon Road. The SCLF is located within the South Coast Air Basin (SCAB), regulated by the South Coast Air Quality Management District (SCAQMD). The SCLF operates in one of the most heavily regulated regions of the United States. The following section provides a detailed description of the types of regulated pollutants and the agency authorities for regulating these pollutants.

<u>Criteria Air Pollutants</u>

The United States Environmental Protection Agency (USEPA) has identified and established ground-level concentration criteria for air pollutants known to have detrimental human health impacts. These "criteria pollutants" and their health effects are described below.

Carbon monoxide (CO) is a colorless, odorless gas formed through the process of incomplete combustion of fossil fuels. Tail-pipe emissions from motor vehicles operating at slow speeds are the primary source of CO within the SCAB. The highest ambient CO concentrations are generally found near congested transportation corridors and intersections. Exposure to harmful levels of CO reduces the body's ability to transport oxygen to vital organs and tissues, and can have detrimental effects on the cardiovascular and central nervous systems.

Ozone (O_3) is a highly reactive and unstable gas formed when volatile organic compounds (VOCs) and nitrogen oxides (NOx), both byproducts of internal combustion found in engine exhaust, undergo slow photochemical reactions in the presence of heat and sunlight. VOCs and NOx are referred to as O_3 "precursors" due to their role in O_3 formation. Exposure to unhealthy levels of ground-level O_3 could result in coughing, throat irritation, chest pain, and congestion. Short-term exposure can result in reduced pulmonary function and localized lung edema, while long-term exposure can result in reduced pulmonary function.

Nitrogen dioxide (NO_2) is highly reactive and is part of the larger NOx group of gases. NO_2 is formed from engine or industrial process emissions through combustion of nitrogen-rich fossil fuels. Health effects from increased exposure include airway inflammation and increased respiratory ailments in asthmatics, and aggravated chronic respiratory disease and respiratory symptoms in sensitive groups. Other risks include pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes.

Sulfur dioxide (SO_2) is highly reactive and is a part of a larger group of gases known as sulfur oxides (SOx). SO_2 is formed during engine operations or industrial processes where sulfur-containing fossil fuels are burned. Exposure to unhealthy levels of SO_2 can cause adverse respiratory effects including bronchoconstriction, asthma, and symptoms such as wheezing, shortness of breath, and chest tightness during exercise or physical activity in persons with asthma.

Particulate matter less than 10 microns in diameter (PM_{10}) includes both fine and coarse liquid and solid particles, and is typically emitted through earthmoving activities, mobile source emissions, and industrial processes. Exposure to unhealthy levels of PM_{10} could lead to effects on the respiratory and breathing systems, damage to lung tissue, and exacerbation of symptoms in sensitive patients with respiratory disease.

Fine particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) is a complex mixture of extremely small particles and liquid droplets made up of a number of components, including acids such as nitrates and sulfates, organic chemicals, metals, and soil and dust particles. $PM_{2.5}$ is of particular concern due to its size and ability to cause respiratory ailments. Exposure to unhealthy levels could cause respiratory ailments, including decreased lung function, asthma, and aggravated symptoms in sensitive patients with respiratory disease.

Lead (Pb) is a metal that poses a serious health threat through the use of leaded-fuels. Fuels no longer contain lead, however, which has significantly decreased lead emissions within the atmosphere. Common sources of lead today include lead smelters, waste incinerators, and battery manufacturing operations. Unhealthy levels of lead exposure can result in increased levels of lead within the body, creating adverse health impacts affecting the nervous, immune, reproductive, developmental, and cardiovascular systems.

Sulfates are colorless gases formed by burning sulfur. SOx gases are formed when fuel containing sulfur, such as coal and oil, is burned, and when gasoline is extracted from oil or metals are extracted from ore. SO_2 dissolves in water vapor to form acid, and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and their environment.

Federal Regulatory Authority for Criteria Pollutants

As described above, the USEPA has identified and established ground-level concentration criteria for recognized air pollutants, or “criteria pollutants”. Under the Clean Air Act (CAA), the USEPA is charged with establishing National Ambient Air Quality Standards (NAAQS) for each criteria pollutant based on the concentration required to protect public health and welfare. In addition, the State of California has implemented the more stringent California Ambient Air Quality Standards (CAAQS) (with the exception of the recent 1-hr NO_2 and SO_2 NAAQS), which aid in effectively reducing harmful emissions in areas with poor air quality or non-attainment designations.

Pursuant to the CAA, the USEPA classifies air basins (i.e. geographic regions) as either “attainment” or “non-attainment” for each criteria pollutant, based on whether or not the NAAQS have been achieved. Some air basins have not received sufficient analysis for certain criteria air pollutants and are designated as “unclassified” for those pollutants.

The federal government first adopted the CAA (United States Code [USC] § 7401) in 1963 to improve air quality and protect citizens’ health and welfare. The NAAQS are revised and changed when scientific evidence indicates a need. The CAA also requires each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). State and local agencies including the California Air Resources Board (CARB) and the SCAQMD are responsible for providing the SIP and attainment plans. The CAA Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. As described below, state and local agencies are responsible for planning for attainment and maintenance of the NAAQS.

The CAA includes standards of performance for new stationary sources, including municipal solid waste (MSW) landfills, per 40 Code of Federal Regulations (CFR) Part 60, Subpart WWW. The provisions of this subpart apply to each MSW landfill that commenced construction, reconstruction, or modification on or after May 30, 1991. Subpart Cc of the same Part 60 (Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills) applies to each existing landfill for which construction, reconstruction or modification was commenced before May 30, 1991. A modification is defined as an increase in the permitted volume design capacity by either horizontal or vertical expansion. Under Subpart WWW rules, facilities with design capacities less than 2.5 million megagrams are required to submit initial design capacity reports, and for those with design capacities greater than 2.5 million megagrams, are required to calculate the facility’s generated non-methane organic compounds (NMOC) emissions. Estimated NMOC emissions exceeding 50 megagrams per year require the owner or operator to submit a collection and control system design plan and install a collection system to capture and control the gas generated. The SCAQMD’s Rule 1150.1 was deemed equivalent to Subpart Cc by the USEPA; MSW landfills in compliance with Rule 1150.1 are deemed in compliance with Subpart Cc.

State Regulatory Authority for Criteria Pollutants

California Clean Air Act (CCAA)

The California Clean Air Act (CCAA), signed into law in 1988, requires all areas to achieve and maintain attainment with the CAAQS by the earliest possible date. The CCAA, enforced by the CARB, requires each area exceeding the CAAQS to develop a plan aimed at achieving those standards. The California Health and Safety Code, Section 40914, requires air districts to design a plan that achieves an annual reduction in district-wide emissions of five percent or more, averaged every consecutive three-year period. To satisfy this requirement, the local Air Quality Management Districts (AQMDs) are required to develop and implement air pollution reduction measures, which are described in their Air Quality Management Plans (AQMPs) and outline strategies for achieving the state ambient air quality standards for criteria pollutants for which the region is classified as non-attainment.

In addition to the CCAA, the CARB:

- Establishes and enforces emission standards for motor vehicles, fuels, and consumer products
- Establishes health-based air quality standards
- Conducts research
- Monitors air quality
- Identifies and promulgates control measures for TACs
- Provides compliance assistance for businesses
- Produces education and outreach programs and materials
- Oversees and assists local air quality districts that regulate most non-vehicular sources of air pollution

Diesel Regulations

As part of California’s Diesel Risk Reduction Plan, CARB has passed numerous regulations to reduce diesel emissions from vehicles and equipment that are already in use. Combining these retrofit regulations with new engine standards for diesel-fueled vehicles and equipment, CARB intends to reduce DPM emissions by 85 percent from year 2000 levels by 2020.

Diesel Fuels

California Diesel Fuel Regulations (13 Cal. Code Regs. §§2281-2285; 17 Cal. Code Regs. §93114) provide standards for motor vehicle fuels and diesel fuel.

In-Use Off-Road Diesel Vehicle Regulation

CARB's In-Use Off-road Diesel Vehicle Regulation establishes various requirements for owners of off-road diesel vehicles, with engine ratings of 25 horsepower (HP) and greater, to reduce emissions of NOx and DPM generated during combustion. Requirements to date have included reporting fleet vehicles to the CARB; obtaining a CARB-issued equipment identification number for all diesel-fleet vehicles; and, developing and implementing a written idling policy restricting non-essential idling to less than 5-minutes. Emission performance requirements became effective January 2014, and established fleet average targets for NOx emission reductions. Emission performance can be achieved through fleet turnover and use of newer model year equipment, as well as installation of certified retrofit equipment such as a particulate filter.

On-Road Heavy Duty Diesel Vehicle Regulation

CARB's On-road Heavy Duty Diesel Vehicles (In-Use) Regulation applies to diesel-fueled trucks and busses with a gross vehicle weight greater than 14,000 pounds. The regulation establishes a phase-in schedule for fleet owners and operators to reduce emissions of PM through fleet turnover and/or installation of retrofit equipment such as exhaust filters. The phase in schedule initiated January 1, 2012, and applies to fleets based on model year.

CEQA Criteria for Carbon Monoxide Hotpots

Per CEQA Guidelines, the potential of a proposed project to result in localized carbon monoxide "hotspots" must be evaluated. Carbon monoxide "hotspots" or areas where CO is concentrated typically occur near congested intersections, parking garages, and other spaces where a substantial number of vehicles remain idle. Fossil-fueled vehicles emit CO emissions, an unhealthy gas which disperses based on wind speed, temperature, traffic speeds, local topography, and other variables. As vehicles idle in traffic congestion or in enclosed space, CO can accumulate to create CO hotspots that can impact sensitive receptors. Sensitive receptors refer to those segments of the population most susceptible to poor air quality (i.e. children, the elderly and those with pre-existing conditions affected by air quality).
Increases in traffic from a project might lead to impacts of CO emissions on sensitive receptors if the traffic increase worsens congestion on roadways or at intersections. An analysis of these impacts is required if:

- The project is anticipated to reduce the level of service (LOS) of an intersection rated at C or worse by one full level.
- The project is anticipated to increase the volume-to-capacity ratio of an intersection rates D or worse by 0.02.

An intersection LOS is a qualitative description of operating conditions of a transportation system including speed, convenience, comfort and security. The LOS is ranked between A through F, from best to worst.

Local Regulatory Authority for Criteria Pollutants

SCAQMD Rules and Regulations

The SCAQMD is the regional agency responsible for regulation and enforcement of federal, state, and local air pollution control regulations in the SCAB. The SCAQMD operates monitoring stations in the SCAB, develops and enforces rules and regulations for stationary sources and equipment, prepares emissions inventory and air quality management planning documents, and conducts source testing and inspections. The SCAQMD AQMP includes control measures and strategies to attain the NAAQS and CAAQS in the SCAB. The SCAQMD then implements these control measures as regulations to control or reduce criteria pollutant emissions from stationary sources or equipment (SCAQMD, 2007b).

It is the responsibility of the SCAQMD to ensure that the NAAQS and the CAAQS are achieved and maintained in the SCAB. Periodically, the SCAQMD prepares an overall AQMP to be submitted for inclusion in the SIP. The Final 2007 AQMP was adopted by the AQMD Governing Board on June 1, 2007, and includes control measures and strategies to be implemented as regulations to control or reduce criteria pollutant emissions from stationary and mobile sources (SCAQMD, 2007b). SCAQMD recently adopted the 2012 Air Quality Management Plan. The 2012 AQMP incorporates the latest scientific and technological information and planning assumptions, including the 2012 Regional Transportation Plan/Sustainable Communities Strategy and updated emission inventory methodologies for various source categories.

The SCAQMD has adopted several regulations that apply to construction and operation of the proposed project, as presented below.

Rule 403 Fugitive Dust

The SCAQMD has adopted specific regulations geared towards reducing and controlling emissions of PM from fugitive dust generated during construction activities. SCAQMD Rule 403, *Fugitive Dust*, states that any active operations, including demolition, grading, and/or earthmoving activities, shall include appropriate best control measures designed to control localized fugitive dust emissions (SCAQMD, 2005b). Best control measures include, but are not limited to, the following:

- Watering the site two to three times a day with a water truck.
- Application of non-chemical soil stabilizers to unpaved roads or disturbed areas.
- Stabilizing equipment staging areas through site watering, application of non-chemical stabilizers, or track-out installation.

Rule 1150 Excavation of Landfill Sites

The SCAQMD has adopted source-specific regulations to reduce and control fugitive emissions from landfills during excavation activities. SCAQMD Rule 1150, *Excavation of Landfill Sites*, states that excavation of an active or inactive landfill requires an Excavation Management Plan (Plan) approved by the SCAQMD Executive Officer. At a minimum, the Plan must describe the quantity and characteristics of the material to be excavated and transported, and identify mitigation measures to ensure that a public nuisance condition does not occur. Mitigation measures may include gas collection and disposal, baling, encapsulation, covering of the material, chemical neutralizing, or other actions approved by the Executive Officer (SCAQMD, 1982).

Rule 1150.1 Control of Gaseous Emissions from MSW Landfills

The SCAQMD has also adopted source-specific regulations to limit gaseous emissions from MSW landfills to prevent public nuisance and public health impacts. SCAQMD Rule 1150.1, *Control of Gaseous Emissions from MSW Landfills*, requires active landfills to have a collection and control system designed to handle the maximum expected gas flow rate and minimize migration of subsurface gas. The regulation was updated in 2011 to incorporate the CARB regulation that controls methane emissions from municipal solid waste landfills. Rule 1150.1 requires all collected gas to be routed to a treatment system that processes the collected gas for subsequent sale or use. The system must either reduce NMOC by at least 98 percent by weight, or reduce the outlet NMOC concentration to less than 20 ppm by volume (ppmv), dry basis as hexane at three percent oxygen. In addition, the treatment system must achieve a methane emissions destruction efficiency of at least 99 percent, except for lean burn internal combustion engines, which must reduce outlet methane concentration to less than 3,000 ppm, dry basis, corrected to 15 percent oxygen. The system must also prevent the concentration of total organic carbon (TOC), measured as CH_4, from exceeding five percent by volume in subsurface refuse boundary sampling probes, 25 ppmv in samples taken on numbered 50,000 square foot landfill grids, or 500 ppmv above background as determined by instantaneous monitoring at any location on the landfill (except at the outlet of any control device) (SCAQMD, 2011a).

General Plans

The City of Glendale's General Plan includes goals and policies geared towards reducing air quality impacts during construction, which are applicable to the proposed project.

The Air Quality Element of the City of Glendale 1994 General Plan identifies the following goals and policies related to criteria pollutants:

- Goal 1: "Air quality will be healthful for all residents of Glendale."
  - Policy Objectives:
    - "Reduce Glendale's contribution to regional emissions in a manner both efficient and equitable to residents and businesses, since emissions generated within Glendale affect regional air quality."
    - "Comply with the AQMP prepared by the SCAQMD and the Southern California Association of Governments."

- Goal 3: "Air emissions from City operations will be minimized, while meeting public service requirements."
  - Policy Objectives:
    - "Continue the aggressive programs of recycling, energy conservation, and hazardous waste collection in order to minimize emissions from the Grayson Power Plant and SCLF."
    - "Operate the power plant in a manner to minimize emissions and comply with various rules of the SCAQMD, while still providing needed electricity to residents and businesses."
    - "Work with the LACSD and the SCAQMD monitoring staff to minimize emissions at the SCLF" (City of Glendale, 1994).

Toxic Air Contaminants

A toxic air contaminant (TAC) is defined as an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health (CARB, 2010c). The California Air Resources Board (CARB) reviews scientific research on exposure and health effects to identify the toxic air pollutants that pose the greatest threat to public health. One of the primary health risks of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is of particular public health concern because it is currently believed by many scientists that there is no "safe" level of exposure to carcinogens; that is, any exposure to a carcinogen poses some risk of causing cancer. Health statistics show that one in four people (or 250,000 in a million) will contract cancer over their lifetime from all causes, including diet, genetic factors, and lifestyle choices (SCAQMD, 2009).

Unlike carcinogens, most non-carcinogens have a threshold level of exposure below which the compound will not pose a health risk. The California Environmental Protection Agency (CalEPA) and California Office of Environmental Health Hazard Assessment (OEHHA) have developed reference exposure levels (RELs) for non-carcinogenic TACs that are health-conservative estimates of the levels of exposure at or below which health effects are not expected. The non-cancer health risk due to exposure to a TAC is assessed by comparing the estimated level of exposure to the REL. The comparison is expressed as the ratio of the estimated exposure level to the REL, called the hazard index (HI).

Some of the compounds that have been identified as TACs to date are briefly described below.

VOCs are organic compounds that easily vaporize at room temperature. Sources include motor vehicle exhaust, burning waste, gasoline, industrial and consumer products, pesticides, industrial processes, degreasing operations, pharmaceutical manufacturing, and dry cleaning operations. Some VOCs are highly reactive and contribute to the formation of O_3, while others have adverse, chronic, and acute health effects. In some cases, VOCs can be both highly reactive and potentially toxic.

Carbonyl compounds, such as aldehydes and ketones, contain a carbon atom and an oxygen atom linked with a double bond (C=O). CARB currently monitors four carbonyls: formaldehyde, acetaldehyde, methyl ethyl ketone, and acrolein. Major sources of directly emitted carbonyls are fuel combustion, mobile sources, and process emissions from oil refineries. Some carbonyls are highly reactive and contribute to O_3 formation, while others have adverse chronic and acute health effects. In some cases, carbonyls can be both highly reactive and potentially toxic.

Toxic metals include ambient arsenic, beryllium, cadmium, chromium, manganese, nickel, lead, copper, zinc, aluminum, bromine, and barium, which are monitored in support of California's TAC Identification and Control Program. Initiated in 1983, this program identifies and controls chemical, physical, and biological agents that are found in ambient air and interfere with life processes.

Diesel particulate matter (DPM) from the combustion of diesel fuels consists of very small carbon particles, or "soot," which absorb diesel-related cancer-causing substances. DPM has the potential to contribute to cancer, premature death, and other health impacts (CARB, 2008c). DPM currently contributes over 70 percent of the currently known risks from TACs (CARB, 2008c; CARB, 2010d).

Federal Regulatory Authority for Toxic Air Contaminants

The USEPA administers several programs that regulate TAC emissions from stationary and mobile sources. The USEPA identified 188 TACs that are known or suspected carcinogens, present a threat to human health or the environment, and are regulated under control technology programs. Also, the

USEPA has identified 33 urban TACs that pose the greatest threat to public health in urban areas and are regulated under the Urban Air Toxics Strategy. The USEPA regulates TACs primarily by setting emission standards for vehicles, and technology standards for industrial source categories.

In 2003, USEPA issued the final National Emissions Standard for Hazardous Air Pollutants (NESHAP) rule to ensure reduction of TACs from MSW landfills. The regulation largely incorporated the requirements of Subpart WWW, with the added requirements for Start-up, Shut-down Malfunction plans and requirements for bioreactor landfills.

State Regulatory Authority for Toxic Air Contaminants

As required by state law, CARB identifies and controls TAC emissions. CARB maintains a twenty station toxic monitoring network within major urban areas. Data from these monitoring stations is used to determine the average annual concentrations of TACs and to assess the effectiveness of controls.

The California Air Toxics Program, developed by the CARB, established the process for identification and control of TAC emissions and includes provisions to make the public aware of significant toxic exposures and to reduce risk. The CalEPA and OEHHA have developed REL thresholds for TAC exposure based on cancer or non-cancer risk, as well as guideline for evaluating TAC emissions through health risk assessments (HRA) completed under the AB 2588 “Hot Spots” program.

The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, 1987, Connelly) was enacted in 1987 and requires stationary sources to report the types and quantities of certain substances routinely released into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emissions data, to identify facilities having localized impacts, to ascertain health risks, to notify nearby residents of significant risks, and to reduce significant risks to acceptable levels.

Local Regulatory Authority for Toxic Air Contaminants

The SCAQMD has established health risk thresholds for both permitting operational emissions and evaluating projects pursuant to CEQA. In addition, the SCAQMD has adopted regulations that apply to operation of the proposed project, as presented below.

SCAQMD Rule 1402, *Control of Toxic Air Contaminants from Existing Sources*, applies to any facility subject to the AB2588 Hot Spots Act and to any facility for which the impact of total facility emissions exceeds any significant or action risk level. The purpose of this rule is to reduce the health risk associated with emissions of toxic air contaminants from existing sources by specifying limits for maximum individual cancer risk (MICR), cancer burden, and non-cancer acute and chronic hazard index (HI) applicable to total facility emissions and by requiring facilities to implement risk reduction plans to achieve specified risk limits, as required by the Hot Spots Act and this rule. The rule also specifies public notification and inventory requirements.

Odors

Regional odor regulations include the SCAQMD’s Rule 402, *Nuisance*, which limits the discharge of odors that “cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property” (SCAQMD, 1976).

6.2.1.2 Environmental Setting

This section discusses the regional climate of the project area, existing ambient air quality conditions for criteria pollutants and TACs in the region, and the existing landfill emission sources and baseline air quality project site conditions.

Regional Climate

The regional climate significantly influences the air quality in the SCAB. Climatic variables such as wind, humidity, precipitation, and even the amount of sunshine influence regional air quality. The SCAB is also frequently subjected to an inversion layer that traps air pollutants. In addition, temperature has an important influence on wind flow, pollutant dispersion, vertical mixing, and photochemistry in the SCAB. Annual average temperatures throughout the SCAB vary from the low to middle 60 degrees Fahrenheit (ºF). However, due to decreased marine influence, the eastern portion of the SCAB shows greater variability in average annual minimum and maximum temperatures. January is the coldest month throughout the SCAB.

Although the climate of the SCAB can be characterized as semi-arid, the air near the land surface is quite moist on most days because of the presence of a marine layer. This shallow layer of sea air is an important modifier of the SCAB climate. Humidity restricts visibility in the SCAB, and the conversion of SO_2 to sulfates is heightened in air with high relative humidity. The marine layer is an excellent environment for that conversion process, especially during the spring and summer months. Because the ocean effect is dominant, periods of heavy early morning fog are frequent, and low stratus clouds are a characteristic feature. These effects decrease with distance from the coast.

Most of the rainfall in the SCAB occurs from November through April, although monthly and yearly rainfall totals are extremely variable. Summer rainfall usually consists of widely scattered thundershowers near the coast and slightly heavier shower activity in the eastern portion of the region and near the mountains. Rainy days are relatively rare in the SCAB, with the frequency being higher near the coast. The influence of rainfall on the contaminant levels in the SCAB is minimal.

Although some wash-out of pollution would be expected with winter rains, air masses that bring significant precipitation are very unstable and provide excellent dispersion that masks wash-out effects. Summer thunderstorm activity affects pollution only to a limited degree. High contaminant levels can persist even in areas of light showers if the inversion is not broken by a major weather system. However, heavy clouds associated with summer storms minimize ozone production because of reduced sunshine and cooler temperatures.

Existing Regional Ambient Conditions

Criteria Pollutants

The SCAQMD measures criteria pollutant levels using a network of monitoring stations located throughout the SCAB. The closest ambient air quality monitoring station to the SCLF for CO, O_3, NOx, $PM_{2.5}$, and sulfates is the West San Gabriel Valley monitoring station, located at 752 South Wilson Avenue, in Pasadena, approximately four miles southeast of the study area. The closest ambient air quality monitoring station for SOx and PM_{10} is the East San Fernando Valley monitoring station, located at 228 West Palm Avenue, Burbank, CA 91502, approximately seven miles northwest of the study area. The closest ambient air quality monitoring station for lead is the Central Los Angeles monitoring station, located at 1630 North Main Street, Los Angeles, CA 90012, approximately six miles southwest of the study area.

Background ambient air quality data from 2009 through 2011, which represents the most recent three years of available data, are compared to the most stringent of either the CAAQS or the NAAQS and are presented in Table 6.2-1. The number of measured values which exceeded the CAAQS is shown in the table in parentheses.

TABLE 6.2-1. BACKGROUND AIR QUALITY DATA (2009 – 2011)

Pollutant (Units)	CAAQS	NAAQS	Maximum Observed Concentration (Number of Days Standard Exceeded)		
			2009	**2010**	**2011**
CO (ppm)					
1-hour	20	35	3.0	3.0	--
8-hour	9.0	9	2.53	1.94	2.26
O_3 (ppm)					
1-hour	0.09	0.12	0.176 (12)	0.101 (1)	0.107 (5)
8-hour	0.070	0.075	0.114 (12)	0.082 (3)	0.085 (5)
NO_2 (ppm)					
1-hour	0.180	0.100	0.080	0.071	0.087
Annual	0.030	0.053	0.022	0.020	0.020
SO_2 (ppm)					
1-hour	0.25	--	--	--	--
24-hour	0.04	0.14	0.003	0.004	0.002
Annual	--	0.030	0.002	--	--
PM_{10} (µg/m^3)					
24-hour	50	150	76.0 (10)	51.0	64.0 (2)
Annual	20	--	38.9	--	--
$PM_{2.5}$ (µg/m^3)					
24- hour	--	35	51.9 (3)	35.2	43.8 (1)
Annual	12	15	--	--	--
Lead (µg/m^3)					
30-day	1.5	--	0.02	--	--
Calendar Quarter	--	1.5	0.01	--	--
Sulfates (µg/m^3)					
24-hour	25	--	9.8	9.1	--
µg/m^3 = micrograms per cubic meter; ppm = parts per million					

Sources: CARB, 2012; SCAQMD, 2012.

As shown in Table 6.2-1 above, the SCAB is in compliance with both CAAQS and NAAQS for CO, NOx, SOx, lead, and sulfates. The CAAQS for O_3 and PM_{10} were exceeded on several days during 2009, 2010, and 2011.

As described previously, the SCAQMD and CARB are the responsible agencies for demonstrating attainment of the NAAQS and CAAQS within the SCAB. Current federal and state attainment designations for the SCAB are presented in Table 6.2-2.

TABLE 6.2-2. SCAB ATTAINMENT STATUS

Pollutant and Averaging Time	State Designation	Federal Designation
O_3 1-hour	Extreme nonattainment	Extreme nonattainment
O_3 8-hour	Nonattainment	Extreme nonattainment
CO	Attainment	Maintenance
SO_2	Attainment	Attainment
NO_2	Nonattainment	Attainment
PM_{10} 24-hour	Nonattainment	Serious nonattainment
PM_{10} Annual Average	Nonattainment	--
$PM_{2.5}$ 24-hour	--	Nonattainment
$PM_{2.5}$ Annual Average	Nonattainment	Nonattainment
Hydrogen Sulfide	Unclassified	--
Sulfates	Attainment	--
Visibility Reducing Particles	Unclassified	--
Lead	Nonattainment (for Los Angeles portion of SCAB)	Attainment

Sources: CARB, *State Area Designations,* 2010; USEPA, *Green Book,* 2010.

Toxic Air Contaminants

The SCAQMD has conducted urban TAC studies within the SCAB, the most comprehensive of which is the Multiple Air Toxics Exposure Study (MATES). The MATES III (2004-2006) is a monitoring and evaluation study conducted in the basin as a follow-up to previous air toxics studies in the Basin (MATES II (1998-1999) and MATES I (1987)) and is part of the SCAQMD Governing Board Environmental Justice Initiative. MATES III consisted of several elements such as a monitoring program, an updated TAC emissions inventory, and a modeling effort to characterize risk across the SCAB (SCAQMD, 2008c).

MATES III estimated the SCAB's basin-wide carcinogenic risk from air toxics at 1,200 cases per million. Estimated "background" carcinogenic risk in the study area based on the MATES III study is approximately 635 cases per million (SCAQMD, 2008b). About 94 percent of the basin-wide risk was attributed to emissions associated with mobile sources, with the remaining attributed to toxics emitted from stationary sources. The estimated population-weighted risk in the SCAB for the MATES III period showed an 8 percent decrease compared to the MATES II period. MATES III (2005 inventory) also noted an 11 percent decrease in the carcinogenic potency weighted emissions since MATES II (1998 emission inventory year). Emissions from on-road, point, and area source categories were estimated to have decreased 12 percent, 66 percent, and 42 percent, respectively, while off-road emissions were determined to be essentially unchanged (an increase of one percent) (SCAQMD, 2008c).

Existing Landfill Emissions Sources and Baseline Project Site Conditions

The SCLF, owned by the City of Glendale and the County of Los Angeles, and operated by the Sanitation Districts of Los Angeles County (Sanitation Districts), maintains SCAQMD operating permits for the landfill gas (LFG) collection system, flares, and a diesel-fired boiler. The SCLF is classified as a major stationary source of emissions (major source) and maintains a Title V operating permit for major sources under the federal Title V Permitting Program. Existing permitted equipment and emissions, as reported in the facility Annual Emission Report (AER), are presented below.

Landfill Activities and Emission Sources

Ongoing landfill activities which generate criteria pollutant emissions include equipment operations, customer traffic, lift construction, permitted and non-permitted stationary sources, and fugitive emissions; additional emission source detail is presented below.

Equipment Operations includes, but is not limited to, the use of both heavy equipment and on-road vehicles to move and cut cover material, perform roadwork, provide dust control (e.g. use of a water truck), and conduct landscaping activities.

Customer Use for disposal of refuse and management of dirt and green waste generates mobile source emissions. Customers include both municipal waste service vendors as well as the general public with the vast majority coming from municipalities that include Glendale, La Canada-Flintridge, Pasadena, South Pasadena, Altadena, and La Crescenta-Montrose. The average trip distance for customer travel is 4.2 miles, from origin to the landfill gate entrance.

Lift Construction includes various activities that allow the landfill to add vertical layers, or lifts, and require specific construction projects including gas projects (i.e. trenching, well installation, and header line placement), drainage projects, and landscape/irrigation to integrate these into the existing facilities. In general, lift thickness can range from 8 to 25 feet.

Stationary Sources include, but are not limited to, sources such as a LFG management system, diesel-powered pressure washer, engines, gas storage and dispensing, diesel storage and dispensing, and VOCs from sources such as paints, sealants, and cleaners. LFG generated at the SCLF and the inactive northern canyon is collected, compressed, dehydrated, and desulfurized, and then transported in a pipeline to the City of Glendale's Grayson Power Plant, where it is combusted to produce power. The Grayson Power Plant is designed to accept 100 percent of the LFG produced under the current operating conditions, except when the compressor loses its capacity. Any excess LFG not used by the Grayson Power Plant during such times is flared on site at the landfill.

> **LFG** is currently collected at the landfill, including the northern canyon, through a collection system with approximately 95 percent collection efficiency. Captured LFG is primarily combusted off site at the city of Glendale's Grayson Power Plant to produce electricity. The City of Glendale operates an LFG pretreatment compression facility and pipeline that transports LFG generated at the landfill to Grayson Power Plant. When the compressor station is out of service, a system of 12 conventional flares provides backup means of combusting any excess LFG. Under normal circumstances, Grayson Power Plant is able to utilize 100 percent of the LFG collected. Combustion of LFG in flares results in on site emissions of both criteria pollutant and TAC emissions. Baseline criteria pollutant emissions and TAC estimates generated from LFG flaring are based on source test results, conducted per SCAQMD's Rule 1150.1 requirements.

Fugitive Sources include, but are not limited to, gas emissions from the landfill surface; fugitive dust from truck loading and unloading, grading and scraping, and wind erosion of stockpiles; and fugitive VOCs from paint and solvent use.

> **Surface Gas** emissions are fugitive emissions which escape through the surface of the landfill and are emitted directly into the atmosphere. Baseline surface gas emissions are based on pollutant concentrations obtained from source testing conducted per SCAQMD Rule 1150.1, and presented in the 2006 through 2009 AERs.

Fugitive Dust emissions result from various activities including, but not limited to, refuse hauling and unloading, site vehicular traffic, compaction, cover placement and maintenance, drainage structure maintenance, excavation and soil stockpiling.

Landfill Criteria Pollutant Emissions

Average daily emissions were estimated for each of the landfill activities identified above. On site mobile equipment emissions were estimated using the inventory of on site equipment and existing daily use schedule. Emissions from customer use were estimated using existing daily trip information from the traffic data collection and calculations, included as Appendix L of the DEIR, as well as geo-referenced data provided by the Sanitation Districts related to the average trip distance of customer travel. Emissions from lift construction were evaluated based on the schedule and equipment inventory needed to complete lift activities such as trenching, header installation, and installation of drainage projects, obtained from Sanitation Districts.

Fugitive dust emissions from vehicle transport on roadways within the SCLF property boundary were based on total trips per day, obtained from the Traffic and Transportation Section, and a round-trip distance of 1 mile each, for paved and unpaved roads. Fugitive dust emissions generated from grading, scraping, and dozing were estimated assuming an equipment speed of 4 miles per hour based on the parameters established in the site Fugitive Dust Control Plan; equipment operation schedule was provided by Sanitation Districts for on site operations and lift construction. Existing on site dust controls include site watering, road sweeping, application of road cover, and topsoil stabilization measures including planting and maintaining native vegetation (Sanitation Districts, 2009). For this analysis, a 75 percent control efficiency has been applied to earthmoving activities including grading, scraping and dozing reflecting the control measures mentioned above, consistent with the SCAQMD recommended efficiency for similar control practices (SCAQMD, 2007); continuous watering, controlled speed limit, and sweeping implemented at the SCLF have been assumed to provide a 75 percent control efficiency for road dust emissions generated during vehicle transport on paved and unpaved roadways within the study area, based on CEQA guidance from SCAQMD (SCAQMD, 2010).

Baseline criteria pollutant emissions from permitted stationary sources and fugitive sources were estimated by averaging the annual emissions presented in the SCLF 2004 through 2009 AER's, representative of the most recent three years of available data (SCAQMD, 2005a, 2007b, 2009b, & 2010b).

Average daily emissions for baseline conditions at SCLF are presented in Table 6.2-3. Detailed emission calculations, inputs and assumptions are presented in Appendix F of the DEIR.

TABLE 6.2-3. BASELINE CONDITIONS - CRITERIA POLLUTANT EMISSIONS SUMMARY (LB/DAY)

Source Type	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
On site Mobile Equipment[1]						
Combustion	18.4	74.0	159.0	0.2	7.1	6.6
Fugitive Dust	--	--	--	--	65.2	6.6
Customer and Employee Vehicles[2]						
Combustion	16.3	84.8	227.9	0.3	8.4	7.2
Fugitive Dust	--	--	--	--	391.5	39.2
Lift Construction[3]						
Mobile Sources	7.5	26.2	66.6	0.1	9.7	4.0
Fugitive Dust	--	--	--	--	6.8	1.3

TABLE 6.2-3. BASELINE CONDITIONS - CRITERIA POLLUTANT EMISSIONS SUMMARY (LB/DAY)

Source Type	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
On site Stationary[4]						
Flaring[5]	0.0	0.0	(0.5)	(0.1)	(0.1)	(0.1)
Surface Fugitive	0.00	0.00	0.0	0.0	0.0	0.0
Engines, Heaters, Other	0.1	0.5	1.9	0.0	0.1	0.1
Permitted/Non-Permitted Equipment						
Baseline Conditions, Emissions Summary =	**42.3**	**185.4**	**454.9**	**0.4**	**489.0**	**64.8**

Source: Modeled by AECOM, 2012.
Notes:
1. Includes on-road vehicles and off-road equipment. Detailed emission calculations are presented in Appendix F (Appendix A-1, Table 4) of the DEIR.
2. Detailed emission calculations are presented in Appendix F (Appendix A-1, Table 6b) of the DEIR.
3. Detailed emission calculations are presented in Appendix F (Appendix A-1, Table 7) of the DEIR.
4. Detailed emission calculations are presented in Appendix F (Appendix A-1, Table 10b) of the DEIR.
5. Flaring emissions have been estimated using 2011 methane gas generation data and based on compressor capacity at Grayson Power Plant.

Landfill CO Hotspots

As described previously, a localized CO hotspot is an air quality impact resulting from congested intersections. Intersections operating at an LOS D or E are required to be evaluated against the CAAQS to determine the potential ambient air quality impacts resulting from baseline and proposed conditions. The 1-hr and 8-hr CO CAAQS are presented in Table 6.2-4 to evaluate the potential CO impact. As presented in Table 6.2-4, baseline conditions do not result in a CO concentration in excess of the CO CAAQS and therefore would not result in a CO hotspot or localized ambient air quality impact.

TABLE 6.2-4. PEAK CO CONCENTRATIONS, BASELINE CONDITIONS

Intersection	LOS (AM/PM)	Peak CO Concentration (ppm)[1]	
		1-hr	8-hr[2]
Figueroa Street/SR 134 Westbound Ramp	E/C	3.5	2.1
California Ambient Air Quality Standard =		20	9
Would baseline conditions exceed the CAAQS (Y/N)? =		No	No

Source: Modeled by AECOM, 2012.
Acronyms:
CAAQS = California Ambient Air Quality Standards; CO = carbon monoxide; LOS = level of service; ppm = parts per million.
Notes:
1 Includes peak 1-hr background CO concentration of 3.0 ppm, as presented previously in Table 6.2-1, from West San Gabriel Valley monitoring station.
2 Applies a persistence factor of 0.6 to the 1-hour background level.

Landfill Toxic Air Contaminants

The CARB maintains information on TACs and health risk assessments for facilities throughout California. Baseline health impacts at SCLF are equal to 6.17 in-a-million for cancer risk, and a hazard index of 0.05 and 0.01 for non-cancer chronic and acute health impacts (CARB 2010f). These are below the SCAQMD's allowable project increment threshold of 10 in-a-million for cancer risk and 1.0 for non-cancer health index.

Existing TAC emission sources include flared LFG combustion, landfill surface gas, heaters, stationary internal combustion engines, paints and cleaners, gasoline and diesel fuel storage and dispensing, and heavy-duty equipment operations. Baseline TAC emissions, as reported in the most recent and publicly available AER are presented in Table 6.2-5.

TABLE 6.2-5. TAC EMISSIONS (REPORTING YEAR 2009)

CAS No.	TAC	Emissions (lb/year)
106990	1,3-Butadiene	< 0.1
75070	Acetaldehyde	0.2
107028	Acrolein	0.2
7664417	Ammonia	1.5
71432	Benzene	47.5
9901	Diesel Engine Exhaust, Particulate Matter	1.1
100414	Ethyl Benzene	122.5
50000	Formaldehyde	0.2
7647010	Hydrochloric Acid	< 0.1
7783064	Hydrogen Sulfide	304.9
1634044	Me T-Butyl Ether	2.2
75092	Methylene Chloride	19.1
1151	PAHs, total, with components not reported	0.1
127184	Perchloroethylene	27.1
108883	Toluene	337.0
79016	Trichloroethylene	10.6
75694	Trichlorofluoromethane (Freon 11)	7.5
75014	Vinyl Chloride	4.0
1330207	Xylenes	293.6
106467	p-Dichlorobenzene	18.7
CAS = chemical abstract service; lb/year = pounds per year; No. = number		

Source: SCAQMD, 2011.

Based on these site conditions, exposure to TAC emissions from baseline SCLF operations do not pose a significant cancer and non-cancer risk to the surrounding community.

Landfill Odors

Odors may result from both the refuse itself and from LFG that migrates through the cover soil and escapes into the atmosphere. However, excessively odorous wastes are rejected prior to unloading, and a number of measures are employed to minimize odors (Sanitation Districts, 2009).

Potential refuse odors are controlled by daily application of cover material. Landfill cover soil removes odorous compounds from the LFG. Soil bacteria and chemical processes substantially reduce trace organic components, thereby reducing odors in the LFG not removed by the collection system (Sanitation Districts, 2009).

LFG odors are minimized through a LFG recovery system comprised of vertical LFG extraction wells and horizontal rock-filled LFG collection trenches with internal piping systems. The captured LFG is then transported via pipeline and combusted at either the City of Glendale’s Grayson Power Plant or the on site flare station. When differential settlement produces cracks in the cover soil, the cracks are filled and the soil re-compacted to prevent direct venting (Sanitation Districts, 2009).

6.2.2 THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, implementation of the proposed project would result in a significant adverse impact on the environment related to air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under any applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors).
- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

As stated in Appendix G of the CEQA Guidelines, the significance criteria established by the applicable AQMD or air pollution control district may be relied upon to make the above determinations. Thus, the appropriate district-recommended emission thresholds, as published in their respective CEQA guidance documents, also apply to individual projects under their jurisdiction. The SCAQMD has recommended daily thresholds of significance for construction and operation to evaluate local and regional impacts, as presented below in Table 6.2-6 and Table 6.2-7.

6.2.2.1 SCAQMD Regional Significance Thresholds

Emissions that can adversely affect air quality originate from various activities. A project generates emissions both during the period of its construction and during ongoing daily operations. Project-related air quality impacts estimated in this environmental analysis would be considered significant if any of the applicable significance thresholds presented in Table 6.2-6 are exceeded.

TABLE 6.2-6. AIR QUALITY SIGNIFICANCE THRESHOLDS

Pollutant	Construction	Operation
Criteria Pollutants Mass Daily Thresholds		
NO_x	100 lb/day	55 lb/day
VOC	75 lb/day	55 lb/day
PM_{10}	150 lb/day	150 lb/day
$PM_{2.5}$	55 lb/day	55 lb/day
SO_x	150 lb/day	150 lb/day
CO	550 lbs/day	550 lb/day
Lead	3 lb/day	3 lb/day
TAC and Odor Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk > 10 in-a-million HI > 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	

Source: SCAQMD, 2009a.
Acronyms: $\mu g/m^3$ = micrograms per cubic meter; HI = hazard index; lb/day = pounds per day; ppm = parts per million; > greater than

6.2.2.2 SCAQMD Localized Significance Thresholds

The SCAQMD has developed localized significance thresholds (LSTs) for determining the localized air quality impacts from construction and operations, based on project location and distance to the nearest sensitive receptor. LSTs have been established for NOx, CO, PM_{10}, and $PM_{2.5}$; the LSTs account for ambient concentrations of each pollutant in relation to each source receptor area (SRA) and distance to the nearest sensitive receptor, based on the NAAQS and CAAQS.

Peak daily emissions during construction and operation are compared to the LSTs presented in Table 6.2-7, which represent the thresholds for a five-acre site within SRA 7 (East San Fernando Valley), with the nearest receptor distance of 200 meters. Although the proposed variations' area footprint exceeds five acres, this analysis presents a conservative analysis to determine if a refined analysis is required for demonstration of localized emissions below a level of significance.

TABLE 6.2-7. LOCALIZED AIR QUALITY SIGNIFICANCE THRESHOLDS[1]

Pollutant	Construction	Operation
NOx	194 lb/day	194 lb/day
CO	4,119 lb/day	4,119 lb/day
PM_{10}	84 lb/day	21 lb/day
$PM_{2.5}$	28 lb/day	7 lb/day

Source: SCAQMD, 2009a.
Notes:
1. Thresholds based on five-acre site, SRA 7, and receptor distance of 200 meters.

6.2.2.3 SCAQMD Health Risk Screening Level Assessment

The health risk impacts associated with the No Project Alternative, and operation of Variations 1 and 2 were evaluated utilizing the SCAQMD's Tier 1 and Tier Screening Level Assessment (SLA) tool. The Tier 1 analysis compares maximum annual TAC emissions from LFG flaring and fugitive emissions to SCAQMD Screening Level (look-up table) thresholds (lb/year) at set distances to the nearest receptor (25, 50 and 100 meters) from the source. The varying receptor locations allow the applicant to account for the increased dispersion of pollutants at distances downwind from the emission source, so nearby sources have less dispersion before impacting a receptor. The established Screening Levels are pollutant emission thresholds that produce a MICR less than 1 in-a-million and/or a HI less than 1, based on overly conservative assumptions. Therefore, if the maximum annual emissions do not exceed the Screening Levels, a refined analysis would not be required. If pollutant emissions are above the Screening Level, a refined health risk impact assessment is warranted.

A Tier 2 analysis is a screening risk assessment, which includes procedures for determining the level of risk from a source and involves calculation of MICR and non-cancer chronic HI at the nearest receptor. MICR is the estimated probability of a potential maximally exposed individual contracting cancer as a result of exposure to TACs over a period of 70 years for residential receptor locations. Chronic HI is the ratio of the estimated long-term level of exposure to a TAC for a potential maximally exposed individual to its chronic REL. For the purpose of calculating the MICR and chronic HI, a receptor is any location outside the property boundary at which a person could experience chronic (long-term) exposure. If a Tier 1/Tier 2 screening approach does not demonstrate compliance with risk limits, an applicant can conduct a refined HRA (Tier 3/Tier 4) using air dispersion modeling and actual exposure scenarios based on receptor type (residential, worker, and child).

TAC emissions from flaring and fugitive LFG emissions were analyzed according to the Tier 1 Screening Emissions Level, and Tier 2 Screening Risk Assessment methodologies. A refined HRA is not included in this study. The results of the Tier 1 and 2 analyses are provided in the following sections.

Risk Definitions and Significance

Cancer risk is the probability or chance of contracting cancer over a human life span, which is assumed to be 70 years. Carcinogens are not assumed to have a threshold below which there would be no human health impact. In other words, any exposure to a carcinogen is assumed to have some probability of causing cancer; the lower the exposure, the lower the cancer risk (i.e., a linear, no-threshold model). In assessing public health impacts, cancer risk is the expected incremental increase in cancer cases based on an equally exposed population of individuals, typically expressed as excess cancer cases per million exposed individuals.

State and local regulations have developed cancer risk levels above which a project is considered to have a potential significant impact on public health. California's AB 2588 Air Toxic Hot Spots Program and California's Proposition 65, for example, have developed a significance level for incremental cancer risk of 10 in-a-million as the public notification level for TAC emissions from existing sources. For carcinogenic health impacts, the SCAQMD considers impacts to be significant if the incremental MICR is greater than or equal to 10 in-a-million. The MICR is the highest of either the maximum exposed individual resident (MEIR) or the maximum exposed individual worker (MEIW). Occupational exposures are calculated utilizing shorter exposure assumptions, i.e., 40 years rather than 70 years.

Non-cancer health effects are characterized as either chronic or acute. In determining potential non-cancer health risks from TAC emissions, it is assumed that there is a dose of the chemical of concern below which there would be no impact on human health. The air concentration corresponding to this dose is the REL. Non-cancer health risks are measured in terms of a HI, which is the calculated exposure of each contaminant divided by its REL. HIs for those pollutants affecting the same target organ are typically summed, with the resulting totals expressed as HIs for each organ system.

Similar to cancer risk, non-cancer impacts also have determined significance thresholds based on the estimated HI for the project. RELs used in the HI calculations were those published in the CAPCOA AB 2588 Risk Assessment Guidelines (CAPCOA, 1993), and as updated by the OEHHA in the Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values (OEHHA, 2010). State and local regulations have developed chronic and acute risk levels above which a project is considered to have a potential significant impact on public health. For non-carcinogenic health impacts, the SCAQMD considers impacts to be significant if incremental HI is greater than or equal to one.

6.2.3 METHODOLOGY

6.2.3.1 Methodology Related to Criteria Pollutants

Off-Road Mobile Sources

Emissions from daily operation of off-road equipment for cover transport and use, shredding, and water application were calculated based on equipment operating records and assuming the maximum permitted tons per day are received at the SCLF.

Composite, average emission factors representative of off-road vehicles operating during 2011 within the SCAB were utilized to estimate mobile source criteria pollutant emissions from baseline conditions, the

No Project Alternative, Variation 1, and Variation 2. For this analysis, construction equipment includes both existing SCLF equipment and additional contractor equipment. It is important to note that due to fleet turnover and regulatory implications resulting from the CARB's In-Use Off-road Diesel Regulation, mobile source emissions will continue to decrease over the lifetime of the project. Off-road emissions have been estimated based on 2011 average emission factors and therefore do not account for the additional benefit realized due to fleet turnover and regulatory implications referenced above. Schedule assumptions, hours of operation, equipment type, and detailed emission calculations are provided in Appendix F of the DEIR.

On-Road Mobile Sources

Construction emissions from gasoline and diesel-fueled on-road light and heavy-duty trucks would result from worker commute trips and on site equipment such as pickup trucks. These emissions were estimated using CARB's on-road emissions inventory model (On-Road EMFAC 2007, Version 2.3), obtained from the SCAQMD website (SCAQMD, 2010c). For baseline conditions, worker commute emissions were calculated for the 31 regular SCLF employees, who were assumed to commute 60 miles round trip. For the No Project Alternative, Variation 1 and Variation 2, worker commute emissions were calculated for 40 regular SCLF employees, who were assumed to commute 60 miles round trip.

Stationary Sources

Stationary sources include devices that manage landfill gas, such as flares. Flaring emissions have been evaluated based on the peak LFG generation and compared to emissions generated during baseline conditions.

Additional stationary sources include engines, heaters, and gas/diesel storage and dispensing. Because the permitted intake of the facility would not increase and is not proposed for modification, it has been assumed that permitted and non-permitted stationary sources (such as heaters or engines) would not result in a change in operational parameters as a result of the No Project Alternative, Variation 1 or Variation 2. Therefore, there would be no incremental increase or decrease in criteria pollutant emissions from existing stationary sources.

Landfill Gas

LFG generated through anaerobic landfill conditions is collected by a permitted gas collection system. The gas is then captured and conveyed to the city of Glendale's Grayson Power Plant where it is used to fire boilers, turbines, and engines to generate electricity. Because the capacity of the Grayson Power Plant to receive LFG from the SCLF is not being modified as part of this project, combustion related criteria pollutant emissions from electrical generation were not evaluated in this analysis.

As described above, LFG generation for the project was based on the maximum amount of waste currently permitted for disposal at SCLF, which is 3,400 tons per day. Combustion of LFG in flares results in criteria pollutant and TAC emissions (TAC emission quantification is described in a separate section below). Criteria pollutant emissions were estimated using emission factors derived from site source tests conducted in accordance with SCAQMD's Rule 1150.1. Criteria pollutant emissions from LFG combustion from the No Project Alternative, Variation 1 and Variation 2 were estimated using factors obtained from the 2009 AER and are presented in Appendix F of the DEIR.

Landfill Surface Gas

As described above, LFG will be primarily controlled through the gas control system and off site LFG-to-energy combustion processes. A small amount of uncontrolled LFG can potentially escape through the surface. The gas collection system is assumed to have a collection efficiency of approximately 95 percent and the remaining 5 percent is assumed to be released as fugitive surface gas. Fugitive gas emissions have been evaluated based on the peak LFG generation and compared to emissions generated during baseline conditions.   This gas is primarily methane (non-VOC) with trace amounts of TAC emissions, therefore no criteria pollutant emissions were calculated due to releases of landfill surface gas.

Fugitive Dust

Sources of fugitive dust within the study area include on site mobile source transport on unpaved and paved roads, material handling by heavy equipment operations including grading and excavation, and wind erosion of site stockpiles. The emissions quantification methodology for these various fugitive dust sources are described in Appendix F of the DEIR.

Carbon Monoxide Hot Spots

The potential for the No Project Alternative, Variation 1 and Variation 2 to cause an exceedance of short-term CO standards (1-hr and 8-hr standards) were evaluated using a tiered approach, in accordance with USEPA guidance. The CO hotspots analysis was conducted for roadway intersections currently operating at, or expected to operate at, LOS D, E or F using the screening methodology described in the California Department of Transportation's Transportation Project-Level Carbon Monoxide Protocol (December 1997). An analysis has been conducted at project-impacted roadway intersections where a CO hotspot could potentially occur.

To analyze the potential for CO hotspots near the study area, baseline LOS conditions at key intersections were compared before and after the implementation of the project, using data from Section 6.11, Transportation and Circulation. If the baseline LOS would not be impacted or degraded as a result of the project, it can be demonstrated that the potential for CO hotspots would be negligible.

6.2.3.2 Methodology Related to Toxic Air Contaminants

TAC emissions resulting from LFG flaring and fugitive surface emissions have been evaluated in accordance with the SCAQMD's Risk Assessment Procedures for Rule 1401 and 212 (SCAQMD, July 2005). Primary gas control is accomplished by the off site combustion of LFG at the City of Glendale's Grayson Power Plant. Because the capacity of the Grayson Power Plant to receive LFG from the SCLF is not being modified as part of this project, TAC emissions from combustion during electricity generation were not evaluated. Flares are utilized to burn any excess LFG not transported to the Grayson Power Plant and when the power plant is down for routine maintenance. TAC emissions resulting from LFG flaring and fugitive surface gas are presented in Appendix F of the DEIR.

6.2.3.3 Methodology Related to Odors

The potential for an odor impact depends on a number of variables, including the nature of the odor source, distance between the receptor and the source, and local meteorological conditions. However, due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, there are no quantitative or formulaic methodologies to determine the presence of a significant odor impact.

Therefore, this analysis discloses all pertinent information that could result in potential odor impacts, including, but not limited to, information about the specific operational processes and any project design odor control features. Examples of control features include buffer zones, recommended screening distances, evaluation of the predominant wind direction and the frequency of temperature inversions in the vicinity of the SCLF, and evaluation of whether receptors would be located upwind or downwind of any odor source.

The SCLF currently implements and maintains various odor control measures designed to reduce nuisance odorous impacts. Control measures include daily application of cover materials, operation of LFG recovery system, monitoring, self-reporting, and customer hotline. In addition, there have not been odor impacts or complaints received at SCLF in the past 10 years. While expansion of the existing landfill could result in potential odor impacts, measures and controls are in place to reduce and control foreseeable nuisance impacts.

6.2.4 IMPACTS

6.2.4.1 Variation 1

Construction

Because Variation 1 does not include any lateral expansion, there will be no “new” construction activities associated with continued operation of the landfill. No further analysis has been conducted. Construction of Variation 1 would not cause or contribute substantially to an existing or projected air quality violation, nor would it result in a cumulatively considerable incremental increase of any criteria pollutant for which the region is in non-attainment. Also, construction of Variation 1 would not expose sensitive receptors to substantial pollutant concentrations, nor would it create objectionable odors affecting a substantial number of people. Therefore, implementation of Variation 1 would not result in significant adverse impacts related to construction.

Operation

Criteria Pollutant Emissions

Regional Air Quality Impacts

Criteria pollutant emissions resulting from operation of Variation 1 would result from on site operations, lift construction, customer use, and stationary sources. The net change in emissions compared to baseline conditions is presented in Table 6.2-8 below.

TABLE 6.2-8. VARIATION 1 - REGIONAL CRITERIA POLLUTANT ANALYSIS

Source Type	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Onsite Mobile Equipment[1]						
Combustion	31.5	125.7	273.4	0.3	12.2	11.2
Fugitive Dust[2]	--	--	--	--	109.0	10.3
Customer and Employee Vehicles[3]						
Combustion	29.6	148.6	436.0	0.4	16.1	13.7
Fugitive Dust[2]	--	--	--	--	793.8	79.4

TABLE 6.2-8. VARIATION 1 - REGIONAL CRITERIA POLLUTANT ANALYSIS

Source Type	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Lift Construction[4]						
Mobile Sources	8.6	29.5	74.7	0.1	10.0	4.3
Fugitive Dust[2]	--	--	--	--	6.8	1.3
Onsite Stationary[5]						
Flaring						
Surface Fugitive	0.1	0.1	0.8	0.2	0.3	0.0
Engines, Heaters, Other Permitted/Non-	0.0	--	--	0.0	0.0	0.0
Permitted Equipment	0.1	0.5	1.9	0.0	0.1	0.0
Variation 1, Emissions Summary =	69.9	304.4	786.8	0.9	948.2	120.7
Baseline Conditions Emissions Summary =	42.3	185.4	454.9	0.4	489.0	64.8
Net Change Compared to Baseline Conditions	27.6	119.0	332.0	0.6	459.2	56.0
SCAQMD Mass Daily Thresholds	55	550	55	150	150	55
Would Variation 1 Exceed Regional Thresholds (Y/N)?	No	No	**Yes**	No	**Yes**	**Yes**

Source: Modeled by AECOM, 2012.
Notes:
[1] Detailed emission calculations are presented in Appendix F (Appendix A-1, Table 5) of the DEIR.
[2] Fugitive dust emissions account for soil moisture and additional control measures implemented through the site's Fugitive Dust Control Plan.
[3] Detailed emission calculations area presented in Appendix F (Appendix A-1, Tables 6e and 6f) of the DEIR.
[4] Detailed emission calculations are presented in Appendix F (Appendix A-1, Table 8) of the DEIR.
[5] Detailed emission calculations for flaring are presented in Appendix F (Appendix B-2, Tables 3 through 7) of the DEIR; Variation 1 would not result in a change in emissions from engine use; engine emission calculations are presented in Appendix F (Appendix A-1, Table 10b) of the DEIR, and represent baseline conditions.

As presented in Table 6.2-8, the net change in daily emissions from operation of Variation 1, compared to baseline conditions, would exceed the SCAQMD's mass daily threshold for NOx, $PM_{10,}$ and $PM_{2.5}$. Therefore, a potentially significant air quality impact related to emissions of criteria pollutants would occur under Variation 1.

Localized Significance Analysis

The incremental increases in on site, operational emissions are compared to the LSTs to present the potential localized impacts of Variation 1, as presented in Table 6.2-9 below. The applicable LSTs represent a five-acre site within SRA 7, with the nearest sensitive receptor located within 200 meters.

As presented in Table 6.2-9, the net increase in NOx, PM_{10} and $PM_{2.5}$ emissions generated from Variation 1 would result in an exceedance above the LST. Therefore, a potentially significant air quality impact related to emissions of criteria pollutants would occur under Variation 1.

TABLE 6.2-9. VARIATION 1 – LOCALIZED IMPACT SUMMARY

Description	Criteria Pollutant (lb/day)					
	ROG	**CO**	**NOx**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Net Change Compared to Baseline Conditions[1]	20.3	82.7	222.9	0.5	455.2	52.4
SCAQMD LSTs	--	4,119	194	--	21	7
Would Variation 1 Exceed Localized Thresholds (Y/N)?	No	No	**Yes**	No	**Yes**	**Yes**

Source: Modeled by AECOM, 2012.
Notes:
1. Detailed emission calculations are presented in Appendix F (Appendix A-1, Table 2b) of the DEIR.

Carbon Monoxide Hotspots Analysis

The potential for localized CO hotspots has been evaluated for Variation 1, based on increased customer use as a result of continued landfill operation. Figueroa Street and SR-134 westbound ramp intersection would be degraded when compared to baseline conditions; the weekday A.M. peak hour conditions would worsen from LOS E to LOS F and P.M. peak hours would worsen from acceptable conditions to LOS D. As presented in Table 6.2-10, future increased customer use would not result in a CO hotspot. Therefore, impacts related to CO hotspots would be considered less than significant.

TABLE 6.2-10. VARIATION 1 - PEAK CO CONCENTRATIONS

Intersection	LOS (AM/PM)	Peak Concentration (ppm)	
		1-hr[1]	**8-hr[2]**
Figueroa Street/SR 134 Westbound Ramp	F/D	5.9	3.5
California Ambient Air Quality Standard =		20	9
Would Variation 1 exceed the CAAQS (Y/N)? =		No	No

Source: Modeled by AECOM, 2012.
Notes:
1. Includes peak 1-hr background CO concentration of 4.8 ppm, obtained from SCAQMD 's projected future 8-hr CO concentration table. Source: http://www.aqmd.gov/ceqa/handbook/CO/CO.html.
2. Applies a persistence factor of 0.6 to the 1-hour background level.

Toxic Air Contaminants

LFG Flaring Emissions

As presented in Table 6.2-11, TAC emissions from landfill flaring were estimated using emission factors developed from gas combustion source tests under the current operating conditions of the landfill. LFG to the flare system based on Variation 1 was derived using the permitted maximum daily disposal rate of 3,400 tons per day.

TABLE 6.2-11. VARIATION 1 - FLARE TAC EMISSIONS DURING NORMAL OPERATIONS

TAC	Emission Factor (lb/MMscf)	Annual Emissions (lb/year)[1,2]
Benzene	6.94E-04	1.05E-02
p-Dichlorobenzene	1.85E-04	2.81E-03
Chlorofluorocarbons	1.97E-04	2.98E-03
Perchloroethylene	2.49E-03	3.76E-02
Toluene	5.09E-04	7.70E-03
Trichlorethylene	2.19E-03	3.31E-02
m-Xylene	3.80E-04	5.75E-03
o-Xylene	1.33E-04	2.02E-03
p-Xylene	3.75E-04	5.68E-03

Source: Modeled by AECOM, 2012.
Acronyms: lb/MMscf = pounds per million standard cubic feet; lb/year = pounds per year; TAC = toxic air contaminant
Notes:
1. Detailed emission calculations presented in Appendix F (Appendix B-2, Table 8) of the DEIR.
2. Emissions based on the incremental increase in annual controlled flow rate of 15.1 MMCFY, which represents the remaining total LFG not used at Grayson Power Plant (based on 7,000 scfm compressor capacity) and diverted to flaring system.

LFG Surface Gas Fugitive Emissions

Table 6.2-12 presents the TAC emissions for surface gas emissions released as fugitive emissions from the landfill surface. TAC emissions are based on 95 percent gas collection efficiency from the collection system.

TABLE 6.2-12. VARIATION 1 - SURFACE GAS FUGITIVE EMISSIONS[1]

TAC	Emission Factor (ppb)	Annual Emission (lb/yr)[2]	Hourly Emission (lb/hr)[2]
Benzene	1,184	39.1	4.46E-03
Methylene Chloride	392	14.1	1.61E-03
Perchloroethylene	441	30.9	3.53E-03
Toluene	9,077	353.3	4.03E-02
1,3-Butadiene	11	0.3	2.87E-05
Trichloroethylene	221	12.3	1.40E-03
Vinyl Chloride	235	6.2	7.08E-04

Source: Modeled by AECOM, 2012.
Acronyms: ppb = parts per billion; lb/hr = pounds per hour; lb/yr = pounds per year
Notes:
1. Detailed emission calculations presented in Appendix F (Appendix B-2, Table 9) of the DEIR.
2. Emissions based on an overall LFG control efficiency of 95 percent.

Screening Level Health Risk Assessment

This section presents the results of a screening level HRA performed to assess potential public health impacts associated with emissions of TACs from Variation 1 as summarized above in Tables 6.2-11 and 6.2-12; the analysis follows SCAQMD-approved Tier 1 and Tier 2 analyses methods for continued operation of the landfill. Table 6.2-13 presents the risk assessment results due to the operation of Variation 1. The Tier 2 analysis results show that the cancer and non-cancer impacts from flared and fugitive emissions are below the SCAQMD's allowable incremental cancer risk of 10 in-a-million.

Since the cancer risks and non-cancer health effects estimated from the screening level HRA show insignificant health effects (cancer risk below 10 in-a-million and non-cancer HI below 1), a refined modeling analysis was not conducted.

TABLE 6.2-13. VARIATION 1 - TIER 2 SCREENING HEALTH RISK ASSESSMENT RESULTS

Source	Cancer Risk		Non-Cancer Risk			
			Resident		Worker	
	MEIR[1]	MEIW[2]	Chronic HI	Acute HI	Chronic HI	Acute HI
Flare & Fugitive	1.86E-06	8.08-07	1.83E-03	5.39E-04	4.12E-03	1.11E-03
Significance Threshold	10 in-a-million		1.0			
Would Variation 1 Exceed the TAC Threshold (Y/N)?	No	No	No	No	No	No

Source: Modeled by AECOM, 2012.

Acronyms: MEIR = Maximum Exposed Individual Resident: MEIW = Maximum Exposed Individual Worker; HI = Hazard Index

Notes:

1. Maximum Exposed Individual Resident (MEIR) is calculated for a residential receptor for a 70 year exposure and a breathing rate of 302 liters/kg-day.
2. Maximum Exposed Individual Worker (MEIW) is calculated for a worker receptor for a 40 year exposure and a breathing rate of 149 liters/kg-day

See Appendix F (Appendix B-2, Tables 11b and 11c) of the DEIR for detailed Tier 1 and Tier 2 calculation outputs.

In conclusion, estimated cancer risks at all receptors in the screening level HRA were low, with a worst-case cancer risk of 1.8 in-a-million for residential 70-year exposure scenario. This estimated cancer risk is lower than the SCAQMD threshold of 10 in-a-million, developed for evaluating acceptable incremental increase in TAC emissions due to implementation of a proposed project. The estimated health risks for all exposure scenarios were below the SCAQMD significance criterion of 10 in-a-million for cancer risk and one for non-cancer chronic and acute health impacts. Based on results of the screening level risk assessment, the proposed project poses an insignificant cancer risk and non-cancer health risk impact, according to established regulatory guidelines. Therefore, impacts related to cancer risk and non-cancer health risk would be considered less than significant.

Odors

Odor impacts and controls would be similar, if not the same, as those described previously. Additional analysis has not been conducted. Implementation and operation of Variation 1 would not create objectionable odors affecting a substantial number of people. Therefore, impacts related to odors would be considered less than significant.

Conformance with Applicable Plans, Policies, and Regulations

As described above, because Variation 1 does not include any lateral expansion, there will be no "new" construction activities associated with continued operation of the landfill. Construction of Variation 1 would therefore not conflict with or obstruct implementation of the AQMP.

However, implementation and operation of Variation 1 would result in PM_{10} emissions in excess of the SCAQMD's localized significance threshold, as discussed above. These impacts could potentially conflict with the SCAQMD's attainment goals for 8-hour ozone and PM_{10}, as set forth in the AQMP. Therefore, a potentially significant air quality impact related to conflicts with an applicable air quality plan would occur under Variation 1.

6.2.4.2 Variation 2

Construction

Characterizing air quality impacts from new construction is unique because of their short-term, high activity level. Ongoing "construction" activities are an integral part of landfill operations, which includes the continual building, filling, and covering of new refuse cells. Therefore, this analysis examines only the new construction associated with Variation 2. New construction activities will include installing a 13-acre liner installation including a geomembrane, geotextile, and drainage layer comprised of sand and gravel, as well as excavation of the hill located in the northern portion of the property.

Ongoing lift construction activities such as gas and drainage projects are part of baseline operations; therefore any incremental change in lift construction emissions not associated with the clay liner installation or hillside removal have been accounted for in the baseline conditions.

Criteria Pollutant Emissions

New construction of the horizontal expansion will require the use of off-road construction equipment that will generate criteria pollutant emissions and fugitive dust, as presented in Table 6.2-14.

TABLE 6.2-14. VARIATION 2 - CONSTRUCTION EQUIPMENT AND SCHEDULE

Activities	Equipment	No. of Equipment	Daily Hours of Operation (hrs/day)
Liner Installation – Peak Daily Activities			
Sub-grade Preparation and Clay Processing	Dozers	1	6
	Scrapers	1	6
	Loaders	1	6
	Pickup Truck	2	6
	Water Truck	1	4
	Haul Trucks	52	--

Source: Sanitation Districts, 2012.

Peak daily construction emissions are presented in Table 6.2-15, including other sources of criteria pollutant emissions such as worker commutes and fugitive dust from truck loading and unloading, bulldozing, grading and scraping. Detailed emission calculations are presented in Appendix F of the DEIR.

TABLE 6.2-15. VARIATION 2 - PEAK DAILY EMISSIONS SUMMARY, CONSTRUCTION[1]

Description	Criteria Pollutant Emissions (lb/day)					
	VOCs	**CO**	**NOx**	**SOx**	**PM_{10}[2]**	**$PM_{2.5}$[2]**
Peak Daily Construction Emissions (lb/day) =	29.5	117.4	**348.2**	0.2	23.5	15.9
SCAQMD Regional Significance Threshold	75	550	100	150	150	55
Local Significance Threshold	--	4,119	194	--	84	28

Source: Modeled by AECOM, 2012.
Notes:
Bold values exceed localized or mass-daily thresholds.
1. Detailed emission calculations are presented in Appendix F (Appendix A-1, Table 9) of the DEIR.
2. PM_{10} and $PM_{2.5}$ emissions include combustion emissions from equipment tail-pipe and fugitive dust emissions from earthmoving activities. A 75 percent control has been applied to paved and unpaved road dust due to continuous site watering and street sweeping activities.

Regional Air Quality Impacts

Regional impacts are evaluated by comparing peak daily construction emissions, resulting from all concurrent activities from construction-related sources, to the SCAQMD's mass daily threshold for construction. As presented in Table 6.2-15, peak daily construction emissions exceed the SCAQMD's mass daily threshold for NOx emissions. Therefore, a potentially significant air quality impact related to emissions of criteria pollutants would occur under Variation 2.

Localized Significance Analysis

Localized impacts are evaluated by comparing peak daily construction emissions to the SCAQMD's LST for a five-acre site in SRA 7, with the nearest sensitive receptor located within 200 meters. As presented in Table 6.2-15, peak daily construction emissions of NOx exceed the SCAQMD's LSTs. Therefore, a potentially significant air quality impact related to emissions of criteria pollutants would occur under Variation 2.

Odors

Construction of Variation 2 may result in objectionable odors, with some odors associated with the operation of diesel engines for construction equipment. However, these odors are typical of urbanized environments and would be subject to construction and air quality regulations, including proper maintenance of machinery to minimize engine emissions. These emissions are also of short duration and are quickly dispersed into the atmosphere. Therefore, Variation 2 would not create objectionable odor impacts during construction, and would not create an odor nuisance as defined by Rule 402 (SCAQMD, 1976). Therefore, impacts related to odors are considered less than significant.

Operation

Criteria Pollutant Emissions

Regional Air Quality Impacts

Criteria pollutant emissions resulting from operation of Variation 2 would result from on site operations, lift construction, customer use, and stationary sources. The net change in emissions compared to baseline conditions is presented in Table 6.2-16 below.

TABLE 6.2-16. VARIATION 2 - REGIONAL CRITERIA POLLUTANT ANALYSIS

Source Type	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
On site Mobile Equipment[1]						
Combustion	31.5	125.7	273.4	0.3	12.2	11.2
Fugitive Dust[2]	--	--	--	--	109.0	10.3
Customer and Employee Vehicles[3]						
Combustion	29.6	148.6	436.0	0.4	16.1	13.7
Fugitive Dust[2]	--	--	--	--	793.8	79.4
Lift Construction[4]						
Mobile Sources	8.6	29.5	74.7	0.1	10.0	4.3
Fugitive Dust[2]	--	--	--	--	6.8	1.3
On site Stationary[5]						
Flaring						
Surface Fugitive	0.1	0.1	1.1	0.2	0.3	0.3
Engines, Heaters, Other Permitted/Non-Permitted Equipment	--	--	--	0.0	0.0	0.0
	0.1	0.5	1.9	0.0	0.1	0.1
Variation 2, Emissions Summary =	69.9	304.4	787.1	1.0	948.2	120.8
Baseline Conditions Emissions Summary =	42.3	185.4	454.9	0.4	489.0	64.8
Net Change Compared to Baseline Conditions	27.6	119.6	332.3	0.6	459.3	56.0
SCAQMD Mass Daily Thresholds	55	550	55	150	150	55
Would Variation 2 Exceed Regional Thresholds (Y/N)?	No	No	**Yes**	No	**Yes**	**Yes**

Source: Modeled by AECOM, 2012.
Notes:
[1] Detailed emission calculations are presented in Appendix F (Appendix A-1, Table 5) of the DEIR.
[2] Fugitive dust emissions account for soil moisture and additional control measures implemented through the site's Fugitive Dust Control Plan.
[3] Detailed emission calculations area presented in Appendix F (Appendix A-1, Tables 6e and 6f) of the DEIR.
[4] Detailed emission calculations are presented in Appendix F (Appendix A-1, Table 9) of the DEIR.
[5] Detailed emission calculations for flaring are presented in Appendix F (Appendix B-2, Tables 3 through 7) of the DEIR; Variation 2 would not result in a change in emissions from engine use; engine emission calculations are presented in Appendix F (Appendix A-1, Table 10b) of the DEIR, and represent baseline conditions.

As presented in Table 6.2-16, the net change in daily emissions from operation of Variation 2, compared to baseline conditions, would exceed the SCAQMD's mass daily threshold for NOx, PM_{10}, and $PM_{2.5}$. Therefore, a potentially significant air quality impact related to emissions of criteria pollutants would occur under Variation 2.

Localized Significance Analysis

The incremental increases in on site, operational emissions are compared to the LSTs to present the potential localized impacts of Variation 2, as presented in Table 6.2-17 below. The applicable LSTs represent a five-acre site within SRA 7, with the nearest sensitive receptor located within 200 meters.

TABLE 6.2-17. VARIATION 2 – LOCALIZED IMPACT SUMMARY

Description	Criteria Pollutant (lb/day)					
	ROG	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$
Net Change Compared to Baseline Conditions[1]	20.3	82.7	223.2	0.5	455.2	52.5
SCAQMD LSTs	--	4,119	194	--	21	7
Exceed Localized Thresholds	No	No	**Yes**	No	**Yes**	**Yes**

Source: Modeled by AECOM, 2012.
Notes:
1. Detailed emission calculations are presented in Appendix F (Appendix A-1, Table 3b) of the DEIR.

As presented in Table 6.2-17, the net increase in emissions would result in an exceedance above the LST for NOx, PM_{10} and $PM_{2.5}$ emissions. Therefore, a potentially significant air quality impact related to emissions of criteria pollutants would occur under Variation 2.

Carbon Monoxide Hotspots Analysis

Increased traffic and CO emissions have the potential to create CO hot spots at areas near roadways. Implementation of Variation 2 would result in similar traffic flow and intersection congestion related impacts as Variation 1. With implementation of Variation 1 or 2, the intersection of Figueroa Street and the SR 134 westbound ramps would be degraded from LOS E/C to LOS F/D, when compared to baseline conditions. As presented in Table 6.2-10 previously, increased customer usage resulting from Variation 1 would not result in ambient CO concentrations in excess of the CAAQS. Therefore, because Variation 1 and 2 would result in similar LOS impacts, localized CO hotspots would not be generated due to implementation of Variation 2. Therefore, impacts related to CO hotspots would be considered less than significant.

Toxic Air Contaminants

LFG Flaring Emissions

As presented in Table 6.2-18, TAC emissions from landfill flaring were estimated using emission factors developed from gas combustion source tests under the current operating conditions of the landfill. LFG to the flare system based on Variation 2 was derived using the permitted maximum daily disposal rate of 3,400 tons per day.

TABLE 6.2-18. VARIATION 2 - FLARE TAC EMISSIONS DURING NORMAL OPERATIONS

TAC	Emission Factor (lb/MMscf)[1]	Annual Emissions (lb/year)[2,3]
Benzene	6.94E-04	1.33E-02
p-Dichlorobenzene	1.85E-04	3.56E-03
Chlorofluorocarbons	1.97E-04	3.79E-03
Perchloroethylene	2.49E-03	4.79E-02
Toluene	5.09E-04	9.78E-03
Trichlorethylene	2.19E-03	4.09E-02
m-Xylene	3.80E-04	7.30E-03
o-Xylene	1.33E-04	2.56E-03
p-Xylene	3.75E-04	7.21E-03

Source: Modeled by AECOM, 2012.
Acronyms: lbs/MMscf = pounds per million standard cubic foot; TAC = toxic air contaminant
Notes:
1. Emission factors obtained from source testing conducted for 2007-2009 AER reporting.
2. Detailed emission calculations presented in Appendix F(Appendix B-3, Table 8) of the DEIR.
3. Emissions based on the incremental increase in annual controlled flow rate of 19.2 MMCFY, which represents the remaining total LFG not used at Grayson Power Plant (based on 7,000 scfm compressor capacity) and diverted to flaring system.

LFG Surface Gas Fugitive Emissions

Table 6.2-19 presents the TAC emissions for surface gas emissions released as fugitive emissions from the landfill surface. TAC emissions are based on 95 percent gas collection efficiency from the collection system.

TABLE 6.2-19. VARIATION 2 - SURFACE GAS FUGITIVE EMISSIONS[1]

TAC	Emission Factor (ppb)	Annual Emission (lb/year)[2]	Hourly Emission (lb/hour)[2]
Benzene	1,184	41.6	4.75E-03
Methylene Chloride	392	15.0	1.71E-03
Perchloroethylene	441	32.9	3.76E-03
Toluene	9,077	376.6	4.30E-02
1,3-Butadiene	11	0.3	3.06E-05
Trichloroethylene	221	13.1	1.49E-03
Vinyl Chloride	235	6.6	7.55E-04

Source: Modeled by AECOM, 2012.
Acronyms: ppb = parts per billion; lb/hr = pounds per hour; lb/yr = pounds per year
Notes:
1. Detailed emission calculations presented in Appendix F (Appendix B-3, Table 9) of the DEIR.
2. Emissions based on an overall LFG control efficiency of 95 percent.

Screening Level Health Risk Assessment

This section presents the results of a screening level HRA performed to assess potential public health impacts associated with emissions of TACs from Variation 2; the analysis follows SCAQMD-approved Tier 1 and Tier 2 analyses methods for continued operation of the landfill. Project-related TAC emissions result from flared emissions and fugitive surface gas emissions. The existing collection efficiency is 95 percent; emissions from flaring have been estimated based on remaining LFG after full compressor capacity at Grayson Power Plant, based on 7,000 scfm. The remaining five percent of uncollected LFG results in surface fugitive emissions.

Table 6.2-20 presents the screening level health risk results due to the operation of Variation 2. The HRA results show that the cancer and non-cancer impacts from flared and fugitive emissions are below the SCAQMD's allowable incremental cancer risk of 10 in-a-million. Since the cancer risks and non-cancer health effects estimated from the screening level HRA show insignificant health effects (cancer risk below 10 in-a-million and non-cancer HI below), a refined modeling analysis was not conducted.

TABLE 6.2-20. VARIATION 2 - TIER 2 SCREENING HEALTH RISK ASSESSMENT RESULTS

Source	Cancer Risk		Non-Cancer Risk			
	MEIR[1]	MEIW[2]	Resident		Worker	
			Chronic HI	Acute HI	Chronic HI	Acute HI
Flare & Fugitive	1.98E-06	8.62-07	1.19E-03	5.75E-04	4.27E-03	1.19E-03
Significance Threshold	10 in-a-million		1.0			
Would Variation 2 Exceed the TAC threshold (Y/N)?	No	No	No	No	No	No

Source: Modeled by AECOM, 2012.
Acronyms: MEIR = Maximum Exposed Individual Resident: MEIW = Maximum Exposed Individual Worker; HI = Hazard Index
Notes:
1. Maximum Exposed Individual Resident (MEIR) is calculated for a residential receptor for a 70-year exposure and a breathing rate of 302 liters/kg-day.
2. Maximum Exposed Individual Worker (MEIW) is calculated for a worker receptor for a 40-year exposure and a breathing rate of 149 liters/kg-day
See Appendix F (Appendix B-3, Tables 11b and 11c) of the DEIR for detailed Tier 1 and Tier 2 calculation outputs.

In conclusion, estimated cancer risks at all receptors in the screening level HRA were low, with a worst-case cancer risk of 1.9 in-a-million for residential 70-year exposure scenario. This estimated cancer risk is lower than the SCAQMD threshold of 10 in-a-million. The estimated health risks for all exposure scenarios were below the SCAQMD significance criterion of 10 in-a-million for cancer risk and one for non-cancer chronic and acute health impacts. Based on results of the screening level risk assessment, the project poses an insignificant cancer risk and non-cancer health risk impact, according to established regulatory guidelines. Therefore, impacts related to cancer risk and non-cancer health risk would be considered less than significant.

Odors

Odor impacts and controls would be similar, if not the same, as those described previously. Additional analysis has not been conducted. Implementation and operation of Variation 2 would not create objectionable odors affecting a substantial number of people. Therefore, impacts related to odors would be considered less than significant.

Conformance with Applicable Plans, Policies, and Regulations

As described above, Variation 2 would result in “new” construction activities due to the proposed hillside cut and 13-acre liner installation. Peak daily construction emissions would occur during liner installation, resulting in emissions of NOx in excess of the SCAQMD’s mass daily threshold and LST. Therefore, this impact could potentially conflict with the SCAQMD’s attainment goals for 8-hour ozone and is considered significant.

In addition, implementation and operation of Variation 2 would result in PM_{10} emissions in excess of the SCAQMD’s localized significance threshold, as discussed above. These impacts could potentially conflict with the SCAQMD’s attainment goals for 8-hour ozone and PM_{10}, as set forth in the AQMP. Therefore, a potentially significant air quality impact related to conflicts with an applicable air quality plan would occur under Variation 2.

6.2.5 MITIGATION MEASURES

6.2.5.1 Variation 1

Mitigation measures designed to control and reduce NOx, PM_{10} and $PM_{2.5}$ emissions during operation of Variation 1 are presented below:

AQ-1 Cover customer haul roads to the working deck[1] with asphalt, crushed asphalt or equivalent material.

AQ-2 Limit vehicle speeds to 15 mph on unpaved roads and 25 mph on paved roads.

AQ-3 Require all trucks hauling material that have the potential to create dust, such as soil and certain building demolition materials, to be covered.

AQ-4 Provide and maintain rumble strips to minimize soil carry-out.

AQ-5 Where practicable, limit the areas of excavation, grading, and other construction activity at any one time.

AQ-6 Stabilize materials that have high potential to create dust, such as large piles of soil by applying sufficient water prior to and after handling.

AQ-7 Apply additional dust control measures during strong wind events.

AQ-8 Post a sign at the site entrance with a phone number that the public can call for information and to log a complaint. Provide a system to respond to such calls including logging of all complaints.

AQ-9 Where practicable, co-locate green waste grinding and soil import operations near to the working face to minimize haul distances and operating time for heavy equipment.

AQ-10 To the extent practicable, minimize use of on site diesel equipment, particularly unnecessary idling.

AQ-11 All construction equipment will be properly maintained and the engines tuned to the engine manufacturer's specifications.

AQ-12 Prohibit construction equipment from idling longer than 5 minutes by posting signs within construction equipment operator compartments and providing awareness training to operators regarding idling limits.

AQ-13 Use on site electricity rather than temporary power generators in portions of the facility where electricity is available.

6.2.5.2 Variation 2

Mitigation measures designed to control and reduce NOx, PM_{10} and $PM_{2.5}$ emissions during construction and operation of Variation 2 are the same as those presented above for Variation 1 (AQ-1 though AQ-13).

[1] The working deck is the deck or lift containing the working face where refuse is currently being unloaded and landfilled.

6.2.6 LEVEL OF SIGNIFICANCE AFTER MITIGATION

6.2.6.1 Variation 1

As described above, construction of Variation 1 would not violate or contribute to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, nor would it create objectionable odors affecting a substantial number of people.

Operation of Variation 1 would result in less than significant impacts related to exposure of sensitive receptors to substantial pollutant concentrations and objectionable odors. However, operation of Variation 1 would result in the generation of criteria pollutants that would exceed the SCAQMD mass daily thresholds and localized significant thresholds for NOx, $PM_{10,}$ and $PM_{2.5}$. Additionally, because Variation 1 would result in PM_{10} emissions in excess of the SCAQMD's localized significance threshold, this impact could potentially conflict with the SCAQMD's attainment goals for 8-hour ozone and PM_{10}, as set forth in the AQMP. Even with implementation of mitigation measures AQ-1 through AQ-13, which represent all feasible mitigation measures, emissions of NOx, PM_{10} and $PM_{2.5}$ generated during operation of Variation 1 would not be reduced to below a level of significance. Therefore, operation of Variation 1 would result in significant unavoidable adverse impacts related to air quality.

6.2.6.2 Variation 2

As described above, construction and operation of Variation 2 would result in less than significant impacts related to exposure of sensitive receptors to substantial pollutant concentrations and objectionable odors.

Construction and operation of Variation 2 would result in the generation of criteria pollutants that would exceed the SCAQMD mass daily thresholds and localized significant thresholds for NOx, $PM_{10,}$ and $PM_{2.5}$. Additionally, because Variation 2 would result in PM_{10} emissions in excess of the SCAQMD's localized significance threshold, this impact could potentially conflict with the SCAQMD's attainment goals for 8-hour ozone and PM_{10}, as set forth in the AQMP. Even with implementation of mitigation measures AQ-1 through AQ-13, which represent all feasible mitigation measures, emissions of NOx, PM_{10} and $PM_{2.5}$ generated during operation of Variation 2 would not be reduced to below a level of significance. Therefore, construction and operation of Variation 2 would result in significant unavoidable adverse impacts related to air quality.