APPENDIX F
AIR QUALITY AND CLIMATE CHANGE TECHNICAL REPORT

Environment

Prepared for:
LACSD
City of Glendale

Prepared by:
AECOM
Orange, CA
60139054
October 2012

Air Quality and Climate Change Technical Report for the Scholl Canyon Landfill Expansion Project

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Contents

List of Appendices

List of Tables

List of Figures

List of Acronyms

AB .... Assembly Bill

AER.................. Annual Emissions Reporting

AP-42 .... USEPA Compilation of Air Pollutant Factors

AQMP .... Air Quality Management Plan

BACM .... Best Available Control Measure

BTU.................. British Thermal Units

CAA.................. Federal Clean Air Act

CAAA .... Clean Air Act Amendments

CAAQS .... California Ambient Air Quality Standards

CalEPA .... California Environmental Protection Agency

CAP.................. Climate Action Plan

CAPCOA .... California Air Pollution Control Officers Association

CARB .... California Air Resources Board

CAS.................. Chemical Abstract Service

CCAA .... California Clean Air Act

CCAR .... California Climate Action Registry

CCR .... California Code of Regulations

CCSP .... Climate Change Scoping Plan

CEC .... California Energy Commission

CEQA .... California Environmental Quality Act

CFC.................. Chlorofluorocarbon

CFR.................. Code of Federal Regulations

CH_4.................... Methane

CO.................... Carbon Monoxide

CO_2 .... Carbon Dioxide

CO_2e .... Carbon Dioxide Equivalent

CPUC................ California Public Utilities Commission

CrVI.................. Hexavalent Chromium

CY..................... Cubic Yards

DPM.................. Diesel Particulate Matter

EIR.................... Environmental Impact Report

EO..................... Executive Order

FIP .... Federal Implementation Plan

FIND.................. Facility Information Detail

GHG.................. Greenhouse Gas

GRP .... California Climate Action Registry General Reporting Protocol

GWP .... Global Warming Potential

HAP................... Hazardous Air Pollutant

HARP................ Hot Spots Analysis Reporting Program

HFC................... Hydrofluorocarbon

HI....................... Hazard Index

HP..................... Horsepower

HRA .... Health Risk Assessment

IPCC .... Intergovernmental Panel on Climate Change

LACSD.............. Los Angeles County Sanitation District

LADWP............. Los Angeles Department of Water & Power

Lb .... Pound

LEA .... Local Enforcement Agency

LFG................... LFG

LOS.................. Level of Service

LST .... Local Significance Threshold

MATES .... Multiple Air Toxics Exposure Study

MEIR................. Maximum Exposed Individual Resident

MEIW .... Maximum Exposed Individual Worker

MICR................. Maximum Individual Cancer Risk

MPO.................. Metropolitan Planning Organization

MMBTU............. Million British Thermal Units

MMCFY............. Million Cubic Feet Per Year

MMSCF............. Million Standard Cubic Feet

MSW .... Municipal Solid Waste

$MTCO_2e$............ Metric Tons of Carbon Dioxide Equivalent

MY..................... Model Year

NAAQS .... National Ambient Air Quality Standards

NHTSA.............. National Highway Traffic Safety Administration

NMOC............... Nonmethane Organic Compounds

NOx................... Nitrogen Oxides

NO_2 .... Nitrogen Dioxide

NWS.................. National Weather Service

N_2O .... Nitrous Oxide

OEHHA............. California Office of Environmental Health Hazard Assessment

O_3...................... Ozone

PAH................... Polycyclic Aromatic Hydrocarbons

Pb...................... Lead

PFC................... Perfluorocarbon

PM..................... Particulate Matter

PPM .... Parts Per Million

PPMV................ Parts Per Million by Volume

$PM_{2.5}$............................ Fine Particulate Matter with an Aerodynamic Mean Diameter of 2.5 Microns or Less

PM_{10}............................. Particulate Matter with an Aerodynamic Mean Diameter of 10 Microns or Less

RECLAIM.......... Regional Clean Air Incentives Market

REL................... Reference Exposure Level

SB .... Senate Bill

SCAB .... South Coast Air Basin

SCAQMD.......... South Coast Air Quality Management District

SCE................... Southern California Edison

scfm .... standard cubic feet per minute

SCLF................. Scholl Canyon Landfill

SF_6 .... Sulfur Hexafluoride

SIP .... State Implementation Plan

SLA .... Screening Level Assessment

SOx................... Sulfur Oxides

SO_2.................... Sulfur Dioxide

SRA................... Source Receptor Area

SWFP .... Solid Waste Facility Permit

TAC................... Toxic Air Contaminant

TOC .... Total Organic Carbon

TPY................... Tons Per Year

UN..................... United Nations

UNFCCC .... United Nations Framework Convention on Climate Change

UNUEA............. United Nations Urban Environmental Accords

US..................... United States

USC .... United States Code

USEPA.............. United States Environmental Protection Agency

VMT .... Vehicle Miles Traveled

VOC .... Volatile Organic Compound

V/C .... Volume-to-Capacity Ratio of an Intersection

WRCC............... Western Regional Climate Center

ºF....................... Degrees Fahrenheit

1.0 Introduction

The City of Glendale and Los Angeles County Sanitation District (LACSD) plan to increase the overall capacity of the Scholl Canyon Landfill (SCLF), located in the City of Glendale (City) and the County of Los Angeles (County). This technical report evaluates the potential air quality and climate change impacts from the proposed expansion and extended operation of the SCLF (herein referred to as the "proposed project"). Additionally, this technical report evaluates existing conditions, referred to as "baseline conditions" in accordance with the California Environmental Quality Act (CEQA), as well as the "No Project Alternative," which represents conditions that would reasonably be expected to occur in the foreseeable future if the proposed project were not approved.

This section provides a brief description of the proposed project and location. The remainder of this technical report is organized into the following sections:

- Section 2.0 describes the federal, state, and regional regulatory setting.
- Section 3.0 presents existing air quality and climate change conditions within the region and the project area footprint (presented in Figure 1-2), herein referred to as the study area.
- Section 4.0 describes the methodologies utilized to evaluate the potential air quality, health risk, and climate change impacts as a result of project implementation. In addition, the qualitative analytical process to evaluate both odor and cumulative impacts is described in this section.
- Section 5.0 presents the CEQA thresholds of significance.
- Section 6.0 presents air quality and climate change impacts from construction and operational activities.
- Section 7.0 presents the CEQA determination.
- Section 8.0 describes recommended mitigation measures to reduce potentially significant impacts.
- Section 9.0 presents any residual air quality and climate change impacts remaining after mitigation.
- Section 10.0 presents cumulative air quality and climate change impacts.

1.1 Project Location

The 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 property boundary and regional location are presented in Figure 1-1.

1.2 Project Description

The LACSD proposes to increase the capacity of the SCLF to meet the increased solid waste disposal demands due to other landfill closures and wasteshed restrictions. The proposed increase in capacity will have the potential to extend the life of the SCLF by approximately 13-19 additional years, assuming baseline disposal rates at the site, while not changing the existing daily waste acceptance limit of 3,400 tons per day of non-hazardous solid waste, as permitted through the SCLF Solid Waste Facility Permit (SWFP).

The LACSD has identified two variations for the proposed project, which include a vertical expansion (Variation 1) and a vertical and lateral expansion (Variation 2).

- Variation 1 consists of vertical expansion of the landfill, providing approximately 11.5 million cubic yards (CY), or 5.5 million tons, of increased capacity over the currently permitted landfill configuration.

- Variation 2 consists of both vertical and lateral expansion of the landfill, providing approximately 16.5 million CY, or 8.0 million tons, of capacity over the currently permitted landfill configuration.

The footprint of each proposed variation is presented in Figure 1-2.

Figure 1-1: Project Location

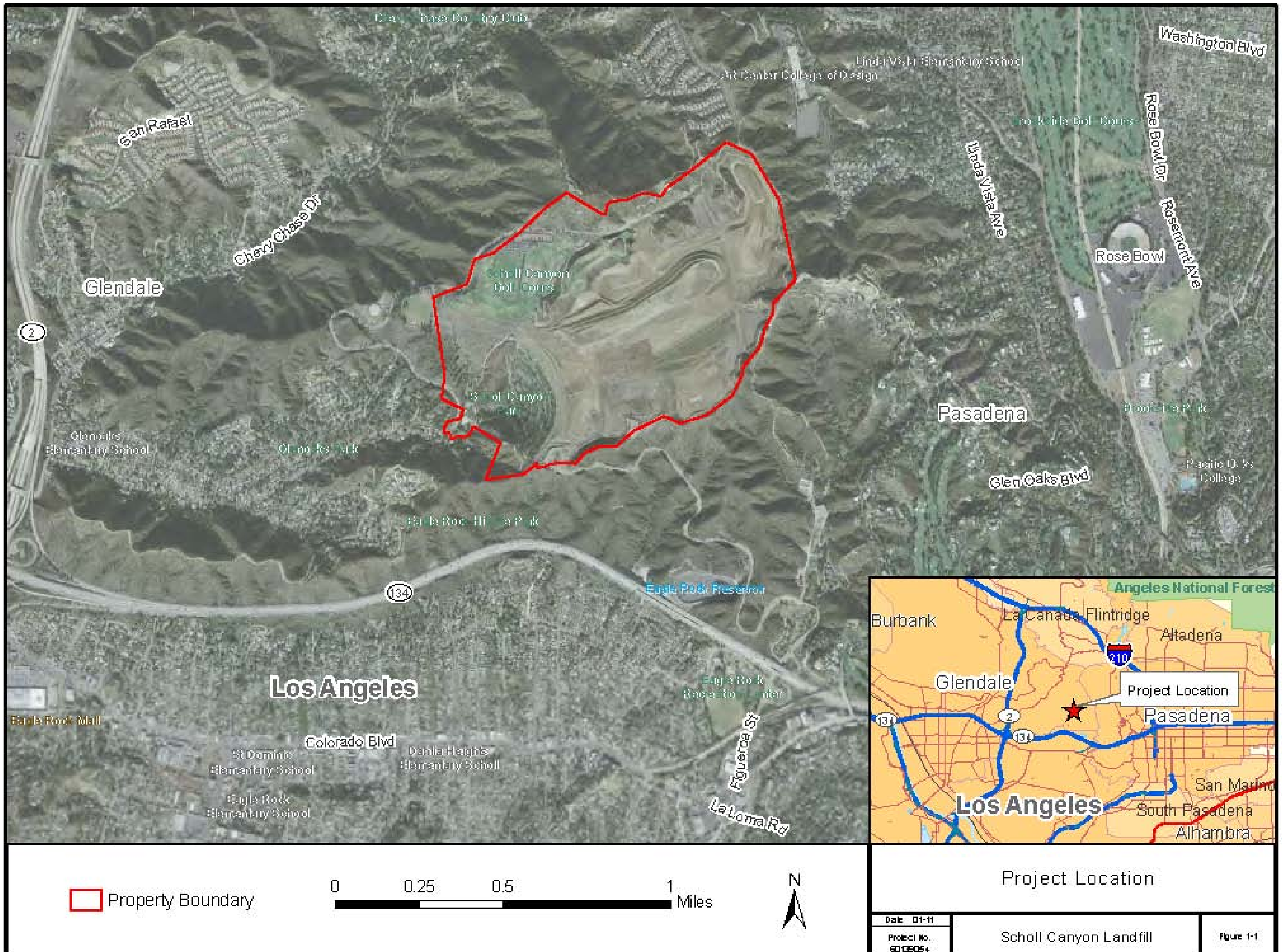
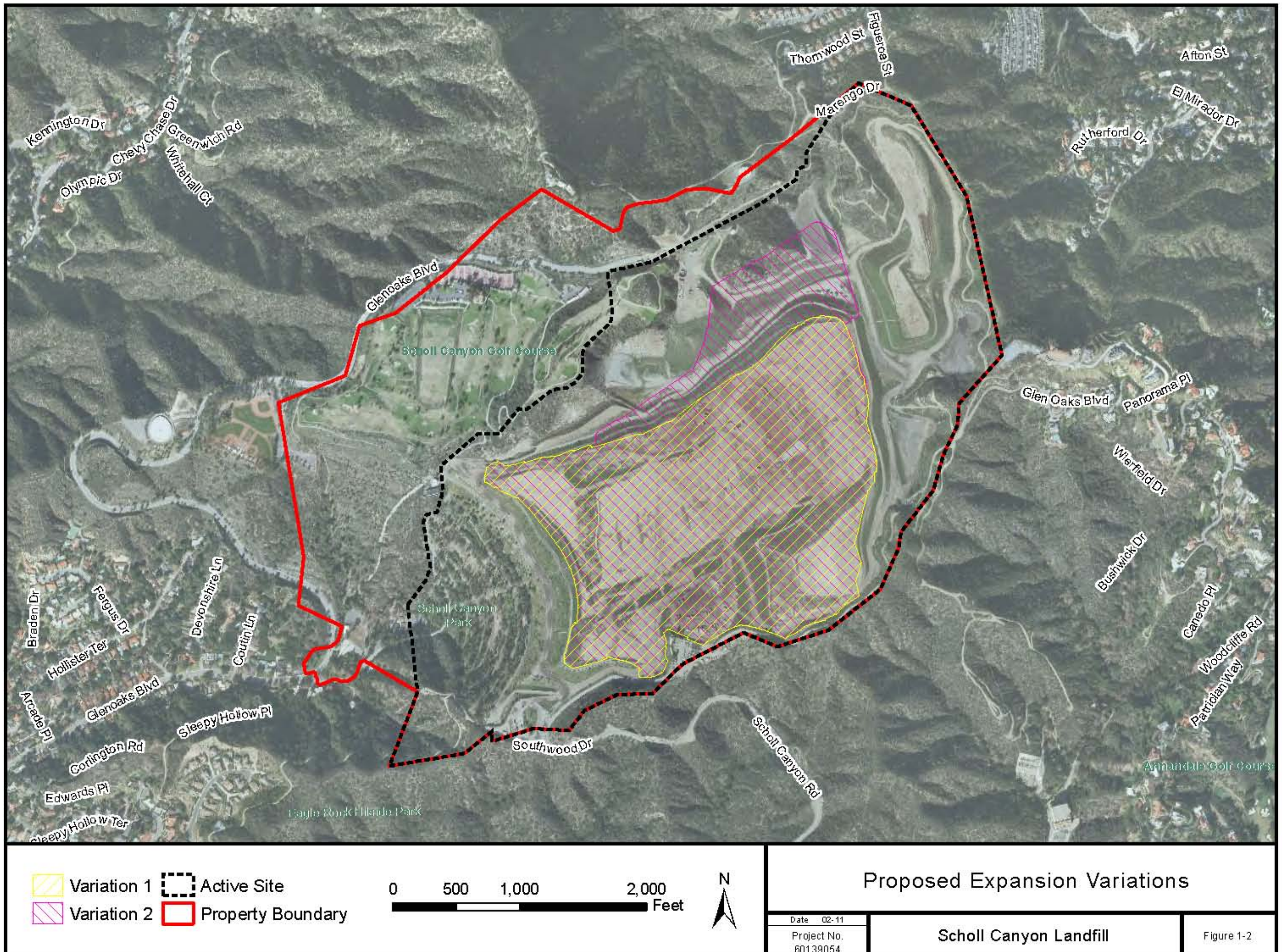


Figure 1-2: Proposed Variations



2.0 Regulatory Setting

The SCLF operates in one of the most heavily regulated regions of the United States. This section provides a detailed description of the types of regulated pollutants and the agency authorities for regulating these pollutants.

2.1 Types of Pollutants

Pollutants of concern include so-called criteria pollutants (so named because of the ambient ground-level criteria standards), toxic air contaminants (TACs), and greenhouse gases (GHG's). These types of pollutants are described below.

2.1.1 Criteria Pollutants

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.

2.1.2 Toxic Air Contaminants

A 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).

2.1.3 Greenhouse Gases

GHGs are defined as any gas that absorbs infrared radiation within the atmosphere. GHGs include, but are not limited to, water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and chlorofluorocarbons (CFCs). These GHGs lead to the trapping and buildup of heat in the atmosphere near the earth’s surface, commonly known as the “greenhouse effect.” The accumulation of GHGs in the atmosphere regulates the earth’s temperature.

Emissions from human activities such as electricity production and vehicle operation have elevated the concentration of these gases in the atmosphere. Emissions of GHGs in excess of natural ambient concentrations are thought to be responsible for the enhancement of the greenhouse effect and contribute to what is termed “climate change,” a trend of unnatural warming of the earth’s average surface temperature and other significant changes in measures of climate, including precipitation, wind, and the incidence of extreme weather.

Unlike criteria air pollutants and TACs, which are pollutants of regional and local concern, GHGs are global pollutants and climate change is a global issue. GHG emissions are normalized based on each specific GHG’s global warming potential (GWP) relative to CO_2, referred to as the “carbon dioxide equivalent” (CO_2e). GHGs are described below.

Water vapor is the most abundant and variable GHG in the atmosphere. It is not considered a pollutant; in the atmosphere, it maintains a climate necessary for life. The main source of water vapor is evaporation from the oceans. Other sources include evaporation from other water bodies, sublimation (change from solid to gas) from ice and snow, and transpiration from plant leaves.

CO_2 is an odorless, colorless GHG. Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic degassing. Anthropogenic (human caused) sources of CO_2 include burning fuels such as gasoline, diesel, oil, coal, natural gas, and wood. Concentrations are currently around 379 CO_2e parts per million (ppm), which may rise to 1,130 CO_2e ppm by 2100 as a direct result of anthropogenic sources (Intergovernmental Panel on Climate Change [IPCC], 2007).

CH_4 is a gas and is the main component of natural gas used in homes. A natural source of CH_4 is the decay of organic matter. Geological deposits known as natural gas fields contain CH_4, which is extracted for fuel. Other sources are the decay of organic material in landfills, the fermentation of manure, and ruminant animals such as cattle.

***N_2O*,** also known as laughing gas, is a colorless gas. N_2O is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (nylon production and nitric acid production) emit N_2O. It is used in rocket engines, as an aerosol spray propellant, and in race cars. NO_x is a generic term for mono-nitrogen oxides, NO and NO_2, which are produced during combustion and are not the same as N_2O. Very small quantities of N_2O may be formed during fuel combustion by reaction of nitrogen and oxygen.

CFCs are gases formed synthetically by replacing all hydrogen atoms in CH_4 or ethane with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble, and chemically nonreactive in the troposphere (the level of air at the earth's surface). CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. Because they destroy stratospheric O_3, their production was stopped as required by the Montreal Protocol. CFCs have a GWP of between 140 and 11,700 CO_2e, with the low end being for HFC-152a and the higher end being for HFC-23.

Sulfur hexafluoride (SF_6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It has the highest global warming potential of any gas at 23,900 CO_2e. SF_6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Ozone is a GHG; however, unlike the other GHGs, O_3 in the troposphere is relatively short-lived and therefore is not global in nature. According to CARB, it is difficult to make an accurate determination of the contribution of O_3 precursors (NO_x and VOCs) to climate change (CARB, 2006).

2.2 Regulatory Authority for Criteria Pollutants

2.2.1 Federal Regulatory Authority

As described in Section 2.1.1, 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. Current NAAQS and CAAQS are presented in Table 5.1-1 below.

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 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.

The USEPA is charged with implementing national air quality programs, which include the review and approval of all SIPs to determine conformation to the mandates of the CAA and its amendments, and to determine whether implementation of the SIPs will achieve air quality goals. If the USEPA determines that a SIP is inadequate, a Federal Implementation Plan (FIP) that imposes additional control measures may be prepared for the nonattainment area. Failure to submit an approvable SIP or to implement the plan within the mandated time frame may result in application of sanctions to transportation funding and stationary air pollution sources in the air basin. 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 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.

The proposed project is currently regulated under Subpart Cc but is likely to be considered a "modification," subjecting the landfill to the full requirements of Subpart WWW.

2.2.2 State Regulatory Authority

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 District's (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; and
- 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 become effective January 2014, and establish 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; or

- 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.

2.2.3 Local Regulatory Authority

2.2.3.1 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 has recently adopted the 2012 Air Quality Management Plan. The 2012 AQMP will incorporate 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; or
- 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% 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).

2.2.3.2 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:

- 1. Goal 1: "Air quality will be healthful for all residents of Glendale."
  - a. Policy Objectives:
    - i. "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."
    - ii. "Comply with the AQMP prepared by the SCAQMD and the Southern California Association of Governments."
- 2. Goal 3: "Air emissions from City operations will be minimized, while meeting public service requirements."
  - b. Policy Objectives:
    - i. "Continue the aggressive programs of recycling, energy conservation, and hazardous waste collection in order to minimize emissions from the Grayson Power Plant and SCLF."

- ii. “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.”
- iii.“Work with the LACSD and the SCAQMD monitoring staff to minimize emissions at the SCLF” (City of Glendale, 1994).

2.3 Regulatory Authority for Toxic Air Contaminants

2.3.1 Federal Regulatory Authority

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.

2.3.2 State Regulatory Authority

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 AB2588 “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.

2.3.3 Local Regulatory Authority

The SCAQMD has established health risk thresholds for both permitting operational emissions and evaluating projects pursuant to CEQA, as presented in Section 5.1. 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.

2.4 Greenhouse Gases and Climate Change

2.4.1 International Regulatory Authority

The Intergovernmental Panel on Climate Change (IPCC) is the leading body for the assessment of climate change. The IPCC is a scientific body that reviews and assesses the most recent scientific, technical, and socio-economic information produced worldwide relevant to the understanding of climate change. The scientific evidence brought up by the first IPCC Assessment Report of 1990 unveiled the importance of climate change as a topic deserving international political attention to tackle its consequences; it therefore played a decisive role in leading to the creation of the United Nations Framework Convention on Climate Change (UNFCCC), the key international treaty to reduce global warming and cope with the consequences of climate change (IPCC, 1990).

On March 21, 1994, the United States (US) joined a number of countries around the world in signing the UNFCCC. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change (United Nations [UN], 1998).

2.4.2 Federal Regulatory Authority

The CAA defines the USEPA's responsibilities for protecting and improving the nation's air quality and the stratospheric O_3 layer. On December 7, 2009, the USEPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the CAA:

Endangerment Finding: the current and projected concentrations of the six key well-mixed GHGs - CO_2, CH_4, N_2O, Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and SF_6 - in the atmosphere threaten the public health and welfare of current and future generations.

Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

In January 2010, the USEPA established a final rule based on the above findings that allowed for the initiation of regulatory development. In addition, on September 22, 2009, the USEPA released its final GHG Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year 2008

Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), that required the USEPA to develop "mandatory reporting of GHGs above appropriate thresholds in all sectors of the economy."

The Reporting Rule applies to most entities that emit 25,000 metric tons of carbon dioxide equivalents ($MTCO_2e$) or more per year. Facility owners are required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule also mandates recordkeeping and administrative requirements in order for the USEPA to verify annual GHG emissions reports. Requirements related to MSW landfill are specific to facilities which emit equal to or greater than 25,000 $MTCO_2e$ of CH_4 emissions.

On June 3, 2010, the USEPA issued the Tailoring Rule and established two steps to implement PSD and Title V:

- Tailoring Rule Step 1 began on January 2, 2011. Step 1 applies to sources subject to PSD or Title V anyway due to their emissions of other pollutants ("anyway" sources) and that have the potential to emit 75,000 tons per year (TPY) CO_2e (or increase emissions by that amount for modifications);

- Tailoring Rule Step 2 began on July 1, 2011. In addition to anyway sources, Step 2 applies to facilities emitting GHGs in excess of 100,000 TPY CO_2e and facilities making changes that would increase GHG emissions by at least 75,000 TPY CO_2e, and that also exceed 100 to 250 TPY of GHGs on a mass basis.

The Tailoring Rule thresholds originally included biogenic CO_2. MSW GHG emissions are largely biogenic CO_2. In response to industry concerns that the regulation thresholds should not include biogenic CO_2, the USEPA issued a three-year deferral for the inclusion of CO_2 emissions from biological decomposition and biogas combustion for the applicability determinations for PSD and Title V. The deferral is in effect through 2014.

2.4.3 State Regulatory Authority

2.4.3.1 State Regulation

In efforts to reduce and mitigate climate change impacts, state and local governments are implementing policies and initiatives aimed at reducing GHG emissions. California, one of the largest state contributors to the national GHG emission inventory, has adopted significant reduction targets and strategies. A brief history of regulations and programs geared towards mitigating and reducing detrimental climate change impacts are represented in Table 2.4-1 below. Extensive programs are described in detail following Table 2.4-1.

Table 2.4-1: California State-wide Greenhouse Gas Policy Progress

Calendar Year	Policy	Initiative
1988	Assembly Bill (AB) 4420	California Energy Commission (CEC) began a study of statewide global warming impacts, and developed an inventory of GHG emission sources
2000	Senate Bill (SB) 1771	Established CCAR to allow companies, cities, and government agencies to voluntarily record GHG emissions in anticipation of early reduction credit
2004	AB 1493	CARB enacted and enforced emission standards that reduced GHG emissions from automobiles
2005	Executive Order (EO) S-3-05	Established GHG emission reduction targets through calendar year 2050; Assigned lead agencies to develop a Climate Action Plan (CAP); the CAP developed programs and strategies to meet reduction targets
2006	SB 107 (Renewable Portfolio Standard)	Required investor owned utilities to get 20 percent of electricity from renewable sources by 2010
2006	AB 1925	Required CEC to study and make recommendations for capturing and storing industrial CO_2
2006	SB 1368	Required California Public Utilities Commission (CPUC) to develop and adopt a GHG emission performance standard for private electric utilities
2006	AB 32 (Global Warming Solutions Act)	Established statewide GHG emission limits, reporting requirements, and a verification procedure to monitor and enforce compliance
2007	EO S-01-07	Established statewide goal to reduce carbon intensity of transportation fuels by at least 10 percent by 2020
2007	SB 97	Required CEQA projects to provide GHG impact analysis; tasked local air districts to help lead and develop significance thresholds and significant impact criteria
2008	CARB Interim Significance Thresholds	CARB developed and proposed significance thresholds for industrial, commercial and residential projects; final recommendations will be promulgated in 2009
2008	SB 375	Established regional targets for reducing GHG emissions from passenger vehicles
2010	17 CCR Section 95100 - 95157	Established mandatory GHG reporting, verification, and other requirements for operators of certain facilities that directly emit GHG (such as electric power generating entities)
Source: CARB 2010.		

AB 32, the California Global Warming Solutions Act of 2006

Assembly Bill (AB) No. 32 (Chapter 488, Statutes of 2006) (AB 32) established specific statewide GHG emission reduction targets, as well as monitoring and reporting requirements for businesses and industries. The first emission reduction target for California is to reduce GHG emissions to 1990 levels by 2020. This legislation represents the first enforceable state-wide program in the US to cap all GHG emissions from major industries and include penalties for non-compliance.

In order to achieve this goal, a Climate Action Team was formed and a Climate Change Scoping Plan (CCSP) was drafted and accepted by CARB. The CCSP describes comprehensive, sector-based strategies and programs tasked with significantly reducing GHG emissions in California. These reduction actions include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. These measures have been introduced through various workshops and continue to be developed (CARB, 2008a).

Sector-based strategies will have a direct impact on electricity generators such as the Grayson Power Plant, to which SCLF's LFG (LFG) is sent to be converted into energy. Electricity generation is the second largest contributor to the national GHG emission inventory. In 2004, California's energy sector contributed 25 percent of the state's GHG emissions. The CCSP tasks the electricity sector with reducing GHG emissions by 40 percent by 2020. To achieve the reduction targets, the CCSP recommends a multi-faceted approach including aggressive energy efficiency programs and standards, a multi-sector regional cap-and-trade program, and economic incentives for renewable energy development (CARB, 2008a).

In addition, CARB has adopted a discrete early action GHG reduction measure under AB 32 to reduce emissions of CH_4 from MSW landfills. Effective June 17, 2010, this regulation requires owners and operators of certain uncontrolled MSW landfills to install gas collection and control systems, and requires existing and newly installed gas and control systems to operate in an optimal manner. The regulation allows local AQMDs to voluntarily enter into memoranda of understanding with CARB to implement and enforce the regulation, and to assess fees to cover costs (CARB, 2010d). In 2011, the SCAQMD took delegation of this regulation by modifying its existing Rule 1150.1 to be fully compliant with the methane reduction regulation.

In addition, the CCSP includes the following recommended actions related to landfills (CARB, 2008a):

- Recommended Action 4: "Achieve 33 percent renewable energy mix statewide."
    - "Renewable energy includes (but is not limited to) wind, solar, geothermal, small hydroelectric, biomass, anaerobic digestion, and LFG."
- Recommended Action 15: "Reduce CH_4 emissions at landfills. Increase waste diversion, composting, and other beneficial uses of organic materials, and mandate commercial recycling. Move toward zero-waste."

Overall, the CCSP calls on the recycling and waste sector to help meet AB 32's 2020 emission reduction target by reducing GHG emissions by 1 million $MTCO_2e$ through landfill methane capture (CARB, 2008a).

2.4.4 Local Plans

The City of Glendale has adopted General Plans geared towards reducing GHG emissions and mitigating climate change impacts. Applicable plans, policies, or goals are briefly described below.

On November 9, 2010, the City Council adopted a Resolution to Address Sustainability & Climate Change. In addition, the Mayor signed the United Nations Urban Environmental Accords (UNUEA) on behalf of the City. The UNUEA set out 21 specific actions for sustainable urban living, and will serve as a framework for the City's future sustainability actions. Participating cities are be rated on how many actions they have achieved (City of Glendale, 2010).

The City of Glendale adopted the *Greener Glendale Plan for Municipal Operations,* which applies to internal government operations, on November 1, 2011 and the *Greener Glendale Plan for Community Activities*, which applies to community development, on March 27, 2012. The *Greener Glendale Plan for Community Activities* includes objectives that would indirectly reduce GHG emissions from landfill operations (City of Glendale, 2011). These objectives include diverting landfill waste to reduce GHG emissions from landfill waste decay, as listed below:

Objective WS2 – Reduce Use of Disposable, Non-Renewable Products

Objective WS3 – Improve Commercial Waste Diversion

Objective WS4 – Expand Waste Diversion Services

The *Greener Glendale Plan for Community Activities* also includes an objective to increase citywide use of renewable energy sources including landfill gas, solar, and wind power sources, as listed below.

Objective E1 – Increase the Use of Renewable Energy Citywide

2.5 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).

3.0 Existing Conditions

This section discusses the regional climate of the project area, existing ambient air quality conditions for criteria pollutants and TAC's in the region, and the California statewide GHG emissions inventory.

3.1 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.

3.2 Existing Ambient Conditions

3.2.1 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 3.2-1 below. The number of measured values which exceeded the CAAQS is shown in the table in parentheses.

Table 3.2-1: 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

Source: CARB, 2012; SCAQMD, 2012.

As shown in Table 3.2-1, 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 in Sections 2.2.2 and 2.2.3, 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 3.2-2.

Table 3.2-2: 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
Source: CARB, *State Area Designations,* 2010; USEPA, *Green Book,* 2010.		

3.2.2 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).

The study estimated the SCAB's basin-wide carcinogenic risk from air toxics at 1,200 cases per million. Estimated “background” carcinogenic risk in 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).

3.2.3 Greenhouse Gases

3.2.3.1 National Inventory

The USEPA publication, *Inventory of US GHG Emissions and Sinks: 1990-2008*, provides a comprehensive emissions inventory of the nation's primary anthropogenic sources of GHG emissions. In 2008, total US GHG emissions were approximately 6,956.8 million $MTCO_2e$, 84.1 percent of which was contributed from the combustion of fossil fuels. Landfills accounted for approximately 22 percent of total anthropogenic CH_4 emissions, the second largest contribution of any CH_4 source in the US (USEPA, 2010c).

3.2.3.2 Statewide Inventory

The State of California is a substantial contributor of GHG emissions. As of 2009, it is the second largest contributor in the US, and the 15th largest in the world, exceeding most nations (Southern California Association of Governments [SCAG], 2009). In 2010, CARB released a detailed inventory of statewide sources and estimated statewide gross emissions at approximately 478 million $MTCO_2e$ in 2008. The two largest contributors were the transportation and electric power sectors, accounting for 175 and 116 million $MTCO_2e$ (approximately 37 percent and 24 percent of total CO2e emissions), respectively. Landfills accounted for 6.71 million $MTCO_2e$, or 1.4 percent of the total. The balance of California's GHG emissions inventory is comprised of the following sectors: commercial and residential, industrial, high GWP sources (such as substitutes for ozone-depleting substances, electricity grid SF_6 losses, and semiconductor manufacturing), agriculture, and forestry (CARB, 2010b).

3.3 Landfill Emissions Sources and Baseline Site Conditions

The SCLF, owned by the City of Glendale and the County of Los Angeles, and operated by the LACSD, maintains SCAQMD operating permits for the 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.

3.3.1 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.

1. **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.

2. **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 Crescentia-Montrose. The average trip distance for customer travel is 4.2 miles, from origin to the landfill gate entrance.

3. **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 20 feet.

4. **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 onsite at the landfill.

    a. **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 offsite 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 onsite 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.

5. **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.

    a. **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.
    b. **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.

3.3.2 Criteria Pollutant Emissions

Average daily emissions were estimated for each of the landfill activities identified above. Onsite mobile equipment emissions were estimated using the inventory of onsite equipment and existing daily use schedule. Emissions from customer use were estimated using existing daily trip information presented in the Traffic and Transportation Technical Study, as well as geo-referenced data provided by the LACSD 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 LACSD.

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 LACSD for onsite operations and lift construction. Existing onsite dust controls include site watering, road sweeping, application of road cover, and topsoil stabilization measures including planting and maintaining native vegetation (LACSD, 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 3.3-1. Detailed emission calculations, inputs and assumptions are presented in Appendix A-1. Future operational conditions have been evaluated under the No Project Alternative in Section 6.1.

Table 3.3-1: Baseline Conditions - Criteria Pollutant Emissions Summary (lb/day)

Source Type	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Onsite 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
Onsite 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 Permitted/Non-Permitted Equipment	0.1	0.5	1.9	0.0	0.1	0.1
Baseline Conditions, Emissions Summary =	**42.3**	**185.4**	**454.9**	**0.4**	**489.0**	**64.8**

Notes:

1. Includes on-road vehicles and off-road equipment. Detailed emission calculations are in Appendix A-1, Table 4a.
2. Detailed emission calculations are presented in Appendix A-1, Table 6b.
3. Detailed emission calculations are presented in Appendix A-1, Table 7.
4. Detailed emission calculations are presented in Appendix A-1, Table 10b.
5. Flaring emissions have been estimated using 2011 methane gas generation data and based on compressor capacity at Grayson Power Plant.

Source: Modeled by AECOM 2012.

3.3.2.1 CO Hotspots

As described in Section 2.2.2, 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 3.3-2 to evaluate the potential CO impact. As presented in Table 3.3-2, 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 3.3-2: 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
Acronyms: CAAQS = California Ambient Air Quality Standards; CO = carbon monoxide; LOS = level of service; ppm = parts per			

Table 3.3-2: Peak CO Concentrations, Baseline Conditions

Intersection	LOS (AM/PM)	Peak CO Concentration (ppm)[1]	
		1-hr	8-hr[2]
million			
Notes:			
[1] Includes peak 1-hr background CO concentration of 3.0 ppm, as presented in Table 3.2-1, from West San Gabriel Valley monitoring station.			
[2] Applies a persistence factor of 0.6 to the 1-hour background level.			
Source: Modeled by AECOM 2012.			

3.3.3 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 (as presented in Table 5.1-1).

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 3.3-3.

Table 3.3-3: TAC Emissions (Reporting Year 2009[1])

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

Table 3.3-3: TAC Emissions (Reporting Year 2009[1])

CAS No.	TAC	Emissions (lb/year)
106990	1,3-Butadiene	< 0.1
75070	Acetaldehyde	0.2
107028	Acrolein	0.2
7664417	Ammonia	1.5
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 [1] 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.

3.3.4 Greenhouse Gas Emissions

Existing direct sources of GHG emissions include mobile and stationary sources, as described in Section 3.3.1. Baseline GHG emissions at the SCLF are presented in Table 3.3-4.

Table 3.3-4: Baseline Conditions - Annual Greenhouse Gas Emissions

Direct Source Type	$MTCO_2e/yr$
Onsite Mobile Equipment[1]	
Off-road Equipment	2,063
On-road Equipment	11
Customer and Employee Vehicles[2]	
Customer Vehicles Employee Vehicles	2,497 720
Lift Construction[3]	
Mobile Sources	68
Annual Greenhouse Gas Emissions[4] =	5,358
Acronyms: $MTCO_2e$/year = metric tons of CO_2 equivalent per year Notes: 1. Detailed emission calculations are presented in Appendix A-1, Table 4a. 2. Detailed emission calculations are presented in Appendix A-1, Table 6b.	

Table 3.3-4: Baseline Conditions - Annual Greenhouse Gas Emissions

Direct Source Type	$MTCO_2e/yr$
[3.] Detailed emission calculations are presented in Appendix A-1, Table 7. [4.] Biogenic sources of GHG emissions are not included in the total presented in Table 3.3-4. Biogenic CO_2 emissions include combustion of LFG and the inherent CO_2 that is produced during the formation of LFG. In addition, the methane emissions due to incomplete combustion of the LFG and from uncontrolled emissions through the landfill cover are also considered biogenic. The biogenic emission breakdown is as follows: CO_2 from combustion processes: 12,049.72 MT CO_2e CO_2 inherent in LFG: 10,633.74 MT CO_2e Methane from combustion processes: 1.81 MT (38 MT CO_2e) Methane fugitive emissions: 240.93 MT (5,060 MT CO_2e) Source: Modeled by AECOM, 2012	

As presented in Table 3.3-4, direct sources of GHG emissions result in approximately 5,358 $MTCO_2e/yr$, which would not be considered a significant climate change impact when compared to the SCAQMD's stationary source threshold of 10,000 metric $MTCO_2e/yr$ for industrial sources. Biogenic CO_2 emissions are excluded from this evaluation because they are the result of materials in the biological/physical carbon cycle, rather than the geological carbon cycle. Based on the cycle, process, and accuracy of quantification, biogenic sources of GHGs from MSW landfills have historically not been included in national (USEPA) or international (IPCC) emissions inventories. Therefore, these sources should not be included in the evaluation of project significance under CEQA.

3.3.5 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 (LACSD, 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 (LACSD, 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 onsite flare station. When differential settlement produces cracks in the cover soil, the cracks are filled and the soil re-compacted to prevent direct venting (LACSD, 2009).

4.0 Emission Quantification Methodology

The methodologies utilized in this analysis to evaluate the air quality, health risk, and GHG emissions impacts are described in detail in the following sections. This section is divided into criteria pollutants, TAC's, and GHG emissions.

4.1 Criteria Pollutants

4.1.1 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 A-1.

4.1.2 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 onsite 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.

4.1.3 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.

4.1.3.1 LFG

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 2009 AER and are presented in Table 4.1-1 below.

Table 4.1-1: Criteria Pollutant Emission Factors - Flaring

Flare Emission Factors	
Criteria Pollutant	**Emission Factor (lb/MMscf)**
ROG	1.586
CO	1.121
NOx	19.549
SOx	3.677
PM_{10}	6.096

Acronyms: lb/MMscf = pounds per million standard cubic feet

Source: Source tests conducted on 5/06. 5/07, 6/08 for inclusion in 2009 AER.

The flow rate of LFG to flares, in million standard cubic feet per year (MMscfy), was projected using LFG generation curves, corrected based on the percent methane, and assuming full use of the onsite compressor facility (7,000 scfm) which sends gas to the Grayson Power Plant with the remaining gas being flared.

Landfill Surface Gas

As described above, LFG will be primarily controlled through the gas control system and offsite 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.

4.1.4 Fugitive Dust

Sources of fugitive dust within the study area include onsite 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 the following subsections.

4.1.4.1 Unpaved Roads

Fugitive dust emissions from unpaved roads correlate with vehicle weight and road surface material loading, measured as percent silt. In addition, the number of wheels in contact with the unpaved surface, the speed of the vehicle, and the level of precipitation all play an important role in the determination of fugitive dust emission from unpaved road surfaces. For this analysis, the silt content has been obtained from the USEPA's Compilation of Air Pollution factors (AP-42) Chapter 13, Section 13.2.2, *Unpaved Roads*, Table 13.2.2-1 for municipal solid waste landfill disposal routes.

The access road from the scale area divides into two main unpaved haul roads. Various paved roads provide access to the site facilities such as the potable water supply storage tanks and the condensate collection system. There are unpaved roads on the benches in the landfill slopes, which are utilized by site personnel for monitoring and maintenance purposes. Based on the length of onsite unpaved roadways, fugitive dust emissions are based on 1 mile per roundtrip, travelled by customer vehicles. The estimated number of vehicle trips on unpaved roadways associated with baseline conditions, the No Project, Variation 1 and Variation 2 are presented in Table 4.1-2 below.

Table 4.1-2 Mobile Source Travel on Unpaved Roadways

Project Alternative	Customer Round Trips/Day[1]	Onsite Miles/Day[2]
Baseline Conditions	1,682	1,682
No Project Alternative	3,337	3,337
Variation 1	3,410	3,410
Variation 2	3,410	3,410

Notes:

1. Customer daily trips obtained from Section 6.11. Transportation and Traffic.
2. Onsite roundtrip miles travelled on unpaved roadways estimated by multiplying daily customer trips by 1 mile/roundtrip.

Source: Modeled by AECOM, 2011.

Emissions have been estimated using Equation 1a for unpaved roads at industrial sites, obtained from the USEPA's AP-42 Chapter 13, Section 13.2.2, *Unpaved Roads*.

$$E = k\,(s/12)^a (W/3)^b$$ **Equation 1a**

Where: E = size-specific emission factor (lb/VMT)

k = particle size multiplier, 1.5

s = surface material silt content (percent), 6.4

a = empirical constant, 0.9

b = empirical constant, 0.45

W = mean vehicle weight (tons), 11.4

Emission estimates for unpaved roadway travel are presented in Sections 6.1.2, 6.2.2, and 6.3.2. As presented in Section 3.3.1, dust control measures such as street sweeping, site watering, and speed control were assumed to result in a control efficiency of 75 percent (SCAQMD, 2010a).

4.1.4.2 Paved Roads

Vehicle travel on paved roads can generate fugitive dust emissions due to resuspension of material previously deposited on the roadway surface. Emissions can be correlated with vehicle weight and road surface material loading, measured as mass of material per unit area. Factors and equations obtained from the USEPA's AP-42 Chapter 13, Section 13.2.1, *Paved Roads*, Table 13.2.1-3 for municipal solid waste landfills were utilized to estimate paved road fugitive dust emissions.

Permanent roads within the SCLF site are paved and swept on a regular basis. For this analysis, it has been assumed that the length of onsite paved roads is 1 mile per round trip, travelled by employee vehicles. Paved roadway fugitive dust emissions are dependent upon the number of vehicles travelling through the study area. The estimated number of vehicle trips on paved roadways associated with baseline condition, the No Project Alternative, Variation 1 and Variation 2 are presented in Table 4.1-3 below.

Table 4.1-3: Mobile Source Travel on Paved Roadways

Project Alternative	Employee Round Trips/Day[1]	Onsite Miles/Day[2]
Baseline Conditions	31	31
No Project Alternative	40	40
Variation 1	40	40
Variation 2	40	40

Notes:

1. Employee based daily trips obtained from Section 6.11. Transportation and Traffic.
2. Onsite miles travelled estimated by multiplying daily employee vehicle trips by 1 mile per roundtrip for onsite travel on paved roadways.

Source: Modeled by AECOM, 2011

Emissions have been estimated using Equation 1b, obtained from the USEPA's AP-42 Chapter 13, Section 13.2.1, *Paved Roads*.

$$E\ (\text{lbs/VMT}) = (k) \times (sL)^{0.91} \times (W)^{1.02}$$ **Equation 1b**

Where: VMT = vehicle miles travelled

K = particle size multiplier, 0.0022

sL = silt content, 7.4 gm/m^2, municipal solid waste landfill

W = mean vehicle weight, 11.4 tons

Emission estimates for paved roadway travel are presented in Sections 6.1.2, 6.2.2, and 6.3.2. As presented in Section 3.3.1, dust control measures such as street sweeping, site watering, and speed control were assumed to result in a combined control efficiency of 75 percent (SCAQMD, 2010a).

4.1.4.3 Material Handling Activities and Wind Erosion

Fugitive dust emissions from earthmoving activities vary as a function of conditional parameters such as soil silt content, soil moisture, wind speed, acreage of disturbance area, and vehicle miles traveled (VMT) on- and offsite. Emissions from earthmoving activities are typically associated with material handling activities including haul truck unloading, scraper unloading, bulldozer activity, and grading. In addition, active or exposed soil stockpiles can cause fugitive dust resulting from wind erosion. The footprint of the stockpile (in acres) and material silt content determine the potential for fugitive dust emissions.

Fugitive dust emissions were estimated using factors from USEPA's AP-42, Chapters 11 and 13, Section 11.9.1, *Western Surface Coal Mining* (per Chapter 13.2.3, *Heavy Construction Operations*), and Section 13.2.4, *Aggregate Handling and Storage Piles* (USEPA, various years). Calculations were based on VMT, material loading (in tons/day), soil moisture due to watering and other control measures, and hours of operation.

4.1.5 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.

4.2 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 offsite 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.

4.2.1 Landfill Gas Flares

Twelve (12) flares are currently installed at the SCLF, including 10 that are used during operation and 2 that are available for backup or replacement. Flares are utilized to burn any excess LFG not transported to the Grayson Power Plant and when the plant compressor is down for routine maintenance. TAC emissions from combustion of LFG in flares were estimated using emission factors derived from site source tests conducted in accordance with SCAQMD's Rule 1150.1.

TAC emissions resulting from LFG flaring were estimated using factors obtained from 2009 AER and are presented in Table 4.2-1 below.

Table 4.2-1: TAC Emission Factors - Flaring

TAC	Factor (lb/MMscf)
Benzene	6.94E-04
p-Dichlorobenzene	1.85E-04
Chlorofluorocarbons (Freon-11)	1.97E-04
Perchloroethylene	2.49E-03
Toluene	5.09E-04
Trichloroethylene	2.19E-03
m-Xylene	3.80E-04
o-Xylene	1.33E-04
p-Xylene	3.75E-04
Acronyms: MMSCF = million metric standard cubic feet; TAC = toxic air contaminant Source: SCLF AER 2009	

Based on the source test factors, emissions from LFG combustion for the No Project Alternative, Variation 1 and Variation 2 were estimated by multiplying the emission factor, as presented in Table 4.2.1, times the controlled flow rate to the flare system. The flow rate of LFG to flares, in million standard cubic feet per year (MMSCFY), was quantified utilizing methane gas generation curves, obtained from the LACSD specific to baseline and proposed future operating conditions. The flow rates utilized to calculate TAC emissions from flaring due to implementation of the No Project Alternative, Variation 1 and Variation 2 were based on remaining LFG following full capacity at Grayson Power Plant, based on 7,000 scfm; gas generation curves and flaring emission calculations are presented in Appendix B-1, B-2, and B-3.

4.2.2 Surface Gas Emissions

Surface gas fugitive emissions, representative of baseline conditions, were estimated using emission factors obtained from 2009 header line raw landfill gas source test data, and are presented in Table 4.2-2. This approach is very conservative. The landfill gas that is not collected in the gas collection system is subject to biological action as it moves through the landfill cover towards the landfill surface. This biological action transforms the landfill gas, which significantly reduces the concentration of methane and TACs that become fugitive emissions. In reality, these levels are at trace concentrations. The LFG collection system captures nearly all of the gas generated onsite; fugitive TAC emissions are estimated to be 5 percent of total gas generation (assuming a 95 percent LFG collection efficiency).

Table 4.2-2: TAC Emission Factors – Fugitive Surface Gas

TAC	Factor (ppbv)
Benzene	1,184
Methylene Chloride (Dichloromethane)	392
Perchloroethylene (Tetrachloroethylene)	441
Toluene	9,077
1,3-Butadiene	11
Trichloroethylene	221
Vinyl Chloride	235
Acronyms: ppbv= parts per billion Source: SCLF AER 2009	

Emission rates were calculated using the CARB technique developed for the AB 2588 "Hot Spots" Program, in conjunction with the pollutant concentrations data measured from the SCAQMD Rule 1150.1 LFG monitoring program. The CARB AB 2588 landfill emission rate estimation technique is useful for estimating the individual gas average emission rate over the life of the landfill, in order to be suitable for use in a 70-year lifetime exposure risk calculation.

Equation 2 was used to calculate the individual gas average emission rate over the lifetime of the landfill:

$Q_i = (2)(C_i)(1\text{-}e)(L_O)(R)/70 \text{ years } (MW_i)(1 \text{ lb mole}/385 \text{ ft}^3)$ **Equation 2**

Where: Q_i = emission rate for any gas I which is a VOC, lbs/yr

2 = a multiplication factor obtained by assuming the LFG consists of 50 percent methane and 50 percent carbon dioxide

C_i = concentration in the landfill of gas *i*, ppbv x 10^{-9}

e = gas collection system efficiency, 95 percent

L_O = potential methane generation capacity of the refuse (3,000 ft^3/ton of refuse)

R = total mass of refuse in place, 27.6 MM tons (as of December 2008), 37.95 (Variation 1), and 40.45 (Variation 2)

MW_i = molecular weight of compound *i*

Detailed emission calculations and gas composition data are presented in Appendix B.

4.3 Greenhouse Gases

GHG emissions from current operational sources are determined, and a discussion of significance is based upon Section 15064.4 of the CEQA Checklist, Appendix G, of the CEQA Guidelines.

As described in Section 3.3.3, sources of direct and indirect GHG emissions have been evaluated and are briefly described below.

4.3.1 Direct Emission Sources

4.3.1.1 Off-Road Mobile Sources

The operation of diesel-fueled mobile sources would result in CO_2 emissions. Emissions from daily operation of off-road equipment for cover transport and use, green waste shredding, and water application were calculated based on the LACSD records of fuel usage by equipment at the SCLF.

Composite, average emission factors representative of off-road vehicles operating during 2011 within the SCAB were utilized to estimate mobile source CO_2 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.

Emissions were quantified using spreadsheets populated with composite, fleet average emission factors for the appropriate equipment type. Schedule assumptions, hours of operation, equipment type, and detailed emission calculations are provided in Appendix A-1.

4.3.1.2 On-Road Mobile Sources

On-road mobile sources include gasoline- and diesel-fueled, on-road light- and heavy-duty trucks used during worker commute trips and operation of assorted onsite equipment such as pickup trucks, and customer vehicles hauling refuse, green waste and soil. These emissions were estimated using emission factors derived from CARB's on-road emissions inventory model (On-Road EMFAC 2011), obtained from the SCAQMD website (SCAQMD, 2010b). 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.

4.3.1.3 Stationary Sources

Existing stationary sources of GHGs consist of permitted equipment such as a diesel-powered pressure washer and LFG flares, as described in Section 3.3.1. These stationary sources primarily result in CO_2 emissions as a direct result of fossil fuel combustion and biogenic activity, respectively. 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 GHG emissions from existing stationary sources.

4.3.2 Indirect Emission Sources

Indirect sources include offsite electricity generation resulting from the electrical demand of SCLF. However, onsite electrical demand is powered by Grayson Power Plant, which receives LFG from SCLF. SCLF LFG is a local source of alternative, renewable fuel which reduces the demand for non-domestic, non-renewable, fossil-fuels. Therefore, the facility's indirect GHG impacts are minimal and have not been further evaluated.

4.4 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.

4.5 Cumulative Impacts

Cumulative impacts refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects, whereas the cumulative impact is the change in the environment from the incremental impact of the project when added to other closely related past, present and reasonably foreseeable future projects. Cumulative impacts can result from individually minor, but collectively significant, projects taking place over a period of time.

CEQA requires that the discussion of cumulative impacts reflect the severity of the impacts, as well as the likelihood of their occurrence; however, the discussion need not be as detailed as the discussion of environmental impacts attributable to the proposed project alone. Further, the discussion is intended to be guided by the standards of practicality and reasonableness. CEQA also requires an EIR to explore the long-term effects of a proposed project, including those impacts that may not be tangible in the near term, but may ultimately evolve into significant adverse environmental impacts in the long term.

As stated in the CEQA Guidelines (Section 15130(b)), an adequate discussion of significant cumulative impacts involves analyzing either (1) “a list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency”, or (2) “a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact.”

The cumulative impact analysis examines the environmental benefits and impacts of the proposed variations within the framework of a list of cumulative projects, as presented in Section 10.0, Cumulative Impacts.

5.0 Significance Thresholds

5.1 Criteria Air Pollutants, Toxic Air Contaminants, and Odors

The thresholds for determining the significance of air quality impacts for this analysis are based on the environmental checklist in Appendix G of the state CEQA Guidelines. Per the CEQA Guidelines, the proposed project, including the No Project Alternative and both proposed variations, would result in a significant air quality impact if any of the following result from implementation:

- Conflict with or obstruct implementation of the applicable AQMP;
- 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 nonattainment under any applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Result in exposure of sensitive receptors to substantial concentrations of toxic air emissions or criteria air pollutants; or
- 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 in Table 5.1-1 and Table 5.1-2.

5.1.1 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 5.1-1 are exceeded.

Table 5.1-1: 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

Table 5.1-1: Air Quality Significance Thresholds

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

5.1.2 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 5.1-2, 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 5.1-2: 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
Notes: 1. Thresholds based on five-acre site, SRA 7, and receptor distance of 200 meters. Source: SCAQMD, 2009a.		

5.1.3 Health Risk Screening Level Assessment

The health risk impacts associated with the No Project Alternative, and operation of Variation 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 AB2588 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.

5.2 Greenhouse Gases

Thresholds of significance, as contained in Appendix G of the CEQA Guidelines, state that project implementation will result in a significant adverse impact on the environment related to GHG emissions if the project will:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or

- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Section 15064.4 of the CEQA Guidelines states that a lead agency should consider the following factors, among others, when assessing the significance of impacts from GHG emissions on the environment:

- The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;

- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and

- The extent to which the project complies with regulations or requirements adopted to implement statewide, regional, or local plans for the reduction or mitigation of GHG emissions.

Agency Guidance

In October 2008, CARB released interim guidance on significance thresholds for industrial and residential projects. This interim threshold has been proposed but not yet been adopted. The draft proposal for industrial projects lists the GHG threshold at 7,000 $MTCO_2e$ per year for operational emissions (excluding transportation).

On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for interim GHG significance thresholds for projects where the SCAQMD is the lead agency. The SCAQMD significance thresholds are designed to reduce GHG emissions by 90 percent. The thresholds provide guidance to existing and future projects required to complete a GHG impact analysis. Formal methodologies for determining project significance are being developed. SCAQMD has published a five-tiered draft GHG threshold approach with bifurcated screening levels. Based on the SCAQMD draft, Tier 3 industrial development projects have a significance threshold of 10,000 $MTCO_2e$ per year, including both stationary and mobile source-related emissions (with construction impacts amortized over a 30-year period, plus operational impacts). If the proposed project exceeds the GHG screening significance threshold level and GHG emissions cannot be mitigated to less than the screening level, the project would move to Tier 4. The SCAQMD threshold for industrial projects has been used for this analysis because it applies to both stationary and mobile source emissions.

SCAQMD recommends mitigation for projects that cause a significant impact to minimize potentially adverse impacts per CEQA Guidelines §15126.4. Because GHG emissions contribute to global change, mitigation measures could be implemented locally, nationally, or internationally and provide global climate change benefits. Because reducing GHG emissions may provide co-benefits through concurrent reductions in criteria pollutants, when considering mitigation measures where the SCAQMD is the lead agency under CEQA, staff recommends mitigation measures that are real, quantifiable, verifiable, and surplus to be selected in the following order of preference:

- Incorporate GHG reduction features into the project design, e.g., increase a boiler's energy efficiency, use materials with a lower GWP than conventional materials, etc.

- Implement onsite measures that provide direct GHG emission reductions onsite, e.g., replace onsite combustion equipment (boilers, heaters, steam generators, etc.) with more efficient combustion equipment, install solar panels on the roof, minimize fugitive emissions, etc.

- Implement neighborhood mitigation measure projects that could include installing solar power, increasing energy efficiency through replacing low-efficiency water heaters with high-efficiency water heaters, increasing building insulation, using fluorescent bulbs, replacing old inefficient refrigerators with efficient refrigerators using low-GWP refrigerants, etc.

- Implement in-district mitigation measures (such as any of the above identified GHG reduction measures); reduce VMT through greater rideshare incentives, transit improvements, etc.

- Implement in-state mitigation measures, which could include any of the above measures.

- Implement out of state mitigation measure projects, which may include purchasing offsets if other options are not feasible.

The analysis quantifies the annual GHG emissions that will result from project-related mobile and stationary sources for construction and operation, and compares them to SCAQMD's *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans* (SCAQMD, 2008a).

Biogenic sources including biological decomposition and biogas combustion have not been quantified or included in this assessment. Based on industry concerns, the USEPA has deferred these sources from inclusion in PSD and Title permitting. In addition, exclusion of biogenic sources from environmental impact analysis under CEQA is supported by numerous regulatory measures. For example:

- USEPA's AP-42 and National GHG Inventory excludes solid waste and wastewater treatment biogenic emissions;

- USEPA's GHG Mandatory Reporting Rule segregates biogenic and anthropogenic emissions in its report formats;
- California's AB32 GHG regulation:
    - Does not require biogenic CO_2 emissions to count towards the threshold to determine what industries are part of the cap-and-trade carbon market
    - Segregates biogenic and anthropogenic emissions in its Mandatory Reporting Program
- The U.S. Department of Energy's GHG accounting protocols exclude biogenic emissions;
- The Bay Area Air Quality Management District's GHG fee regulation and CEQA Guidelines excludes biogenic CO_2 because "these are a result of materials in the biological/ physical carbon cycle, rather than the geological carbon cycle";
- The Regional GHG Initiative (RGGI) and the European Union both consider biomass energy to be a zero-greenhouse-gas-emitting technology.

The 2006 version (and earlier versions) of the United Nations Intergovernmental Panel on Climate Change (IPCC) Guidelines for national GHG inventories, excludes biogenic emissions from GHG inventory accounting. For similar reasons, these sources have been omitted from the GHG impact evaluation and significance determination and are not further evaluated in this Technical Report. However, an evaluation of existing plans and policies has been completed to demonstrate consistency in meeting local and regional GHG reduction targets and goals.

6.0 Environmental Impacts

The section presents the air quality and climate change impacts associated with construction and operation of the No Project Alternative, Variation 1, and Variation 2.

6.1 No Project Alternative

The No Project Alternative assumes existing operations continue with no change in the landfill's overall disposal capacity. Although current daily tonnage is well below the existing 3,400 tons per day permit limit, 3,400 tons per day is assumed as the worst case disposal rate for the No Project Alternative just like 3,400 tons per day is assumed as the worst case disposal rate for the Variation 1 and 2 analyses. The peak year of landfill gas production is projected to be 2015 under the No Project Alternative.

6.1.1 Construction

The No Project Alternative includes continuous operation of the landfill; additional "new" construction activities are not proposed as part of this alternative. No further analysis has been conducted.

6.1.2 Operation

Operational emissions associated with the No Project Alternative would result from the continuation of onsite operations, customer use, lift construction, and operation of stationary sources. Combustion sources include vehicular traffic exhaust, construction equipment exhaust, and LFG flaring. Fugitive dust sources include equipment movement on unpaved and paved roads, wind erosion, daily cover placement operations, site grading, and short-term high level construction activities such as lateral excavation, earth movement, and soil stockpiling.

Onsite operations include the use of off- and on-road heavy duty equipment. The equipment is used for daily cover activities, refuse compaction, and roadway construction. Lift construction includes trench, well and header line installation, referred to as a gas project, as well as the installation of drainage facilities. Based on the Traffic and Transportation Section, customer and employee trips would peak in 2020.

Onsite Mobile Equipment

Onsite mobile equipment is a critical component of landfill operations. Mobile equipment supports in the preparation, compaction, and daily cover activities associated with landfill cells. Heavy equipment is utilized to prepare the working face, compact the refuse, and excavate, transport and spread the cover material on a daily basis. The equipment used during the daily operations is similar to that used during lift construction activities, utilizing the same emission factors for emission estimation.

Daily Customer Traffic and Fugitive Dust

Emissions generated as a result of customer use of the landfill have been estimated based on increased vehicle trips per day, obtained from Section 6.11 Transportation and Traffic. Fugitive dust emissions would increase as a result of increased vehicle traffic, and increased daily refuse intake.

Landfill Gas

As described above, 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 onsite at the landfill.

The flaring of LFG results in the emissions of criteria air pollutants and several TACs. Source tests have been conducted to estimate the emission factors for criteria pollutants emitted during gas combustion under the current operating conditions of the landfill. These source test data were used to calculate the emission rates of criteria pollutants at the projected fill rates of 3,400 tons per day compared to baseline conditions of 1,400 tons per day. The incremental increase in combustion emissions are presented in Table 6.1-1 below. LFG generation curves for the No Project Alternative were obtained from the LACSD for the purpose of evaluating the future peak generation year, and subsequent flaring and fugitive surface gas emissions. Based on the LFG curves, future year 2015 would result in the peak methane generation, based on daily intake rate of 3,400 tons per day.

Peak operational emissions as well as the net change in emissions compared to baseline conditions are presented in Table 6.1-1 below.

6.1.2.1 Criteria Pollutant Emissions

Regional Air Quality Impacts

Potential ambient air quality impacts from mobile sources include increased customer use and employee trips, resulting in the generation or criteria pollutants and fugitive dust. Potential ambient air quality impacts from LFG flaring during the peak methane generation year (2015) were estimated using Equation 2. Peak operational emissions, as well as the net change in emissions compared to baseline conditions, are presented in Table 6.1-1 below. Detailed emission calculations are presented in Appendix B-1.

Table 6.1-1: No Project Alternative - Regional Criteria Pollutant Analysis

Source Type	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Onsite Mobile Equipment[1]						
Combustion	31.5	125.8	273.4	0.3	12.2	11.2
Fugitive Dust[2]	--	--	--	--	109.0	10.3
Customer and Employee Vehicles[3]						
Combustion	29.1	146.3	427.6	0.4	15.8	13.5
Fugitive Dust[2]	--	--	--	--	776.8	77.7

Table 6.1-1: No Project Alternative - Regional Criteria Pollutant Analysis

Source Type	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Lift Construction						
Mobile Sources	7.5	26.2	66.6	0.1	9.7	4.0
Fugitive Dust[2]	--	--	--	--	6.8	1.3
Onsite Stationary[4]						
Flaring	0.0	0.0	0.1	0.0	0.0	0.0
Surface Fugitive	0.0	0.0	0.0	0.0	0.0	0.0
Engines, Heaters, Other Permitted/Non-Permitted Equipment	0.1	0.5	1.9	0.0	0.1	0.1
No Project, Emissions Summary =	68.3	298.7	769.6	0.8	930.4	118.3
Baseline Conditions Emissions Summary =	42.3	185.4	454.9	0.4	489.0	64.8
Net Change Compared to Baseline Conditions =	26.0	113.3	314.8	0.4	441.4	53.4
SCAQMD Mass Daily Thresholds	55	550	55	150	150	55
Would the No Project Alternative Exceed Regional Thresholds (Yes/No)?	No	No	**Yes**	No	**Yes**	No

Notes:

[1] Detailed emission calculations are presented in Appendix A-1, Table 5.

[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 A-1, Tables 6c, and 6d.

[4] Detailed emission calculations are presented in Appendix A-1, Table 10.

Source: Modeled by AECOM 2012.

Peak daily operational emissions are based on the incremental increase in emissions compared to baseline conditions. Due to regional growth, customer usage is expected to double as compared to baseline conditions. The net change in daily emissions from operation of the No Project Alternative is compared to the SCAQMD's mass daily thresholds. As presented in Table 6.1-1, criteria pollutant emissions of NOx and PM_{10} would exceed the SCAQMD's mass daily threshold. Therefore, this impact is **considered significant.**

Localized Significance Analysis

Localized operational emission impacts are based on the incremental increase in emissions from onsite sources, compared to baseline conditions. The net increase in daily onsite operational emissions is compared to the SCAQMD's LSTs applicable for a 5-acre site within SRA 7, with the nearest sensitive receptor located within 200 meters. Project-level operational emissions are compared to the LSTs to present the potential localized impacts related to increased customer use, as presented in Table 6.1-2. As shown, the net increase in emissions of NOx, PM_{10} and $PM_{2.5}$ would result in an exceedance above the LSTs; therefore, this impact is **considered significant**.

Table 6.1-2: No Project Alternative – 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]	18.9	78.1	209.9	0.3	437.6	50.1
SCAQMD LSTs	--	4,119	194	--	21	7
Would the No Project Alternative Exceed Localized Thresholds (Yes/No)?	No	No	**Yes**	No	**Yes**	**Yes**

Values presented in "bold" represent an exceedance above the SCAQMD's LST.

Notes:

1. Detailed emission calculations are presented in Appendix A-1, Table 1c.

Source: Modeled by AECOM 2012

Carbon Monoxide Hotspots Analysis

The potential for localized CO hotspots has been evaluated for the No Project Alternative. Figueroa Street and SR 134 westbound ramp intersection would be degraded from E/C to F/D when compared to baseline conditions for AM/PM LOS impacts. However, future increased customer use would not result in a CO hotspot, as presented in Table 6.1-3; this impact would be **less-than-significant**.

Table 6.1-3: No Project Alternative - 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 the No Project Alternative exceed the CAAQS (Y/N)? =		No	No

Notes:

1. Includes peak 1-hr background CO concentration of 3.0 ppm, as presented in Table 3.2-1, obtained from the West San Gabriel Valley monitoring station.
2. Applies a persistence factor of 0.6 to the 1-hour background level.

Source: Modeled by AECOM 2012.

6.1.2.2 Toxic Air Contaminants

The No Project Alternative would generate TAC emissions from LFG flaring and surface gas fugitive emissions. TAC emission summaries are presented below.

LFG Flaring Emissions

Combustion of LFG in flares would result in TAC emissions. Source tests have been conducted to estimate emission factors for stack sources at the SCLF. Emissions from flaring are based on the peak year of methane generation due to the increased disposal rate from baseline conditions at 1,400 tons per day to the permitted maximum disposal rate of 3,400 tons per day. Emissions identified during source testing are presented in the analysis of flaring emission from the No Project Alternative, as presented in Table 6.1-4 below.

Table 6.1-4: No Project Alternative - Flare TAC Emissions During Normal Operations[1]

TAC	Emission Factor (lb/MMscf)	Annual Emission (lb/year)[2]
Benzene	6.94E-04	1.27E-03
p-Dichlorobenzene	1.85E-04	3.38E-04
Chlorofluorocarbons (Freon-11)	1.97E-04	3.59E-04
Perchloroethylene	2.49E-03	4.54E-03
Toluene	5.09E-04	9.28E-04
Trichloroethylene	2.19E-03	3.99E-03
m-Xylene	3.80E-04	6.93E-04
o-Xylene	1.33E-04	2.43E-04
p-Xylene	3.75E-04	6.85E-04

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 B-1, Table 8.
2. Emissions based on annual controlled flow rate of 1.82 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.

Source: Modeled by AECOM 2012.

LFG Surface Gas Fugitive Emissions

Potential TAC emissions from fugitive surface gas emissions during peak methane generation were based on an overall LFG control efficiency of 95 percent, and estimated using Equation 2. Annual and peak hourly emissions are presented in Table 6.1-5 below. Detailed emission calculations are presented in Appendix B-1.

Table 6.1-5: No Project Alternative - Surface Gas Fugitive Emissions[1]

TAC	Emission Factor (ppb)	Annual Emission (lb/yr)	Hourly Emission (lb/hr)
Benzene	1,184	28.4	3.24E-03
Methylene Chloride	392	10.2	1.17E-03
Perchloroethylene	441	22.5	2.56E-03
Toluene	9,077	256.9	2.93E-02
1,3-Butadiene	11	0.2	2.09E-05
Trichloroethylene	221	8.9	1.02E-03
Vinyl Chloride	235	4.5	5.15E-04

Acronyms: ppb = parts per billion; lb/hr = pounds per hour; lb/yr = pounds per year

Notes:

[1] Detailed emission calculations presented in Appendix B-1, Table 9.

Source: Modeled by AECOM 2012.

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 the No Project Alternative; 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, resulting in a release potential of 5 percent of total generated TAC emissions. Table 6.1-6 presents the risk assessment results due to the operation of the No Project Alternative. The Tier 2 results show that the cancer and non-cancer impacts from flared and fugitive emissions are below Rule 1401 significant risk thresholds adopted by the SCAQMD. SCAQMD allows for an 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 6.1-6: No Project Alternative - 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	1.35E-06	5.87E-07	1.31E-03	3.91E-04	3.00E-03	8.09E-04
Significance Threshold	10 in-a-million		1.0			
Would the No Project Alternative Exceed the TAC Threshold?	No	No	No	No	No	No

Table 6.1-6: No Project Alternative - 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

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 B-1, Table 11b and 11c for detailed calculation outputs.

Source: Modeled by AECOM 2012.

In conclusion, estimated cancer risks at all receptors in the screening level HRA were low, with a worst-case cancer risk of 1.3 in-a-million for residential 70-year exposure scenario. This estimated cancer risk is lower than the SCAQMD's TAC 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 No Project Alternative poses an insignificant cancer risk and non-cancer health risk impact, according to established regulatory guidelines.

6.1.2.3 Greenhouse Gas Emissions

GHG emissions are evaluated based on direct and indirect sources. Direct GHG emissions are generated at the facility and can be controlled by the facility. Indirect GHG emissions are a result of site activities that are owned or controlled by another entity, such as offsite electricity generation. Direct sources of GHG emissions include mobile and stationary sources, as described in Section 3.3.1. Indirect sources include offsite generation of electricity to meet the energy demands of the landfill.

As described in Section 5.2, biogenic sources of GHG emissions have not been included in this evaluation. All sources presented are categorized as direct emission sources. Indirect sources, such as offsite electricity generation to meet the electrical demands of the SCLF, are not expected to change as a result of the proposed project. Although gas generation would increase as a result of increased refuse intake, the electricity generation capacity at Grayson Power Plant would not change and therefore would not result in an incremental impact compared to baseline conditions. The incremental increase in annual GHG emissions resulting from the No Project Alternative, compared to baseline conditions, is presented in Table 6.1-7.

Table 6.1-7: No Project Alternative – Annual Greenhouse Gas Emissions

Direct Source Type	$MTCO_2e/yr$
Onsite Mobile Equipment[1]	
Off-road Equipment	3,632

Table 6.1-7: No Project Alternative – Annual Greenhouse Gas Emissions

Direct Source Type	$MTCO_2e/yr$
On-road Equipment	11
Customer and Employee Vehicles[2]	
Customer Vehicles	4,953
Employee Vehicles	929
Lift Construction	
Mobile Sources	68
Annual GHG Emissions, No Project	9,594
Annual GHG Emissions, Baseline Conditions	5,358
Net Annual Change in GHG Emissions compared to Baseline Conditions	4,235
SCAQMD's Interim GHG Threshold	10,000
Would the No Project Alternative Exceed the SCAQMD's Interim GHG Threshold (Y/N)?	No

Acronyms: $MTCO_2e/yr$ = metric tons of carbon dioxide equivalent per year

Notes:

1. Detailed emission calculations are presented in Appendix A-1, Table 5a.
2. Detailed emission calculations are presented in Appendix A-1, Table 6d.

Source: Modeled by AECOM, 2012.

As presented in Table 6.1-7, the incremental increase in direct GHG emissions generated from the No Project Alternative, compared to baseline conditions, would not exceed the SCAQMD's GHG threshold of 10,000 $MTCO_2e/yr$ for industrial projects. This impact is considered **less-than-significant**.

6.1.2.4 Odors

Odor impacts and controls would be similar, if not the same, as those described in Section 3.3.5, Existing Conditions. Additional analysis is not required. This impact is considered **less-than-significant**.

6.2 Variation 1 (Vertical Expansion)

6.2.1 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. There would be **no impact**.

6.2.2 Operation

Variation 1 includes vertical expansion and therefore would result in operational emissions similar to the No Project Alternative, as presented in Section 6.1.2. Operational impacts resulting from implementation of Variation 1 are compared to baseline conditions, as presented in Table 6.2-1; the incremental change in daily emissions is compared to the SCAQMD regional mass-based threshold to determine impact significance.

6.2.2.1 Criteria Pollutant Emissions

Regional Air Quality Impacts

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

Table 6.2-1: 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
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	0.1	0.1	0.8	0.2	0.3	0.0
Surface Fugitive	0.0	--	--	0.0	0.0	0.0
Engines, Heaters, Other Permitted/Non-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**

Notes:

1 Detailed emission calculations are presented in Appendix A-1, Table 5.

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 A-1, Tables 6e, and 6f.

4 Detailed emission calculations are presented in Appendix A-1, Table 10.

5 Detailed emission calculations for flaring are presented in Appendix B-2, Tables 3 through 7; Variation 1 would not result in a change in emissions from engine use; engine emission calculations are presented in Appendix A-1, Table 10b, and represent baseline conditions.

Source: Modeled by AECOM 2012.

As presented in Table 6.2-1, 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, this impact is **considered significant.**

Localized Significance Analysis

The incremental increases in onsite, operational emissions are compared to the LSTs to present the potential localized impacts of Variation 1, as presented in Table 6.2-2 below. The applicable LSTs represent a 5-acre site within SRA 7, with the nearest sensitive receptor located within 200 meters.

Table 6.2-2: 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**

Notes: Values presented in "bold" represent an exceedance above the SCAQMD's LST.

[1.] Detailed emission calculations are presented in Appendix A-1, Table 2b.

Source: Modeled by AECOM 2012.

As presented in Table 6.2-2, the net increase in NOx, PM_{10} and $PM_{2.5}$ emissions generated from Variation 1 would result in an exceedance above the LST; this impact is **considered significant**.

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 6.2-3, future increased customer use would not result in a CO hotspot; this impact would be **less-than-significant**.

Table 6.2-3: 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

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.

Table 6.2-3: Variation 1 - Peak CO Concentrations

Intersection	LOS (AM/PM)	Peak Concentration (ppm)	
		1-hr[1]	8-hr[2]
[2.] Applies a persistence factor of 0.6 to the 1-hour background level.			
Source: Modeled by AECOM 2012.			

6.2.2.2 Toxic Air Contaminants

LFG Flaring Emissions

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 6.2-4: 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

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 B-2, Table 8.

[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.

Source: Modeled by AECOM 2012.

LFG Surface Gas Fugitive Emissions

Table 6.2-5 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 6.2-5: 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

Acronyms: ppb = parts per billion; lb/hr = pounds per hour; lb/yr = pounds per year

Notes:

1. Detailed emission calculations presented in Appendix B-2, Table 9.
2. Emissions based on an overall LFG control efficiency of 95 percent.

Source: Modeled by AECOM 2012.

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 in Tables 6.2-4 and 6.2-5; the analysis follows SCAQMD-approved Tier 1 and Tier 2 analyses methods for continued operation of the landfill. Table 6.2-6 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 6.2-6: Variation 1 - 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	1.86E-06	8.08-07	1.83E-03	5.39E-04	4.12E-03	1.11E-03
Significance Threshold	10 in-a-million		1.0			

Table 6.2-6: Variation 1 - 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
Would Variation 1 Exceed the TAC Threshold (Y/N)?	No	No	No	No	No	No

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 B-2, Table 11b and 11c for detailed calculation outputs.

Source: Modeled by AECOM 2012.

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 project poses an insignificant cancer risk and non-cancer health risk impact, according to established regulatory guidelines.

6.2.2.3 Greenhouse Gas Emissions

The estimated annual incremental increase in GHG emissions resulting from Variation 1, compared to baseline conditions, is presented in Table 6.2-7.

Table 6.2-7: Variation 1 – Annual Greenhouse Gas Emissions

Direct Source Type	$MTCO_2e$/year
Onsite Mobile Equipment[1]	
Off-road Equipment	3,633
On-road Equipment	11
Customer and Employee Vehicles[2]	
Customer Vehicles Employee Vehicles	5,061 929
Lift Construction	
Mobile Sources	140
Annual GHG Emissions, Variation 1	9,774

Table 6.2-7: Variation 1 – Annual Greenhouse Gas Emissions

Direct Source Type	$MTCO_2e$/year
Annual GHG Emissions, Baseline Conditions	5,358
Net Change in Annual GHG Emissions compared to Baseline Conditions	4,416
SCAQMD's Interim GHG Threshold	10,000
Would Variation 1 Exceed the SCAQMD's Interim GHG Threshold (Y/N)?	No

Notes:

1. Detailed emission calculations are presented in Appendix A-1, Table 5.
2. Detailed emission calculations are presented in Appendix A-1, Table 6f.

Source: Modeled by AECOM, 2012.

As described in Section 5.2, biogenic sources of GHG emissions have not been included in this evaluation. As presented in Table 6.2-7, the incremental increase in direct GHG emissions generated from Variation 1, compared to baseline conditions, would not exceed the SCAQMD's GHG threshold of 10,000 $MTCO_2e$/yr for industrial projects. Therefore, this impact is considered **less-than-significant.**

6.2.2.4 Odor Impacts

Odor impacts and controls would be similar, if not the same, as those described in Section 3.3.5, Existing Conditions. Additional analysis has not been conducted. This impact is considered **less-than-significant**.

6.3 Variation 2 (Vertical and Horizontal Expansion)

Variation 2 involves both vertical and horizontal expansion. Impacts due to Variation 2 construction and operation are analyzed below.

6.3.1 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 clay liner 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.

6.3.1.1 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. Sub-grade preparation is the phase of liner construction that would have the most equipment use, as presented in Table 6.3-1.

Table 6.3-1: 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	150	--

Peak daily construction emissions are presented in Table 6.3-2, 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 Table 9 of Appendix A-1.

Table 6.3-2: 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

Notes:

Values in "bold" represent an exceedance above the localized or mass-daily thresholds.

1. Detailed emission calculations are presented in Appendix A-1, Table 9.
2. PM_{10} and $PM_{2.5}$ emissions include combustion emissions from equipment tail-pipe and fugitive dust emissions from earthmoving activities. An 75 percent control has been applied to paved and unpaved road dust due to continuous site watering and street sweeping activities.

Source: Modeled by AECOM, 2012.

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 6.3-2, peak daily construction emissions exceed the SCAQMD's mass daily threshold for NOx emissions. Therefore, this impact is considered **significant**.

Localized Significance Analysis

Localized impacts are evaluated by comparing peak daily construction emissions to the SCAQMD's LST for a 5-acre site in SRA 7, with the nearest sensitive receptor located within 200 meters. As presented in Table 6.3-2, peak daily construction emissions of NOx exceed the SCAQMD's LSTs. Therefore, this impact is considered **significant**.

6.3.1.2 Greenhouse Gas Emissions

State and regional efforts to mitigate and control emissions of GHGs currently focus on operational emissions. Variation 2 would result in short-term, temporary construction activities that would result in GHG emissions as a direct result of equipment operations and fossil-fuel combustion. CO_2 emission estimates during construction are represented in Table 6.3-3 below. These emission estimates are provided for project reference. In addition, total GHG emissions for construction are also amortized over 30 years, per SCAQMD guidance.

Table 6.3-3: Variation 2 Construction Greenhouse Gas Emissions Summary

Construction Activity	$MTCO_2e$[1]
Total Construction, $MTCO_2e$/Project =	3,130
Amortized Emissions, $MTCO_2e$/Yr[2] =	104

Acronyms: $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Notes:

1. Detailed emission calculations are presented in Appendix A-1, Table 9.
2. Construction emissions have been amortized over the projected 30-year project duration, in accordance with SCAQMD guidance.

Source: Modeled by AECOM 2012.

GHG emissions are evaluated by summing amortized construction emissions and operational emissions. The annual GHG emissions impact, accounting for both construction and operation, is presented in Section 6.3.2.4.

6.3.1.3 Odors

Implementation of Variation 2 may result in objectionable odors during construction, 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). This impact is considered **less-than-significant**.

6.3.2 Operation

Variation 2 involves vertical and horizontal expansion and includes “new” construction activities, as presented in Section 6.3.1 above. Operational emissions are based on a daily intake rate of 3,400 tons per day, the existing permit limit, and would be similar to the No Project Alternative, as presented in Section 6.1.2.

6.3.2.1 Criteria Pollutant Emissions

Regional Air Quality Impacts

Criteria pollutant emissions resulting from operation of Variation 2 would result from onsite operations, lift construction, customer use, and stationary sources. The net change in emissions compared to baseline conditions is presented in Table 6.3-4 below.

Table 6.3-4: Variation 2 - 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
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	0.1	0.1	1.1	0.2	0.3	0.3
Surface Fugitive	--	--	--	0.0	0.0	0.0
Engines, Heaters, Other Permitted/Non-Permitted Equipment	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**

Notes:

[1] Detailed emission calculations are presented in Appendix A-1, Table 5.

[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 A-1, Tables 6e, and 6f.

[4] Detailed emission calculations are presented in Appendix A-1, Table 10.

[5] Detailed emission calculations for flaring are presented in Appendix B-2, Tables 3 through 7; Variation 1 would not result in a change in emissions from engine use; engine emission calculations are presented in Appendix A-1, Table 10b, and represent baseline conditions.

Source: Modeled by AECOM 2012.

As presented in Table 6.3-4, 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, this impact is **considered significant.**

Localized Significance Analysis

The incremental increases in onsite, operational emissions are compared to the LSTs to present the potential localized impacts of Variation 1, as presented in Table 6.3-5 below. The applicable LSTs represent a 5-acre site within SRA 7, with the nearest sensitive receptor located within 200 meters.

Table 6.3-5: 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**

Values in "**bold**" exceed the SCAQMD mass daily threshold.

Notes:

1. Detailed emission calculations are presented in Appendix A-1, Table 3b.

Source: Modeled by AECOM 2012

As presented in Table 6.3-5, the net increase in emissions would result in an exceedance above the LST for NOx, PM_{10} and $PM_{2.5}$ emissions; therefore, this impact is considered **significant**.

6.3.2.2 Carbon Monoxide Hot Spots

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 6.2-3 above, 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. The impacts would be **less than significant.**

6.3.2.3 Toxic Air Contaminants

LFG Flaring Emissions

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 6.3-6: 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

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 B-3, Table 8.
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.

Source: Modeled by AECOM 2012.

LFG Surface Gas Fugitive Emissions

Table 6.3-7 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 6.3-7: 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

Acronyms: ppb = parts per billion; lb/hr = pounds per hour; lb/yr = pounds per year

Notes:

1. Detailed emission calculations presented in Appendix B-2, Table 9.
2. Emissions based on an overall LFG control efficiency of 95 percent.

Source: Modeled by AECOM 2012.

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 5 percent of uncollected LFG results in surface fugitive emissions.

Table 6.3-8 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 1, a refined modeling analysis was not conducted.

Table 6.3-8: 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

Table 6.3-8: Variation 2 - Tier 2 Screening Health Risk Assessment Results

Source	Cancer Risk		Non-Cancer Risk	
	MEIR[1]	MEIW[2]	Resident	Worker
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 B-3, Table 11b and 11c for detailed calculation outputs.				
Source: Modeled by AECOM 2012.				

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.

6.3.2.4 Greenhouse Gas Emissions

GHG emissions resulting from the operation of Variation 2 are evaluated based on direct sources. Direct sources of GHG emissions include mobile and stationary sources, as described in Section 3.3.1. The incremental increases in annual GHG emissions resulting from Variation 2, compared to baseline conditions, are presented in Table 6.3-9.

Table 6.3-9: Variation 2 –Annual Greenhouse Gas Emissions

Direct Source Type	$MTCO_2e$/year[1]
Onsite Mobile Equipment[2]	
Off-road Equipment	3,633
On-road Equipment	11
Customer and Employee Vehicles[3]	
Customer Vehicles Employee Vehicles	5,061 929
Lift Construction	
Mobile Sources	157
Annual Operational GHG Emissions, Variation 2	9,791
Amortized Construction GHG Emissions, Variation 2	104
Annual GHG Emissions, Baseline Conditions	5,358
Net Change in Annual GHG Emissions compared to	4,537

Table 6.3-9: Variation 2 –Annual Greenhouse Gas Emissions

Direct Source Type	$MTCO_2e$/year[1]
Baseline Conditions	
SCAQMD's Interim GHG Threshold	10,000
Would Variation 2 Exceed the SCAQMD's Interim GHG Threshold (Y/N)?	No

Notes:

1. Annual emissions are based on projected lifetime operation of 27 years
2. Detailed emission calculations are presented in Appendix A-1, Table 5a.
3. Detailed emission calculations are presented in Appendix A-1, Table 6f.

Source: Modeled by AECOM, 2012.

As described in Section 5.2, biogenic sources of GHG emissions have not been included in this evaluation. As presented in Table 6.3-9, the incremental increase in direct GHG emissions generated from Variation 2, compared to baseline conditions, would not exceed the SCAQMD's interim GHG threshold for industrial projects, and thus would not be significant.

6.3.2.5 Odor Impacts

Odor impacts and controls would be similar, if not the same, as those described in Section 3.3.5, Existing Conditions. Additional analysis has not been conducted. This impact is considered **less-than-significant**.

7.0 CEQA Determination

7.1 Air Quality

Evaluation of the following CEQA Checklist questions is presented in the subsection below:

Would the proposed project conflict with or obstruct implementation of the applicable air quality plan?

Would the proposed project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Would the proposed project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Would the proposed project expose sensitive receptors to substantial pollutant concentrations?

Construction Impacts

No Project Alternative

Under the No Project Alternative, no “new” construction activities would occur; therefore, no construction emissions would be generated. There would be **no impact.**

Variation 1

Implementation of Variation 1 would not result in any “new” construction activities; therefore, no construction emissions would be generated. There would be **no impact**.

Variation 2

Implementation of Variation 2 would result in “new” construction activities due to the proposed hillside cut and 13-acre liner installation. Peak daily construction emissions occur during liner installation, resulting in emissions of NOx in excess of the SCAQMD’s mass daily regional threshold. Therefore, without mitigation this impact is considered **significant.**

Operational Impacts

No Project Alternative, Variation 1 and Variation 2

Implementation and operation of the No Project Alternative, Variation 1 or Variation 2 would result in NOx and PM_{10} emissions in excess of the SCAQMD’s regional significance threshold, as presented in Tables 6.1-1, 6.2-1, and 6.3-4. Implementation and operation of Variation 1 or Variation 2 would result in $PM_{2.5}$ emissions in excess of the SCAQMD’s regional significance threshold, as presented in Tables 6.2-1 and 6.3-4. Implementation and operation of the No Project Alternative, Variation 1 or Variation 2 would result in NOx, $PM_{10,}$ and $PM_{2.5}$ emissions in excess of the SCAQMD’s localized significance threshold, as presented in Tables 6.1-2, 6.2-2, and 6.3-5. Without mitigation, these impacts are considered **significant**. Proposed mitigation measures which could reduce emissions of NOx, $PM_{10,}$ and $PM_{2.5}$ are described in Section 8.1.

Would the proposed project create objectionable odors affecting a substantial number of people?

Construction Impacts

No Project Alternative

Under the No Project Alternative, no "new" construction activities would occur; therefore, no construction emissions would be generated. The No Project Alternative would not create objectionable odors affecting a substantial number of people; there would be **no impact**.

Variation 1

Implementation of Variation 1 would not result in any "new" construction activities; therefore, Variation 1 would not create objectionable odors affecting a substantial number of people. There would be **no impact**.

Variation 2

Implementation of Variation 2 would result in "new" construction activities due to the proposed hillside cut and 13-acre liner installation. Although short-term, temporary construction activities would result in diesel exhaust, which is sometimes considered an objectionable odor source. Any nuisance odors would be intermittent and temporary and would dissipate rapidly from the source with an increase in distance. Therefore, construction activities associated with Variation 2 would not expose sensitive receptors to odorous impacts. This impact is considered **less-than-significant**.

Operational Impacts

No Project Alternative, Variation 1 and Variation 2

Implementation and operation of the No Project Alternative, Variation 1 or Variation 2 would result in continued operation of the SCLF; landfills are a common type of facility known to produce odors. However, existing odor controls will remain in place and will reduce and control any nuisance odors to a less-than-significant level. This impact is considered **less-than-significant**.

7.2 Climate Change and Greenhouse Gas Emissions

Evaluation of the following CEQA Checklist questions is presented in the subsection below:

Would the proposed project generate GHG's emissions, either directly or indirectly, that may have a significant impact on the environment?

Would the proposed project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHG's?

Construction Impacts

No Project Alternative

Under the No Project Alternative, no "new" construction activities would occur; therefore, GHG emissions resulting from mobile source combustion during construction would not be generated. The No Project Alternative would not result in climate change impacts; there would be **no impact**.

Variation 1

Implementation of Variation 1 would not result in any "new" construction activities; therefore, Variation 1 would not generate direct GHG emissions or have a significant environmental impact. There would be **no impact**.

Variation 2

Implementation of Variation 2 would result in "new" construction activities due to the proposed hillside cut and 13-acre liner installation. Project-related GHG emissions are evaluated based on operational emissions and amortized construction emissions; amortized construction emissions are based on the life of the project, or an estimated 30-year lifetime. Therefore, the impacts of GHG emissions generated during construction of Variation 2 are described below under Operational Impacts.

Operational Impacts

No Project Alternative, Variation 1 and Variation 2

Implementation and operation of the No Project Alternative, Variation 1 or Variation 2 would not result in direct GHG emissions in excess of the SCAQMD's interim GHG threshold of 10,000 $MTCO_2e$/yr, as presented in Tables 6.1-6, 6.2-6, and 6.3-9, respectively. Biogenic sources including biological decomposition and biogas combustion have not been quantified or included in this assessment. Based on industry concerns, the USEPA has deferred these sources from inclusion in PSD and Title V permitting; for similar reasons, these sources have been omitted from the GHG impact evaluation and significance determination.

Additionally, implementation and operation of the No Project Alternative, Variation 1 or Variation 2 would result in continued operation of the SCLF, which provides a renewable energy source for electricity generation. This is consistent with the CCSP Recommended Action 4 to provide renewable energy sources as an alternative to fossil fuel combustion. Therefore, the proposed project would not conflict or obstruct existing plans and policies aimed at improving the availability of renewable energy sources. Additional mitigation measures have been proposed that would reduce and control mobile source related CO_2 emissions, resulting from fossil-fuel combustion. Therefore, potential environmental impacts would be considered **less-than-significant**.

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8.0 Mitigation

8.1 Air Quality

Emissions of NOx, PM_{10} and $PM_{2.5}$ are anticipated to exceed the SCAQMD's mass daily regional and localized thresholds. Mitigation measures designed to control and reduce NOx, PM_{10} and $PM_{2.5}$ emissions are presented below:

- Cover customer haul roads to the working deck[1] with asphalt, crushed asphalt or equivalent material.
- Limit vehicle speeds to 15 mph on unpaved roads and 25 mph on paved roads.
- Require all trucks hauling material that has the potential to create dust, such as soil and certain building demolition materials, to be covered.
- Provide and maintain rumble strips to minimize soil carry-out.
- Where practicable, limit the areas of excavation, grading, and other construction activity at any one time.
- Stabilize materials that have high potential to create dust, such as large piles of soil by applying sufficient water prior to and after handling.
- Apply additional dust control measures during strong wind events.
- 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.
- 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.
- To the extent practicable, minimize use of on-site diesel equipment, particularly unnecessary idling.
- All construction equipment will be properly maintained and the engines tuned to the engine manufacturer's specifications.
- 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.
- Use on-site electricity rather than temporary power generators in portions of the facility where electricity is available.

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

9.0 Residual Impacts

9.1 Residual Construction Impacts

Residual construction impacts remaining after mitigation would include a finding of potential significance for air quality impacts, both cumulatively and regionally. With implementation of the mitigation measures presented in Section 8.0, which represent all feasible mitigation measures, emissions of NOx generated during Variation 2 construction, would not be reduced to a less-than-significant level. With mitigation, Variation 2 construction would potentially result in residually **significant air quality impacts**.

9.2 Residual Operational Impacts

Residual operational impacts remaining after mitigation would include a finding of potential significance for regional air quality impacts, both cumulatively and regionally. With implementation of the mitigation measures presented in Section 8.0, which represent all feasible mitigation measures, emissions of NOx, PM_{10} and $PM_{2.5}$ generated during operation of the No Project Alternative, Variation 1 or Variation 2 would not be reduced to a less-than-significant level. With mitigation, operation of the No Project, Variation 1 and Variation 2 would potentially result in residually **significant air quality impacts**.

10.0 Cumulative Impacts

10.1 Cumulative Projects

Existing projects that have either been approved and/or are currently being implemented were evaluated to determine the potential cumulative impacts of concurrent projects. An evaluation of projects within the City of Glendale, Los Angeles, and Pasadena has been conducted, based on these cities' proximity to the study area.

10.2 Cumulative Air Quality Impacts

Currently, there are no projects within the Cities of Glendale or Los Angeles that would, in conjunction with the proposed project, create a cumulatively considerable incremental impact to existing air quality change (City of Glendale, 2011).

Two projects within the City of Pasadena have the potential to contribute to a cumulative air quality impact. As presented in its FEIR, the Colorado at Lake Mixed-Use and Hotel Development Project would create a significant and unavoidable air quality impact with respect to localized $PM_{2.5}$ and PM_{10} impacts. Located at 880 East Colorado Boulevard, Pasadena, CA, this project is approximately 3.5 miles from the SCLF (City of Pasadena, 2010). In addition, as presented in its Final Supplemental EIR, the Rose Bowl Stadium Renovation Project would create a significant and unavoidable impact with respect to VOCs and NOx. Located at 1001 Rose Bowl Drive, Pasadena, CA, this project is approximately 1.5 miles from the SCLF (City of Pasadena, 2010).

Proposed mitigation measures would not reduce the incremental contribution of NOx, $PM_{10,}$ and $PM_{2.5}$ generated from the No Project Alternative, Variation 1 and Variation 2, to a less-than-significant level. Therefore, the cumulative project-level impacts would contribute significantly to the existing cumulatively considerable impact resulting from other concurrent projects.

10.3 Cumulative GHG Impacts

Because GHG concerns are global, any project that emits GHGs has the potential to contribute a cumulatively considerable incremental impact. However, because the SCLF provides a renewable energy source alternative to fossil fuel combustion, continued operation through the No Project Alternative, Variation 1 or Variation 2 would demonstrate consistency with current, applicable goals for reducing global GHG emissions. Therefore, the No Project Alternative, Variation 1 and Variation 2 would contribute to global levels of GHGs, but would not be considered cumulatively significant.

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Technical Appendix A-1: Baseline, No Project, Variation 1 and Variation 2

Criteria Pollutant and GHG Emissions Summary

Table 1a: Baseline Conditions (@ 1,400 TPD) - Criteria Pollutant and GHG Emissions Summary									
Source	Average Daily Criteria Pollutant Emissions, lb/day						GHGs, lb/day		GHG
	ROG	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH4	MTCO2e/yr
Onsite Operations									
Off-road Equipment	18.4	73.5	158.5	0.2	7.1	6.6	14,640.7	1.7	2,063.2
On-road Equipment	0.1	0.5	0.5	0.0	0.0	0.0	74.3	0.0	10.5
Fugitive Dust	-	-	-	-	65.2	6.6	-	-	-
Customer Use									
Customer On-road (Diesel & CNG)	11.8	53.3	192.7	0.2	7.0	6.1	17,747.0	0.5	2,496.6
Employee Commute	4.5	31.5	35.2	0.1	1.3	1.1	5,118.4	0.2	720.2
Paved Road	-	-	-	-	0.1	0.0	-	-	-
Unpaved Road	-	-	-	-	391.5	39.2	-	-	-
Lift Construction									
Mobile Sources	7.5	26.2	66.6	0.1	9.7	4.0	7,973.2	-	67.9
Fugitive Dust	-	-	-	-	6.8	1.3	-	-	-
Stationary Sources [1]									
Flare[2]	0.0	0.0	-0.5	-0.1	0.0	-0.2	-	-	-
Surface Fugitive	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Engines, Heaters, Other	0.1	0.5	1.9	0.0	0.1	0.1	-	-	-
Emissions Summary =	**42.3**	**185.4**	**454.9**	**0.4**	**489.0**	**64.8**	**45,553.5**	**2.4**	**5,358.3**

Notes:

1. GHG emissions generated from biogenic sources are not included in this table or used to compare project related incremental impacts.

2. Flaring emissions for baseline conditions have been estimated using the future peak year of methane generation, assuming waste acceptance remains at 1,400 TPD.

Table 1b: No Project Alternative (@ 3,400 TPD) - Criteria Pollutant and GHG Emissions Summary									
Source	Average Daily Criteria Pollutant Emissions, lb/day						GHGs, lb/day		GHG
	ROG	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH4	MTCO2e/yr
Onsite Operations									
Off-road Equipment	31.4	125.3	272.9	0.3	12.2	11.2	25,781.1	2.8	3,632.8
On-road Equipment	0.1	0.5	0.5	0.0	0.0	0.0	74.3	0.0	10.5
Fugitive Dust	-	-	-	-	109.0	10.3	-	-	-
Customer Use									
Customer On-road (Diesel & CNG)	23.3	105.7	382.2	0.3	13.9	12.1	35,209.2	1.1	4,953.1
Employee Commute	5.8	40.6	45.4	0.1	1.7	1.4	6,604.3	0.3	929.3
Paved Road	-	-	-	-	0.2	0.0	-	-	-
Unpaved Road	-	-	-	-	776.8	77.7	-	-	-
Lift Construction									
Mobile Sources	7.5	26.2	66.6	0.1	9.7	4.0	7,973.2	-	67.9
Fugitive Dust	-	-	-	-	6.8	1.3	-	-	-
Stationary Sources									
Flare	0.0	0.0	0.1	0.0	0.0	0.0	-	-	-
Surface Fugitive	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Engines, Heaters, Other	0.1	0.5	1.9	0.0	0.1	0.1	-	-	-
Emissions Summary =	**68.3**	**298.7**	**769.6**	**0.8**	**930.4**	**118.3**	**75,642.2**	**4.2**	**9,593.6**

Table 1c: No Project Alternative - Net Change in Operational Emissions Compared to Baseline									
Source	Average Daily Criteria Pollutant Emissions, lb/day						GHGs, lb/day		GHG
	ROG	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH4	MTCO2e/yr
Onsite Operations									
Off-road Equipment	13.0	51.7	114.4	0.1	5.1	4.7	11,140.5	1.2	1,569.7
On-road Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Dust	-	-	-	-	43.7	3.7	-	-	-
Customer Use									
Customer On-road (Diesel & CNG)	11.6	52.4	189.6	0.2	6.9	6.0	17,462.1	0.5	2,456.5
Employee Commute	1.3	9.1	10.2	0.0	0.4	0.3	1,486.0	0.1	209.1
Paved Road	-	-	-	-	0.0	0.0	-	-	-
Unpaved Road	-	-	-	-	385.3	38.5	-	-	-
Lift Construction									
Mobile Sources	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0
Fugitive Dust	-	-	-	-	0.0	--	-	-	-
Stationary Sources									
Flare	0.1	0.0	0.6	0.1	0.0	0.2	-	-	-
Surface Fugitive	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
Engines, Heaters, Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
Net Change Compared to Baseline Conditions (Regional) =	**26.0**	**113.3**	**314.8**	**0.4**	**441.4**	**53.4**	**30,088.6**	**1.8**	**4,235.2**
Net Change Compared to Baseline Conditions (local) =	**18.9**	**78.1**	**209.9**	**0.3**	**437.6**	**50.1**	**19,896.3**	**1.4**	**2,801.4**

Table 2a: Variation 1 Operations - Criteria Pollutant and GHG Emissions									
Source	Average Daily Criteria Pollutant Emissions, lb/day						GHGs, lb/day		GHG
	ROG	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH4	MTCO2e/yr
Onsite Operations									
Off-road Equipment	31.4	125.3	272.9	0.3	12.2	11.2	25,781.1	2.8	3,632.8
On-road Equipment	0.1	0.5	0.5	0.0	0.0	0.0	74.3	0.0	10.5
Fugitive Dust	-	-	-	-	109.0	10.3	-	-	-
Customer Use									
Customer On-road (Diesel & CNG)	23.8	108.0	390.6	0.3	14.2	12.3	35,979.4	1.1	5,061.4
Employee Commute	5.8	40.6	45.4	0.1	1.7	1.4	6,604.3	0.3	929.3
Paved Road	-	-	-	-	0.2	0.0	-	-	-
Unpaved Road	-	-	-	-	793.8	79.4	-	-	-
Lift Construction									
Mobile Sources	8.6	29.5	74.7	0.1	10.0	4.3	8,120.7	-	139.8
Fugitive Dust	-	-	-	-	6.8	1.3	-	-	
Stationary Sources									
Flare	0.1	0.1	0.8	0.2	0.3	0.3	-	-	-
Surface Fugitive	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Engines, Heaters, Other	0.1	0.5	1.9	0.0	0.1	0.1	-	-	-
Emissions Summary =	**69.9**	**304.4**	**786.8**	**0.9**	**948.2**	**120.7**	**76,559.9**	**4.2**	**9,773.8**

Table 2b: Variation 1 - Net Change in Operational Emissions Compared to Baseline									
Source	Average Daily Criteria Pollutant Emissions, lb/day						GHGs, lb/day		GHG
	ROG	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH4	MTCO2e/yr
Onsite Operations									
Off-road Equipment	13.0	51.7	114.4	0.1	5.1	4.7	11,140.5	1.2	1,569.7
On-road Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Dust	-	-	-	-	43.7	3.7	-	-	-
Customer Use									
Customer On-road (Diesel & CNG)	12.1	54.7	197.9	0.2	7.2	6.2	18,232.4	0.6	2,564.8
Employee Commute	1.3	9.1	10.2	0.0	0.4	0.3	1,486.0	0.1	209.1
Paved Road	-	-	-	-	0.0	0.0	-	-	-
Unpaved Road	-	-	-	-	402.3	40.2	-	-	-
Lift Construction									
Mobile Sources	1.1	3.3	8.1	0.0	0.3	0.3	147.5	-	71.9
Fugitive Dust	-	-	-	-	0.0	0.0	-	-	-
Stationary Sources									
Flare	0.1	0.1	1.3	0.3	0.3	0.4	-	-	-
Surface Fugitive	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Engines, Heaters, Other	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Net Change Compared to Baseline Conditions (Regional) =	**27.6**	**119.0**	**332.0**	**0.6**	**459.2**	**55.9**	**31,006.4**	**1.8**	**4,415.5**
Net Change Compared to Baseline Conditions (local) =	**20.3**	**82.7**	**222.9**	**0.5**	**455.2**	**52.4**	**20,429.0**	**1.5**	**3,574.4**

Table 3a: Variation 2 Operations - Peak Daily Criteria Pollutant Emissions									
Source	Average Daily Criteria Pollutant Emissions, lb/day						GHGs, lb/day		GHG
	ROG	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH4	MTCO2e/yr
Onsite Operations									
Off-road Equipment	31.4	125.3	272.9	0.3	12.2	11.2	25,781.1	2.8	3,632.8
On-road Equipment	0.1	0.5	0.5	0.0	0.0	0.0	74.3	0.0	10.5
Fugitive Dust	-	-	-	-	109.0	10.3	-	-	-
Customer Use									
Customer On-road (Diesel & CNG)	23.8	108.0	390.6	0.3	14.2	12.3	35,979.4	1.1	5,061.4
Employee Commute	5.8	40.6	45.4	0.1	1.7	1.4	6,604.3	0.3	929.3
Paved Road	-	-	-	-	0.2	0.0	-	-	-
Unpaved Road	-	-	-	-	793.8	79.4	-	-	-
Lift Construction									
Mobile Sources	8.6	29.5	74.7	0.1	10.0	4.3	8,120.7	-	157.2
Fugitive Dust	-	-	-	-	6.8	1.3	-	-	-
Stationary Sources									
Flare	0.1	0.1	1.1	0.2	0.3	0.3	0.0	-	-
Surface Fugitive	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Engines, Heaters, Other	0.1	0.5	1.9	0.0	0.1	0.1	-	-	-
Emissions Summary =	**69.9**	**304.4**	**787.1**	**1.0**	**948.2**	**120.8**	**76,559.9**	**4.2**	**9,791.1**

Table 3b: Variation 2 - Net Change in Daily Operational Emissions Compared to Baseline									
Source	Peak Daily Criteria Pollutant Emissions, lb/day						GHGs, lb/day		GHG
	ROG	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH4	MTCO2e/yr
Onsite Operations									
Off-road Equipment	13.0	51.7	114.4	0.1	5.1	4.7	11,140.5	1.2	1,569.7
On-road Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Dust	-	-	-	-	43.7	3.7	-	-	
Customer Use									
Customer On-road (Diesel & CNG)	12.1	54.7	197.9	0.2	7.2	6.2	18,232.4	0.6	2,564.8
Employee Commute	1.3	9.1	10.2	0.0	0.4	0.3	1,486.0	0.1	209.1
Paved Road	-	-	-	-	0.0	0.0	-	-	
Unpaved Road	-	-	-	-	402.3	40.2	-	-	
Lift Construction									
Mobile Sources	1.1	3.3	8.1	0.0	0.3	0.3	147.5	-	89.2
Fugitive Dust	-	-	-	-	0.0	0.0	-	-	
Stationary Sources									
Flare[1]	0.1	0.1	1.6	0.3	0.4	0.5	-	-	-
Surface Fugitive	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Engines, Heaters, Other	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Net Change Compared to Baseline Conditions (Regional) =	**27.6**	**119.0**	**332.3**	**0.6**	**459.3**	**56.0**	**31,006.4**	**1.8**	**4,432.8**
Net Change Compared to Baseline Conditions (local) =	**20.3**	**82.7**	**223.2**	**0.5**	**455.3**	**52.5**	**20,429.0**	**1.5**	**3,747.9**

Notes: 1. Represents emissions from the net change in landfill gas generation compared to baseline conditions.

Table 3c: Variation 2 Construction - Peak Daily Criteria Pollutant Emissions								
Source	Peak Daily Criteria Pollutant Emissions, lb/day						GHGs, lb/day	
	ROG	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH4
Lift Construction Activities and Fugitive Dust)[1]	29.5	117.4	348.2	0.4	23.5	15.9	41,394.5	3,129.5
Total =	**29.5**	**117.4**	**348.2**	**0.4**	**23.5**	**15.9**	**41,394.5**	**3,129.5**

Notes:

1. Emission calculations presented in Table 9.

Table 4: Baseline Conditions - Onsite Mobile Equipment Emission Summary

Baseline Conditions (@1400 TPD) - Equipment Usage and Criteria Pollutant Emission Factors (lb/hr)										
Equipment	**No. of Equipment**	**Hrs Per Day**	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**	**CH4**
Off-road Equipment										
Scraper-657EPP	2	8	0.31	1.17	2.73	0.00	0.12	0.11	262.50	0.03
Dozer-D9N	4	8	0.32	1.33	2.83	0.00	0.12	0.11	239.10	0.03
Refuse Compactor	0	0	0.10	0.40	0.93	0.00	0.04	0.04	122.73	0.01
Wh. loader w/back grader	1	2	0.09	0.39	0.63	0.00	0.05	0.04	66.80	0.01
Wheeled loader	1	8	0.09	0.39	0.63	0.00	0.05	0.04	66.80	0.01
Excavator	1	8	0.14	0.55	1.06	0.00	0.06	0.05	119.58	0.01
Grinder	1	8	0.10	0.40	0.93	0.00	0.04	0.04	122.73	0.01
Portable light tower**	3	1	0.09	0.32	0.61	0.00	0.04	0.03	60.99	0.01
On-road Equipment										
Water truck	3	8	2.42E-03	1.69E-02	1.89E-02	2.73E-05	7.01E-04	5.97E-04	2.75E+00	1.17E-04
Light duty pickups	1	3	2.42E-03	1.69E-02	1.89E-02	2.73E-05	7.01E-04	5.97E-04	2.75E+00	1.17E-04
Fugitive Dust										
Activity	**Factor**	**Unit**					**PM_{10}**	**$PM_{2.5}$**		
							lb/miles			
Grading and Scraping	72	miles/day	-	-	-	-	1.50	0.08	-	-
Dozing	128	miles/day	-	-	-	-	0.26	0.04	-	-
Paved Road Transport	12	miles/day	-	-	-	-	0.03	0.01	-	-
Unpaved Road Transport	12	miles/day	-	-	-	-	1.55	0.16	-	-

Table 4: Baseline Conditions - Onsite Mobile Equipment Emission Summary

Baseline Conditions (@1400 TPD) - Equipment Usage and Criteria Pollutant Emission Factors (lb/hr)

Baseline Conditions - Criteria Pollutant Emissions Summary, lb/day								
Equipment	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**	**CH4**
Scraper-657EPP	4.89	18.66	43.74	0.04	1.87	1.72	4199.96	0.44
Dozer-D9N	10.38	42.51	90.71	0.08	3.88	3.57	7651.18	0.94
Refuse Compactor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wh. loader w/back grader	0.19	0.77	1.26	0.00	0.10	0.09	133.61	0.02
Wheeled loader	0.75	3.10	5.02	0.01	0.39	0.35	534.43	0.07
Excavator	1.11	4.39	8.51	0.01	0.47	0.44	956.65	0.10
Grinder	0.79	3.16	7.46	0.01	0.32	0.30	981.85	0.07
Portable light tower**	0.27	0.96	1.84	0.00	0.11	0.10	182.98	0.02
Water truck	0.06	0.41	0.45	0.00	0.02	0.01	66.04	0.00
Light duty pickups	0.01	0.05	0.06	0.00	0.00	0.00	8.26	0.00
Fugitive Dust (Uncontrolled)	-	-	-	-	160.42	12.21	-	-
Fugitive Dust (Controlled)[1]	-	-	-	-	65.23	6.57	-	-
Off-road Summary	18.38	73.55	158.52	0.15	7.14	6.57	14640.66	1.66
On-road Summary	0.07	0.46	0.51	0.00	0.02	0.02	74.30	0.00
Fugitive Dust	-	-	-	-	65.23	6.57	-	-
Daily Operations =	**18.44**	**74.01**	**159.03**	**0.15**	**72.40**	**13.16**	**14,714.96**	**1.66**

Notes:

1. Emission factors are uncontrolled; however, existing fugitive dust control measures including site watering and sweeping are implemented daily to reduce and control visible emissions. The control efficiency is 75% based on frequency of implemented control measures.

Baseline Conditions - GHG Emissions Summary						
CO2	**CH4**	**CO2e**	**GHG**			
lb/day			**lb/yr**	**TPY, CO2e**	**MTCO2e/yr**	**MTCO2e/ project**
14,715.0	1.7	14,749.8	4,572,450.6	2,286.2	2,073.6	20,736.1

Conversions/Schedule

Table 4: Baseline Conditions - Onsite Mobile Equipment Emission Summary

Baseline Conditions (@1400 TPD) - Equipment Usage and Criteria Pollutant Emission Factors (lb/hr)

310	days/year	Operating Schedule
2000	lbs/ton	Conversion
21	GWP of CH4:CO2	

Table 5: Onsite Mobile Equipment (No Project, Variation 1 and 2 at 3,400 TPD) Emissions Summary										
No Project Alternative, Variation 1 and Variation 2 (@3400 TPD) - Equipment Usage and Criteria Pollutant Emission Factors (lb/hr)										
Equipment	**No. of Equipment**	**Hrs Per Day**	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**	**CH4**
Off-road Equipment										
Scraper-657EPP	4	8	0.31	1.17	2.73	0.00	0.12	0.11	262.50	0.03
Dozer-D9N	6	8	0.32	1.33	2.83	0.00	0.12	0.11	239.10	0.03
Refuse Compactor	1	8	0.10	0.40	0.93	0.00	0.04	0.04	122.73	0.01
Wh. loader w/back grader	1	4	0.09	0.39	0.63	0.00	0.05	0.04	66.80	0.01
Wheeled loader	1	8	0.09	0.39	0.63	0.00	0.05	0.04	66.80	0.01
Excavator	2	8	0.14	0.55	1.06	0.00	0.06	0.05	119.58	0.01
Grinder	2	8	0.10	0.40	0.93	0.00	0.04	0.04	122.73	0.01
Portable light tower**	4	1	0.09	0.32	0.61	0.00	0.04	0.03	60.99	0.01
On-road Equipment										
Water truck	3	8	2.42E-03	1.69E-02	1.89E-02	2.73E-05	7.01E-04	5.97E-04	2.75E+00	1.17E-04
Light duty pickups	1	3	2.42E-03	1.69E-02	1.89E-02	2.73E-05	7.01E-04	5.97E-04	2.75E+00	1.17E-04
Fugitive Dust										
Activity	**Factor**	**Unit**					**PM_{10}**	**$PM_{2.5}$**		
							lb/miles			
Grading and Scraping	144	miles/day	-	-	-	-	1.50	0.08	-	-
Dozing	192	miles/day	-	-	-	-	0.26	0.04	-	-
Paved Road Transport	12	miles/day	-	-	-	-	0.03	0.01	-	-
Unpaved Road Transport	12	miles/day	-	-	-	-	1.55	0.16	-	-

Table 5: Onsite Mobile Equipment (No Project, Variation 1 and 2 at 3,400 TPD) Emissions Summary

No Project Alternative, Variation 1 and Variation 2 (@3400 TPD) - Equipment Usage and Criteria Pollutant Emission Factors (lb/hr)

Baseline Conditions - Criteria Pollutant Emissions Summary, lb/day

Equipment	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH4
Scraper-657EPP	9.78	37.31	87.47	0.09	3.75	3.45	8399.92	0.88
Dozer-D9N	15.57	63.76	136.06	0.12	5.82	5.35	11476.78	1.41
Refuse Compactor	0.79	3.16	7.46	0.01	0.32	0.30	981.85	0.07
Wh. loader w/back grader	0.38	1.55	2.51	0.00	0.19	0.18	267.22	0.03
Wheeled loader	0.75	3.10	5.02	0.01	0.39	0.35	534.43	0.07
Excavator	2.22	8.77	17.01	0.02	0.95	0.87	1913.30	0.20
Grinder	1.57	6.33	14.91	0.02	0.65	0.59	1963.69	0.14
Portable light tower**	0.36	1.28	2.45	0.00	0.15	0.14	243.97	0.03
Water truck	0.06	0.41	0.45	0.00	0.02	0.01	66.04	0.00
Light duty pickups	0.01	0.05	0.06	0.00	0.00	0.00	8.26	0.00
Fugitive Dust (Uncontrolled)	-	-	-	-	285.13	20.14	-	-
Fugitive Dust (Controlled)[1]	-	-	-	-	108.98	10.31	-	-
Off-road Summary	31.42	125.27	272.90	0.27	12.21	11.23	25781.15	2.83
On-road Summary	0.07	0.46	0.51	0.00	0.02	0.02	74.30	0.00
Fugitive Dust	-	-	-	-	108.98	10.31	-	-
Daily Operations =	**31.48**	**125.73**	**273.41**	**0.27**	**121.20**	**21.56**	**25,855.45**	**2.84**

Notes:

1. Emission factors are uncontrolled; however, existing fugitive dust control measures including site watering and sweeping are implemented daily to reduce and control visible emissions. The control efficiency is 75% based on frequency of implemented control measures.

No Project, Variation 1 and Variation 2 - GHG Emissions Summary

CO2	CH4	CO2e	GHG			MTCO2e/Project		
lb/day			lb/yr	TPY, CO2e	MTCO2e	No Project	Variation 1	Variation 2
25,855.4	2.8	25,915.0	8,033,663.9	4,016.8	3,643.3	36,432.7	83,795.1	98,368.2

Conversions/Schedule		
310	days/year	Operating Schedule
2000	lbs/ton	Conversion
21	GWP of CH4:CO2	

Table 6: Customer Mobile Source Emissions

Table 6a: Baseline Conditions - Customer and Employee Trips

Mobile Sources	Roundtrips/Day	Miles/Roundtrip	Miles/Day			
			Total Miles/Day	Diesel	CNG	Gasoline
Customer/User Vehicles	1682	5	8,410.0	4,205.0	4,205.0	-
Employee Vehicles	31	60	1,860.0	-	-	1,860.0
Paved Road	-	1	31.0	-	-	-
Unpaved Road	-	1	1,682.0	-	-	-

Table 6b: Baseline Conditions - Criteria Pollutant anf GHG Emissions Summary from Customer and Employee Trips

Pollutant	Peak Daily Criteria Pollutant Emissions						GHG Emissions Summary			
	ROG (lb/day)	CO (lb/day)	NOx (lb/day)	SO_2 (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)	CH_4 (lb/day)	CO2e (MT/yr)	MTCO2e (Total Project)
Customer/User	11.8	53.3	192.7	0.2	7.0	6.1	17,747.0	0.5	2,496.6	24,965.7
Employee	4.5	31.5	35.2	0.1	1.3	1.1	5,118.4	0.2	720.2	7,202.1
Paved Road	-	-	-	-	0.9	0.2	-	-	-	
Unpaved Road	-	-	-	-	2,610.3	261.0	-	-	-	
Total Daily Emissions (Uncontrolled) =	16.3	84.8	227.9	0.2	2,619.5	268.4	22,865.4	0.8	3,216.8	32,167.7
Total Daily Emissions (Controlled) =	16.3	84.8	227.9	0.2	400.0	46.4	22,865.4	0.8	3,216.8	32,167.7

Table 6c: No Project Alternative Customer and Employee Trips (@3,400 TPD)

Mobile Sources	Roundtrips/Day	Miles/Roundtrip	Miles/Day	Diesel	CNG	Gasoline
Customer/User Vehicles	3337	5	16,685.0	8,342.5	8,342.5	-
Employee Vehicles	40	60	2,400.0	-	-	2,400.0
Paved Road	-	1	40.0	-	-	-
Unpaved Road	-	1	3,337.0	-	-	-

Table 6d: No Project Alternative - Criteria Pollutant and GHG Emissions from Customer and Employee Trips

Pollutant	Peak Daily Criteria Pollutant Emissions						GHG Emissions Summary			
	ROG (lb/day)	CO (lb/day)	NOx (lb/day)	SO2 (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	CO2 (lb/day)	CH4 (lb/day)	CO2e (MT/yr)	MTCO2e (Total Project)
Customer/User	23.3	105.7	382.2	0.3	13.9	12.1	35,209.2	1.1	4,953.1	49,530.6
Employee	5.8	40.6	45.4	0.1	1.7	1.4	6,604.3	0.3	929.3	9,293.0
Paved Road	-	-	-	-	1.1	0.3	-	-	-	
Unpaved Road	-	-	-	-	5,178.7	517.9	-	-	-	
Total Daily Emissions (Uncontrolled) =	29.1	146.3	427.7	0.4	5,195.4	531.6	41,813.5	1.4	5,882.4	58,823.6
Total Daily Emissions (Controlled) =	29.1	146.3	427.7	0.4	792.5	91.2	41,813.5	1.4	5,882.4	58,823.6
Incremental Increas	12.9	61.6	199.8	0.2	392.5	44.8	18,948.1	0.6	2,665.6	26,655.8

Table 6e: Variation 1 and 2 Customer and Employee Trips (@3,400 TPD)

Mobile Sources	Roundtrips/Day	Miles/Roundtrip	Miles/Day	Diesel	CNG	Gasoline
Customer/User Vehicles	3410	5	17,050.0	8,525.0	8,525.0	-
Employee Vehicles	40	60	2,400.0	-	-	2,400.0
Paved Road	-	1	40.0	-	-	-
Unpaved Road	-	1	3,410.0	-	-	-

Table 6f: Variation 1 and 2 (2034 and 2040) - Criteria Pollutant and GHG Emissions from Customer and Employee Trips

Pollutant	Peak Daily Criteria Pollutant Emissions						Daily & Annual GHGs			Variation 1	Variation 2
	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	SO2 (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	CO2e (MT/yr)	MTCO2e (Total Project)	
Customer/User	23.8	108.0	390.6	0.3	14.2	12.3	35,979.4	1.1	5,061.4	116,412.5	136,658.1
Employee	5.8	40.6	45.4	0.1	1.7	1.4	6,604.3	0.3	929.3	21,373.8	25,091.0
Paved Road	-	-	-	-	1.1	0.3	-	-	-		
Unpaved Road	-	-	-	-	5,292.0	529.2	-	-	-		
Total Daily Emissions (Uncontrolled) (lbs/day) =	29.6	148.7	436.0	0.4	5,308.9	543.2	42,583.7	1.4	5,990.7	137,786.3	161,749.1
Total Daily Emissions (Controlled) (lbs/day) =	29.6	148.7	436.0	0.4	809.8	93.2	42,583.7	1.4	5,990.7	137,786.3	161,749.1
Incremental Increas	13.4	63.9	208.2	0.2	409.8	46.8	19,718.3	0.6	2,773.9	105,618.6	161,749.1

On-road Emission Factors

	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	Units
2011 Fleet Average Factors									
Passenger	2.42E-03	1.69E-02	1.89E-02	2.73E-05	7.01E-04	5.97E-04	2.75E+00	1.17E-04	lb/mile
Delivery	2.24E-03	1.55E-02	1.73E-02	2.67E-05	6.50E-04	5.50E-04	2.77E+00	1.07E-04	lb/mile
Heavy Heavy Duty	2.80E-03	1.11E-02	3.46E-02	3.97E-05	1.66E-03	1.44E-03	4.22E+00	1.29E-04	lb/mile
CNG Factors*	0.00E+00	1.55E-03	1.13E-02	--	0.00E+00	0.00E+00	--	--	lb/mile
Passenger	1.44E-02	1.40E-01	1.43E-02	1.83E-04	1.50E-03	9.58E-04	1.87E+01	1.30E-03	lb/gal
Delivery	4.10E-02	2.87E-01	3.21E-01	4.62E-04	1.19E-02	1.01E-02	4.66E+01	1.98E-03	lb/gal
Heavy Heavy Duty	4.74E-02	1.89E-01	5.86E-01	6.73E-04	2.81E-02	2.45E-02	7.15E+01	2.19E-03	lb/gal

Fuel (Gasoline) Usage Conversion Factor

Factor	Unit	Source
16.947	miles/gal	EmFac Output

CNG Vehicles - Emission Control*

VOCs	NOx	CO	PM
100%	35%	90%	100%

Source: US Dept of Energy. Available: www.afdc.energy.gov/afdc

Supplemental Information

Factor	Description	
310	days of operati	Based on daily activities
21	GWP CH4:CO2	
2000	lbs/ton	
0.907	ton/MT	

Table 7: Baseline Conditions Lift Construction, Criteria Pollutant and GHG Emissions Summary

Source	No. of Equipment	Usage Factor	Usage Units	Emission Factor								Daily Emissions Summary (lbs/day)								GHG Emissions Summary (total project)							
				ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	Unit	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	Unit	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	Unit
Lift Construction																											
Gas Project (Trenching, Well Installation, Header Lines)																											
Excavator	1	6	hr/day	0.14	0.55	1.06	0.00	0.06	0.05	119.58	lb/hr	0.83	3.29	6.38	0.01	0.36	0.33	717.49	lbs/day	0.02	0.10	0.19	0.00	0.01	0.01	21.52	total tons
Wheel Loaders	1	6	hr/day	0.09	0.39	0.63	0.00	0.05	0.04	66.80	lb/hr	0.56	2.32	3.77	0.00	0.29	0.27	400.82	lbs/day	0.02	0.07	0.11	0.00	0.01	0.01	12.02	total tons
Scrapers	1	1	hr/day	0.31	1.17	2.73	0.00	0.12	0.11	262.50	lb/hr	0.31	1.17	2.73	0.00	0.12	0.11	262.50	lbs/day	0.01	0.03	0.08	0.00	0.00	0.00	7.87	total tons
Drilling Rigs	1	6	hr/day	0.09	0.51	1.01	0.00	0.04	0.04	164.95	lb/hr	0.57	3.06	6.05	0.01	0.26	0.24	989.71	lbs/day	0.02	0.09	0.18	0.00	0.01	0.01	29.69	total tons
Dump Truck	3	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	2.83	8.39	26.33	0.03	0.95	0.87	3,121.12	lbs/day	0.08	0.25	0.79	0.00	0.03	0.03	93.63	total tons
Backhoe	1	6	hr/day	0.09	0.39	0.63	0.00	0.05	0.04	66.80	lb/hr	0.56	2.32	3.77	0.00	0.29	0.27	400.82	lbs/day	0.02	0.07	0.11	0.00	0.01	0.01	12.02	total tons
MD Gasoline Truck	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.94	2.80	8.78	0.01	0.32	0.29	1,040.37	lbs/day	0.03	0.08	0.26	0.00	0.01	0.01	31.21	total tons
HD Diesel Truck	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.94	2.80	8.78	0.01	0.32	0.29	1,040.37	lbs/day	0.03	0.08	0.26	0.00	0.01	0.01	31.21	total tons
Drainage Facilities																											
Excavator	1	6	hr/day	0.14	0.55	1.06	0.00	0.06	0.05	119.58	lb/hr	0.83	3.29	6.38	0.01	0.36	0.33	717.49	lbs/day	0.06	0.24	0.46	0.00	0.03	0.02	51.66	total tons
Dozer	1	6	hr/day	0.32	1.33	2.83	0.00	0.12	0.11	239.10	lb/hr	1.95	7.97	17.01	0.01	0.73	0.67	1,434.60	lbs/day	0.14	0.57	1.22	0.00	0.05	0.05	103.29	total tons
Wheel Loaders	1	6	hr/day	0.09	0.39	0.63	0.00	0.05	0.04	66.80	lb/hr	0.56	2.32	3.77	0.00	0.29	0.27	400.82	lbs/day	0.04	0.17	0.27	0.00	0.02	0.02	28.86	total tons
Dump Truck	2	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	1.88	5.60	17.55	0.02	0.63	0.58	2,080.74	lbs/day	0.14	0.40	1.26	0.00	0.05	0.04	149.81	total tons
Electric Generator	1	6	hr/day	0.09	0.32	0.61	0.00	0.04	0.03	60.99	lb/hr	0.54	1.92	3.67	0.00	0.23	0.21	365.96	lbs/day	0.04	0.14	0.26	0.00	0.02	0.01	26.35	total tons
MD Gasoline Truck	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.94	2.80	8.78	0.01	0.32	0.29	1,040.37	lbs/day	0.07	0.20	0.63	0.00	0.02	0.02	74.91	total tons
HD Diesel Truck	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.94	2.80	8.78	0.01	0.32	0.29	1,040.37	lbs/day	0.07	0.20	0.63	0.00	0.02	0.02	74.91	total tons
Onsite Fugitive Sources																											
Truck Loading and Unloading	--	1,400	Tons/day	--	--	--	--	1.37E-03	2.08E-04	--	lb/ton	--	--	--	--	0.30	0.05	--	lbs/day	--	--	--	--	1.92	0.29	--	total tons
Grading and Scraping	--	7	VMT/day	--	--	--	--	1.50	0.08	--	lb/VMT	--	--	--	--	1.63	0.08	--	lbs/day	--	--	--	--	10.50	0.54	--	total tons
Stockpiles	--	20	acres	--	--	--	--	7.85	1.63	--	lb/acre-day	--	--	--	--	24.34	5.06	--	lbs/day	--	--	--	--	157.02	32.66	--	total tons
Controlled Fugitive Dust =																6.79	1.33		lbs/day	--	--	--	--	43.80	8.59	--	total tons
Gas Project Emissions Summary[1] (Operations) =												**7.54**	**26.15**	**66.58**	**0.08**	**9.69**	**4.00**	**7,973.21**	lbs/day								
Drainage Project Emissions Summary[1] (Operations) =												**7.65**	**26.70**	**65.93**	**0.07**	**9.65**	**3.97**	**7,080.35**	lbs/day								
Annual Emissions Summary =																				**0.78**	**2.71**	**6.74**	**0.01**	**44.09**	**8.86**	**748.98**	total tons
																										679.33	total MT

Notes:
1. The drainage projects will not overlap the gas projects.

Lift Construction Parameters		
Factor	Description	Basis
24	days/month	
Fugitive Dust Parameters		
Factor	Description	
310	days of operation	Based on daily activities
Conversions		
2000	lbs/ton	
75%	Fugitive dust contr	SCAQMD WRAP Fugitive Dust Handbook

Schedule				
Gas Pr	2.5	months	60	total days
Drainag	3	months	72	days/project
	2	projects	144	total days

Sources:
County Sanitation Districts of Los Angeles County,

SCAQMD, 2010, *Annual Emissions Reporting: Los Angeles County Sanitation Districts, Scholl Canyon, Reporting Year 2009.*

Table 8: Variation 1 Lift Construction, Criteria Pollutant and GHG Emissions Summary

Source	No. of Equipment	Usage Factor	Usage Units	Emission Factor								Daily Emissions Summary (lbs/day)								GHG Emissions Summary (total project)							
				ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	Unit	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	Unit	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	Unit
Lift Construction																											
Gas Project (Trenching, Well Installation, Header Lines)																											
Excavator	1	6	hr/day	0.14	0.55	1.06	0.00	0.06	0.05	119.58	lb/hr	0.83	3.29	6.38	0.01	0.36	0.33	717.49	lbs/day	0.10	0.39	0.77	0.00	0.04	0.04	86.10	total tons
Wheel Loaders	1	6	hr/day	0.09	0.39	0.63	0.00	0.05	0.04	66.80	lb/hr	0.56	2.32	3.77	0.00	0.29	0.27	400.82	lbs/day	0.07	0.28	0.45	0.00	0.03	0.03	48.10	total tons
Scrapers	1	1	hr/day	0.31	1.17	2.73	0.00	0.12	0.11	262.50	lb/hr	0.31	1.17	2.73	0.00	0.12	0.11	262.50	lbs/day	0.04	0.14	0.33	0.00	0.01	0.01	31.50	total tons
Drilling Rigs	1	6	hr/day	0.09	0.51	1.01	0.00	0.04	0.04	164.95	lb/hr	0.57	3.06	6.05	0.01	0.26	0.24	989.71	lbs/day	0.07	0.37	0.73	0.00	0.03	0.03	118.77	total tons
Dump Truck	3	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	2.83	8.39	26.33	0.03	0.95	0.87	3,121.12	lbs/day	0.34	1.01	3.16	0.00	0.11	0.10	374.53	total tons
Backhoe	1	6	hr/day	0.09	0.39	0.63	0.00	0.05	0.04	66.80	lb/hr	0.56	2.32	3.77	0.00	0.29	0.27	400.82	lbs/day	0.07	0.28	0.45	0.00	0.03	0.03	48.10	total tons
MD Gasoline Truck	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.94	2.80	8.78	0.01	0.32	0.29	1,040.37	lbs/day	0.11	0.34	1.05	0.00	0.04	0.03	124.84	total tons
HD Diesel Truck	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.94	2.80	8.78	0.01	0.32	0.29	1,040.37	lbs/day	0.11	0.34	1.05	0.00	0.04	0.03	124.84	total tons
Drainage Facilities																											
Excavator	1	6	hr/day	0.14	0.55	1.06	0.00	0.06	0.05	119.58	lb/hr	0.83	3.29	6.38	0.01	0.36	0.33	717.49	lbs/day	0.06	0.24	0.46	0.00	0.03	0.02	51.66	total tons
Dozer	1	6	hr/day	0.32	1.33	2.83	0.00	0.12	0.11	239.10	lb/hr	1.95	7.97	17.01	0.01	0.73	0.67	1,434.60	lbs/day	0.14	0.57	1.22	0.00	0.05	0.05	103.29	total tons
Wheel Loaders	1	6	hr/day	0.09	0.39	0.63	0.00	0.05	0.04	66.80	lb/hr	0.56	2.32	3.77	0.00	0.29	0.27	400.82	lbs/day	0.04	0.17	0.27	0.00	0.02	0.02	28.86	total tons
Dump Truck	2	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	1.88	5.60	17.55	0.02	0.63	0.58	2,080.74	lbs/day	0.14	0.40	1.26	0.00	0.05	0.04	149.81	total tons
Electric Generator	1	6	hr/day	0.09	0.32	0.61	0.00	0.04	0.03	60.99	lb/hr	0.54	1.92	3.67	0.00	0.23	0.21	365.96	lbs/day	0.04	0.14	0.26	0.00	0.02	0.01	26.35	total tons
MD Gasoline Truck	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.94	2.80	8.78	0.01	0.32	0.29	1,040.37	lbs/day	0.07	0.20	0.63	0.00	0.02	0.02	74.91	total tons
HD Diesel Truck	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.94	2.80	8.78	0.01	0.32	0.29	1,040.37	lbs/day	0.07	0.20	0.63	0.00	0.02	0.02	74.91	total tons
Concrete Trucks	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.94	2.80	8.78	0.01	0.32	0.29	1,040.37	lbs/day	0.07	0.20	0.63	0.00	0.02	0.02	74.91	total tons
Onsite Fugitive Sources																											
Truck Loading and Unloading	--	1,400	Tons/day	--	--	--	--	1.37E-03	2.08E-04	--	lb/ton	--	--	--	--	0.30	0.05	--	lbs/day	--	--	--	--	1.92	0.29	--	total tons
Grading and Scraping	--	7	VMT/day	--	--	--	--	1.50	0.08	--	lb/VMT	--	--	--	--	1.63	0.08	--	lbs/day	--	--	--	--	10.50	0.54	--	total tons
Stockpiles	--	20	acres	--	--	--	--	7.85	1.63	--	lb/acre-day	--	--	--	--	24.34	5.06	--	lbs/day	--	--	--	--	157.02	32.66	--	total tons
Controlled Fugitive Dust =																6.79	1.33		lbs/day	--	--	--	--	43.80	8.59	--	total tons
Gas Project Emissions Summary[1] (Operations) =												7.54	26.15	66.58	0.08	9.69	4.00	7,973.21	lbs/day	--	--	--	--	--	--	--	--
Drainage Project Emissions Summary[1] (Operations) =												8.59	29.50	74.71	0.08	9.97	4.26	8,120.73	lbs/day	--	--	--	--	--	--	--	--
Annual Emissions Summary[2] =																				1.52	5.26	13.37	0.02	44.38	9.12	1541.48	total tons
																										1,398.12	total MT

Notes:
1. The drainage projects will not overlap the gas projects.
2. Accounts for two drainage projects within 1-year.

Lift Construction Parameters		
Factor	Description	Basis
24	days/month	
Fugitive Dust Parameters		
Factor	Description	
310	days of operati	Based on daily activities
Conversions		
2000	lbs/ton	
75%	Fugitive dust cc	SCAQMD WRAP Fugitive Dust Handbook

Schedule			
Gas Project	2.5	months	60	days/project
	4	projects	240	total days
Drainage Pro	3	months		
	2	projects	144	total days

Sources:
CCAR, 2007, *Total Emissions Summary Report: County Sanitation Districts of Los Angeles County, Reporting Year 2006.*
SCAQMD, 2010, *Annual Emissions Reporting: Los Angeles County Sanitation Districts, Scholl Canyon, Reporting Year 2009.*

Table 9: Variation 2 Lift Construction, Criteria Pollutant and GHG Emissions Summary

Source	No. of Equipment	Usage Factor	Usage Units	Emission Factor ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	Unit	Daily Emissions Summary (lbs/day) ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	Unit	GHG Emissions Summary (total project) ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	Unit
Lift Construction																											
Gas Project (Trenching, Well Installation, Header Lines)																											
Excavator	1	6	hr/day	0.14	0.55	1.06	0.00	0.06	0.05	119.58	lb/hr	0.83	3.29	6.38	0.01	0.36	0.33	717.49	lbs/day	0.12	0.47	0.92	0.00	0.05	0.05	103.32	total tons
Wheel Loaders	1	6	hr/day	0.09	0.39	0.63	0.00	0.05	0.04	66.80	lb/hr	0.56	2.32	3.77	0.00	0.29	0.27	400.82	lbs/day	0.08	0.33	0.54	0.00	0.04	0.04	57.72	total tons
Scrapers	1	1	hr/day	0.31	1.17	2.73	0.00	0.12	0.11	262.50	lb/hr	0.31	1.17	2.73	0.00	0.12	0.11	262.50	lbs/day	0.04	0.17	0.39	0.00	0.02	0.02	37.80	total tons
Drilling Rigs	1	6	hr/day	0.09	0.51	1.01	0.00	0.04	0.04	164.95	lb/hr	0.57	3.06	6.05	0.01	0.26	0.24	989.71	lbs/day	0.08	0.44	0.87	0.00	0.04	0.03	142.52	total tons
Dump Truck	3	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	2.83	8.39	26.33	0.03	0.95	0.87	3,121.12	lbs/day	0.41	1.21	3.79	0.00	0.14	0.13	449.44	total tons
Backhoe	1	6	hr/day	0.09	0.39	0.63	0.00	0.05	0.04	66.80	lb/hr	0.56	2.32	3.77	0.00	0.29	0.27	400.82	lbs/day	0.08	0.33	0.54	0.00	0.04	0.04	57.72	total tons
MD Gasoline Truck	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.94	2.80	8.78	0.01	0.32	0.29	1,040.37	lbs/day	0.14	0.40	1.26	0.00	0.05	0.04	149.81	total tons
HD Diesel Truck	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.94	2.80	8.78	0.01	0.32	0.29	1,040.37	lbs/day	0.14	0.40	1.26	0.00	0.05	0.04	149.81	total tons
Drainage Facilities																											
Excavator	1	6	hr/day	0.14	0.55	1.06	0.00	0.06	0.05	119.58	lb/hr	0.83	3.29	6.38	0.01	0.36	0.33	717.49	lbs/day	0.06	0.24	0.46	0.00	0.03	0.02	51.66	total tons
Dozer	1	6	hr/day	0.32	1.33	2.83	0.00	0.12	0.11	239.10	lb/hr	1.95	7.97	17.01	0.01	0.73	0.67	1,434.60	lbs/day	0.14	0.57	1.22	0.00	0.05	0.05	103.29	total tons
Wheel Loaders	1	6	hr/day	0.09	0.39	0.63	0.00	0.05	0.04	66.80	lb/hr	0.56	2.32	3.77	0.00	0.29	0.27	400.82	lbs/day	0.04	0.17	0.27	0.00	0.02	0.02	28.86	total tons
Dump Truck	2	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	1.88	5.60	17.55	0.02	0.63	0.58	2,080.74	lbs/day	0.14	0.40	1.26	0.00	0.05	0.04	149.81	total tons
Electric Generator	1	6	hr/day	0.09	0.32	0.61	0.00	0.04	0.03	60.99	lb/hr	0.54	1.92	3.67	0.00	0.23	0.21	365.96	lbs/day	0.04	0.14	0.26	0.00	0.02	0.01	26.35	total tons
MD Gasoline Truck	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.94	2.80	8.78	0.01	0.32	0.29	1,040.37	lbs/day	0.07	0.20	0.63	0.00	0.02	0.02	74.91	total tons
HD Diesel Truck	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.94	2.80	8.78	0.01	0.32	0.29	1,040.37	lbs/day	0.07	0.20	0.63	0.00	0.02	0.02	74.91	total tons
Concrete Trucks	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.94	2.80	8.78	0.01	0.32	0.29	1,040.37	lbs/day	0.07	0.20	0.63	0.00	0.02	0.02	74.91	total tons
Native Cut (Hillside Prep, Demolition and Grading)																											
Dozers	2	6	hr/day	0.32	1.33	2.83	0.00	0.12	0.11	239.10	lb/hr	3.9	15.9	34.0	0.0	1.5	1.3	2869.2	lbs/day	0.63	2.58	5.51	0.00	0.24	0.22	464.81	total tons
Scrapers	6	6	hr/day	0.31	1.17	2.73	0.00	0.12	0.11	262.50	lb/hr	11.0	42.0	98.4	0.1	4.2	3.9	9449.9	lbs/day	1.78	6.80	15.94	0.02	0.68	0.63	1530.88	total tons
Water Truck	1	8	miles/day	2.42E-03	1.69E-02	1.89E-02	2.73E-05	7.01E-04	5.97E-04	2.75E+00	lb/mile	0.0	0.1	0.2	0.0	0.0	0.0	22.0	lbs/day	0.00	0.02	0.02	0.00	0.00	0.00	3.57	total tons
Liner Installation																											
Dozer	1	6	hr/day	0.32	1.33	2.83	0.00	0.12	0.11	239.10	lb/hr	1.9	8.0	17.0	0.0	0.7	0.7	1434.6	lbs/day	0.21	0.86	1.84	0.00	0.08	0.07	154.94	total tons
Scrapers	1	6	hr/day	0.31	1.17	2.73	0.00	0.12	0.11	262.50	lb/hr	1.8	7.0	16.4	0.0	0.7	0.6	1575.0	lbs/day	0.20	0.76	1.77	0.00	0.08	0.07	170.10	total tons
Loaders	1	6	hr/day	0.09	0.39	0.63	0.00	0.05	0.04	66.80	lb/hr	0.6	2.3	3.8	0.0	0.3	0.3	400.8	lbs/day	0.06	0.25	0.41	0.00	0.03	0.03	43.29	total tons
Backhoe	1	6	hr/day	0.09	0.39	0.63	0.00	0.05	0.04	66.80	lb/hr	0.6	2.3	3.8	0.0	0.3	0.3	400.8	lbs/day	0.06	0.25	0.41	0.00	0.03	0.03	43.29	total tons
Forklift	1	6	hr/day	0.06	0.23	0.47	0.00	0.03	0.02	54.40	lb/hr	0.4	1.4	2.8	0.0	0.2	0.1	326.4	lbs/day	0.04	0.15	0.31	0.00	0.02	0.02	35.25	total tons
Screen Plant	1	6	hr/day	0.10	0.40	0.93	0.00	0.04	0.04	122.73	lb/hr	0.6	2.4	5.6	0.0	0.2	0.2	736.4	lbs/day	0.06	0.26	0.60	0.00	0.03	0.02	79.53	total tons
Sheep's Foot	1	6	hr/day	0.10	0.40	0.93	0.00	0.04	0.04	122.73	lb/hr	0.6	2.4	5.6	0.0	0.2	0.2	736.4	lbs/day	0.06	0.26	0.60	0.00	0.03	0.02	79.53	total tons
Pickup	2	6	hr/day	8.52E-04	8.26E-03	8.45E-04	1.08E-05	8.88E-05	5.65E-05	1.10E+00	lb/mile	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02	lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	total tons
Water Truck	2	8	hr/day	2.42E-03	1.69E-02	1.89E-02	2.73E-05	7.01E-04	5.97E-04	2.75E+00	lb/mile	0.0	0.3	0.3	0.0	0.0	0.0	44.0	lbs/day	0.00	0.03	0.03	0.00	0.00	0.00	4.76	total tons
Roller	1	6	hr/day	0.11	0.42	0.73	0.00	0.05	0.05	67.05	lb/hr	0.7	2.5	4.4	0.0	0.3	0.3	402.3	lbs/day	0.07	0.27	0.48	0.00	0.03	0.03	43.45	total tons
MD Gasoline Truck	1	4	hr/day	8.52E-04	8.26E-03	8.45E-04	1.08E-05	8.88E-05	5.65E-05	1.10E+00	lb/mile	6.8E-03	6.6E-02	6.8E-03	8.6E-05	7.1E-04	4.5E-04	8.8E+00	lbs/day	0.00	0.01	0.00	0.00	0.00	0.00	0.95	total tons
HD Diesel Truck	1	4	hr/day	0.24	0.70	2.19	0.00	0.08	0.07	260.09	lb/hr	0.9	2.8	8.8	0.0	0.3	0.3	1040.4	lbs/day	0.10	0.30	0.95	0.00	0.03	0.03	112.36	total tons
Haul Trucks	-	150	trips/day	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Haul Trucks		9000	miles/day	2.80E-03	1.11E-02	3.46E-02	3.97E-05	1.66E-03	1.44E-03	4.22E+00	lb/mile	25.2	100.1	311.0	0.4	14.9	13.0	37984.1	lbs/day	0.45	1.80	5.60	0.01	0.27	0.23	683.71	total tons
Onsite Fugitive Sources																											
Truck Loading and Unloading	--	1,400	Tons/day	--	--	--	--	1.37E-03	2.08E-04	--	lb/ton	--	--	--	--	0.30	0.05	--	lbs/day	--	--	--	--	1.92	0.29	--	total tons
Grading and Scraping	--	7	VMT/day	--	--	--	--	1.50	0.08	--	lb/VMT	--	--	--	--	1.63	0.08	--	lbs/day	--	--	--	--	10.50	0.54	--	total tons
Stockpiles	--	20	acres	--	--	--	--	7.85	1.63	--	lb/acre-day	--	--	--	--	24.34	5.06	--	lbs/day	--	--	--	--	157.02	32.66	--	total tons
Controlled Fugitive Dust =																6.79	1.33		lbs/day	--	--	--	--	43.80	8.59	--	total tons
Gas Project Emissions Summary[1] (Operations) =												7.54	26.15	66.58	0.08	9.69	4.00	7,973.21	lbs/day	1.09	3.77	9.59	0.01	44.22	8.98	1,148.14	total tons
Drainage Project Emissions Summary[1] (Operations) =												8.59	29.50	74.71	0.08	9.97	4.26	8,120.73	lbs/day	0.62	2.12	5.38	0.01	44.03	8.80	584.69	total tons
Native Cut Emissions Summary (Construction) =												14.91	58.05	132.58	0.13	5.68	5.22	12,341.11	lbs/day								
Liner Installation - Peak Daily Emissions Summary (Construction) =												29.50	117.41	348.20	0.39	23.46	15.92	41,394.52	lbs/day	3.75	14.60	34.47	0.04	45.34	10.00	3,450.42	total tons
Gas Projects + Drainage Projects (Operations) Emissions Summary[2] =																				1.55	5.34	13.57	0.02	80.04	16.12	1,571.68	total MT
Native Cut and Liner Installation (Construction) Emissions Summary =																				3.40	13.24	31.27	0.03	41.13	9.07	3,129.53	total MT
																										104.3	Amortized, MT

Notes:
1. The drainage projects will not overlap the gas projects.
2. Accounts for two drainage projects within 1-year.

Lift Construction Parameters		
Factor	Description	Basis
2	miles/hr	Onsite speed
36	days liner materi	nceptual Design
24	Operating days/month	
Fugitive Dust Parameters		
Factor	Description	
310	days of operation	l on daily activities
Conversions		
2000	lbs/ton	
75%	Fugitive dust con	AP Fugitive Dust Handbook

Schedule				
Gas Project	3.0	months	72	days/project
	4	projects	288	total days
Drainage Pr	3	months		
	2	projects	144	total days
Native Cut	13.5	months	324	total days
Liner Installa	9.0	months	216	total days

Sources:
CCAR, 2007, *Total Emissions Summary Report: County Sanitation Districts of Los Angeles County, Reporting Year 2006.*
SCAQMD, 2010, *Annual Emissions Reporting: Los Angeles County Sanitation Districts, Scholl Canyon, Reporting Year 2009.*

Table 10a: Annual Average Emissions, Onsite Stationary Sources (lb/year)						
Description	**Reporting Year**	**ROG**	**CO**	**NOX**	**SOX**	**PM**
Permitted Sources						
Heater <10MMBTU/hr	2007	0.69	2.60	10.40	3.69	1.04
	2008	0.69	2.60	10.40	3.69	1.04
	2009	0.69	2.60	10.40	3.69	1.04
Non-Permitted Sources						
Landfill Surface Gas Emissions	2007	0.00	0.00	0.00	0.00	0.00
	2008	0.00	0.00	0.00	0.00	0.00
	2009	0.00	0.00	0.00	0.00	0.00
Diesel Storage and Dispensing	2007	14.29	0.00	0.00	0.00	0.00
	2008	7.25	0.00	0.00	0.00	0.00
	2009	3.91	0.00	0.00	0.00	0.00
Gasolone Storage and Dispensing	2007	0.00	0.00	0.00	0.00	0.00
	2008	0.01	0.00	0.00	0.00	0.00
	2009	0.00	0.00	0.00	0.00	0.00
Engine #6473 - Generator	2007	18.75	51.00	234.50	3.55	16.75
	2008	14.10	38.35	176.34	2.67	12.60
	2009	0.00	0.00	0.00	0.00	0.00
Engines #1149, 6577, 6643 - Compressor	2007	11.25	30.60	140.70	2.13	10.05
	2008	14.10	38.35	176.34	2.67	12.60
	2009	0.00	0.00	0.00	0.00	0.00
Engines #6494, 6495 - Light Tower	2007	105.00	385.60	1,313.20	19.88	93.80
	2008	0.00	0.00	0.00	0.00	0.00
	2009	0.00	0.00	0.00	0.00	0.00
Organics (Paint, Sealant, Cleaner, etc.)	2007	802.21	0.00	0.00	0.00	0.00
	2008	24.33	0.00	0.00	0.00	0.00
	2009	24.33	0.00	0.00	0.00	0.00
Operating Schedule						
310	days of operation/year					

Source:

SCAQMD, 2005, Annual Emissions Reporting: Los Angeles County Sanitation Districts, Scholl Canyon, Reporting Year 2004-2005.

SCAQMD, 2007, Annual Emissions Reporting: Los Angeles County Sanitation Districts, Scholl Canyon, Reporting Year 2006-2007.

SCAQMD, 2009, Annual Emissions Reporting: Los Angeles County Sanitation Districts, Scholl Canyon, Reporting Year 2008-2009.

Table 10b: Average Annual and Daily Emissions, Onsite Stationary Sources					
Combustion Source	**ROG**	**CO**	**NOX**	**SOX**	**PM**
Heater <10MMBTU/hr	0.69	2.6	10.4	3.69	1.04
Landfill Surface Gas Emissions	0.00	0.00	0.00	0.00	0.00
Diesel Storage and Dispensing	8.48	0.00	0.00	0.00	0.00
Gasoline Storage and Dispensing	0.00	0.00	0.00	0.00	0.00
Engine #6473 - Generator	10.95	29.78	136.95	2.07	9.78
Engines #1149, 6577, 6643 - Compressor	8.45	22.98	105.68	1.60	7.55
Engines #6494, 6495 - Light Tower	35.00	128.53	437.73	6.63	31.27
Organics (Paint, Sealant, Cleaner, etc.)	283.62	0.00	0.00	0.00	0.00
Annual Average, Total Stationary Sources (lbs/year) =	347.20	183.90	690.76	13.99	49.64
Annual Average, Total Stationary Sources (tons/year) =	0.17	0.09	0.35	0.01	0.02
Annual Average, Total Stationary Sources (lbs/day) =	0.95	0.50	1.89	0.04	0.14

Appendix A-2: CO Hotspots Analysis (Baseline Conditions, No Project Alternative, Variation 1 and Variation 2)

Index

Table 1: Baseline Conditions - CO Hotspots Screening Level Analysis

				Preliminary Input Information									Table Data								Calculations							
	Peak AM LOS	Landfill Peak Hour	Peak PM LOS	Geographic Location	Intersection Type	Distance from Nearest Travel Lane to Receptor (meters)	Average Cruise Speed (mph)	Peak Traffic Volume (Vehicles/Hr-Ln)	% of Red	% Cold Starts	Analysis Year	Background CO Concentration from West San Gabriel Valley monitoring station (ppm)	Peak Traffic Volume (Vehicles/Hr-Ln)	Average Cruise Speed (mph)	CO Concentration (ppm)	Traffic Volume Correction Factor	Approach Performance Correction Factor	Departure Performance Correction Factor	Cold Start Correction Factor	Wind Correction Factor	Traffic Volume (Vol/Hr-Ln)	CO Conc Adjusted for Traffic Volume (ppm)	CO Conc Adjusted for Preformance (ppm)	Sum of T10 to T13	CO Conc Corrected for % Cold Starts (ppm)	CO Conc Correction for Wind Angle (ppm)	Total 1-hour CO Concentration (ppm)	Estimtated Total 8-hour CO Concentration (ppm)
Intersections/Data Sources	Traffic Study	Traffic Study	Traffic Study	Table A.2	Traffic Rpt & Table A.2	Table A.2	Traffic Rpt	Traffic Rpt				SCAQMD	Table A.2	Table A.2	Table A.4	Table A.5	Table A.6	Table A.7	Table A.8	Table A.9	Calculation							0.6 Persistence Factor
Figueroa Street at SR 134 westbound ramps	E	A	C									Existing Peak 1-hr CO																
EW Approach				Coastal	2 x 2	3	40	0	30	20	2011	3.00	0	40	30.1	0	0	0	0.17	0.86	0	0.0	0.0	3.5	0.6	0.5	3.5	2.1
EW Departure				Coastal	2 x 2	3	40	135.5	30	20	2011	3.00	200	40	20.1	0.27	0.17	0.09			135.5	5.4	0.5					
NS Approach				Coastal	2 x 2	3	40	431	30	20	2011	3.00	400	40	30.1	0.47	0.18	0.09			431	14.1	2.5					
NS Departure				Coastal	2 x 2	3	40	82.5	30	20	2011	3.00	200	40	20.1	0.27	0.17	0.09			82.5	5.4	0.5					

Table 2: No Project, Variation 1 and Variation 2 - CO Hotspots Screening Level Analysis																											
				Preliminary Input Information									**Table Data**								**Calculations**							
	Peak AM LOS	Landfill Peak Hour	Peak PM LOS	Geographic Location	Intersection Type	Distance from Nearest Travel Lane to Receptor (meters)	Average Cruise Speed (mph)	Peak Traffic Volume (Vehicles/Hr-Ln)	% of Red	% Cold Starts	Analysis Year	Background CO Concentration from West San Gabriel Valley monitoring station (ppm)	Peak Traffic Volume (Vehicles/Hr-Ln)	Average Cruise Speed (mph)	CO Concentration (ppm)	Traffic Volume Correction Factor	Approach Performance Correction Factor	Departure Performance Correction Factor	Cold Start Correction Factor	Wind Correction Factor	Traffic Volume (Vol/Hr-Ln)	CO Conc Adjusted for Traffic Volume (ppm)	CO Conc Adjusted for Preformance (ppm)	Sum of T10 to T13	CO Conc Corrected for % Cold Starts (ppm)	CO Conc Correction for Wind Angle (ppm)	Total 1-hour CO Concentration (ppm)	Estimtated Total 8-hour CO Concentration (ppm)
Intersections/Data Sources	Traffic Study	Traffic Study	Traffic Study	Table A.2	Traffic Rpt & Table A.2	Table A.2	Traffic Rpt	Traffic Rpt				SCAQMD	Table A.2	Table A.2		Table A.5	Table A.6	Table A.7	Table A.8	Table A.9	Calculation							0.6 Persistence Factor
Figueroa Street at SR 134 westbound ramps	F	E	D									2020, Projected Future 8-Hour Concentration																
EW Approach				Coastal	2 x 2	3	40	538.5	30	20	2020	4.8	600	40	30.1	0.67	0.21	0.1	0.17	0.81	538.5	20.2	4.2	7.7	1.3	1.1	5.9	3.5
EW Departure				Coastal	2 x 2	3	40	0	30	20	2020	4.8	0	40	20.1	0	0	0			0	0.0	0.0					
NS Approach				Coastal	2 x 2	3	40	280	30	20	2020	4.8	300	40	30.1	0.37	0.17	0.09			280	11.1	1.9					
NS Departure				Coastal	2 x 2	3	40	676.5	30	20	2020	4.8	700	40	20.1	0.76	0.23	0.1			676.5	15.3	1.5					

Appendix B-1: SCLF - No Project Alternative (@3,400 TPD)

Flare and Surface Gas Emissions - Criteria Pollutants and Toxic Air Contaminants

Appendix B-1: Spreadsheet Index	
Table 1	No Project Alternative - Landfill Gas Generation
Table 2	No Project Alternative Methane Generation
Table 3	No Project Alternative Flare - NOx Emissions Summary
Table 4	No Project Alternative Flare - CO Emissions Summary
Table 5	No Project Alternative Flare - VOCs Emissions Summary
Table 6	No Project Alternative Flare - PM10 Emissions Summary
Table 7	No Project Alternative Flare - SO2 Emissions Summary
Table 8	No Project Alternative Flare - Toxic Emissions
Table 9	No Project Alternative Surface Gas Fugitive Emissions
Table 10	No Project Alternative Tier 1 Screening Level Health Risk Assessment - Flare&Fugitive Emissions

Table 1 - No Project Alternative Landfill Gas Generation		
Year	SCFM	MMCMY
	Remaining Capacity: 4.85 mil.tons	
	3,400 TPD	
1987	1533.023225	19.38
1988	1692.623762	21.40
1989	1739.746825	21.99
1990	1795.494627	22.70
1991	1839.797321	23.26
1992	1880.557239	23.77
1993	1914.90539	24.21
1994	1949.225001	24.64
1995	1973.697945	24.95
1996	1990.333649	25.16
1997	2006.17523	25.36
1998	2032.540951	25.70
1999	2055.355175	25.98
2000	2071.991693	26.19
2001	2094.457303	26.48
2002	2106.827719	26.64
2003	2119.877946	26.80
2004	2142.576331	27.09
2005	2161.380211	27.32
2006	2178.625742	27.54
2007	2198.930096	27.80
2008	2214.248339	27.99
2009	2222.078759	28.09
2010	2220.348514	28.07
2011	2300.4674	29.08
2012	2379.02173	30.08
2013	2456.173228	31.05
2014	2531.789875	32.01
2015	2557.026395	32.33
2016	2506.802321	31.69
2017	2457.875992	31.07

Baseline Conditions	
SCFM	MMCMY
Remaining Capacity: 4.85 mil.tons	
1400 TPD	
1533.023225	19.38
1692.623762	21.40
1739.746825	21.99
1795.494627	22.70
1839.797321	23.26
1880.557239	23.77
1914.90539	24.21
1949.225001	24.64
1973.697945	24.95
1990.333649	25.16
2006.17523	25.36
2032.540951	25.70
2055.355175	25.98
2071.991693	26.19
2094.457303	26.48
2106.827719	26.64
2119.877946	26.80
2142.576331	27.09
2161.380211	27.32
2178.625742	27.54
2198.930096	27.80
2214.248339	27.99
2222.078759	28.09
2220.348514	28.07
2227.806704	28.16
2235.0037	28.26
2242.079649	28.35
2249.300952	28.44
2256.97556	28.53
2263.718206	28.62
2270.597133	28.71

Year	Table 1 - No Project Alternative Landfill Gas Generation		Baseline Conditions	
	SCFM	MMCMY	SCFM	MMCMY
	Remaining Capacity: 4.85 mil.tons		*Remaining Capacity: 4.85 mil.tons*	
	3,400 TPD		**1400 TPD**	
2018	2410.363023	30.47	2277.373921	28.79
2019	2363.73497	29.88	2283.908033	28.87
2020	2317.738147	29.30	2290.05368	28.95
2021	2272.724528	28.73	2296.504718	29.03
2022	2228.942897	28.18	2260.809482	28.58
2023	2185.794731	27.63	2217.259321	28.03
2024	2143.712741	27.10	2174.35225	27.49
2025	2102.367484	26.58	2132.469827	26.96
2026	2061.809538	26.07	2091.333387	26.44
2027	2022.204601	25.57	2050.996505	25.93
2028	1982.938451	25.07	2011.603888	25.43
2029	1944.724977	24.59	1972.535063	24.94
2030	1906.902622	24.11	1934.544859	24.46
2031	1869.934147	23.64	1896.889376	23.98
2032	1833.987872	23.19	1860.115673	23.52
2033	1798.524684	22.74	1824.353498	23.06
2034	1763.779698	22.30	1789.074389	22.62
2035	1729.920585	21.87	1754.553583	22.18
2036	1696.630119	21.45	1720.827003	21.76
2037	1664.00958	21.04	1687.708921	21.34
2038	1631.828278	20.63	1655.272356	20.93
2039	1600.162933	20.23	1623.267003	20.52
2040	1568.987672	19.84	1591.767789	20.12
	2557.026395			
		32.33		29.03

Legend

(grey)	No Project Closure Date
(blue)	No Project Peak Year

Conversions		Operating Schedule
35.31	ft^3/m^3	60
1000000	m^3/MMcm	24
35,310,000	ft^3/MMcm	310
		7440

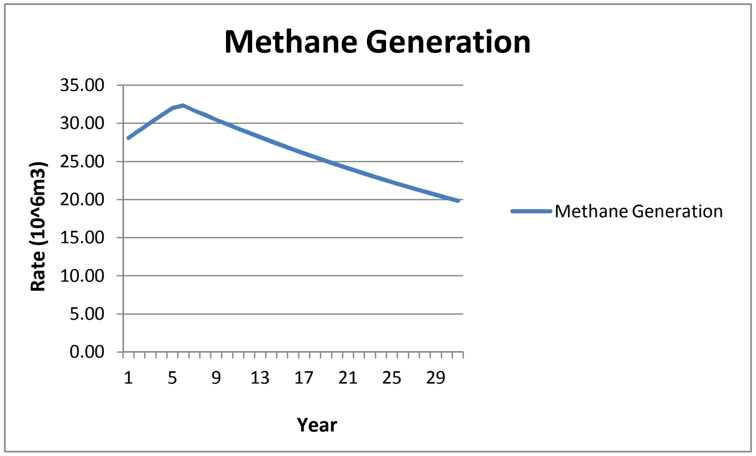
Uncontrolled Methane Gas Production
No Project Alternative

Table 2 - No Project Alternative Flare Gas Emissions				
Year	Time (yrs)	Q_{CH4} (10^6 m^3/yr)	Reference	LFG (10^6 m^3/yr)
2010	0	28.07	SCLF	82.56
2011	1	29.08		85.54
2012	2	30.08		88.46
2013	3	31.05		91.33
2014	4	32.01		94.14
2015	**5**	**32.33**		**95.08**
2016	6	31.69		93.21
2017	7	31.07		91.39
2018	8	30.47		89.63
2019	9	29.88		87.89
2020	10	29.30		86.18
2021	11	28.73		84.51
2022	12	28.18		82.88
2023	13	27.63		81.27
2024	14	27.10		79.71
2025	15	26.58		78.17
2026	16	26.07		76.66
2027	17	25.57		75.19
2028	18	25.07		73.73
2029	19	24.59		72.31
2030	20	24.11		70.90
2031	21	23.64		69.53
2032	22	23.19		68.19
2033	23	22.74		66.88
2034	24	22.30		65.58
2035	25	21.87		64.32
2036	26	21.45		63.09
2037	27	21.04		61.87
2038	28	20.63		60.68
2039	29	20.23		59.50
2040	30	19.84		58.34

34% Percent of Methane in LFG

34% Historic Average

Peak = 95.08



NOx FLARE EMISSIONS

Table 3: No Project Alternative - NOx Emissions Summary							
Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor Capacity @ 7,000 scfm (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of NOx from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	(7.2)	(0.07)	(0.39)	(0.02)
2	30.08	84.04	(4.46)	(4.5)	(0.04)	(0.24)	(0.01)
3	31.05	86.76	(1.74)	(1.7)	(0.02)	(0.09)	(0.00)
4	32.01	89.43	0.93	0.9	0.01	0.05	0.00
5	**32.33**	**90.32**	**1.82**	**1.8**	**0.02**	**0.10**	**0.00**
6	31.69	88.55	0.05	0.1	0.00	0.00	0.00
7	31.07	86.82	(1.68)	(1.7)	(0.02)	(0.09)	(0.00)
8	30.47	85.14	(3.36)	(3.4)	(0.03)	(0.18)	(0.01)
9	29.88	83.50	(5.00)	(5.0)	(0.05)	(0.27)	(0.01)
10	29.30	81.87	(6.63)	(6.6)	(0.06)	(0.35)	(0.01)
11	28.73	80.28	(8.22)	(8.2)	(0.08)	(0.44)	(0.02)
12	28.18	78.74	(9.76)	(9.8)	(0.10)	(0.52)	(0.02)
13	27.63	77.21	(11.29)	(11.3)	(0.11)	(0.60)	(0.03)
14	27.10	75.72	(12.78)	(12.8)	(0.12)	(0.68)	(0.03)
15	26.58	74.26	(14.24)	(14.2)	(0.14)	(0.76)	(0.03)
16	26.07	72.83	(15.67)	(15.7)	(0.15)	(0.84)	(0.03)
17	25.57	71.43	(17.07)	(17.1)	(0.17)	(0.91)	(0.04)
18	25.07	70.05	(18.45)	(18.5)	(0.18)	(0.99)	(0.04)
19	24.59	68.70	(19.80)	(19.8)	(0.19)	(1.06)	(0.04)
20	24.11	67.36	(21.14)	(21.1)	(0.21)	(1.13)	(0.05)
21	23.64	66.05	(22.45)	(22.4)	(0.22)	(1.20)	(0.05)
22	23.19	64.78	(23.72)	(23.7)	(0.23)	(1.27)	(0.05)
23	22.74	63.53	(24.97)	(25.0)	(0.24)	(1.34)	(0.06)
24	22.30	62.30	(26.20)	(26.2)	(0.26)	(1.40)	(0.06)
25	21.87	61.11	(27.39)	(27.4)	(0.27)	(1.47)	(0.06)
26	21.45	59.93	(28.57)	(28.6)	(0.28)	(1.53)	(0.06)
27	21.04	58.78	(29.72)	(29.7)	(0.29)	(1.59)	(0.07)
28	20.63	57.64	(30.86)	(30.9)	(0.30)	(1.65)	(0.07)
29	20.23	56.52	(31.98)	(32.0)	(0.31)	(1.71)	(0.07)
30	19.84	55.42	(33.08)	(33.1)	(0.32)	(1.77)	(0.07)

EF[1]	19.549	lbs/million ft^3 fuel burned		Collection Efficiency	95%
	88.5	GPP Capacity		% to Flares	100%

Notes

1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.

12 flares; 10 active, 2 additional to provide backup

CO FLARE EMISSIONS

Table 4: No Project Alternative - CO Emissions Summary							
Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor Capacity @ 7,000 (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of CO from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	(7.24)	(0.00)	(0.02)	(0.00)
2	30.08	84.04	(4.46)	(4.46)	(0.00)	(0.01)	(0.00)
3	31.05	86.76	(1.74)	(1.74)	(0.00)	(0.01)	(0.00)
4	32.01	89.43	0.93	0.93	0.00	0.00	0.00
5	**32.33**	**90.32**	**1.82**	**1.82**	**0.00**	**0.01**	**0.00**
6	31.69	88.55	0.05	0.05	0.00	0.00	0.00
7	31.07	86.82	(1.68)	(1.68)	(0.00)	(0.01)	(0.00)
8	30.47	85.14	(3.36)	(3.36)	(0.00)	(0.01)	(0.00)
9	29.88	83.50	(5.00)	(5.00)	(0.00)	(0.02)	(0.00)
10	29.30	81.87	(6.63)	(6.63)	(0.00)	(0.02)	(0.00)
11	28.73	80.28	(8.22)	(8.22)	(0.00)	(0.03)	(0.00)
12	28.18	78.74	(9.76)	(9.76)	(0.01)	(0.03)	(0.00)
13	27.63	77.21	(11.29)	(11.29)	(0.01)	(0.03)	(0.00)
14	27.10	75.72	(12.78)	(12.78)	(0.01)	(0.04)	(0.00)
15	26.58	74.26	(14.24)	(14.24)	(0.01)	(0.04)	(0.00)
16	26.07	72.83	(15.67)	(15.67)	(0.01)	(0.05)	(0.00)
17	25.57	71.43	(17.07)	(17.07)	(0.01)	(0.05)	(0.00)
18	25.07	70.05	(18.45)	(18.45)	(0.01)	(0.06)	(0.00)
19	24.59	68.70	(19.80)	(19.80)	(0.01)	(0.06)	(0.00)
20	24.11	67.36	(21.14)	(21.14)	(0.01)	(0.06)	(0.00)
21	23.64	66.05	(22.45)	(22.45)	(0.01)	(0.07)	(0.00)
22	23.19	64.78	(23.72)	(23.72)	(0.01)	(0.07)	(0.00)
23	22.74	63.53	(24.97)	(24.97)	(0.01)	(0.08)	(0.00)
24	22.30	62.30	(26.20)	(26.20)	(0.01)	(0.08)	(0.00)
25	21.87	61.11	(27.39)	(27.39)	(0.02)	(0.08)	(0.00)
26	21.45	59.93	(28.57)	(28.57)	(0.02)	(0.09)	(0.00)
27	21.04	58.78	(29.72)	(29.72)	(0.02)	(0.09)	(0.00)
28	20.63	57.64	(30.86)	(30.86)	(0.02)	(0.09)	(0.00)
29	20.23	56.52	(31.98)	(31.98)	(0.02)	(0.10)	(0.00)
30	19.84	55.42	(33.08)	(33.08)	(0.02)	(0.10)	(0.00)

EF[1]	1.121	lbs/million ft^3 fuel burned		Collection Efficiency	95%	
	88.5	GPP Capacity		% to Flares	100%	

Notes
1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.
12 flares; 10 active, 2 additional to provide backup

VOC FLARE EMISSIONS

Table 5: No Project Alternative - VOCs Emissions Summary							
Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor Capacity @ 7,000 scfm (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of VOCs from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	(7.2)	(0.01)	(0.03)	(0.00)
2	30.08	84.04	(4.46)	(4.5)	(0.00)	(0.02)	(0.00)
3	31.05	86.76	(1.74)	(1.7)	(0.00)	(0.01)	(0.00)
4	32.01	89.43	0.93	0.9	0.00	0.00	0.00
5	**32.33**	**90.32**	**1.82**	**1.8**	**0.00**	**0.01**	**0.00**
6	31.69	88.55	0.05	0.1	0.00	0.00	0.00
7	31.07	86.82	(1.68)	(1.7)	(0.00)	(0.01)	(0.00)
8	30.47	85.14	(3.36)	(3.4)	(0.00)	(0.01)	(0.00)
9	29.88	83.50	(5.00)	(5.0)	(0.00)	(0.02)	(0.00)
10	29.30	81.87	(6.63)	(6.6)	(0.01)	(0.03)	(0.00)
11	28.73	80.28	(8.22)	(8.2)	(0.01)	(0.04)	(0.00)
12	28.18	78.74	(9.76)	(9.8)	(0.01)	(0.04)	(0.00)
13	27.63	77.21	(11.29)	(11.3)	(0.01)	(0.05)	(0.00)
14	27.10	75.72	(12.78)	(12.8)	(0.01)	(0.06)	(0.00)
15	26.58	74.26	(14.24)	(14.2)	(0.01)	(0.06)	(0.00)
16	26.07	72.83	(15.67)	(15.7)	(0.01)	(0.07)	(0.00)
17	25.57	71.43	(17.07)	(17.1)	(0.01)	(0.07)	(0.00)
18	25.07	70.05	(18.45)	(18.5)	(0.01)	(0.08)	(0.00)
19	24.59	68.70	(19.80)	(19.8)	(0.02)	(0.09)	(0.00)
20	24.11	67.36	(21.14)	(21.1)	(0.02)	(0.09)	(0.00)
21	23.64	66.05	(22.45)	(22.4)	(0.02)	(0.10)	(0.00)
22	23.19	64.78	(23.72)	(23.7)	(0.02)	(0.10)	(0.00)
23	22.74	63.53	(24.97)	(25.0)	(0.02)	(0.11)	(0.00)
24	22.30	62.30	(26.20)	(26.2)	(0.02)	(0.11)	(0.00)
25	21.87	61.11	(27.39)	(27.4)	(0.02)	(0.12)	(0.00)
26	21.45	59.93	(28.57)	(28.6)	(0.02)	(0.12)	(0.01)
27	21.04	58.78	(29.72)	(29.7)	(0.02)	(0.13)	(0.01)
28	20.63	57.64	(30.86)	(30.9)	(0.02)	(0.13)	(0.01)
29	20.23	56.52	(31.98)	(32.0)	(0.03)	(0.14)	(0.01)
30	19.84	55.42	(33.08)	(33.1)	(0.03)	(0.14)	(0.01)

EF[1]	1.586	lbs/million ft^3 fuel burned		Collection Efficiency	95%
	88.5	GPP Capacity		% to Flares	100%

Notes

1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.

12 flares; 10 active, 2 additional to provide backup

PM10 FLARE EMISSIONS

Table 6: No Project Alternative PM10 Emissions Summary							
Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor Capacity @ 7,000 scfm (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of PM10 from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	(7.2)	(0.02)	(0.12)	(0.01)
2	30.08	84.04	(4.46)	(4.5)	(0.01)	(0.07)	(0.00)
3	31.05	86.76	(1.74)	(1.7)	(0.01)	(0.03)	(0.00)
4	32.01	89.43	0.93	0.9	0.00	0.02	0.00
5	**32.33**	**90.32**	**1.82**	**1.8**	**0.01**	**0.03**	**0.00**
6	31.69	88.55	0.05	0.1	0.00	0.00	0.00
7	31.07	86.82	(1.68)	(1.7)	(0.01)	(0.03)	(0.00)
8	30.47	85.14	(3.36)	(3.4)	(0.01)	(0.06)	(0.00)
9	29.88	83.50	(5.00)	(5.0)	(0.02)	(0.08)	(0.00)
10	29.30	81.87	(6.63)	(6.6)	(0.02)	(0.11)	(0.00)
11	28.73	80.28	(8.22)	(8.2)	(0.03)	(0.14)	(0.01)
12	28.18	78.74	(9.76)	(9.8)	(0.03)	(0.16)	(0.01)
13	27.63	77.21	(11.29)	(11.3)	(0.03)	(0.19)	(0.01)
14	27.10	75.72	(12.78)	(12.8)	(0.04)	(0.21)	(0.01)
15	26.58	74.26	(14.24)	(14.2)	(0.04)	(0.24)	(0.01)
16	26.07	72.83	(15.67)	(15.7)	(0.05)	(0.26)	(0.01)
17	25.57	71.43	(17.07)	(17.1)	(0.05)	(0.29)	(0.01)
18	25.07	70.05	(18.45)	(18.5)	(0.06)	(0.31)	(0.01)
19	24.59	68.70	(19.80)	(19.8)	(0.06)	(0.33)	(0.01)
20	24.11	67.36	(21.14)	(21.1)	(0.06)	(0.35)	(0.01)
21	23.64	66.05	(22.45)	(22.4)	(0.07)	(0.37)	(0.02)
22	23.19	64.78	(23.72)	(23.7)	(0.07)	(0.40)	(0.02)
23	22.74	63.53	(24.97)	(25.0)	(0.08)	(0.42)	(0.02)
24	22.30	62.30	(26.20)	(26.2)	(0.08)	(0.44)	(0.02)
25	21.87	61.11	(27.39)	(27.4)	(0.08)	(0.46)	(0.02)
26	21.45	59.93	(28.57)	(28.6)	(0.09)	(0.48)	(0.02)
27	21.04	58.78	(29.72)	(29.7)	(0.09)	(0.50)	(0.02)
28	20.63	57.64	(30.86)	(30.9)	(0.09)	(0.52)	(0.02)
29	20.23	56.52	(31.98)	(32.0)	(0.10)	(0.53)	(0.02)
30	19.84	55.42	(33.08)	(33.1)	(0.10)	(0.55)	(0.02)

EF[1]	6.096	lbs/million ft^3 fuel burned		Collection Efficiency	95%
	88.5	GPP Capacity		% to Flares	100%

Notes
1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.
12 flares; 10 active, 2 additional to provide backup

SO2 FLARE EMISSIONS

Table 7: No Project Alternative - SO_2 Emissions Summary							
Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of SO2 from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	(7.24)	(0.01)	(0.07)	(0.00)
2	30.08	84.04	(4.46)	(4.46)	(0.01)	(0.04)	(0.00)
3	31.05	86.76	(1.74)	(1.74)	(0.00)	(0.02)	(0.00)
4	32.01	89.43	0.93	0.93	0.00	0.01	0.00
5	**32.33**	**90.32**	**1.82**	**1.82**	**0.00**	**0.02**	**0.00**
6	31.69	88.55	0.05	0.05	0.00	0.00	0.00
7	31.07	86.82	(1.68)	(1.68)	(0.00)	(0.02)	(0.00)
8	30.47	85.14	(3.36)	(3.36)	(0.01)	(0.03)	(0.00)
9	29.88	83.50	(5.00)	(5.00)	(0.01)	(0.05)	(0.00)
10	29.30	81.87	(6.63)	(6.63)	(0.01)	(0.07)	(0.00)
11	28.73	80.28	(8.22)	(8.22)	(0.02)	(0.08)	(0.00)
12	28.18	78.74	(9.76)	(9.76)	(0.02)	(0.10)	(0.00)
13	27.63	77.21	(11.29)	(11.29)	(0.02)	(0.11)	(0.00)
14	27.10	75.72	(12.78)	(12.78)	(0.02)	(0.13)	(0.01)
15	26.58	74.26	(14.24)	(14.24)	(0.03)	(0.14)	(0.01)
16	26.07	72.83	(15.67)	(15.67)	(0.03)	(0.16)	(0.01)
17	25.57	71.43	(17.07)	(17.07)	(0.03)	(0.17)	(0.01)
18	25.07	70.05	(18.45)	(18.45)	(0.03)	(0.19)	(0.01)
19	24.59	68.70	(19.80)	(19.80)	(0.04)	(0.20)	(0.01)
20	24.11	67.36	(21.14)	(21.14)	(0.04)	(0.21)	(0.01)
21	23.64	66.05	(22.45)	(22.45)	(0.04)	(0.23)	(0.01)
22	23.19	64.78	(23.72)	(23.72)	(0.04)	(0.24)	(0.01)
23	22.74	63.53	(24.97)	(24.97)	(0.05)	(0.25)	(0.01)
24	22.30	62.30	(26.20)	(26.20)	(0.05)	(0.26)	(0.01)
25	21.87	61.11	(27.39)	(27.39)	(0.05)	(0.28)	(0.01)
26	21.45	59.93	(28.57)	(28.57)	(0.05)	(0.29)	(0.01)
27	21.04	58.78	(29.72)	(29.72)	(0.05)	(0.30)	(0.01)
28	20.63	57.64	(30.86)	(30.86)	(0.06)	(0.31)	(0.01)
29	20.23	56.52	(31.98)	(31.98)	(0.06)	(0.32)	(0.01)
30	19.84	55.42	(33.08)	(33.08)	(0.06)	(0.33)	(0.01)

EF[1]	3.677	lbs/million ft^3 fuel burned		Collection Efficiency	95%
	88.5	GPP Capacity		% to Flares	100%

Notes
1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.
12 flares; 10 active, 2 additional to provide backup

Table 8: No Project Alternative Flare - Toxic Emissions							
TAC	Emission Factor[1]	Total Emissions				Per Flare	
	(lbs/10^6 ft^3 fuel burned)	(lbs/yr)	(lbs/day)	(lbs/hr)	(g/s)	(g/s)	(lbs/day)
Benzene*	6.94E-04	1.27E-03	3.47E-06	1.44E-07	1.82E-08	1.82E-09	1.45E-08
p-Dichlorbenzene*	1.85E-04	3.38E-04	9.27E-07	3.86E-08	4.87E-09	4.87E-10	3.86E-09
Chlorofluorocarbons (Freon-11)*	1.97E-04	3.59E-04	9.85E-07	4.10E-08	5.17E-09	5.17E-10	4.11E-09
Perchloroethylene (Tetrachloroethylene)	2.49E-03	4.54E-03	1.24E-05	5.18E-07	6.53E-08	6.53E-09	5.18E-08
Toluene*	5.09E-04	9.28E-04	2.54E-06	1.06E-07	1.34E-08	1.34E-09	1.06E-08
Trichloroethylene	2.19E-03	3.99E-03	1.09E-05	4.56E-07	5.75E-08	5.75E-09	4.56E-08
m-Xylene*	3.80E-04	6.93E-04	1.90E-06	7.91E-08	9.98E-09	9.98E-10	7.92E-09
o-Xylene*	1.33E-04	2.43E-04	6.67E-07	2.78E-08	3.50E-09	3.50E-10	2.78E-09
p-Xylene*	3.75E-04	6.85E-04	1.88E-06	7.82E-08	9.86E-09	9.86E-10	7.82E-09

% to Flares	100%	
Year 2015 Controlled Gas Generation	1.82E+06	ft^3/yr
Year 2015 Controlled Gas Generation	1.82	MMCFY

Notes:

[1] Emission factors obtained from 2006/07 and 2009 AER, based on average of source test data collected during 06 - 08 testing, per SCAQMD Rule 1150.

* Based on average calculated in the 2009 AER; average based on 06, 07 and 08 source test data.

Table 9: No Project Alternative Surface Gas Fugitive Emissions						
TAC	**Emission Factor[1]**	**Molecular Weight[2]**	**Total Emissions**			
	(ppb)		(lbs/yr)	(lbs/day)	(lbs/hr)	(g/s)
Benzene*	1184.00	78.11	28.4	7.78E-02	3.24E-03	4.09E-04
Methylene Chloride (Dichloromethane)*	392.00	84.94	10.2	2.80E-02	1.17E-03	1.47E-04
Perchloroethylene (Tetrachloroethylene)*	441.00	165.83	22.5	6.16E-02	2.56E-03	3.23E-04
Toluene*	9077.00	92.13	256.9	7.04E-01	2.93E-02	3.70E-03
1,3-Butadiene*	11.00	54.09	0.2	5.01E-04	2.09E-05	2.63E-06
Trichloroethylene*	221.00	131.40	8.9	2.44E-02	1.02E-03	1.28E-04
Vinyl Chloride*	235.00	62.50	4.5	1.24E-02	5.15E-04	6.50E-05

Notes:

1. Emission factors obtained from the average of source tests conducted for 1150.1 compliance and used in the 2008-09 AERs.
2. Emission estimates calcuated based on the following equation: Qi = (2)(Ci)(1-e)(L_O)(R)/70 years (MWi)(1 lb mole/385 ft3)

Where: Qi = emission rate for any gas I which is a VOC, lbs/yr

2 = a multiplication factor obtained by assuming the landfill gas consists of 50% methane and 50% carbon dioxide

Ci = concentration in the landfill of gas i, ppbv x 10-9

e = gas collection system efficiency, 95% (5% to surface fugitives)

L_O = potential methane generation capacity of the refuse (3,000 ft3/ton of refuse)

R = total mass of refuse in place, 27.6 MM tons (as of December 2008), 37.95 (Variation 1), and 40.45 (Variation 2)

MWi = molecular weight of compound i

Variable	Factor	Unit
	2	%CH4:%CO2
C_i =	1.00E-09	
e=	95%	
L_O =	3.00E+03	ft^3/yr
R =	2.76E+07	MM tons/refuse

Table 10: No Project Alternative Tier 1 Screening Level Health Risk Assessment - Flare&Fugitive Emissions

Compound Code	TAC	CAS No.	Flare&Fug Emissions		25 Meter		50 Meter		100 Meter	
			(lbs/yr)	(lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)
B1	Benzene*	71-43-2	28.42	3.24E-03	Fail	Pass	Fail	Pass	Fail	Pass
C2	Carbon Disulfide	75-15-0	0.01	1.55E-06	Pass	Pass	Pass	Pass	Pass	Pass
C7	Chlorobenzene	108-90-7	0.01	9.87E-07	Pass		Pass		Pass	
C14	Chloroform	67-66-3	0.00	1.26E-07	Pass	Pass	Pass	Pass	Pass	Pass
D4	p-Dichlorbenzene*	106-46-7	0.00	3.86E-08	Pass		Pass		Pass	
M13	Methylene Chloride (Dichloromethane)	75-09-2	10.23	1.17E-03	Pass	Pass	Pass	Pass	Pass	Pass
P2	Perchloroethylene (Tetrachloroethylene	127-18-4	22.47	2.57E-03	Fail	Pass	Fail	Pass	Pass	Pass
T3	Toluene*	108-88-3	256.93	2.93E-02	Pass	Pass	Pass	Pass	Pass	Pass
B9	1,3-Butadiene*	106-99-0	0.18	2.09E-05	Pass		Pass		Pass	
T8	Trichloroethylene	79-01-6	8.93	1.02E-03	Pass		Pass		Pass	
V5	Vinyl Chloride	75-01-4	4.51	5.15E-04	Fail	Pass	Fail	Pass	Fail	Pass
X2	m-Xylene*	108-38-3	0.00	7.91E-08	Pass	Pass	Pass	Pass	Pass	Pass
X3	o-Xylene*	95-47-6	0.00	2.78E-08	Pass	Pass	Pass	Pass	Pass	Pass
X4	p-Xylene*	106-42-3	0.00	7.82E-08	Pass	Pass	Pass	Pass	Pass	Pass

Compound Code	TAC	CAS No.	Screening Emission Level					
			25 Meter		50 Meter		100 Meter	
			Chronic (lbs/yr)	Acute (lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)
B1	Benzene*	71-43-2	1.14E+00	7.39E-01	2.99E+00	1.48E+00	8.92E+00	3.96E+00
D4	p-Dichlorbenzene*	106-46-7	2.85E+00		7.48E+00		2.23E+01	
M13	Methylene Chloride (Dichloromethane)	75-09-2	3.26E+01	7.00E+00	8.55E+01	1.40E+01	2.55E+02	3.75E+01
P2	Perchloroethylene (Tetrachloroethylene	127-18-4	5.44E+00	1.00E+01	1.43E+01	2.00E+01	4.25E+01	5.35E+01
T3	Toluene*	108-88-3	9.92E+03	1.85E+01	2.60E+04	3.70E+01	7.75E+04	9.91E+01
B9	1,3-Butadiene*	106-99-0	1.90E-01		4.99E-01		1.49E+00	
T8	Trichloroethylene	79-01-6	1.63E+01		4.28E+01		1.27E+02	
V5	Vinyl Chloride	75-01-4	4.23E-01	9.00E+01	1.11E+00	1.80E+02	3.30E+00	4.82E+02
X2	m-Xylene*	108-38-3	2.31E+04	1.10E+01	6.07E+04	2.20E+01	1.81E+05	5.89E+01
X3	o-Xylene*	95-47-6	2.31E+04	1.10E+01	6.07E+04	2.20E+01	1.81E+05	5.89E+01
X4	p-Xylene*	106-42-3	2.31E+04	1.10E+01	6.07E+04	2.20E+01	1.81E+05	5.89E+01

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Table 11a: No Project Tier 1 SLA

Application deemed complete date:	09/10/10
A/N:	
Fac:	

Stack Data

		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	P	P or V
Stack Height or Building Height	16	feet
Area (For Volume Source Only)	900	ft^2
Distance-Residential	200	meters
Distance-Commercial	150	meters
Meteorological Station	Pasadena	

Source Type:	O - Other
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO

Emission Units	lb/hr	
Source output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0-1	lbs/hr
B1	Benzene (including benzene from gasoline)	3.24E-03	78.11	0.00324		0.00324
D4	Dichlorobenzene, p- (or 1,4-dichlorobenzene)	3.86E-08	147.01	3.86E-08		3.86E-08
M13	Methylene chloride(Dichloromethane)	1.17E-03	84.94	0.00117		0.00117
P2	Perchloroethylene (or tetrachloroethylene)	2.57E-03	165.83	0.00257		0.00257
T3	Toluene (methyl benzene)	2.93E-02	92.13	0.0293		0.0293
B9	Butadiene, 1,3-	2.09E-05	54.09	0.0000209		0.0000209
T8	Trichloroethylene	1.02E-03	130.4	0.00102		0.00102
V5	Vinyl chloride (chloroethylene)	5.15E-04	62.5	0.000515		0.000515
X2	Xylene, m-	7.91E-08	106.17	7.91E-08		7.91E-08
X3	Xylene, o-	2.78E-08	106.18	2.78E-08		2.78E-08
X4	Xylene, p-	7.82E-08	106.17	7.82E-08		7.82E-08
				0		
				0		
				0		
				0		
				0		
				0		
				0		
				0		
				0		
				0		
				0		
				0		
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				0		
				0		
				0		
				0		
				0		
				0		
				0		
				0		
				0		

TIER 1 SCREENING RISK ASSESSMENT REPORT

Receptor Distance (actual)	150
Receptor Distance (for X/Q LOOKUP)	100

Tier 1 Results	
Cancer/Chronic ASI	**Acute ASI**
5.30E+00	1.20E-03
FAILED	PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate (lbs/yr)	Max Hourly Emission Rate (lbs/hr)	Cancer / Chronic Pollutant Screening Level (lbs/yr)	Acute Pollutant Screening Level (lbs/hr)	Cancer / Chronic Pollutant Screening Index (PSI)	Acute Pollutant Screening Index (PSI)
Benzene (including benzene from gasoline)	2.83E+01	3.24E-03	8.92E+00	3.96E+00	3.17E+00	8.19E-04
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	3.37E-04	3.86E-08	2.23E+01		1.51E-05	
Methylene chloride(Dichloromethane)	1.02E+01	1.17E-03	2.55E+02	3.75E+01	4.01E-02	3.12E-05
Perchloroethylene (or tetrachloroethylene)	2.25E+01	2.57E-03	4.25E+01	5.35E+01	5.28E-01	4.80E-05
Toluene (methyl benzene)	2.56E+02	2.93E-02	7.75E+04	9.91E+01	3.30E-03	2.96E-04
Butadiene, 1,3-	1.83E-01	2.09E-05	1.49E+00		1.23E-01	
Trichloroethylene	8.91E+00	1.02E-03	1.27E+02		6.99E-02	
Vinyl chloride (chloroethylene)	4.50E+00	5.15E-04	3.30E+00	4.82E+02	1.36E+00	1.07E-06
Xylene, m-	6.91E-04	7.91E-08	1.81E+05	5.89E+01	3.82E-09	1.34E-09
Xylene, o-	2.43E-04	2.78E-08	1.81E+05	5.89E+01	1.34E-09	4.72E-10
Xylene, p-	6.83E-04	7.82E-08	1.81E+05	5.89E+01	3.78E-09	1.33E-09
TOTAL (APPLICATION SCREENING INDEX)					**5.30E+00**	**1.20E-03**

Table 11c: No Project Alternative Tier 2 SLA

TIER 2 SCREENING RISK ASSESSMENT REPORT

A/N:	
Fac:	

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.88
4 hr	0.93
6 or 7 hrs	0.87

Dispersion Factors tables

3	For Chronic X/Q
6	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	2.24	119.2
Commercial	4.99	246.35

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

3. Rule 1401 Compound Data

Table 11c: No Project Alternative Tier 2 SLA

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	3.24E-03	3.24E-03	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	3.86E-08	3.86E-08	4.00E-02	1	1	1	1	800	
Methylene chloride(Dichloromethane)	1.17E-03	1.17E-03	3.50E-03	1	1	1	1.0000	400	14000
Perchloroethylene (or tetrachloroethylene)	2.57E-03	2.57E-03	2.10E-02	1	1	1	1	35	20000
Toluene (methyl benzene)	2.93E-02	2.93E-02		1.0000	1.0000	1	1	300	37000
Butadiene, 1,3-	2.09E-05	2.09E-05	6.00E-01	1.0000	1.0000	1	1	20	
Trichloroethylene	1.02E-03	1.02E-03	7.00E-03	1	1	1	1	600	
Vinyl chloride (chloroethylene)	5.15E-04	5.15E-04	2.70E-01	1	1	1	1		180000
Xylene, m-	7.91E-08	7.91E-08		1.0000	1.0000	1	1	700	22000
Xylene, o-	2.78E-08	2.78E-08		1	1	1	1	700	22000
Xylene, p-	7.82E-08	7.82E-08		1	1	1.0000	1.0000	700	22000

Table 11c: No Project Alternative Tier 2 SLA

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	3.24E-03	3.24E-03	28.30464	0.01415232
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	3.86E-08	3.86E-08	0.00033721	1.68605E-07
Methylene chloride(Dichloromethane)	1.17E-03	1.17E-03	10.22112	0.00511056
Perchloroethylene (or tetrachloroethylene)	2.57E-03	2.57E-03	22.45152	0.01122576
Toluene (methyl benzene)	2.93E-02	2.93E-02	255.9648	0.1279824
Butadiene, 1,3-	2.09E-05	2.09E-05	0.1825824	9.12912E-05
Trichloroethylene	1.02E-03	1.02E-03	8.91072	0.00445536
Vinyl chloride (chloroethylene)	5.15E-04	5.15E-04	4.49904	0.00224952
Xylene, m-	7.91E-08	7.91E-08	0.00069102	3.45509E-07
Xylene, o-	2.78E-08	2.78E-08	0.00024286	1.2143E-07
Xylene, p-	7.82E-08	7.82E-08	0.00068316	3.41578E-07
Total	3.78E-02	3.78E-02	3.31E+02	1.65E-01

Table 11c: No Project Alternative Tier 2 SLA

A/N: | **Application deemed complete date:** 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	8.09E-07	3.52E-07
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	3.85E-12	1.68E-12
Methylene chloride(Dichloromethane)	1.02E-08	4.45E-09
Perchloroethylene (or tetrachloroethylene)	1.35E-07	5.86E-08
Toluene (methyl benzene)		
Butadiene, 1,3-	3.13E-08	1.36E-08
Trichloroethylene	1.78E-08	7.75E-09
Vinyl chloride (chloroethylene)	3.47E-07	1.51E-07
Xylene, m-		
Xylene, o-		
Xylene, p-		
Total	**1.35E-06**	**5.87E-07**
	PASS	**PASS**

5b. Cancer Burden	**YES**
X/Q for one-in-a-million:	1.6592912179
Distance (meter)	249.21
Area (km2):	1.95E-01
Population:	1,365
Cancer Burden:	**1.84E-03**

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Table 11c: No Project Alternative Tier 2 SLA

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		1.41E-03	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		5.61E-05	Pass	Pass
Developmental - DEV	8.09E-04	2.91E-03	Pass	Pass
Endocrine system - END			Pass	Pass
Eye	2.27E-04	3.26E-05	Pass	Pass
Hematopoietic system - HEM	6.14E-04	1.04E-03	Pass	Pass
Immune system - IMM	6.14E-04		Pass	Pass
Kidney - KID		1.41E-03	Pass	Pass
Nervous system - NS	2.48E-04	3.00E-03	Pass	Pass
Reproductive system - REP	8.09E-04	2.00E-05	Pass	Pass
Respiratory system - RES	2.27E-04	1.87E-03	Pass	Pass
Skin			Pass	Pass

Table 11c: No Project Alternative Tier 2 SLA

A/N: **Application deemed complete date:** 09/10/10

6a. Hazard Index Acute

HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			2.97E-04		2.97E-04	2.97E-04		2.97E-04		
Dichlorobenzene, p- (or 1,4-dichlorobenzene)										
Methylene chloride(Dichloromethane)							9.96E-06			
Perchloroethylene (or tetrachloroethylene)				1.53E-05			1.53E-05		1.53E-05	
Toluene (methyl benzene)			9.44E-05	9.44E-05			9.44E-05	9.44E-05	9.44E-05	
Butadiene, 1,3-										
Trichloroethylene										
Vinyl chloride (chloroethylene)				3.41E-07			3.41E-07		3.41E-07	
Xylene, m-				4.29E-10					4.29E-10	
Xylene, o-				1.51E-10					1.51E-10	
Xylene, p-				4.24E-10					4.24E-10	
Total			3.91E-04	1.10E-04	2.97E-04	2.97E-04	1.20E-04	3.91E-04	1.10E-04	

Table 11c: No Project Alternative Tier 2 SLA

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			6.14E-04		6.14E-04	6.14E-04		6.14E-04		
Dichlorobenzene, p- (or 1,4-dichlorobenzene)										
Methylene chloride(Dichloromethane)							2.06E-05			
Perchloroethylene (or tetrachloroethylene)				3.17E-05			3.17E-05		3.17E-05	
Toluene (methyl benzene)			1.95E-04	1.95E-04			1.95E-04	1.95E-04	1.95E-04	
Butadiene, 1,3-										
Trichloroethylene										
Vinyl chloride (chloroethylene)				7.05E-07			7.05E-07		7.05E-07	
Xylene, m-				8.86E-10					8.86E-10	
Xylene, o-				3.11E-10					3.11E-10	
Xylene, p-				8.76E-10					8.76E-10	
Total			8.09E-04	2.27E-04	6.14E-04	6.14E-04	2.48E-04	8.09E-04	2.27E-04	

Table 11c: No Project Alternative Tier 2 SLA

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				4.65E-04			4.65E-04			4.65E-04			
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	4.15E-10								4.15E-10	4.15E-10		4.15E-10	
Methylene chloride(Dichloromethane)			2.52E-05							2.52E-05			
Perchloroethylene (or tetrachloroethylene)	6.32E-04								6.32E-04				
Toluene (methyl benzene)				8.41E-04						8.41E-04		8.41E-04	
Butadiene, 1,3-											9.00E-06		
Trichloroethylene						1.46E-05				1.46E-05			
Vinyl chloride (chloroethylene)													
Xylene, m-										9.73E-10		9.73E-10	
Xylene, o-										3.42E-10		3.42E-10	
Xylene, p-										9.62E-10		9.62E-10	
Total	6.32E-04		2.52E-05	1.31E-03		1.46E-05	4.65E-04		6.32E-04	1.35E-03	9.00E-06	8.41E-04	

A/N: | **Application deemed complete date:** 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.04E-03			1.04E-03			1.04E-03			
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	9.25E-10								9.25E-10	9.25E-10		9.25E-10	
Methylene chloride(Dichloromethane)			5.61E-05							5.61E-05			
Perchloroethylene (or tetrachloroethylene)	1.41E-03								1.41E-03				
Toluene (methyl benzene)				1.87E-03						1.87E-03		1.87E-03	
Butadiene, 1,3-											2.00E-05		
Trichloroethylene						3.26E-05				3.26E-05			
Vinyl chloride (chloroethylene)													
Xylene, m-										2.17E-09		2.17E-09	
Xylene, o-										7.62E-10		7.62E-10	
Xylene, p-										2.14E-09		2.14E-09	
Total	1.41E-03		5.61E-05	2.91E-03		3.26E-05	1.04E-03		1.41E-03	3.00E-03	2.00E-05	1.87E-03	

Appendix B-2: SCLF - Variation 1

Flare and Surface Gas Emissions - Criteria Pollutants and Toxic Air Contaminants

Appendix B-2 Spreadsheet Index	
Table 1	Landfill Gas Generation (Baseline: Variation 1)
Table 2	Variation 1 Methane Generation (Incremental Increase)
Table 3	Variation 1 Flare - NOx Emissions Summary
Table 4	Variation 1 Flare - CO Emissions Summary
Table 5	Variation 1 Flare - VOCs Emissions Summary
Table 6	Variation 1 Flare - PM10 Emissions Summary
Table 7	Variation 1 Flare - SO2 Emissions Summary
Table 8	Variation 1 Flare - Toxic Emissions
Table 9	Variation 1 Surface Gas Fugitive Emissions
Table 10	Variation 1 Tier 1 Screening Level Health Risk Assessment - Flare&Fugitive Emissions
Table 11a	Variation 1 - SLA Emissions
Table 11b	Variation 1 - Tier 1 SLA
Table 11c	Variation 1 - Tier 2 SLA

Table 1 - Landfill Gas Generation (Baseline:Variation 1)

Year	Baseline Conditions		Variation 1	
	SCFM	MMCMY	SCFM	MMCMY
	Remaining Capacity: 4.85 mil.tons		*Remaining Capacity: 10.35 mil.tons*	
	1400 TPD		3400 TPD	
1987	1533.023225	19.38	1533.023225	19.38
1988	1692.623762	21.40	1692.623762	21.40
1989	1739.746825	21.99	1739.746825	21.99
1990	1795.494627	22.70	1795.494627	22.70
1991	1839.797321	23.26	1839.797321	23.26
1992	1880.557239	23.77	1880.557239	23.77
1993	1914.90539	24.21	1914.90539	24.21
1994	1949.225001	24.64	1949.225001	24.64
1995	1973.697945	24.95	1973.697945	24.95
1996	1990.333649	25.16	1990.333649	25.16
1997	2006.17523	25.36	2006.17523	25.36
1998	2032.540951	25.70	2032.540951	25.70
1999	2055.355175	25.98	2055.355175	25.98
2000	2071.991693	26.19	2071.991693	26.19
2001	2094.457303	26.48	2094.457303	26.48
2002	2106.827719	26.64	2106.827719	26.64
2003	2119.877946	26.80	2119.877946	26.80
2004	2142.576331	27.09	2142.576331	27.09
2005	2161.380211	27.32	2161.380211	27.32
2006	2178.625742	27.54	2178.625742	27.54
2007	2198.930096	27.80	2198.930096	27.80
2008	2214.248339	27.99	2214.248339	27.99
2009	2222.078759	28.09	2222.078759	28.09

Table 1 - Landfill Gas Generation (Baseline:Variation 1)				
Year	Baseline Conditions		Variation 1	
	SCFM	MMCMY	SCFM	MMCMY
	Remaining Capacity: 4.85 mil.tons		*Remaining Capacity: 10.35 mil.tons*	
	1400 TPD		**3400 TPD**	
2010	2220.348514	28.07	2220.348514	28.07
2011	2227.806704	28.16	2300.4674	29.08
2012	2235.0037	28.26	2379.02173	30.08
2013	2242.079649	28.35	2456.173228	31.05
2014	2249.300952	28.44	2531.789875	32.01
2015	2256.97556	28.53	2605.976243	32.95
2016	2263.718206	28.62	2678.71881	33.87
2017	2270.597133	28.71	2750.013214	34.77
2018	2277.373921	28.79	2820.091721	35.65
2019	2283.908033	28.87	2888.751896	36.52
2020	2290.05368	28.95	2933.809716	37.09
2021	2296.504718	29.03	2876.092875	36.36
2022	2260.809482	28.58	2820.289957	35.65
2023	2217.259321	28.03	2765.467662	34.96
2024	2174.35225	27.49	2711.987285	34.29
2025	2132.469827	26.96	2659.183089	33.62
2026	2091.333387	26.44	2607.627862	32.97
2027	2050.996505	25.93	2557.354683	32.33
2028	2011.603888	25.43	2507.774757	31.70
2029	1972.535063	24.94	2459.313154	31.09
2030	1934.544859	24.46	2412.063609	30.49
2031	1896.889376	23.98	2365.61467	29.91
2032	1860.115673	23.52	2320.095671	29.33
2033	1824.353498	23.06	2275.075998	28.76
2034	1789.074389	22.62	2231.154665	28.21
2035	1754.553583	22.18	2187.880868	27.66
2036	1720.827003	21.76	2145.461598	27.12
2037	1687.708921	21.34	2104.226918	26.60
2038	1655.272356	20.93	2063.572556	26.09
2039	1623.267003	20.52	2023.639554	25.58
2040	1591.767789	20.12	1984.88921	25.09

Incremental Change - MMCMY
Baseline:Variation 1
0.00
0.92
1.82
2.71
3.57
4.41
5.25
6.06
6.86
7.65
8.14
7.33
7.07
6.93
6.80
6.66
6.53
6.40
6.27
6.15
6.04
5.93
5.82
5.70
5.59
5.48
5.37
5.27
5.16
5.06
4.97

Legend

No Project Closure Date

Variation 1 Peak Year

Conversions		Operating Schedule
35.31	ft^3/m^3	60
1000000	m^3/MMcm	24
35,310,000	ft^3/MMcm	310
		7440

Uncontrolled Methane Gas Production
Variation 1

Table 2 - Variation 1 Methane Generation (Incremental Increase)				
Year	**Time (yrs)**	**Q_{CH4} (10^6 m^3/yr)**	**Reference**	**LFG (10^6 m^3/yr)**
2010	0	28.07	SCLF	82.56
2011	1	29.08		85.54
2012	2	30.08		88.46
2013	3	31.05		91.33
2014	4	32.01		94.14
2015	5	32.95		96.90
2016	6	33.87		99.60
2017	7	34.77		102.25
2018	8	35.65		104.86
2019	9	36.52		107.41
2020	**10**	37.09		**109.09**
2021	11	36.36		106.94
2022	12	35.65		104.87
2023	13	34.96		102.83
2024	14	34.29		100.84
2025	15	33.62		98.88
2026	16	32.97		96.96
2027	17	32.33		95.09
2028	18	31.70		93.25
2029	19	31.09		91.45
2030	20	30.49		89.69
2031	21	29.91		87.96
2032	22	29.33		86.27
2033	23	28.76		84.59
2034	24	28.21		82.96
2035	25	27.66		81.35
2036	26	27.12		79.78
2037	27	26.60		78.24
2038	28	26.09		76.73
2039	29	25.58		75.25
2040	30	25.09		73.80

34% Percent of Methane in LFG

34% Historic Average

Peak = 109.09

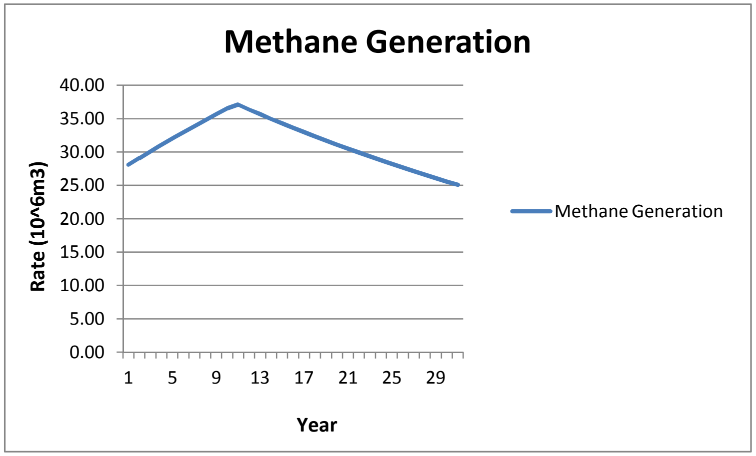

Table 3: Variation 1 Flare - NOx Emissions Summary							
Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor Capacity @ 7,000 scfm (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of NOx from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	0.0	0.00	0.00	0.00
2	30.08	84.04	(4.46)	0.0	0.00	0.00	0.00
3	31.05	86.76	(1.74)	0.0	0.00	0.00	0.00
4	32.01	89.43	0.93	0.9	0.01	0.05	0.00
5	32.95	92.05	3.55	3.6	0.03	0.19	0.01
6	33.87	94.62	6.12	6.1	0.06	0.33	0.01
7	34.77	97.14	8.64	8.6	0.08	0.46	0.02
8	35.65	99.62	11.12	11.1	0.11	0.60	0.02
9	36.52	102.04	13.54	13.5	0.13	0.73	0.03
10	**37.09**	**103.63**	**15.13**	**15.1**	**0.15**	**0.81**	**0.03**
11	36.36	101.60	13.10	13.1	0.13	0.70	0.03
12	35.65	99.62	11.12	11.1	0.11	0.60	0.02
13	34.96	97.69	9.19	9.2	0.09	0.49	0.02
14	34.29	95.80	7.30	7.3	0.07	0.39	0.02
15	33.62	93.93	5.43	5.4	0.05	0.29	0.01
16	32.97	92.11	3.61	3.6	0.04	0.19	0.01
17	32.33	90.34	1.84	1.8	0.02	0.10	0.00
18	31.70	88.58	0.08	0.1	0.00	0.00	0.00
19	31.09	86.87	(1.63)	0.0	0.00	0.00	0.00
20	30.49	85.20	(3.30)	0.0	0.00	0.00	0.00
21	29.91	83.56	(4.94)	0.0	0.00	0.00	0.00
22	29.33	81.96	(6.54)	0.0	0.00	0.00	0.00
23	28.76	80.37	(8.13)	0.0	0.00	0.00	0.00
24	28.21	78.81	(9.69)	0.0	0.00	0.00	0.00
25	27.66	77.28	(11.22)	0.0	0.00	0.00	0.00
26	27.12	75.79	(12.71)	0.0	0.00	0.00	0.00
27	26.60	74.33	(14.17)	0.0	0.00	0.00	0.00
28	26.09	72.89	(15.61)	0.0	0.00	0.00	0.00
29	25.58	71.48	(17.02)	0.0	0.00	0.00	0.00
30	25.09	70.11	(18.39)	0.0	0.00	0.00	0.00

EF[1]	19.549	lbs/million ft^3 fuel burned		Landfill Flare eff.	95%
	88.5	GPP Capacity		% to Flares	100%

Notes

1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.

12 flares; 10 active, 2 additional to provide backup

Table 4: Variation 1 Flare - CO Emissions Summary							
Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor Capacity @ 7,000 scfm (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of CO from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	0.0	0.00	0.00	0.00
2	30.08	84.04	(4.46)	0.0	0.00	0.00	0.00
3	31.05	86.76	(1.74)	0.0	0.00	0.00	0.00
4	32.01	89.43	0.93	0.9	0.00	0.00	0.00
5	32.95	92.05	3.55	3.6	0.00	0.01	0.00
6	33.87	94.62	6.12	6.1	0.00	0.02	0.00
7	34.77	97.14	8.64	8.6	0.00	0.03	0.00
8	35.65	99.62	11.12	11.1	0.01	0.03	0.00
9	36.52	102.04	13.54	13.5	0.01	0.04	0.00
10	**37.09**	**103.63**	**15.13**	**15.1**	**0.01**	**0.05**	**0.00**
11	36.36	101.60	13.10	13.1	0.01	0.04	0.00
12	35.65	99.62	11.12	11.1	0.01	0.03	0.00
13	34.96	97.69	9.19	9.2	0.01	0.03	0.00
14	34.29	95.80	7.30	7.3	0.00	0.02	0.00
15	33.62	93.93	5.43	5.4	0.00	0.02	0.00
16	32.97	92.11	3.61	3.6	0.00	0.01	0.00
17	32.33	90.34	1.84	1.8	0.00	0.01	0.00
18	31.70	88.58	0.08	0.1	0.00	0.00	0.00
19	31.09	86.87	(1.63)	0.0	0.00	0.00	0.00
20	30.49	85.20	(3.30)	0.0	0.00	0.00	0.00
21	29.91	83.56	(4.94)	0.0	0.00	0.00	0.00
22	29.33	81.96	(6.54)	0.0	0.00	0.00	0.00
23	28.76	80.37	(8.13)	0.0	0.00	0.00	0.00
24	28.21	78.81	(9.69)	0.0	0.00	0.00	0.00
25	27.66	77.28	(11.22)	0.0	0.00	0.00	0.00
26	27.12	75.79	(12.71)	0.0	0.00	0.00	0.00
27	26.60	74.33	(14.17)	0.0	0.00	0.00	0.00
28	26.09	72.89	(15.61)	0.0	0.00	0.00	0.00
29	25.58	71.48	(17.02)	0.0	0.00	0.00	0.00
30	25.09	70.11	(18.39)	0.0	0.00	0.00	0.00

EF[1]	1.121	lbs/million ft^3 fuel burned		Landfill Flare eff.	95%
	88.5	GPP Capacity		% to Flares	100%

Notes

1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.

12 flares; 10 active, 2 additional to provide backup

Table 5: Variation 1 Flare - VOCs Emissions Summary

Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor Capacity @ 7,000 scfm (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of VOCs from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	0.0	0.00	0.00	0.00
2	30.08	84.04	(4.46)	0.0	0.00	0.00	0.00
3	31.05	86.76	(1.74)	0.0	0.00	0.00	0.00
4	32.01	89.43	0.93	0.9	0.00	0.00	0.00
5	32.95	92.05	3.55	3.6	0.00	0.02	0.00
6	33.87	94.62	6.12	6.1	0.00	0.03	0.00
7	34.77	97.14	8.64	8.6	0.01	0.04	0.00
8	35.65	99.62	11.12	11.1	0.01	0.05	0.00
9	36.52	102.04	13.54	13.5	0.01	0.06	0.00
10	**37.09**	**103.63**	**15.13**	**15.1**	**0.01**	**0.07**	**0.00**
11	36.36	101.60	13.10	13.1	0.01	0.06	0.00
12	35.65	99.62	11.12	11.1	0.01	0.05	0.00
13	34.96	97.69	9.19	9.2	0.01	0.04	0.00
14	34.29	95.80	7.30	7.3	0.01	0.03	0.00
15	33.62	93.93	5.43	5.4	0.00	0.02	0.00
16	32.97	92.11	3.61	3.6	0.00	0.02	0.00
17	32.33	90.34	1.84	1.8	0.00	0.01	0.00
18	31.70	88.58	0.08	0.1	0.00	0.00	0.00
19	31.09	86.87	(1.63)	0.0	0.00	0.00	0.00
20	30.49	85.20	(3.30)	0.0	0.00	0.00	0.00
21	29.91	83.56	(4.94)	0.0	0.00	0.00	0.00
22	29.33	81.96	(6.54)	0.0	0.00	0.00	0.00
23	28.76	80.37	(8.13)	0.0	0.00	0.00	0.00
24	28.21	78.81	(9.69)	0.0	0.00	0.00	0.00
25	27.66	77.28	(11.22)	0.0	0.00	0.00	0.00
26	27.12	75.79	(12.71)	0.0	0.00	0.00	0.00
27	26.60	74.33	(14.17)	0.0	0.00	0.00	0.00
28	26.09	72.89	(15.61)	0.0	0.00	0.00	0.00
29	25.58	71.48	(17.02)	0.0	0.00	0.00	0.00
30	25.09	70.11	(18.39)	0.0	0.00	0.00	0.00

EF[1]	1.586	lbs/million ft^3 fuel burned		Landfill Flare eff.	95%
	88.5	GPP Capacity		% to Flares	100%

Notes

1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.

12 flares; 10 active, 2 additional to provide backup

Table 6: Variation 1 Flare - PM10 Emissions Summary							
Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor Capacity @ 7,000 scfm (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of PM10 from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	0.0	0.00	0.00	0.00
2	30.08	84.04	(4.46)	0.0	0.00	0.00	0.00
3	31.05	86.76	(1.74)	0.0	0.00	0.00	0.00
4	32.01	89.43	0.93	0.9	0.00	0.02	0.00
5	32.95	92.05	3.55	3.6	0.01	0.06	0.00
6	33.87	94.62	6.12	6.1	0.02	0.10	0.00
7	34.77	97.14	8.64	8.6	0.03	0.14	0.01
8	35.65	99.62	11.12	11.1	0.03	0.19	0.01
9	36.52	102.04	13.54	13.5	0.04	0.23	0.01
10	**37.09**	**103.63**	**15.13**	**15.1**	**0.05**	**0.25**	**0.01**
11	36.36	101.60	13.10	13.1	0.04	0.22	0.01
12	35.65	99.62	11.12	11.1	0.03	0.19	0.01
13	34.96	97.69	9.19	9.2	0.03	0.15	0.01
14	34.29	95.80	7.30	7.3	0.02	0.12	0.01
15	33.62	93.93	5.43	5.4	0.02	0.09	0.00
16	32.97	92.11	3.61	3.6	0.01	0.06	0.00
17	32.33	90.34	1.84	1.8	0.01	0.03	0.00
18	31.70	88.58	0.08	0.1	0.00	0.00	0.00
19	31.09	86.87	(1.63)	0.0	0.00	0.00	0.00
20	30.49	85.20	(3.30)	0.0	0.00	0.00	0.00
21	29.91	83.56	(4.94)	0.0	0.00	0.00	0.00
22	29.33	81.96	(6.54)	0.0	0.00	0.00	0.00
23	28.76	80.37	(8.13)	0.0	0.00	0.00	0.00
24	28.21	78.81	(9.69)	0.0	0.00	0.00	0.00
25	27.66	77.28	(11.22)	0.0	0.00	0.00	0.00
26	27.12	75.79	(12.71)	0.0	0.00	0.00	0.00
27	26.60	74.33	(14.17)	0.0	0.00	0.00	0.00
28	26.09	72.89	(15.61)	0.0	0.00	0.00	0.00
29	25.58	71.48	(17.02)	0.0	0.00	0.00	0.00
30	25.09	70.11	(18.39)	0.0	0.00	0.00	0.00

EF[1]	6.096	lbs/million ft^3 fuel burned		Landfill Flare eff.	95%
	88.5	GPP Capacity		% to Flares	100%

Notes

1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.

12 flares; 10 active, 2 additional to provide backup

Table 7: Variation 1 Flare - SO_2 Emissions Summary							
Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor Capacity @ 7,000 scfm (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of SO2 from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	0.0	0.00	0.00	0.00
2	30.08	84.04	(4.46)	0.0	0.00	0.00	0.00
3	31.05	86.76	(1.74)	0.0	0.00	0.00	0.00
4	32.01	89.43	0.93	0.9	0.00	0.01	0.00
5	32.95	92.05	3.55	3.6	0.01	0.04	0.00
6	33.87	94.62	6.12	6.1	0.01	0.06	0.00
7	34.77	97.14	8.64	8.6	0.02	0.09	0.00
8	35.65	99.62	11.12	11.1	0.02	0.11	0.00
9	36.52	102.04	13.54	13.5	0.02	0.14	0.01
10	**37.09**	**103.63**	**15.13**	**15.1**	**0.03**	**0.15**	**0.01**
11	36.36	101.60	13.10	13.1	0.02	0.13	0.01
12	35.65	99.62	11.12	11.1	0.02	0.11	0.00
13	34.96	97.69	9.19	9.2	0.02	0.09	0.00
14	34.29	95.80	7.30	7.3	0.01	0.07	0.00
15	33.62	93.93	5.43	5.4	0.01	0.05	0.00
16	32.97	92.11	3.61	3.6	0.01	0.04	0.00
17	32.33	90.34	1.84	1.8	0.00	0.02	0.00
18	31.70	88.58	0.08	0.1	0.00	0.00	0.00
19	31.09	86.87	(1.63)	0.0	0.00	0.00	0.00
20	30.49	85.20	(3.30)	0.0	0.00	0.00	0.00
21	29.91	83.56	(4.94)	0.0	0.00	0.00	0.00
22	29.33	81.96	(6.54)	0.0	0.00	0.00	0.00
23	28.76	80.37	(8.13)	0.0	0.00	0.00	0.00
24	28.21	78.81	(9.69)	0.0	0.00	0.00	0.00
25	27.66	77.28	(11.22)	0.0	0.00	0.00	0.00
26	27.12	75.79	(12.71)	0.0	0.00	0.00	0.00
27	26.60	74.33	(14.17)	0.0	0.00	0.00	0.00
28	26.09	72.89	(15.61)	0.0	0.00	0.00	0.00
29	25.58	71.48	(17.02)	0.0	0.00	0.00	0.00
30	25.09	70.11	(18.39)	0.0	0.00	0.00	0.00

EF[1]	3.677	lbs/million ft^3 fuel burned		Landfill Flare eff.	95%
	88.5	GPP Capacity		% to Flares	100%

Notes

1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.

12 flares; 10 active, 2 additional to provide backup

Table 8: Variation 1 Flare - Toxic Emissions[1]							
TAC	Emission Factor[2]	Total Emissions				Per Flare	
	(lbs/10^6 ft^3 fuel burned)	(lbs/yr)	(lbs/day)	(lbs/hr)	(g/s)	(g/s)	(lbs/day)
Benzene*	6.94E-04	1.05E-02	2.88E-05	1.20E-06	1.51E-07	1.51E-08	1.20E-07
p-Dichlorbenzene*	1.85E-04	2.81E-03	7.69E-06	3.20E-07	4.04E-08	4.04E-09	3.21E-08
Chlorofluorocarbons (Freon-11)*	1.97E-04	2.98E-03	8.17E-06	3.40E-07	4.29E-08	4.29E-09	3.41E-08
Perchloroethylene (Tetrachloroethylene)	2.49E-03	3.76E-02	1.03E-04	4.29E-06	5.42E-07	5.42E-08	4.30E-07
Toluene*	5.09E-04	7.70E-03	2.11E-05	8.79E-07	1.11E-07	1.11E-08	8.80E-08
Trichloroethylene	2.19E-03	3.31E-02	9.07E-05	3.78E-06	4.77E-07	4.77E-08	3.78E-07
m-Xylene*	3.80E-04	5.75E-03	1.58E-05	6.56E-07	8.28E-08	8.28E-09	6.57E-08
o-Xylene*	1.33E-04	2.02E-03	5.53E-06	2.30E-07	2.91E-08	2.91E-09	2.31E-08
p-Xylene*	3.75E-04	5.68E-03	1.56E-05	6.48E-07	8.17E-08	8.17E-09	6.49E-08

% to Flares	100%	
Year 2020 Controlled Gas Generation	1.51E+07	ft^3/yr
Year 2020 Controlled Gas Generation	15.13	MMCFY

Notes:

1. Emissions are calculated using the following equation: Emission Factor (lbs/MMscf) x Controlled Flow Rate to Flares (MMscf/yr)
2. Emission factors obtained from 2009 AER, based on average of source test data collected during 06 - 08 testing, per SCAQMD Rule 1150.

* Based on average calculated in the 2009 AER; average based on 06, 07 and 08 source test data.

Table 9: Variation 1 Surface Gas Fugitive Emissions							
TAC	**Emission Factor**[1]	**Molecular Weight**[2]	**Total Emissions**				
	(ppb)		(lbs/yr)	(lbs/day)	(lbs/hr)	(g/s)	
Benzene	1184.00	78.11	39.1	0.1	4.46E-03	5.62E-04	
Methylene Chloride (Dichloromethane)	392.00	84.94	14.1	0.0	1.61E-03	2.02E-04	
Perchloroethylene (Tetrachloroethylene)	441.00	165.83	30.9	0.1	3.53E-03	4.45E-04	
Toluene	9077.00	92.13	353.3	1.0	4.03E-02	5.09E-03	
1,3-Butadiene	11.00	54.09	0.3	0.0	2.87E-05	3.62E-06	
Trichloroethylene	221.00	131.40	12.3	0.0	1.40E-03	1.77E-04	
Vinyl Chloride	235.00	62.50	6.2	0.0	7.08E-04	8.93E-05	

Notes:

1. Emission factors obtained from the average of source tests conducted for 1150.1 compliance and used in the 2008-09 AERs.
2. Emission estimates calcuated based on the following equation: Qi = (2)(Ci)(1-e)(L_O)(R)/70 years (MWi)(1 lb mole/385 ft3)

Where: Qi = emission rate for any gas I which is a VOC, lbs/yr

2 = a multiplication factor obtained by assuming the landfill gas consists of 50% methane and 50% carbon dioxide

Ci = concentration in the landfill of gas i, ppbv x 10-9

e = gas collection system efficiency, 95% (Exiting Conditions/Variation 1) and 98% (Variation 2)

L_O = potential methane generation capacity of the refuse (3,000 ft3/ton of refuse)

R = total mass of refuse in place, 27.6 MM tons (as of December 2008), 37.95 (Variation 1), and 40.45 (Variation 2)

MWi = molecular weight of compound i

Variable	Factor	Unit
	2	%CH4:%CO2
C_i =	1.00E-09	
e=	95%	

Table 10: Variation 1 Tier 1 Screening Level Health Risk Assessment - Flare&Fugitive Emissions

Compound Code	TAC	CAS No.	Flare&Fug Emissions		25 Meter		50 Meter		100 Meter	
			(lbs/yr)	(lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)
B1	Benzene*	71-43-2	39.08	4.46E-03	Fail	Pass	Fail	Pass	Fail	Pass
D4	p-Dichlorbenzene*	106-46-7	0.00	3.20E-07	Pass		Pass		Pass	
M13	Methylene Chloride (Dichloromethane)	75-09-2	14.07	1.61E-03	Pass	Pass	Pass	Pass	Pass	Pass
P2	Perchloroethylene (Tetrachloroethylene	127-18-4	30.93	3.53E-03	Fail	Pass	Fail	Pass	Pass	Pass
T3	Toluene*	108-88-3	353.29	4.03E-02	Pass	Pass	Pass	Pass	Pass	Pass
B9	1,3-Butadiene*	106-99-0	0.25	2.87E-05	Fail		Pass		Pass	
T8	Trichloroethylene	79-01-6	12.30	1.40E-03	Pass		Pass		Pass	
V5	Vinyl Chloride	75-01-4	6.20	7.08E-04	Fail	Pass	Fail	Pass	Fail	Pass
X2	m-Xylene*	108-38-3	0.01	6.56E-07	Pass	Pass	Pass	Pass	Pass	Pass
X3	o-Xylene*	95-47-6	0.00	2.30E-07	Pass	Pass	Pass	Pass	Pass	Pass
X4	p-Xylene*	106-42-3	0.01	6.48E-07	Pass	Pass	Pass	Pass	Pass	Pass

Compound Code	TAC	CAS No.	Screening Emission Level					
			25 Meter		50 Meter		100 Meter	
			Chronic (lbs/yr)	Acute (lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)
B1	Benzene*	71-43-2	1.14E+00	7.39E-01	2.99E+00	1.48E+00	8.92E+00	3.96E+00
D4	p-Dichlorbenzene*	106-46-7	2.85E+00		7.48E+00		2.23E+01	
M13	Methylene Chloride (Dichloromethane)	75-09-2	3.26E+01	7.00E+00	8.55E+01	1.40E+01	2.55E+02	3.75E+01
P2	Perchloroethylene (Tetrachloroethylene	127-18-4	5.44E+00	1.00E+01	1.43E+01	2.00E+01	4.25E+01	5.35E+01
T3	Toluene*	108-88-3	9.92E+03	1.85E+01	2.60E+04	3.70E+01	7.75E+04	9.91E+01
B9	1,3-Butadiene*	106-99-0	1.90E-01		4.99E-01		1.49E+00	
T8	Trichloroethylene	79-01-6	1.63E+01		4.28E+01		1.27E+02	
V5	Vinyl Chloride	75-01-4	4.23E-01	9.00E+01	1.11E+00	1.80E+02	3.30E+00	4.82E+02
X2	m-Xylene*	108-38-3	2.31E+04	1.10E+01	6.07E+04	2.20E+01	1.81E+05	5.89E+01
X3	o-Xylene*	95-47-6	2.31E+04	1.10E+01	6.07E+04	2.20E+01	1.81E+05	5.89E+01
X4	p-Xylene*	106-42-3	2.31E+04	1.10E+01	6.07E+04	2.20E+01	1.81E+05	5.89E+01

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Table 11a: Variation 1 Tier 2 Emissions Summary

Application deemed complete date:	09/10/10
A/N:	
Fac:	

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	P	P or V
Stack Height or Building Height	16	feet
Area (For Volume Source Only)	900	ft^2
Distance-Residential	200	meters
Distance-Commercial	150	meters
Meteorological Station	Pasadena	

Source Type:	O - Other	
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO	

Emission Units	lb/hr	
Source output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0-1	lbs/hr
B1	Benzene (including benzene from gasoline)	4.46E-03	78.11	0.00446		0.00446
D4	Dichlorobenzene, p- (or 1,4-dichlorobenzene)	3.20E-07	147.01	0.00000032		0.00000032
M13	Methylene chloride(Dichloromethane)	1.61E-03	84.94	0.00161		0.00161
P2	Perchloroethylene (or tetrachloroethylene)	3.53E-03	165.83	0.00353		0.00353
T3	Toluene (methyl benzene)	4.03E-02	92.13	0.0403		0.0403
B9	Butadiene, 1,3-	2.87E-05	54.09	0.0000287		0.0000287
T8	Trichloroethylene	1.40E-03	130.4	0.0014		0.0014
V5	Vinyl chloride (chloroethylene)	7.08E-04	62.5	0.000708		0.000708
X2	Xylene, m-	6.56E-07	106.17	0.000000656		0.000000656
X3	Xylene, o-	2.30E-07	106.18	0.00000023		0.00000023
X4	Xylene, p-	6.48E-07	106.17	0.000000648		0.000000648
				0		
				0		
				0		
				0		
				0		
				0		
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				0		
				0		

TIER 1 SCREENING RISK ASSESSMENT REPORT

Receptor Distance (actual)	150
Receptor Distance (for X/Q LOOKUP)	100

Tier 1 Results	
Cancer/Chronic ASI	**Acute ASI**
7.29E+00	1.64E-03
FAILED	PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate (lbs/yr)	Max Hourly Emission Rate (lbs/hr)	Cancer / Chronic Pollutant Screening Level (lbs/yr)	Acute Pollutant Screening Level (lbs/hr)	Cancer / Chronic Pollutant Screening Index (PSI)	Acute Pollutant Screening Index (PSI)
Benzene (including benzene from gasoline)	3.90E+01	4.46E-03	8.92E+00	3.96E+00	4.37E+00	1.13E-03
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	2.80E-03	3.20E-07	2.23E+01		1.25E-04	
Methylene chloride(Dichloromethane)	1.41E+01	1.61E-03	2.55E+02	3.75E+01	5.52E-02	4.30E-05
Perchloroethylene (or tetrachloroethylene)	3.08E+01	3.53E-03	4.25E+01	5.35E+01	7.26E-01	6.59E-05
Toluene (methyl benzene)	3.52E+02	4.03E-02	7.75E+04	9.91E+01	4.54E-03	4.07E-04
Butadiene, 1,3-	2.51E-01	2.87E-05	1.49E+00		1.69E-01	
Trichloroethylene	1.22E+01	1.40E-03	1.27E+02		9.59E-02	
Vinyl chloride (chloroethylene)	6.19E+00	7.08E-04	3.30E+00	4.82E+02	1.87E+00	1.47E-06
Xylene, m-	5.73E-03	6.56E-07	1.81E+05	5.89E+01	3.17E-08	1.11E-08
Xylene, o-	2.01E-03	2.30E-07	1.81E+05	5.89E+01	1.11E-08	3.90E-09
Xylene, p-	5.66E-03	6.48E-07	1.81E+05	5.89E+01	3.13E-08	1.10E-08
TOTAL (APPLICATION SCREENING INDEX)					**7.29E+00**	**1.64E-03**

TIER 2 SCREENING RISK ASSESSMENT REPORT

Table 11c: Variation 1 Tier 2 SLA

A/N:	
Fac:	

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.88
4 hr	0.93
6 or 7 hrs	0.87

Dispersion Factors tables

3	For Chronic X/Q
6	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	2.24	119.2
Commercial	4.99	246.35

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

3. Rule 1401 Compound Data

Table 11c: Variation 1 Tier 2 SLA

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	4.46E-03	4.46E-03	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	3.20E-07	3.20E-07	4.00E-02	1	1	1	1	800	
Methylene chloride(Dichloromethane)	1.61E-03	1.61E-03	3.50E-03	1	1	1	1.0000	400	14000
Perchloroethylene (or tetrachloroethylene)	3.53E-03	3.53E-03	2.10E-02	1	1	1	1	35	20000
Toluene (methyl benzene)	4.03E-02	4.03E-02		1.0000	1.0000	1	1	300	37000
Butadiene, 1,3-	2.87E-05	2.87E-05	6.00E-01	1.0000	1.0000	1	1	20	
Trichloroethylene	1.40E-03	1.40E-03	7.00E-03	1	1	1	1	600	
Vinyl chloride (chloroethylene)	7.08E-04	7.08E-04	2.70E-01	1	1	1	1		180000
Xylene, m-	6.56E-07	6.56E-07		1.0000	1.0000	1	1	700	22000
Xylene, o-	2.30E-07	2.30E-07		1	1	1	1	700	22000
Xylene, p-	6.48E-07	6.48E-07		1	1	1.0000	1.0000	700	22000

Table 11c: Variation 1 Tier 2 SLA

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	4.46E-03	4.46E-03	38.96256	0.01948128
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	3.20E-07	3.20E-07	0.00279552	1.39776E-06
Methylene chloride(Dichloromethane)	1.61E-03	1.61E-03	14.06496	0.00703248
Perchloroethylene (or tetrachloroethylene)	3.53E-03	3.53E-03	30.83808	0.01541904
Toluene (methyl benzene)	4.03E-02	4.03E-02	352.0608	0.1760304
Butadiene, 1,3-	2.87E-05	2.87E-05	0.2507232	0.000125362
Trichloroethylene	1.40E-03	1.40E-03	12.2304	0.0061152
Vinyl chloride (chloroethylene)	7.08E-04	7.08E-04	6.185088	0.003092544
Xylene, m-	6.56E-07	6.56E-07	0.00573082	2.86541E-06
Xylene, o-	2.30E-07	2.30E-07	0.00200928	1.00464E-06
Xylene, p-	6.48E-07	6.48E-07	0.00566093	2.83046E-06
Total	5.20E-02	5.20E-02	4.55E+02	2.27E-01

Table 11c: Variation 1 Tier 2 SLA

A/N: | **Application deemed complete date:** 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	1.11E-06	4.84E-07
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	3.20E-11	1.39E-11
Methylene chloride(Dichloromethane)	1.41E-08	6.12E-09
Perchloroethylene (or tetrachloroethylene)	1.85E-07	8.05E-08
Toluene (methyl benzene)		
Butadiene, 1,3-	4.30E-08	1.87E-08
Trichloroethylene	2.45E-08	1.06E-08
Vinyl chloride (chloroethylene)	4.77E-07	2.08E-07
Xylene, m-		
Xylene, o-		
Xylene, p-		
Total	**1.86E-06**	**8.08E-07**
	PASS	**PASS**

5b. Cancer Burden	**YES**
X/Q for one-in-a-million:	1.2061691619
Distance (meter)	287.61
Area (km2):	2.60E-01
Population:	1,818
Cancer Burden:	**3.38E-03**

6. Hazard Index

Table 11c: Variation 1 Tier 2 SLA

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		1.93E-03	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		7.72E-05	Pass	Pass
Developmental - DEV	1.11E-03	4.00E-03	Pass	Pass
Endocrine system - END			Pass	Pass
Eye	3.13E-04	4.48E-05	Pass	Pass
Hematopoietic system - HEM	8.45E-04	1.43E-03	Pass	Pass
Immune system - IMM	8.45E-04		Pass	Pass
Kidney - KID		1.93E-03	Pass	Pass
Nervous system - NS	3.41E-04	4.12E-03	Pass	Pass
Reproductive system - REP	1.11E-03	2.75E-05	Pass	Pass
Respiratory system - RES	3.13E-04	2.58E-03	Pass	Pass
Skin			Pass	Pass

Table 11c: Variation 1 Tier 2 SLA

A/N: [ ] **Application deemed complete date:** 09/10/10

6a. Hazard Index Acute

HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			4.09E-04		4.09E-04	4.09E-04		4.09E-04		
Dichlorobenzene, p- (or 1,4-dichlorobenzene)										
Methylene chloride(Dichloromethane)							1.37E-05			
Perchloroethylene (or tetrachloroethylene)				2.10E-05			2.10E-05		2.10E-05	
Toluene (methyl benzene)			1.30E-04	1.30E-04			1.30E-04	1.30E-04	1.30E-04	
Butadiene, 1,3-										
Trichloroethylene										
Vinyl chloride (chloroethylene)				4.69E-07			4.69E-07		4.69E-07	
Xylene, m-				3.55E-09					3.55E-09	
Xylene, o-				1.25E-09					1.25E-09	
Xylene, p-				3.51E-09					3.51E-09	
Total			5.39E-04	1.51E-04	4.09E-04	4.09E-04	1.65E-04	5.39E-04	1.51E-04	

Table 11c: Variation 1 Tier 2 SLA

Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
	HIA - Commercial									
Benzene (including benzene from gasoline)			8.45E-04		8.45E-04	8.45E-04		8.45E-04		
Dichlorobenzene, p- (or 1,4-dichlorobenzene)										
Methylene chloride(Dichloromethane)							2.83E-05			
Perchloroethylene (or tetrachloroethylene)				4.35E-05			4.35E-05		4.35E-05	
Toluene (methyl benzene)			2.68E-04	2.68E-04			2.68E-04	2.68E-04	2.68E-04	
Butadiene, 1,3-										
Trichloroethylene										
Vinyl chloride (chloroethylene)				9.69E-07			9.69E-07		9.69E-07	
Xylene, m-				7.35E-09					7.35E-09	
Xylene, o-				2.58E-09					2.58E-09	
Xylene, p-				7.26E-09					7.26E-09	
Total			1.11E-03	3.13E-04	8.45E-04	8.45E-04	3.41E-04	1.11E-03	3.13E-04	

Table 11c: Variation 1 Tier 2 SLA

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				6.40E-04			6.40E-04			6.40E-04			
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	3.44E-09								3.44E-09	3.44E-09		3.44E-09	
Methylene chloride(Dichloromethane)			3.47E-05							3.47E-05			
Perchloroethylene (or tetrachloroethylene)	8.68E-04								8.68E-04				
Toluene (methyl benzene)				1.16E-03						1.16E-03		1.16E-03	
Butadiene, 1,3-											1.24E-05		
Trichloroethylene						2.01E-05				2.01E-05			
Vinyl chloride (chloroethylene)													
Xylene, m-										8.07E-09		8.07E-09	
Xylene, o-										2.83E-09		2.83E-09	
Xylene, p-										7.97E-09		7.97E-09	
Total	8.68E-04		3.47E-05	1.80E-03		2.01E-05	6.40E-04		8.68E-04	1.85E-03	1.24E-05	1.16E-03	

A/N: Table 11c: Variation 1 Tier 2 SLA **Application deemed complete date:** 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.43E-03			1.43E-03			1.43E-03			
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	7.67E-09								7.67E-09	7.67E-09		7.67E-09	
Methylene chloride(Dichloromethane)			7.72E-05							7.72E-05			
Perchloroethylene (or tetrachloroethylene)	1.93E-03								1.93E-03				
Toluene (methyl benzene)				2.58E-03						2.58E-03		2.58E-03	
Butadiene, 1,3-											2.75E-05		
Trichloroethylene						4.48E-05				4.48E-05			
Vinyl chloride (chloroethylene)													
Xylene, m-										1.80E-08		1.80E-08	
Xylene, o-										6.30E-09		6.30E-09	
Xylene, p-										1.78E-08		1.78E-08	
Total	1.93E-03		7.72E-05	4.00E-03		4.48E-05	1.43E-03		1.93E-03	4.12E-03	2.75E-05	2.58E-03	

Appendix B-3: SCLF - Variation 2

Flare and Surface Gas Emissions - Criteria Pollutants and Toxic Air Contaminants

Appendix B-3 Spreadsheet Index	
Table 1	Landfill Gas Generation (Baseline: Variation 2)
Table 2	Variation 2 Methane Generation (Incremental Increase)
Table 3	Variation 2 Flare - NOx Emissions Summary
Table 4	Variation 2 Flare - CO Emissions Summary
Table 5	Variation 2 Flare - VOCs Emissions Summary
Table 6	Variation 2 Flare - PM10 Emissions Summary
Table 7	Variation 2 Flare - SO2 Emissions Summary
Table 8	Variation 2 Flare - Toxic Emissions
Table 9	Variation 2 Surface Gas Fugitive Emissions
Table 10	Variation 2 Tier 1 Screening Level Health Risk Assessment - Flare&Fugitive Emissions
Table 11a	Variation 2 - SLA Emissions
Table 11b	Variation 2 - Tier 1 SLA
Table 11c	Variation 2 - Tier 2 SLA

Table 1: Landfill Gas Generation (Baseline:Variation 2)				
Year	Baseline (Existing Conditions)		Variation 2	
	SCFM	MMCMY	SCFM	MMCMY
	Remaining Capacity: 4.85 mil.tons		*Remaining Capacity: 12.85 mil.tons*	
	1400 TPD		3400 TPD	
1987	1533.023225	19.38	1533.023225	19.38
1988	1692.623762	21.40	1692.623762	21.40
1989	1739.746825	21.99	1739.746825	21.99
1990	1795.494627	22.70	1795.494627	22.70
1991	1839.797321	23.26	1839.797321	23.26
1992	1880.557239	23.77	1880.557239	23.77
1993	1914.90539	24.21	1914.90539	24.21
1994	1949.225001	24.64	1949.225001	24.64
1995	1973.697945	24.95	1973.697945	24.95
1996	1990.333649	25.16	1990.333649	25.16
1997	2006.17523	25.36	2006.17523	25.36
1998	2032.540951	25.70	2032.540951	25.70
1999	2055.355175	25.98	2055.355175	25.98
2000	2071.991693	26.19	2071.991693	26.19
2001	2094.457303	26.48	2094.457303	26.48
2002	2106.827719	26.64	2106.827719	26.64
2003	2119.877946	26.80	2119.877946	26.80
2004	2142.576331	27.09	2142.576331	27.09
2005	2161.380211	27.32	2161.380211	27.32
2006	2178.625742	27.54	2178.625742	27.54
2007	2198.930096	27.80	2198.930096	27.80
2008	2214.248339	27.99	2214.248339	27.99
2009	2222.078759	28.09	2222.078759	28.09

Table 1: Landfill Gas Generation (Baseline:Variation 2)				
Year	**Baseline (Existing Conditions)**		**Variation 2**	
	SCFM	**MMCMY**	**SCFM**	**MMCMY**
	Remaining Capacity: 4.85 mil.tons		***Remaining Capacity: 12.85 mil.tons***	
	1400 TPD		**3400 TPD**	
2010	2220.348514	28.07	2220.348514	28.07
2011	2227.806704	28.16	2300.4674	29.08
2012	2235.0037	28.26	2379.02173	30.08
2013	2242.079649	28.35	2456.173228	31.05
2014	2249.300952	28.44	2531.789875	32.01
2015	2256.97556	28.53	2605.976243	32.95
2016	2263.718206	28.62	2678.71881	33.87
2017	2270.597133	28.71	2750.013214	34.77
2018	2277.373921	28.79	2820.091721	35.65
2019	2283.908033	28.87	2888.751896	36.52
2020	2290.05368	28.95	2955.983672	37.37
2021	2296.504718	29.03	3021.978421	38.20
2022	**2260.809482**	**28.58**	**3086.604851**	**39.02**
2023	2217.259321	28.03	3049.52519	38.55
2024	2174.35225	27.49	2990.219557	37.80
2025	2132.469827	26.96	2932.237232	37.07
2026	2091.333387	26.44	2875.528569	36.35
2027	2050.996505	25.93	2819.565438	35.65
2028	2011.603888	25.43	2764.850844	34.95
2029	1972.535063	24.94	2711.537169	34.28
2030	1934.544859	24.46	2659.028065	33.62
2031	1896.889376	23.98	2607.815926	32.97
2032	1860.115673	23.52	2557.579749	32.33
2033	1824.353498	23.06	2508.232246	31.71
2034	1789.074389	22.62	2460.035958	31.10
2035	1754.553583	22.18	2412.283003	30.50

Table 1: Landfill Gas Generation (Baseline:Variation 2)				
Year	**Baseline (Existing Conditions)**		**Variation 2**	
	SCFM	**MMCMY**	**SCFM**	**MMCMY**
	Remaining Capacity: 4.85 mil.tons		***Remaining Capacity: 12.85 mil.tons***	
	1400 TPD		**3400 TPD**	
2036	1720.827003	21.76	2365.764212	29.91
2037	1687.708921	21.34	2319.805376	29.33
2038	1655.272356	20.93	2274.830211	28.76
2039	1623.267003	20.52	2231.115525	28.21
2040	1591.767789	20.12	2187.98195	27.66
	7000	88.50		
	3100	39.19		

Legend

(grey)	No Project Closure Date
(blue)	Variation 2 Peak Year

Conversions		Operating Schedule
35.31	ft^3/m^3	60
1000000	m^3/MMcm	24
35,310,000	ft^3/MMcm	310
		7440

Uncontrolled Methane Gas Production
Variation 2

Table 2 - Variation 2 Flare Gas Emissions (Incremental Increase)				
Year	**Time (yrs)**	**Q_{CH4} (10^6 m^3/yr)**	**Reference**	**LFG (10^6 m^3/yr)**
2010	0	28.07		82.56
2011	1	29.08		85.54
2012	2	30.08		88.46
2013	3	31.05		91.33
2014	4	32.01		94.14
2015	5	32.95		96.90
2016	6	33.87		99.60
2017	7	34.77		102.25
2018	8	35.65		104.86
2019	9	36.52		107.41
2020	10	37.37		109.91
2021	11	38.20		112.37
2022	**12**	**39.02**		**114.77**
2023	13	38.55		113.39
2024	14	37.80		111.19
2025	15	37.07	SCLF	109.03
2026	16	36.35		106.92
2027	17	35.65		104.84
2028	18	34.95		102.81
2029	19	34.28		100.82
2030	20	33.62		98.87
2031	21	32.97		96.97
2032	22	32.33		95.10
2033	23	31.71		93.26
2034	24	31.10		91.47
2035	25	30.50		89.70
2036	26	29.91		87.97
2037	27	29.33		86.26
2038	28	28.76		84.59
2039	29	28.21		82.96
2040	30	27.66		81.36
34%	Percent of Methane in LFG			
34%	Historic Average			
			Peak =	114.77

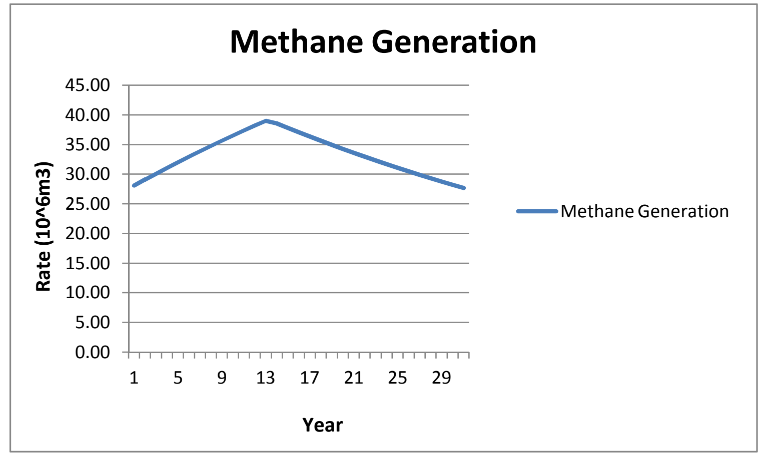

Table 3: Variation 2 Flare - NOx Emissions Summary							
Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor Capacity @ 7,000 scfm (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of NOx from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	(7.24)	(0.07)	(0.39)	(0.02)
2	30.08	84.04	(4.46)	(4.46)	(0.04)	(0.24)	(0.01)
3	31.05	86.76	(1.74)	(1.74)	(0.02)	(0.09)	(0.00)
4	32.01	89.43	0.93	0.93	0.01	0.05	0.00
5	32.95	92.05	3.55	3.55	0.03	0.19	0.01
6	33.87	94.62	6.12	6.12	0.06	0.33	0.01
7	34.77	97.14	8.64	8.64	0.08	0.46	0.02
8	35.65	99.62	11.12	11.12	0.11	0.60	0.02
9	36.52	102.04	13.54	13.54	0.13	0.73	0.03
10	37.37	104.42	15.92	15.92	0.16	0.85	0.04
11	38.20	106.75	18.25	18.25	0.18	0.98	0.04
12	**39.02**	**109.03**	**20.53**	20.53	**0.20**	**1.10**	**0.05**
13	38.55	107.72	19.22	19.22	0.19	1.03	0.04
14	37.80	105.63	17.13	17.13	0.17	0.92	0.04
15	37.07	103.58	15.08	15.08	0.15	0.81	0.03
16	36.35	101.58	13.08	13.08	0.13	0.70	0.03
17	35.65	99.60	11.10	11.10	0.11	0.59	0.02
18	34.95	97.67	9.17	9.17	0.09	0.49	0.02
19	34.28	95.78	7.28	7.28	0.07	0.39	0.02
20	33.62	93.93	5.43	5.43	0.05	0.29	0.01
21	32.97	92.12	3.62	3.62	0.04	0.19	0.01
22	32.33	90.34	1.84	1.84	0.02	0.10	0.00
23	31.71	88.60	0.10	0.10	0.00	0.01	0.00
24	31.10	86.90	(1.60)	(1.60)	(0.02)	(0.09)	(0.00)
25	30.50	85.21	(3.29)	(3.29)	(0.03)	(0.18)	(0.01)
26	29.91	83.57	(4.93)	(4.93)	(0.05)	(0.26)	(0.01)
27	29.33	81.95	(6.55)	(6.55)	(0.06)	(0.35)	(0.01)
28	28.76	80.36	(8.14)	(8.14)	(0.08)	(0.44)	(0.02)
29	28.21	78.81	(9.69)	(9.69)	(0.09)	(0.52)	(0.02)
30	27.66	77.29	(11.21)	(11.21)	(0.11)	(0.60)	(0.03)

EF[1]	19.549	lbs/million ft^3 fuel burned		Landfill Capture and Control	95%
	88.5	GPP Capacity		% to Flares	100%

Notes

1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.

12 flares; 10 active, 2 additional to provide backup

Table 4: Variation 2 Flare - CO Emissions Summary							
Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor Capacity @ 7,000 scfm (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of CO from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	(7.24)	(0.00)	(0.02)	(0.00)
2	30.08	84.04	(4.46)	(4.46)	(0.00)	(0.01)	(0.00)
3	31.05	86.76	(1.74)	(1.74)	(0.00)	(0.01)	(0.00)
4	32.01	89.43	0.93	0.93	0.00	0.00	0.00
5	32.95	92.05	3.55	3.55	0.00	0.01	0.00
6	33.87	94.62	6.12	6.12	0.00	0.02	0.00
7	34.77	97.14	8.64	8.64	0.00	0.03	0.00
8	35.65	99.62	11.12	11.12	0.01	0.03	0.00
9	36.52	102.04	13.54	13.54	0.01	0.04	0.00
10	37.37	104.42	15.92	15.92	0.01	0.05	0.00
11	38.20	106.75	18.25	18.25	0.01	0.06	0.00
12	**39.02**	**109.03**	**20.53**	20.53	**0.01**	**0.06**	**0.00**
13	38.55	107.72	19.22	19.22	0.01	0.06	0.00
14	37.80	105.63	17.13	17.13	0.01	0.05	0.00
15	37.07	103.58	15.08	15.08	0.01	0.05	0.00
16	36.35	101.58	13.08	13.08	0.01	0.04	0.00
17	35.65	99.60	11.10	11.10	0.01	0.03	0.00
18	34.95	97.67	9.17	9.17	0.01	0.03	0.00
19	34.28	95.78	7.28	7.28	0.00	0.02	0.00
20	33.62	93.93	5.43	5.43	0.00	0.02	0.00
21	32.97	92.12	3.62	3.62	0.00	0.01	0.00
22	32.33	90.34	1.84	1.84	0.00	0.01	0.00
23	31.71	88.60	0.10	0.10	0.00	0.00	0.00
24	31.10	86.90	(1.60)	(1.60)	(0.00)	(0.00)	(0.00)
25	30.50	85.21	(3.29)	(3.29)	(0.00)	(0.01)	(0.00)
26	29.91	83.57	(4.93)	(4.93)	(0.00)	(0.02)	(0.00)
27	29.33	81.95	(6.55)	(6.55)	(0.00)	(0.02)	(0.00)
28	28.76	80.36	(8.14)	(8.14)	(0.00)	(0.03)	(0.00)
29	28.21	78.81	(9.69)	(9.69)	(0.01)	(0.03)	(0.00)
30	27.66	77.29	(11.21)	(11.21)	(0.01)	(0.03)	(0.00)

EF[1]	1.121	lbs/million ft^3 fuel burned		Landfill Flare eff.	95%
	88.5	GPP Capacity		% to Flares	100%

Notes

1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.

12 flares; 10 active, 2 additional to provide backup

Table 5: Variation 2 Flare - VOCs Emissions Summary							
Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor Capacity @ 7,000 scfm (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of VOCs from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	(7.24)	(0.01)	(0.03)	(0.00)
2	30.08	84.04	(4.46)	(4.46)	(0.00)	(0.02)	(0.00)
3	31.05	86.76	(1.74)	(1.74)	(0.00)	(0.01)	(0.00)
4	32.01	89.43	0.93	0.93	0.00	0.00	0.00
5	32.95	92.05	3.55	3.55	0.00	0.02	0.00
6	33.87	94.62	6.12	6.12	0.00	0.03	0.00
7	34.77	97.14	8.64	8.64	0.01	0.04	0.00
8	35.65	99.62	11.12	11.12	0.01	0.05	0.00
9	36.52	102.04	13.54	13.54	0.01	0.06	0.00
10	37.37	104.42	15.92	15.92	0.01	0.07	0.00
11	38.20	106.75	18.25	18.25	0.01	0.08	0.00
12	**39.02**	**109.03**	**20.53**	20.53	**0.02**	**0.09**	**0.00**
13	38.55	107.72	19.22	19.22	0.02	0.08	0.00
14	37.80	105.63	17.13	17.13	0.01	0.07	0.00
15	37.07	103.58	15.08	15.08	0.01	0.07	0.00
16	36.35	101.58	13.08	13.08	0.01	0.06	0.00
17	35.65	99.60	11.10	11.10	0.01	0.05	0.00
18	34.95	97.67	9.17	9.17	0.01	0.04	0.00
19	34.28	95.78	7.28	7.28	0.01	0.03	0.00
20	33.62	93.93	5.43	5.43	0.00	0.02	0.00
21	32.97	92.12	3.62	3.62	0.00	0.02	0.00
22	32.33	90.34	1.84	1.84	0.00	0.01	0.00
23	31.71	88.60	0.10	0.10	0.00	0.00	0.00
24	31.10	86.90	(1.60)	(1.60)	(0.00)	(0.01)	(0.00)
25	30.50	85.21	(3.29)	(3.29)	(0.00)	(0.01)	(0.00)
26	29.91	83.57	(4.93)	(4.93)	(0.00)	(0.02)	(0.00)
27	29.33	81.95	(6.55)	(6.55)	(0.01)	(0.03)	(0.00)
28	28.76	80.36	(8.14)	(8.14)	(0.01)	(0.04)	(0.00)
29	28.21	78.81	(9.69)	(9.69)	(0.01)	(0.04)	(0.00)
30	27.66	77.29	(11.21)	(11.21)	(0.01)	(0.05)	(0.00)

EF[1]	1.586	lbs/million ft^3 fuel burned		Landfill Flare eff.	95%
	88.5	GPP Capacity		% to Flares	100%

Notes

1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.

12 flares; 10 active, 2 additional to provide backup

Table 6: Variation 2 Flare - PM10 Emissions Summary							
Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor Capacity @ 7,000 scfm (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of PM10 from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	(7.24)	(0.02)	(0.12)	(0.01)
2	30.08	84.04	(4.46)	(4.46)	(0.01)	(0.07)	(0.00)
3	31.05	86.76	(1.74)	(1.74)	(0.01)	(0.03)	(0.00)
4	32.01	89.43	0.93	0.93	0.00	0.02	0.00
5	32.95	92.05	3.55	3.55	0.01	0.06	0.00
6	33.87	94.62	6.12	6.12	0.02	0.10	0.00
7	34.77	97.14	8.64	8.64	0.03	0.14	0.01
8	35.65	99.62	11.12	11.12	0.03	0.19	0.01
9	36.52	102.04	13.54	13.54	0.04	0.23	0.01
10	37.37	104.42	15.92	15.92	0.05	0.27	0.01
11	38.20	106.75	18.25	18.25	0.06	0.30	0.01
12	**39.02**	**109.03**	**20.53**	20.53	**0.06**	**0.34**	**0.01**
13	38.55	107.72	19.22	19.22	0.06	0.32	0.01
14	37.80	105.63	17.13	17.13	0.05	0.29	0.01
15	37.07	103.58	15.08	15.08	0.05	0.25	0.01
16	36.35	101.58	13.08	13.08	0.04	0.22	0.01
17	35.65	99.60	11.10	11.10	0.03	0.19	0.01
18	34.95	97.67	9.17	9.17	0.03	0.15	0.01
19	34.28	95.78	7.28	7.28	0.02	0.12	0.01
20	33.62	93.93	5.43	5.43	0.02	0.09	0.00
21	32.97	92.12	3.62	3.62	0.01	0.06	0.00
22	32.33	90.34	1.84	1.84	0.01	0.03	0.00
23	31.71	88.60	0.10	0.10	0.00	0.00	0.00
24	31.10	86.90	(1.60)	(1.60)	(0.00)	(0.03)	(0.00)
25	30.50	85.21	(3.29)	(3.29)	(0.01)	(0.05)	(0.00)
26	29.91	83.57	(4.93)	(4.93)	(0.02)	(0.08)	(0.00)
27	29.33	81.95	(6.55)	(6.55)	(0.02)	(0.11)	(0.00)
28	28.76	80.36	(8.14)	(8.14)	(0.02)	(0.14)	(0.01)
29	28.21	78.81	(9.69)	(9.69)	(0.03)	(0.16)	(0.01)
30	27.66	77.29	(11.21)	(11.21)	(0.03)	(0.19)	(0.01)

EF[1]	6.096	lbs/million ft^3 fuel burned		Landfill Flare eff.	95%
	88.5	GPP Capacity		% to Flares	100%

Notes

1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.

12 flares; 10 active, 2 additional to provide backup

Table 7: Variation 2 Flare - SO_2 Emissions Summary							
Year	CH_4 Production (10^6 m^3/yr)	Total Collected Landfill Gas - 95% Control Eff. (10^6 m^3/yr)	Grayson Power Plant - Compressor Capacity @ 7,000 scfm (88.50 10^6 m^3/yr)	Total Landfill Gas to Flares (10^6 ft^3/yr)	Total Emissions of SO2 from All Flares		
					tons/yr	lbs/day	lbs/hr
1	29.08	81.26	(7.24)	(7.24)	(0.01)	(0.07)	(0.00)
2	30.08	84.04	(4.46)	(4.46)	(0.01)	(0.04)	(0.00)
3	31.05	86.76	(1.74)	(1.74)	(0.00)	(0.02)	(0.00)
4	32.01	89.43	0.93	0.93	0.00	0.01	0.00
5	32.95	92.05	3.55	3.55	0.01	0.04	0.00
6	33.87	94.62	6.12	6.12	0.01	0.06	0.00
7	34.77	97.14	8.64	8.64	0.02	0.09	0.00
8	35.65	99.62	11.12	11.12	0.02	0.11	0.00
9	36.52	102.04	13.54	13.54	0.02	0.14	0.01
10	37.37	104.42	15.92	15.92	0.03	0.16	0.01
11	38.20	106.75	18.25	18.25	0.03	0.18	0.01
12	**39.02**	**109.03**	**20.53**	**20.53**	**0.04**	**0.21**	**0.01**
13	38.55	107.72	19.22	19.22	0.04	0.19	0.01
14	37.80	105.63	17.13	17.13	0.03	0.17	0.01
15	37.07	103.58	15.08	15.08	0.03	0.15	0.01
16	36.35	101.58	13.08	13.08	0.02	0.13	0.01
17	35.65	99.60	11.10	11.10	0.02	0.11	0.00
18	34.95	97.67	9.17	9.17	0.02	0.09	0.00
19	34.28	95.78	7.28	7.28	0.01	0.07	0.00
20	33.62	93.93	5.43	5.43	0.01	0.05	0.00
21	32.97	92.12	3.62	3.62	0.01	0.04	0.00
22	32.33	90.34	1.84	1.84	0.00	0.02	0.00
23	31.71	88.60	0.10	0.10	0.00	0.00	0.00
24	31.10	86.90	(1.60)	(1.60)	(0.00)	(0.02)	(0.00)
25	30.50	85.21	(3.29)	(3.29)	(0.01)	(0.03)	(0.00)
26	29.91	83.57	(4.93)	(4.93)	(0.01)	(0.05)	(0.00)
27	29.33	81.95	(6.55)	(6.55)	(0.01)	(0.07)	(0.00)
28	28.76	80.36	(8.14)	(8.14)	(0.01)	(0.08)	(0.00)
29	28.21	78.81	(9.69)	(9.69)	(0.02)	(0.10)	(0.00)
30	27.66	77.29	(11.21)	(11.21)	(0.02)	(0.11)	(0.00)

EF[1]	3.677	lbs/million ft^3 fuel burned		Landfill Flare eff.	95%
	88.5	GPP Capacity		% to Flares	100%

Notes
1. Based on 5/06, 6/07, and 6/08 Source Tests, as reported in 2009 AER.
12 flares; 10 active, 2 additional to provide backup

Table 8: Variation 2 Flare Toxic Emissions							
TAC	Emission Factor[1]	Total Emissions				Per Flare	
	(lbs/10^6 ft^3 fuel burned)	(lbs/yr)	(lbs/day)	(lbs/hr)	(g/s)	(g/s)	(lbs/day)
Benzene*	6.94E-04	1.33E-02	3.65E-05	1.52E-06	1.92E-07	1.92E-08	1.52E-07
p-Dichlorbenzene*	1.85E-04	3.56E-03	9.76E-06	4.07E-07	5.13E-08	5.13E-09	4.07E-08
Chlorofluorocarbons (Freon-11)*	1.97E-04	3.79E-03	1.04E-05	4.32E-07	5.45E-08	5.45E-09	4.33E-08
Perchloroethylene (Tetrachloroethylene)	2.49E-03	4.79E-02	1.31E-04	5.46E-06	6.89E-07	6.89E-08	5.47E-07
Toluene*	5.09E-04	9.78E-03	2.68E-05	1.12E-06	1.41E-07	1.41E-08	1.12E-07
Trichloroethylene	2.13E-03	4.09E-02	1.12E-04	4.67E-06	5.89E-07	5.89E-08	4.68E-07
m-Xylene*	3.80E-04	7.30E-03	2.00E-05	8.34E-07	1.05E-07	1.05E-08	8.35E-08
o-Xylene*	1.33E-04	2.56E-03	7.03E-06	2.93E-07	3.69E-08	3.69E-09	2.93E-08
p-Xylene*	3.75E-04	7.21E-03	1.98E-05	8.23E-07	1.04E-07	1.04E-08	8.24E-08

% to Flares	100%	
Year 2023 Controlled Gas Generation	1.92E+07	ft^3/yr
Year 2023 Controlled Gas Generation	1.92E+01	MMCFY

Notes:

[1] Emission factors obtained from 2009 AER, based on average of source test data collected during 06 - 08 testing, per SCAQMD Rule 1150.

* Based on average calculated in the 2009 AER; average based on 06, 07 and 08 source test data.

Table 9: Variation 2 Surface Gas Fugitive Emissions

TAC	Emission Factor[1]	Molecular Weight	Total Emissions			
	(ppb)		(lbs/yr)[2]	(lbs/day)	(lbs/hr)	(g/s)
Benzene	1184.00	78.11	41.6	0.1	4.75E-03	5.99E-04
Methylene Chloride (Dichloromethane)	392.00	84.94	15.0	0.0	1.71E-03	2.16E-04
Perchloroethylene (Tetrachloroethylene)	441.00	165.83	32.9	0.1	3.76E-03	4.74E-04
Toluene	9077.00	92.13	376.6	1.0	4.30E-02	5.42E-03
1,3-Butadiene	11.00	54.09	0.3	0.0	3.06E-05	3.86E-06
Trichloroethylene	221.00	131.40	13.1	0.0	1.49E-03	1.88E-04
Vinyl Chloride	235.00	62.50	6.6	0.0	7.55E-04	9.52E-05

Notes:

1. Emission factors obtained from the average of source tests conducted for 1150.1 compliance and used in the 2008-09 AERs.

2. Emission estimates calcuated based on the following equation: Qi = (2)(Ci)(1-e)(L_O)(R)/70 years (MWi)(1 lb mole/385 ft3)

Where: Qi = emission rate for any gas I which is a VOC, lbs/yr

2 = a multiplication factor obtained by assuming the landfill gas consists of 50% methane and 50% carbon dioxide

Ci = concentration in the landfill of gas i, ppbv x 10-9

e = gas collection system efficiency, 95% (Exiting Conditions/Variation 1) and 98% (Variation 2)

L_O = potential methane generation capacity of the refuse (3,000 ft3/ton of refuse)

R = total mass of refuse in place, 27.6 MM tons (as of December 2008), 37.95 (Variation 1), and 40.45 (Variation 2)

MWi = molecular weight of compound i

Variable	Factor	Unit
	2	%CH4:%CO2
C_i =	1.00E-09	
e=	95%	
L_O =	3.00E+03	ft^3/yr
R =	4.05E+07	MM tons/refuse
	70	year lifetime
	385	

Table 10: Variation 2 Tier 1 Screening Level Health Risk Assessment - Flare&Fugitive Emissions

Compound Code	TAC	CAS No.	Flare&Fug Emissions		25 Meter		50 Meter		100 Meter	
			(lbs/yr)	(lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)
B1	Benzene*	71-43-2	41.66	4.76E-03	Fail	Pass	Fail	Pass	Fail	Pass
D4	p-Dichlorbenzene*	106-46-7	0.00	4.07E-07	Pass		Pass		Pass	
M13	Methylene Chloride (Dichloromethane)	75-09-2	14.99	1.71E-03	Pass	Pass	Pass	Pass	Pass	Pass
P2	Perchloroethylene (Tetrachloroethylene	127-18-4	32.98	3.76E-03	Fail	Pass	Fail	Pass	Pass	Pass
T3	Toluene*	108-88-3	376.56	4.30E-02	Pass	Pass	Pass	Pass	Pass	Pass
B9	1,3-Butadiene*	106-99-0	0.27	3.06E-05	Fail		Pass		Pass	
T8	Trichloroethylene	79-01-6	13.12	1.50E-03	Pass		Pass		Pass	
V5	Vinyl Chloride	75-01-4	6.61	7.55E-04	Fail	Pass	Fail	Pass	Fail	Pass
X2	m-Xylene*	108-38-3	0.01	8.34E-07	Pass	Pass	Pass	Pass	Pass	Pass
X3	o-Xylene*	95-47-6	0.00	2.93E-07	Pass	Pass	Pass	Pass	Pass	Pass
X4	p-Xylene*	106-42-3	0.01	8.23E-07	Pass	Pass	Pass	Pass	Pass	Pass

Compound Code	TAC	CAS No.	Screening Emission Level					
			25 Meter		50 Meter		100 Meter	
			Chronic (lbs/yr)	Acute (lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)	Chronic (lbs/yr)	Acute (lbs/hr)
B1	Benzene*	71-43-2	1.14E+00	7.39E-01	2.99E+00	1.48E+00	8.92E+00	3.96E+00
D4	p-Dichlorbenzene*	106-46-7	2.85E+00		7.48E+00		2.23E+01	
M13	Methylene Chloride (Dichloromethane)	75-09-2	3.26E+01	7.00E+00	8.55E+01	1.40E+01	2.55E+02	3.75E+01
P2	Perchloroethylene (Tetrachloroethylene	127-18-4	5.44E+00	1.00E+01	1.43E+01	2.00E+01	4.25E+01	5.35E+01
T3	Toluene*	108-88-3	9.92E+03	1.85E+01	2.60E+04	3.70E+01	7.75E+04	9.91E+01
B9	1,3-Butadiene*	106-99-0	1.90E-01		4.99E-01		1.49E+00	
T8	Trichloroethylene	79-01-6	1.63E+01		4.28E+01		1.27E+02	
V5	Vinyl Chloride	75-01-4	4.23E-01	9.00E+01	1.11E+00	1.80E+02	3.30E+00	4.82E+02
X2	m-Xylene*	108-38-3	2.31E+04	1.10E+01	6.07E+04	2.20E+01	1.81E+05	5.89E+01
X3	o-Xylene*	95-47-6	2.31E+04	1.10E+01	6.07E+04	2.20E+01	1.81E+05	5.89E+01
X4	p-Xylene*	106-42-3	2.31E+04	1.10E+01	6.07E+04	2.20E+01	1.81E+05	5.89E+01

TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Table 11a: Variation 2 Tier 1 SLA

Application deemed complete date: 09/10/10

A/N:
Fac:

Stack Data		Units
Hour/Day	24	hr/day
Day/Week	7	day/wk
Week/Year	52	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	P	P or V
Stack Height or Building Height	16	feet
Area (For Volume Source Only)	900	ft^2
Distance-Residential	200	meters
Distance-Commercial	150	meters
Meteorological Station	Pasadena	

Source Type:	O - Other	
Screening Mode (**NO** = Tier 1 or Tier 2; **YES** = Tier 3)	NO	

Emission Units	lb/hr	
Source output capacity	n/a	n/a

FOR OTHER SOURCE TYPES DIFFERENT THAN BOILER, CREMATORY OR ICE, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0-1	lbs/hr
B1	Benzene (including benzene from gasoline)	4.76E-03	78.11	0.00476		0.00476
D4	Dichlorobenzene, p- (or 1,4-dichlorobenzene)	4.07E-07	147.01	0.000000407		0.000000407
M13	Methylene chloride(Dichloromethane)	1.71E-03	84.94	0.00171		0.00171
P2	Perchloroethylene (or tetrachloroethylene)	3.76E-03	165.83	0.00376		0.00376
T3	Toluene (methyl benzene)	4.30E-02	92.13	0.043		0.043
B9	Butadiene, 1,3-	3.06E-05	54.09	0.0000306		0.0000306
T8	Trichloroethylene	1.50E-03	130.4	0.0015		0.0015
V5	Vinyl chloride (chloroethylene)	7.55E-04	62.5	0.000755		0.000755
X2	Xylene, m-	8.34E-07	106.17	0.000000834		0.000000834
X3	Xylene, o-	2.93E-07	106.18	0.000000293		0.000000293
X4	Xylene, p-	8.23E-07	106.17	0.000000823		0.000000823
				0		
				0		
				0		
				0		
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TIER 1 SCREENING RISK ASSESSMENT REPORT

Receptor Distance (actual)	150
Receptor Distance (for X/Q LOOKUP)	100

Tier 1 Results	
Cancer/Chronic ASI	**Acute ASI**
7.78E+00	1.75E-03
FAILED	PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate (lbs/yr)	Max Hourly Emission Rate (lbs/hr)	Cancer / Chronic Pollutant Screening Level (lbs/yr)	Acute Pollutant Screening Level (lbs/hr)	Cancer / Chronic Pollutant Screening Index (PSI)	Acute Pollutant Screening Index (PSI)
Benzene (including benzene from gasoline)	4.16E+01	4.76E-03	8.92E+00	3.96E+00	4.66E+00	1.20E-03
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	3.56E-03	4.07E-07	2.23E+01		1.59E-04	
Methylene chloride(Dichloromethane)	1.49E+01	1.71E-03	2.55E+02	3.75E+01	5.86E-02	4.56E-05
Perchloroethylene (or tetrachloroethylene)	3.28E+01	3.76E-03	4.25E+01	5.35E+01	7.73E-01	7.02E-05
Toluene (methyl benzene)	3.76E+02	4.30E-02	7.75E+04	9.91E+01	4.85E-03	4.34E-04
Butadiene, 1,3-	2.67E-01	3.06E-05	1.49E+00		1.80E-01	
Trichloroethylene	1.31E+01	1.50E-03	1.27E+02		1.03E-01	
Vinyl chloride (chloroethylene)	6.60E+00	7.55E-04	3.30E+00	4.82E+02	2.00E+00	1.57E-06
Xylene, m-	7.29E-03	8.34E-07	1.81E+05	5.89E+01	4.03E-08	1.42E-08
Xylene, o-	2.56E-03	2.93E-07	1.81E+05	5.89E+01	1.42E-08	4.97E-09
Xylene, p-	7.19E-03	8.23E-07	1.81E+05	5.89E+01	3.97E-08	1.40E-08
TOTAL (APPLICATION SCREENING INDEX)					**7.78E+00**	**1.75E-03**

TIER 2 SCREENING RISK ASSESSMENT REPORT

Table 11c: Variation 2 Tier 2 SLA

A/N:
Fac:

Application deemed complete date: 09/10/10

2. Tier 2 Data

MET Factor	0.88
4 hr	0.93
6 or 7 hrs	0.87

Dispersion Factors tables

3	For Chronic X/Q
6	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	2.24	119.2
Commercial	4.99	246.35

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

3. Rule 1401 Compound Data

Table 11c: Variation 2 Tier 2 SLA

Compound	R1 - uncontrolled (lbs/hr)	R2 - controlled (lbs/hr)	CP	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic	REL Acute
Benzene (including benzene from gasoline)	4.76E-03	4.76E-03	1.00E-01	1.0000	1.0000	1.0000	1.0000	60	1300
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	4.07E-07	4.07E-07	4.00E-02	1	1	1	1	800	
Methylene chloride(Dichloromethane)	1.71E-03	1.71E-03	3.50E-03	1	1	1	1.0000	400	14000
Perchloroethylene (or tetrachloroethylene)	3.76E-03	3.76E-03	2.10E-02	1	1	1	1	35	20000
Toluene (methyl benzene)	4.30E-02	4.30E-02		1.0000	1.0000	1	1	300	37000
Butadiene, 1,3-	3.06E-05	3.06E-05	6.00E-01	1.0000	1.0000	1	1	20	
Trichloroethylene	1.50E-03	1.50E-03	7.00E-03	1	1	1	1	600	
Vinyl chloride (chloroethylene)	7.55E-04	7.55E-04	2.70E-01	1	1	1	1		180000
Xylene, m-	8.34E-07	8.34E-07		1.0000	1.0000	1	1	700	22000
Xylene, o-	2.93E-07	2.93E-07		1	1	1	1	700	22000
Xylene, p-	8.23E-07	8.23E-07		1	1	1.0000	1.0000	700	22000

Table 11c: Variation 2 Tier 2 SLA

4. Emission Calculations

Compound	uncontrolled R1 (lb/hr)	controlled R2 (lb/hr)	R2 (lb/yr)	R2 (ton/yr)
Benzene (including benzene from gasoline)	4.76E-03	4.76E-03	41.58336	0.02079168
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	4.07E-07	4.07E-07	0.00355555	1.77778E-06
Methylene chloride(Dichloromethane)	1.71E-03	1.71E-03	14.93856	0.00746928
Perchloroethylene (or tetrachloroethylene)	3.76E-03	3.76E-03	32.84736	0.01642368
Toluene (methyl benzene)	4.30E-02	4.30E-02	375.648	0.187824
Butadiene, 1,3-	3.06E-05	3.06E-05	0.2673216	0.000133661
Trichloroethylene	1.50E-03	1.50E-03	13.104	0.006552
Vinyl chloride (chloroethylene)	7.55E-04	7.55E-04	6.59568	0.00329784
Xylene, m-	8.34E-07	8.34E-07	0.00728582	3.64291E-06
Xylene, o-	2.93E-07	2.93E-07	0.00255965	1.27982E-06
Xylene, p-	8.23E-07	8.23E-07	0.00718973	3.59486E-06
Total	5.55E-02	5.55E-02	4.85E+02	2.43E-01

Table 11c: Variation 2 Tier 2 SLA

A/N: | **Application deemed complete date:** 09/10/10

TIER 2 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	1.19E-06	5.17E-07
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	4.06E-11	1.77E-11
Methylene chloride(Dichloromethane)	1.49E-08	6.50E-09
Perchloroethylene (or tetrachloroethylene)	1.97E-07	8.58E-08
Toluene (methyl benzene)		
Butadiene, 1,3-	4.58E-08	1.99E-08
Trichloroethylene	2.62E-08	1.14E-08
Vinyl chloride (chloroethylene)	5.09E-07	2.21E-07
Xylene, m-		
Xylene, o-		
Xylene, p-		
Total	**1.98E-06**	**8.62E-07**
	PASS	**PASS**

5b. Cancer Burden	**YES**
X/Q for one-in-a-million:	1.1306179003
Distance (meter)	294.02
Area (km2):	2.71E-01
Population:	1,900
Cancer Burden:	**3.76E-03**

6. Hazard Index

Table 11c: Variation 2 Tier 2 SLA

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL
HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		2.06E-03	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		8.20E-05	Pass	Pass
Developmental - DEV	1.19E-03	4.27E-03	Pass	Pass
Endocrine system - END			Pass	Pass
Eye	3.34E-04	4.80E-05	Pass	Pass
Hematopoietic system - HEM	9.02E-04	1.52E-03	Pass	Pass
Immune system - IMM	9.02E-04		Pass	Pass
Kidney - KID		2.06E-03	Pass	Pass
Nervous system - NS	3.64E-04	4.40E-03	Pass	Pass
Reproductive system - REP	1.19E-03	2.93E-05	Pass	Pass
Respiratory system - RES	3.34E-04	2.75E-03	Pass	Pass
Skin			Pass	Pass

Table 11c: Variation 2 Tier 2 SLA

A/N: | **Application deemed complete date:** 09/10/10

6a. Hazard Index Acute

HIA = [Q(lb/hr) * (X/Q)max] *AF/ Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			4.36E-04		4.36E-04	4.36E-04		4.36E-04		
Dichlorobenzene, p- (or 1,4-dichlorobenzene)										
Methylene chloride(Dichloromethane)							1.46E-05			
Perchloroethylene (or tetrachloroethylene)				2.24E-05			2.24E-05		2.24E-05	
Toluene (methyl benzene)			1.39E-04	1.39E-04			1.39E-04	1.39E-04	1.39E-04	
Butadiene, 1,3-										
Trichloroethylene										
Vinyl chloride (chloroethylene)				5.00E-07			5.00E-07		5.00E-07	
Xylene, m-				4.52E-09					4.52E-09	
Xylene, o-				1.59E-09					1.59E-09	
Xylene, p-				4.46E-09					4.46E-09	
Total			5.75E-04	1.61E-04	4.36E-04	4.36E-04	1.76E-04	5.75E-04	1.61E-04	

Table 11c: Variation 2 Tier 2 SLA

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)			9.02E-04		9.02E-04	9.02E-04		9.02E-04		
Dichlorobenzene, p- (or 1,4-dichlorobenzene)										
Methylene chloride(Dichloromethane)							3.01E-05			
Perchloroethylene (or tetrachloroethylene)				4.63E-05			4.63E-05		4.63E-05	
Toluene (methyl benzene)			2.86E-04	2.86E-04			2.86E-04	2.86E-04	2.86E-04	
Butadiene, 1,3-										
Trichloroethylene										
Vinyl chloride (chloroethylene)				1.03E-06			1.03E-06		1.03E-06	
Xylene, m-				9.34E-09					9.34E-09	
Xylene, o-				3.28E-09					3.28E-09	
Xylene, p-				9.22E-09					9.22E-09	
Total			1.19E-03	3.34E-04	9.02E-04	9.02E-04	3.64E-04	1.19E-03	3.34E-04	

Table 11c: Variation 2 Tier 2 SLA

6b. Hazard Index Chronic

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

	HIC - Residential												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				6.83E-04			6.83E-04			6.83E-04			
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	4.38E-09								4.38E-09	4.38E-09		4.38E-09	
Methylene chloride(Dichloromethane)			3.68E-05							3.68E-05			
Perchloroethylene (or tetrachloroethylene)	9.25E-04								9.25E-04				
Toluene (methyl benzene)				1.23E-03						1.23E-03		1.23E-03	
Butadiene, 1,3-											1.32E-05		
Trichloroethylene						2.15E-05				2.15E-05			
Vinyl chloride (chloroethylene)													
Xylene, m-										1.03E-08		1.03E-08	
Xylene, o-										3.60E-09		3.60E-09	
Xylene, p-										1.01E-08		1.01E-08	
Total	9.25E-04		3.68E-05	1.92E-03		2.15E-05	6.83E-04		9.25E-04	1.98E-03	1.32E-05	1.23E-03	

A/N: | **Application deemed complete date:** 09/10/10

6b. Hazard Index Chronic (cont.)

	HIC - Commercial												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Benzene (including benzene from gasoline)				1.52E-03			1.52E-03			1.52E-03			
Dichlorobenzene, p- (or 1,4-dichlorobenzene)	9.76E-09								9.76E-09	9.76E-09		9.76E-09	
Methylene chloride(Dichloromethane)			8.20E-05							8.20E-05			
Perchloroethylene (or tetrachloroethylene)	2.06E-03								2.06E-03				
Toluene (methyl benzene)				2.75E-03						2.75E-03		2.75E-03	
Butadiene, 1,3-											2.93E-05		
Trichloroethylene						4.80E-05				4.80E-05			
Vinyl chloride (chloroethylene)													
Xylene, m-										2.29E-08		2.29E-08	
Xylene, o-										8.03E-09		8.03E-09	
Xylene, p-										2.26E-08		2.26E-08	
Total	2.06E-03		8.20E-05	4.27E-03		4.80E-05	1.52E-03		2.06E-03	4.40E-03	2.93E-05	2.75E-03	