# APPENDIX B
# AIR QUALITY REPORT

# ELYSIAN PARK/USC
# WATER RECYCLING PROJECT
# AIR QUALITY IMPACT REPORT

taha
environmental planners

**Prepared for**

**AECOM**

**Prepared by**

**TERRY A. HAYES ASSOCIATES INC.**

**MAY 29, 2012**
taha 2012-016

# ELYSIAN PARK/USC
# WATER RECYCLING PROJECT
## *AIR QUALITY IMPACT REPORT*

**Prepared for**

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# 1.0 SUMMARY OF FINDINGS

Terry A. Hayes Associates Inc. has completed an air quality analysis for the proposed Elysian Park/USC Water Recycling Project (proposed project). Key findings are listed below.

- Regional construction emissions would result in a less-than-significant impact and no mitigation measures are required.

- Localized construction emissions would result in a less-than-significant impact and no mitigation measures are required.

- Toxic air contaminant construction emissions would result in a less-than-significant impact and no mitigation measures are required.

- Construction odors would result in a less-than-significant impact and no mitigation measures are required.

- The proposed project would not consist of long-term operational activities. Therefore, the proposed project would not result in significant impact and no mitigation measures are required.

- The proposed project would result in a less-than significant impact related to greenhouse gas emissions and no mitigation is required.

# 2.0 INTRODUCTION

## 2.1 PURPOSE

The purpose of this report is to evaluate the potential for air quality impacts of the proposed Elysian Park/USC Water Recycling Project (proposed project). Potential air quality emissions are analyzed for construction of the proposed project. The proposed project has been prepared pursuant to the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

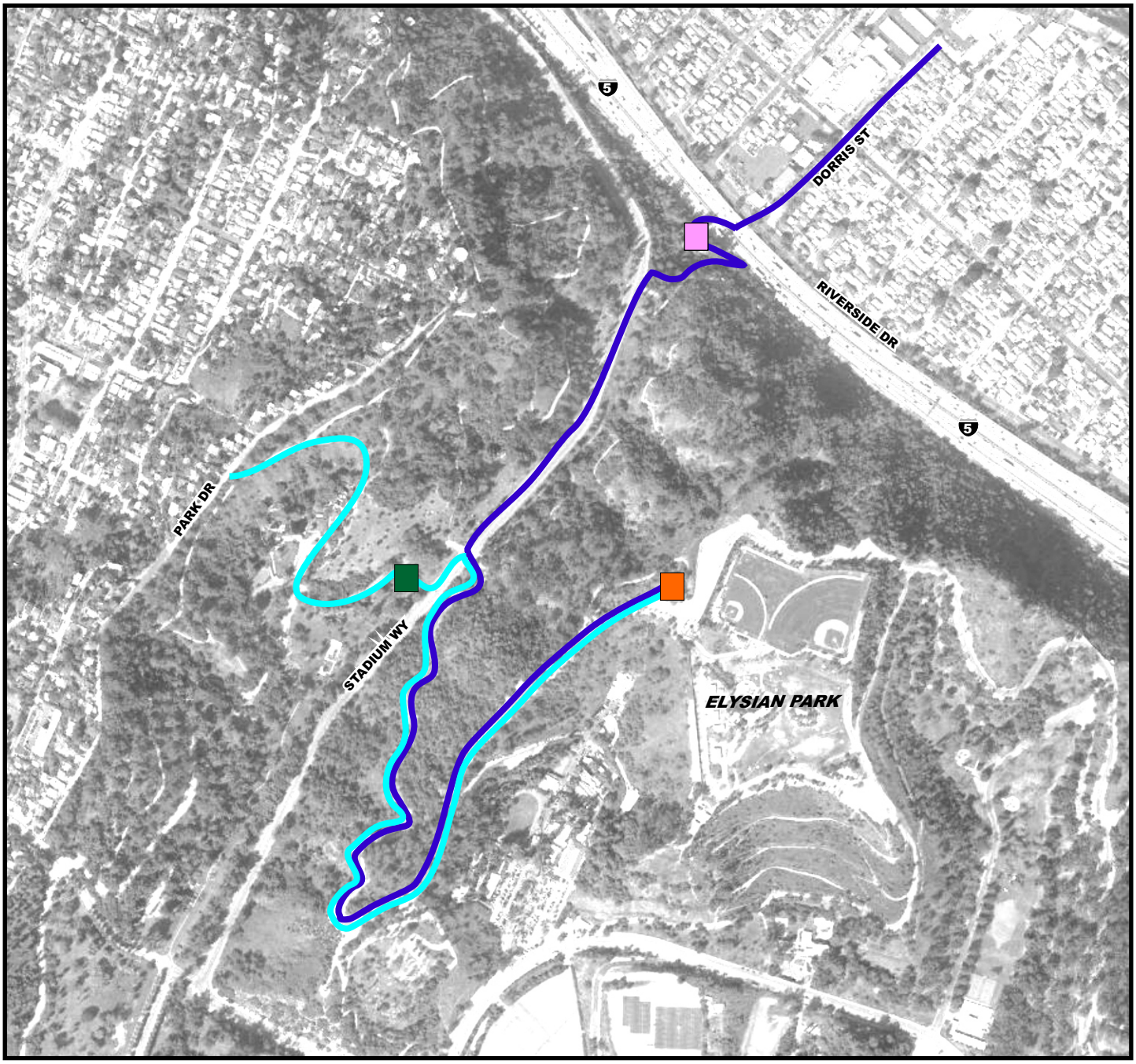
## 2.2 PROJECT DESCRIPTION

With imported water supplies becoming increasingly restricted and unreliable, the Los Angeles Department of Water and Power (LADWP) 2010 Urban Water Management Plan calls for 59,000 acre feet per year (AFY) of potable supplies to be replaced by recycled water by 2035.[1] The proposed project is part of the effort to maximize the use of recycled water for non-potable uses. The proposed project would provide recycled water to some of the City of Los Angeles' largest water customers, and where feasible, switch their potable water use into recycled water use. The proposed pipeline route would be implemented in two phases.

The first phase of the project involves the delivery of recycled water to Elysian Park. The park is bounded by Golden State Freeway (I-5) to the north, State Route 110 (SR-110) and Solano Canyon to the east, the Chinatown community to the south, and the Echo Park community to the west. A new 16-inch recycled water pipeline would be constructed from the existing recycled water pipeline serving Taylor Yard. It would begin on Dorris Street on the west side of the Los Angeles River in the Elysian Valley neighborhood. A total of approximately 8,400 linear feet of pipe would be installed connecting the Taylor Yard Water Recycling Project with a two-million gallon (MG) recycled water storage tank located in Elysian Fields. The proposed route for the recycled water pipeline would roughly follow Stadium Way. Due to fluctuations in recycled water demand, a backup potable water supply is necessary to irrigate Elysian Park. Approximately 7,300 linear feet of 12-inch potable water pipeline would be constructed from Park Drive to the proposed recycled water storage tank in Elysian Fields via a new potable water pumping station near the Grace E. Simons Lodge (**Figure 2-1**).

Installation of the recycled water pipeline within Dorris Street, Stadium Way, and Academy Road would use trench construction known as "cut and cover." An approximately three-foot wide by 4.5-foot deep trench would be excavated within the roadway that could be covered with metal plates during periods of the day when construction is not occurring. Once a segment of pipeline has been installed, the trench would be backfilled with materials from the excavation processed and repaved. Recycled water pipeline installation would necessitate restrictions on-street parking and closure of up to two lanes of the roadway depending on the location of construction. Installation of the recycled water pipeline from Dorris Street across I-5 would require a trenchless form of construction called "microtunneling" so as not to affect traffic on the freeway. A tunnel less than 1,000 linear feet would be tunneled beneath the freeway. Launching and receiving pits would be located on either end of the tunnel. Hydraulic jacks would drive pipes through the ground. Excavated soil and other material would be disposed of at an appropriate regional landfill.

[1] Recycled water is municipal wastewater that has gone through various treatment processes to meet specific water quality criteria.




LEGEND:

- Proposed Potable Water Pipeline
- Proposed Recycled Water Pipeline
- Potable Water Pumping Station
- Recycled Water Pumping Station
- Existing Water Tank

APPROX. SCALE

N

0 1,060 2,120 FEET

SOURCE: TAHA, 2012 and Google Earth, 2012.



*FIGURE 2-1*

PROJECT ALIGNMENT - PHASE 1

A flat pad of approximately 65 feet long by 30 feet wide would be cleared and graded on which a slab foundation and the recycled water pump station would be located. The pump station would be an exposed facility less than five feet and secured by chain link fencing. Clearing of vegetation in the area would be necessary prior to construction of the concrete pad. An existing road would be used to access the proposed site.

From the recycled water pumping station, the recycled water pipeline would be installed along Stadium Way to Angels Point Road past the Police Academy to a hilltop adjacent to Elysian Fields. It would supply the proposed 2-MG recycled water storage tank located in a flat area of Elysian Fields north of Angels Point Road. A flat pad would be cleared and graded on which the 85-foot diameter recycled water storage tank would be placed. The tank would be a steel structure approximately 48 feet tall. The area already contains a 0.5-MG water tank. The existing tank is not planned to be removed as part of this project.

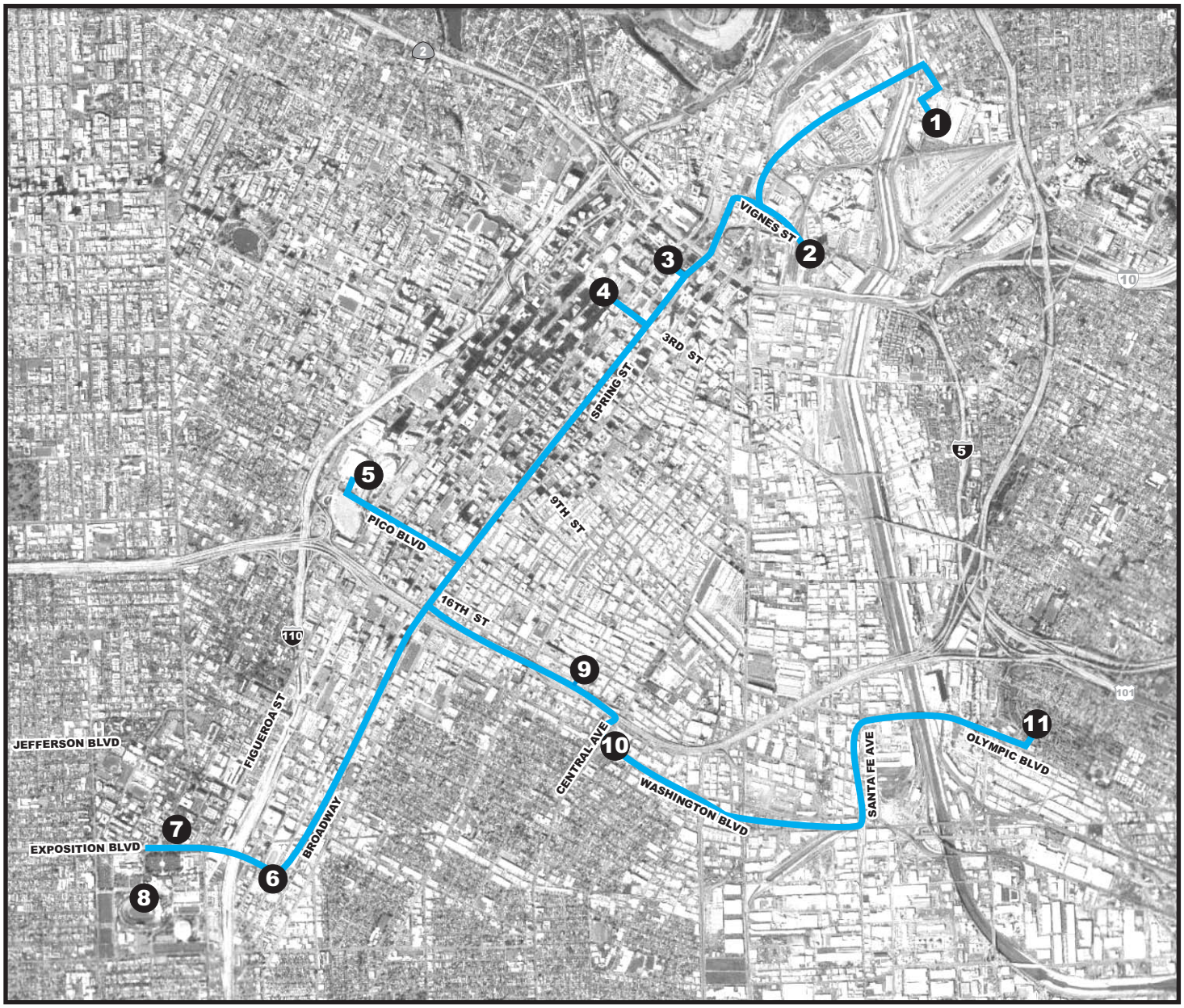
To provide for the potable water needs of Elysian Park, such as restroom facilities, a 5,000-gallon potable water tank would be constructed adjacent to the proposed recycled water storage tank. The potable water tank would be constructed of steel and approximately 14 feet in diameter and 10 feet tall.

Approximately 7,300 linear feet of 12-inch potable water pipeline would be installed to connect the potable water storage tank to an existing potable water service pipeline located outside of Elysian Park within Park Drive. An existing fire road from Park Drive to Grace E. Simons Lodge where it would connect to Elysian Park Drive and Angels Point Road would be used to access the project site. An approximately 2.5-foot wide by four-foot deep trench would be excavated for the potable water pipeline using the cut and cover technique. Once the pipeline has been installed within a segment, the trench would be backfilled with the excavated material and repaved.

The potable water pipeline would be connected to a potable water pumping station to be installed on the southwest of corner of Stadium Way and Elysian Park Drive within the grounds of the Grace E. Simons Lodge. A flat pad of approximately 65 feet long by 30 feet wide would be cleared and graded to accommodate the potable water pumping station. It would be constructed of a similar material as the existing pump house, stand approximately 10 feet tall, and be capable of pumping 2,000 gallons per minute.

All areas within Elysian Park temporarily cleared or disturbed during construction, including those areas used for materials and equipment staging, would be restored at the completion of the Phase 1 construction process. All public roads where trenching is to occur and any park roads or other roads indirectly damaged during construction would be repaired at the end of construction.

Phase 2 of the project involves construction of approximately ten miles of new 16-inch recycled water pipeline from the current terminus at Mesnagers Street near the Cornfields Park to customers located in Downtown Los Angeles, USC, and Boyle Heights. The mainline would roughly follow Broadway south to Exposition Street. To reach Boyle Heights, the pipeline would roughly follow 16$^{th}$ Street to Washington and Olympic Boulevards (**Figure 2-2**).




LEGEND:

Proposed Pipeline Route Phase 2

(#) Customers

1. Atlas Carpet
2. Twin Towers Correctional Facility
3. LA County Central Heating and Refrigeration Plant
4. Veolia Energy
5. Convention Center and Event Center
6. Matchmaster
7. USC Main Campus
8. Exposition Park
9. Dye House, Inc.
10. Washington Garment
11. Boyle Heights Mixed-Use Project

APPROX. SCALE

N

0 0.75 1.5 MILE

SOURCE: TAHA, 2012 and Google Earth, 2012.

taha

Elysian Park/USC Water Recycling Project
Air Quality Impact Report

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*FIGURE 2-2*

PROJECT ALIGNMENT - PHASE 2

The mainline segment totaling would total approximately 28,200 linear feet would roughly follow Broadway south through Downtown Los Angeles to Exposition Park. It would generally travel south along Spring Street to Alpine Street, westward along Alpine Street to Broadway, south on Broadway to 37th Street, westward along 37th Street to Exposition Boulevard, and westward on Exposition Boulevard to terminate at USC's main campus in Exposition Park. To cross State Route 101 (SR-101) on Broadway, it would be necessary to install the pipeline along the side of the roadway bridging the SR-101 instead of trenching (approximately 150 linear feet). In addition, there are two railroad crossings on the mainline segment. The pipeline would cross the Metro Blue Line light rail tracks located at Broadway and Washington Boulevard, and the Metro Exposition Line light rail tracks at Exposition Boulevard and Figueroa Street, requiring trenchless construction.

From the mainline segment, extensions would serve specific known customers.

- The Atlas Carpet segment would extend approximately 1,200 linear feet from the mainline segment southward from Spring Street on Avenue 18 to Albion Street then westward on Albion Street to Avenue 17 where it would terminate at the Atlas Carpet Mills, Inc.

- The Twin Towers Correctional Facilities segment would extend approximately 1,650 feet east from Spring Street along Vignes Street to Avila Street, where it would terminate at the Los Angeles County Sheriff's Department Twin Towers Correctional Facility.

- The Trigen-LA Bunker Hill segment would extend from the mainline segment approximately 1,700 feet west of Broadway along 3rd Street to Hope Street, where it would terminate at Veolia Energy facility (formerly Trigen-LA). This route includes trenching within the 3rd Street Tunnel.

- The Los Angeles Convention Center segment would extend from the mainline segment approximately 2,500 feet west of Broadway along Pico Boulevard to L.A. Live Way, where it would terminate at the Los Angeles Convention Center. The pipeline would cross the Metro Blue Line light rail tracks located at Pico Boulevard and Flower Street, requiring trenchless construction.

- The Dye House segment would extend approximately 6,660 linear feet from the mainline segment approximately 5,400 feet east from Broadway Boulevard along Venice Boulevard/16th Street to Central Avenue, south on Central Avenue to 18th Street, and east on 18th Street terminating at Dye House, Inc.

- The Boyle Heights Mixed-Use Project segment would extend approximately 14,100 linear feet from the Dye House, Inc. along 18th Street to Naomi Avenue, south on Naomi Avenue to Washington Boulevard, east on Washington Boulevard to Santa Fe Avenue, north on Santa Fe Avenue to Olympic Boulevard, and east on Olympic Boulevard to Evergreen Avenue. The pipeline would cross the Metro Blue Line light rail tracks located at Washington Boulevard and Long Beach Avenue, and railroad tracks located approximately 900 feet west of Santa Fe Avenue serving an industrial complex. Trenchless construction would be required for rail crossings. In addition, the Boyle Heights Mixed-Use Project segment would require a bridge crossing on Olympic Boulevard totaling 1,750 linear feet over the Los Angeles River. As discussed above, the pipeline would be hung below or along the side of the bridge.

Installation of the recycled water pipeline would occur within public roads and use cut and cover trenching. An approximately 2.5-foot wide by 5-foot deep trench would be excavated within the roadway that could be covered with metal plates during periods of the day when construction is not occurring. Once the pipeline has been installed within a segment, the trench would be backfilled with the excavated material and repaved. Recycled water pipeline installation would necessitate restrictions on-street parking and closure of up to two lanes of the roadway depending on the location of construction. In general, approximately 90 linear feet of pipeline would be installed at one time. Construction would occur sequentially along the alignment to minimize long-term disruption within an area. Materials and equipment staging and construction worker parking would use City facilities and public parking lots located along or near the proposed alignments.

Railroad crossings would require tunneling instead of trenching. As described above, launching and receiving pits would be located on either end of the tunnel. Hydraulic jacks would drive pipes through the ground. Excess soil that cannot be reused as backfill material would be disposed of at an appropriate regional landfill.

### Construction Schedule and Procedures

Construction of Phase 1 is anticipated to begin in summer 2016 and take approximately two years to complete, concluding in summer 2018. Construction of Phase 2 is anticipated to begin following completion of Phase 1 in fall 2018. It would approximately take 2.5 years to complete Phase 2, concluding in spring 2021. Spreadsheets that reflect the various construction activities by month for Phases 1 and 2 are included in Appendix C, *Construction Emission Calculations*.

Generally, in accordance with the Noise Ordinance, construction activity would occur Mondays through Fridays from 7:00 a.m. to approximately 3:30 p.m. However, due to the nature of construction activities within public roadways and within Elysian Park, construction activity could be limited to off-peak periods and at night in non-residential areas to minimize disruptions to traffic on public streets and recreational users of Elysian Park. Construction would also be coordinated with the Dodgers organization and the City of Los Angeles Department of Transportation (LADOT) to minimize traffic disturbances on game days.

An appropriate combination of monitoring and resource impact avoidance would be employed during all phases of the proposed project, including implementation of Best Management Practices. The proposed project would implement Rule 403 dust control measures required by the South Coast Air Quality Management District (SCAQMD), which would include the following:

1) Water shall be applied to exposed surfaces at least two times per day to prevent generation of dust plumes;

2) The construction contractor shall utilize at least one of the following measures at each vehicle egress from the project alignment to a paved public road:
   a. Install a pad consisting of washed gravel maintained in clean condition to a depth of at least six inches and extending at least 30 feet wide and at least 50 feet long;
   b. Pave the surface extending at least 100 feet and at least 20 feet wide;
   c. Utilize a wheel shaker/wheel spreading device consisting of raised dividers at least 24 feet long and 10 feet wide to remove bulk material from tires and vehicle undercarriages; or
   d. Install a wheel washing system to remove bulk material from tires and vehicle undercarriages.

3) All haul trucks hauling soil, sand, and other loose materials shall be covered (e.g., with tarps or other enclosures that would reduce fugitive dust emissions);

4) Construction activity on exposed or unpaved dirt surfaces shall be suspended when wind speed exceeds 25 miles per hour (such as instantaneous gusts);

5) Ground cover in disturbed areas shall be replaced in a timely fashion when work is completed in the area;

6) Identify a community liaison concerning on-site construction activity including resolution of issues related to $PM_{10}$ generation;

7) Apply non-toxic soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for ten days or more);

8) Traffic speeds on all unpaved roads to be limited to 15 mph or less; and

9) Sweep streets at the end of the day if visible soil is carried onto adjacent public paved roads. If feasible, use water sweepers with reclaimed water.

Upon completion of the construction of the water recycling pipeline network, there will be no operational activities for the proposed project. Therefore, operational analysis will not be considered and evaluated for the proposed project.

# 3.0 AIR QUALITY

This analysis examines the degree to which the proposed project may cause significant adverse changes to air quality. Both short-term construction emissions occurring from activities, such as excavating and haul truck trips are discussed in this section. The analysis focuses on air pollution from two perspectives: daily emissions and pollutant concentrations. "Emissions" refer to the quantity of pollutants released into the air, measured in pounds per day (ppd). "Concentrations" refer to the amount of pollutant material per volumetric unit of air, measured in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$).

## 3.1 POLLUTANTS & EFFECTS

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

**Carbon Monoxide**. CO is a colorless and odorless gas formed by the incomplete combustion of fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft and trains. In urban areas such as the project location, automobile exhaust accounts for the majority of CO emissions. CO is a non-reactive air pollutant that dissipates relatively quickly, so ambient CO concentrations generally follow the spacial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions, primarily wind speed, topography and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, a typical situation at dusk in urban areas between November and February.[2] The highest levels of CO typically occur during the colder months of the year when inversion conditions are more frequent. In terms of health, CO competes with oxygen, often replacing it in the blood, thus reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can be dizziness, fatigue, and impairment of central nervous system functions.

**Ozone**. $O_3$ is a colorless gas that is formed in the atmosphere when reactive organic gases (ROG), which includes volatile organic compounds (VOC) and nitrogen oxides ($NO_X$) react in the presence of ultraviolet sunlight. $O_3$ is not a primary pollutant; it is a secondary pollutant formed by complex interactions of two pollutants directly emitted into the atmosphere. The primary sources of ROG and $NO_X$, components of $O_3$, are automobile exhaust and industrial sources. Meteorology and terrain play major roles in $O_3$ formation. Ideal conditions occur during summer and early autumn, on days with low wind speeds or stagnant air, warm temperatures and cloudless skies. The greatest source of smog-producing gases is the automobile. Short-term exposure (lasting for a few hours) to $O_3$ at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue and some immunological changes.

[2]Inversion is an atmospheric condition in which a layer of warm air traps cooler air near the surface of the earth, preventing the normal rising of surface air.

**Nitrogen Dioxide**. $NO_2$, like $O_3$, is not directly emitted into the atmosphere but is formed by an atmospheric chemical reaction between nitric oxide (NO) and atmospheric oxygen. NO and $NO_2$ are collectively referred to as $NO_X$ and are major contributors to $O_3$ formation. $NO_2$ also contributes to the formation of $PM_{10}$. High concentrations of $NO_2$ can cause breathing difficulties and result in a brownish-red cast to the atmosphere with reduced visibility. There is some indication of a relationship between $NO_2$ and chronic pulmonary fibrosis. Some increase of bronchitis in children (two and three years old) has also been observed at concentrations below 0.3 ppm.

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

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

$PM_{2.5}$ and $PM_{10}$ pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and $PM_{10}$ can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances, such as lead, sulfates and nitrates can cause lung damage directly. These substances can be absorbed into the blood stream and cause damage elsewhere in the body. These substances can transport absorbed gases, such as chlorides or ammonium, into the lungs and cause injury. Whereas $PM_{10}$ tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, as well as produce haze and reduce regional visibility.

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

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

**Toxic Air Contaminants**. Toxic air contaminants (TACs) are generally defined as those contaminants that are known or suspected to cause serious health problems, but do not have a corresponding ambient air quality standard. TACs are also defined as an air pollutant that may increase a person's risk of developing cancer and/or other serious health effects; however, the emission of a toxic chemical does not automatically create a health hazard. Other factors, such as the amount of the chemical; its toxicity, and how it is released into the air, the weather, and the terrain, all influence whether the emission could be hazardous to human health. TACs are emitted by a variety of industrial processes such as petroleum refining, electric utility and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust and may exist as $PM_{10}$ and $PM_{2.5}$ or as vapors (gases). TACs include metals, other particles, gases absorbed by particles, and certain vapors from fuels and other sources.

The emission of toxic substances into the air can be damaging to human health and to the environment. Human exposure to these pollutants at sufficient concentrations and durations can result in cancer, poisoning, and rapid onset of sickness, such as nausea or difficulty in breathing. Other less measurable effects include immunological, neurological, reproductive, developmental, and respiratory problems. Pollutants deposited onto soil or into lakes and streams affect ecological systems and eventually human health through consumption of contaminated food. The carcinogenic potential of TACs is a particular public health concern because many scientists currently believe that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk of contracting cancer.

The public's exposure to TACs is a significant public health issue in California. The Air Toxics "Hotspots" Information and Assessment Act is a state law requiring facilities to report emissions of TACs to air districts. The program is designated to quantify the amounts of potentially hazardous air pollutants released, the location of the release, the concentrations to which the public is exposed, and the resulting health risks.

To date, the most comprehensive study on air toxics in the Basin is the Multiple Air Toxics Exposure Study (MATES-III), conducted by the SCAQMD. The monitoring program measured more than 30 air pollutants, including both gases and particulates. The monitoring study was accompanied by a computer modeling study in which SCAQMD estimated the risk of cancer from breathing toxic air pollution throughout the region based on emissions and weather data. MATES-III found that the average cancer risk in the region from carcinogenic air pollutants ranges from about 870 in a million to 1,400 in a million, with an average regional risk of about 1,200 in a million.

**Diesel Particulate Matter**. According to the 2006 California Almanac of Emissions and Air Quality, the majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being particulate matter from the exhaust of diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances.

Diesel exhaust is composed of two phases, gas and particle, and both phases contribute to the health risk. The gas phase is composed of many of the urban hazardous air pollutants, such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde and polycyclic aromatic hydrocarbons. The particle phase is also composed of many different types of particles by size or composition. Fine and ultra fine diesel particulates are of the greatest health concern, and may be composed of elemental carbon with adsorbed compounds such as organic compounds, sulfate, nitrate, metals and other trace elements. Diesel exhaust is emitted from a broad range of diesel engines; the on road diesel engines of trucks, buses and cars and the off road diesel engines that include locomotives, marine vessels and heavy duty equipment. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present.

The most common exposure to diesel PM is breathing the air that contains diesel PM. The fine and ultra-fine particles are respirable (similar to $PM_{2.5}$), which means that they can avoid many of the human respiratory system defense mechanisms and enter deeply into the lung. Exposure to diesel PM comes from both on-road and off-road engine exhaust that is either directly emitted from the engines or lingering in the atmosphere.

Diesel exhaust causes health effects from both short-term or acute exposures, and long-term chronic exposures. The type and severity of health effects depends upon several factors including the amount of chemical exposure and the duration of exposure. Individuals also react differently to different levels of exposure. There is limited information on exposure to just diesel PM but there is enough evidence to indicate that inhalation exposure to diesel exhaust causes acute and chronic health effects.

Acute exposure to diesel exhaust may cause irritation to the eyes, nose, throat and lungs, some neurological effects such as lightheadedness. Acute exposure may also elicit a cough or nausea as well as exacerbate asthma. Chronic exposure to diesel PM in experimental animal inhalation studies have shown a range of dose-dependent lung inflammation and cellular changes in the lung and immunological effects. Based upon human and laboratory studies, there is considerable evidence that diesel exhaust is a likely carcinogen. Human epidemiological studies demonstrate an association between diesel exhaust exposure and increased lung cancer rates in occupational settings.

Unlike other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, California Air Resources Board (CARB) has made preliminary concentration estimates based on a PM exposure method. This method uses the CARB emissions inventory's $PM_{10}$ database, ambient $PM_{10}$ monitoring data, and the results from several studies to estimate concentrations of diesel PM.

Diesel PM poses the greatest health risk among these ten TACs mentioned. Based on receptor modeling techniques, SCAQMD estimated that diesel PM accounts for 84 percent of the total risk in the South Coast Air Basin.

**Greenhouse Gases**. Greenhouse gas (GHG) emissions refer to a group of emissions that are generally believed to affect global climate conditions. Simply put, the greenhouse effect compares the Earth and the atmosphere surrounding it to a greenhouse with glass panes. The glass panes in a greenhouse let heat from sunlight in and reduce the amount of heat that escapes. GHGs, such as carbon dioxide ($CO_2$), methane ($CH_4$) and nitrous oxide ($N_2O$) keep the average surface temperature of the Earth close to 60 degrees Fahrenheit (°F). Without the

greenhouse effect, the Earth would be a frozen globe with an average surface temperature of about 5°F.

In addition to $CO_2$, $CH_4$, and $N_2O$, GHGs include hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and water vapor. Of all the GHGs, $CO_2$ is the most abundant pollutant that contributes to climate change through fossil fuel combustion. $CO_2$ comprised 81 percent of the total GHG emissions in California in 2002 and non-fossil fuel $CO_2$ comprised 2.3 percent.[3] The other GHGs are less abundant but have higher global warming potential than $CO_2$. To account for this higher potential, emissions of other GHGs are frequently expressed in the equivalent mass of $CO_2$, denoted as $CO_2e$. The $CO_2e$ of $CH_4$ and $N_2O$ represented 6.4 and 6.8 percent, respectively, of the 2002 California GHG emissions. Other high global warming potential gases represented 3.5 percent of these emissions.[4] In addition, there are a number of man-made pollutants, such as CO, $NO_X$, non-methane VOC, and $SO_2$, that have indirect effects on terrestrial or solar radiation absorption by influencing the formation or destruction of other climate change emissions.

## 3.2 REGULATORY SETTING

### Federal

**United States Environmental Protection Agency**. The Federal Clean Air Act (CAA) governs air quality in the United States. The United State Environmental Protection Agency (USEPA) is responsible for enforcing the CAA. USEPA is also responsible for establishing the National Ambient Air Quality Standards (NAAQS). NAAQS are required under the 1977 CAA and subsequent amendments. USEPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. USEPA has jurisdiction over emission sources outside State waters (e.g., beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet stricter emission standards established by CARB.

As required by the CAA, NAAQS have been established for seven major air pollutants: CO, $NO_2$, $O_3$, $PM_{2.5}$, $PM_{10}$, $SO_2$, and Pb. The CAA requires USEPA to designate areas as attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for each criteria pollutant based on whether the NAAQS have been achieved. The federal standards are summarized in **Table 3-1**. The USEPA has classified the South Coast Air Basin as maintenance for CO and nonattainment for $O_3$, $PM_{2.5}$, and $PM_{10}$.

**Clean Air Act**. Actions taken by federal agencies could affect state, tribal, and local agencies' ability to attain and maintain the NAAQS. The 1990 amendments to federal CAA clarified and strengthen the provisions in Section 176 (c), which requires the USEPA to create rules that would ensure that federal actions would not violate the NAAQS or interfere with the purpose stated in State Implementation Plan (SIP), Transportation Implementation Plan (TIP), or Facility Implementation Plan (FIP).

[3] California Environmental Protection Agency, Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006, p. 11.
[4] *Ibid.*

**TABLE 3-1: STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS AND ATTAINMENT STATUS FOR THE SOUTH COAST AIR BASIN**

| Pollutant | Averaging Period | California | | National | |
|---|---|---|---|---|---|
| | | Standards | Attainment Status | Standards | Attainment Status |
| Ozone ($O_3$) | 1-hour | 0.09 ppm (180 µg/m$^3$) | Nonattainment | -- | -- |
| | 8-hour | 0.070 ppm (137 µg/m$^3$) | n/a | 0.075 ppm (147 µg/m$^3$) | Nonattainment |
| Respirable Particulate Matter ($PM_{10}$) | 24-hour | 50 µg/m$^3$ | Nonattainment | 150 µg/m$^3$ | Nonattainment |
| | Annual Arithmetic Mean | 20 µg/m$^3$ | Nonattainment | -- | -- |
| Fine Particulate Matter ($PM_{2.5}$) | 24-hour | -- | -- | 35 µg/m$^3$ | Nonattainment |
| | Annual Arithmetic Mean | 12 µg/m$^3$ | Nonattainment | 15 µg/m$^3$ | Nonattainment |
| Carbon Monoxide (CO) | 1-hour | 20 ppm (23 mg/m$^3$) | Attainment | 35 ppm (40 mg/m$^3$) | Unclassified/ Attainment |
| | 8-hour | 9.0 ppm (10 mg/m$^3$) | Attainment | 9 ppm (10 mg/m$^3$) | Unclassified/ Attainment |
| Nitrogen Dioxide ($NO_2$) | 1-hour | 0.18 ppm (338 µg/m$^3$) | Nonattainment | 100 ppb (188 µg/m$^3$) | n/a |
| | Annual Arithmetic Mean | 0.030 ppm (57 µg/m$^3$) | Nonattainment | 53 ppb (100 µg/m$^3$) | Unclassified/ Attainment |
| Sulfur Dioxide ($SO_2$) | 1-hour | 0.25 ppm (655 µg/m$^3$) | Attainment | -- | -- |
| | 24-hour | 0.04 ppm (105 µg/m$^3$) | Attainment | 0.14 ppm (365 µg/m$^3$) | Attainment |
| | 3-hour | -- | -- | -- | -- |
| | Annual Arithmetic Mean | -- | -- | 0.030 ppm (80 µg/m$^3$) | Attainment |
| Lead (Pb) | 30-day average | 1.5 µg/m$^3$ | Attainment | -- | -- |
| | Calendar Quarter | -- | -- | 0.15 µg/m$^3$ | Attainment |

n/a = not available
**SOURCE**: CARB, *Ambient Air Quality Standards*, February 7, 2012.

In 1993, the USEPA promulgated the General Conformity Rule (40 CFR Section 51 and 93). Any federal supported or funded projects are required to perform a General Conformity analysis to determine that the action conforms to the applicable SIP. Federal agencies must demonstrate that the funded activities shall not perform the following actions:

- Federal actions will not cause or contribute to any new air quality standard violation;
- Federal actions will not increase the frequency or severity of any existing standard violation; and/or
- Federal actions will not delay the timely attainment of any standards, interim emission reduction, or other milestone.

Actions can be exempted from a conformity determination when the total direct and indirect emissions related to both construction and operation activities is below the specified emission rate thresholds, known as *de minimis* levels, and that the emissions would be less than ten percent of the area emission budget. **Table 3-2** shows the *de minimis* levels for criteria pollutants relevant to the project area.

**TABLE 3-2: FEDERAL DE MINIMIS LEVELS**

| Pollutants | Area Type | De Minimis Levels (Tons per Year) |
|---|---|---|
| Ozone (VOC or $NO_X$) | Extreme Nonattainment | 10 |
| Carbon Monoxide (CO), Sulfur Dioxide ($SO_2$), and Nitrogen Dioxide ($NO_2$) | All Nonattainment and Maintenance | 100 |
| Respirable Particulate Matter ($PM_{10}$) | Serious Nonattainment | 70 |

**SOURCE**: USEPA, *General Conformity De Minimis Levels*, July 22, 2011.

## State

**California Air Resources Board**. In addition to being subject to the requirements of CAA, air quality in California is also governed by more stringent regulations under the California Clean Air Act (CCAA). In California, the CCAA is administered by the California Air Resources Board (CARB) at the State level and by the air quality management districts and air pollution control districts at the regional and local levels. CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for meeting the State requirements of the CAA, administering the CCAA, and establishing the California Ambient Air Quality Standards (CAAQS). The CCAA, as amended in 1992, requires all air districts in the State to endeavor to achieve and maintain the CAAQS. CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. CARB regulates mobile air pollution sources, such as motor vehicles. CARB is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. CARB established passenger vehicle fuel specifications, which became effective in March 1996. CARB oversees the functions of local air pollution control districts and air quality management districts, which, in turn, administer air quality activities at the regional and county levels. The State standards are summarized in **Table 3-1**.

The CCAA requires CARB to designate areas within California as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved. Under the CCAA, areas are designated as nonattainment for a pollutant if air quality data shows that a State standard for the pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a State standard and are not used as a basis for designating areas as nonattainment. Under the CCAA, the Los Angeles County portion of the Basin is designated as a nonattainment area for $O_3$, $PM_{2.5}$, $PM_{10}$, and $NO_2$.[5]

[5]CARB, Area Designation Maps, available at http://www.arb.ca.gov/desig/adm/adm.htm, accessed March 8, 2012.

**Toxic Air Contaminants**. CARB's Statewide comprehensive air toxics program was established in the early 1980's. The Toxic Air Contaminant Identification and Control Act created California's program to reduce exposure to air toxics. Under the Toxic Air Contaminant Identification and Control Act, CARB is required to use certain criteria in the prioritization for the identification and control of air toxics. In selecting substances for review, CARB must consider criteria relating to "the risk of harm to public health, amount or potential amount of emissions, manner of, and exposure to, usage of the substance in California, persistence in the atmosphere, and ambient concentrations in the community" [Health and Safety Code Section 39666(f)]. The Toxic Air Contaminant Identification and Control Act also requires CARB to use available information gathered from the Air Toxics "Hot Spots" Information and Assessment Act program to include in the prioritization of compounds.

California has established a two-step process of risk identification and risk management to address the potential health effects from air toxic substances and protect the public health of Californians. During the first step (identification), CARB and the Office of Environmental Health Hazard Assessment (OEHHA) determine if a substance should be formally identified as a TAC in California. During this process, CARB and the OEHHA staff draft a report that serves as the basis for this determination. CARB staff assesses the potential for human exposure to a substance and the OEHHA staff evaluates the health effects. After CARB and the OEHHA staff hold several comment periods and workshops, the report is then submitted to an independent, nine-member Scientific Review Panel (SRP), who reviews the report for its scientific accuracy. If the SRP approves the report, they develop specific scientific findings which are officially submitted to CARB. CARB staff then prepares a hearing notice and draft regulation to formally identify the substance as a TAC. Based on the input from the public and the information gathered from the report, the CARB decides whether to identify a substance as a TAC. In 1993, the California Legislature amended the Toxic Air Contaminant Identification and Control Act by requiring CARB to identify 189 federal hazardous air pollutants as State TACs.

In the second step (risk management), CARB reviews the emission sources of an identified TAC to determine if any regulatory action is necessary to reduce the risk. The analysis includes a review of controls already in place, the available technologies and associated costs for reducing emissions, and the associated risk.

The Air Toxics "Hot Spots" Information and Assessment Act (Health and Safety Code Section 44360) supplements the Toxic Air Contaminant Identification and Control Act by requiring a Statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks. The "Hot Spots" Act also requires facilities that pose a significant health risk to the community to reduce their risk through a risk management plan.

*California's Diesel Risk Reduction Program*. CARB identified particulate emissions from diesel-fueled engines (diesel PM) TACs in August 1998. Following the identification process, the ARB was required by law to determine if there is a need for further control, which led to the risk management phase of the program.

For the risk management phase, CARB formed the Diesel Advisory Committee to assist in the development of a risk management guidance document and a risk reduction plan. With the assistance of the Advisory Committee and its subcommittees, CARB developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles and the Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines. The Diesel Advisory Committee approved these documents on September 28, 2000, paving the way for the next step in the regulatory process: the control measure phase.

During the control measure phase, specific Statewide regulations designed to further reduce diesel PM emissions from diesel-fueled engines and vehicles have and continue to be evaluated and developed. The goal of each regulation is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce diesel PM emissions.

### Local

**South Coast Air Quality Management District**. The 1977 Lewis Air Quality Management Act created the SCAQMD to coordinate air quality planning efforts throughout Southern California. This Act merged four county air pollution control agencies into one regional district to better address the issue of improving air quality in Southern California. Under the Act, renamed the Lewis-Presley Air Quality Management Act in 1988, the SCAQMD is the agency principally responsible for comprehensive air pollution control in the region. Specifically, the SCAQMD is responsible for monitoring air quality, as well as planning, implementing, and enforcing programs designed to attain and maintain State and federal ambient air quality standards in the district. Programs that were developed include air quality rules and regulations that regulate stationary sources, area sources, point sources, and certain mobile source emissions. The SCAQMD is also responsible for establishing stationary source permitting requirements and for ensuring that new, modified, or relocated stationary sources do not create net emission increases.

The SCAQMD monitors air quality within the project area. The SCAQMD has jurisdiction over an area of 10,743 square miles, consisting of Orange County; the non-desert portions of Los Angeles, Riverside, and San Bernardino counties; and the Riverside County portion of the Salton Sea Air Basin and Mojave Desert Air Basin. The Basin is a subregion of the SCAQMD and covers an area of 6,745 square miles. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The Basin is bounded by the Pacific Ocean to the west; the San Gabriel, San Bernardino and San Jacinto mountains to the north and east; and the San Diego County line to the south (**Figure 3-1**).

**Air Quality Management Plan**. All areas designated as nonattainment under the CCAA are required to prepare plans showing how the area would meet the State air quality standards by its attainment dates. The Air Quality Management Plan (AQMP) is the SCAQMD plan for improving regional air quality. It addresses CAA and CCAA requirements and demonstrates attainment with State and federal ambient air quality standards. The AQMP is prepared by SCAQMD and the Southern California Association of Governments (SCAG). The AQMP provides policies and control measures that reduce emissions to attain both State and federal ambient air quality standards by their applicable deadlines. Environmental review of individual projects within the Basin must demonstrate that daily construction and operational emissions thresholds, as established by the SCAQMD, would not be exceeded. The environmental review must also demonstrate that individual projects would not increase the number or severity of existing air quality violations.

The 2007 AQMP was adopted by the SCAQMD on June 1, 2007. The 2007 AQMP proposes attainment demonstration of the federal $PM_{2.5}$ standards through a more focused control of $SO_X$, directly-emitted $PM_{2.5}$, and $NO_X$ supplemented with VOC by 2015. The eight-hour ozone control strategy builds upon the $PM_{2.5}$ strategy, augmented with additional $NO_X$ and VOC reductions to meet the standard by 2024. The 2007 AQMP also addresses several federal planning requirements and incorporates significant new scientific data, primarily in the form of updated


LEGEND:

South Coast Air Basin

State of California

SOURCE: California Air Resources Board, State and Local Air Monitoring Network Plan, October 1998

APPROX. SCALE

N

0 75 150 MILES

taha

Elysian Park/USC Water Recycling Project
Air Quality Impact Report

taha 2012-016 AECOM

*FIGURE 3-1*

SOUTH COAST AIR BASIN

emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The 2007 AQMP is consistent with and builds upon the approaches taken in the 2003 AQMP. However, the 2007 AQMP highlights the significant amount of reductions needed and the urgent need to identify additional strategies, especially in the area of mobile sources, to meet all federal criteria pollutant standards within the time frames allowed under the CAA.

**Toxic Air Contaminants**. The SCAQMD has a long and successful history of reducing air toxics and criteria emissions in the South Coast Air Basin (Basin). SCAQMD has an extensive control program, including traditional and innovative rules and policies. These policies can be viewed in the SCAQMD's *Air Toxics Control Plan for the Next Ten Years* (March 2000). To date, the most comprehensive study on air toxics in the Basin is the Multiple Air Toxics Exposure Study (MATES-III), conducted by the SCAQMD. The monitoring program measured more than 30 air pollutants, including both gases and particulates. The monitoring study was accompanied by a computer modeling study in which SCAQMD estimated the risk of cancer from breathing toxic air pollution throughout the region based on emissions and weather data. MATES-III found that the cancer risk in the region from carcinogenic air pollutants ranges from about 870 in a million to 1,400 in a million, with an average regional risk of about 1,200 in a million.

An addendum to the plan was completed in March 2004 that included a status update on the implementation of the various mobile and stationary source strategies. Revised projections were based on accomplishments thus far and a new inventory was included to reflect the updated 2003 AQMP.

### Global Climate Change

In response to growing scientific and political concern with global climate change, California adopted a series of laws to reduce emissions of GHGs into the atmosphere. Applicable regulations are provided below.

**Executive Order S-3-05**. On June 1, 2005, Executive Order (E.O.) S-3-05 set the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels. The Executive Order establishes State GHG emission targets of 1990 levels by 2020 (the same as AB 32) and 80 percent below 1990 levels by 2050. It calls for the Secretary of California Environmental Protection Agency (Cal/EPA) to be responsible for coordination of State agencies and progress reporting. A recent California Energy Commission report concludes, however, that the primary strategies to achieve this target should be major "decarbonization" of electricity supplies and fuels, and major improvements in energy efficiency.

In response to the E.O., the Secretary of the Cal/EPA created the Climate Action Team (CAT). California's CAT originated as a coordinating council organized by the Secretary for Environmental Protection. It included the Secretaries of the Natural Resources Agency, and the Department of Food and Agriculture, and the Chairs of the Air Resources Board, Energy Commission, and Public Utilities Commission. The original council was an informal collaboration between the agencies to develop potential mechanisms for reductions in GHG emissions in the State. The council was given formal recognition in E.O. S-3-05 and became the CAT.

The original mandate for the CAT was to develop proposed measures to meet the emission reduction targets set forth in the executive order. The CAT has since expanded and currently has members from 18 State agencies and departments. The CAT also has ten working groups

which coordinate policies among their members. The working groups and their major areas of focus are:

- Agriculture: Focusing on opportunities for agriculture to reduce GHG emissions through efficiency improvements and alternative energy projects, while adapting agricultural systems to climate change
- Biodiversity: Designing policies to protect species and natural habitats from the effects of climate change
- Energy: Reducing GHG emissions through extensive energy efficiency policies and renewable energy generation
- Forestry: Coupling GHG mitigation efforts with climate change adaptation related to forest preservation and resilience, waste to energy programs and forest offset protocols
- Land Use and Infrastructure: Linking land use and infrastructure planning to efforts to reduce GHG from vehicles and adaptation to changing climatic conditions
- Oceans and Coastal: Evaluating the effects sea level rise and changes in coastal storm patterns on human and natural systems in California
- Public Health: Evaluating the effects of GHG mitigation policies on public health and adapting public health systems to cope with changing climatic conditions
- Research: Coordinating research concerning impacts of and responses to climate change in California
- State Government: Evaluating and implementing strategies to reduce GHG emissions resulting from State government operations; an
- Water: Reducing GHG impacts associated with the State's water systems and exploring strategies to protect water distribution and flood protection infrastructure

The CAT is responsible for preparing reports that summarize the State's progress in reducing GHG emissions. The most recent CAT Report was published in December 2010. The CAT Report discusses mitigation and adaptation strategies, State research programs, policy development, and future efforts.

Assembly Bill 32. In September 2006, the State passed the California Global Warming Solutions Act of 2006, also known as Assembly Bill (AB) 32, into law. AB 32 focuses on reducing GHG emissions in California, and requires the ARB to adopt rules and regulations that would achieve greenhouse gas emissions equivalent to Statewide levels in 1990 by 2020. To achieve this goal, AB 32 mandates that the CARB establish a quantified emissions cap, institute a schedule to meet the cap, implement regulations to reduce Statewide GHG emissions from stationary sources, and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved. Because the intent of AB 32 is to limit 2020 emissions to the equivalent of 1990, it is expected that the regulations would affect many existing sources of GHG emissions and not just new general development projects. Senate Bill (SB) 1368, a companion bill to AB 32, requires the California Public Utilities Commission and the California Energy Commission to establish GHG emission performance standards for the generation of electricity. These standards will also apply to power that is generated outside of California and imported into the State.

AB 32 charges CARB with the responsibility to monitor and regulate sources of GHG emissions in order to reduce those emissions. On June 1, 2007, CARB adopted three discrete early action measures to reduce GHG emissions. These measures involved complying with a low carbon fuel standard, reducing refrigerant loss from motor vehicle air conditioning maintenance, and increasing methane capture from landfills. On October 25, 2007, CARB tripled the set of

previously approved early action measures. The approved measures include improving truck efficiency (i.e., reducing aerodynamic drag), electrifying port equipment, reducing perfluorocarbons from the semiconductor industry, reducing propellants in consumer products, promoting proper tire inflation in vehicles, and reducing sulfur hexaflouride emission from the non-electricity sector. The CARB has determined that the total Statewide aggregated GHG 1990 emissions level and 2020 emissions limit is 427 million metric tons of $CO_2e$. The 2020 target reductions are currently estimated to be 174 million metric tons of $CO_2e$.

The CARB AB 32 Scoping Plan contains the main strategies to achieve the 2020 emissions cap. The Scoping Plan was developed by the CARB with input from the CAT and proposes a comprehensive set of actions designed to reduce overall carbon emissions in California, improve the environment, reduce oil dependency, diversify energy sources, and enhance public health while creating new jobs and improving the State economy. The GHG reduction strategies contained in the Scoping Plan include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. Key approaches for reducing greenhouse gas emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a Statewide renewable electricity standard of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets; and
- Adopting and implementing measures to reduce transportation sector emissions, including California's.

CARB has also developed the GHG mandatory reporting regulation, which required reporting beginning on January 1, 2008 pursuant to requirements of AB 32. The regulations require reporting for certain types of facilities that make up the bulk of the stationary source emissions in California. The regulation language identifies major facilities as those that generate more than 25,000 metric tons of $CO_2$ per year. Cement plants, oil refineries, electric generating facilities/providers, co-generation facilities, and hydrogen plants and other stationary combustion sources that emit more than 25,000 metric tons of $CO_2$ per year, make up 94 percent of the point source $CO_2$ emissions in California.

CEQA Guidelines Amendments. California Senate Bill (SB) 97 required the Governor's Office of Planning and Research (OPR) to develop CEQA Guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions." The CEQA Guidelines amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. Noteworthy revisions to the CEQA Guidelines include:

- Lead agencies should quantify all relevant GHG emissions and consider the full range of project features that may increase or decrease GHG emissions as compared to the existing setting;
- Consistency with the CARB Scoping Plan is not a sufficient basis to determine that a project's GHG emissions would not be cumulatively considerable;
- A lead agency may appropriately look to thresholds developed by other public agencies, including the CARB's recommended CEQA thresholds;

- To qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project. General compliance with a plan, by itself, is not mitigation;
- The effects of GHG emissions are cumulative and should be analyzed in the context of CEQA's requirements for cumulative impact analysis; and
- Given that impacts resulting from GHG emissions are cumulative, significant advantages may result from analyzing such impacts on a programmatic level. If analyzed properly, later projects may tier, incorporate by reference, or otherwise rely on the programmatic analysis.

CARB Guidance. The CARB has published draft guidance for setting interim GHG significance thresholds (October 24, 2008). The guidance is the first step toward developing the recommended Statewide interim thresholds of significance for GHG emissions that may be adopted by local agencies for their own use. The guidance does not attempt to address every type of project that may be subject to CEQA, but instead focuses on common project types that are responsible for substantial GHG emissions (i.e., industrial, residential, and commercial projects). The CARB believes that thresholds in these important sectors will advance climate objectives, streamline project review, and encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the State.

SCAQMD Guidance. The SCAQMD has convened a GHG CEQA Significance Threshold Working Group to provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents. Members of the working group include government agencies implementing CEQA and representatives from various stakeholder groups that will provide input to the SCAQMD staff on developing GHG CEQA significance thresholds. On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. The SCAQMD has not adopted guidance for CEQA projects under other lead agencies.

Green LA Action Plan. The City of Los Angeles has issued guidance promoting green building to reduce GHG emissions. The goal of the Green LA Action Plan (Plan) is to reduce greenhouse gas emissions 35 percent below 1990 levels by 2030.[6] The Plan identifies objectives and actions designed to make the City a leader in confronting global climate change. The measures would reduce emissions directly from municipal facilities and operations, and create a framework to address City-wide GHG emissions. The Plan lists various focus areas in which to implement GHG reduction strategies. Focus areas listed in the Plan include energy, water, transportation, land use, waste, port, airport, and ensuring that changes to the local climate are incorporated into planning and building decisions. The Plan discusses City goals for each focus area, as follows:

### *Energy*

- Increase the generation of renewable energy;
- Encourage the use of mass transit;
- Develop sustainable construction guidelines;
- Increase City-wide energy efficiency; and
- Promote energy conservation.

[6]City of Los Angeles, Green LA: An Action Plan to Lead the Nation in Fighting Global Warming, May 2007.

### *Water*

- Decrease per capita water use to reduce electricity demand associated with water pumping and treatment.

### *Transportation*

- Power the City vehicle fleet with alternative fuels; and
- Promote alternative transportation (e.g., mass transit and rideshare).

### *Other Goals*

- Create a more livable City through land use regulations;
- Increase recycling, reducing emissions generated by activity associated with the Port of Los Angeles and regional airports;
- Create more City parks, promoting the environmental economic sector; and
- Adapt planning and building policies to incorporate climate change policy.

The City adopted an ordinance to establish a green building program in April 2008. The ordinance establishes green building requirements for projects involving 50 or more dwelling units. The Green Building Program was established to reduce the use of natural resources, create healthier living environments and minimize the negative impacts of development on local, regional, and global ecosystems. The program addresses the following five areas:

- Site: location, site planning, landscaping, storm water management, construction and demolition recycling
- Water Efficiency: efficient fixtures, wastewater reuse, and efficient irrigation
- Energy and Atmosphere: energy efficiency, and clean/renewable energy
- Materials and Resources: materials reuse, efficient building systems, and use of recycled and rapidly renewable materials
- Indoor Environmental Quality: improved indoor air quality, increased natural lighting, and thermal comfort/control

## 3.3 EXISTING AIR QUALITY

### 3.3.1 Air Pollution Climatology

The proposed alignment is located within the Los Angeles County portion of the Basin. Ambient pollution concentrations recorded in Los Angeles County are among the highest in the four counties comprising the Basin.

The Basin is in an area of high air pollution potential due to its climate and topography. The general region lies in the semi-permanent high pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds. The Basin experiences warm summers, mild winters, infrequent rainfalls, light winds, and moderate humidity. This usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The Basin is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the west and high mountains around the rest of its perimeter. The mountains and hills within the area contribute to the variation of rainfall, temperature, and winds throughout the region.

The Basin experiences frequent temperature inversions. Temperature typically decreases with height. However, under inversion conditions, temperature increases as altitude increases, thereby preventing air close to the ground from mixing with the air above it. As a result, air pollutants are trapped near the ground. During the summer, air quality problems are created due to the interaction between the ocean surface and the lower layer of the atmosphere. This interaction creates a moist marine layer. An upper layer of warm air mass forms over the cool marine layer, preventing air pollutants from dispersing upward. Additionally, hydrocarbons and $NO_2$ react under strong sunlight, creating smog. Light, daytime winds, predominantly from the west, further aggravate the condition by driving air pollutants inland, toward the mountains. During the fall and winter, air quality problems are created due to CO and $NO_2$ emissions. CO concentrations are generally worse in the morning and late evening (around 10:00 p.m.). In the morning, CO levels are relatively high due to cold temperatures and the large number of cars traveling. High CO levels during the late evenings are a result of stagnant atmospheric conditions trapping CO in the area. Since CO emissions are produced almost entirely from automobiles, the highest CO concentrations in the Basin are associated with heavy traffic. $NO_2$ concentrations are also generally higher during fall and winter days.

### 3.3.2 Local Climate

The mountains and hills within the Basin contribute to the variation of rainfall, temperature, and winds throughout the region. Within the proposed alignment, the average wind speed, as recorded at the Downtown Wind Monitoring Station, is approximately five miles per hour, with calm winds occurring 7.9 percent of the time. Wind in the vicinity of the proposed alignment predominately blows from the southwest.[7]

The annual average temperature in the project area is 74.1°F.[8] The project area experiences an average winter temperature of 67.1°F and an average summer temperature of 80.9°F. Total precipitation in the project area averages approximately 14.9 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer. Precipitation averages 9.0 inches during the winter, 3.8 inches during the spring, 2.0 inches during the fall, and less than one inch during the summer.[9]

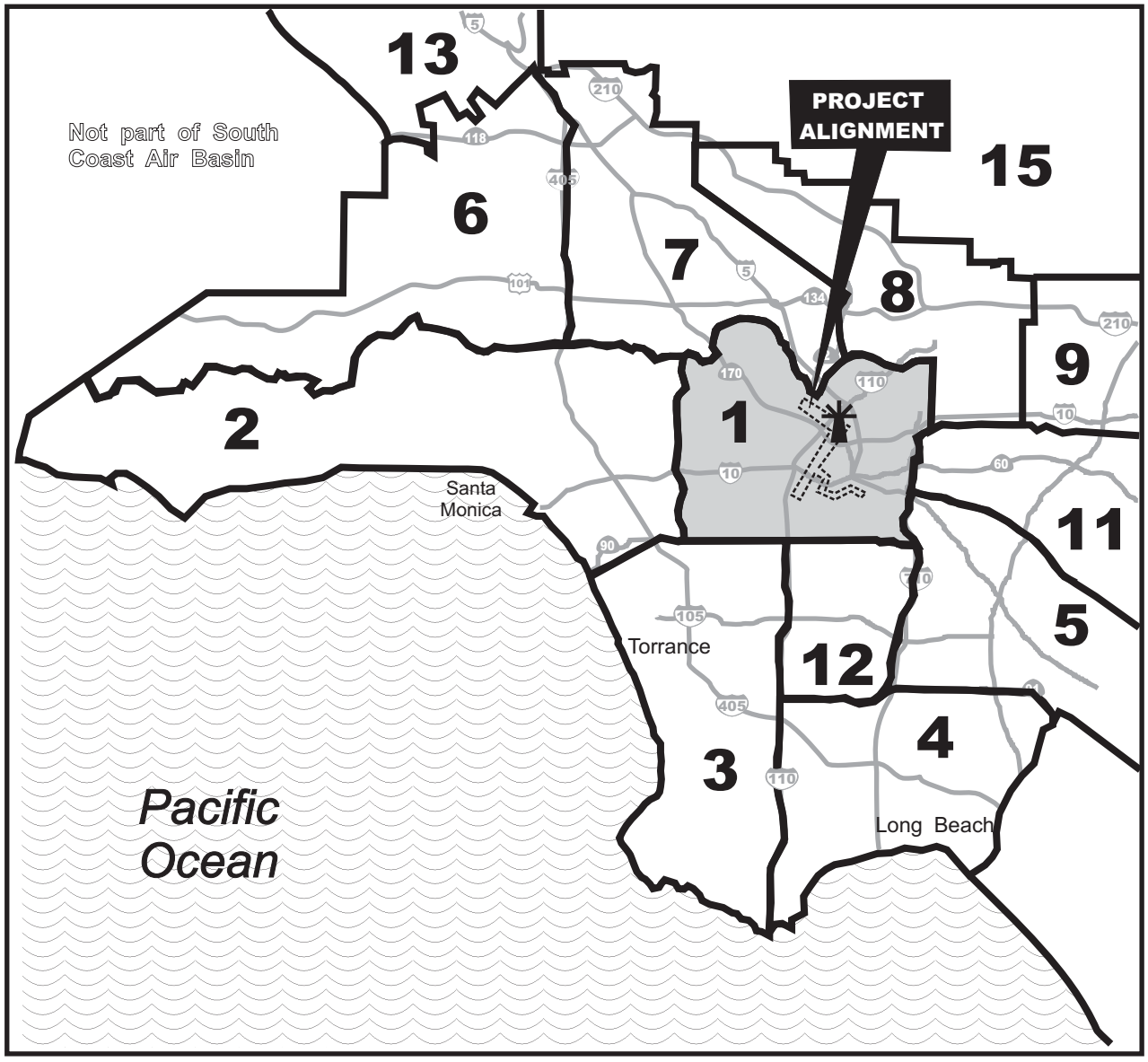
### 3.3.3 Air Monitoring Data

The SCAQMD monitors air quality conditions at 38 locations throughout the Basin. The proposed alignment is located in SCAQMD's Central Los Angeles County Air Monitoring Subregion, which is served by the Los Angeles-North Main Street Monitoring Station. The Los Angeles-North Main Street Monitoring Station is located on 1630 North Main Street and is approximately three miles southeast of the proposed alignment (**Figure 3-2**). Historical data from the Los Angeles-North Main Street Monitoring Station were used to characterize existing conditions in the vicinity of the project area. Criteria pollutants monitored at the Los Angeles-North Main Street Monitoring Station include $O_3$, CO, $NO_2$, $PM_{10}$, $PM_{2.5}$, and $SO_2$.

[7] SCAQMD, Meteorological Data, available at http://www.aqmd.gov/smog/metdata/MeteorologicalData.html, accessed March 8, 2012. See Appendix A.

[8] Western Regional Climate Center, Historical Climate Information, available at http://www.wrcc.dri.edu, accessed March 8, 2012.

[9] *Ibid*.




LEGEND: Los Angeles Monitoring Station

Air Monitoring Areas in Los Angeles County:

**1**. Central Los Angeles
**2**. Northwest Coastal
**3**. Southwest Coastal
**4**. South Coastal
**5**. Southeast Los Angeles County
**6**. West San Fernando Valley
**7**. East San Fernando Valley
**8**. West San Gabriel Valley
**9**. East San Gabriel Valley
**10**. Pomona/Walnut Valley (not shown)
**11**. South San Gabriel Valley
**12**. South Central Los Angeles
**13**. Santa Clarita Valley
**14**. Antelope Valley (not shown)
**15**. San Gabriel Mountains

SOURCE: South Coast Air Quality Management District Air Monitoring Areas Map, 1999.

Approx. Scale

N

0 4.5 9.0 Miles



*FIGURE 3-2*

AIR MONITORING AREA

**Table 3-3** shows pollutant levels, the State and federal standards, and the number of exceedances recorded at the Los Angeles-North Main Street Monitoring Station from 2009 to 2011.[10] As **Table 3-3** indicates, criteria pollutants CO, $NO_2$, and $SO_2$ did not exceed the State and federal standards from 2009 to 2011. However, the one-hour State standard for $O_3$ was exceeded one to three times during this period. The eight-hour State standard for $O_3$ was exceeded zero to five times while the eight-hour federal standard for $O_3$ was exceeded zero to two times. The 24-hour State standard for $PM_{10}$ was exceeded zero to four times during this period and the annual State standard for $PM_{2.5}$ was also exceeded each year from 2009 to 2011. The 24-hour federal standard for $PM_{10}$ and the annual federal $PM_{2.5}$ was not exceeded between the year 2009 to 2011.

**TABLE 3-3: 2009-2011 AMBIENT AIR QUALITY DATA**

| Pollutant | Pollutant Concentration & Standards | 2009 | 2010 | 2011 |
|---|---|---|---|---|
| Ozone ($O_3$) | Maximum 1-hr Concentration (ppm) | 0.14 | 0.10 | 0.13 |
| | Days > 0.09 ppm (State 1-hr standard) | 3 | 1 | 1 |
| | Maximum 8-hr Concentration (ppm) | 0.10 | 0.08 | 0.07 |
| | Days > 0.07 ppm (State 8-hr standard) | 5 | 1 | 0 |
| | Days > 0.075 ppm (National 8-hr standard) | 2 | 1 | 0 |
| Carbon Monoxide (CO) | Maximum 1-hr concentration (ppm) | 3 | 3 | n/a |
| | Days > 20 ppm (State1-hr standard) | 0 | 0 | n/a |
| | Days > 35 ppm (National 1-hr standard) | 0 | 0 | n/a |
| | Maximum 8-hr concentration (ppm) | 2.2 | 2.3 | 2.4 |
| | Days > 9.0 ppm (State 8-hr standard) | 0 | 0 | 0 |
| | Days > 9 ppm (National 8-hr standard) | 0 | 0 | 0 |
| Nitrogen Dioxide ($NO_2$) | Maximum 1-hr Concentration (ppm) | 0.16 | 0.09 | 0.11 |
| | Days > 0.18 ppm (State 1-hr standard) | 0 | 0 | 0 |
| | Days > 0.100 ppm (National 1-hr standard) | n/a | n/a | n/a |
| Respirable Particulate Matter ($PM_{10}$) | Maximum 24-hr concentration ($\mu g/m^3$) | 70 | 41 | 53 |
| | Days > 50 $\mu g/m^3$ (State 24-hr standard) | 4 | 0 | 1 |
| | Days > 150 $\mu g/m^3$ (National 24-hr standard) | 0 | 0 | 0 |
| Fine Particulate Matter ($PM_{2.5}$) | Maximum 24-hr concentration ($\mu g/m^3$) | 64 | 39 | 49 |
| | Exceed State Standard (12 $\mu g/m^3$) | Yes | Yes | Yes |
| | Days > 35 $\mu g/m^3$ (National 24-hr standard) | 7 | 5 | 8 |
| Sulfur Dioxide ($SO_2$) | Maximum 24-hr Concentration (ppm) | 0.002 | 0.002 | 0.002 |
| | Days > 0.04 ppm (State 24-hr standard) | 0 | 0 | 0 |
| | Days > 0.14 ppm (National 24-hr standard) | 0 | 0 | 0 |

'n/a' = not available
**SOURCE**: CARB, Air Quality Data Statistics, *Top 4 Summary*, http://www.arb.ca.gov/adam/topfour/topfour1.php, accessed April 30, 2012.
CO pollutant concentration was obtained from SCAQMD, Historical Data by Year, available at http://www.aqmd.gov/smog/historicaldata.htm, accessed April 30, 2012.

[10]Monitored data for 2011 was not available when this analysis was completed.

### 3.3.4 Greenhouse Gas Emissions

The primary effect of rising global concentrations of atmospheric GHG levels is a rise in the average global temperature of approximately 0.2 degrees Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005. Climate change modeling using 2000 emission rates shows that further warming is likely to occur given the expected rise in global atmospheric GHG concentrations from innumerable sources of GHG emissions worldwide, which would induce further changes in the global climate system during the current century.[11] Adverse impacts from global climate change worldwide and in California include:

- Declining sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates with a corresponding increase in atmospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;[12]

- Rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets;[13]
- Changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;[14]

- Declining Sierra Mountains snowpack levels, which account for approximately half of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years;[15]

- Increasing the number of days conducive to ozone formation (e.g., clear days with intense sun light) by 25 to 85 percent (depending on the future temperature scenario) in high $O_3$ areas located in the Southern California area and the San Joaquin Valley by the end of the 21st Century;[16] and

- Increasing the potential for erosion of California's coastlines and seawater intrusion into the Sacramento Delta and associated levee systems due to the rise in sea level.[17]

Scientific understanding of the fundamental processes responsible for global climate change has improved over the past decade. However, there remain significant scientific uncertainties, for example, in predictions of local effects of climate change, occurrence of extreme weather events, and effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of the climate system, the uncertainty surrounding the implications of climate change may never be completely eliminated. Because of these uncertainties, there continues to be significant debate as to the extent to which increased concentrations of GHGs have caused or will cause climate change, and with respect to the appropriate actions to limit and/or respond to climate change. In addition, it may not be possible to link specific development projects to future specific climate change impacts, though estimating project-specific impacts is possible.

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[11] USEPA, Draft Endangerment Finding, 74 Fed. Reg. 18886, 18904, April 24, 2009.
[12] *Ibid.*
[13] Intergovernmental Panel on Climate Change, *Climate Change 2007*, 2007.
[14] *Ibid.*
[15] California Environmental Protection Agency, Climate Action Team, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, 2006.
[16] *Ibid.*
[17] *Ibid.*

California is the fifteenth largest emitter of GHG on the planet, representing about two percent of the worldwide emissions.[18] **Table 3-4** shows the California GHG emissions inventory for years 2000 to 2009. Statewide GHG emissions slightly decreased in 2009 due to a noticeable drop in on-road transportation, electricity generation, and industrial emissions.

**TABLE 3-4: CALIFORNIA GREENHOUSE GAS EMISSIONS INVENTORY**

| | $CO_2e$ Emissions (Million Metric Tons) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sector** | **2000** | **2001** | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2008** | **2009** |
| Transportation | 172 | 175 | 181 | 179 | 183 | 186 | 187 | 187 | 178 | 173 |
| Electric Power (In-State) | 60 | 64 | 51 | 49 | 50 | 46 | 51 | 55 | 55 | 56 |
| Electric Power (Imports) | 46 | 59 | 59 | 65 | 66 | 63 | 55 | 60 | 66 | 48 |
| Commercial and Residential | 43 | 41 | 43 | 41 | 43 | 41 | 42 | 42 | 42 | 43 |
| Industrial | 97 | 93 | 94 | 92 | 94 | 93 | 92 | 90 | 87 | 81 |
| Recycling and Waste | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| Agriculture | 29 | 29 | 32 | 31 | 32 | 33 | 34 | 33 | 33 | 32 |
| Forest Net Emissions | (4.5) | (4.3) | (4.2) | (4.2) | (4.2) | (4.0) | (3.9) | (3.9) | (3.8) | (3.8) |
| **Emissions Total** | **459** | **475** | **475** | **472** | **484** | **479** | **478** | **485** | **481** | **453** |

**SOURCE**: CARB, *California Greenhouse Gas Inventory 2000-2009*, December 2011.

The transportation sector – largely the cars and trucks that move people and goods – is the largest contributor with 38 percent of the State's total GHG emissions in 2009. On-road emissions (from passenger vehicles and heavy duty trucks) constitute 93 percent of the transportation sector total emissions. Of the on-road vehicles, light duty passenger vehicles accounted for approximately 74 percent of the total sector emissions in 2009 GHG emissions. Transportation emissions showed a decline from 187 million metric tons of $CO_2e$ in 2007 to 173 million metric tons of $CO_2e$ in 2009.

The electricity sector is the next largest contributor at approximately 23 percent of the Statewide GHG emissions. This sector includes power plants and cogeneration facilities that generate electricity for on-site use and for sale to the power grid. In 2009, this sector emitted approximately 105 million metric ton of $CO_2e$. Emissions from imported electricity generation from specified imports, unspecified imports, and transmission and distribution accounts for 68, 31, and less than 1 percent, respectively. In-State electricity generation includes CHP commercial, CHP industrial, merchant owned, transmission and distribution, and utility owned. The percent contributions from CHP commercial is approximately 2, CHP industrial is approximately 30, merchant owned is approximately 57, transmission and distribution is approximately 1, and utility owned is approximately 18.. Emissions from natural gas accounts for 87 percent of in-State GHG emissions associated with electricity generation.

The industrial sector is the third largest contributor to the Statewide GHG emissions. California's industrial sector includes industrial CHP useful heat, landfills, manufacturing, mining, oil and gas extraction, petroleum refining, petroleum marketing, pipelines, wastewater treatment, and other large industrial sources. Of these emitters, petroleum refining, manufacturing accounts for 32, oil extraction accounts for 25, gas extraction accounts for 15, CHP accounts for 12, and landfills accounts for 8 percent.

[18]CARB, Climate Change Scoping Plan, December 2008.

The sector termed recycling and waste management is a unique system, encompassing not just emissions from waste facilities but also the emissions associated with the production, distribution and disposal of products throughout the economy.

Although high global warming potential gases (e.g., PFCs, HFCs, and SF6) are a small contributor to historic GHG emissions, levels of these gases are projected to increase sharply over the next several decades making them a significant source by 2020. These gases are used in growing industries such as semiconductor manufacturing.

The forest sector greenhouse gas inventory includes $CO_2$ uptake and greenhouse gas emissions from wild and prescribed fires, the decomposition and combustion of residues from harvest and conversion/development, and wood products decomposition. The forest sector is unique in that forests both emit GHGs and absorb $CO_2$ through carbon sequestration. While the current inventory shows forests absorb 3.8 million metric tons of $CO_2e$, carbon sequestration has declined since 2000 due to losses of forest area and emission increases from decomposing wood products consumed in the State. For this reason, the 2020 projection assumes no net emissions from forests.

The agricultural GHG emissions shown are largely methane emissions from livestock, both from the animals and their waste. Emissions of GHG from fertilizer application are also important contributors from the agricultural sector. Opportunities to sequester $CO_2$ in the agricultural sector may also exist; however, additional research is needed to identify and quantify potential sequestration benefits.

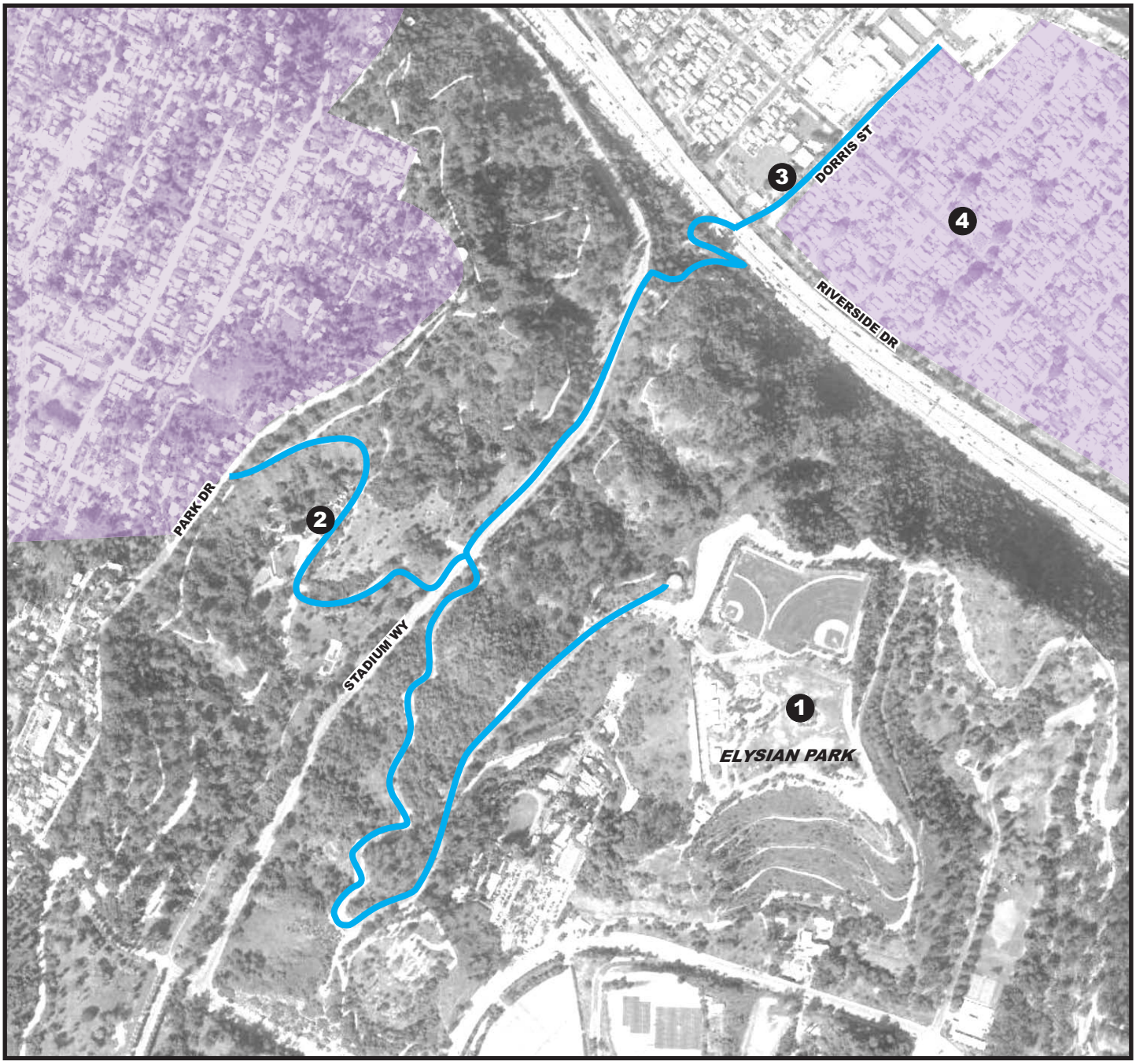
### 3.3.5 Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. CARB has identified the following groups who are most likely to be affected by air pollution: children less than 14 years of age, the elderly over 65 years of age, athletes and people with cardiovascular and chronic respiratory diseases. According to the SCAQMD, sensitive receptors include residences, schools, playgrounds, child care centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers and retirement homes.

As shown in **Figures 3-3** and **3-4**, samples of sensitive receptors within one-quarter mile (1,320 feet) of the proposed pipeline route that include, but are not limited to, the following:

*Phase 1*

- Los Angeles Downtown Elysian Park located adjacent to proposed alignment
- Grace E. Simons Lodge located adjacent to proposed alignment
- Dorris Place Elementary School located adjacent to the proposed alignment
- Single-Family Residences located approximately 115 feet to the east
- St. Ann Religious Education located approximately 940 feet to the east
- Single- and Multi-Family Residences located approximately 1,024 feet to the west




LEGEND:

Proposed Pipeline Route Phase 1

(#) Air Quality Sensitive Receptor Locations

Single-Family Residences (ParK and Riverside Drives)

1. Elysian Park
2. Grace E. Simons Lodge
3. Dorris Place Elementary School
4. St. Ann Religious School

Approx. Scale

N

0 1,060 2,120 Feet

SOURCE: TAHA, 2012 and Google Earth, 2012.

taha

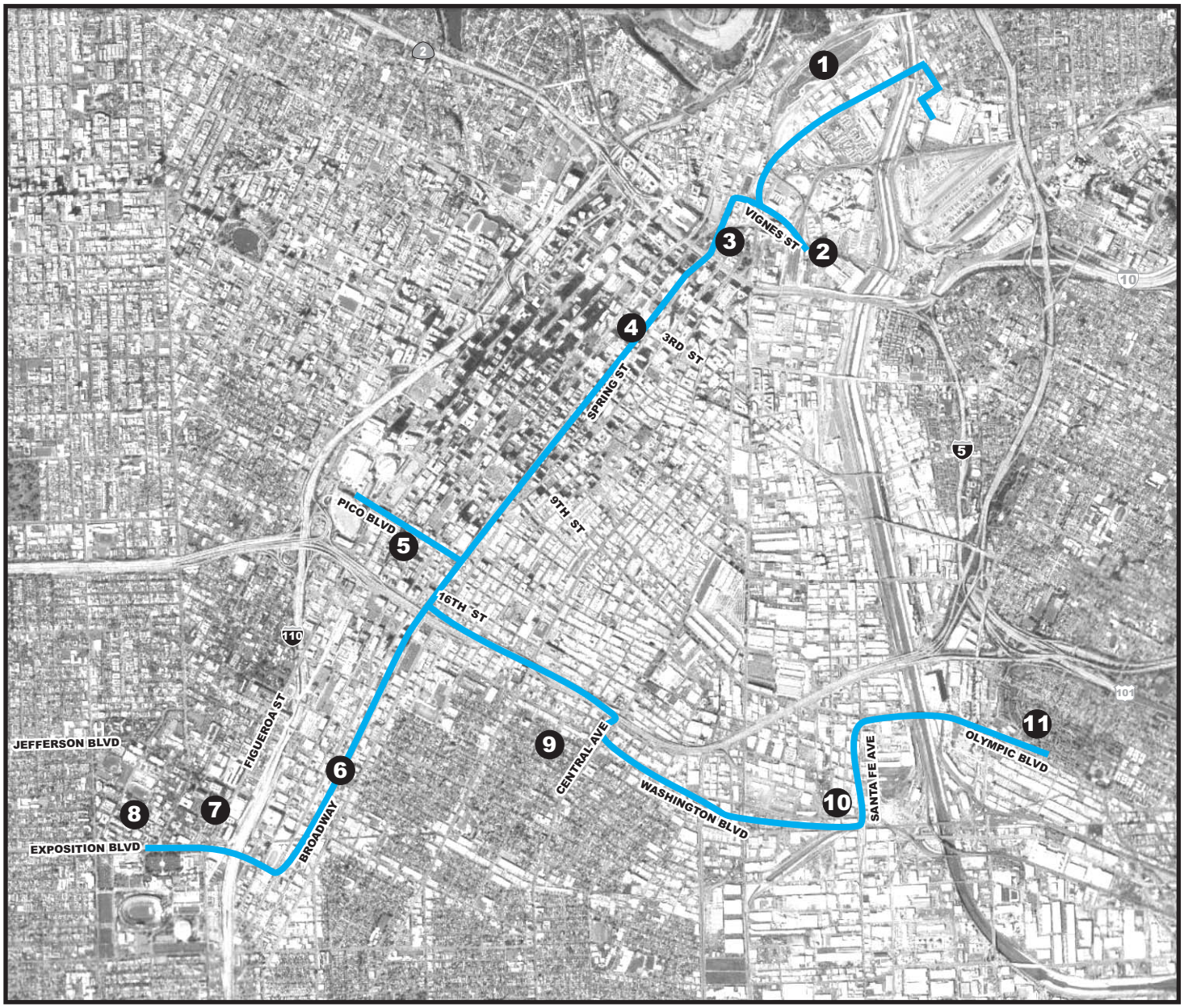
Elysian Park/USC Water Recycling Project
Air Quality Impact Report

taha 2012-016

AECOM

*FIGURE 3-3*

AIR QUALITY SENSITIVE RECEPTOR LOCATIONS - PHASE 1




LEGEND:

Proposed Pipeline Route Phase 2

(#) Air Quality Sensitive Receptor Locations

1. Los Angeles Historic Park
2. Twin Towers Correctional Facility
3. Cathedral of Our Lady of Angels
4. Bradbury Building
5. City of Lights Apartments
6. John Adams Middle School
7. Single- and Multi-Family Residences - Figueroa Street
8. USC Main Campus
9. Single- and Multi-Family Residences - Washington Boulevard
10. St. Turibius School and Church
11. Wyvernwood Apartments

APPROX. SCALE

N

0 0.75 1.5 MILE

SOURCE: TAHA, 2012 and Google Earth, 2012.



*FIGURE 3-4*

AIR QUALITY SENSITIVE RECEPTOR LOCATIONS - PHASE 2

*Phase 2*

The following are samples of sensitive receptors that are adjacent to the proposed pipeline route:

- Los Angeles Historic State Park
- Twin Towers Correctional Facility
- Cathedral of Our Lady of Angels
- USC Main Campus
- Bradbury Building
- City of Lights Apartments
- St. Turibius School and Church
- Wyvernwood Apartments
- John Adams Middle School
- Single- and Multi-Family Residences located on Figueroa Street
- Single- and Multi-Family Residences located on Washington Boulevard

The above sensitive receptors represent the nearest residential land uses with the potential to be impacted by the proposed project. Additional sensitive receptors are located further from the project alignment in the surround community and would be less impacted by air emissions than the above sensitive receptors.

## 3.4 METHODOLOGY AND SIGNIFICANCE CRITERIA

### 3.4.1 Methodology

Potential impacts associated with air emissions were evaluated based on current SCAQMD guidance. This includes the SCAQMD *CEQA Air Quality Handbook* and associated updates on the SCAQMD website, and the *Localized Significance Methodology for CEQA Evaluations*.[19] In addition, emissions estimations formulas were obtained from the USEPA AP-42 *Compilation of Air Pollutant Emission Factors*.

The estimate of emissions was based upon a detailed spreadsheet provided by LADWP that described the construction process. The spreadsheet included construction phases, equipment type and hours, truck trips, and worker commute trips. The following assumptions are used to calculate emissions generated from construction activities:

Phase 1

- Total full-time operating equipment: 13
- Maximum daily personnel: 51
- Maximum daily commuter vehicle round-trips: 118
- Maximum daily haul truck round-trips: 22
- Amount of excavated material for recycled water line: 4,200 cubic yard
- Amount of excavated material for pipeline water line: 2,704 cubic yard
- Distance travelled to waste facility (Vulcan located at 11520 Sheldon Street): 22.3 miles (one-way)

[19]SCAQMD, *Localized Significance Methodology*, June 2003, revised July 2008.

Phase 2

- Total full-time operating equipments: 8
- Maximum daily personnel: 12
- Number of daily haul truck round-trips: 12
- Amount of soil hauled per day: 1,350 cubic feet
- Distance travelled to waste facility (Vulcan located at 11520 Sheldon Street): 22.3 miles (one-way)

The complete spreadsheet is included in Appendix C, *Construction Emission Calculations*. The spreadsheet was used to characterize daily activity throughout the construction process. Equipment engine emissions were estimated using OFFROAD2007 and truck and commute trips emissions were estimated using EMFAC2011. Fugitive dust emissions from sources including excavation were estimated using AP-42 emission factors. The analysis compares the worst-case emissions day from each year of construction activity to the SCAQMD regional significance thresholds.

Localized on-site emissions (i.e., equipment exhaust and fugitive dust) were estimated as described above. The mass emissions were compared to the localized screening thresholds (LSTs) established by the SCAQMD.

### 3.4.2 Significance Criteria

The following are significance criteria that SCAQMD has established to assess construction and GHG impacts. The proposed project would not include operational activity and operational significant criteria are not relevant.

#### Construction Phase Significance Criteria

The proposed project would have a significant impact if:

- Daily localized or regional, construction emissions were to exceed SCAQMD thresholds for VOC, $NO_X$, CO, $SO_X$, $PM_{2.5}$ or $PM_{10}$, as presented in **Table 3-5**;
- The proposed project would generate significant emissions of TACs; and/or
- The proposed project would create an odor nuisance.

**TABLE 3-5: SCAQMD DAILY CONSTRUCTION EMISSIONS THRESHOLDS**

| Criteria Pollutant | Regional Emissions (Pounds Per Day) | Localized Emissions (Pounds Per Day) /a/ |
|---|---|---|
| Volatile Organic Compounds (VOC) | 75 | -- |
| Nitrogen Oxides ($NO_X$) | 100 | 74 |
| Carbon Monoxide (CO) | 550 | 680 |
| Sulfur Oxides ($SO_X$) | 150 | -- |
| Fine Particulates ($PM_{2.5}$) | 55 | 3 |
| Particulates ($PM_{10}$) | 150 | 5 |

/a/ Localized thresholds based on 25-meter receptor distance and a one-acre project site.
**SOURCE:** SCAQMD, 2012.

### Greenhouse Gas Significance Criteria

The SCAQMD has not approved a GHG significance threshold for the development of non-SCAQMD and non-industrial projects. The significance threshold is based on the methodologies recommended by the California Air Pollution Control Officers Association (CAPCOA) CEQA and Climate Change white paper (January 2008). CAPCOA conducted an analysis of various approaches and significance thresholds, ranging from a zero threshold (all projects are cumulatively considerable) to a high of 40,000 to 50,000 metric tons of $CO_2e$ per year. For example, an approach assuming a zero threshold and compliance with AB 32 2020 targets would require all discretionary projects to achieve a 33 percent reduction from projected "business-as-usual" emissions to be considered less than significant. A zero threshold approach could be considered on the basis that climate change is a global phenomenon, and not controlling small source emissions would potentially neglect a major portion of the GHG inventory. However, the CEQA Guidelines also recognize that there may be a point where a project's contribution, although above zero, would not be a considerable contribution to the cumulative impact (CEQA Guidelines, Section 15130 (a)). Therefore, a threshold of greater than zero is considered more appropriate for the analysis of GHG emissions under CEQA.

Another method would use a quantitative threshold of greater than 900 metric tons $CO_2e$ per year based on a market capture approach that requires mitigation for greater than 90 percent of likely future discretionary development. Another potential threshold would be the 10,000 metric tons standard used by the Market Advisory Committee for inclusion in a GHG Cap and Trade System in California. The basic concepts for the various approaches suggested by CAPCOA are used herein to determine whether or not the proposed project's GHG emissions are "cumulatively considerable."

The most conservative (i.e., lowest) thresholds, suggested by CAPCOA, would not be appropriate for the proposed project given that it is located in a community that is highly urbanized. Similarly, the 900-ton threshold was also determined to be too conservative for general development in the South Coast Air Basin. Consequently, the threshold of 10,000 metric tons $CO_2e$ is used as a quantitative benchmark for significance.

## 3.5 ENVIRONMENTAL IMPACTS

### 3.5.1 Construction Phase

#### Regional Impacts

Construction of the proposed project has the potential to create air quality impacts through the use of heavy-duty construction equipment and through vehicle trips generated by construction workers traveling to and from the proposed alignment. Fugitive dust emissions would primarily result from trenching activities. $NO_X$ emissions would primarily result from the use of construction equipment. The assessment of construction air quality impacts considers each of these potential sources. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation and, for dust, the prevailing weather conditions.

It is mandatory for all construction projects in the Basin to comply with SCAQMD Rule 403 for Fugitive Dust. Specific Rule 403 control requirements include, but are not limited to, applying water in sufficient quantities to prevent the generation of visible dust plumes, applying soil binders to uncovered areas, reestablishing ground cover as quickly as possible, utilizing a wheel washing

system to remove bulk material from tires and vehicle undercarriages before vehicles exit the proposed alignment, and maintaining effective cover over exposed areas. Compliance with Rule 403 would reduce regional $PM_{2.5}$ and $PM_{10}$ emissions associated with construction activities by approximately 61 percent.

Table 3-6 shows the maximum daily emissions associated with each construction year for both Phase 1 and 2 of the proposed project. As shown in Table 3-6, the criteria pollutants would not exceed the SCAQMD regional thresholds. Therefore, the proposed project would result in a less-than-significant impact related to regional construction emissions.

**TABLE 3-6: REGIONAL CONSTRUCTION EMISSIONS**

| | Pounds Per Day | | | | | |
|---|---|---|---|---|---|---|
| **Construction Year** | **VOC** | **$NO_X$** | **CO** | **$SO_X$** | **$PM_{2.5}$** | **$PM_{10}$** |
| **Phase 1** | | | | | | |
| Year 2016 /a/ | 6 | 41 | 31 | <1 | 2 | 2 |
| Year 2017 /b/ | 7 | 51 | 44 | <1 | 3 | 2 |
| Year 2018 /c/ | 4 | 26 | 25 | <1 | 1 | 1 |
| Maximum Regional Total | 7 | 51 | 44 | <1 | 3 | 2 |
| **REGIONAL SIGNIFICANCE THRESHOLD** | **75** | **100** | **550** | **150** | **55** | **150** |
| Exceed Threshold? | No | No | No | No | No | No |
| **Phase 2** | | | | | | |
| Year 2018 | 4 | 27 | 25 | <1 | 1 | 1 |
| **REGIONAL SIGNIFICANCE THRESHOLD** | **75** | **100** | **550** | **150** | **55** | **150** |
| Exceed Threshold? | No | No | No | No | No | No |

/a/ Maximum daily emissions would occur in December.
/b/ Maximum daily VOC would occur for all months except January, February, October, and December. Maximum daily $NO_X$ would occur in May, July, August, and September. Maximum daily CO would occur in June, July, and September. Maximum daily $SO_X$, $PM_{10}$, and $PM_{2.5}$ would occur in June.
/c/ Maximum daily emissions would occur in January.
**SOURCE**: TAHA, 2012.

## Localized Impacts

Construction activity would generate on-site pollutant emissions associated with equipment exhaust and fugitive dust. Table 3-7 shows the estimated localized emissions associated with each construction year. Maximum daily VOC, $NO_X$, CO, $SO_X$, $PM_{2.5}$, and $PM_{10}$ emissions would not exceed the SCAQMD LST. Therefore, the proposed project would result in a less-than-significant impacts related to localized concentrations.

Installation of the recycled water pipeline would restrict street parking and closure of up to two roadway lanes. Consequently, traffic flow would be affected whenever a mixed-flow traffic lane is closed for construction activities. Reduced speeds through construction zones would result in additional localized concentrations. Traffic congestion would lessen as some automobile travelers would reroute to parallel streets when lane closures would occur. The proposed project is not projected to substantially increase traffic congestion since road closures would be limited limited to off-peak periods. In addition, construction activities would be limited to 90 feet of the public roads at one time to minimize long-term traffic disruption. Therefore, the proposed project would result in a less-than-significant impact related to localized traffic concentrations

**TABLE 3-7: LOCALIZED CONSTRUCTION EMISSIONS**

| Construction Year | Pounds Per Day | | | | | |
|---|---|---|---|---|---|---|
| | VOC | $NO_X$ | CO | $SO_X$ | $PM_{2.5}$ | $PM_{10}$ |
| **Phase 1** | | | | | | |
| Year 2016 /a/ | 5 | 40 | 24 | <1 | 2 | 2 |
| Year 2017 /b/ | 7 | 50 | 36 | <1 | 3 | 2 |
| Year 2018 /c/ | 4 | 25 | 21 | <1 | 1 | 1 |
| Maximum Localized Total | 7 | 50 | 36 | <1 | 3 | 2 |
| **LOCALIZED SIGNIFICANCE THRESHOLD** | **n/a** | **74** | **680** | **n/a** | **2** | **3** |
| Exceed Threshold? | No | No | No | No | No | No |
| **Phase 2** | | | | | | |
| Year 2018 | 4 | 26 | 21 | <1 | 1 | 1 |
| **LOCALIZED SIGNIFICANCE THRESHOLD** | **n/a** | **74** | **680** | **n/a** | **2** | **3** |
| Exceed Threshold? | No | No | No | No | No | No |

/a/ Maximum daily emissions would occur in December.
/b/ Maximum daily VOC would occur for all months except January, February, October, and December. Maximum daily $NO_X$ would occur in May, July, August, and September. Maximum daily CO would occur in June, July, and September. Maximum daily $SO_X$, $PM_{10}$, and $PM_{2.5}$ would occur in June.
/c/ Maximum daily emissions would occur in January.
**SOURCE**: TAHA, 2012.

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## Toxic Air Contaminant Impacts

The greatest potential for toxic air contaminant (TAC) emissions during construction would be diesel particulate emissions associated with heavy-duty equipment operations. The SCAQMD has not published guidance for assessing the risk from construction projects. The California Air Pollution Control Officers Association (CAPCOA) has published *Health Risk Assessments for Proposed Land Use Projects* (July 2009). Page 2 of the document states that, "This guidance does not include how risk assessments for construction projects should be addressed in CEQA. As this is intended to be a 'living document', the risks near construction projects are expected to be included at a later time as the toxic emissions from construction activities are better quantified. State risk assessment policy is likely to change to reflect current science, and therefore this document will need modification as this occurs." As regional and localized particulate matter emissions would not result in significant impacts, it is similarly anticipated that diesel particulate emissions would not result in a significant health impact. Therefore, the proposed project would result in a less-than-significant impact related to construction TAC emissions.

## Odor Impacts

Potential sources that may emit odors during construction activities include equipment exhaust. Odors from these sources would be localized and generally confined to the immediate area surrounding the proposed alignment. The proposed project would utilize typical construction techniques, and the odors would be typical of most construction sites and temporary in nature. Therefore, the proposed project would result in a less-than-significant impact related to construction odors.

### Construction Phase Mitigation Measures

Impacts related to regional and localized air emissions were determined to be less-than-significant without mitigation. In addition, the proposed project shall implement the following Best Management Practices during all phases of construction:

- The proposed project shall implement Rule 403 dust control measures required by the SCAQMD.

- Residences and businesses near the pipeline alignment would be notified prior to the start of construction (e.g., flyers) of lane closures and parking restrictions in their vicinity. The notices shall include a telephone number for comments or questions related to construction activities.

- The proposed project construction would incorporate source reduction techniques and recycling measures and maintain a recycling program to divert waste in accordance with the Citywide Construction and Demolition Debris Recycling Ordinance.

### Impacts After Mitigation

**Regional Impacts**. Impacts related to regional air emissions were determined to be less-than significant without mitigation.

**Localized Impacts**. Impacts related to localized air emissions were determined to be less-than-significant without mitigation.

**Toxic Air Contaminant Impacts**. Impacts related to toxic air contaminant emissions were determined to be less-than-significant without mitigation.

**Odor Impacts**. Impacts related to odors were determined to be less-than-significant without mitigation.

## 3.5.2 Operational Phase

Upon completion of the proposed pipeline route, the proposed project will not include any new operational activities. Therefore, no impacts related to regional operational emissions would occur.

### Operational Phase Mitigation Measures

No impacts related to operational air quality emissions would occur. No mitigation measures are required.

### Impacts After Mitigation

No impacts related to operational air quality emissions would occur.

## 3.6 GENERAL CONFORMITY FOR NEPA

### 3.6.1 General Conformity Analysis

The proposed project would receive federal funds for Phase 1 of the proposed project and the environmental analysis is required to include a general air quality conformity analysis. The USEPA has designated areas as attainment, nonattainment, or maintenance for each criteria pollutant based on whether the NAAQS have been achieved. As shown in **Table 3-1**, above, the proposed project is located within a nonattainment area for $O_3$ and $PM_{10}$, and maintenance area for CO. This analysis does not assess sulfur dioxide and lead because USEPA has designated the Basin as an attainment area for these pollutants.

The *de minimis* level is used to determine $O_3$, $PM_{10}$, and CO impacts. VOC and $NO_X$ are precursors of $O_3$; thus, VOC and $NO_X$ emissions are used to determine $O_3$ impacts. **Table 3-8** shows the annual construction emissions and the applicable *de minimis* thresholds for VOC, $NO_X$, CO, and $PM_{10}$. Emissions for VOC, $NO_X$, CO, and $PM_{10}$ would not exceed the *de minimis* threshold. Therefore, the proposed project would be consistent with general air quality conformity rules and regulations.

**TABLE 3-8: ANNUAL CONSTRUCTION EMISSIONS FOR GENERAL CONFORMITY**

| | Tons Per Year | | | |
|---|---|---|---|---|
| **Construction Year** | **VOC** | **$NO_X$** | **CO** | **$PM_{10}$** |
| Year 2016 /a/ | 0.75 | 5 | 4 | 0.25 |
| Year 2017 /b/ | 0.88 | 6 | 5 | 0.25 |
| Year 2018 /c/ | 0.50 | 3 | 3 | 0.13 |
| Maximum Annual Construction Total | 0.88 | 6 | 5 | 0.25 |
| ***DE MINIMIS* THRESHOLD** | **10** | **10** | **100** | **70** |
| Exceed Threshold? | No | No | No | No |

/a/ Maximum annual emissions would occur in December.
/b/ Maximum annual VOC would occur for all months except January, February, October, and December. Maximum annual $NO_X$ would occur in May, July, August, and September. Maximum annual CO would occur in June, July, and September. Maximum daily $SO_X$, $PM_{10}$, and $PM_{2.5}$ would occur in June.
/c/ Maximum annual emissions would occur in January.
**SOURCE**: TAHA, 2012.

## 3.7 CUMULATIVE IMPACTS

### 3.7.1 SCAQMD Methodology

A significant impact would occur if the proposed project resulted in a cumulative net increase in any criteria pollutant above threshold standards. The SCAQMD's approach for assessing cumulative air quality impacts is based on the AQMP forecasts of attainment of ambient air quality standards in accordance with the requirements of the federal and State Clean Air Acts. The SCAQMD has set forth significance thresholds designed to assistant in the attainment of ambient air quality standards. The proposed project would not result in significant emissions after the implementation of mitigation. Therefore, the proposed project would not result in a cumulatively considerable impact related to construction air quality.

### 3.7.2 Global Climate Change

Greenhouse gas emissions were estimated for equipment exhaust, truck trips, and worker commute trips. As shown in **Table 3-9**, total GHG emissions for Phases 1 and 2 would be 4,468 metric tons per year. The SCAQMD has developed guidance for the determination of significance of GHG construction emissions, and recommends emissions from construction be amortized over 30 years. Hence, the amortized construction emissions would result in total annual emissions of 149 metric tons of $CO_2e$. Estimated GHG emissions would be less than the 10,000 metric tons of $CO_2e$ per year quantitative significance threshold. The proposed project would not include significant sources of constructional and operational emissions. The proposed project would not conflict with any State or local climate change policy or regulation. Therefore, the proposed project would result in a less-than-significant impact related to GHG emissions.

**TABLE 3-9: ANNUAL GREENHOUSE GAS EMISSIONS**

| Year | Carbon Dioxide Equivalent (Metric Tons per Year) |
|---|---|
| **Phase 1** | |
| Year 2016 | 950 |
| Year 2017 | 2,570 |
| Year 2018 | 239 |
| **Phase 2** | |
| Year 2018 | 709 |
| **Total Emissions** | **4,468** |
| **Total Amortized Emissions /a/** | **149** |
| **SIGNIFICANCE THRESHOLD** | **10,000** |
| Exceed Threshold? | No |

/a/ The SCAQMD recommends annualizing construction emissions over 30 years in the GHG analysis.
**SOURCE**: TAHA, 2012.

# Appendices

A. Wind & Climate Information
B. CARB Data
C. Construction Emission Calculations
D. GHG Emission Calculations
E. EMFAC2011 Output Files
F. SCAQMD Rule 403 – Fugitive Dust

# Appendix A

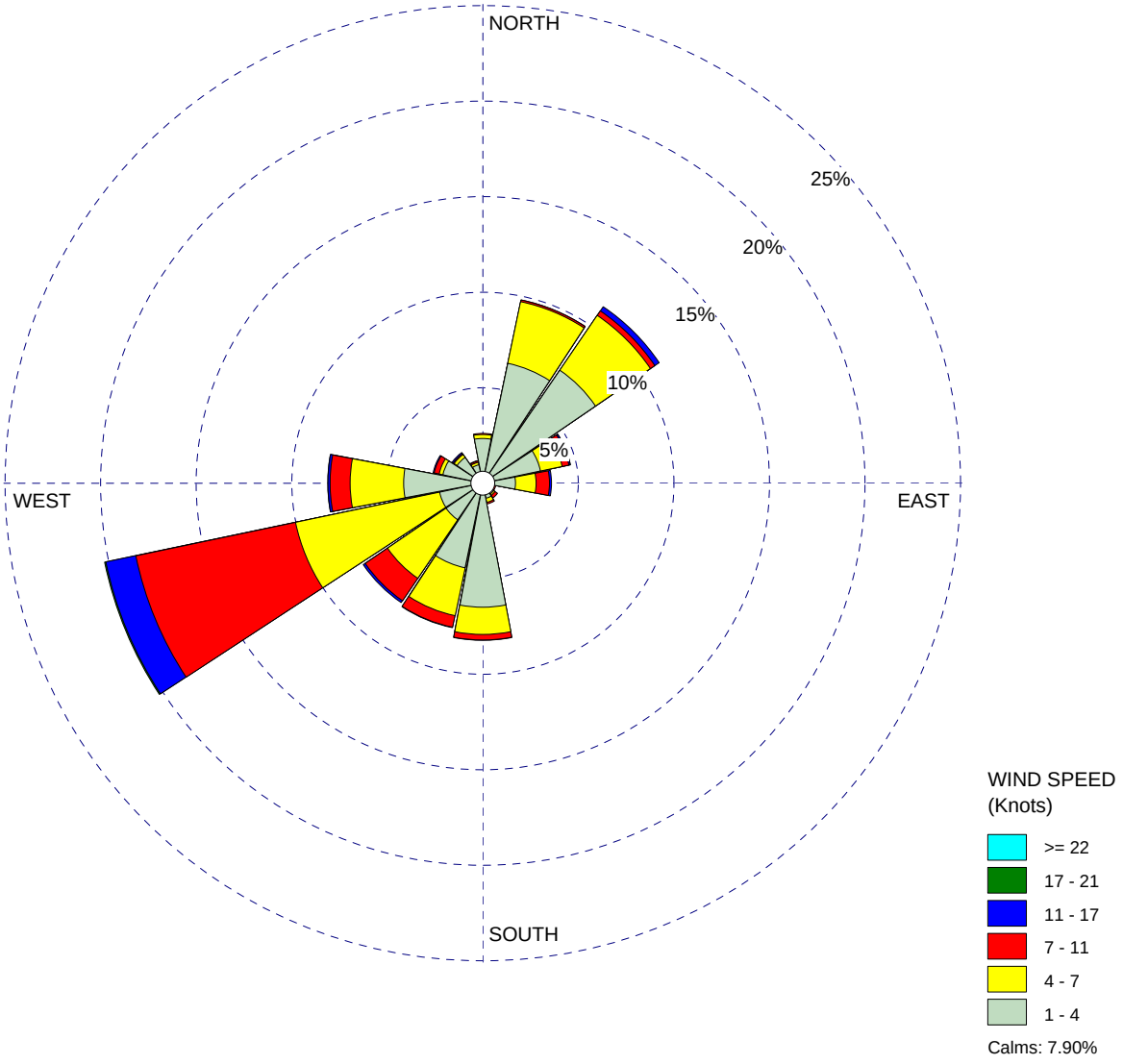
# Wind and Climate Information

WIND ROSE PLOT:

**Elysian/USC Water Recycling Project**

DISPLAY:

**Wind Speed**
**Direction (blowing from)**




| | | | |
|---|---|---|---|
| COMMENTS: | DATA PERIOD:<br>**Start Date: 1/1/1981 - 00:00**<br>**End Date: 12/31/1981 - 23:00** | COMPANY NAME: | |
| | | MODELER: | |
| | CALM WINDS:<br>**7.90%** | TOTAL COUNT:<br>**8760 hrs.** | |
| | AVG. WIND SPEED:<br>**4.31 Knots** | DATE:<br>**4/18/2012** | PROJECT NO.: |

# Southern California Climate Summaries

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- Ash Mountain
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- Barstow
- Barstow Fire Station
- Beaumont 1 E
- Big Bear Lake
- Blythe
- Blythe CCA Airport
- Borrego Desert Park
- Brawley 2 SW
- Buttonwillow
- Cachuma Lake
- Campo
- Cantil
- Carmel Valley
- Chula Vista
- Coalinga
- Corcoran Irrig. Dist.
- Cuyamaca
- Daggett
- Death Valley
- Dry Canyon Reservoir
- Eagle Mountain
- El Cajon
- El Capitan Dam
- El Centro 2 SSW
- El Mirage Field
- Escondido
- Escondido 2
- Fairmont
- Five Points 5 SSW
- Fresno WSO
- Giant Forest
- Glennville
- Gold Rock Ranch
- Grant Grove
- Haiwee
- Hanford 1 S
- Hayfield Reservoir
- Henshaw Dam

## Los Angeles Basin Area, California Climate Summaries

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- Canoga Park Pierce College
- Claremont Pomona College
- Corona
- Culver City
- Elsinore
- Fontana Kaiser
- Laguna Beach
- Lake Arrowhead
- Long Beach
- Los Angeles Airport
- Los Angeles Civic Center
- Montebello
- Mount Wilson
- Newport Beach Harbor
- Pasadena
- Pomona Cal Poly
- Redlands
- Riverside Citrus Exp. Farm
- Riverside Fire Station 3
- San Bernardino
- San Fernando
- San Gabriel Fire Dept.
- San Pedro
- Santa Ana Fire Station
- Santa Monica Pier
- Sun City
- Torrance
- Tujunga
- Tustin Irvine Ranch
- U. C. L. A.
- Yorba Linda

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*Western Regional Climate Center, wrcc@dri.edu*

# LOS ANGELES CIVIC CENTE, CALIFORNIA

### Period of Record General Climate Summary - Precipitation

**Station:(045115) LOS ANGELES CIVIC CENTE**

From Year=1914 To Year=2006

| | Precipitation | | | | | | | | | | | Total Snowfall | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | High | Year | Low | Year | 1 Day Max. | | >= 0.01 in. | >= 0.10 in. | >= 0.50 in. | >= 1.00 in. | Mean | High | Yea |
| | in. | in. | - | in. | - | in. | dd/yyyy or yyyymmdd | # Days | # Days | # Days | # Days | in. | in. | - |
| January | 3.18 | 14.94 | 1969 | 0.00 | 1948 | 5.71 | 26/1956 | 6 | 4 | 2 | 1 | 0.0 | 0.3 | 194 |
| February | 3.44 | 13.68 | 1998 | 0.00 | 1933 | 4.26 | 18/1914 | 6 | 5 | 2 | 1 | 0.0 | 0.0 | 194 |
| March | 2.45 | 8.37 | 1983 | 0.00 | 1931 | 5.88 | 02/1938 | 6 | 4 | 2 | 1 | 0.0 | 0.0 | 194 |
| April | 1.04 | 7.53 | 1926 | 0.00 | 1916 | 2.74 | 05/1926 | 4 | 2 | 1 | 0 | 0.0 | 0.2 | 195 |
| May | 0.26 | 3.57 | 1921 | 0.00 | 1923 | 2.02 | 08/1977 | 1 | 1 | 0 | 0 | 0.0 | 0.0 | 194 |
| June | 0.06 | 0.98 | 1999 | 0.00 | 1915 | 0.76 | 05/1993 | 1 | 0 | 0 | 0 | 0.0 | 0.0 | 194 |
| July | 0.01 | 0.18 | 1986 | 0.00 | 1915 | 0.13 | 08/1991 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 194 |
| August | 0.06 | 2.26 | 1977 | 0.00 | 1914 | 2.06 | 17/1977 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 194 |
| September | 0.28 | 5.67 | 1939 | 0.00 | 1914 | 3.96 | 25/1939 | 1 | 0 | 0 | 0 | 0.0 | 0.0 | 194 |
| October | 0.44 | 4.56 | 2004 | 0.00 | 1915 | 1.72 | 17/1934 | 2 | 1 | 0 | 0 | 0.0 | 0.0 | 194 |
| November | 1.30 | 9.68 | 1965 | 0.00 | 1929 | 3.85 | 07/1966 | 3 | 2 | 1 | 0 | 0.0 | 0.0 | 194 |
| December | 2.37 | 8.77 | 2004 | 0.00 | 1929 | 5.55 | 28/2004 | 5 | 4 | 2 | 1 | 0.0 | 0.0 | 194 |
| Annual | 14.91 | 34.04 | 1983 | 3.85 | 1953 | 5.88 | 19380302 | 36 | 23 | 10 | 4 | 0.0 | 0.3 | 194 |
| Winter | 9.00 | 29.11 | 2005 | 1.19 | 1924 | 5.71 | 19560126 | 18 | 13 | 6 | 3 | 0.0 | 0.3 | 194 |
| Spring | 3.75 | 13.89 | 1983 | 0.00 | 1997 | 5.88 | 19380302 | 11 | 7 | 3 | 1 | 0.0 | 0.2 | 195 |
| Summer | 0.13 | 2.26 | 1977 | 0.00 | 1915 | 2.06 | 19770817 | 1 | 0 | 0 | 0 | 0.0 | 0.0 | 194 |

- Hollister
- Idyllwild Fire Dept.
- Imperial
- Independence
- Indio Fire Station
- Inyokern
- Iron Mountain
- Julian Wynola
- Kern River PH 1
- Kern River PH 3
- Kettleman Stn
- King City
- La Mesa
- Lancaster
- Lemon Cove
- Lindsay
- Lodgepole
- Lompoc
- **Los Angeles Basin Area**
- Maricopa
- Mecca
- Middlewater
- Mitchell Caverns
- Mojave
- Monterey
- Morro Bay Fire Dept.
- Mountain Pass
- Needles
- New Cuyama Fire Station
- Oceanside Marina
- Ojai
- Orange Cove
- Oxnard
- Palmdale
- Palm Springs
- Palomar Mountain Observatory
- Parker Reservoir
- Paso Robles
- Paso Robles FAA Airport
- Pinnacles National Monument
- Pismo Beach
- Porterville
- Posey 3 E
- Priest Valley
- Ramona Fire Dept.
- Randsburg
- Salinas 2 E
- Salinas FAA Airport
- San Diego WSO
- San Jacinto


| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fall | 2.03 | 11.48 | 1965 | 0.00 | 1980 | 3.96 | 19390925 | 6 | 4 | 1 | 0 | 0.0 | 0.0 | 194 |

Table updated on Jul 28, 2006

For monthly and annual means, thresholds, and sums:
Months with 5 or more missing days are not considered
Years with 1 or more missing months are not considered
Seasons are climatological not calendar seasons

Winter = Dec., Jan., and Feb. Spring = Mar., Apr., and May

Summer = Jun., Jul., and Aug. Fall = Sep., Oct., and Nov.

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*Western Regional Climate Center, wrcc@dri.edu*

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- El Cajon
- El Capitan Dam
- El Centro 2 SSW
- El Mirage Field
- Escondido
- Escondido 2
- Fairmont
- Five Points 5 SSW
- Fresno WSO
- Giant Forest
- Glennville
- Gold Rock Ranch
- Grant Grove
- Haiwee
- Hanford 1 S
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- Montebello
- Mount Wilson
- Newport Beach Harbor
- Pasadena
- Pomona Cal Poly
- Redlands
- Riverside Citrus Exp. Farm
- Riverside Fire Station 3
- San Bernardino
- San Fernando
- San Gabriel Fire Dept.
- San Pedro
- Santa Ana Fire Station
- Santa Monica Pier
- Sun City
- Torrance
- Tujunga
- Tustin Irvine Ranch
- U. C. L. A.
- Yorba Linda

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*Western Regional Climate Center,*
*wrcc@dri.edu*

# LOS ANGELES CIVIC CENTE, CALIFORNIA

### Period of Record General Climate Summary - Temperature

**Station:(045115) LOS ANGELES CIVIC CENTE**

From Year=1914 To Year=2006

| | Monthly Averages | | | Daily Extremes | | | | Monthly Extremes | | | | Max. Temp. | | Min. Temp. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Max. | Min. | Mean | High | Date | Low | Date | Highest Mean | Year | Lowest Mean | Year | >= 90 F | <= 32 F | <= 32 F | <= 0 F |
| | F | F | F | F | dd/yyyy or yyyymmdd | F | dd/yyyy or yyyymmdd | F | - | F | - | # Days | # Days | # Days | # Day |
| January | 66.4 | 48.4 | 57.4 | 95 | 18/1971 | 28 | 04/1949 | 65.9 | 1986 | 46.9 | 1949 | 0.1 | 0.0 | 0.1 | 0. |
| February | 67.4 | 49.7 | 58.5 | 95 | 20/1995 | 34 | 14/1949 | 65.3 | 1995 | 52.7 | 1949 | 0.1 | 0.0 | 0.0 | 0. |
| March | 68.8 | 51.2 | 60.0 | 98 | 26/1988 | 35 | 04/1976 | 66.0 | 1931 | 54.6 | 1945 | 0.2 | 0.0 | 0.0 | 0. |
| April | 71.1 | 53.5 | 62.3 | 106 | 06/1989 | 39 | 07/1975 | 69.6 | 1992 | 56.0 | 1975 | 0.8 | 0.0 | 0.0 | 0. |
| May | 73.1 | 56.6 | 64.8 | 102 | 16/1967 | 40 | 12/1933 | 72.6 | 1997 | 58.7 | 1917 | 0.8 | 0.0 | 0.0 | 0. |
| June | 77.1 | 59.8 | 68.4 | 112 | 26/1990 | 49 | 01/1917 | 77.4 | 1981 | 63.4 | 1944 | 1.2 | 0.0 | 0.0 | 0. |
| July | 82.4 | 63.1 | 72.8 | 107 | 01/1985 | 54 | 09/1920 | 79.2 | 1985 | 66.6 | 1944 | 3.2 | 0.0 | 0.0 | 0. |
| August | 83.2 | 64.0 | 73.6 | 105 | 06/1983 | 53 | 26/1943 | 80.8 | 1983 | 68.1 | 1914 | 4.1 | 0.0 | 0.0 | 0. |
| September | 81.8 | 62.7 | 72.2 | 110 | 01/1955 | 50 | 22/1921 | 81.3 | 1984 | 64.6 | 1933 | 4.9 | 0.0 | 0.0 | 0. |
| October | 77.5 | 58.8 | 68.2 | 108 | 03/1987 | 41 | 30/1971 | 74.2 | 1983 | 59.7 | 1916 | 3.0 | 0.0 | 0.0 | 0. |
| November | 72.9 | 53.3 | 63.1 | 100 | 01/1966 | 37 | 28/1919 | 68.9 | 1932 | 58.4 | 1978 | 0.7 | 0.0 | 0.0 | 0. |
| December | 67.6 | 49.3 | 58.5 | 92 | 08/1938 | 30 | 08/1978 | 64.2 | 1939 | 52.6 | 1916 | 0.0 | 0.0 | 0.0 | 0. |
| Annual | 74.1 | 55.9 | 65.0 | 112 | 19900626 | 28 | 19490104 | 68.9 | 1981 | 60.9 | 1916 | 19.3 | 0.0 | 0.1 | 0. |
| Winter | 67.1 | 49.1 | 58.1 | 95 | 19710118 | 28 | 19490104 | 63.3 | 1986 | 51.0 | 1949 | 0.2 | 0.0 | 0.1 | 0. |
| Spring | 71.0 | 53.8 | 62.4 | 106 | 19890406 | 35 | 19760304 | 67.8 | 1997 | 57.8 | 1917 | 1.9 | 0.0 | 0.0 | 0. |
| Summer | 80.9 | 62.3 | 71.6 | 112 | 19900626 | 49 | 19170601 | 77.6 | 1981 | 66.4 | 1916 | 8.5 | 0.0 | 0.0 | 0. |
| Fall | 77.4 | 58.3 | 67.8 | 110 | 19550901 | 37 | 19191128 | 72.2 | 1983 | 61.4 | 1916 | 8.7 | 0.0 | 0.0 | 0. |

Table updated on Jul 28, 2006
For monthly and annual means, thresholds, and sums:
Months with 5 or more missing days are not considered
Years with 1 or more missing months are not considered
Seasons are climatological not calendar seasons

# Appendix B

# CARB Data

# Top 4 Summary: Highest 4 Daily Maximum Hourly Ozone Measurements

at Los Angeles-North Main Street

| | 2009 | | 2010 | | 2011 | |
|---|---|---|---|---|---|---|
| | Date | Measurement | Date | Measurement | Date | Measurement |
| First High: | Aug 30 | 0.139 | Sep 26 | 0.098 | Sep 9 | 0.133 |
| Second High: | Sep 26 | 0.119 | Sep 4 | 0.090 | Sep 7 | 0.087 |
| Third High: | Aug 26 | 0.104 | Sep 25 | 0.087 | Aug 27 | 0.080 |
| Fourth High: | Aug 31 | 0.092 | Aug 23 | 0.081 | Aug 28 | 0.080 |
| California: | | | | | | |
| # Days Above the Standard: | 3 | | 1 | | 1 | |
| California Designation Value: | 0.11 | | 0.10 | | 0.10 | |
| Expected Peak Day Concentration: | 0.105 | | 0.101 | | 0.095 | |
| National: | | | | | | |
| *# Days Above the Standard:* | *1* | | *0* | | *1* | |
| *Nat'l Standard Design Value:* | *0.111* | | *0.104* | | *0.104* | |
| Year Coverage: | 96 | | 96 | | 89 | |

◄ Shift Backward [1 year] Shift Forward ►

Notes:

Hourly ozone measurements and related statistics are available at Los Angeles-North Main Street between 1979 and 2011. Some years in this range may not be represented.

All concentrations expressed in parts per million.

The national 1-hour ozone standard was revoked in June 2005 and is no longer in effect. Statistics related to the revoked standard are shown in *italics* or *italics*.

yellow exceeds a California ambient air quality standard. *orange* exceeds the revoked 1-hour national ambient air quality standard.

An exceedance of a standard is not necessarily related to a violation of the standard.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

# Top 4 Summary: Highest 4 Daily Maximum Hourly Nitrogen Dioxide Measurements

at Los Angeles-North Main Street

| | 2009 | | 2010 | | 2011 | |
|---|---|---|---|---|---|---|
| | Date | Measurement | Date | Measurement | Date | Measurement |
| First High: | Nov 3 | 0.115 | Aug 24 | 0.089 | Sep 7 | 0.110 |
| Second High: | Sep 26 | 0.103 | Sep 24 | 0.078 | Dec 30 | 0.098 |
| Third High: | Sep 24 | 0.085 | Sep 27 | 0.074 | Sep 27 | 0.089 |
| Fourth High: | Sep 25 | 0.085 | Sep 25 | 0.073 | Dec 31 | 0.079 |
| California: | | | | | | |
| # Days Above the Standard: | 0 | | 0 | | 0 | |
| Annual Average: | 0.028 | | 0.025 | | 0.023 | |
| Year Coverage: | 93 | | 96 | | 86 | |

◄ Shift Backward 1 Shift Forward ►

Notes:

Hourly nitrogen dioxide measurements and related statistics are available at Los Angeles-North Main Street between 1979 and 2011. Some years in this range may not be represented.

All concentrations expressed in parts per million.

yellow exceeds a California ambient air quality standard. orange exceeds a national ambient air quality standard.

An exceedance of a standard is not necessarily related to a violation of the standard.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

# Top 4 Summary: Highest 4 Daily Maximum 8-Hour Ozone Averages

at Los Angeles-North Main Street

| | 2009 | | 2010 | | 2011 | |
|---|---|---|---|---|---|---|
| | Date | 8-Hr Average | Date | 8-Hr Average | Date | 8-Hr Average |
| National: | | | | | | |
| First High: | Aug 30 | 0.100 | Sep 26 | 0.080 | Sep 5 | 0.065 |
| Second High: | Aug 26 | 0.078 | Jun 5 | 0.065 | Sep 7 | 0.064 |
| Third High: | Aug 31 | 0.075 | Sep 25 | 0.065 | Jul 4 | 0.061 |
| Fourth High: | Aug 29 | 0.073 | Aug 23 | 0.064 | Aug 28 | 0.060 |
| California: | | | | | | |
| First High: | Aug 30 | 0.101 | Sep 26 | 0.080 | Sep 5 | 0.065 |
| Second High: | Aug 26 | 0.078 | Sep 25 | 0.066 | Sep 7 | 0.064 |
| Third High: | Aug 31 | 0.075 | Jun 5 | 0.065 | Jul 4 | 0.062 |
| Fourth High: | Aug 29 | 0.073 | Aug 23 | 0.064 | Aug 28 | 0.061 |
| National: | | | | | | |
| # Days Above the Standard: | | 2 | | 1 | | 0 |
| Nat'l Standard Design Value: | | 0.072 | | 0.070 | | 0.065 |
| National Year Coverage: | | 94 | | 95 | | 88 |
| California: | | | | | | |
| # Days Above the Standard: | | 5 | | 1 | | 0 |
| California Designation Value: | | 0.081 | | 0.081 | | 0.073 |
| Expected Peak Day Concentration: | | 0.085 | | 0.081 | | 0.074 |
| California Year Coverage: | | 91 | | 93 | | 87 |

◄ Shift Backward [1] Shift Forward ►

Notes:

Eight-hour ozone averages and related statistics are available at Los Angeles-North Main Street between 1979 and 2011. Some years in this range may not be represented.

All averages expressed in parts per million.

yellow exceeds a California ambient air quality standard. orange exceeds a national ambient air quality standard.

An exceedance of a standard is not necessarily related to a violation of the standard.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

# Top 4 Summary: Highest 4 Daily Maximum 8-Hour Carbon Monoxide Averages

at Los Angeles-North Main Street

| | 2009 | | 2010 | | 2011 | |
|---|---|---|---|---|---|---|
| | Date | 8-Hr Average | Date | 8-Hr Average | Date | 8-Hr Average |
| National: | | | | | | |
| First High: | Jan 1 | 2.17 | Dec 10 | 2.32 | Dec 31 | 2.40 |
| Second High: | Jan 17 | 1.84 | Dec 3 | 2.09 | Dec 30 | 2.18 |
| Third High: | Aug 30 | 1.79 | Jan 8 | 1.98 | Dec 31 | 2.18 |
| Fourth High: | Feb 4 | 1.76 | Dec 9 | 1.95 | Nov 30 | 2.00 |
| California: | | | | | | |
| First High: | Jan 1 | 2.20 | Dec 10 | 2.32 | Dec 31 | 2.42 |
| Second High: | Jan 16 | 1.84 | Dec 2 | 2.09 | Dec 30 | 2.34 |
| Third High: | Aug 30 | 1.79 | Jan 7 | 1.98 | Dec 29 | 2.18 |
| Fourth High: | Feb 3 | 1.76 | Dec 9 | 1.95 | Nov 29 | 2.00 |
| National: | | | | | | |
| # Days Above the Standard: | | 0 | | 0 | | 0 |
| California: | | | | | | |
| # Days Above the Standard: | | 0 | | 0 | | 0 |
| Expected Peak Day Concentration: | | 2.15 | | 2.08 | | 2.19 |
| Year Coverage: | | 97 | | 99 | | 97 |

◄ Shift Backward [1] Shift Forward ►

Notes:

Eight-hour carbon monoxide averages and related statistics are available at Los Angeles-North Main Street between 1979 and 2011. Some years in this range may not be represented.

All averages expressed in parts per million.

yellow exceeds a California ambient air quality standard. orange exceeds a national ambient air quality standard.

An exceedance of a standard is not necessarily related to a violation of the standard.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

# Top 4 Summary: Highest 4 Daily 24-Hour PM10 Averages

at Los Angeles-North Main Street

| | 2009 | | 2010 | | 2011 | |
|---|---|---|---|---|---|---|
| | Date | 24-Hr Average | Date | 24-Hr Average | Date | 24-Hr Average |
| National: | | | | | | |
| First High: | Jan 1 | 72.0 | Jul 1 | 42.0 | Oct 24 | 53.0 |
| Second High: | Oct 28 | 62.0 | Aug 24 | 41.0 | Dec 29 | 50.0 |
| Third High: | Mar 20 | 57.0 | Dec 4 | 41.0 | Oct 18 | 45.0 |
| Fourth High: | Jan 7 | 53.0 | Dec 10 | 41.0 | Apr 15 | 44.0 |
| California: | | | | | | |
| First High: | Jan 1 | 70.0 | Jul 1 | 41.0 | Oct 24 | 53.0 |
| Second High: | Oct 28 | 61.0 | Dec 4 | 41.0 | Dec 29 | 49.0 |
| Third High: | Mar 20 | 56.0 | Feb 1 | 40.0 | Apr 15 | 44.0 |
| Fourth High: | Jan 7 | 51.0 | Aug 24 | 40.0 | Oct 18 | 44.0 |
| National: | | | | | | |
| Estimated # Days > 24-Hour Std: | | 0.0 | | 0.0 | | 0.0 |
| Measured # Days > 24-Hour Std: | | 0 | | 0 | | 0 |
| 3-Yr Avg Est # Days > 24-Hr Std: | | * | | * | | 0.0 |
| *Annual Average:* | | *33.1* | | *27.1* | | *29.0* |
| *3-Year Average:* | | *30* | | *28* | | *30* |
| California: | | | | | | |
| Estimated # Days > 24-Hour Std: | | 24.1 | | * | | 6.5 |
| Measured # Days > 24-Hour Std: | | 4 | | 0 | | 1 |
| Annual Average: | | 32.5 | | * | | 28.7 |
| 3-Year Maximum Annual Average: | | 33 | | * | | 29 |
| Year Coverage: | | 99 | | 94 | | 97 |

◄ Shift Backward [1] Shift Forward ►

Notes:

Daily PM10 averages and related statistics are available at Los Angeles-North Main Street between 1988 and 2011. Some years in this range may not be represented.

All averages expressed in micrograms per cubic meter.

The national annual average PM10 standard was revoked in December 2006 and is no longer in effect. Statistics related to the revoked standard are shown in *italics* or *italics*.

yellow exceeds a California ambient air quality standard. orange exceeds a national ambient air quality standard.

An exceedance of a standard is not necessarily related to a violation of the standard.

All values listed above represent midnight-to-midnight 24-hour averages and may be related to an exceptional event.

State and national statistics may differ for the following reasons:

- State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers.
- State statistics for 1998 and later are based on local conditions (except for sites in the South Coast Air Basin, where State statistics for 2002 and later are based on local conditions). National statistics are based on standard conditions.
- State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

Measurements are usually collected every six days. Measured days counts the days that a measurement was greater than the level of the standard; Estimated days mathematically estimates how many days concentrations would have been greater than the level of the standard had each day been monitored.

3-Year statistics represent the listed year and the 2 years before the listed year.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

# Top 4 Summary: Highest 4 Daily 24-Hour PM2.5 Averages

at Los Angeles-North Main Street

| | 2009 | | 2010 | | 2011 | |
|---|---|---|---|---|---|---|
| | Date | 24-Hr Average | Date | 24-Hr Average | Date | 24-Hr Average |
| National: | | | | | | |
| First High: | Jan 1 | 61.6 | Nov 17 | 48.6 | Nov 1 | 69.2 |
| Second High: | Jan 2 | 53.8 | Feb 2 | 40.7 | Oct 19 | 50.8 |
| Third High: | Mar 19 | 53.0 | Oct 14 | 39.2 | Dec 31 | 49.3 |
| Fourth High: | Mar 20 | 45.3 | Feb 18 | 37.5 | Dec 30 | 44.1 |
| California: | | | | | | |
| First High: | Jan 1 | 64.1 | Oct 14 | 39.2 | Dec 31 | 49.3 |
| Second High: | Jan 2 | 53.8 | Feb 18 | 37.5 | Dec 30 | 44.1 |
| Third High: | Mar 19 | 53.0 | Dec 4 | 33.9 | Oct 24 | 41.7 |
| Fourth High: | Mar 20 | 46.6 | Feb 1 | 31.3 | Oct 23 | 39.6 |
| National: | | | | | | |
| Estimated # Days > 24-Hour Std: | | 7.0 | | 5.0 | | 8.1 |
| Measured # Days > 24-Hour Std: | | 7 | | 5 | | 8 |
| 24-Hour Standard Design Value: | | 42 | | 35 | | 34 |
| 24-Hour Standard 98th Percentile: | | 33.9 | | 31.3 | | 35.8 |
| Annual Standard Design Value: | | 15.8 | | 14.4 | | 13.5 |
| Annual Average: | | 14.4 | | 12.6 | | 13.5 |
| California: | | | | | | |
| Annual Std Designation Value: | | 16 | | 16 | | 16 |
| Annual Average: | | 15.6 | | 12.6 | | 13.3 |
| Year Coverage: | | 100 | | 100 | | 97 |

◄ Shift Backward [1] Shift Forward ►

Notes:

Daily PM2.5 averages and related statistics are available at Los Angeles-North Main Street between 1999 and 2011. Some years in this range may not be represented.

All averages expressed in micrograms per cubic meter.

yellow exceeds a California ambient air quality standard. orange exceeds a national ambient air quality standard.

An exceedance of a standard is not necessarily related to a violation of the standard.

State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

# Top 4 Summary: Highest 4 Daily Maximum State 24-Hour Sulfur Dioxide Averages

at Los Angeles-North Main Street

| | 2009 | | 2010 | | 2011 | |
|---|---|---|---|---|---|---|
| | Date | 24-Hr Average | Date | 24-Hr Average | Date | 24-Hr Average |
| First High: | Feb 5 | 0.002 | Jan 12 | 0.002 | Mar 1 | 0.002 |
| Second High: | Jul 20 | 0.002 | Dec 3 | 0.002 | Jan 8 | 0.002 |
| Third High: | Mar 19 | 0.002 | Dec 9 | 0.002 | Jan 31 | 0.002 |
| Fourth High: | May 14 | 0.002 | Jul 15 | 0.002 | Jan 19 | 0.001 |
| Annual Average: | | 0.000 | | 0.000 | | * |
| Year Coverage: | | 96 | | 95 | | 59 |

◄ Shift Backward 1 Shift Forward ►

Notes:

Hourly sulfur dioxide measurements and related statistics are available at Los Angeles-North Main Street between 1979 and 2011. Some years in this range may not be represented.

All averages expressed in parts per million.

yellow exceeds a California ambient air quality standard.

An exceedance of a standard is not necessarily related to a violation of the standard.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

# Appendix C

# Construction Emission Calculations

# LADWP Elysian Park Water Recycling Project

## ESTIMATED VEHICLE TRIPS

| | | | | QTY | | Trips Support/Misc | Trips Total | Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | Total Trips |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mob | | | 1 | ls | | 30 | | 15 | | | | | | | | | | | | | | | | | | | | | | 15 | | 30 |
| | Pipe (Assumed to be delivered in total to District yard and taken to jobsite each morning on pipe truck) | | | | | | 370 | | | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | | | | | | | 370 |
| | Pump Station (Misc equip., supplies, etc.) | | | | | | 200 | | | | | | | | | | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | | | |
| | Tank (Tank pieces delivery, misc. equipment) | | | | | | 150 | | | | | | | | | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | | | | | 150 |
| 1 | Mobilize Construction Yards, Etc. | | | | | | | | 15 | | | | | | | | | | | | | | | | | | | | | | 15 | | 30 |
| 2a | RW Line from LA River to EPWRP-1 Tank (8,400 LF) -> (113,400 CF) | Trench cut (3'X4.5') | | 4,200 | CY | | 630 | | | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | | | | | | | | | | | | | | 630 |
| 2b | PW Line from Park Dr. to EPWRP-1 Tank (7,300 LF) -> (73,000 CF) | Trench cut (2.5'X4') | | 2,704 | CY | | 405 | | | | | | | | | | | | | 51 | 51 | 51 | 51 | 51 | 51 | 51 | 51 | | | | | | 405 |
| 3a | Construct RW Pump Station | Foundation (65' X 30' X 2' deep) | Assumed | 150 | CY | | 22 | | | | | | | | | | 4 | 4 | 4 | 4 | 4 | | | | | | | | | | | | 22 |
| 3b | Construct PW Pump Station | Foundation (65' X 30' X 2' deep) | Assumed | 150 | CY | | 22 | | | | | | | | | | | | | | | 4 | 4 | 4 | 4 | 4 | | | | | | | 22 |
| 4a | Construct RW Tank | Foundation Exc (85' dia X 5' deep) | Assumed | 1051 | CY | | 158 | | | | | | | | 23 | 23 | 23 | 23 | 23 | 23 | 23 | | | | | | | | | | | | | 158 |
| 4b | Construct PW Tank | Foundation Exc (14' dia X 2' deep) | Assumed | 12 | CY | 2 | 4 | | | | | | | | | | | | | | | | | 4 | | | | | | | | | 4 |
| | Misc. Concrete Operations (Pipeline Bckfill + Tank Fdn + Pump Sta Fdn) | | | | | | | | | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 72 | 83 | 51 | 51 | 44 | 40 | 40 | | | | | | 781 |
| | Total Commuter Vehicle Trips | | | | | | | | 180 | 260 | 260 | 260 | 260 | 540 | 540 | 540 | 680 | 720 | 720 | 720 | 880 | 900 | 1,020 | 1,020 | 1,020 | 880 | 660 | 660 | 200 | 200 | 120 | 0 | 13,240 |

| | General Construction Schedule | Quantity | WD | Months | Start | Finish | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Mobilize Construction Yards, Etc.** | | 20 | 1.0 | 0.0 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2a | **RW Line from LA River to EPWRP-1 Tank** | | 200 | 10.0 | 1.0 | 11.0 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2b | **PW Line from Park Dr. to EPWRP-1 Tank** | | 170 | 8.5 | 11.0 | 19.5 | | | | | | | | | | | | | | | | | | | | | | | | |
| 3a | **Construct RW Pump Station** | | 240 | 12.0 | 6.0 | 18.0 | | | | | | | | | | | | | | | | | | | | | | | | |
| 3b | **Construct PW Pump Station** | | 200 | 10.0 | 13.0 | 23.0 | | | | | | | | | | | | | | | | | | | | | | | | |
| 4a | **Construct RW Tank (8-mo grading/foundation, 4-mo tank install, 3-mo mech/elec)** | 1051 CY | 300 | 15.0 | 5.0 | 20.0 | | | | | | | | | | | | | | | | | | | | | | | | |
| 4b | **Construct PW Tank** | 12 CY | 60 | 3.0 | 18.0 | 21.0 | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | **Demobilize** | | 20 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Note that all these vehicles require a return trip. Multiply by 2.**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total Vehicles** | 210 | 385 | 385 | 385 | 385 | 687 | 687 | 698 | 857 | 897 | 947 | 916 | 1,069 | 1,053 | 1,177 | 1,166 | 1,162 | 1,017 | 685 | 685 | 225 | 214 | 150 | 0 |
| **Total Delivery Vehicle Trips** | 30 | 125 | 125 | 125 | 125 | 147 | 147 | 158 | 177 | 177 | 227 | 196 | 189 | 153 | 157 | 146 | 142 | 137 | 25 | 25 | 25 | 14 | 30 | 0 |
| **Avg. Daily Delivery Vehicle Trips** | 2 | 6 | 6 | 6 | 6 | 7 | 7 | 8 | 9 | 9 | 11 | 10 | 9 | 8 | 8 | 7 | 7 | 7 | 1 | 1 | 1 | 1 | 2 | 0 |
| **Total Commuter Vehicle Trips** | 180 | 260 | 260 | 260 | 260 | 540 | 540 | 540 | 680 | 720 | 720 | 720 | 880 | 900 | 1,020 | 1,020 | 1,020 | 880 | 660 | 660 | 200 | 200 | 120 | 0 |
| **Avg. Daily Commuter Vehicle Trips** | 9 | 13 | 13 | 13 | 13 | 27 | 27 | 27 | 34 | 36 | 36 | 36 | 44 | 45 | 51 | 51 | 51 | 44 | 33 | 33 | 10 | 10 | 9 | 0 |
| **Avg. Daily Total Vehicle Trips** | 11 | 19 | 19 | 19 | 19 | 34 | 34 | 35 | 43 | 45 | 47 | 46 | 53 | 53 | 59 | 58 | 58 | 51 | 34 | 34 | 11 | 11 | 11 | 0 |

## ESTIMATED EQUIPMENT OPERATIONS

23 /Month

| | | Qty | Operating Hrs/WD/each | Operating Hours per Month | Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | Totals, Operating Hours | Unit Days |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1/2 Ton Pickup (Commute Vehicle) | 6 | 2 | 240 | | 400 | 400 | 400 | 400 | 400 | 800 | 800 | 800 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 800 | 800 | 800 | 400 | 400 | | 17,600 | 110 |
| 2 | 3/4 Ton Pickup | 2 | 8 | 320 | | | 320 | 320 | 320 | 320 | 640 | 640 | 640 | 960 | 960 | 960 | 960 | 960 | 960 | 960 | 960 | 960 | 640 | 640 | 640 | 320 | 320 | 320 | | 14,720 | 92 |
| 3 | 1 Ton Pickup | 0 | 8 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 4000 Gallon Water Truck | 1 | 2 | 40 | | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 20 | 20 | 20 | 10 | 10 | | 800 | 5 |
| 5 | Job Trailers (1) | 1 | 8 | 160 | | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | | 3,680 | 23 |
| 6 | Excavator, Cat 365 | 1 | 8 | 160 | | | | | | | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | | | 160 | 160 | | | | | 2,080 | 13 |
| 7 | Roller/Compactor (Vibratory) | 1 | 4 | 80 | | | | | | | | | | | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | | | | | | | | 640 | 4 |
| 8 | Backhoe with Carrier | 1 | 6 | 120 | | | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 120 | 120 | | | | | | | 3,000 | 19 |
| 9 | Dump Truck (3-axle) | 3 | 8 | 480 | | | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | | | | | | | 8,160 | 51 |
| 10 | AC paver | 1 | 8 | 160 | | | | | | | | | | | | | | | | | | | 160 | 160 | 80 | | | | | 400 | 3 |
| 11 | Tandem Roller | 1 | 8 | 160 | | | | | | | | | | | | | | | | | | | | | 80 | 160 | | | | 240 | 2 |
| 12 | Concrete/slurry truck | 1 | 8 | 160 | | | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 320 | 480 | 320 | 320 | 320 | 160 | 160 | 20 | | | | | 3,700 | 23 |
| 13 | Hoist, truck mounted | 2 | 8 | 320 | | | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | | | | | | 5,440 | 34 |
| 14 | Forklift | 1 | 8 | 160 | | | | | | | | | | | | 160 | 160 | 320 | 320 | 320 | 320 | 320 | 320 | 160 | 160 | | | | | 2,560 | 16 |
| 15 | K45 Generator | 1 | 8 | 160 | | | 160 | 160 | 160 | 160 | 160 | 320 | 320 | 320 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 480 | 320 | 320 | 160 | 160 | | | 7,040 | 44 |
| 16 | Air compressor | 1 | 8 | 160 | | | | | | | | 160 | 160 | 160 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 160 | 160 | 160 | | | | 3,840 | 24 |
| 17 | Misc. | 4 | 2 | 160 | | | | | | | | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | | | | 2,400 | 15 |
| | | | | | TOTAL Hours | 600 | 2,160 | 2,160 | 2,160 | 2,160 | 3,040 | 3,520 | 3,520 | 4,160 | 4,720 | 4,720 | 5,040 | 5,200 | 5,040 | 5,040 | 5,040 | 4,600 | 4,200 | 2,760 | 2,580 | 1,940 | 1,050 | 890 | 0 | 76,300 | 477 |
| | | | | | TOTAL Ave. Daily Equip. Units | 3 | 12 | 12 | 12 | 12 | 17 | 19 | 19 | 23 | 26 | 26 | 27 | 28 | 27 | 27 | 27 | 25 | 23 | 15 | 14 | 11 | 6 | 5 | 0 | | |

| | General Construction Schedule | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Mobilize Construction Yards, Etc.** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2a | **RW Line from LA River to EPWRP-1 Tank** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2b | **PW Line from Park Dr. to EPWRP-1 Tank** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3a | **Construct RW Pump Station** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3b | **Construct PW Pump Station** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4a | **Construct RW Tank (8-mo grading/foundation, 4-mo tank install, 3-mo mech/elec)** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4b | **Construct PW Tank** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | **Demobilize** | | | | | | | | | | | | | | | | | | | | | | | | | | |

## ESTIMATED PERSONNEL

**Civil Work**

**MANDAYS**

| | | | | Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Mobilize Construction Yards, Etc. | | | | 120 | | | | | | | | | | | | | | | | | | | | | | | |
| 2a | RW Line from LA River to EPWRP-1 Tank | | | | | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | | | | | | | | | | | | | |
| 2b | PW Line from Park Dr. to EPWRP-1 Tank | | | | | | | | | | | | | | | 200 | 200 | 200 | 200 | 200 | 200 | 200 | | | | | | |
| 3a | Construct RW Pump Station | | | | | | | | | | | | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | | | | |
| 3b | Construct PW Pump Station | | | | | | | | | | | | | | | | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | | | |
| 4a | Construct RW Tank (8-mo grading/foundation, 4-mo tank install, 3-mo mech/elec) | | | | | | | | | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | | | | |
| 4b | Construct PW Tank | | | | | | | | | | | | | | | | | | 120 | 120 | 120 | | | | | | | |
| 5 | Demobilize | | | | | | | | | | | | | | | | | | | | | | | | | | 120 | |
| | Office and Supervision | WD/Month | 20 | | 60 | 60 | 60 | 60 | 60 | 100 | 100 | 100 | 100 | 140 | 140 | 140 | 160 | 180 | 180 | 180 | 180 | 160 | 140 | 140 | 60 | 60 | | |
| | | | | TOTAL MD/Month | 180 | 260 | 260 | 260 | 260 | 540 | 540 | 540 | 680 | 720 | 720 | 720 | 880 | 900 | 1,020 | 1,020 | 1,020 | 880 | 660 | 660 | 200 | 200 | 120 | 0 |
| | | | | Avg. Field Worker MDs | 6 | 10 | 10 | 10 | 10 | 22 | 22 | 22 | 29 | 29 | 29 | 29 | 36 | 36 | 42 | 42 | 42 | 36 | 26 | 26 | 7 | 7 | 6 | 0 |
| | | | | Office and Supervision | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 7 | 7 | 7 | 8 | 9 | 9 | 9 | 9 | 8 | 7 | 7 | 3 | 3 | 3 | 0 |
| | | | | Avg. Daily Total Personnel | 9 | 13 | 13 | 13 | 13 | 27 | 27 | 27 | 34 | 36 | 36 | 36 | 44 | 45 | 51 | 51 | 51 | 44 | 33 | 33 | 10 | 10 | 9 | 0 |

| General Construction Schedule | | | Field Worker MDs | Total Avg MDs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Mobilize Construction Yards, Etc. | | 6 | 9 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2a | RW Line from LA River to EPWRP-1 Tank | | 10 | 13 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2b | PW Line from Park Dr. to EPWRP-1 Tank | | 10 | 13 | | | | | | | | | | | | | | | | | | | | | | | | |
| 3a | Construct RW Pump Station | | 7 | 9 | | | | | | | | | | | | | | | | | | | | | | | | |
| 3b | Construct PW Pump Station | | 7 | 9 | | | | | | | | | | | | | | | | | | | | | | | | |
| 4a | Construct RW Tank (8-mo grading/foundation, 4-mo tank install, 3-mo mech/elec) | | 12 | 14 | | | | | | | | | | | | | | | | | | | | | | | | |
| 4b | Construct PW Tank | | 6 | 8 | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Demobilize | | 6 | 9 | | | | | | | | | | | | | | | | | | | | | | | | |

# Elysian Park/USC Water Recycling Project Phase I - Summary

| TOTAL EMISSIONS | | Emissions (ppd) | | | | | |
|---|---|---|---|---|---|---|---|
| | | ROG | CO | NOX | SOX | PM10 | PM2.5 |
| Year 2016 | | | | | | | |
| **June** | | **0** | **2** | **0** | **0.0** | **0** | **0** |
| | Construction Equipments | 0 | 0 | 0 | 0.0 | 0 | 0 |
| | Worker Vehicle | 0.04 | 1.26 | 0.11 | 0.00 | 0.002 | 0.002 |
| | Off-Site Trucks | 0.06 | 0.78 | 0.19 | 0.00 | 0.001 | 0.001 |
| | Water Trucks | 0.01 | 0.09 | 0.01 | 0.00 | 0.0003 | 0.0002 |
| | Excavation | | | | | 0.00 | 0.00 |
| **July** | | **3** | **17** | **32** | **0.035** | **1.078** | **0.966** |
| | Construction Equipments | 3 | 12.41 | 31 | 0.035 | 1 | 1 |
| | Worker Vehicle | 0.05 | 1.80 | 0.16 | 0.000 | 0.0028 | 0.0026 |
| | Off-Site Trucks | 0.17 | 2.35 | 0.58 | 0.000 | 0.0021 | 0.0019 |
| | Water Trucks | 0.01 | 0.09 | 0.01 | 0.000 | 0.0003 | 0.0002 |
| | Excavation | | | | | 0.030 | 0.002 |
| **August** | | **3** | **17** | **24** | **0.035** | **1.078** | **0.966** |
| | Construction Equipments | 3 | 12 | 23 | 0.035 | 1.0 | 1.0 |
| | Worker Vehicle | 0.05 | 1.80 | 0.16 | 0.000 | 0.0028 | 0.0026 |
| | Off-Site Trucks | 0.17 | 2.35 | 0.58 | 0.000 | 0.0021 | 0.0019 |
| | Water Trucks | 0.01 | 0.09 | 0.01 | 0.000 | 0.0003 | 0.0002 |
| | Excavation | | | | | 0.03 | 0.002 |
| **September** | | **3** | **17** | **24** | **0.035** | **1.078** | **0.965** |
| | Construction Equipments | 3 | 12 | 23 | 0.035 | 1.0 | 1.0 |
| | Worker Vehicle | 0.05 | 1.80 | 0.16 | 0.000 | 0.0028 | 0.0026 |
| | Off-Site Trucks | 0.17 | 2.35 | 0.58 | 0.000 | 0.0021 | 0.0019 |
| | Water Trucks | 0.01 | 0.09 | 0.01 | 0.000 | 0.0003 | 0.0002 |
| | Excavation | | | | | 0.03 | 0.001 |
| **October** | | **3** | **17** | **24** | **0.035** | **1.078** | **0.966** |
| | Construction Equipments | 3 | 12 | 23 | 0.035 | 1.043 | 0.960 |
| | Worker Vehicle | 0.05 | 1.80 | 0.16 | 0.000 | 0.003 | 0.003 |
| | Off-Site Trucks | 0.17 | 2.35 | 0.58 | 0.000 | 0.002 | 0.002 |
| | Water Trucks | 0.01 | 0.09 | 0.01 | 0.000 | 0.0003 | 0.0002 |
| | Excavation | | | | | 0.03 | 0.002 |
| **November** | | **4** | **23** | **29** | **0.046** | **1.358** | **1.215** |
| | Construction Equipments | 4 | 17 | 28 | 0.046 | 1.309 | 1.204 |
| | Worker Vehicle | 0.10 | 3.66 | 0.33 | 0.000 | 0.006 | 0.005 |
| | Off-Site Trucks | 0.19 | 2.74 | 0.68 | 0.000 | 0.002 | 0.002 |
| | Water Trucks | 0.01 | 0.09 | 0.01 | 0.000 | 0.0003 | 0.0002 |
| | Excavation | | | | | 0.04 | 0.003 |
| **December** | | **6** | **31** | **41** | **0.067** | **1.984** | **1.798** |
| | Construction Equipments | 5 | 24 | 40 | 0.067 | 1.943 | 1.788 |
| | Worker Vehicle | 0.10 | 3.66 | 0.33 | 0.000 | 0.006 | 0.005 |
| | Off-Site Trucks | 0.19 | 2.74 | 0.68 | 0.000 | 0.002 | 0.002 |
| | Water Trucks | 0.01 | 0.09 | 0.01 | 0.000 | 0.000 | 0.000 |
| | Excavation | | | | | 0.032 | 0.003 |

| Year 2017 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **January** | | **5** | **30** | **38** | **0.067** | **1.785** | **1.608** |
| | Construction Equipments | 5 | 24 | 37 | 0.1 | 1.7 | 1.6 |
| | Worker Vehicle | 0.09 | 3.34 | 0.30 | 0.00 | 0.005 | 0.005 |
| | Off-Site Trucks | 0.20 | 2.83 | 0.72 | 0.00 | 0.003 | 0.002 |
| | Water Trucks | 0.01 | 0.34 | 0.01 | 0.00 | 0.000 | 0.000 |
| | Excavation | | | | | 0.04 | 0.003 |
| **February** | | **6** | **31** | **39** | **0.072** | **1.919** | **1.729** |
| | Construction Equipments | 5 | 26 | 39 | 0.1 | 2 | 2 |
| | Worker Vehicle | 0.11 | 4.13 | 0.37 | 0.00 | 0.01 | 0.01 |
| | Off-Site Trucks | 0.22 | 0.00 | 0.00 | 0.00 | 0.000 | 0.000 |
| | Water Trucks | 0.01 | 0.34 | 0.01 | 0.00 | 0.000 | 0.000 |
| | Excavation | | | | | 0.043 | 0.0030 |
| **March** | | **7** | **41** | **49** | **0.088** | **2.420** | **2.190** |
| | Construction Equipments | 7 | 33 | 48 | 0.09 | 2.4 | 2.2 |
| | Worker Vehicle | 0.11 | 4.38 | 0.40 | 0.00 | 0.01 | 0.01 |
| | Off-Site Trucks | 0.22 | 3.19 | 0.81 | 0.00 | 0.00 | 0.00 |
| | Water Trucks | 0.01 | 0.34 | 0.01 | 0.00 | 0.00 | 0.00 |
| | Excavation | | | | | 0.04 | 0.00 |
| **April** | | **7** | **41** | **49** | **0.088** | **2.444** | **2.191** |
| | Construction Equipments | 7 | 33 | 48 | 0.1 | 2.4 | 2.2 |
| | Worker Vehicle | 0.11 | 4.38 | 0.40 | 0.00 | 0.01 | 0.01 |
| | Off-Site Trucks | 0.27 | 3.90 | 0.99 | 0.00 | 0.00 | 0.00 |
| | Water Trucks | 0.01 | 0.34 | 0.01 | 0.00 | 0.00 | 0.00 |
| | Excavation | | | | | 0.07 | 0.00 |
| **May** | | **7** | **43** | **51** | **0.089** | **2.527** | **2.293** |
| | Construction Equipments | 7 | 35 | 50 | 0.09 | 2.5 | 2.3 |
| | Worker Vehicle | 0.11 | 4.38 | 0.40 | 0.00 | 0.01 | 0.01 |
| | Off-Site Trucks | 0.25 | 3.54 | 0.90 | 0.00 | 0.00 | 0.00 |
| | Water Trucks | 0.01 | 0.34 | 0.01 | 0.00 | 0.00 | 0.00 |
| | Excavation | | | | | 0.04 | 0.00 |
| **June** | | **7** | **44** | **48** | **0.095** | **2.537** | **2.309** |
| | Construction Equipments | 7 | 35 | 46 | 0.1 | 2.5 | 2.3 |
| | Worker Vehicle | 0.14 | 5.35 | 0.48 | 0.00 | 0.01 | 0.01 |
| | Off-Site Trucks | 0.22 | 3.19 | 0.81 | 0.00 | 0.00 | 0.00 |
| | Water Trucks | 0.01 | 0.34 | 0.01 | 0.00 | 0.00 | 0.00 |
| | Excavation | | | | | 0.03 | 0.00 |
| **July** | | **7** | **44** | **51** | **0.094** | **2.517** | **2.293** |
| | Construction Equipments | 7 | 35 | 50 | 0.1 | 2.5 | 2.3 |
| | Worker Vehicle | 0.14 | 5.53 | 0.50 | 0.00 | 0.01 | 0.01 |
| | Off-Site Trucks | 0.20 | 2.83 | 0.72 | 0.00 | 0.00 | 0.00 |
| | Water Trucks | 0.01 | 0.34 | 0.01 | 0.00 | 0.00 | 0.00 |
| | Excavation | | | | | 0.03 | 0.00 |
| **August** | | **7** | **43** | **51** | **0.093** | **2.516** | **2.291** |
| | Construction Equipments | 7 | 35 | 50 | 0.1 | 2.5 | 2.3 |
| | Worker Vehicle | 0.16 | 4.66 | 0.43 | 0.00 | 0.01 | 0.01 |
| | Off-Site Trucks | 0.20 | 2.83 | 0.72 | 0.00 | 0.00 | 0.00 |
| | Water Trucks | 0.01 | 0.34 | 0.01 | 0.00 | 0.00 | 0.00 |
| | Excavation | | | | | 0.03 | 0.00 |
| **September** | | **7** | **44** | **51** | **0.094** | **2.518** | **2.294** |
| | Construction Equipments | 7 | 35 | 50 | 0.1 | 2.5 | 2.3 |
| | Worker Vehicle | 0.16 | 6.26 | 0.57 | 0.00 | 0.01 | 0.01 |
| | Off-Site Trucks | 0.17 | 2.48 | 0.63 | 0.00 | 0.00 | 0.00 |
| | Water Trucks | 0.01 | 0.34 | 0.01 | 0.00 | 0.00 | 0.00 |
| | Excavation | | | | | 0.03 | 0.00 |
| **October** | | **6** | **37** | **44** | **0.078** | **2.136** | **1.942** |
| | Construction Equipments | 6 | 28 | 43 | 0.1 | 2.1 | 1.9 |
| | Worker Vehicle | 0.16 | 6.26 | 0.57 | 0.00 | 0.01 | 0.01 |
| | Off-Site Trucks | 0.17 | 2.48 | 0.63 | 0.00 | 0.00 | 0.00 |
| | Water Trucks | 0.01 | 0.34 | 0.01 | 0.00 | 0.00 | 0.00 |
| | Excavation | | | | | 0.03 | 0.00 |
| **November** | | **7** | **39** | **47** | **0.080** | **2.395** | **2.182** |
| | Construction Equipments | 6 | 30 | 46 | 0.1 | 2.4 | 2.2 |
| | Worker Vehicle | 0.14 | 5.35 | 0.48 | 0.00 | 0.01 | 0.01 |
| | Off-Site Trucks | 0.17 | 2.48 | 0.63 | 0.00 | 0.00 | 0.00 |
| | Water Trucks | 0.01 | 0.34 | 0.01 | 0.00 | 0.00 | 0.00 |
| | Excavation | | | | | 0.02 | 0.00 |
| **December** | | **4** | **25** | **27** | **0.050** | **1.448** | **1.333** |
| | Construction Equipments | 4 | 20 | 26 | 0.1 | 1.4 | 1.3 |
| | Worker Vehicle | 0.10 | 4.07 | 0.37 | 0.00 | 0.01 | 0.01 |
| | Off-Site Trucks | 0.02 | 0.35 | 0.09 | 0.00 | 0.0003 | 0.0003 |
| | Water Trucks | 0.01 | 0.17 | 0.01 | 0.00 | 0.0001 | 0.0001 |
| | Excavation | | | | | | |

| Year 2018 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **January** | | **4** | **25** | **26** | **0.051** | **1.422** | **1.309** |
| | Construction Equipments | 4 | 21 | 25 | 0.1 | 1.4 | 1.3 |
| | Worker Vehicle | 0.09 | 3.72 | 0.34 | 0.00 | 0.0063 | 0.0058 |
| | Off-Site Trucks | 0.02 | 0.32 | 0.08 | 0.00 | 0.0003 | 0.0003 |
| | Water Trucks | 0.01 | 0.13 | 0.00 | 0.00 | 0.0001 | 0.0001 |
| | Excavation | | | | | | |
| **February** | | **2** | **12** | **14** | **0.028** | **0.730** | **0.672** |
| | Construction Equipments | 2 | 11 | 13 | 0 | 1 | 1 |
| | Worker Vehicle | 0.03 | 1.11 | 0.10 | 0.00 | 0.0019 | 0.0017 |
| | Off-Site Trucks | 0.02 | 0.32 | 0.08 | 0.00 | 0.0003 | 0.0003 |
| | Water Trucks | 0.01 | 0.13 | 0.00 | 0.00 | 0.0001 | 0.0001 |
| | Excavation | | | | | | |
| **March** | | **0** | **4** | **3** | **0.006** | **0.156** | **0.143** |
| | Construction Equipments | 0 | 2 | 3 | 0.0 | 0.2 | 0.1 |
| | Worker Vehicle | 0.03 | 1.11 | 0.10 | 0.00 | 0.0019 | 0.0017 |
| | Off-Site Trucks | 0.02 | 0.32 | 0.08 | 0.00 | 0.0003 | 0.0003 |
| | Water Trucks | 0.00 | 0.07 | 0.00 | 0.00 | 0.0000 | 0.0000 |
| | Excavation | | | | | | |
| **April** | | **0** | **2** | **0** | **0.000** | **0.002** | **0.002** |
| | Construction Equipments | | | | | | |
| | Worker Vehicle | 0.03 | 1.05 | 0.10 | 0.00 | 0.0018 | 0.0016 |
| | Off-Site Trucks | 0.04 | 0.64 | 0.17 | 0.00 | 0.0006 | 0.0005 |
| | Water Trucks | 0.00 | 0.07 | 0.00 | 0.00 | 0.0000 | 0.0000 |
| | Excavation | | | | | | |
| **Regional Daily Maximum** | | **7** | **44** | **51** | **0.1** | **3** | **2** |
| **THRESHOLD** | | **75** | **550** | **100** | **150** | **150** | **55** |
| IMPACT? | | NO | NO | NO | NO | NO | NO |
| **On-Site Daily Maximum /a-d/** | | **7** | **36** | **50** | **0.1** | **3** | **2** |
| **THRESHOLD /e/** | | **n/a** | **680** | **74** | **n/a** | **5** | **3** |
| IMPACT? | | n/a | NO | NO | n/a | NO | NO |

/a/Daily maximum regional VOC emissions occur in March through September 2017.
/b/ Daily maximum regional CO emissions occur in June, July, and September 2017.
/c/ Daily maximum regional NOx emissions occur in May, July, August, and September 2017.
/d/ Daily maximum regional emissions for SOx, PM10, and PM2.5 occur in June 2017.
/e/ The proposed project is assumed to be one acre. The closest residential receptor is approximately 25 meter from the project site.

# Elysian Park/USC Water Recycling Project Phase I - Construction Equipment Emissions

**Estimated Equipment Construction Emissions**

| Equipment Type | Qty | Operating Hrs/WD/ each | Operating Hours per Day | Number of Operating Days | Rog Rate (lbs/hr) | Rog (lbs/day) | CO rate (lbs/hr) | CO (lbs/day) | NOX rate (lbs/hr) | NOX (lbs/day) | SOX rate (lbs/hr) | SOX (lbs/day) | PM rate (lbs/hr) | PM (lbs/day) | PM10 (lbs/day) | PM2.5 (lbs/day) | CO2 Rate (lbs/hr) | CO2 (lbs/day) | CO2 (lbs) | CH4 rate (lbs/hr) | CH4 (lbs/day) | CH4 (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **July Year 2016** | | | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Roller/Compactor (Vibratory) | 0 | 4 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.37 | 0.37 | 2.21 | 0.41 | 2.44 | 0.0008 | 0.00 | 0.026 | 0.15 | 0.15 | 0.14 | 67 | 401 | 2091 | 0.0055 | 0.03 | 0.17 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.41 | 9.77 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 3819 | 0.0008 | 0.02 | 0.42 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.07 | 0.04 | 0.33 | 0.05 | 0.43 | 0.0001 | 0.00 | 0.002 | 0.02 | 0.02 | 0.02 | 7 | 58 | 403 | 0.0008 | 0.01 | 0.04 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.82 | 0.43 | 6.82 | 0.94 | 15.02 | 0.0014 | 0.02 | 0.039 | 0.62 | 0.62 | 0.57 | 129 | 2058 | 28634 | 0.0103 | 0.16 | 2.28 |
| Forklift | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.06 | 0.46 | 0.29 | 2.29 | 0.44 | 3.50 | 0.0007 | 0.01 | 0.024 | 0.19 | 0.19 | 0.18 | 61 | 488 | 3394 | 0.0052 | 0.04 | 0.29 |
| Air Compressor | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Miscellanous | 0 | 2 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| ***July Year 2016 Construction Equipment Total Emissions*** | | | | **54** | | **2.94** | | **12.41** | | **31.16** | | **0.04** | | **1.04** | **1.04** | **0.96** | | **3188** | **38,341.63** | | **0.27** | **3.21** |
| **August Year 2016 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Roller/Compactor (Vibratory) | 0 | 4 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.37 | 0.37 | 2.21 | 0.41 | 2.44 | 0.0008 | 0.00 | 0.026 | 0.15 | 0.15 | 0.14 | 67 | 401 | 2091 | 0.0055 | 0.03 | 0.17 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.41 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 3819 | 0.0008 | 0.02 | 0.42 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.07 | 0.04 | 0.33 | 0.05 | 0.43 | 0.0001 | 0.00 | 0.002 | 0.02 | 0.02 | 0.02 | 7 | 58 | 403 | 0.0008 | 0.01 | 0.04 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.82 | 0.43 | 6.82 | 0.94 | 15.02 | 0.0014 | 0.02 | 0.039 | 0.62 | 0.62 | 0.57 | 129 | 2058 | 28634 | 0.0103 | 0.16 | 2.28 |
| Forklift | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.06 | 0.46 | 0.29 | 2.29 | 0.44 | 3.50 | 0.0007 | 0.01 | 0.024 | 0.19 | 0.19 | 0.18 | 61 | 488 | 3394 | 0.0052 | 0.04 | 0.29 |
| Air Compressor | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Miscellanous | 0 | 2 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| ***August Year 2016 Construction Equipment Total Emissions*** | | | | **54** | | **2.94** | | **12.41** | | **22.80** | | **0.04** | | | **1.04** | **0.96** | | **3188** | **38,341.63** | | **0.27** | **3.21** |
| **September Year 2016 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Roller/Compactor (Vibratory) | 0 | 4 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.37 | 0.37 | 2.21 | 0.41 | 2.44 | 0.0008 | 0.00 | 0.026 | 0.15 | 0.15 | 0.14 | 67 | 401 | 2091 | 0.0055 | 0.03 | 0.17 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.41 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 3819 | 0.0008 | 0.02 | 0.42 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.07 | 0.04 | 0.33 | 0.05 | 0.43 | 0.0001 | 0.00 | 0.002 | 0.02 | 0.02 | 0.02 | 7 | 58 | 403 | 0.0008 | 0.01 | 0.04 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.82 | 0.43 | 6.82 | 0.94 | 15.02 | 0.0014 | 0.02 | 0.039 | 0.62 | 0.62 | 0.57 | 129 | 2058 | 28634 | 0.0103 | 0.16 | 2.28 |
| Forklift | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.06 | 0.46 | 0.29 | 2.29 | 0.44 | 3.50 | 0.0007 | 0.01 | 0.024 | 0.19 | 0.19 | 0.18 | 61 | 488 | 3394 | 0.0052 | 0.04 | 0.29 |
| Air Compressor | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Miscellanous | 0 | 2 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| ***September Year 2012 Construction Equipment Total Emissions*** | | | | **54** | | **2.94** | | **12.41** | | **22.80** | | **0.04** | | **1.04** | **1.04** | **0.96** | | **3188** | **38341.63** | | **0.27** | **3.21** |

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **October Year 2016 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Roller/Compactor (Vibratory) | 0 | 4 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.37 | 0.37 | 2.21 | 0.41 | 2.44 | 0.0008 | 0.00 | 0.026 | 0.15 | 0.15 | 0.14 | 67 | 401 | 2091 | 0.0055 | 0.03 | 0.17 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.41 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 3819 | 0.0008 | 0.02 | 0.42 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.07 | 0.04 | 0.33 | 0.05 | 0.43 | 0.0001 | 0.00 | 0.002 | 0.02 | 0.02 | 0.02 | 7 | 58 | 403 | 0.0008 | 0.01 | 0.04 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.82 | 0.43 | 6.82 | 0.94 | 15.02 | 0.0014 | 0.02 | 0.039 | 0.62 | 0.62 | 0.57 | 129 | 2058 | 28634 | 0.0103 | 0.16 | 2.28 |
| Forklift | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.06 | 0.46 | 0.29 | 2.29 | 0.44 | 3.50 | 0.0007 | 0.01 | 0.024 | 0.19 | 0.19 | 0.18 | 61 | 488 | 3394 | 0.0052 | 0.04 | 0.29 |
| Air Compressor | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Miscellanous | 0 | 2 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| ***October Year 2016 Construction Equipment Total Emissions*** | | | | **54** | | **2.94** | | **12.41** | | **22.80** | | **0.04** | | **1.04** | **1.04** | **0.96** | | **3188** | **38341.63** | | **0.27** | **3.21** |
| **November Year 2016 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 1 | 8 | 8 | 7 | 0.10 | 0.79 | 0.52 | 4.17 | 0.66 | 5.28 | 0.0013 | 0.01 | 0.033 | 0.27 | 0.27 | 0.24 | 120 | 957 | 6655 | 0.0089 | 0.07 | 0.50 |
| Roller/Compactor (Vibratory) | 0 | 4 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.37 | 0.37 | 2.21 | 0.41 | 2.44 | 0.0008 | 0.00 | 0.026 | 0.15 | 0.15 | 0.14 | 67 | 401 | 2091 | 0.0055 | 0.03 | 0.17 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.41 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 3819 | 0.0008 | 0.02 | 0.42 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.07 | 0.04 | 0.33 | 0.05 | 0.43 | 0.0001 | 0.00 | 0.002 | 0.02 | 0.02 | 0.02 | 7 | 58 | 403 | 0.0008 | 0.01 | 0.04 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.82 | 0.43 | 6.82 | 0.94 | 15.02 | 0.0014 | 0.02 | 0.039 | 0.62 | 0.62 | 0.57 | 129 | 2058 | 28634 | 0.0103 | 0.16 | 2.28 |
| Forklift | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.06 | 0.46 | 0.29 | 2.29 | 0.44 | 3.50 | 0.0007 | 0.01 | 0.024 | 0.19 | 0.19 | 0.18 | 61 | 488 | 3394 | 0.0052 | 0.04 | 0.29 |
| Air Compressor | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Miscellanous | 0 | 2 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| ***Construction Equipment Total Emissions*** | | | | **61** | | **3.73** | | **16.58** | | **28.08** | | **0.05** | | **1.31** | **1.31** | **1.20** | | **4144** | **44996.52** | | **0.34** | **3.71** |
| **December Year 2016 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 1 | 8 | 8 | 7 | 0.10 | 0.79 | 0.52 | 4.17 | 0.66 | 5.28 | 0.0013 | 0.01 | 0.033 | 0.27 | 0.27 | 0.24 | 120 | 957 | 6655 | 0.0089 | 0.07 | 0.50 |
| Roller/Compactor (Vibratory) | 0 | 4 | 0 | 7 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0.00 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.37 | 0.37 | 2.21 | 0.41 | 2.44 | 0.0008 | 0.00 | 0.026 | 0.15 | 0.15 | 0.14 | 67 | 401 | 2091 | 0.0055 | 0.03 | 0.17 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.41 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 3819 | 0.0008 | 0.02 | 0.42 |
| AC Paver | 0 | 8 | 0 | 7 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 7 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.07 | 0.04 | 0.33 | 0.05 | 0.43 | 0.0001 | 0.00 | 0.002 | 0.02 | 0.02 | 0.02 | 7 | 58 | 403 | 0.0008 | 0.01 | 0.04 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.82 | 0.43 | 6.82 | 0.94 | 15.02 | 0.0014 | 0.02 | 0.039 | 0.62 | 0.62 | 0.57 | 129 | 2058 | 28634 | 0.0103 | 0.16 | 2.28 |
| Forklift | 0 | 8 | 0 | 7 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0.0000 | 0.00 | 0.00 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.06 | 0.93 | 0.29 | 4.58 | 0.44 | 6.99 | 0.0007 | 0.01 | 0.024 | 0.39 | 0.39 | 0.35 | 61 | 976 | 6789 | 0.0052 | 0.08 | 0.58 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.07 | 0.56 | 0.32 | 2.57 | 0.47 | 3.78 | 0.0007 | 0.01 | 0.032 | 0.25 | 0.25 | 0.23 | 64 | 509 | 3540 | 0.0064 | 0.05 | 0.35 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.07 | 0.58 | 0.36 | 2.88 | 0.57 | 4.54 | 0.0013 | 0.01 | 0.023 | 0.19 | 0.19 | 0.17 | 123 | 981 | 6821 | 0.0065 | 0.05 | 0.36 |
| ***December Year 2016 Construction Equipment Total Emissions*** | | | | **103** | | **5.34** | | **24.32** | | **39.91** | | **0.07** | | **1.94** | **1.94** | **1.79** | | **6122** | **58751.67** | | **0.48** | **4.71** |

# Elysian Park/USC Water Recycling Project Phase I - Construction Equipment Emissions

**Estimated Equipment Construction Emissions**

| Equipment Type | Qty | Operating Hrs/WD/ each | Operating Hours per Day | Number of Operating Days | Rog Rate (lbs/hr) | Rog (lbs/day) | CO rate (lbs/hr) | CO (lbs/day) | NOX rate (lbs/hr) | NOX (lbs/day) | SOX rate (lbs/hr) | SOX (lbs/day) | PM rate (lbs/hr) | PM (lbs/day) | PM10 (lbs/day) | PM2.5 (lbs/day) | CO2 Rate (lbs/hr) | CO2 (lbs/day) | CH4 rate (lbs/hr) | CH4 (lbs/day) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **January Year 2017** | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 1 | 8 | 8 | 7 | 0.09 | 0.73 | 0.5184 | 4.15 | 0.59 | 4.69 | 0.0013 | 0.01 | 0.029 | 0.23 | 0.23 | 0.21 | 120 | 957 | 0.008 | 0.07 |
| Roller/Compactor (Vibratory) | 0 | 4 | 0 | 0 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.34 | 0.3666 | 2.20 | 0.37 | 2.21 | 0.0008 | 0.00 | 0.022 | 0.13 | 0.13 | 0.12 | 67 | 401 | 0.005 | 0.03 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.0314 | 0.75 | 0.06 | 1.40 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 0.001 | 0.02 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.07 | 0.0417 | 0.33 | 0.05 | 0.43 | 0.0001 | 0.00 | 0.002 | 0.02 | 0.02 | 0.02 | 7 | 58 | 0.001 | 0.01 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.72 | 0.4152 | 6.64 | 0.86 | 13.80 | 0.0014 | 0.02 | 0.035 | 0.56 | 0.56 | 0.52 | 129 | 2058 | 0.010 | 0.15 |
| Forklift | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 0.84 | 0.2821 | 4.51 | 0.41 | 6.48 | 0.0007 | 0.01 | 0.022 | 0.34 | 0.34 | 0.32 | 61 | 976 | 0.005 | 0.08 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.06 | 0.51 | 0.3165 | 2.53 | 0.43 | 3.45 | 0.0007 | 0.01 | 0.028 | 0.23 | 0.23 | 0.21 | 64 | 509 | 0.006 | 0.05 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.07 | 0.54 | 0.3568 | 2.85 | 0.50 | 4.04 | 0.0013 | 0.01 | 0.021 | 0.16 | 0.16 | 0.15 | 123 | 980 | 0.006 | 0.05 |
| ***January Year 2017 Construction Equipment Total Emissions*** | | | | **75** | | **4.97** | | **23.98** | | **36.50** | | **0.07** | | **1.74** | **1.74** | **1.60** | | **6,121.51** | | **0.45** |
| **February Year 2017 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 1 | 8 | 8 | 7 | 0.09 | 0.73 | 0.52 | 4.15 | 0.59 | 4.69 | 0.0013 | 0.01 | 0.029 | 0.23 | 0.23 | 0.21 | 120 | 957 | 0.008 | 0.07 |
| Roller/Compactor (Vibratory) | 0 | 4 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.67 | 0.37 | 4.40 | 0.37 | 4.42 | 0.0008 | 0.01 | 0.022 | 0.27 | 0.27 | 0.24 | 67 | 802 | 0.005 | 0.06 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.40 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 0.001 | 0.02 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.07 | 0.04 | 0.33 | 0.05 | 0.43 | 0.0001 | 0.00 | 0.002 | 0.02 | 0.02 | 0.02 | 7 | 58 | 0.001 | 0.01 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.72 | 0.42 | 6.64 | 0.86 | 13.80 | 0.0014 | 0.02 | 0.035 | 0.56 | 0.56 | 0.52 | 129 | 2058 | 0.010 | 0.15 |
| Forklift | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 0.84 | 0.28 | 4.51 | 0.41 | 6.48 | 0.0007 | 0.01 | 0.022 | 0.34 | 0.34 | 0.32 | 61 | 976 | 0.005 | 0.08 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.06 | 0.51 | 0.32 | 2.53 | 0.43 | 3.45 | 0.0007 | 0.01 | 0.028 | 0.23 | 0.23 | 0.21 | 64 | 509 | 0.006 | 0.05 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.07 | 0.54 | 0.36 | 2.85 | 0.50 | 4.04 | 0.0013 | 0.01 | 0.021 | 0.16 | 0.16 | 0.15 | 123 | 980 | 0.006 | 0.05 |
| ***February Year 2017 Construction Equipment Total Emissions*** | | | | **75** | | **5.31** | | **26.18** | | **38.71** | | **0.07** | | | **1.87** | **1.72** | | **6,522.29** | | **0.48** |
| **March Year 2017 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 1 | 8 | 8 | 7 | 0.09 | 0.73 | 0.52 | 4.15 | 0.59 | 4.69 | 0.0013 | 0.01 | 0.029 | 0.23 | 0.23 | 0.21 | 120 | 957 | 0.008 | 0.07 |
| Roller/Compactor (Vibratory) | 1 | 4 | 4 | 3 | 0.01 | 0.02 | 0.03 | 0.11 | 0.03 | 0.13 | 0.0001 | 0.00 | 0.001 | 0.00 | 0.00 | 0.00 | 4 | 17 | 0.000 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.67 | 0.37 | 4.40 | 0.37 | 4.42 | 0.0008 | 0.01 | 0.022 | 0.27 | 0.27 | 0.24 | 67 | 802 | 0.005 | 0.06 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.40 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 0.001 | 0.02 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.07 | 0.04 | 0.33 | 0.05 | 0.43 | 0.0001 | 0.00 | 0.002 | 0.02 | 0.02 | 0.02 | 7 | 58 | 0.001 | 0.01 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.72 | 0.42 | 6.64 | 0.86 | 13.80 | 0.0014 | 0.02 | 0.035 | 0.56 | 0.56 | 0.52 | 129 | 2058 | 0.010 | 0.15 |
| Forklift | 1 | 8 | 8 | 7 | 0.04 | 0.32 | 0.22 | 1.74 | 0.25 | 1.99 | 0.0006 | 0.00 | 0.012 | 0.09 | 0.09 | 0.09 | 54 | 435 | 0.004 | 0.03 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 1.26 | 0.28 | 6.77 | 0.41 | 9.73 | 0.0007 | 0.02 | 0.022 | 0.52 | 0.52 | 0.48 | 61 | 1464 | 0.005 | 0.11 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.06 | 1.03 | 0.32 | 5.06 | 0.43 | 6.91 | 0.0007 | 0.01 | 0.028 | 0.45 | 0.45 | 0.41 | 64 | 1018 | 0.006 | 0.09 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.07 | 0.54 | 0.36 | 2.85 | 0.50 | 4.04 | 0.0013 | 0.01 | 0.021 | 0.16 | 0.16 | 0.15 | 123 | 980 | 0.006 | 0.05 |
| ***March Year 2017 Construction Equipment Total Emissions*** | | | | **85** | | **6.58** | | **32.82** | | **47.53** | | **0.09** | | **2.37** | **2.37** | **2.18** | | **7,971.51** | | **0.59** |
| **April Year 2017 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 1 | 8 | 8 | 7 | 0.09 | 0.73 | 0.52 | 4.15 | 0.59 | 4.69 | 0.0013 | 0.01 | 0.029 | 0.23 | 0.23 | 0.21 | 120 | 957 | 0.008 | 0.07 |
| Roller/Compactor (Vibratory) | 1 | 4 | 4 | 3 | 0.01 | 0.02 | 0.03 | 0.11 | 0.03 | 0.13 | 0.0001 | 0.00 | 0.001 | 0.00 | 0.00 | 0.00 | 4 | 17 | 0.000 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.67 | 0.37 | 4.40 | 0.37 | 4.42 | 0.0008 | 0.01 | 0.022 | 0.27 | 0.27 | 0.24 | 67 | 802 | 0.005 | 0.06 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.40 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 0.001 | 0.02 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.07 | 0.04 | 0.33 | 0.05 | 0.43 | 0.0001 | 0.00 | 0.002 | 0.02 | 0.02 | 0.02 | 7 | 58 | 0.001 | 0.01 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.72 | 0.42 | 6.64 | 0.86 | 13.80 | 0.0014 | 0.02 | 0.035 | 0.56 | 0.56 | 0.52 | 129 | 2058 | 0.010 | 0.15 |
| Forklift | 1 | 8 | 8 | 7 | 0.04 | 0.32 | 0.22 | 1.74 | 0.25 | 1.99 | 0.0006 | 0.00 | 0.012 | 0.09 | 0.09 | 0.09 | 54 | 435 | 0.004 | 0.03 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 1.26 | 0.28 | 6.77 | 0.41 | 9.73 | 0.0007 | 0.02 | 0.022 | 0.52 | 0.52 | 0.48 | 61 | 1464 | 0.005 | 0.11 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.06 | 1.03 | 0.32 | 5.06 | 0.43 | 6.91 | 0.0007 | 0.01 | 0.028 | 0.45 | 0.45 | 0.41 | 64 | 1018 | 0.006 | 0.09 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.07 | 0.54 | 0.36 | 2.85 | 0.50 | 4.04 | 0.0013 | 0.01 | 0.021 | 0.16 | 0.16 | 0.15 | 123 | 980 | 0.006 | 0.05 |
| ***April Year 2017 Construction Equipment Total Emissions*** | | | | **85** | | **6.58** | | **32.82** | | **47.53** | | **0.09** | | **2.37** | **2.37** | **2.18** | | **7,971.51** | | **0.59** |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **May Year 2017 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 1 | 8 | 8 | 7 | 0.09 | 0.73 | 0.52 | 4.15 | 0.59 | 4.69 | 0.0013 | 0.01 | 0.029 | 0.23 | 0.23 | 0.21 | 120 | 957 | 0.008 | 0.07 |
| Roller/Compactor (Vibratory) | 1 | 4 | 4 | 3 | 0.01 | 0.02 | 0.03 | 0.11 | 0.03 | 0.13 | 0.0001 | 0.00 | 0.001 | 0.00 | 0.00 | 0.00 | 4 | 17 | 0.000 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.67 | 0.37 | 4.40 | 0.37 | 4.42 | 0.0008 | 0.00 | 0.022 | 0.27 | 0.27 | 0.24 | 67 | 802 | 0.005 | 0.06 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.40 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 0.001 | 0.02 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.14 | 0.04 | 0.67 | 0.05 | 0.86 | 0.0001 | 0.00 | 0.002 | 0.04 | 0.04 | 0.03 | 7 | 116 | 0.001 | 0.01 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.72 | 0.42 | 6.64 | 0.86 | 13.80 | 0.0014 | 0.02 | 0.035 | 0.56 | 0.56 | 0.52 | 129 | 2058 | 0.010 | 0.15 |
| Forklift | 1 | 8 | 8 | 7 | 0.04 | 0.64 | 0.22 | 3.49 | 0.25 | 3.99 | 0.0006 | 0.01 | 0.012 | 0.19 | 0.19 | 0.17 | 54 | 870 | 0.004 | 0.06 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 1.26 | 0.28 | 6.77 | 0.41 | 9.73 | 0.0007 | 0.02 | 0.022 | 0.52 | 0.52 | 0.48 | 61 | 1464 | 0.005 | 0.11 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.06 | 1.03 | 0.32 | 5.06 | 0.43 | 6.91 | 0.0007 | 0.01 | 0.028 | 0.45 | 0.45 | 0.41 | 64 | 1018 | 0.006 | 0.09 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.07 | 0.54 | 0.36 | 2.85 | 0.50 | 4.04 | 0.0013 | 0.01 | 0.021 | 0.16 | 0.16 | 0.15 | 123 | 980 | 0.006 | 0.05 |
| ***May Year 2017 Construction Equipment Total Emissions*** | | | | **85** | | **6.97** | | **34.90** | | **49.95** | | **0.09** | | **2.48** | **2.48** | **2.28** | | **8,464.66** | | **0.63** |
| **June Year 2017 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 1 | 8 | 8 | 7 | 0.09 | 0.73 | 0.52 | 4.15 | 0.59 | 4.69 | 0.0013 | 0.01 | 0.029 | 0.23 | 0.23 | 0.21 | 120 | 957 | 0.008 | 0.07 |
| Roller/Compactor (Vibratory) | 1 | 4 | 4 | 3 | 0.01 | 0.02 | 0.03 | 0.11 | 0.03 | 0.13 | 0.0001 | 0.00 | 0.001 | 0.00 | 0.00 | 0.00 | 4 | 17 | 0.000 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.67 | 0.37 | 4.40 | 0.37 | 4.42 | 0.0008 | 0.01 | 0.022 | 0.27 | 0.27 | 0.24 | 67 | 802 | 0.005 | 0.06 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.40 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 0.001 | 0.02 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.21 | 0.04 | 1.00 | 0.05 | 1.29 | 0.0001 | 0.00 | 0.002 | 0.05 | 0.05 | 0.05 | 7 | 174 | 0.001 | 0.02 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.72 | 0.42 | 6.64 | 0.86 | 13.80 | 0.0014 | 0.02 | 0.035 | 0.56 | 0.56 | 0.52 | 129 | 2058 | 0.010 | 0.15 |
| Forklift | 1 | 8 | 8 | 7 | 0.04 | 0.64 | 0.22 | 3.49 | 0.25 | 0.00 | 0.0006 | 0.01 | 0.012 | 0.19 | 0.19 | 0.17 | 54 | 870 | 0.004 | 0.06 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 1.26 | 0.28 | 6.77 | 0.41 | 9.73 | 0.0007 | 0.02 | 0.022 | 0.52 | 0.52 | 0.48 | 61 | 1464 | 0.005 | 0.11 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.06 | 1.03 | 0.32 | 5.06 | 0.43 | 6.91 | 0.0007 | 0.01 | 0.028 | 0.45 | 0.45 | 0.41 | 64 | 1018 | 0.006 | 0.09 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.07 | 0.54 | 0.36 | 2.85 | 0.50 | 4.04 | 0.0013 | 0.01 | 0.021 | 0.16 | 0.16 | 0.15 | 123 | 980 | 0.006 | 0.05 |
| ***June Year 2017 Construction Equipment Total Emissions*** | | | | **85** | | **7.04** | | **35.23** | | **46.40** | | **0.09** | | **2.50** | **2.50** | **2.30** | | **8,522.65** | | **0.64** |
| **July Year 2017 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 1 | 8 | 8 | 7 | 0.09 | 0.73 | 0.52 | 4.15 | 0.59 | 4.69 | 0.0013 | 0.01 | 0.029 | 0.23 | 0.23 | 0.21 | 120 | 957 | 0.008 | 0.07 |
| Roller/Compactor (Vibratory) | 1 | 4 | 4 | 3 | 0.01 | 0.02 | 0.03 | 0.11 | 0.03 | 0.13 | 0.0001 | 0.00 | 0.001 | 0.00 | 0.00 | 0.00 | 4 | 17 | 0.000 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.67 | 0.37 | 4.40 | 0.37 | 4.42 | 0.0008 | 0.01 | 0.022 | 0.27 | 0.27 | 0.24 | 67 | 802 | 0.005 | 0.06 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.40 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 0.001 | 0.02 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.14 | 0.04 | 0.67 | 0.05 | 0.86 | 0.0001 | 0.00 | 0.002 | 0.04 | 0.04 | 0.03 | 7 | 116 | 0.001 | 0.01 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.72 | 0.42 | 6.64 | 0.86 | 13.80 | 0.0014 | 0.02 | 0.035 | 0.56 | 0.56 | 0.52 | 129 | 2058 | 0.010 | 0.15 |
| Forklift | 1 | 8 | 8 | 7 | 0.04 | 0.64 | 0.22 | 3.49 | 0.25 | 3.99 | 0.0006 | 0.01 | 0.012 | 0.19 | 0.19 | 0.17 | 54 | 870 | 0.004 | 0.06 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 1.26 | 0.28 | 6.77 | 0.41 | 9.73 | 0.0007 | 0.02 | 0.022 | 0.52 | 0.52 | 0.48 | 61 | 1464 | 0.005 | 0.11 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.06 | 1.03 | 0.32 | 5.06 | 0.43 | 6.91 | 0.0007 | 0.01 | 0.028 | 0.45 | 0.45 | 0.41 | 64 | 1018 | 0.006 | 0.09 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.07 | 0.54 | 0.36 | 2.85 | 0.50 | 4.04 | 0.0013 | 0.01 | 0.021 | 0.16 | 0.16 | 0.15 | 123 | 980 | 0.006 | 0.05 |
| ***July Year 2017 Construction Equipment Total Emissions*** | | | | **85** | | **6.97** | | **34.90** | | **49.95** | | **0.09** | | **2.48** | **2.48** | **2.28** | | **8,464.66** | | **0.63** |
| **August Year 2017 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 1 | 8 | 8 | 7 | 0.09 | 0.73 | 0.52 | 4.15 | 0.59 | 4.69 | 0.0013 | 0.01 | 0.029 | 0.23 | 0.23 | 0.21 | 120 | 957 | 0.008 | 0.07 |
| Roller/Compactor (Vibratory) | 1 | 4 | 4 | 3 | 0.01 | 0.02 | 0.03 | 0.11 | 0.03 | 0.13 | 0.0001 | 0.00 | 0.001 | 0.00 | 0.00 | 0.00 | 4 | 17 | 0.000 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.67 | 0.37 | 4.40 | 0.37 | 4.42 | 0.0008 | 0.01 | 0.022 | 0.27 | 0.27 | 0.24 | 67 | 802 | 0.005 | 0.06 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.40 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 0.001 | 0.02 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.14 | 0.04 | 0.67 | 0.05 | 0.86 | 0.0001 | 0.00 | 0.002 | 0.04 | 0.04 | 0.03 | 7 | 116 | 0.001 | 0.01 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.72 | 0.42 | 6.64 | 0.86 | 13.80 | 0.0014 | 0.02 | 0.035 | 0.56 | 0.56 | 0.52 | 129 | 2058 | 0.010 | 0.15 |
| Forklift | 1 | 8 | 8 | 7 | 0.04 | 0.64 | 0.22 | 3.49 | 0.25 | 3.99 | 0.0006 | 0.01 | 0.012 | 0.19 | 0.19 | 0.17 | 54 | 870 | 0.004 | 0.06 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 1.26 | 0.28 | 6.77 | 0.41 | 9.73 | 0.0007 | 0.02 | 0.022 | 0.52 | 0.52 | 0.48 | 61 | 1464 | 0.005 | 0.11 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.06 | 1.03 | 0.32 | 5.06 | 0.43 | 6.91 | 0.0007 | 0.01 | 0.028 | 0.45 | 0.45 | 0.41 | 64 | 1018 | 0.006 | 0.09 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.07 | 0.54 | 0.36 | 2.85 | 0.50 | 4.04 | 0.0013 | 0.01 | 0.021 | 0.16 | 0.16 | 0.15 | 123 | 980 | 0.006 | 0.05 |
| ***August Year 2017 Construction Equipment Total Emissions*** | | | | **85** | | **6.97** | | **34.90** | | **49.95** | | **0.09** | | **2.48** | **2.48** | **2.28** | | **8,464.66** | | **0.63** |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **September Year 2017 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 1 | 8 | 8 | 7 | 0.09 | 0.73 | 0.52 | 4.15 | 0.59 | 4.69 | 0.0013 | 0.01 | 0.029 | 0.23 | 0.23 | 0.21 | 120 | 957 | 0.008 | 0.07 |
| Roller/Compactor (Vibratory) | 1 | 4 | 4 | 3 | 0.01 | 0.02 | 0.03 | 0.11 | 0.03 | 0.13 | 0.0001 | 0.00 | 0.001 | 0.00 | 0.00 | 0.00 | 4 | 17 | 0.000 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.67 | 0.37 | 4.40 | 0.37 | 4.42 | 0.0008 | 0.01 | 0.022 | 0.27 | 0.27 | 0.24 | 67 | 802 | 0.005 | 0.06 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.40 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 0.001 | 0.02 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.14 | 0.04 | 0.67 | 0.05 | 0.86 | 0.0001 | 0.00 | 0.002 | 0.04 | 0.04 | 0.03 | 7 | 116 | 0.001 | 0.01 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.72 | 0.42 | 6.64 | 0.86 | 13.80 | 0.0014 | 0.02 | 0.035 | 0.56 | 0.56 | 0.52 | 129 | 2058 | 0.010 | 0.15 |
| Forklift | 1 | 8 | 8 | 7 | 0.04 | 0.64 | 0.22 | 3.49 | 0.25 | 3.99 | 0.0006 | 0.01 | 0.012 | 0.19 | 0.19 | 0.17 | 54 | 870 | 0.004 | 0.06 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 1.26 | 0.28 | 6.77 | 0.41 | 9.73 | 0.0007 | 0.02 | 0.022 | 0.52 | 0.52 | 0.48 | 61 | 1464 | 0.005 | 0.11 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.06 | 1.03 | 0.32 | 5.06 | 0.43 | 6.91 | 0.0007 | 0.01 | 0.028 | 0.45 | 0.45 | 0.41 | 64 | 1018 | 0.006 | 0.09 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.07 | 0.54 | 0.36 | 2.85 | 0.50 | 4.04 | 0.0013 | 0.01 | 0.021 | 0.16 | 0.16 | 0.15 | 123 | 980 | 0.006 | 0.05 |
| ***September Year 2017 Construction Equipment Total Emissions*** | | | | **85** | | **6.97** | | **34.90** | | **49.95** | | **0.09** | | **2.48** | **2.48** | **2.28** | | **8,464.66** | | **0.63** |
| **October Year 2017 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Roller/Compactor (Vibratory) | 1 | 4 | 4 | 3 | 0.01 | 0.02 | 0.03 | 0.11 | 0.03 | 0.13 | 0.0001 | 0.00 | 0.001 | 0.00 | 0.00 | 0.00 | 4 | 17 | 0.000 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.34 | 0.37 | 2.20 | 0.37 | 2.21 | 0.0008 | 0.00 | 0.022 | 0.13 | 0.13 | 0.12 | 67 | 401 | 0.005 | 0.03 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.40 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 0.001 | 0.02 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.07 | 0.04 | 0.33 | 0.05 | 0.43 | 0.0001 | 0.00 | 0.002 | 0.02 | 0.02 | 0.02 | 7 | 58 | 0.001 | 0.01 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.72 | 0.42 | 6.64 | 0.86 | 13.80 | 0.0014 | 0.02 | 0.035 | 0.56 | 0.56 | 0.52 | 129 | 2058 | 0.010 | 0.15 |
| Forklift | 1 | 8 | 8 | 7 | 0.04 | 0.64 | 0.22 | 3.49 | 0.25 | 3.99 | 0.0006 | 0.01 | 0.012 | 0.19 | 0.19 | 0.17 | 54 | 870 | 0.004 | 0.06 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 1.26 | 0.28 | 6.77 | 0.41 | 9.73 | 0.0007 | 0.02 | 0.022 | 0.52 | 0.52 | 0.48 | 61 | 1464 | 0.005 | 0.11 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.06 | 1.03 | 0.32 | 5.06 | 0.43 | 6.91 | 0.0007 | 0.01 | 0.028 | 0.45 | 0.45 | 0.41 | 64 | 1018 | 0.006 | 0.09 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.07 | 0.54 | 0.36 | 2.85 | 0.50 | 4.04 | 0.0013 | 0.01 | 0.021 | 0.16 | 0.16 | 0.15 | 123 | 980 | 0.006 | 0.05 |
| ***October Year 2017 Construction Equipment Total Emissions*** | | | | **78** | | **5.83** | | **28.22** | | **42.63** | | **0.08** | | **2.10** | **2.10** | **1.93** | | **7,049.26** | | **0.53** |
| **November Year 2017 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Roller/Compactor (Vibratory) | 0 | 4 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Backhoe with Carrier | 1 | 6 | 6 | 5 | 0.06 | 0.34 | 0.37 | 2.20 | 0.37 | 2.21 | 0.0008 | 0.00 | 0.022 | 0.13 | 0.13 | 0.12 | 67 | 401 | 0.005 | 0.03 |
| Dump Truck (3-axle) | 3 | 8 | 24 | 21 | 0.01 | 0.22 | 0.03 | 0.75 | 0.06 | 1.40 | 0.0001 | 0.00 | 0.002 | 0.06 | 0.06 | 0.05 | 8 | 183 | 0.001 | 0.02 |
| AC Paver | 1 | 8 | 8 | 7 | 0.12 | 0.95 | 0.51 | 4.06 | 0.67 | 5.34 | 0.0009 | 0.01 | 0.045 | 0.36 | 0.36 | 0.33 | 78 | 623 | 0.011 | 0.09 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.07 | 0.04 | 0.33 | 0.05 | 0.43 | 0.0001 | 0.00 | 0.002 | 0.02 | 0.02 | 0.02 | 7 | 58 | 0.001 | 0.01 |
| Hoist, Truck Mounted | 2 | 8 | 16 | 14 | 0.11 | 1.72 | 0.42 | 6.64 | 0.86 | 13.80 | 0.0014 | 0.02 | 0.035 | 0.56 | 0.56 | 0.52 | 129 | 2058 | 0.010 | 0.15 |
| Forklift | 1 | 8 | 8 | 7 | 0.04 | 0.32 | 0.22 | 1.74 | 0.25 | 1.99 | 0.0006 | 0.00 | 0.012 | 0.09 | 0.09 | 0.09 | 54 | 435 | 0.004 | 0.03 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 1.26 | 0.28 | 6.77 | 0.41 | 9.73 | 0.0007 | 0.02 | 0.022 | 0.52 | 0.52 | 0.48 | 61 | 1464 | 0.005 | 0.11 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.06 | 1.03 | 0.32 | 5.06 | 0.43 | 6.91 | 0.0007 | 0.01 | 0.028 | 0.45 | 0.45 | 0.41 | 64 | 1018 | 0.006 | 0.09 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.07 | 0.54 | 0.36 | 2.85 | 0.50 | 4.04 | 0.0013 | 0.01 | 0.021 | 0.16 | 0.16 | 0.15 | 123 | 980 | 0.006 | 0.05 |
| ***November Year 2017 Construction Equipment Total Emissions*** | | | | **82** | | **6.45** | | **30.42** | | **45.85** | | **0.08** | | **2.36** | **2.36** | **2.17** | | **7,220.30** | | **0.58** |
| **December Year 2017 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 1 | 8 | 8 | 7 | 0.09 | 0.73 | 0.52 | 4.15 | 0.59 | 4.69 | 0.0013 | 0.01 | 0.029 | 0.23 | 0.23 | 0.21 | 120 | 957 | 0.008 | 0.07 |
| Roller/Compactor (Vibratory) | 0 | 4 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Backhoe with Carrier | 0 | 6 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Dump Truck (3-axle) | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| AC Paver | 1 | 8 | 8 | 7 | 0.12 | 0.95 | 0.51 | 4.06 | 0.67 | 5.34 | 0.0009 | 0.01 | 0.045 | 0.36 | 0.36 | 0.33 | 78 | 623 | 0.011 | 0.09 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Concrete/slurry Truck | 1 | 8 | 8 | 7 | 0.01 | 0.07 | 0.04 | 0.33 | 0.05 | 0.43 | 0.0001 | 0.00 | 0.002 | 0.02 | 0.02 | 0.02 | 7 | 58 | 0.001 | 0.01 |
| Hoist, Truck Mounted | 0 | 8 | 0 | 0 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Forklift | 1 | 8 | 8 | 7 | 0.04 | 0.32 | 0.22 | 1.74 | 0.25 | 1.99 | 0.0006 | 0.00 | 0.012 | 0.09 | 0.09 | 0.09 | 54 | 435 | 0.004 | 0.03 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 0.84 | 0.28 | 4.51 | 0.41 | 6.48 | 0.0007 | 0.01 | 0.022 | 0.34 | 0.34 | 0.32 | 61 | 976 | 0.005 | 0.08 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.06 | 0.51 | 0.32 | 2.53 | 0.43 | 3.45 | 0.0007 | 0.01 | 0.028 | 0.23 | 0.23 | 0.21 | 64 | 509 | 0.006 | 0.05 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.07 | 0.54 | 0.36 | 2.85 | 0.50 | 4.04 | 0.0013 | 0.01 | 0.021 | 0.16 | 0.16 | 0.15 | 123 | 980 | 0.006 | 0.05 |
| ***December Year 2017 Construction Equipment Total Emissions*** | | | | **49** | | **3.97** | | **20.18** | | **26.42** | | **0.05** | | **1.44** | **1.44** | **1.33** | | **4,538.33** | | **0.36** |

# Elysian Park/USC Water Recycling Project Phase I - Construction Equipment Emissions

**Estimated Equipment Construction Emissions**

| Equipment Type | Qty | Operating Hrs/WD/ each | Operating Hours per Day | Number of Operating Days | Rog Rate (lbs/hr) | Rog (lbs/day) | CO rate (lbs/hr) | CO (lbs/day) | NOX rate (lbs/hr) | NOX (lbs/day) | SOX rate (lbs/hr) | SOX (lbs/day) | PM rate (lbs/hr) | PM (lbs/day) | PM10 (lbs/day) | PM2.5 (lbs/day) | CO2 Rate (lbs/hr) | CO2 (lbs/day) | CH4 rate (lbs/hr) | CH4 (lbs/day) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **January Year 2018 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 1 | 8 | 8 | 7 | 0.08 | 0.68 | 0.52 | 4.13 | 0.52 | 4.14 | 0.0013 | 0.01 | 0.025 | 0.20 | 0.20 | 0.18 | 120 | 957 | 0.008 | 0.06 |
| Roller/Compactor (Vibratory) | 0 | 4 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Backhoe with Carrier | 0 | 6 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Dump Truck (3-axle) | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| AC Paver | 1 | 8 | 8 | 7 | 0.11 | 0.90 | 0.50 | 4.01 | 0.62 | 4.99 | 0.0009 | 0.01 | 0.042 | 0.34 | 0.34 | 0.31 | 78 | 623 | 0.010 | 0.08 |
| Tandem Roller | 1 | 8 | 8 | 7 | 0.07 | 0.55 | 0.39 | 3.11 | 0.45 | 3.59 | 0.0008 | 0.01 | 0.029 | 0.23 | 0.23 | 0.21 | 67 | 536 | 0.006 | 0.05 |
| Concrete/slurry Truck | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Hoist, Truck Mounted | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Forklift | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 0.76 | 0.28 | 4.46 | 0.38 | 6.01 | 0.0007 | 0.01 | 0.019 | 0.31 | 0.31 | 0.28 | 61 | 976 | 0.004 | 0.07 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.06 | 0.47 | 0.31 | 2.50 | 0.39 | 3.15 | 0.0007 | 0.01 | 0.025 | 0.20 | 0.20 | 0.18 | 64 | 509 | 0.005 | 0.04 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.06 | 0.51 | 0.35 | 2.83 | 0.45 | 3.58 | 0.0013 | 0.01 | 0.018 | 0.14 | 0.14 | 0.13 | 123 | 980 | 0.006 | 0.05 |
| ***January Year 2018 Construction Equipment Total Emissions*** | | | | **42** | | **3.86** | | **21.04** | | **25.47** | | **0.05** | | | **1.42** | **1.30** | | **4,581.36** | | **0.35** |
| **February Year 2018 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Roller/Compactor (Vibratory) | 0 | 4 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Backhoe with Carrier | 0 | 6 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Dump Truck (3-axle) | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Tandem Roller | 1 | 8 | 8 | 7 | 0.07 | 0.55 | 0.39 | 3.11 | 0.45 | 3.59 | 0.0008 | 0.01 | 0.029 | 0.23 | 0.23 | 0.21 | 67 | 536 | 0.006 | 0.05 |
| Concrete/slurry Truck | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Hoist, Truck Mounted | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Forklift | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 0.38 | 0.28 | 2.23 | 0.38 | 3.01 | 0.0007 | 0.01 | 0.019 | 0.15 | 0.15 | 0.14 | 61 | 488 | 0.004 | 0.03 |
| Air Compressor | 1 | 8 | 8 | 7 | 0.06 | 0.47 | 0.31 | 2.50 | 0.39 | 3.15 | 0.0007 | 0.01 | 0.025 | 0.20 | 0.20 | 0.18 | 64 | 509 | 0.005 | 0.04 |
| Miscellanous | 4 | 2 | 8 | 7 | 0.06 | 0.51 | 0.35 | 2.83 | 0.45 | 3.58 | 0.0013 | 0.01 | 0.018 | 0.14 | 0.14 | 0.13 | 123 | 980 | 0.006 | 0.05 |
| ***FebruaryYear 2018 Construction Equipment Total Emissions*** | | | | **28** | | **1.90** | | **10.67** | | **13.33** | | **0.03** | | **0.73** | **0.73** | **0.67** | | **2,513.32** | | **0.17** |
| **March Year 2018 - Construction Equipments** | | | | | | | | | | | | | | | | | | | | |
| Excavator, Cat 365 | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Roller/Compactor (Vibratory) | 0 | 4 | 0 | 3 | 0.01 | 0.00 | 0.03 | 0.00 | 0.03 | 0.00 | 0.0001 | 0.00 | 0.001 | 0 | 0.00 | 0.00 | 4 | 0 | 0.000 | 0.00 |
| Backhoe with Carrier | 0 | 6 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Dump Truck (3-axle) | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| AC Paver | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Tandem Roller | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Concrete/slurry Truck | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Hoist, Truck Mounted | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Forklift | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| K45 Generator | 1 | 8 | 8 | 7 | 0.05 | 0.38 | 0.28 | 2.23 | 0.38 | 3.01 | 0.0007 | 0.01 | 0.019 | 0.15 | 0.15 | 0.14 | 61 | 488 | 0.004 | 0.03 |
| Air Compressor | 0 | 8 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| Miscellanous | 0 | 2 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0000 | 0.00 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0.000 | 0.00 |
| ***March Year 2018 Construction Equipment Total Emissions*** | | | | **10** | | **0.38** | | **2.23** | | **3.01** | | **0.01** | | **0.15** | **0.15** | **0.14** | | **487.94** | | **0.03** |

# Elysian Park/USC Water Recycling Project Phase I - Mobile Emissions

| WORKER VEHICLES | | | Worker Vehicle Emissions (ppd) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | # of Workers | Total VMT/Day | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 |
| **June Year 2016-Worker Vehicles Emissions** | **9** | **239.40** | **0.04** | **1.26** | **0.11** | **0.00** | **0.0019** | **0.0018** | **204.89** |
| *Cars* | *4.0* | 106.40 | 0.01 | 0.28 | 0.02 | 0.00 | 0.0005 | 0.0004 | 83.99 |
| *Trucks* | *5.0* | 133.00 | 0.03 | 0.98 | 0.09 | 0.00 | 0.0015 | 0.0014 | 120.90 |
| **Total June Year 2012 Worker Vehicles Emissions (tons per year)** | | | *0.0004* | *0.0145* | *0.0013* | *0.0000* | *0.0000* | *0.0000* | *2.3562* |
| **July Year 2016-Worker Vehicles Emissions** | **13** | **345.80** | **0.05** | **1.80** | **0.16** | **0.00** | **0.003** | **0.003** | **295.25** |
| *Cars* | *6.0* | 159.60 | 0.01 | 0.42 | 0.0357 | 0.0000 | 0.0007 | 0.0006 | 125.9896 |
| *Trucks* | *7.0* | 186.20 | *0.04* | *1.37* | *0.13* | *0.00* | *0.0021* | *0.0019* | *169.26* |
| **Total July Year 2016 Worker Vehicles Emissions (tons per year)** | | | *0.006* | *0.207* | *0.019* | *0.000* | *0.000* | *0.000* | *33.953* |
| **August Year 2016-Worker Vehicles Emissions** | **13** | **345.80** | **0.05** | **1.80** | **0.16** | **0.00** | **0.00** | **0.00** | **295.25** |
| *Cars* | *6.0* | 159.60 | 0.01 | 0.42 | 0.04 | 0.00 | 0.00 | 0.00 | 125.99 |
| *Trucks* | *7.0* | 186.20 | *0.04* | *1.37* | *0.13* | *0.00* | *0.0021* | *0.0019* | *169.26* |
| **Total August Year 2016 Worker Vehicles Emissions (tons per year)** | | | *0.006* | *0.207* | *0.019* | *0.000* | *0.000* | *0.000* | *33.953* |
| **September Year 2016-Worker Vehicles Emissions** | **13** | **345.80** | **0.05** | **1.80** | **0.16** | **0.000** | **0.003** | **0.003** | **295.245** |
| *Cars* | *6.0* | *159.60* | 0.01 | 0.42 | 0.04 | 0.00 | 0.00 | 0.00 | 125.99 |
| *Trucks* | *7.0* | *186.20* | *0.04* | *1.37* | *0.13* | *0.00* | *0.00* | *0.00* | *169.26* |
| **Total September Year 2016 Worker Vehicles Emissions (tons per year)** | | | *0.006* | *0.207* | *0.019* | *0.000* | *0.000* | *0.000* | *33.953* |
| **October Year 2016-Worker Vehicles Emissions** | **13** | **345.80** | **0.05** | **1.80** | **0.16** | **0.00** | **0.00** | **0.00** | **295.25** |
| *Cars* | *6.0* | 159.60 | 0.01 | 0.42 | 0.04 | 0.00 | 0.00 | 0.00 | 125.99 |
| *Trucks* | *7.0* | 186.20 | *0.04* | *1.37* | *0.13* | *0.00* | *0.00* | *0.00* | *169.26* |
| **Total October Year 2016 Worker Vehicles Emissions (tons per year)** | | | *0.006* | *0.207* | *0.019* | *0.000* | *0.000* | *0.000* | *33.953* |
| **November Year 2016-Worker Vehicles Emissions** | **27** | **718.20** | **0.10** | **3.66** | **0.33** | **0.00** | **0.01** | **0.01** | **611.49** |
| *Cars* | *13.0* | 345.80 | 0.02 | 0.92 | 0.08 | 0.00 | 0.00 | 0.00 | 272.98 |
| *Trucks* | *14.0* | 372.40 | *0.08* | *2.74* | *0.25* | *0.00* | *0.00* | *0.00* | *338.51* |
| **Total November Year 2016 Worker Vehicles Emissions (tons per year)** | | | *0.01* | *0.42* | *0.04* | *0.00* | *0.00* | *0.00* | *70.32* |
| **December Year 2016-Worker Vehicles Emissions** | **27** | **718.20** | **0.10** | **3.66** | **0.33** | **0.00** | **0.01** | **0.01** | **611.49** |
| *Cars* | *13.0* | 345.80 | 0.02 | 0.92 | 0.08 | 0.00 | 0.00 | 0.00 | 272.98 |
| *Trucks* | *14.0* | 372.40 | *0.08* | *2.74* | *0.25* | *0.00* | *0.00* | *0.00* | *338.51* |
| **Total December Year 2016 Worker Vehicles Emissions (tons per year)** | | | *0.01* | *0.42* | *0.04* | *0.00* | *0.00* | *0.00* | *70.32* |

| OFF-SITE TRUCK T | | | | Heavy-duty Truck Emissions | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Trips per Day | Round Trip Length /a/ | VMT/day | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 |
| **June Year 2016- Haul Truck Trips (pounds per day)** | 4 | 45 | 178 | 0.055 | 0.783 | 0.194 | 0.000 | 0.001 | 0.001 | 243.407 |
| *Year 2016- Haul Truck Trips (tons per year)* | | | | *0.0006* | *0.009* | *0.002* | *0.000* | *0.000* | *0.000* | *2.799* |
| **July Year 2016- Haul Truck Trips (pounds per day)** | 12 | 45 | 535 | 0.17 | 2.35 | 0.58 | 0.00 | 0.00 | 0.00 | 730.22 |
| *Year 2016- Haul Truck Trips (tons per year)* | | | | *0.019* | *0.270* | *0.067* | *0.000* | *0.000* | *0.000* | *83.976* |
| **August Year 2016- Haul Truck Trips (pounds per day)** | 12 | 45 | 535 | 0.17 | 2.35 | 0.58 | 0.00 | 0.00 | 0.00 | 730.22 |
| *Year 2016- Haul Truck Trips (tons per year)* | | | | *0.019* | *0.270* | *0.067* | *0.000* | *0.000* | *0.000* | *83.976* |
| **September Year 2016- Haul Truck Trips (pounds per day)** | 12 | 45 | 535 | 0.17 | 2.35 | 0.58 | 0.00 | 0.00 | 0.00 | 730.22 |
| *Year 2016- Haul Truck Trips (tons per year)* | | | | *0.019* | *0.270* | *0.067* | *0.000* | *0.000* | *0.000* | *83.976* |
| **October Year 2016- Haul Truck Trips (pounds per day)** | 12 | 45 | 535 | 0.17 | 2.35 | 0.58 | 0.00 | 0.00 | 0.00 | 730.22 |
| *Year 2016- Haul Truck Trips (tons per year)* | | | | *0.019* | *0.270* | *0.067* | *0.000* | *0.000* | *0.000* | *83.976* |
| **November Year 2016- Haul Truck Trips (pounds per day)** | 14 | 45 | 624 | 0.19 | 2.74 | 0.68 | 0.00 | 0.00 | 0.00 | 851.93 |
| *Year 2016- Haul Truck Trips (tons per year)* | | | | *0.022* | *0.315* | *0.078* | *0.000* | *0.000* | *0.000* | *97.971* |
| **December Year 2016- Haul Truck Trips (pounds per day)** | 14 | 45 | 624 | 0.19 | 2.74 | 0.68 | 0.00 | 0.00 | 0.00 | 851.93 |
| *Year 2016- Haul Truck Trips (tons per year)* | | | | *0.022* | *0.137* | *0.034* | *0.000* | *0.000* | *0.000* | *42.596* |

/a/ Dump site is located at 11520 Sheldon Street, Sun Valley, CA, which is approximately 22.3 miles (one-way trip) from project site.

| WATER TRUCK EMISSIONS/b/ | | | | Heavy-duty Truck Emissions (ppd) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | # of Water Trucks | Hours of Operation Per Month | VMT/day | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 |
| **June Year 2016 - Water Truck Emission (pounds per day)** | 1 | 40 | 8.70 | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 36.50 |
| *June Year 2016 - Water Truck Emission (Tons per Year)* | | | | 0.0001 | 0.0011 | 0.0001 | 0.0000 | 0.0000 | 0.0000 | 0.4198 |
| **July Year 2016-Water Truck Emission (pounds per day)** | 1 | 40 | 8.70 | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 36.50 |
| *Year 2016- Water Truck Emission (tons per year)* | | | | *0.001* | *0.011* | *0.001* | *0.000* | *0.000* | *0.000* | *4.198* |
| **August Year 2016- Water Truck Emission (pounds per day)** | 1 | 40 | 8.70 | 0.007 | 0.092 | 0.011 | 0.000 | 0.000 | 0.000 | 36.500 |
| *Year 2016- Water Truck Emission (tons per year)* | | | | *0.0008* | *0.011* | *0.001* | *0.000* | *0.000* | *0.000* | *4.198* |
| **September Year 2016- Water Truck Emission (pounds per day)** | 1 | 40 | 8.70 | 0.0073 | 0.0924 | 0.0107 | 0.0000 | 0.0003 | 0.0002 | 36.5000 |
| *Year 2016- Water Truck Emission (tons per year)* | | | | *0.0008* | *0.011* | *0.001* | *0.000* | *0.000* | *0.000* | *4.198* |
| **October Year 2016- Water Truck Emission (pounds per day)** | 1 | 40 | 8.70 | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 36.50 |
| *Year 2016- Water Truck Emission (tons per year)* | | | | *0.001* | *0.011* | *0.001* | *0.000* | *0.000* | *0.000* | *4.198* |
| **November Year 2016- Water Truck Emission (pounds per day)** | 1 | 40 | 8.70 | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 36.50 |
| *Year 2016- Water Truck Emission (tons per year)* | | | | *0.001* | *0.011* | *0.001* | *0.000* | *0.000* | *0.000* | *4.198* |
| **December Year 2016- Water Truck Emission (pounds per day)** | 1 | 40 | 8.70 | 0.01 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 36.50 |
| *Year 2016- Water Truck Emission (tons per year)* | | | | *0.001* | *0.011* | *0.001* | *0.000* | *0.000* | *0.000* | *4.198* |

[b] Water trucks would operate on site two hours each day at a rate of 5 mph (compliance with Rule 403). Number of water trucks used and hours of operation are provided from project descriptions. The proposed project assumes 23 work days per average month.

# Elysian Park/USC Water Recycling Project Phase I - Mobile Emissions

| WORKER VEHICLES | # of Workers | Total VMT/Day | Worker Vehicle Emissions (ppd) ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|
| **January Year 2017-Worker Vehicles Emissions** | **27** | **718.20** | **0.09** | **3.34** | **0.30** | **0.00** | **0.01** | **0.00** | **611.87** |
| *Cars* | *13.0* | 345.80 | 0.02 | 0.83 | 0.07 | 0.00 | 0.00 | 0.00 | 273.08 |
| *Trucks* | *14.0* | 372.40 | *0.07* | *2.51* | *0.23* | *0.00* | *0.00* | *0.00* | *338.79* |
| **Total January Year 2017 Worker Vehicles Emissions (tons per year)** | | | *0.010* | *0.384* | *0.035* | *0.000* | *0.001* | *0.001* | *70.365* |
| **February Year 2017-Worker Vehicles Emissions** | **34** | **904.40** | **0.11** | **4.13** | **0.37** | **0.00** | **0.01** | **0.01** | **768.49** |
| *Cars* | *17.0* | 452.20 | 0.03 | 1.08 | 0.09 | 0.00 | 0.00 | 0.00 | 357.10 |
| *Trucks* | *17.0* | 452.20 | *0.08* | *3.05* | *0.28* | *0.00* | *0.00* | *0.00* | *411.39* |
| **Total February Year 2017 Worker Vehicles Emissions (tons per year)** | | | *0.012* | *0.475* | *0.043* | *0.000* | *0.001* | *0.001* | *88.376* |
| **March Year 2017-Worker Vehicles Emissions** | **36** | **957.60** | **0.11** | **4.38** | **0.40** | **0.000** | **0.007** | **0.007** | **813.694** |
| *Cars* | *18.0* | *478.80* | 0.03 | 1.15 | 0.10 | 0.00 | 0.00 | 0.00 | 378.11 |
| *Trucks* | *18.0* | *478.80* | *0.09* | *3.23* | *0.30* | *0.00* | *0.01* | *0.00* | *435.59* |
| **Total March Year 2017 Worker Vehicles Emissions (tons per year)** | | | *0.013* | *0.503* | *0.046* | *0.000* | *0.001* | *0.001* | *93.575* |
| **April Year 2017-Worker Vehicles Emissions** | **36** | **957.60** | **0.11** | **4.38** | **0.40** | **0.00** | **0.01** | **0.01** | **813.69** |
| *Cars* | *18.0* | 478.80 | 0.03 | 1.15 | 0.10 | 0.00 | 0.00 | 0.00 | 378.11 |
| *Trucks* | *18.0* | 478.80 | *0.09* | *3.23* | *0.30* | *0.00* | *0.01* | *0.00* | *435.59* |
| **Total April Year 2017 Worker Vehicles Emissions (tons per year)** | | | *0.013* | *0.503* | *0.046* | *0.000* | *0.001* | *0.001* | *93.575* |
| **May Year 2017-Worker Vehicles Emissions** | **36** | **957.60** | **0.11** | **4.38** | **0.40** | **0.00** | **0.01** | **0.01** | **813.69** |
| *Cars* | *18.0* | 478.80 | 0.03 | 1.15 | 0.10 | 0.00 | 0.00 | 0.00 | 378.11 |
| *Trucks* | *18.0* | 478.80 | *0.09* | *3.23* | *0.30* | *0.00* | *0.01* | *0.00* | *435.59* |
| **Total May Year 2017 Worker Vehicles Emissions (tons per year)** | | | *0.010* | *0.403* | *0.036* | *0.000* | *0.001* | *0.001* | *74.860* |
| **June Year 2017-Worker Vehicles Emissions** | **44** | **1,170.40** | **0.14** | **5.35** | **0.48** | **0.000** | **0.009** | **0.008** | **994.515** |
| *Cars* | *22.0* | *585.20* | 0.03 | 1.40 | 0.12 | 0.00 | 0.00 | 0.00 | 462.13 |
| *Trucks* | *22.0* | *585.20* | *0.10* | *3.95* | *0.37* | *0.00* | *0.01* | *0.01* | *532.39* |
| **Total June Year 2017 Worker Vehicles Emissions (tons per year)** | | | *0.013* | *0.492* | *0.045* | *0.000* | *0.001* | *0.001* | *91.495* |
| **July Year 2017-Worker Vehicles Emissions** | **45** | **1,197.00** | **0.14** | **5.53** | **0.50** | **0.00** | **0.01** | **0.01** | **1,018.71** |
| *Cars* | *22.0* | 585.20 | 0.03 | 1.40 | 0.12 | 0.00 | 0.00 | 0.00 | 462.13 |
| *Trucks* | *23.0* | 611.80 | *0.11* | *4.12* | *0.38* | *0.00* | *0.01* | *0.01* | *556.59* |
| **Total July Year 2017 Worker Vehicles Emissions (tons per year)** | | | *0.013* | *0.509* | *0.046* | *0.000* | *0.001* | *0.001* | *93.722* |
| **August Year 2017-Worker Vehicles Emissions** | **51** | **1,356.60** | **0.16** | **4.66** | **0.43** | **0.00** | **0.01** | **0.01** | **629.18** |
| *Cars* | *25.0* | 665.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Trucks* | *26.0* | 691.60 | *0.12* | *4.66* | *0.43* | *0.00* | *0.01* | *0.01* | *629.18* |
| **Total August Year 2017 Worker Vehicles Emissions (tons per year)** | | | *0.015* | *0.429* | *0.040* | *0.000* | *0.001* | *0.001* | *57.885* |
| **September Year 2017-Worker Vehicles Emissions** | **51** | **1,356.60** | **0.16** | **6.26** | **0.57** | **0.00** | **0.01** | **0.01** | **1,154.33** |
| *Cars* | *25.0* | 665.00 | 0.04 | 1.60 | 0.13 | 0.00 | 0.00 | 0.00 | 525.15 |
| *Trucks* | *26.0* | 691.60 | *0.12* | *4.66* | *0.43* | *0.00* | *0.01* | *0.01* | *629.18* |
| **Total September Year 2017 Worker Vehicles Emissions (tons per year)** | | | *0.015* | *0.576* | *0.052* | *0.000* | *0.001* | *0.001* | *106.198* |
| **October Year 2017-Worker Vehicles Emissions** | **51** | **1,356.60** | **0.16** | **6.26** | **0.57** | **0.000** | **0.010** | **0.009** | **1,154.331** |
| *Cars* | *25.0* | *665.00* | 0.04 | 1.60 | 0.13 | 0.00 | 0.00 | 0.00 | 525.15 |
| *Trucks* | *26.0* | *691.60* | *0.12* | *4.66* | *0.43* | *0.00* | *0.01* | *0.01* | *629.18* |
| **Total October Year 2017 Worker Vehicles Emissions (tons per year)** | | | *0.015* | *0.576* | *0.052* | *0.000* | *0.001* | *0.001* | *106.198* |
| **November Year 2017-Worker Vehicles Emissions** | **44** | **1,170.40** | **0.14** | **5.35** | **0.48** | **0.00** | **0.01** | **0.01** | **994.52** |
| *Cars* | *22.0* | 585.20 | 0.03 | 1.40 | 0.12 | 0.00 | 0.00 | 0.00 | 462.13 |
| *Trucks* | *22.0* | 585.20 | *0.10* | *3.95* | *0.37* | *0.00* | *0.01* | *0.01* | *532.39* |
| **Total November Year 2017 Worker Vehicles Emissions (tons per year)** | | | *0.013* | *0.492* | *0.045* | *0.000* | *0.001* | *0.001* | *91.495* |
| **December Year 2017-Worker Vehicles Emissions** | **33** | **877.80** | **0.10** | **4.07** | **0.37** | **0.00** | **0.01** | **0.01** | **747.48** |
| *Cars* | *16.0* | 425.60 | 0.02 | 1.02 | 0.09 | 0.00 | 0.00 | 0.00 | 336.09 |
| *Trucks* | *17.0* | 452.20 | *0.08* | *3.05* | *0.28* | *0.00* | *0.00* | *0.00* | *411.39* |
| **Total December Year 2017 Worker Vehicles Emissions (tons per year)** | | | *0.01* | *0.56* | *0.05* | *0.00* | *0.00* | *0.00* | *103.15* |

| OFF-SITE TRUCK T | Trips per Day | Round Trip Length /a/ | Heavy-duty Truck Emissions VMT/day | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|
| **January Year 2017- Haul Truck Trips (pounds per day)** | 16 | 45 | 714 | 0.200 | 2.835 | 0.720 | 0.000 | 0.003 | 0.002 | 973.63 |
| *Year 2017- Haul Truck Trips (tons per year)* | | | | 0.0230 | 0.3260 | 0.0827 | 0.0000 | 0.0003 | 0.0003 | 111.97 |
| **February Year 2017- Haul Truck Trips (pounds per day)** | 18 | 45 | 803 | 0.225 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| *Year 2017- Haul Truck Trips (tons per year)* | | | | 0.0258 | 0.0001 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| **March Year 2017- Haul Truck Trips (pounds per day)** | 18 | 45 | 803 | 0.225 | 3.189 | 0.809 | 0.000 | 0.003 | 0.003 | 1,095.33 |
| *Year 2017- Haul Truck Trips (tons per year)* | | | | 0.0258 | 0.3667 | 0.0931 | 0.0000 | 0.0003 | 0.0003 | 125.96 |
| **April Year 2017- Haul Truck Trips (pounds per day)** | 22 | 45 | 981 | 0.275 | 3.898 | 0.989 | 0.000 | 0.004 | 0.003 | 1,338.74 |
| *Year 2017- Haul Truck Trips (tons per year)* | | | | 0.0316 | 0.4482 | 0.1138 | 0.0000 | 0.0004 | 0.0004 | 153.96 |
| **May Year 2017- Haul Truck Trips (pounds per day)** | 20 | 45 | 892 | 0.250 | 3.543 | 0.899 | 0.000 | 0.003 | 0.003 | 1,217.04 |
| *Year 2017- Haul Truck Trips (tons per year)* | | | | 0.0230 | 0.3260 | 0.0827 | 0.0000 | 0.0003 | 0.0003 | 111.97 |
| **June Year 2017- Haul Truck Trips (pounds per day)** | 18 | 45 | 803 | 0.225 | 3.189 | 0.809 | 0.000 | 0.003 | 0.003 | 1,095.33 |
| *Year 2017- Haul Truck Trips (tons per year)* | | | | 0.0218 | 0.3093 | 0.0785 | 0.0000 | 0.0003 | 0.0003 | 106.25 |
| **July Year 2017- Haul Truck Trips (pounds per day)** | 16 | 45 | 714 | 0.200 | 2.835 | 0.720 | 0.000 | 0.003 | 0.002 | 973.63 |
| *Year 2017- Haul Truck Trips (tons per year)* | | | | 0.0184 | 0.2608 | 0.0662 | 0.0000 | 0.0002 | 0.0002 | 89.57 |
| **August Year 2017- Haul Truck Trips (pounds per day)** | 16 | 45 | 714 | 0.200 | 2.835 | 0.720 | 0.000 | 0.003 | 0.002 | 973.63 |
| *Year 2017- Haul Truck Trips (tons per year)* | | | | 0.0184 | 0.2608 | 0.0662 | 0.0000 | 0.0002 | 0.0002 | 89.57 |
| **September Year 2017- Haul Truck Trips (pounds per day)** | 14 | 45 | 624 | 0.175 | 2.480 | 0.630 | 0.000 | 0.002 | 0.002 | 851.93 |
| *Year 2017- Haul Truck Trips (tons per year)* | | | | 0.0161 | 0.2282 | 0.0579 | 0.0000 | 0.0002 | 0.0002 | 78.38 |
| **October Year 2017- Haul Truck Trips (pounds per day)** | 14 | 45 | 624 | 0.175 | 2.480 | 0.630 | 0.000 | 0.002 | 0.002 | 851.93 |
| *Year 2017- Haul Truck Trips (tons per year)* | | | | 0.0161 | 0.2282 | 0.0579 | 0.0000 | 0.0002 | 0.0002 | 78.38 |
| **November Year 2017- Haul Truck Trips (pounds per day)** | 14 | 45 | 624 | 0.175 | 2.480 | 0.630 | 0.000 | 0.002 | 0.002 | 851.93 |
| *Year 2017- Haul Truck Trips (tons per year)* | | | | 0.0161 | 0.2282 | 0.0579 | 0.0000 | 0.0002 | 0.0002 | 78.38 |
| **December Year 2017- Haul Truck Trips (pounds per day)** | 2 | 45 | 89 | 0.025 | 0.354 | 0.090 | 0.000 | 0.000 | 0.000 | 121.70 |
| *Year 2017- Haul Truck Trips (tons per year)* | | | | 0.0034 | 0.0489 | 0.0124 | 0.0000 | 0.0000 | 0.0000 | 16.80 |

/a/ Dump site is located at 11520 Sheldon Street, Sun Valley, CA, which is approximately 22.3 miles (one-way trip) from project site.

| WATER TRUCK EMISSIONS/b/ | # of Water Trucks | Hours of Operation Per Month | VMT/day | Heavy-duty Truck Emissions (ppd) ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|
| **January Year 2017 - Water Truck Emission (pounds per day)** | 1 | 40 | 9 | 0.014 | 0.344 | 0.010 | 0.000 | 0.000 | 0.000 | 48.142 |
| *January Year 2017 - Water Truck Emission (Tons per Year)* | | | | 0.0016 | 0.0395 | 0.0012 | 0.0000 | 0.0000 | 0.0000 | 5.5363 |
| **February Year 2017 - Water Truck Emission (pounds per day)** | 1 | 40 | 9 | 0.014 | 0.344 | 0.010 | 0.000 | 0.000 | 0.000 | 48.142 |
| *February Year 2017 - Water Truck Emission (Tons per Year)* | | | | 0.0016 | 0.0395 | 0.0012 | 0.0000 | 0.0000 | 0.0000 | 5.5363 |
| **March Year 2017 - Water Truck Emission (pounds per day)** | 1 | 40 | 9 | 0.014 | 0.344 | 0.010 | 0.000 | 0.000 | 0.000 | 48.142 |
| *March Year 2017 - Water Truck Emission (Tons per Year)* | | | | 0.0016 | 0.0395 | 0.0012 | 0.0000 | 0.0000 | 0.0000 | 5.5363 |
| **April Year 2017 - Water Truck Emission (pounds per day)** | 1 | 40 | 9 | 0.014 | 0.344 | 0.010 | 0.000 | 0.000 | 0.000 | 48.142 |
| *April Year 2017 - Water Truck Emission (Tons per Year)* | | | | 0.0016 | 0.0395 | 0.0012 | 0.0000 | 0.0000 | 0.0000 | 5.5363 |
| **May Year 2017 - Water Truck Emission (pounds per day)** | 1 | 40 | 9 | 0.014 | 0.344 | 0.010 | 0.000 | 0.000 | 0.000 | 48.142 |
| *May Year 2017 - Water Truck Emission (Tons per Year)* | | | | 0.0013 | 0.0316 | 0.0009 | 0.0000 | 0.0000 | 0.0000 | 4.4291 |
| **June Year 2017 - Water Truck Emission (pounds per day)** | 1 | 40 | 9 | 0.014 | 0.344 | 0.010 | 0.000 | 0.000 | 0.000 | 48.142 |
| *June Year 2017 - Water Truck Emission (Tons per Year)* | | | | 0.0013 | 0.0316 | 0.0009 | 0.0000 | 0.0000 | 0.0000 | 4.4291 |
| **July Year 2017 - Water Truck Emission (pounds per day)** | 1 | 40 | 9 | 0.014 | 0.344 | 0.010 | 0.000 | 0.000 | 0.000 | 48.142 |
| *July Year 2017 - Water Truck Emission (Tons per Year)* | | | | 0.0013 | 0.0316 | 0.0009 | 0.0000 | 0.0000 | 0.0000 | 4.4291 |
| **August Year 2017 - Water Truck Emission (pounds per day)** | 1 | 40 | 9 | 0.014 | 0.344 | 0.010 | 0.000 | 0.000 | 0.000 | 48.142 |
| *August Year 2017 - Water Truck Emission (Tons per Year)* | | | | 0.0013 | 0.0316 | 0.0009 | 0.0000 | 0.0000 | 0.0000 | 4.4291 |
| **September Year 2017 - Water Truck Emission (pounds per** | 1 | 40 | 9 | 0.014 | 0.344 | 0.010 | 0.000 | 0.000 | 0.000 | 48.142 |
| *September Year 2017 - Water Truck Emission (Tons per Year)* | | | | 0.0013 | 0.0316 | 0.0009 | 0.0000 | 0.0000 | 0.0000 | 4.4291 |
| **October Year 2017- Water Truck Emission (pounds per day)** | 1 | 40 | 9 | 0.014 | 0.344 | 0.010 | 0.000 | 0.000 | 0.000 | 48.142 |
| *October Year 2017- Water Truck Emission (tons per year)* | | | | 0.0013 | 0.0316 | 0.0009 | 0.0000 | 0.0000 | 0.0000 | 4.4291 |
| **November Year 2017- Water Truck Emission (pounds per day)** | 1 | 40 | 9 | 0.014 | 0.344 | 0.010 | 0.000 | 0.000 | 0.000 | 48.142 |
| *November Year 2017- Water Truck Emission (tons per year)* | | | | 0.0013 | 0.0316 | 0.0009 | 0.0000 | 0.0000 | 0.0000 | 4.4291 |
| **December Year 2017- Water Truck Emission (pounds per day)** | 1 | 20 | 4 | 0.007 | 0.172 | 0.005 | 0.000 | 0.000 | 0.000 | 24.071 |
| *December Year 2017- Water Truck Emission (tons per year)* | | | | 0.0010 | 0.0237 | 0.0007 | 0.0000 | 0.0000 | 0.0000 | 3.3218 |

[b] Water trucks would operate on site two hours each day at a rate of 5 mph (compliance with Rule 403). Number of water trucks used and hours of operation are provided from project descriptions. The proposed project assumes 23 work days per average month.

# Elysian Park/USC Water Recycling Project Phase I - Mobile Emissions

| WORKER VEHICLES | | | | Worker Vehicle Emissions (ppd) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | # of Workers | Total VMT/Day | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 |
| **January Year 2018-Worker Vehicles Emissions** | | **33** | **877.80** | **0.09** | **3.72** | **0.34** | **0.00** | **0.01** | **0.01** | **747.88** |
| | *Cars* | *16.0* | 425.60 | 0.02 | 0.93 | 0.08 | 0.00 | 0.00 | 0.00 | 336.19 |
| | *Trucks* | *17.0* | 452.20 | *0.07* | *2.79* | *0.26* | *0.00* | *0.00* | *0.00* | *411.69* |
| **Total January Year 2018 Worker Vehicles Emissions (tons per year)** | | | | *0.01* | *0.51* | *0.05* | *0.00* | *0.00* | *0.00* | *103.21* |
| **February Year 2018-Worker Vehicles Emissions** | | **10** | **266.00** | **0.03** | **1.11** | **0.10** | **0.00** | **0.00** | **0.00** | **226.14** |
| | *Cars* | *5.0* | 133.00 | 0.01 | 0.29 | 0.02 | 0.00 | 0.00 | 0.00 | 105.06 |
| | *Trucks* | *5.0* | 133.00 | *0.02* | *0.82* | *0.08* | *0.00* | *0.00* | *0.00* | *121.08* |
| **Total February Year 2018 Worker Vehicles Emissions (tons per year)** | | | | *0.00* | *0.13* | *0.01* | *0.00* | *0.00* | *0.00* | *26.01* |
| **March Year 2018-Worker Vehicles Emissions** | | **10** | **266.00** | **0.03** | **1.11** | **0.10** | **0.00** | **0.00** | **0.00** | **226.14** |
| | *Cars* | *5.0* | 133.00 | 0.01 | 0.29 | 0.02 | 0.00 | 0.00 | 0.00 | 105.06 |
| | *Trucks* | *5.0* | 133.00 | *0.02* | *0.82* | *0.08* | *0.00* | *0.00* | *0.00* | *121.08* |
| **Total March Year 2018 Worker Vehicles Emissions (tons per year)** | | | | *0.00* | *0.13* | *0.01* | *0.00* | *0.00* | *0.00* | *26.01* |
| **April Year 2018-Worker Vehicles Emissions** | | **9** | **239.40** | **0.03** | **1.05** | **0.10** | **0.00** | **0.00** | **0.00** | **205.13** |
| | *Cars* | *4.0* | 106.40 | 0.01 | 0.23 | 0.02 | 0.00 | 0.00 | 0.00 | 84.05 |
| | *Trucks* | *5.0* | 133.00 | *0.02* | *0.82* | *0.08* | *0.00* | *0.00* | *0.00* | *121.08* |
| **Total April Year 2018 Worker Vehicles Emissions (tons per year)** | | | | *0.00* | *0.01* | *0.00* | *0.00* | *0.00* | *0.00* | *2.36* |

| OFF-SITE TRUCK T | | Heavy-duty Truck Emissions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Trips per Day | Round Trip Length /a/ | VMT/day | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 |
| **January Year 2018- Haul Truck Trips (pounds per** | | 2 | 45 | 89 | 0.022 | 0.320 | 0.083 | 0.000 | 0.000 | 0.000 | 121.70 |
| | *Year 2018- Haul Truck Trips (tons per year)* | | | | *0.0031* | *0.0441* | *0.0115* | *0.0000* | *0.0000* | *0.0000* | *16.80* |
| **February Year 2018- Haul Truck Trips (pounds per** | | 2 | 45 | 89 | 0.02 | 0.32 | 0.08 | 0.00 | 0.00 | 0.00 | 121.70 |
| | *Year 2018- Haul Truck Trips (tons per year)* | | | | *0.003* | *0.037* | *0.010* | *0.000* | *0.000* | *0.000* | *14.00* |
| **March Year 2018- Haul Truck Trips (pounds per day)** | | 2 | 45 | 89 | 0.02 | 0.32 | 0.08 | 0.00 | 0.00 | 0.00 | 121.70 |
| | *Year 2018- Haul Truck Trips (tons per year)* | | | | *0.003* | *0.037* | *0.010* | *0.000* | *0.000* | *0.000* | *14.00* |
| **April Year 2018- Haul Truck Trips (pounds per day)** | | 4 | 45 | 178 | 0.045 | 0.640 | 0.167 | 0.000 | 0.001 | 0.001 | 243.41 |
| | *Year 2018- Haul Truck Trips (tons per year)* | | | | *0.0005* | *0.0074* | *0.0019* | *0.0000* | *0.0000* | *0.0000* | *2.80* |

/a/ Dump site is located at 11520 Sheldon Street, Sun Valley, CA, which is approximately 22.3 miles (one-way trip) from project site.

| WATER TRUCK EMISSIONS/b/ | | | | Heavy-duty Truck Emissions (ppd) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | # of Water Trucks | Hours of Operation Per Month | VMT/day | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 |
| **January Year 2018 - Water Truck Emission (pounds** | 1 | 20 | 4.35 | 0.01 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 24.07 |
| *January Year 2018 - Water Truck Emission (Tons per* | | | | 0.0008 | 0.0184 | 0.0006 | 0.0000 | 0.0000 | 0.0000 | 3.3218 |
| **February Year 2018 - Water Truck Emission (pounds** | 1 | 20 | 4.35 | 0.005 | 0.133 | 0.004 | 0.000 | 0.000 | 0.000 | 24.071 |
| *February Year 2018 - Water Truck Emission (Tons per* | | | | *0.0006* | *0.0153* | *0.0005* | *0.0000* | *0.0000* | *0.0000* | *2.7682* |
| **March Year 2018 - Water Truck Emission (pounds** | 1 | 10 | 2.17 | 0.003 | 0.067 | 0.002 | 0.000 | 0.000 | 0.000 | 12.036 |
| *March Year 2018 - Water Truck Emission (Tons per* | | | | *0.0003* | *0.0077* | *0.0003* | *0.0000* | *0.0000* | *0.0000* | *1.3841* |
| **April Year 2018 - Water Truck Emission (pounds per** | 1 | 10 | 2.17 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 12.04 |
| *April Year 2018 - Water Truck Emission (Tons per* | | | | 0.0000 | 0.0008 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1384 |

[b] Water trucks would operate on site two hours each day at a rate of 5 mph (compliance with Rule 403). Number of water trucks used and hours of operation are provided from project descriptions. The proposed project assumes 23 work days per average month.

**Elysian Park/USC Water Recycling Project - Fugitive Dust Emissions from Excavation Year 2016**

| Excavation - RW Line from LA River to EPWRP-1 Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule July Year 2016) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 420 | 45,652 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.00 | 0.00 |
| Material Handling | 61 | 0.00 | 0.00 |
| Dragline | 61 | 0.030 | 0.002 |
| **Total** | | **0.03** | **0.00** |

| Excavation - RW Line from LA River to EPWRP-1 Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule August Year 2016) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 420 | 45,652 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.030 | 0.002 |
| **Total** | | **0.03** | **0.00** |

| Excavation - RW Line from LA River to EPWRP-1 Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule September Year 2016) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 420 | 45,652 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.030 | 0.001 |
| **Total** | | **0.03** | **0.00** |

| Excavation - RW Line from LA River to EPWRP-1 Tank Excavation Schedule October Year 2016) - | Construction Activity 23 days[a] |
|---|---|

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 420 | 45,652 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.030 | 0.002 |
| **Total** | | **0.03** | **0.00** |

| Excavation - RW Line from LA River to EPWRP-1 Tank Excavation Schedule November Year 2016) - | Construction Activity 23 days[a] |
|---|---|

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 420 | 45,652 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.030 | 0.002 |
| **Total** | | **0.03** | **0.00** |

| Excavation - RW Line from LA River to EPWRP-1 Tank Excavation Schedule December Year 2016) - | Construction Activity 23 days[a] |
|---|---|

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 420 | 45,652 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.030 | 0.002 |
| **Total** | | **0.03** | **0.00** |

**Notes:**

a) Obtained from client.
b) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.
c) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Corection Factors Applicable to the Predictive Emission Factor Equations
d) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993
e) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.
f) Assumed storage piles are 0.02 acres in size
g) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm
h) Mean wind speed at the Downtown Wind Monitoring Station.
i) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28.
j) Assuming 420 cubic yards of dirt handled [(420 cyd x 2,500 lb/cyd)/23 days = 45,652 lb/day]
k) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 µm
l) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, Equation 1
m) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12.
n) Includes watering at least three times a day per Rule 403 (61% control efficiency).
o) Source: USEPA, AP-42, Emission Factor Equations for Uncontrolled Dust Sources at Western Surface Coal Mines, Table 11.9-1, Dragline calculations for $PM_{10}$ and $PM_{2.5}$.

| Excavation - Construct RW Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule (November Year 2016) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 150 | 16,320 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.011 | 0.001 |
| **Total** | | **0.011** | **0.001** |

| Excavation - Construct RW Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule (December Year 2016) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 150 | 16,320 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.002 | 0.001 |
| **Total** | | **0.002** | **0.001** |

**Notes:**

a) Obtained from client.
b) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.
c) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Corection Factors Applicable to the Predictive Emission Factor Equations
d) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993
e) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.
f) Assumed storage piles are 0.02 acres in size
g) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm
h) Mean wind speed at the Downtown Wind Monitoring Station.
i) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28.
j) Assuming 150 cubic yards of dirt handled [(150 cyd x 2,500 lb/cyd)/23 days = 16,320 lb/day]
k) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 µm
l) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, Equation 1
m) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12.
n) Includes watering at least three times a day per Rule 403 (61% control efficiency).
o) Source: USEPA, AP-42, Emission Factor Equations for Uncontrolled Dust Sources at Western Surface Coal Mines, Table 11.9-1, Dragline calculations for $PM_{10}$ and $PM_{2.5}$.

**Elysian Park/USC Water Recycling Project - Fugitive Dust Emissions from Excavation Year 2016**

| **Excavation - RW Line from LA River to EPWRP-1 Tank** | | **Construction Activity** |
|---|---|---|
| **Excavation Schedule January Year 2017) -** | **23** | **days**[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 420 | 45,652 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.00 | 0.00 |
| Material Handling | 61 | 0.00 | 0.00 |
| Dragline | 61 | 0.030 | 0.002 |
| **Total** | | **0.030** | **0.002** |

| **Excavation - RW Line from LA River to EPWRP-1 Tank** | | **Construction Activity** |
|---|---|---|
| **Excavation Schedule February Year 2017) -** | **23** | **days**[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 420 | 45,652 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.030 | 0.002 |
| **Total** | | **0.030** | **0.002** |

| **Excavation - RW Line from LA River to EPWRP-1 Tank** | | **Construction Activity** |
|---|---|---|
| **Excavation Schedule March Year 2017) -** | **23** | **days**[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 420 | 45,652 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.030 | 0.002 |
| **Total** | | **0.030** | **0.002** |

| Excavation - RW Line from LA River to EPWRP-1 Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule April Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 420 | 45,652 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton)
(1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.030 | 0.002 |
| **Total** | | **0.030** | **0.002** |

**Notes:**

a) Obtained from client.
b) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.
c) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Corection Factors Applicable to the Predictive Emission Factor Equations
d) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993
e) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.
f) Assumed storage piles are 0.02 acres in size
g) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm
h) Mean wind speed at the Burbank Wind Monitoring Station.
i) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28.
j) Assuming 420 cubic yards of dirt handled [(420 cyd x 2,500 lb/cyd)/23 days = 45,652 lb/day]
k) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 µm
l) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, Equation 1
m) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12.
n) Includes watering at least three times a day per Rule 403 (61% control efficiency).
o) Source: USEPA, AP-42, Emission Factor Equations for Uncontrolled Dust Sources at Western Surface Coal Mines, Table 11.9-1, Dragline calculations for $PM_{10}$ and $PM_{2.5}$.

| Excavation - PW Line from Park Dr. to EPWRP-1 Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule April Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 338 | 36,739 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton)
(1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.024 | 0.001 |
| **Total** | | **0.02** | **0.001** |

| Excavation - PW Line from Park Dr. to EPWRP-1 Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule May Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 338 | 36,739 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.024 | 0.001 |
| **Total** | | **0.024** | **0.001** |

| Excavation - PW Line from Park Dr. to EPWRP-1 Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule June Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 338 | 36,739 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.024 | 0.001 |
| **Total** | | **0.024** | **0.001** |

| Excavation - PW Line from Park Dr. to EPWRP-1 Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule July Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 338 | 36,739 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.024 | 0.001 |
| **Total** | | **0.024** | **0.001** |

| Excavation - PW Line from Park Dr. to EPWRP-1 Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule August Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 338 | 36,739 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.024 | 0.001 |
| **Total** | | **0.024** | **0.001** |

| | | |
|---|---|---|
| **Excavation - PW Line from Park Dr. to EPWRP-1 Tank** | | **Construction Activity** |
| **Excavation Schedule September Year 2017) -** | **23** | **days[a]** |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 338 | 36,739 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.024 | 0.001 |
| **Total** | | **0.024** | **0.001** |

| | | |
|---|---|---|
| **Excavation - PW Line from Park Dr. to EPWRP-1 Tank** | | **Construction Activity** |
| **Excavation Schedule October Year 2017) -** | **23** | **days[a]** |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 338 | 36,739 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.024 | 0.001 |
| **Total** | | **0.024** | **0.001** |

| Excavation - PW Line from Park Dr. to EPWRP-1 Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule November Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 338 | 36,739 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.024 | 0.001 |
| **Total** | | **0.024** | **0.001** |

**Notes:**

a) Obtained from client.
b) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.
c) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Corection Factors Applicable to the Predictive Emission Factor Equations
d) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993
e) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.
f) Assumed storage piles are 0.02 acres in size
g) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm
h) Mean wind speed at the Burbank Wind Monitoring Station.
i) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28.
j) Assuming 338 cubic yards of dirt handled [(338 cyd x 2,500 lb/cyd)/23 days = 36,739 lb/day]
k) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 µm
l) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, Equation 1
m) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12.
n) Includes watering at least three times a day per Rule 403 (61% control efficiency).
o) Source: USEPA, AP-42, Emission Factor Equations for Uncontrolled Dust Sources at Western Surface Coal Mines, Table 11.9-1, Dragline calculations for $PM_{10}$ and $PM_{2.5}$.

| Excavation - Construct RW Pump Station | | Construction Activity |
|---|---|---|
| Excavation Schedule (February Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 30 | 3,261 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.002 | 0.0001 |
| **Total** | | **0.002** | **0.000** |

| Excavation - Construct RW Pump Station | | Construction Activity |
|---|---|---|
| Excavation Schedule (March Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 30 | 3,261 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.002 | 0.000 |
| **Total** | | **0.002** | **0.000** |

| Excavation - Construct RW Pump Station | | Construction Activity |
|---|---|---|
| Excavation Schedule (April Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 30 | 3,261 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.002 | 0.000 |
| **Total** | | **0.002** | **0.000** |

| Excavation - Construct RW Pump Station | | Construction Activity |
|---|---|---|
| Excavation Schedule (May Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 30 | 3,261 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.002 | 0.0001 |
| **Total** | | **0.002** | **0.000** |

| Excavation - Construct RW Pump Station | | Construction Activity |
|---|---|---|
| Excavation Schedule (June Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 30 | 3,261 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.002 | 0.0001 |
| **Total** | | **0.002** | **0.0000** |

**Notes:**

a) Obtained from client.
b) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.
c) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Corection Factors Applicable to the Predictive Emission Factor Equations
d) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993
e) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.
f) Assumed storage piles are 0.02 acres in size
g) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm
h) Mean wind speed at the Burbank Wind Monitoring Station.
i) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28.
j) Assuming 030 cubic yards of dirt handled [(030 cyd x 2,500 lb/cyd)/23 days = 3,261 lb/day]
k) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 µm
l) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, Equation 1
m) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12.
n) Includes watering at least three times a day per Rule 403 (61% control efficiency).
o) Source: USEPA, AP-42, Emission Factor Equations for Uncontrolled Dust Sources at Western Surface Coal Mines, Table 11.9-1, Dragline calculations for $PM_{10}$ and $PM_{2.5}$.

| Excavation - Construct PW Pump Station | | Construction Activity |
|---|---|---|
| Excavation Schedule (June Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 30 | 3,261 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.002 | 0.0001 |
| **Total** | | **0.002** | **0.0000** |

| Excavation - Construct PW Pump Station | | Construction Activity |
|---|---|---|
| Excavation Schedule (July Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 30 | 3,261 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.002 | 0.000 |
| **Total** | | **0.002** | **0.000** |

| Excavation - Construct PW Pump Station | | Construction Activity |
|---|---|---|
| Excavation Schedule (August Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 30 | 3,261 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.002 | 0.000 |
| **Total** | | **0.002** | **0.000** |

| Excavation - Construct PW Pump Station | Construction Activity |
|---|---|
| Excavation Schedule (September Year 2017) - | 23 days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 30 | 3,261 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.002 | 0.000 |
| **Total** | | **0.002** | **0.000** |

| Excavation - Construct PW Pump Station | Construction Activity |
|---|---|
| Excavation Schedule (October Year 2017) - | 23 days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 30 | 3,261 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.002 | 0.000 |
| **Total** | | **0.002** | **0.000** |

**Notes:**

a) Obtained from client.
b) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.
c) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Corection Factors Applicable to the Predictive Emission Factor Equations
d) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993
e) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.
f) Assumed storage piles are 0.02 acres in size
g) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm
h) Mean wind speed at the Burbank Wind Monitoring Station.
i) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28.
j) Assuming 030 cubic yards of dirt handled [(030 cyd x 2,500 lb/cyd)/23 days = 3,261 lb/day]
k) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 µm
l) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, Equation 1
m) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12.
n) Includes watering at least three times a day per Rule 403 (61% control efficiency).
o) Source: USEPA, AP-42, Emission Factor Equations for Uncontrolled Dust Sources at Western Surface Coal Mines, Table 11.9-1, Dragline calculations for $PM_{10}$ and $PM_{2.5}$.

| Excavation - Construct RW Tank | Construction Activity |
|---|---|
| Excavation Schedule (January Year 2017) - | 23 days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 150 | 16,320 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.011 | 0.001 |
| **Total** | | **0.011** | **0.001** |

| Excavation - Construct RW Tank | Construction Activity |
|---|---|
| Excavation Schedule (February Year 2017) - | 23 days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 150 | 16,320 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.011 | 0.001 |
| **Total** | | **0.011** | **0.001** |

| Excavation - Construct RW Tank | Construction Activity |
|---|---|
| Excavation Schedule (March Year 2017) - | 23 days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 150 | 16,320 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.011 | 0.001 |
| **Total** | | **0.011** | **0.001** |

| Excavation - Construct RW Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule (April Year 2017) - | 23 | days[a] |

| Fugitive Dust Stockpiling Parameters | | | | |
|---|---|---|---|---|
| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

| Fugitive Dust Material Handling | | | | |
|---|---|---|---|---|
| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
| 0.35 | 4.96 | 7.9 | 150 | 16,320 |

| Dragline Parameters | | | |
|---|---|---|---|
| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.011 | 0.001 |
| **Total** | | **0.011** | **0.001** |

| Excavation - Construct RW Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule (May Year 2017) - | 23 | days[a] |

| Fugitive Dust Stockpiling Parameters | | | | |
|---|---|---|---|---|
| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

| Fugitive Dust Material Handling | | | | |
|---|---|---|---|---|
| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
| 0.35 | 4.96 | 7.9 | 150 | 16,320 |

| Dragline Parameters | | | |
|---|---|---|---|
| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.011 | 0.001 |
| **Total** | | **0.011** | **0.001** |

**Notes:**

a) Obtained from client.
b) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.
c) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Corection Factors Applicable to the Predictive Emission Factor Equations
d) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993
e) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.
f) Assumed storage piles are 0.02 acres in size
g) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm
h) Mean wind speed at the DOwntown Wind Monitoring Station.
i) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28.
j) Assuming 150 cubic yards of dirt handled [(150 cyd x 2,500 lb/cyd)/23 days = 16,320 lb/day]
k) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 µm
l) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, Equation 1
m) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12.
n) Includes watering at least three times a day per Rule 403 (61% control efficiency).
o) Source: USEPA, AP-42, Emission Factor Equations for Uncontrolled Dust Sources at Western Surface Coal Mines, Table 11.9-1, Dragline calculations for $PM_{10}$ and $PM_{2.5}$.

| Excavation - Construct PW Tank | | Construction Activity |
|---|---|---|
| Excavation Schedule (August Year 2017) - | 23 | days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 12 | 1,304 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency % | Unmitigated PM10[n] lb/day | Unmitigated PM2.5 lb/day |
|---|---|---|---|
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.001 | 0.000 |
| **Total** | | **0.001** | **0.000** |

**Notes:**

a) Obtained from client.
b) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.
c) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Corection Factors Applicable to the Predictive Emission Factor Equations
d) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993
e) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.
f) Assumed storage piles are 0.02 acres in size
g) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm
h) Mean wind speed at the Downtown Wind Monitoring Station.
i) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28.
j) Assuming 012 cubic yards of dirt handled [(012 cyd x 2,500 lb/cyd)/23 days = 1,304 lb/day]
k) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 µm
l) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, Equation 1
m) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12.
n) Includes watering at least three times a day per Rule 403 (61% control efficiency).
o) Source: USEPA, AP-42, Emission Factor Equations for Uncontrolled Dust Sources at Western Surface Coal Mines, Table 11.9-1, Dragline calculations for $PM_{10}$ and $PM_{2.5}$.

| EMFAC2011 RATES (grams per mile) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Vehicle Type** | **ROG** | **CO** | **NOX** | **SOX** | **PM10** | **PM2.5** | **CO2** |
| **Year 2016** | | | | | | | |
| Haul Truck @ 30 MPH | 0.14 | 2 | 0.49 | 0 | 0.002 | 0.002 | 619.43 |
| Water Truck @ 5 MPH | 0.38 | 4.8 | 0.56 | 0 | 0.013 | 0.012 | 1905.67 |
| Worker Vehicle @30 MPH | 0.03 | 1.2 | 0.1 | 0 | 0.002 | 0.002 | 358.39 |
| Light-Duty Truck @30 MPH | 0.09 | 3.3 | 0.31 | 0 | 0.005 | 0.005 | 412.69 |
| **Year 2017** | | | | | | | |
| Haul Truck @ 30 MPH | 0.13 | 1.8 | 0.46 | 0 | 0.002 | 0.001 | 619.43 |
| Water Truck @ 5 MPH | 0.74 | 18 | 0.53 | 0 | 0.011 | 0.010 | 2513.50 |
| Worker Vehicle @30 MPH | 0.03 | 1.1 | 0.09 | 0 | 0.002 | 0.002 | 358.52 |
| Light-Duty Truck @30 MPH | 0.08 | 3.1 | 0.28 | 0 | 0.005 | 0.004 | 413.03 |
| **Year 2018** | | | | | | | |
| Haul Truck @ 30 MPH | 0.11 | 1.6 | 0.42 | 0 | 0.001 | 0.001 | 619.43 |
| Water Truck @ 5 MPH | 0.57 | 14 | 0.46 | 0 | 0.009 | 0.008 | 2513.50 |
| Worker Vehicle @30 MPH | 0.02 | 1 | 0.08 | 0 | 0.002 | 0.002 | 358.62 |
| Light-Duty Truck @30 MPH | 0.07 | 2.8 | 0.26 | 0 | 0.004 | 0.004 | 413.33 |
| **Assumptions:** | | | | | | | |
| Construction Year | 2016-2021 | | | | | | |
| Season | Annual | | | | | | |

# PROJECT: ELYSIAN PARK WATER RECYCLING PROJECT PHASE II

**Work Schedule**

| Total footage of pipe (LF) | Pipe lay rate (LF/day) | Total days required to install pipe | Working days per year | Number of years required to install total pipe |
|---|---|---|---|---|
| 52,800 | 90 | 587 | 251 | 2.3 |

**Excavation of Soils**

| Total soil excavated incl. 20% expansion ($ft^3$)[1] | Soil hauled per day ($ft^3$/day) | Soil hauled per day ($yd^3$/day) | Maximum volume allowed in a 10-yd. Dump Truck ($yd^3$) | Number of loads (loads per day) | Number of 10 $yd^3$ Dump Trucks used | Round trips per truck |
|---|---|---|---|---|---|---|
| 792,000 | 1,350 | 50.0 | 8.5 | 6 | 3 | 2 |

**Dump Site Locations**

NU-WAY 1270 Arrow HighWay Irwindale Ca. I -10 E 19.0 miles
Vulcan 11520 Sheldon St. Sun Valley Ca. I - 5 N (4.7 miles - 22.3 miles)

| Construction Crew | | Crew Equipment | |
|---|---|---|---|
| 1-Supervisor | 2-Operator | 2-Pick-up Trk | 1-Truck Mounted Crane |
| 1-Sr.W.U.W. | 3- H.D.T.O. | 1-Gang Trk | 1-Back Hoe W/ Carrier |
| 2-W.U.W. | 1-Field Engineer | 1-5 $yd^3$ Dump Trk | 1-Pipe Trk |
| 2-M.C.H | | 3-10 $yd^3$. Dump Trk | |

| CNG |
|---|
| DIESEL |
| GAS |

**Trips per vehicle**

Pick-up truck - varies
5 $yd^3$ dump truck - varies
Gang Trk - 1 trip to and from job
Pipe Truck - 1 trip to & from job
Backhow w/carrier - 1 trip to and from job
Truck mounted crane - 1 trip to and from job
10 $yard^3$ dump trucks - see round trips above

**Best Management Practices**

Geotextile Fabrics / sandbag on all storm drain catch basins opening
All spoils being transported covered with tarp
Comply with City approved traffic control plans

[1] *assumed a 2.5' wide x 5' deep trench*

## Elysian Park/USC Water Recycling Project- Summary of Construction Emissions

| TOTAL EMISSIONS | Emissions (ppd) | | | | | |
|---|---|---|---|---|---|---|
| | ROG | CO | NOX | SOX | PM10 | PM2.5 |
| Construction Equipments | 4 | 21 | 26 | 0.1 | 1 | 1 |
| Worker Vehicle | 0.03 | 1.33 | 0.12 | 0.00 | 0.002 | 0.002 |
| Off-Site Trucks | 0.13 | 1.92 | 0.50 | 0.00 | 0.002 | 0.002 |
| Water Trucks | 0.01 | 0.27 | 0.01 | 0.00 | 0.0002 | 0.0002 |
| Excavation | | | | | 0.10 | 0.01 |
| **Regional Daily Maximum** | **4** | **25** | **27** | **0** | **1** | **1** |
| **THRESHOLD** | **75** | **550** | **100** | **150** | **150** | **55** |
| IMPACT? | NO | NO | NO | NO | NO | NO |
| **On-Site Daily Maximum** | **4** | **21** | **26** | **0** | **1** | **1** |
| **THRESHOLD /a/** | **n/a** | **680** | **74** | **n/a** | **5** | **3** |
| IMPACT? | n/a | NO | NO | n/a | NO | NO |

/a/ The proposed project is assumed to be one acre. The closest residential receptor is approximately 25 meter from the project site.

## Elysian Park/USC Water Recycling Project Phase II - Construction Equipment Emissions

**Estimated Equipment Construction Emissions**

| Equipment Type | Qty | Operating Hrs/WD/ each | Operating Hours per Day | Rog Rate (lbs/hr) | Rog (lbs/day) | CO rate (lbs/hr) | CO (lbs/day) | NOX rate (lbs/hr) | NOX (lbs/day) | SOX rate (lbs/hr) | SOX (lbs/day) | PM rate (lbs/hr) | PM (lbs/day) | PM10 (lbs/day) | PM2.5 (lbs/day) | CO2 Rate (lbs/hr) | CO2 (lbs/day) | CH4 rate (lbs/hr) | CH4 (lbs/day) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Construction Equipment /a/*** | | | | | | | | | | | | | | | | | | | |
| Cement and Mortar Mixers | 1 | 8 | 8 | 0.01 | 0.07 | 0.04 | 0.33 | 0.05 | 0.43 | 0.0003 | 0.00 | 0.00 | 0.02 | 0.02 | 0.02 | 7 | 58 | 0.00 | 0.01 |
| Cranes | 1 | 8 | 8 | 0.10 | 0.81 | 0.41 | 3.25 | 0.79 | 6.33 | 0.0014 | 0.01 | 0.03 | 0.25 | 0.25 | 0.23 | 129 | 1029 | 0.01 | 0.07 |
| Backhoe with Carrier | 1 | 8 | 8 | 0.05 | 0.41 | 0.36 | 2.92 | 0.33 | 2.66 | 0.0008 | 0.01 | 0.02 | 0.15 | 0.15 | 0.14 | 67 | 534 | 0.00 | 0.04 |
| Excavators | 1 | 8 | 8 | 0.08 | 0.68 | 0.52 | 4.13 | 0.52 | 4.14 | 0.0013 | 0.01 | 0.02 | 0.20 | 0.20 | 0.18 | 120 | 957 | 0.01 | 0.06 |
| Forklift | 1 | 8 | 8 | 0.04 | 0.30 | 0.22 | 1.74 | 0.22 | 1.75 | 0.0006 | 0.00 | 0.01 | 0.08 | 0.08 | 0.07 | 54 | 435 | 0.00 | 0.03 |
| Generator Sets | 1 | 8 | 8 | 0.05 | 0.38 | 0.28 | 2.23 | 0.38 | 3.01 | 0.0007 | 0.01 | 0.02 | 0.15 | 0.15 | 0.14 | 61 | 488 | 0.00 | 0.03 |
| Paving Equipment | 1 | 8 | 8 | 0.09 | 0.69 | 0.41 | 3.31 | 0.56 | 4.45 | 0.0008 | 0.01 | 0.04 | 0.30 | 0.30 | 0.28 | 69 | 552 | 0.01 | 0.06 |
| Rollers | 1 | 8 | 8 | 0.07 | 0.55 | 0.39 | 3.11 | 0.45 | 3.59 | 0.0008 | 0.01 | 0.03 | 0.23 | 0.23 | 0.21 | 67 | 536 | 0.01 | 0.05 |
| ***Year 2018 Construction Equipment Total Emissions*** | | | | | **3.88** | | **21.01** | | **26.36** | | **0.05** | | | **1.39** | **1.28** | | **4,589.01** | | **0.35** |

/a/ Phase II would take approximately 2.5 years to complete (begin in fall of 2018 and conclude in spring 2021). Offroad emission factors for year 2018 would be used for a conservative analysis since older construction equipment would generate more emissions.

# Elysian Park/USC Water Recycling Project Phase II - Mobile Emissions

| WORKER VEHICLES | | | | Worker Vehicle Emissions (ppd) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | # of Workers | Total VMT/Day | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 |
| **Construction Crew** | | | | | | | | | | |
| **Worker Vehicles Emissions** | | **12** | **319.20** | **0.03** | **1.33** | **0.12** | **0.00** | **0.002** | **0.002** | **271.37** |
| | *Cars* | *6.0* | 159.60 | 0.01 | 0.35 | 0.03 | 0.00 | 0.001 | 0.001 | 126.07 |
| | *Trucks* | *6.0* | 159.60 | *0.02* | *0.99* | *0.09* | *0.00* | *0.002* | *0.001* | *145.30* |
| **Total January Year 2018 Worker Vehicles Emissions (tons per year)** | | | | *0.00* | *0.02* | *0.00* | *0.00* | *0.000* | *0.000* | *34.06* |

| OFF-SITE TRUCK TRIPS /a | | Heavy-duty Truck Emissions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Trips per Day | Round Trip Length /b/ | VMT/day | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 |
| **Haul Truck Trips (pounds per day)** | | 12 | 45 | 535 | 0.135 | 1.919 | 0.500 | 0.000 | 0.002 | 0.002 | 730.222 |
| *Year 2018- Haul Truck Trips (tons per year)* | | | | | *0.0186* | *0.2648* | *0.0689* | *0.000* | *0.0002* | *0.0002* | *91.6429* |

/a/ Obtained from the client, there will be three 10 cubic yards dump trucks that will carry a maximum amount of 8.5 cubic yards of material (total of six loads per day). Each dump trucks would do two loads per day (total of 12 trips per day).

/b/ Dump site is located at 11520 Sheldon Street, Sun Valley, CA, which is approximately 22.3 miles (one-way trip) from project site.

| WATER TRUCK EMISSIONS/b/ | | | | Heavy-duty Truck Emissions (ppd) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | # of Water Trucks | Hours of Operation Per Month | VMT/day | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 |
| **January Year 2018 - Water Truck Emission (pounds** | 1 | 40 | 8.70 | 0.01 | 0.27 | 0.01 | 0.00 | 0.0002 | 0.0002 | 48.14 |
| *January Year 2018 - Water Truck Emission (Tons per* | | | | 0.0015 | 0.0368 | 0.0012 | 0.0000 | 0.00002 | 0.00002 | 6.0418 |

[b] Water trucks would operate on site two hours each day at a rate of 5 mph (compliance with Rule 403).
The proposed project assumes 23 work days per average month.

**Elysian Park/USC Water Recycling Project - Fugitive Dust Emissions from Excavation Year 2018**

| | Construction Activity |
|---|---|
| **Excavation Schedule** | **23** days[a] |

**Fugitive Dust Stockpiling Parameters**

| Silt Content[c] | Precipitation Days[d] | Mean Wind Speed Percent[e] | TSP Fraction | Area[f] (acres) |
|---|---|---|---|---|
| 6.9 | 10 | 0.03 | 0.5 | 0.02 |

**Fugitive Dust Material Handling**

| Aerodynamic Particle Size Multiplier[g] | Mean Wind Speed (mph)[h] | Moisture Content[i] | Dirt Handled (cy)[a] | Dirt Handled (lbs./day)[j] |
|---|---|---|---|---|
| 0.35 | 4.96 | 7.9 | 1,350 | 146,739 |

**Dragline Parameters**

| Drop Height (feet) | Moisture Content[i] | $PM_{10}$ Scaling Factor | $PM_{2.5}$ Scaling Factor |
|---|---|---|---|
| 3 | 7.9% | 0.75 | 0.017 |

**Incremental Increase in Fugitive Dust Emissions from Construction Operations**

**Equations:**

Grading[k]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[l]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[m]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Dragline Equation for $PM_{10}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{0.7}$) / (moisture content)$^{0.3}$] x 0.75 x Dirt Handled x Control Efficiency

Dragline Equation for $PM_{2.5}$ Emissions[o] (lbs/day) = [((0.0021) x (drop height)$^{1.1}$) / (moisture content)$^{0.3}$] x 0.017 x Dirt Handled x Control Efficiency

| Description | Control Efficiency | Unmitigated PM10[n] | Unmitigated PM2.5 |
|---|---|---|---|
| | % | lb/day | lb/day |
| Storage Piles | 61 | 0.000 | 0.000 |
| Material Handling | 61 | 0.000 | 0.000 |
| Dragline | 61 | 0.096 | 0.006 |
| **Total** | | **0.096** | **0.006** |

**Notes:**

a) Obtained from client.
b) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.
c) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Corection Factors Applicable to the Predictive Emission Factor Equations
d) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993
e) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.
f) Assumed storage piles are 0.02 acres in size
g) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm
h) Mean wind speed at the Downtown Wind Monitoring Station.
i) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28.
j) Assuming 1350 cubic yards of dirt handled [(1350 cyd x 2,500 lb/cyd)/23 days = 146,739 lb/day]
k) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 µm
l) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggretate Handling and Storage Piles, Equation 1
m) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12.
n) Includes watering at least three times a day per Rule 403 (61% control efficiency).
o) Source: USEPA, AP-42, Emission Factor Equations for Uncontrolled Dust Sources at Western Surface Coal Mines, Table 11.9-1, Dragline calculations for $PM_{10}$ and $PM_{2.5}$.

**EMFAC2011 RATES (grams per mile)**

| Vehicle Type | ROG | CO | NOX | SOX | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|
| **Year 2018** | | | | | | | |
| Haul Truck @ 30 MPH | 0.1142 | 1.63 | 0.4 | 0 | 0.001 | 0.001 | 619.43 |
| Water Truck @ 5 MPH | 0.5712 | 13.93 | 0.5 | 0 | 0.009 | 0.008 | 2513.50 |
| Worker Vehicle @30 MPH | 0.0213 | 0.99 | 0.1 | 0 | 0.002 | 0.002 | 358.62 |
| Light-Duty Truck @30 MPH | 0.0683 | 2.81 | 0.3 | 0 | 0.004 | 0.004 | 413.33 |

**Assumptions:**

Construction Year 2018-2021

Season Annual

# Appendix D

# GHG Emission Calculations

# Elysian Park/USC Water Recycling Project - GHG Emissions

| TOTAL EMISSIONS | | Emissions (tonnes per year) | |
|---|---|---|---|
| | | CO2 | CH4 |
| Year 2016 | | | |
| June | | 6 | 0 |
| | Construction Equipmen | 0 | 0.000 |
| | Worker Vehicle | 2.36 | 0.00 |
| | Off-Site Trucks | 2.80 | 0.00 |
| | Water Trucks | 0.42 | 0.00 |
| Tonnes per year CO2e | | 5.58 | 0.00 |
| Total tonnes/year | | | 5.58 |
| July | | 141 | 0 |
| | Construction Equipmen | 19 | 0.0016 |
| | Worker Vehicle | 33.95 | 0.00 |
| | Off-Site Trucks | 83.98 | 0.00 |
| | Water Trucks | 4.20 | 0.00 |
| Total Emissions (tons) | | 141.30 | 0.03 |
| Total tonnes/year | | | 141.33 |
| August | | 141 | 0 |
| | Construction Equipmen | 19.17 | 0.0016 |
| | Worker Vehicle | 33.95 | 0.00 |
| | Off-Site Trucks | 83.98 | 0.00 |
| | Water Trucks | 4.20 | |
| Total Emissions (tons) | | 141.30 | 0.03 |
| Total tonnes/year | | | 141.33 |
| September | | 141 | 0 |
| | Construction Equipmen | 19.17 | 0.0016 |
| | Worker Vehicle | 33.95 | 0.00 |
| | Off-Site Trucks | 83.98 | 0.00 |
| | Water Trucks | 4.20 | 0.00 |
| Total Emissions (tons) | | 141.30 | 0.03 |
| Total tonnes/year | | | 141.33 |
| October | | 141 | 0 |
| | Construction Equipmen | 19.17 | 0.0016 |
| | Worker Vehicle | 33.95 | 0.00 |
| | Off-Site Trucks | 83.98 | 0.00 |
| | Water Trucks | 4.20 | 0.00 |
| Total Emissions (tons) | | 141.30 | 0.03 |
| Total tonnes/year | | | 141.33 |
| November | | 195 | 0 |
| | Construction Equipmen | 22.50 | 0.0019 |
| | Worker Vehicle | 70.32 | 0.00 |
| | Off-Site Trucks | 97.97 | 0.00 |
| | Water Trucks | 4.20 | 0.00 |
| Total Emissions (tons) | | 194.99 | 0.04 |
| Total tonnes/year | | | 195.03 |
| December | | 146 | 2 |
| | Construction Equipmen | 29.38 | 0.0024 |
| | Worker Vehicle | 70.32 | 1.77 |
| | Off-Site Trucks | 42.60 | 0.00 |
| | Water Trucks | 4.20 | 0.00 |
| Total Emissions (tons) | | 146.49 | 37.21 |
| Total tonnes/year | | | 183.70 |
| Year 2016 CO2e (tonnes per year) | | | 949.62 |

| Year 2017 | | | |
|---|---|---|---|
| **January** | | **217** | **0** |
| | Construction Equipmen | 29 | 0.0022 |
| | Worker Vehicle | 70.36 | 0.00 |
| | Off-Site Trucks | 111.97 | 0.00 |
| | Water Trucks | 5.54 | 0.00 |
| **Total Emissions (tons)** | | 217.24 | 0.05 |
| **Total tonnes/year** | | | **217.29** |
| **February** | | **124** | **0** |
| | Construction Equipmen | 30 | 0.0023 |
| | Worker Vehicle | 88.38 | 0.00 |
| | Off-Site Trucks | 0.00 | 0.00 |
| | Water Trucks | 5.54 | 0.00 |
| **Total Emissions (tons)** | | 124.33 | 0.05 |
| **Total tonnes/year** | | | **124.38** |
| **March** | | **261** | **0** |
| | Construction Equipmen | 35.43 | 0.0027 |
| | Worker Vehicle | 93.57 | 0.00 |
| | Off-Site Trucks | 125.96 | 0.00 |
| | Water Trucks | 5.54 | 0.00 |
| **Total Emissions (tons)** | | 260.51 | 0.06 |
| **Total tonnes/year** | | | **260.56** |
| **April** | | **288** | **0** |
| | Construction Equipmen | 35.43 | 0.0027 |
| | Worker Vehicle | 93.57 | 0.00 |
| | Off-Site Trucks | 153.96 | 0.00 |
| | Water Trucks | 5.54 | 0.00 |
| **Total Emissions (tons)** | | 288.50 | 0.06 |
| **Total tonnes/year** | | | **288.55** |
| **May** | | **231** | **0** |
| | Construction Equipmen | 40.17 | 0.0028 |
| | Worker Vehicle | 74.86 | 0.00 |
| | Off-Site Trucks | 111.97 | 0.00 |
| | Water Trucks | 4.43 | 0.00 |
| **Total Emissions (tons)** | | 231.43 | 0.06 |
| **Total tonnes/year** | | | **231.49** |
| **June** | | **240** | **0** |
| | Construction Equipmen | 37 | 0.0028 |
| | Worker Vehicle | 91.50 | 0.00 |
| | Off-Site Trucks | 106.25 | 0.00 |
| | Water Trucks | 4.43 | 0.00 |
| **Total Emissions (tons)** | | 239.52 | 0.06 |
| **Total tonnes/year** | | | **239.58** |
| **July** | | **225** | **0** |
| | Construction Equipmen | 37 | 0.003 |
| | Worker Vehicle | 93.72 | 0.00 |
| | Off-Site Trucks | 89.57 | 0.00 |
| | Water Trucks | 4.43 | 0.00 |
| **Total Emissions (tons)** | | 224.87 | 0.06 |
| **Total tonnes/year** | | | **224.93** |
| **August** | | **189** | **0** |
| | Construction Equipmen | 37.15 | 0.0028 |
| | Worker Vehicle | 57.88 | 0.00 |
| | Off-Site Trucks | 89.57 | 0.00 |
| | Water Trucks | 4.43 | 0.00 |
| **Total Emissions (tons)** | | 189.03 | 0.06 |
| **Total tonnes/year** | | | **189.09** |
| **September** | | **226** | **0** |
| | Construction Equipmen | 37.15 | 0.0028 |
| | Worker Vehicle | 106.20 | 0.00 |

| | | | |
|---|---|---|---|
| | Off-Site Trucks | 78.38 | 0.00 |
| | Water Trucks | 4.43 | 0.00 |
| **Total Emissions (tons)** | | 226.15 | 0.06 |
| **Total tonnes/year** | | | **226.21** |
| **October** | | **222** | **0** |
| | Construction Equipmen | 32.57 | 0.0025 |
| | Worker Vehicle | 106.20 | 0.00 |
| | Off-Site Trucks | 78.38 | 0.00 |
| | Water Trucks | 4.43 | 0.00 |
| **Total Emissions (tons)** | | 221.58 | 0.05 |
| **Total tonnes/year** | | | **221.63** |
| **November** | | **207** | **0** |
| | Construction Equipmen | 33.20 | 0.0027 |
| | Worker Vehicle | 91.50 | 0.00 |
| | Off-Site Trucks | 78.38 | 0.00 |
| | Water Trucks | 4.43 | 0.00 |
| **Total Emissions (tons)** | | 207.50 | 0.06 |
| **Total tonnes/year** | | | **207.55** |
| **December** | | **139** | **0** |
| | Construction Equipmen | 15.79 | 0.0012 |
| | Worker Vehicle | 103.15 | 0.00 |
| | Off-Site Trucks | 16.80 | 0.00 |
| | Water Trucks | 3.32 | 0.00 |
| **Total Emissions (tons)** | | 139.06 | 0.03 |
| **Total tonnes/year** | | | **139.08** |
| **Year 2017 CO2e (tonnes per year)** | | | **2,570.36** |

| Year 2018 | | | |
|---|---|---|---|
| **January** | | **139** | **0** |
| | Construction Equipmen | 16 | 0.0012 |
| | Worker Vehicle | 103.21 | 0.00 |
| | Off-Site Trucks | 16.80 | 0.00 |
| | Water Trucks | 3.32 | 0.00 |
| **Total Emissions (tons)** | | 139.26 | 0.03 |
| **Total tonnes/year** | | | **139.28** |
| **February** | | **52** | **0** |
| | Construction Equipmen | 9 | 0.0006 |
| | Worker Vehicle | 26.01 | 0.00 |
| | Off-Site Trucks | 14.00 | 0.00 |
| | Water Trucks | 2.77 | 0.00 |
| **Total Emissions (tons)** | | 51.51 | 0.01 |
| **Total tonnes/year** | | | **51.53** |
| **March** | | **43** | **0** |
| | Construction Equipmen | 1.70 | 0.0001 |
| | Worker Vehicle | 26.01 | 0.00 |
| | Off-Site Trucks | 14.00 | 0.00 |
| | Water Trucks | 1.38 | 0.00 |
| **Total Emissions (tons)** | | 43.08 | 0.00 |
| **Total tonnes/year** | | | **43.09** |
| **April** | | **5** | **0** |
| | Construction Equipmen | 0.00 | 0.00 |
| | Worker Vehicle | 2.36 | 0.00 |
| | Off-Site Trucks | 2.80 | 0.00 |
| | Water Trucks | 0.14 | 0.00 |
| **Total Emissions (tons)** | | 5.30 | 0.00 |
| **Total tonnes/year** | | | **5.30** |
| **Year 2018 CO2e (tonnes per year)** | | | **239.19** |

# Elysian Park/USC Water Recycling Project -GHG Emissions

| TOTAL EMISSIONS | | Emissions (tonnes per year) | |
|---|---|---|---|
| | | CO2 | CH4 |
| **Year 2018** | | | |
| | Construction Equipments | 576 | 0.044 |
| | Worker Vehicle | 34.06 | 0.00 |
| | Off-Site Trucks | 91.64 | 0.00 |
| | Water Trucks | 6.04 | 0.00 |
| **Tonnes per year CO2e** | | 707.66 | 0.92 |
| **Total tonnes/year** | | | **708.58** |
| **Year 2016 CO2e (tonnes per year)** | | | **708.58** |

# Appendix E

# EMFAC 2011 Output Files

EMFAC 2011
2016 Estimated Annual Emission Rates
EMFAC 2011 Vehicle Categories
Los Angeles COUNTY
South Coast AIR BASIN
South Coast AQMD

| Area | CalYr | Season | Veh | Fuel | MdlYr | Speed (Miles/hr) | VMT (Miles/day) | ROG_RUNEX (gms/mile) | CO_RUNEX (gms/mile) | NOX_RUNEX (gms/mile) | SOX_RUNEX (gms/mile) | PM10_RUNEX (gms/mile) | PM2_5_RUNEX (gms/mile) | CO2_RUNEX (gms/mile) | TOG_RUNEX (gms/mile) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Los Angeles (SC) | 2016 | Annual | LDA | GAS | AllMYr | 5 | 277308.2233 | 0.156000002 | 2.208768357 | 0.166348375 | 0 | 0.010803906 | 0.009942907 | 1100.458232 | 0.231242913 |
| Los Angeles (SC) | 2016 | Annual | LDA | DSL | AllMYr | 5 | 947.0005241 | 0.107502615 | 0.707821001 | 0.645039099 | 0 | 0.079886864 | 0.073495922 | 471.6477016 | 0.122384572 |
| Los Angeles (SC) | 2016 | Annual | LDA | GAS | AllMYr | 30 | 2.38E+07 | 0.031745336 | 1.208307258 | 0.101447264 | 0 | 0.00196512 | 0.00180237 | 358.3914639 | 0.045398054 |
| Los Angeles (SC) | 2016 | Annual | LDA | DSL | AllMYr | 30 | 81156.32713 | 0.042715811 | 0.216465696 | 0.398109874 | 0 | 0.031779608 | 0.029237242 | 298.4289113 | 0.04862911 |
| Los Angeles (SC) | 2016 | Annual | LDT1 | GAS | AllMYr | 5 | 30427.13306 | 0.439141813 | 6.561631349 | 0.571674276 | 0 | 0.025435219 | 0.023452252 | 1267.169283 | 0.588511624 |
| Los Angeles (SC) | 2016 | Annual | LDT1 | DSL | AllMYr | 5 | 44.3470699 | 0.20651851 | 1.23958974 | 0.916221781 | 0 | 0.172358098 | 0.158569455 | 455.1357103 | 0.235107582 |
| Los Angeles (SC) | 2016 | Annual | LDT1 | GAS | AllMYr | 30 | 2607553.556 | 0.094816029 | 3.345188075 | 0.308756364 | 0 | 0.00508226 | 0.004677545 | 412.6850813 | 0.125775579 |
| Los Angeles (SC) | 2016 | Annual | LDT1 | DSL | AllMYr | 30 | 3800.46831 | 0.082370875 | 0.356724092 | 0.550760372 | 0 | 0.068832085 | 0.063325523 | 315.0896112 | 0.093773765 |
| Los Angeles (SC) | 2016 | Annual | LDT2 | GAS | AllMYr | 5 | 92905.02147 | 0.216031013 | 3.132691609 | 0.33948857 | 0 | 0.011882293 | 0.010950892 | 1499.328054 | 0.323475079 |
| Los Angeles (SC) | 2016 | Annual | LDT2 | DSL | AllMYr | 5 | 43.56250298 | 0.13626621 | 0.944574968 | 0.885275725 | 0 | 0.109243101 | 0.100503662 | 455.9460359 | 0.155130015 |
| Los Angeles (SC) | 2016 | Annual | LDT2 | GAS | AllMYr | 30 | 7961802.249 | 0.042836844 | 1.77400317 | 0.194139702 | 0 | 0.002145923 | 0.001972035 | 488.293249 | 0.062507298 |
| Los Angeles (SC) | 2016 | Annual | LDT2 | DSL | AllMYr | 30 | 3733.232317 | 0.054234415 | 0.279218466 | 0.535024993 | 0 | 0.04356193 | 0.040076978 | 307.906381 | 0.061742273 |
| Los Angeles (SC) | 2016 | Annual | LHD1 | GAS | AllMYr | 5 | 14434.44605 | 0.688030736 | 8.100638111 | 0.39993553 | 0 | 0.00857298 | 0.007909087 | 2513.497271 | 0.806342268 |
| Los Angeles (SC) | 2016 | Annual | LHD1 | DSL | AllMYr | 5 | 1938.185782 | 0.482185154 | 3.410224212 | 5.471920689 | 0 | 0.110119639 | 0.101310066 | 523.1610686 | 0.548935726 |
| Los Angeles (SC) | 2016 | Annual | LHD1 | GAS | AllMYr | 30 | 954935.2013 | 0.140804424 | 1.992376181 | 0.49447796 | 0 | 0.001773674 | 0.00163632 | 619.4336649 | 0.166432533 |
| Los Angeles (SC) | 2016 | Annual | LHD1 | DSL | AllMYr | 30 | 164932.6174 | 0.192978378 | 0.915958181 | 3.131031441 | 0 | 0.044071681 | 0.040545945 | 523.1610839 | 0.219693058 |
| Los Angeles (SC) | 2016 | Annual | LHD2 | GAS | AllMYr | 5 | 1628.775651 | 0.489444718 | 6.465260233 | 0.362528833 | 0 | 0.007477196 | 0.006862384 | 2513.497198 | 0.589912686 |
| Los Angeles (SC) | 2016 | Annual | LHD2 | DSL | AllMYr | 5 | 742.9113975 | 0.45593155 | 3.263711356 | 5.189199995 | 0 | 0.109308026 | 0.100563383 | 524.4335255 | 0.519047751 |
| Los Angeles (SC) | 2016 | Annual | LHD2 | GAS | AllMYr | 30 | 107754.4127 | 0.100142419 | 1.592076954 | 0.448195479 | 0 | 0.001546966 | 0.001419766 | 619.4336383 | 0.121885982 |
| Los Angeles (SC) | 2016 | Annual | LHD2 | DSL | AllMYr | 30 | 63219.0745 | 0.182471286 | 0.876606109 | 2.969258849 | 0 | 0.043746862 | 0.040247117 | 524.4336001 | 0.20773142 |
| Los Angeles (SC) | 2016 | Annual | MCY | GAS | AllMYr | 5 | 1924.849806 | 4.740408292 | 26.17148821 | 1.16320247 | 0 | 9.45E-04 | 7.76E-04 | 258.7535124 | 5.219318241 |
| Los Angeles (SC) | 2016 | Annual | MCY | GAS | AllMYr | 30 | 164956.3436 | 2.086499983 | 16.655064 | 1.115031341 | 0 | 4.34E-04 | 3.53E-04 | 144.3538806 | 2.294017131 |
| Los Angeles (SC) | 2016 | Annual | MDV | GAS | AllMYr | 5 | 65373.90066 | 0.382025498 | 4.821686798 | 0.559985386 | 0 | 0.013449263 | 0.012400735 | 1905.666804 | 0.545996538 |
| Los Angeles (SC) | 2016 | Annual | MDV | DSL | AllMYr | 5 | 74.5008577 | 0.100308539 | 0.670158331 | 0.580822775 | 0 | 0.081314476 | 0.074809324 | 477.7624376 | 0.114194605 |
| Los Angeles (SC) | 2016 | Annual | MDV | GAS | AllMYr | 30 | 5602431.924 | 0.074193054 | 2.648988385 | 0.317561473 | 0 | 0.002476098 | 0.002277341 | 620.6275729 | 0.105129534 |
| Los Angeles (SC) | 2016 | Annual | MDV | DSL | AllMYr | 30 | 6384.59642 | 0.039792281 | 0.21020582 | 0.365365707 | 0 | 0.032324465 | 0.029738513 | 297.0722997 | 0.045300866 |
| Los Angeles (SC) | 2016 | Annual | MH | GAS | AllMYr | 5 | 619.9196773 | 0.954824503 | 23.08676641 | 0.599667507 | 0 | 0.012770447 | 0.011518474 | 2513.497225 | 1.134280043 |
| Los Angeles (SC) | 2016 | Annual | MH | DSL | AllMYr | 5 | 61.45574084 | 1.597047091 | 2.450926003 | 17.84405734 | 0 | 0.529322924 | 0.486977082 | 2383.307541 | 1.81813187 |
| Los Angeles (SC) | 2016 | Annual | MH | GAS | AllMYr | 30 | 44911.59013 | 0.19588002 | 5.691122091 | 0.738896132 | 0 | 0.002642092 | 0.00238307 | 619.433625 | 0.234873028 |
| Los Angeles (SC) | 2016 | Annual | MH | DSL | AllMYr | 30 | 5209.472245 | 0.178924749 | 0.684158173 | 7.141155193 | 0 | 0.161506807 | 0.148586266 | 1227.617494 | 0.20369392 |
| Los Angeles (SC) | 2016 | Annual | Motor Coa | DSL | AllMYr | 5 | 216.7639304 | 2.80265 | 5.313328223 | 21.92752836 | 0 | 0.197219873 | 0.181442283 | 4021.783899 | 3.190603683 |
| Los Angeles (SC) | 2016 | Annual | Motor Coa | DSL | AllMYr | 30 | 20702.93553 | 0.259582382 | 1.007530223 | 7.388695337 | 0 | 0.074523183 | 0.068561328 | 1884.722504 | 0.295514782 |
| Los Angeles (SC) | 2016 | Annual | OBUS | GAS | AllMYr | 5 | 369.4062736 | 0.68675397 | 9.72746592 | 0.711729694 | 0 | 0.003805872 | 0.003510465 | 2513.497133 | 0.844346284 |
| Los Angeles (SC) | 2016 | Annual | OBUS | GAS | AllMYr | 30 | 26762.53876 | 0.140117562 | 2.395302201 | 0.876753118 | 0 | 7.87E-04 | 7.26E-04 | 619.4336301 | 0.17472376 |
| Los Angeles (SC) | 2016 | Annual | SBUS | GAS | AllMYr | 5 | 270.3705225 | 4.774842185 | 65.0783697 | 1.646060531 | 0 | 0.02690975 | 0.024020138 | 2513.497068 | 5.24152843 |
| Los Angeles (SC) | 2016 | Annual | SBUS | DSL | AllMYr | 5 | 913.9132164 | 1.675183618 | 2.197055951 | 28.43990862 | 0 | 0.431122855 | 0.396633026 | 2647.344007 | 1.907069032 |
| Los Angeles (SC) | 2016 | Annual | SBUS | GAS | AllMYr | 30 | 4872.008034 | 0.989086665 | 16.0352661 | 2.015316967 | 0 | 0.005567388 | 0.004969553 | 619.4335732 | 1.085417423 |
| Los Angeles (SC) | 2016 | Annual | SBUS | DSL | AllMYr | 30 | 16468.48264 | 0.15915236 | 0.61094204 | 9.562018327 | 0 | 0.09839404 | 0.090522517 | 1240.620817 | 0.181182847 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Los Angeles (SC) | 2016 | Annual | T6 Ag | DSL | AllMYr | 5 | 6.14790107 | 4.008570225 | 5.433532281 | 18.27491667 | 0 | 0.947133985 | 0.871363266 | 2602.550779 | 4.563452064 |
| Los Angeles (SC) | 2016 | Annual | T6 Ag | DSL | AllMYr | 30 | 521.1444778 | 0.368211444 | 1.423210989 | 6.239577617 | 0 | 0.236630387 | 0.217699956 | 1219.629434 | 0.419180701 |
| Los Angeles (SC) | 2016 | Annual | T6 CAIRP h | DSL | AllMYr | 5 | 3.06886456 | 1.284082617 | 2.135476348 | 10.67676768 | 0 | 0.126958467 | 0.116801789 | 2588.944124 | 1.461830314 |
| Los Angeles (SC) | 2016 | Annual | T6 CAIRP h | DSL | AllMYr | 30 | 260.1411116 | 0.117163779 | 0.408567491 | 3.559904718 | 0 | 0.042079093 | 0.038712766 | 1213.252968 | 0.133382044 |
| Los Angeles (SC) | 2016 | Annual | T6 CAIRP sı | DSL | AllMYr | 5 | 10.09620495 | 1.551289213 | 2.626994268 | 6.562389498 | 0 | 0.144012783 | 0.132491761 | 2574.368534 | 1.766024682 |
| Los Angeles (SC) | 2016 | Annual | T6 CAIRP sı | DSL | AllMYr | 30 | 855.8337872 | 0.143670754 | 0.492014385 | 2.238581199 | 0 | 0.059623496 | 0.054853616 | 1206.422432 | 0.163558217 |
| Los Angeles (SC) | 2016 | Annual | T6 instate ( | DSL | AllMYr | 5 | 192.2377361 | 1.326027551 | 2.099208704 | 18.00124755 | 0 | 0.187413953 | 0.172420836 | 2608.353435 | 1.509581428 |
| Los Angeles (SC) | 2016 | Annual | T6 instate ( | DSL | AllMYr | 30 | 16295.5834 | 0.115674504 | 0.425237761 | 5.919486787 | 0 | 0.047956083 | 0.044119596 | 1222.348724 | 0.131686618 |
| Los Angeles (SC) | 2016 | Annual | T6 instate ( | DSL | AllMYr | 5 | 498.3750248 | 2.203388109 | 3.573125364 | 10.41820716 | 0 | 0.302684245 | 0.278469505 | 2581.438417 | 2.508389637 |
| Los Angeles (SC) | 2016 | Annual | T6 instate ( | DSL | AllMYr | 30 | 42246.18924 | 0.195862373 | 0.703386364 | 3.521791442 | 0 | 0.101059648 | 0.092974876 | 1209.73558 | 0.222974403 |
| Los Angeles (SC) | 2016 | Annual | T6 instate I | DSL | AllMYr | 5 | 928.4173317 | 1.30830495 | 2.098943412 | 16.11122198 | 0 | 0.169866725 | 0.156277387 | 2603.398277 | 1.489405595 |
| Los Angeles (SC) | 2016 | Annual | T6 instate I | DSL | AllMYr | 30 | 78699.95954 | 0.115572986 | 0.418667418 | 5.312812149 | 0 | 0.046103792 | 0.042415488 | 1220.026596 | 0.131571047 |
| Los Angeles (SC) | 2016 | Annual | T6 instate s | DSL | AllMYr | 5 | 2516.98341 | 2.05173326 | 3.345722366 | 9.472434922 | 0 | 0.269482067 | 0.247923501 | 2578.994668 | 2.335742136 |
| Los Angeles (SC) | 2016 | Annual | T6 instate s | DSL | AllMYr | 30 | 213359.3221 | 0.183352052 | 0.654386373 | 3.204724087 | 0 | 0.091647036 | 0.084315273 | 1208.59037 | 0.208732355 |
| Los Angeles (SC) | 2016 | Annual | T6 OOS hea | DSL | AllMYr | 5 | 1.759444038 | 1.284082607 | 2.135476339 | 10.67676766 | 0 | 0.126958464 | 0.116801787 | 2588.944123 | 1.461830303 |
| Los Angeles (SC) | 2016 | Annual | T6 OOS hea | DSL | AllMYr | 30 | 149.1443232 | 0.117163778 | 0.408567486 | 3.55990471 | 0 | 0.042079092 | 0.038712765 | 1213.252968 | 0.133382043 |
| Los Angeles (SC) | 2016 | Annual | T6 OOS sm | DSL | AllMYr | 5 | 5.788364804 | 1.551289213 | 2.626994268 | 6.562389498 | 0 | 0.144012783 | 0.132491761 | 2574.368534 | 1.766024682 |
| Los Angeles (SC) | 2016 | Annual | T6 OOS sm | DSL | AllMYr | 30 | 490.6673543 | 0.143670754 | 0.492014385 | 2.238581199 | 0 | 0.059623496 | 0.054853616 | 1206.422432 | 0.163558217 |
| Los Angeles (SC) | 2016 | Annual | T6 Public | DSL | AllMYr | 5 | 102.96671 | 0.720043351 | 1.123433704 | 19.41012682 | 0 | 0.127732606 | 0.117513997 | 2628.139034 | 0.819714544 |
| Los Angeles (SC) | 2016 | Annual | T6 Public | DSL | AllMYr | 30 | 8728.268673 | 0.065537237 | 0.237295629 | 6.486480115 | 0 | 0.033288803 | 0.030625699 | 1231.62082 | 0.074609155 |
| Los Angeles (SC) | 2016 | Annual | T6 utility | DSL | AllMYr | 5 | 18.56960089 | 0.753732253 | 1.297291345 | 11.04707956 | 0 | 0.058000608 | 0.05336056 | 2602.659765 | 0.858066796 |
| Los Angeles (SC) | 2016 | Annual | T6 utility | DSL | AllMYr | 30 | 1574.105512 | 0.070982826 | 0.237931618 | 3.697337066 | 0 | 0.023828174 | 0.02192192 | 1219.680508 | 0.080808544 |
| Los Angeles (SC) | 2016 | Annual | T6TS | GAS | AllMYr | 5 | 1412.903919 | 1.167342559 | 16.39871077 | 0.898392617 | 0 | 0.006317272 | 0.005710772 | 2513.49754 | 1.363812871 |
| Los Angeles (SC) | 2016 | Annual | T6TS | GAS | AllMYr | 30 | 102361.2848 | 0.239154558 | 4.041223907 | 1.106720336 | 0 | 0.001306987 | 0.001181508 | 619.4336241 | 0.282243793 |
| Los Angeles (SC) | 2016 | Annual | T7 Ag | DSL | AllMYr | 5 | 13.14987191 | 5.337607233 | 9.219605404 | 31.67011135 | 0 | 1.038763411 | 0.955662338 | 4032.068271 | 6.076459529 |
| Los Angeles (SC) | 2016 | Annual | T7 Ag | DSL | AllMYr | 30 | 1255.932893 | 0.472136868 | 2.36388203 | 10.67740508 | 0 | 0.258838495 | 0.238131416 | 1889.542054 | 0.537491885 |
| Los Angeles (SC) | 2016 | Annual | T7 CAIRP | DSL | AllMYr | 5 | 1247.885489 | 3.137178978 | 6.175237508 | 15.12597566 | 0 | 0.123212463 | 0.113355466 | 3997.265356 | 3.571439461 |
| Los Angeles (SC) | 2016 | Annual | T7 CAIRP | DSL | AllMYr | 30 | 119184.4639 | 0.300386954 | 1.111513533 | 5.174803551 | 0 | 0.069817991 | 0.064232552 | 1873.232417 | 0.341967681 |
| Los Angeles (SC) | 2016 | Annual | T7 CAIRP ci | DSL | AllMYr | 5 | 112.0013479 | 3.156856664 | 6.207387014 | 15.7663322 | 0 | 0.126529208 | 0.116406872 | 3999.845941 | 3.593841008 |
| Los Angeles (SC) | 2016 | Annual | T7 CAIRP ci | DSL | AllMYr | 30 | 10697.15188 | 0.301950421 | 1.118809364 | 5.388475425 | 0 | 0.070404594 | 0.064772227 | 1874.441753 | 0.34374757 |
| Los Angeles (SC) | 2016 | Annual | T7 NNOOS | DSL | AllMYr | 5 | 1403.82453 | 2.525170479 | 5.017837114 | 8.459332942 | 0 | 0.08194028 | 0.075385058 | 3972.659568 | 2.874714371 |
| Los Angeles (SC) | 2016 | Annual | T7 NNOOS | DSL | AllMYr | 30 | 134078.0668 | 0.243966726 | 0.892249451 | 2.918265516 | 0 | 0.055477108 | 0.05103894 | 1861.701443 | 0.277737547 |
| Los Angeles (SC) | 2016 | Annual | T7 NOOS | DSL | AllMYr | 5 | 454.4481855 | 3.168504753 | 6.231812812 | 15.18680258 | 0 | 0.1282502 | 0.117990184 | 3997.027189 | 3.60710147 |
| Los Angeles (SC) | 2016 | Annual | T7 NOOS | DSL | AllMYr | 30 | 43403.95317 | 0.303127995 | 1.123178289 | 5.193578358 | 0 | 0.071731794 | 0.065993251 | 1873.120805 | 0.345088147 |
| Los Angeles (SC) | 2016 | Annual | T7 other pc | DSL | AllMYr | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Los Angeles (SC) | 2016 | Annual | T7 other pc | DSL | AllMYr | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Los Angeles (SC) | 2016 | Annual | T7 POAK | DSL | AllMYr | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Los Angeles (SC) | 2016 | Annual | T7 POAK | DSL | AllMYr | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Los Angeles (SC) | 2016 | Annual | T7 POLA | DSL | AllMYr | 5 | 1603.567855 | 5.382668136 | 10.70754041 | 23.62551196 | 0 | 0.112758126 | 0.103737476 | 4077.749385 | 6.127757937 |
| Los Angeles (SC) | 2016 | Annual | T7 POLA | DSL | AllMYr | 30 | 153155.379 | 0.521224952 | 1.898566991 | 8.165335199 | 0 | 0.080356692 | 0.073928157 | 1910.949525 | 0.593374932 |
| Los Angeles (SC) | 2016 | Annual | T7 Public | DSL | AllMYr | 5 | 80.39017855 | 1.145475212 | 2.036263089 | 38.77390371 | 0 | 0.262249324 | 0.241269378 | 4099.714897 | 1.304036333 |
| Los Angeles (SC) | 2016 | Annual | T7 Public | DSL | AllMYr | 30 | 7677.996428 | 0.105420389 | 0.52154344 | 13.20382632 | 0 | 0.065523584 | 0.060281698 | 1921.24319 | 0.120013088 |
| Los Angeles (SC) | 2016 | Annual | T7 Single | DSL | AllMYr | 5 | 671.2941352 | 2.029870155 | 3.735353232 | 25.39396806 | 0 | 0.21937252 | 0.201822718 | 4021.647989 | 2.310852655 |
| Los Angeles (SC) | 2016 | Annual | T7 Single | DSL | AllMYr | 30 | 64114.72229 | 0.181050059 | 0.740547494 | 8.384556129 | 0 | 0.061068356 | 0.056182887 | 1884.658813 | 0.20611171 |
| Los Angeles (SC) | 2016 | Annual | T7 single cc | DSL | AllMYr | 5 | 289.7327507 | 2.027829613 | 3.722710704 | 26.15570483 | 0 | 0.223819966 | 0.205914369 | 4023.944001 | 2.308529653 |
| Los Angeles (SC) | 2016 | Annual | T7 single cc | DSL | AllMYr | 30 | 27672.12445 | 0.180413975 | 0.740383971 | 8.633680744 | 0 | 0.061618799 | 0.056689295 | 1885.73479 | 0.205387577 |
| Los Angeles (SC) | 2016 | Annual | T7 SWCV | DSL | AllMYr | 5 | 217.8207977 | 1.531962903 | 2.787109003 | 34.22519677 | 0 | 0.280438948 | 0.258003832 | 4091.563937 | 1.744023151 |
| Los Angeles (SC) | 2016 | Annual | T7 SWCV | DSL | AllMYr | 30 | 20803.87601 | 0.14495244 | 0.704134377 | 11.84611041 | 0 | 0.07816828 | 0.071914818 | 1917.423418 | 0.165017319 |
| Los Angeles (SC) | 2016 | Annual | T7 tractor | DSL | AllMYr | 5 | 1760.696075 | 2.972125248 | 5.624904826 | 23.99816031 | 0 | 0.220012226 | 0.202411248 | 4018.278301 | 3.383538353 |
| Los Angeles (SC) | 2016 | Annual | T7 tractor | DSL | AllMYr | 30 | 168162.5594 | 0.27378104 | 1.073338634 | 8.041548795 | 0 | 0.078469446 | 0.07219189 | 1883.079681 | 0.311678874 |
| Los Angeles (SC) | 2016 | Annual | T7 tractor ( | DSL | AllMYr | 5 | 216.0171798 | 2.949110521 | 5.515065669 | 26.33626842 | 0 | 0.247294802 | 0.227511217 | 4022.299183 | 3.357337838 |
| Los Angeles (SC) | 2016 | Annual | T7 tractor ( | DSL | AllMYr | 30 | 20631.61402 | 0.268388597 | 1.069235251 | 8.786107501 | 0 | 0.08109138 | 0.074604069 | 1884.963981 | 0.305539988 |
| Los Angeles (SC) | 2016 | Annual | T7 utility | DSL | AllMYr | 5 | 9.360670204 | 1.327188082 | 2.534363327 | 21.8258831 | 0 | 0.104832829 | 0.096446203 | 4029.150771 | 1.510902605 |
| Los Angeles (SC) | 2016 | Annual | T7 utility | DSL | AllMYr | 30 | 894.0295157 | 0.12361641 | 0.471203089 | 7.230196728 | 0 | 0.036149492 | 0.033257533 | 1888.174831 | 0.140727873 |
| Los Angeles (SC) | 2016 | Annual | T7IS | GAS | AllMYr | 5 | 309.9176387 | 3.473819597 | 118.6574708 | 3.30560284 | 0 | 0.002532692 | 0.002259584 | 2513.497371 | 4.106524979 |
| Los Angeles (SC) | 2016 | Annual | T7IS | GAS | AllMYr | 30 | 22452.73879 | 0.709629531 | 29.21963202 | 4.07208352 | 0 | 5.24E-04 | 4.67E-04 | 619.4336645 | 0.849852273 |
| Los Angeles (SC) | 2016 | Annual | UBUS | GAS | AllMYr | 5 | 1014.431701 | 8.142645331 | 59.45016211 | 2.753398177 | 0 | 0.015812507 | 0.014218026 | 2513.49715 | 8.74316513 |
| Los Angeles (SC) | 2016 | Annual | UBUS | DSL | AllMYr | 5 | 5873.711957 | 1.774157625 | 11.40349978 | 30.3353878 | 0 | 0.754445886 | 0.694090241 | 2564.605776 | 2.019760424 |
| Los Angeles (SC) | 2016 | Annual | UBUS | GAS | AllMYr | 30 | 18114.41111 | 1.684640988 | 14.65107342 | 3.381477065 | 0 | 0.003271467 | 0.002941583 | 619.4336132 | 1.808883109 |
| Los Angeles (SC) | 2016 | Annual | UBUS | DSL | AllMYr | 30 | 104885.169 | 0.551259718 | 2.277139869 | 13.4646107 | 0 | 0.23441865 | 0.215665165 | 2564.605653 | 0.627572507 |
| Los Angeles (SC) | 2016 | Annual | All Other B | DSL | AllMYr | 5 | 255.6908951 | 1.729590921 | 2.697167426 | 16.60709888 | 0 | 0.264331654 | 0.243185121 | 2601.889922 | 1.969007605 |
| Los Angeles (SC) | 2016 | Annual | All Other B | DSL | AllMYr | 30 | 21674.37252 | 0.152290689 | 0.564487873 | 5.499751924 | 0 | 0.06746716 | 0.062069787 | 1219.319738 | 0.173371357 |

EMFAC 2011
2017 Estimated Annual Emission Rates
EMFAC 2011 Vehicle Categories
Los Angeles COUNTY
South Coast AIR BASIN
South Coast AQMD

| Area | CalYr | Season | Veh | Fuel | MdlYr | Speed (Miles/hr) | VMT (Miles/day) | ROG_RUNEX (gms/mile) | CO_RUNEX (gms/mile) | NOX_RUNEX (gms/mile) | SOX_RUNEX (gms/mile) | PM10_RUNEX (gms/mile) | PM2_5_RUNEX (gms/mile) | CO2_RUNEX (gms/mile) | TOG_RUNEX (gms/mile) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Los Angele | 2017 | Annual | LDA | GAS | AllMYr | 5 | 278561.88 | 0.131913978 | 1.937493467 | 0.152319698 | 0 | 0.010671377 | 0.009849276 | 1100.855852 | 0.201956 |
| Los Angele | 2017 | Annual | LDA | DSL | AllMYr | 5 | 956.1318 | 0.091325974 | 0.606352175 | 0.587252722 | 0 | 0.066962502 | 0.061605507 | 476.6622469 | 0.103969 |
| Los Angele | 2017 | Annual | LDA | GAS | AllMYr | 30 | 2.39E+07 | 0.026162508 | 1.089234626 | 0.091784344 | 0 | 0.001918251 | 0.001766434 | 358.5210057 | 0.038739 |
| Los Angele | 2017 | Annual | LDA | DSL | AllMYr | 30 | 81938.865 | 0.036217067 | 0.191333266 | 0.36736205 | 0 | 0.026592429 | 0.024465036 | 295.5704187 | 0.041231 |
| Los Angele | 2017 | Annual | LDT1 | GAS | AllMYr | 5 | 30524.224 | 0.38035895 | 5.866914858 | 0.531402238 | 0 | 0.024121306 | 0.022296681 | 1268.219723 | 0.520046 |
| Los Angele | 2017 | Annual | LDT1 | DSL | AllMYr | 5 | 44.708691 | 0.187249645 | 1.114609597 | 0.851903603 | 0 | 0.15435355 | 0.142005289 | 460.725892 | 0.213171 |
| Los Angele | 2017 | Annual | LDT1 | GAS | AllMYr | 30 | 2615874 | 0.080641043 | 3.060843492 | 0.283627251 | 0 | 0.004772244 | 0.004406254 | 413.027181 | 0.109315 |
| Los Angele | 2017 | Annual | LDT1 | DSL | AllMYr | 30 | 3831.4586 | 0.074627618 | 0.325862483 | 0.516976689 | 0 | 0.061610411 | 0.056681585 | 311.2724155 | 0.084959 |
| Los Angele | 2017 | Annual | LDT2 | GAS | AllMYr | 5 | 93499.71 | 0.186169458 | 2.770994395 | 0.302430521 | 0 | 0.011572527 | 0.010689649 | 1499.278021 | 0.285787 |
| Los Angele | 2017 | Annual | LDT2 | DSL | AllMYr | 5 | 45.19461 | 0.103423124 | 0.739807285 | 0.747940899 | 0 | 0.078036022 | 0.071793147 | 466.1584367 | 0.11774 |
| Los Angele | 2017 | Annual | LDT2 | GAS | AllMYr | 30 | 8012765.7 | 0.036136343 | 1.599501213 | 0.172380509 | 0 | 0.002066093 | 0.001904703 | 488.276998 | 0.05421 |
| Los Angele | 2017 | Annual | LDT2 | DSL | AllMYr | 30 | 3873.1011 | 0.041047059 | 0.227882449 | 0.460694793 | 0 | 0.031050071 | 0.028566067 | 300.6724729 | 0.046729 |
| Los Angele | 2017 | Annual | LHD1 | GAS | AllMYr | 5 | 14528.176 | 0.620672531 | 7.332875476 | 0.3702493 | 0 | 0.00784982 | 0.007245537 | 2513.497302 | 0.730737 |
| Los Angele | 2017 | Annual | LHD1 | DSL | AllMYr | 5 | 1948.0832 | 0.464508542 | 3.364049747 | 5.13263087 | 0 | 0.105745678 | 0.097286028 | 522.6807138 | 0.528812 |
| Los Angele | 2017 | Annual | LHD1 | GAS | AllMYr | 30 | 961136.18 | 0.127015969 | 1.803415804 | 0.457768645 | 0 | 0.001624058 | 0.001499037 | 619.4336044 | 0.150826 |
| Los Angele | 2017 | Annual | LHD1 | DSL | AllMYr | 30 | 165774.83 | 0.185903939 | 0.903556258 | 2.936890521 | 0 | 0.04232116 | 0.038935465 | 522.6808055 | 0.211639 |
| Los Angele | 2017 | Annual | LHD2 | GAS | AllMYr | 5 | 1640.9221 | 0.407014127 | 5.382457154 | 0.324353174 | 0 | 0.006557971 | 0.00603688 | 2513.497007 | 0.497147 |
| Los Angele | 2017 | Annual | LHD2 | DSL | AllMYr | 5 | 744.06786 | 0.440345686 | 3.229576734 | 4.885270863 | 0 | 0.10518995 | 0.09677475 | 523.8973177 | 0.501304 |
| Los Angele | 2017 | Annual | LHD2 | GAS | AllMYr | 30 | 108557.98 | 0.083244617 | 1.324787237 | 0.400991993 | 0 | 0.001356786 | 0.001248977 | 619.4336312 | 0.102695 |
| Los Angele | 2017 | Annual | LHD2 | DSL | AllMYr | 30 | 63317.489 | 0.176233557 | 0.867437771 | 2.795350826 | 0 | 0.042098738 | 0.038730841 | 523.8973267 | 0.20063 |
| Los Angele | 2017 | Annual | MCY | GAS | AllMYr | 5 | 1934.3339 | 4.716036315 | 25.50061765 | 1.169835884 | 0 | 8.32E-04 | 6.90E-04 | 260.2785302 | 5.19492 |
| Los Angele | 2017 | Annual | MCY | GAS | AllMYr | 30 | 165769.1 | 2.061991266 | 16.26052806 | 1.108552356 | 0 | 3.77E-04 | 3.09E-04 | 145.1863529 | 2.268192 |
| Los Angele | 2017 | Annual | MDV | GAS | AllMYr | 5 | 65613.151 | 0.354149543 | 4.488267176 | 0.520025233 | 0 | 0.013276235 | 0.012251471 | 1907.424572 | 0.509877 |
| Los Angele | 2017 | Annual | MDV | DSL | AllMYr | 5 | 75.278076 | 0.088048958 | 0.585507458 | 0.53753531 | 0 | 0.069933889 | 0.064339183 | 481.6663079 | 0.100238 |
| Los Angele | 2017 | Annual | MDV | GAS | AllMYr | 30 | 5622935.1 | 0.068361465 | 2.489399104 | 0.294585186 | 0 | 0.002425207 | 0.002233025 | 621.200095 | 0.097596 |
| Los Angele | 2017 | Annual | MDV | DSL | AllMYr | 30 | 6451.2028 | 0.034864391 | 0.189316846 | 0.34259997 | 0 | 0.027757111 | 0.025536545 | 294.5789762 | 0.039691 |
| Los Angele | 2017 | Annual | MH | GAS | AllMYr | 5 | 627.27035 | 0.738312076 | 17.94661029 | 0.526319786 | 0 | 0.010729021 | 0.009757394 | 2513.49729 | 0.894298 |
| Los Angele | 2017 | Annual | MH | DSL | AllMYr | 5 | 61.765401 | 1.56796886 | 2.425957258 | 17.38648619 | 0 | 0.502939457 | 0.462704293 | 2384.437755 | 1.785028 |
| Los Angele | 2017 | Annual | MH | GAS | AllMYr | 30 | 45444.13 | 0.151275139 | 4.422203796 | 0.648501566 | 0 | 0.002219739 | 0.002018718 | 619.4336341 | 0.185117 |
| Los Angele | 2017 | Annual | MH | DSL | AllMYr | 30 | 5235.7217 | 0.175672776 | 0.668823517 | 6.95151354 | 0 | 0.154303185 | 0.141958934 | 1228.199643 | 0.199992 |
| Los Angele | 2017 | Annual | Motor Coa | DSL | AllMYr | 5 | 223.61627 | 2.517281536 | 4.896968702 | 18.30034963 | 0 | 0.118512521 | 0.109031519 | 4010.589971 | 2.865733 |
| Los Angele | 2017 | Annual | Motor Coa | DSL | AllMYr | 30 | 21357.397 | 0.238406498 | 0.892334723 | 6.192286405 | 0 | 0.057246486 | 0.052666767 | 1879.476711 | 0.271408 |
| Los Angele | 2017 | Annual | OBUS | GAS | AllMYr | 5 | 366.23766 | 0.616664201 | 8.712465905 | 0.644132959 | 0 | 0.00341785 | 0.003157348 | 2513.497272 | 0.761453 |
| Los Angele | 2017 | Annual | OBUS | GAS | AllMYr | 30 | 26532.979 | 0.125833687 | 2.145228775 | 0.793482895 | 0 | 7.07E-04 | 6.53E-04 | 619.4336031 | 0.157562 |
| Los Angele | 2017 | Annual | SBUS | GAS | AllMYr | 5 | 272.5308 | 4.592953261 | 61.91112479 | 1.588210955 | 0 | 0.025526812 | 0.022831707 | 2513.496961 | 5.042697 |
| Los Angele | 2017 | Annual | SBUS | DSL | AllMYr | 5 | 921.91772 | 1.70727163 | 2.247394037 | 28.28271401 | 0 | 0.432994059 | 0.398354534 | 2645.676744 | 1.943599 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Los Angele | 2017 | Annual | SBUS | GAS | AllMYr | 30 | 4910.9355 | 0.95149649 | 15.25658061 | 1.944493199 | 0 | 0.005281271 | 0.004723678 | 619.4336091 | 1.044336 |
| Los Angele | 2017 | Annual | SBUS | DSL | AllMYr | 30 | 16612.722 | 0.161896017 | 0.621245959 | 9.50327376 | 0 | 0.09885999 | 0.090951191 | 1239.83949 | 0.184306 |
| Los Angele | 2017 | Annual | T6 Ag | DSL | AllMYr | 5 | 6.2131867 | 2.765198211 | 4.034129668 | 13.03532046 | 0 | 0.517606916 | 0.476198362 | 2594.523643 | 3.147968 |
| Los Angele | 2017 | Annual | T6 Ag | DSL | AllMYr | 30 | 526.6786 | 0.257046901 | 0.953940676 | 4.450983023 | 0 | 0.140394025 | 0.129162503 | 1215.86769 | 0.292628 |
| Los Angele | 2017 | Annual | T6 CAIRP h | DSL | AllMYr | 5 | 3.1212259 | 1.115395828 | 1.910235138 | 9.349314076 | 0 | 0.077652614 | 0.071440404 | 2585.112438 | 1.269793 |
| Los Angele | 2017 | Annual | T6 CAIRP h | DSL | AllMYr | 30 | 264.57967 | 0.104480929 | 0.352751447 | 3.127726479 | 0 | 0.032420335 | 0.029826708 | 1211.457331 | 0.118944 |
| Los Angele | 2017 | Annual | T6 CAIRP sı | DSL | AllMYr | 5 | 10.408549 | 1.409358742 | 2.407286156 | 5.508119542 | 0 | 0.115350273 | 0.106122251 | 2569.967185 | 1.604448 |
| Los Angele | 2017 | Annual | T6 CAIRP sı | DSL | AllMYr | 30 | 882.31052 | 0.131674895 | 0.44596248 | 1.882331567 | 0 | 0.051032491 | 0.046949892 | 1204.359834 | 0.149902 |
| Los Angele | 2017 | Annual | T6 instate ( | DSL | AllMYr | 5 | 203.8262 | 1.196213782 | 1.959205901 | 16.30743452 | 0 | 0.132900127 | 0.122268117 | 2605.082643 | 1.361798 |
| Los Angele | 2017 | Annual | T6 instate ( | DSL | AllMYr | 30 | 17277.913 | 0.107376203 | 0.381090921 | 5.388318008 | 0 | 0.039728708 | 0.036550411 | 1220.815938 | 0.12224 |
| Los Angele | 2017 | Annual | T6 instate ( | DSL | AllMYr | 5 | 536.21078 | 1.976533203 | 3.254067161 | 8.889197708 | 0 | 0.240642077 | 0.221390711 | 2577.636713 | 2.250133 |
| Los Angele | 2017 | Annual | T6 instate ( | DSL | AllMYr | 30 | 45453.445 | 0.178306274 | 0.629125753 | 3.013954579 | 0 | 0.086479658 | 0.079561285 | 1207.953993 | 0.202988 |
| Los Angele | 2017 | Annual | T6 instate l | DSL | AllMYr | 5 | 937.04895 | 1.179734931 | 1.956344708 | 14.55537608 | 0 | 0.118017636 | 0.108576225 | 2600.235236 | 1.343038 |
| Los Angele | 2017 | Annual | T6 instate l | DSL | AllMYr | 30 | 79431.643 | 0.107157812 | 0.375093406 | 4.823084584 | 0 | 0.038077462 | 0.035031265 | 1218.544305 | 0.121991 |
| Los Angele | 2017 | Annual | T6 instate s | DSL | AllMYr | 5 | 2584.7039 | 1.843697854 | 3.052423577 | 8.070944808 | 0 | 0.212993545 | 0.195954062 | 2575.435631 | 2.09891 |
| Los Angele | 2017 | Annual | T6 instate s | DSL | AllMYr | 30 | 219099.85 | 0.167212513 | 0.586324136 | 2.739032348 | 0 | 0.078266854 | 0.072005505 | 1206.922504 | 0.190359 |
| Los Angele | 2017 | Annual | T6 OOS hea | DSL | AllMYr | 5 | 1.7894639 | 1.115395828 | 1.910235138 | 9.349314076 | 0 | 0.077652614 | 0.071440404 | 2585.112438 | 1.269793 |
| Los Angele | 2017 | Annual | T6 OOS hea | DSL | AllMYr | 30 | 151.68904 | 0.104480929 | 0.352751448 | 3.127726479 | 0 | 0.032420335 | 0.029826708 | 1211.457331 | 0.118944 |
| Los Angele | 2017 | Annual | T6 OOS sm | DSL | AllMYr | 5 | 5.9674381 | 1.409358742 | 2.407286156 | 5.508119542 | 0 | 0.115350273 | 0.106122251 | 2569.967185 | 1.604448 |
| Los Angele | 2017 | Annual | T6 OOS sm | DSL | AllMYr | 30 | 505.84702 | 0.131674895 | 0.44596248 | 1.882331567 | 0 | 0.051032491 | 0.046949892 | 1204.359834 | 0.149902 |
| Los Angele | 2017 | Annual | T6 Public | DSL | AllMYr | 5 | 106.4754 | 0.743216302 | 1.185674785 | 17.66301112 | 0 | 0.114843475 | 0.105655997 | 2622.29706 | 0.846095 |
| Los Angele | 2017 | Annual | T6 Public | DSL | AllMYr | 30 | 9025.6925 | 0.068196412 | 0.242874628 | 5.908994268 | 0 | 0.031922165 | 0.029368391 | 1228.883104 | 0.077636 |
| Los Angele | 2017 | Annual | T6 utility | DSL | AllMYr | 5 | 19.098827 | 0.774498485 | 1.344881814 | 9.377933775 | 0 | 0.05031829 | 0.046292827 | 2596.089444 | 0.881708 |
| Los Angele | 2017 | Annual | T6 utility | DSL | AllMYr | 30 | 1618.9669 | 0.073541642 | 0.24420999 | 3.15529704 | 0 | 0.023274064 | 0.021412139 | 1216.601469 | 0.083722 |
| Los Angele | 2017 | Annual | T6TS | GAS | AllMYr | 5 | 1432.1918 | 0.988537696 | 13.75220024 | 0.785436387 | 0 | 0.005317472 | 0.004837341 | 2513.497201 | 1.161713 |
| Los Angele | 2017 | Annual | T6TS | GAS | AllMYr | 30 | 103758.63 | 0.202473392 | 3.388145232 | 0.967568915 | 0 | 0.001100138 | 0.001000803 | 619.4336544 | 0.240383 |
| Los Angele | 2017 | Annual | T7 Ag | DSL | AllMYr | 5 | 13.27032 | 4.141153033 | 7.445257368 | 25.8152682 | 0 | 0.630675155 | 0.580221143 | 4023.79338 | 4.714387 |
| Los Angele | 2017 | Annual | T7 Ag | DSL | AllMYr | 30 | 1267.4368 | 0.376018208 | 1.745050971 | 8.713518493 | 0 | 0.172798078 | 0.158974232 | 1885.664205 | 0.428068 |
| Los Angele | 2017 | Annual | T7 CAIRP | DSL | AllMYr | 5 | 1299.957 | 2.927621795 | 5.798224183 | 12.47634004 | 0 | 0.09878309 | 0.090880443 | 3984.942661 | 3.332875 |
| Los Angele | 2017 | Annual | T7 CAIRP | DSL | AllMYr | 30 | 124157.77 | 0.281880845 | 1.035418584 | 4.272497582 | 0 | 0.062143561 | 0.057172076 | 1867.457651 | 0.3209 |
| Los Angele | 2017 | Annual | T7 CAIRP c | DSL | AllMYr | 5 | 120.01681 | 2.937433032 | 5.812586153 | 12.94237897 | 0 | 0.100913578 | 0.092840492 | 3986.855622 | 3.344044 |
| Los Angele | 2017 | Annual | T7 CAIRP c | DSL | AllMYr | 30 | 11462.702 | 0.282584002 | 1.03908994 | 4.427521205 | 0 | 0.062395557 | 0.057403913 | 1868.354119 | 0.3217 |
| Los Angele | 2017 | Annual | T7 NNOOS | DSL | AllMYr | 5 | 1462.4031 | 2.37336561 | 4.727085046 | 7.226484179 | 0 | 0.06811747 | 0.062668073 | 3967.608377 | 2.701896 |
| Los Angele | 2017 | Annual | T7 NNOOS | DSL | AllMYr | 30 | 139672.85 | 0.229683395 | 0.838777282 | 2.494142365 | 0 | 0.047849654 | 0.044021682 | 1859.334312 | 0.261477 |
| Los Angele | 2017 | Annual | T7 NOOS | DSL | AllMYr | 5 | 473.41132 | 2.926148925 | 5.793870604 | 12.5215753 | 0 | 0.09930571 | 0.091361253 | 3985.003041 | 3.331198 |
| Los Angele | 2017 | Annual | T7 NOOS | DSL | AllMYr | 30 | 45215.106 | 0.281667943 | 1.034968393 | 4.286413405 | 0 | 0.062154144 | 0.057181813 | 1867.485947 | 0.320658 |
| Los Angele | 2017 | Annual | T7 other p | DSL | AllMYr | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Los Angele | 2017 | Annual | T7 other p | DSL | AllMYr | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Los Angele | 2017 | Annual | T7 POAK | DSL | AllMYr | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Los Angele | 2017 | Annual | T7 POAK | DSL | AllMYr | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Los Angele | 2017 | Annual | T7 POLA | DSL | AllMYr | 5 | 1712.5422 | 5.640867348 | 11.22116644 | 24.27255208 | 0 | 0.118093389 | 0.108645918 | 4078.639106 | 6.421698 |
| Los Angele | 2017 | Annual | T7 POLA | DSL | AllMYr | 30 | 163563.42 | 0.546227398 | 1.989638647 | 8.388962074 | 0 | 0.084158849 | 0.077426142 | 1911.366474 | 0.621838 |
| Los Angele | 2017 | Annual | T7 Public | DSL | AllMYr | 5 | 83.009494 | 1.164772425 | 2.095699162 | 36.49079305 | 0 | 0.240930364 | 0.221655935 | 4093.434914 | 1.326005 |
| Los Angele | 2017 | Annual | T7 Public | DSL | AllMYr | 30 | 7928.165 | 0.107981072 | 0.517550194 | 12.4532513 | 0 | 0.063216404 | 0.058159092 | 1918.300211 | 0.122928 |
| Los Angele | 2017 | Annual | T7 Single | DSL | AllMYr | 5 | 699.30579 | 1.841032013 | 3.470199272 | 23.21243306 | 0 | 0.151229602 | 0.139131234 | 4018.152386 | 2.095875 |
| Los Angele | 2017 | Annual | T7 Single | DSL | AllMYr | 30 | 66790.091 | 0.168326018 | 0.661494897 | 7.690721547 | 0 | 0.049407 | 0.04545444 | 1883.020674 | 0.191626 |
| Los Angele | 2017 | Annual | T7 single c | DSL | AllMYr | 5 | 310.46769 | 1.837773416 | 3.456032789 | 23.95539363 | 0 | 0.1551269 | 0.142716748 | 4020.463632 | 2.092165 |
| Los Angele | 2017 | Annual | T7 single c | DSL | AllMYr | 30 | 29652.501 | 0.167620104 | 0.660795477 | 7.934478296 | 0 | 0.049894128 | 0.045902598 | 1884.10379 | 0.190823 |
| Los Angele | 2017 | Annual | T7 SWCV | DSL | AllMYr | 5 | 224.91795 | 1.578200085 | 2.894938156 | 32.05662726 | 0 | 0.263927011 | 0.242812851 | 4080.094681 | 1.796661 |
| Los Angele | 2017 | Annual | T7 SWCV | DSL | AllMYr | 30 | 21481.719 | 0.149030531 | 0.704558334 | 11.07187775 | 0 | 0.074592587 | 0.06862518 | 1912.048598 | 0.16966 |
| Los Angele | 2017 | Annual | T7 tractor | DSL | AllMYr | 5 | 1834.1661 | 2.770726587 | 5.34105406 | 21.26026618 | 0 | 0.156758005 | 0.144217364 | 4009.550624 | 3.154261 |
| Los Angele | 2017 | Annual | T7 tractor | DSL | AllMYr | 30 | 175179.62 | 0.259452132 | 0.987960143 | 7.132400072 | 0 | 0.065732444 | 0.060473848 | 1878.989643 | 0.295367 |
| Los Angele | 2017 | Annual | T7 tractor ( | DSL | AllMYr | 5 | 231.47661 | 2.719339266 | 5.195110028 | 23.50258127 | 0 | 0.174416202 | 0.160462906 | 4014.320089 | 3.095761 |
| Los Angele | 2017 | Annual | T7 tractor ( | DSL | AllMYr | 30 | 22108.131 | 0.252262953 | 0.972327118 | 7.853493892 | 0 | 0.066810886 | 0.061466015 | 1881.22475 | 0.287182 |
| Los Angele | 2017 | Annual | T7 utility | DSL | AllMYr | 5 | 9.6135417 | 1.362266398 | 2.622416582 | 19.55181945 | 0 | 0.094005376 | 0.086484946 | 4021.739969 | 1.550837 |
| Los Angele | 2017 | Annual | T7 utility | DSL | AllMYr | 30 | 918.18105 | 0.127875883 | 0.482921798 | 6.503946809 | 0 | 0.035634823 | 0.032784037 | 1884.701917 | 0.145577 |
| Los Angele | 2017 | Annual | T7IS | GAS | AllMYr | 5 | 306.27666 | 3.341544714 | 119.4682122 | 3.29934801 | 0 | 0.002161198 | 0.001953077 | 2513.497326 | 3.970238 |
| Los Angele | 2017 | Annual | T7IS | GAS | AllMYr | 30 | 22188.961 | 0.682063081 | 29.41560677 | 4.064362734 | 0 | 4.47E-04 | 4.04E-04 | 619.4336698 | 0.821602 |
| Los Angele | 2017 | Annual | UBUS | GAS | AllMYr | 5 | 1020.0517 | 8.063045027 | 57.39759322 | 2.703238729 | 0 | 0.015134437 | 0.013655797 | 2513.497101 | 8.655237 |
| Los Angele | 2017 | Annual | UBUS | DSL | AllMYr | 5 | 5906.2541 | 1.749644599 | 11.2879822 | 29.90405464 | 0 | 0.745179199 | 0.685564881 | 2558.648299 | 1.991854 |
| Los Angele | 2017 | Annual | UBUS | GAS | AllMYr | 30 | 18214.766 | 1.668172606 | 14.14523221 | 3.319875509 | 0 | 0.003131181 | 0.002825263 | 619.4336409 | 1.790692 |
| Los Angele | 2017 | Annual | UBUS | DSL | AllMYr | 30 | 105466.25 | 0.543643193 | 2.254072665 | 13.27316188 | 0 | 0.231539372 | 0.21301623 | 2558.648382 | 0.618902 |
| Los Angele | 2017 | Annual | All Other B | DSL | AllMYr | 5 | 263.37484 | 1.317761771 | 2.179454392 | 15.14279534 | 0 | 0.135562436 | 0.124717442 | 2598.206035 | 1.500171 |
| Los Angele | 2017 | Annual | All Other B | DSL | AllMYr | 30 | 22325.724 | 0.119174832 | 0.420390193 | 5.003816461 | 0 | 0.042484282 | 0.03908554 | 1217.593364 | 0.135671 |

EMFAC 2011
2018 Estimated Annual Emission Rates
EMFAC 2011 Vehicle Categories
Los Angeles COUNTY
South Coast AIR BASIN
South Coast AQMD

| Area | CalYr | Season | Veh | Fuel | MdlYr | Speed (Miles/hr) | Pop (Vehicles) | VMT (Miles/day) | Trips (Trips/day) | ROG_RUNEX (gms/mile) | CO_RUNEX (gms/mile) | NOX_RUNEX (gms/mile) | SOX_RUNEX (gms/mile) | PM10_RUNEX (gms/mile) | PM2_5_RUNEX (gms/mile) | CO2_RUNEX (gms/mile) | TOG_RUNEX (gms/mile) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Los Angele | 2018 | Annual | LDA | GAS | AllMYr | 5 | 0 | 279676.739 | 0 | 0.111291729 | 1.703293819 | 0.140848176 | 0 | 0.010702107 | 0.009904348 | 1101.175014 | 0.177003 |
| Los Angele | 2018 | Annual | LDA | DSL | AllMYr | 5 | 0 | 960.0619313 | 0 | 0.078060311 | 0.523465272 | 0.542331971 | 0 | 0.056880377 | 0.052329952 | 480.7595638 | 0.088866 |
| Los Angele | 2018 | Annual | LDA | GAS | AllMYr | 30 | 0 | 2.40E+07 | 0 | 0.021338686 | 0.987557953 | 0.083716271 | 0 | 0.001902445 | 0.001758606 | 358.6249276 | 0.033018 |
| Los Angele | 2018 | Annual | LDA | DSL | AllMYr | 30 | 0 | 82275.67169 | 0 | 0.030885853 | 0.170977638 | 0.34371917 | 0 | 0.022544347 | 0.0207408 | 293.3529926 | 0.035161 |
| Los Angele | 2018 | Annual | LDT1 | GAS | AllMYr | 5 | 0 | 30595.46789 | 0 | 0.32935377 | 5.250517811 | 0.494072563 | 0 | 0.022976243 | 0.021287609 | 1269.135177 | 0.460401 |
| Los Angele | 2018 | Annual | LDT1 | DSL | AllMYr | 5 | 0 | 45.179557 | 0 | 0.165550466 | 0.985450988 | 0.787688968 | 0 | 0.136772623 | 0.125830814 | 466.2846354 | 0.188468 |
| Los Angele | 2018 | Annual | LDT1 | GAS | AllMYr | 30 | 0 | 2621979.376 | 0 | 0.068349588 | 2.805217297 | 0.260811251 | 0 | 0.004498425 | 0.004165931 | 413.3253586 | 0.094982 |
| Los Angele | 2018 | Annual | LDT1 | DSL | AllMYr | 30 | 0 | 3871.81097 | 0 | 0.065912943 | 0.293772052 | 0.483139158 | 0 | 0.054558869 | 0.050194167 | 307.6591049 | 0.075037 |
| Los Angele | 2018 | Annual | LDT2 | GAS | AllMYr | 5 | 0 | 94174.87191 | 0 | 0.15958748 | 2.448381204 | 0.270555137 | 0 | 0.011418304 | 0.010571 | 1499.243834 | 0.252305 |
| Los Angele | 2018 | Annual | LDT2 | DSL | AllMYr | 5 | 0 | 45.47797413 | 0 | 0.090135057 | 0.631522287 | 0.684552888 | 0 | 0.063348927 | 0.058281015 | 471.9718449 | 0.102613 |
| Los Angele | 2018 | Annual | LDT2 | GAS | AllMYr | 30 | 0 | 8070625.808 | 0 | 0.030149355 | 1.444560989 | 0.15351167 | 0 | 0.002015789 | 0.001864321 | 488.2658749 | 0.046816 |
| Los Angele | 2018 | Annual | LDT2 | DSL | AllMYr | 30 | 0 | 3897.384675 | 0 | 0.03569444 | 0.201766418 | 0.427706653 | 0 | 0.025154674 | 0.023142302 | 297.0167015 | 0.040636 |
| Los Angele | 2018 | Annual | LHD1 | GAS | AllMYr | 5 | 0 | 14619.03381 | 0 | 0.558004646 | 6.619879041 | 0.342759144 | 0 | 0.007178303 | 0.006629302 | 2513.497455 | 0.660262 |
| Los Angele | 2018 | Annual | LHD1 | DSL | AllMYr | 5 | 0 | 1960.530864 | 0 | 0.44473423 | 3.304827115 | 4.788920236 | 0 | 0.101054578 | 0.092970216 | 522.2270883 | 0.5063 |
| Los Angele | 2018 | Annual | LHD1 | GAS | AllMYr | 30 | 0 | 967146.9575 | 0 | 0.114185619 | 1.627937304 | 0.423775668 | 0 | 0.001485127 | 0.001371544 | 619.4336186 | 0.136278 |
| Los Angele | 2018 | Annual | LHD1 | DSL | AllMYr | 30 | 0 | 166834.081 | 0 | 0.177989935 | 0.887649471 | 2.740219241 | 0 | 0.040443704 | 0.037208206 | 522.2271427 | 0.20263 |
| Los Angele | 2018 | Annual | LHD2 | GAS | AllMYr | 5 | 0 | 1653.484067 | 0 | 0.330835375 | 4.353900721 | 0.289945311 | 0 | 0.005657835 | 0.005233031 | 2513.497143 | 0.411151 |
| Los Angele | 2018 | Annual | LHD2 | DSL | AllMYr | 5 | 0 | 749.1100846 | 0 | 0.419622265 | 3.165894223 | 4.543429811 | 0 | 0.099708638 | 0.091731947 | 523.2505042 | 0.477712 |
| Los Angele | 2018 | Annual | LHD2 | GAS | AllMYr | 30 | 0 | 109389.0468 | 0 | 0.067620514 | 1.070664899 | 0.358447437 | 0 | 0.001170556 | 0.001082668 | 619.4336248 | 0.084893 |
| Los Angele | 2018 | Annual | LHD2 | DSL | AllMYr | 30 | 0 | 63746.56156 | 0 | 0.16793971 | 0.850333235 | 2.599749509 | 0 | 0.03990503 | 0.036712627 | 523.2505295 | 0.191188 |
| Los Angele | 2018 | Annual | MCY | GAS | AllMYr | 5 | 0 | 1944.765129 | 0 | 4.696341757 | 24.95592495 | 1.17526743 | 0 | 7.46E-04 | 6.24E-04 | 261.5149792 | 5.175213 |
| Los Angele | 2018 | Annual | MCY | GAS | AllMYr | 30 | 0 | 166663.061 | 0 | 2.042089476 | 15.94029771 | 1.103277838 | 0 | 3.33E-04 | 2.76E-04 | 145.8611861 | 2.247222 |
| Los Angele | 2018 | Annual | MDV | GAS | AllMYr | 5 | 0 | 65820.72107 | 0 | 0.327966849 | 4.176489115 | 0.483031647 | 0 | 0.013163891 | 0.012157583 | 1908.95464 | 0.475855 |
| Los Angele | 2018 | Annual | MDV | DSL | AllMYr | 5 | 0 | 75.5399364 | 0 | 0.077365981 | 0.512473823 | 0.506766457 | 0 | 0.06153307 | 0.056610427 | 484.8837834 | 0.088076 |
| Los Angele | 2018 | Annual | MDV | GAS | AllMYr | 30 | 0 | 5640723.589 | 0 | 0.062906139 | 2.33855134 | 0.273311313 | 0 | 0.00238639 | 0.002199674 | 621.6983448 | 0.090532 |
| Los Angele | 2018 | Annual | MDV | DSL | AllMYr | 30 | 0 | 6473.644271 | 0 | 0.03056928 | 0.171395962 | 0.326804843 | 0 | 0.024383471 | 0.022432795 | 292.8181554 | 0.034801 |
| Los Angele | 2018 | Annual | MH | GAS | AllMYr | 5 | 0 | 634.303643 | 0 | 0.571239901 | 13.92558664 | 0.461747369 | 0 | 0.008997298 | 0.008245182 | 2513.49725 | 0.707619 |
| Los Angele | 2018 | Annual | MH | DSL | AllMYr | 5 | 0 | 62.13214712 | 0 | 1.539790341 | 2.400397056 | 16.94826987 | 0 | 0.478159387 | 0.439906645 | 2385.665184 | 1.752949 |
| Los Angele | 2018 | Annual | MH | GAS | AllMYr | 30 | 0 | 45953.67273 | 0 | 0.11689417 | 3.429910114 | 0.568922649 | 0 | 0.001861461 | 0.001705855 | 619.4336735 | 0.146424 |
| Los Angele | 2018 | Annual | MH | DSL | AllMYr | 30 | 0 | 5266.810336 | 0 | 0.172577148 | 0.654249064 | 6.770708463 | 0 | 0.147359178 | 0.135570453 | 1228.831862 | 0.196468 |
| Los Angele | 2018 | Annual | Motor Coa | DSL | AllMYr | 5 | 0 | 227.5295593 | 0 | 2.477896881 | 4.865920341 | 15.32221074 | 0 | 0.10197369 | 0.093815794 | 3997.996246 | 2.820897 |
| Los Angele | 2018 | Annual | Motor Coa | DSL | AllMYr | 30 | 0 | 21731.15143 | 0 | 0.236676366 | 0.877616083 | 5.215451477 | 0 | 0.05595903 | 0.051482307 | 1873.574933 | 0.269438 |
| Los Angele | 2018 | Annual | OBUS | GAS | AllMYr | 5 | 0 | 363.2201485 | 0 | 0.547794372 | 7.722191667 | 0.578947464 | 0 | 0.003061713 | 0.002833289 | 2513.497205 | 0.680171 |
| Los Angele | 2018 | Annual | OBUS | GAS | AllMYr | 30 | 0 | 26314.3689 | 0 | 0.111793723 | 1.90125953 | 0.713183016 | 0 | 6.33E-04 | 5.86E-04 | 619.43363 | 0.140734 |
| Los Angele | 2018 | Annual | SBUS | GAS | AllMYr | 5 | 0 | 274.4685033 | 0 | 4.279605486 | 56.37969153 | 1.51832422 | 0 | 0.023383249 | 0.021073689 | 2513.497166 | 4.703571 |
| Los Angele | 2018 | Annual | SBUS | DSL | AllMYr | 5 | 0 | 916.9761739 | 0 | 1.246384939 | 1.83963147 | 25.85545928 | 0 | 0.24095329 | 0.221677027 | 2638.385583 | 1.418914 |
| Los Angele | 2018 | Annual | SBUS | GAS | AllMYr | 30 | 0 | 4945.852395 | 0 | 0.886822559 | 13.89846411 | 1.858935503 | 0 | 0.004837787 | 0.004359959 | 619.4336357 | 0.974352 |
| Los Angele | 2018 | Annual | SBUS | DSL | AllMYr | 30 | 0 | 16523.67635 | 0 | 0.109130449 | 0.416722096 | 8.566707158 | 0 | 0.051794529 | 0.047650967 | 1236.422645 | 0.124237 |
| Los Angele | 2018 | Annual | T6 Ag | DSL | AllMYr | 5 | 0 | 6.193693161 | 0 | 2.628848866 | 3.877629557 | 12.09453164 | 0 | 0.469235624 | 0.431696774 | 2591.197355 | 2.992744 |
| Los Angele | 2018 | Annual | T6 Ag | DSL | AllMYr | 30 | 0 | 525.0261758 | 0 | 0.244308142 | 0.900376689 | 4.128214103 | 0 | 0.128546881 | 0.11826313 | 1214.308897 | 0.278126 |
| Los Angele | 2018 | Annual | T6 CAIRP h | DSL | AllMYr | 5 | 0 | 3.132900032 | 0 | 1.101497162 | 1.898908111 | 8.299830341 | 0 | 0.069825817 | 0.064239752 | 2581.0785 | 1.253971 |
| Los Angele | 2018 | Annual | T6 CAIRP h | DSL | AllMYr | 30 | 0 | 265.5692622 | 0 | 0.103847789 | 0.347874136 | 2.787426688 | 0 | 0.03162013 | 0.029090519 | 1209.566913 | 0.118223 |
| Los Angele | 2018 | Annual | T6 CAIRP si | DSL | AllMYr | 5 | 0 | 10.59119002 | 0 | 1.297054594 | 2.230941507 | 4.737791247 | 0 | 0.091791785 | 0.084448442 | 2567.15287 | 1.476598 |
| Los Angele | 2018 | Annual | T6 CAIRP si | DSL | AllMYr | 30 | 0 | 897.7926172 | 0 | 0.122191564 | 0.40881554 | 1.622384103 | 0 | 0.043790988 | 0.040287709 | 1203.040966 | 0.139106 |
| Los Angele | 2018 | Annual | T6 instate ( | DSL | AllMYr | 5 | 0 | 206.6889056 | 0 | 1.194523079 | 1.982907999 | 14.89282922 | 0 | 0.118716295 | 0.109218991 | 2601.190102 | 1.359874 |
| Los Angele | 2018 | Annual | T6 instate ( | DSL | AllMYr | 30 | 0 | 17520.57825 | 0 | 0.108612109 | 0.379706919 | 4.944365414 | 0 | 0.039013456 | 0.035892379 | 1218.991783 | 0.123647 |
| Los Angele | 2018 | Annual | T6 instate ( | DSL | AllMYr | 5 | 0 | 551.5045793 | 0 | 1.770637491 | 2.94833982 | 7.56682678 | 0 | 0.18577796 | 0.170915724 | 2574.485731 | 2.015736 |
| Los Angele | 2018 | Annual | T6 instate ( | DSL | AllMYr | 30 | 0 | 46749.8684 | 0 | 0.162015282 | 0.55947751 | 2.573427831 | 0 | 0.072456691 | 0.066660155 | 1206.477354 | 0.184442 |
| Los Angele | 2018 | Annual | T6 instate I | DSL | AllMYr | 5 | 0 | 934.72047 | 0 | 1.177665556 | 1.97623772 | 13.27110491 | 0 | 0.105507911 | 0.097067278 | 2596.508227 | 1.340683 |
| Los Angele | 2018 | Annual | T6 instate I | DSL | AllMYr | 30 | 0 | 79234.26315 | 0 | 0.108191962 | 0.373693983 | 4.418691951 | 0 | 0.037432123 | 0.034437553 | 1216.797722 | 0.123168 |
| Los Angele | 2018 | Annual | T6 instate : | DSL | AllMYr | 5 | 0 | 2619.005527 | 0 | 1.660338669 | 2.780183346 | 6.892314118 | 0 | 0.16438777 | 0.151236748 | 2572.549264 | 1.890169 |
| Los Angele | 2018 | Annual | T6 instate : | DSL | AllMYr | 30 | 0 | 222007.5196 | 0 | 0.152687349 | 0.524403293 | 2.346291755 | 0 | 0.065799672 | 0.060535698 | 1205.56987 | 0.173823 |
| Los Angele | 2018 | Annual | T6 OOS hea | DSL | AllMYr | 5 | 0 | 1.796156909 | 0 | 1.101497162 | 1.898908111 | 8.299830342 | 0 | 0.069825817 | 0.064239752 | 2581.0785 | 1.253971 |
| Los Angele | 2018 | Annual | T6 OOS hea | DSL | AllMYr | 30 | 0 | 152.2563951 | 0 | 0.103847789 | 0.347874136 | 2.787426688 | 0 | 0.03162013 | 0.029090519 | 1209.566913 | 0.118223 |
| Los Angele | 2018 | Annual | T6 OOS sm | DSL | AllMYr | 5 | 0 | 6.072150065 | 0 | 1.297054594 | 2.230941507 | 4.737791247 | 0 | 0.091791785 | 0.084448442 | 2567.15287 | 1.476598 |
| Los Angele | 2018 | Annual | T6 OOS sm | DSL | AllMYr | 30 | 0 | 514.7232264 | 0 | 0.122191564 | 0.40881554 | 1.622384103 | 0 | 0.043790988 | 0.040287709 | 1203.040966 | 0.139106 |
| Los Angele | 2018 | Annual | T6 Public | DSL | AllMYr | 5 | 0 | 108.6049036 | 0 | 0.762919227 | 1.238729319 | 16.08467738 | 0 | 0.10340455 | 0.095132186 | 2616.893358 | 0.868525 |
| Los Angele | 2018 | Annual | T6 Public | DSL | AllMYr | 30 | 0 | 9206.206332 | 0 | 0.070502034 | 0.247536534 | 5.387665213 | 0 | 0.030729632 | 0.028271261 | 1226.350775 | 0.080261 |
| Los Angele | 2018 | Annual | T6 utility | DSL | AllMYr | 5 | 0 | 19.37933451 | 0 | 0.788560286 | 1.379952146 | 7.876229956 | 0 | 0.043291578 | 0.039828252 | 2589.938918 | 0.897716 |
| Los Angele | 2018 | Annual | T6 utility | DSL | AllMYr | 30 | 0 | 1642.744906 | 0 | 0.075413736 | 0.248425405 | 2.667863471 | 0 | 0.022766548 | 0.020945224 | 1213.719157 | 0.085853 |
| Los Angele | 2018 | Annual | T6TS | GAS | AllMYr | 5 | 0 | 1446.025483 | 0 | 0.835458766 | 11.51485462 | 0.68529001 | 0 | 0.004496263 | 0.004116293 | 2513.497317 | 0.988295 |
| Los Angele | 2018 | Annual | T6TS | GAS | AllMYr | 30 | 0 | 104760.8407 | 0 | 0.171082007 | 2.836190239 | 0.844198369 | 0 | 9.30E-04 | 8.52E-04 | 619.4336219 | 0.204468 |
| Los Angele | 2018 | Annual | T7 Ag | DSL | AllMYr | 5 | 0 | 13.22868533 | 0 | 4.128202265 | 7.506046523 | 23.63030287 | 0 | 0.580266446 | 0.533845131 | 4015.61763 | 4.699644 |
| Los Angele | 2018 | Annual | T7 Ag | DSL | AllMYr | 30 | 0 | 1263.460295 | 0 | 0.377086649 | 1.708972435 | 7.983933032 | 0 | 0.166072804 | 0.15278698 | 1881.832815 | 0.429284 |
| Los Angele | 2018 | Annual | T7 CAIRP | DSL | AllMYr | 5 | 0 | 1334.731422 | 0 | 2.819809207 | 5.596346071 | 10.60513144 | 0 | 0.092800329 | 0.085376303 | 3975.556955 | 3.210138 |
| Los Angele | 2018 | Annual | T7 CAIRP | DSL | AllMYr | 30 | 0 | 127479.0437 | 0 | 0.271888235 | 0.997564726 | 3.636695814 | 0 | 0.060192837 | 0.05537741 | 1863.059242 | 0.309524 |
| Los Angele | 2018 | Annual | T7 CAIRP c | DSL | AllMYr | 5 | 0 | 122.9613716 | 0 | 2.82385263 | 5.600368064 | 10.93099234 | 0 | 0.094310344 | 0.086765517 | 3976.896104 | 3.214741 |
| Los Angele | 2018 | Annual | T7 CAIRP c | DSL | AllMYr | 30 | 0 | 11743.93425 | 0 | 0.272091434 | 0.999129598 | 3.744694381 | 0 | 0.060308708 | 0.055484011 | 1863.686805 | 0.309755 |
| Los Angele | 2018 | Annual | T7 NNOOS | DSL | AllMYr | 5 | 0 | 1501.522958 | 0 | 2.328032426 | 4.640709819 | 6.401134087 | 0 | 0.066322709 | 0.061016892 | 3963.253992 | 2.650288 |
| Los Angele | 2018 | Annual | T7 NNOOS | DSL | AllMYr | 30 | 0 | 143409.1591 | 0 | 0.225380463 | 0.823089522 | 2.211057274 | 0 | 0.046995655 | 0.043236003 | 1857.293723 | 0.256579 |
| Los Angele | 2018 | Annual | T7 NOOS | DSL | AllMYr | 5 | 0 | 486.0752672 | 0 | 2.818606391 | 5.592776131 | 10.64184856 | 0 | 0.093211276 | 0.085754374 | 3975.612747 | 3.208769 |
| Los Angele | 2018 | Annual | T7 NOOS | DSL | AllMYr | 30 | 0 | 46424.62839 | 0 | 0.271715534 | 0.997185871 | 3.648005095 | 0 | 0.060199167 | 0.055383233 | 1863.085387 | 0.309327 |
| Los Angele | 2018 | Annual | T7 other p | DSL | AllMYr | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Los Angele | 2018 | Annual | T7 other p | DSL | AllMYr | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Los Angele | 2018 | Annual | T7 POAK | DSL | AllMYr | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Los Angele | 2018 | Annual | T7 POAK | DSL | AllMYr | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Los Angele | 2018 | Annual | T7 POLA | DSL | AllMYr | 5 | 0 | 1806.917943 | 0 | 5.837303519 | 11.61192957 | 24.76151845 | 0 | 0.122235955 | 0.112457079 | 4079.222199 | 6.645326 |
| Los Angele | 2018 | Annual | T7 POLA | DSL | AllMYr | 30 | 0 | 172577.1701 | 0 | 0.565249086 | 2.058925331 | 8.557956268 | 0 | 0.087111035 | 0.080142152 | 1911.639728 | 0.643493 |
| Los Angele | 2018 | Annual | T7 Public | DSL | AllMYr | 5 | 0 | 84.66968398 | 0 | 1.197875122 | 2.18403967 | 34.0910262 | 0 | 0.219885875 | 0.202295005 | 4086.633829 | 1.36369 |
| Los Angele | 2018 | Annual | T7 Public | DSL | AllMYr | 30 | 0 | 8086.728291 | 0 | 0.111917248 | 0.518967846 | 11.66413345 | 0 | 0.060934514 | 0.056059753 | 1915.113029 | 0.127409 |
| Los Angele | 2018 | Annual | T7 Single | DSL | AllMYr | 5 | 0 | 718.0124965 | 0 | 1.881749759 | 3.578541931 | 21.18993746 | 0 | 0.137556611 | 0.126552082 | 4013.231621 | 2.142229 |
| Los Angele | 2018 | Annual | T7 Single | DSL | AllMYr | 30 | 0 | 68576.75257 | 0 | 0.173721405 | 0.67382418 | 7.045277779 | 0 | 0.048711139 | 0.044814247 | 1880.714663 | 0.197769 |
| Los Angele | 2018 | Annual | T7 single c | DSL | AllMYr | 5 | 0 | 318.0848898 | 0 | 1.879543421 | 3.566961593 | 21.90813247 | 0 | 0.141176514 | 0.129882393 | 4015.547555 | 2.139717 |
| Los Angele | 2018 | Annual | T7 single c | DSL | AllMYr | 30 | 0 | 30380.01273 | 0 | 0.173146793 | 0.673440954 | 7.281673252 | 0 | 0.049195473 | 0.045259835 | 1881.799976 | 0.197114 |
| Los Angele | 2018 | Annual | T7 SWCV | DSL | AllMYr | 5 | 0 | 229.4163098 | 0 | 1.628712643 | 3.009350484 | 30.05697711 | 0 | 0.248956287 | 0.229039784 | 4069.174041 | 1.854165 |
| Los Angele | 2018 | Annual | T7 SWCV | DSL | AllMYr | 30 | 0 | 21911.35334 | 0 | 0.153603969 | 0.708988925 | 10.36098293 | 0 | 0.071394688 | 0.065683113 | 1906.930875 | 0.174866 |
| Los Angele | 2018 | Annual | T7 tractor | DSL | AllMYr | 5 | 0 | 1883.23079 | 0 | 2.762846677 | 5.360414262 | 18.91375763 | 0 | 0.143666117 | 0.132172828 | 4001.170246 | 3.145291 |
| Los Angele | 2018 | Annual | T7 tractor | DSL | AllMYr | 30 | 0 | 179865.744 | 0 | 0.260244298 | 0.984402026 | 6.359657222 | 0 | 0.064299402 | 0.05915545 | 1875.062359 | 0.296268 |
| Los Angele | 2018 | Annual | T7 tractor | DSL | AllMYr | 5 | 0 | 237.155795 | 0 | 2.724623395 | 5.247167237 | 21.03320082 | 0 | 0.158968969 | 0.146251452 | 4006.307176 | 3.101776 |
| Los Angele | 2018 | Annual | T7 tractor | DSL | AllMYr | 30 | 0 | 22650.54487 | 0 | 0.254653664 | 0.973098672 | 7.046226901 | 0 | 0.065354067 | 0.060125741 | 1877.469671 | 0.289904 |
| Los Angele | 2018 | Annual | T7 utility | DSL | AllMYr | 5 | 0 | 9.754737377 | 0 | 1.393057141 | 2.703965562 | 17.25087367 | 0 | 0.082751152 | 0.07613106 | 4014.108283 | 1.58589 |
| Los Angele | 2018 | Annual | T7 utility | DSL | AllMYr | 30 | 0 | 931.6665305 | 0 | 0.131784016 | 0.493256973 | 5.770770042 | 0 | 0.035104953 | 0.032296557 | 1881.125492 | 0.150026 |
| Los Angele | 2018 | Annual | T7IS | GAS | AllMYr | 5 | 0 | 299.8240929 | 0 | 3.257399996 | 120.6094994 | 3.290881237 | 0 | 0.00192394 | 0.001754509 | 2513.497244 | 3.883698 |
| Los Angele | 2018 | Annual | T7IS | GAS | AllMYr | 30 | 0 | 21721.48732 | 0 | 0.664526368 | 29.69455592 | 4.053923655 | 0 | 3.98E-04 | 3.63E-04 | 619.4336381 | 0.803672 |
| Los Angele | 2018 | Annual | UBUS | GAS | AllMYr | 5 | 0 | 1024.784555 | 0 | 7.87277515 | 53.4466029 | 2.637194826 | 0 | 0.013958186 | 0.012726499 | 2513.497276 | 8.449303 |
| Los Angele | 2018 | Annual | UBUS | DSL | AllMYr | 5 | 0 | 5933.656732 | 0 | 1.658796085 | 10.6087349 | 27.96249746 | 0 | 0.706917487 | 0.650364126 | 2529.115981 | 1.888429 |
| Los Angele | 2018 | Annual | UBUS | GAS | AllMYr | 30 | 0 | 18299.2787 | 0 | 1.628807366 | 13.17153869 | 3.238766534 | 0 | 0.002887825 | 0.002633 | 619.4336439 | 1.748086 |
| Los Angele | 2018 | Annual | UBUS | DSL | AllMYr | 30 | 0 | 105955.5803 | 0 | 0.515415048 | 2.118435095 | 12.41138524 | 0 | 0.21965081 | 0.202078757 | 2529.115891 | 0.586766 |
| Los Angele | 2018 | Annual | All Other B | DSL | AllMYr | 5 | 0 | 267.9838989 | 0 | 1.305650149 | 2.168595609 | 14.09774141 | 0 | 0.128387671 | 0.118116657 | 2593.930692 | 1.486383 |
| Los Angele | 2018 | Annual | All Other B | DSL | AllMYr | 30 | 0 | 22716.42427 | 0 | 0.118639694 | 0.415785351 | 4.661584909 | 0 | 0.041744895 | 0.038405303 | 1215.589816 | 0.135062 |

# Appendix F

# SCAQMD Rule 403

(Adopted May 7, 1976) (Amended November 6, 1992)
(Amended July 9, 1993) (Amended February 14, 1997)
(Amended December 11, 1998)(Amended April 2, 2004)
(Amended June 3, 2005)

**RULE 403. FUGITIVE DUST**

(a) Purpose

The purpose of this Rule is to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce or mitigate fugitive dust emissions.

(b) Applicability

The provisions of this Rule shall apply to any activity or man-made condition capable of generating fugitive dust.

(c) Definitions

(1) ACTIVE OPERATIONS means any source capable of generating fugitive dust, including, but not limited to, earth-moving activities, construction/demolition activities, disturbed surface area, or heavy- and light-duty vehicular movement.

(2) AGGREGATE-RELATED PLANTS are defined as facilities that produce and / or mix sand and gravel and crushed stone.

(3) AGRICULTURAL HANDBOOK means the region-specific guidance document that has been approved by the Governing Board or hereafter approved by the Executive Officer and the U.S. EPA. For the South Coast Air Basin, the Board-approved region-specific guidance document is the Rule 403 Agricultural Handbook dated December 1998. For the Coachella Valley, the Board-approved region-specific guidance document is the Rule 403 Coachella Valley Agricultural Handbook dated April 2, 2004.

(4) ANEMOMETERS are devices used to measure wind speed and direction in accordance with the performance standards, and maintenance and calibration criteria as contained in the most recent Rule 403 Implementation Handbook.

(5) BEST AVAILABLE CONTROL MEASURES means fugitive dust control actions that are set forth in Table 1 of this Rule.

(6) BULK MATERIAL is sand, gravel, soil, aggregate material less than two inches in length or diameter, and other organic or inorganic particulate matter.

(7) CEMENT MANUFACTURING FACILITY is any facility that has a cement kiln at the facility.

(8) CHEMICAL STABILIZERS are any non-toxic chemical dust suppressant which must not be used if prohibited for use by the Regional Water Quality Control Boards, the California Air Resources Board, the U.S. Environmental Protection Agency (U.S. EPA), or any applicable law, rule or regulation. The chemical stabilizers shall meet any specifications, criteria, or tests required by any federal, state, or local water agency. Unless otherwise indicated, the use of a non-toxic chemical stabilizer shall be of sufficient concentration and application frequency to maintain a stabilized surface.

(9) COMMERCIAL POULTRY RANCH means any building, structure, enclosure, or premises where more than 100 fowl are kept or maintained for the primary purpose of producing eggs or meat for sale or other distribution.

(10) CONFINED ANIMAL FACILITY means a source or group of sources of air pollution at an agricultural source for the raising of 3,360 or more fowl or 50 or more animals, including but not limited to, any structure, building, installation, farm, corral, coop, feed storage area, milking parlor, or system for the collection, storage, or distribution of solid and liquid manure; if domesticated animals, including horses, sheep, goats, swine, beef cattle, rabbits, chickens, turkeys, or ducks are corralled, penned, or otherwise caused to remain in restricted areas for commercial agricultural purposes and feeding is by means other than grazing.

(11) CONSTRUCTION/DEMOLITION ACTIVITIES means any on-site mechanical activities conducted in preparation of, or related to, the building, alteration, rehabilitation, demolition or improvement of property, including, but not limited to the following activities: grading, excavation, loading, crushing, cutting, planing, shaping or ground breaking.

(12) CONTRACTOR means any person who has a contractual arrangement to conduct an active operation for another person.

(13) DAIRY FARM is an operation on a property, or set of properties that are contiguous or separated only by a public right-of-way, that raises cows or

produces milk from cows for the purpose of making a profit or for a livelihood. Heifer and calf farms are dairy farms.

(14) DISTURBED SURFACE AREA means a portion of the earth's surface which has been physically moved, uncovered, destabilized, or otherwise modified from its undisturbed natural soil condition, thereby increasing the potential for emission of fugitive dust. This definition excludes those areas which have:

(A) been restored to a natural state, such that the vegetative ground cover and soil characteristics are similar to adjacent or nearby natural conditions;

(B) been paved or otherwise covered by a permanent structure; or

(C) sustained a vegetative ground cover of at least 70 percent of the native cover for a particular area for at least 30 days.

(15) DUST SUPPRESSANTS are water, hygroscopic materials, or non-toxic chemical stabilizers used as a treatment material to reduce fugitive dust emissions.

(16) EARTH-MOVING ACTIVITIES means the use of any equipment for any activity where soil is being moved or uncovered, and shall include, but not be limited to the following: grading, earth cutting and filling operations, loading or unloading of dirt or bulk materials, adding to or removing from open storage piles of bulk materials, landfill operations, weed abatement through disking, and soil mulching.

(17) DUST CONTROL SUPERVISOR means a person with the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule 403 requirements at an active operation.

(18) FUGITIVE DUST means any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of any person.

(19) HIGH WIND CONDITIONS means that instantaneous wind speeds exceed 25 miles per hour.

(20) INACTIVE DISTURBED SURFACE AREA means any disturbed surface area upon which active operations have not occurred or are not expected to occur for a period of 20 consecutive days.

(21) LARGE OPERATIONS means any active operations on property which contains 50 or more acres of disturbed surface area; or any earth-moving operation with a daily earth-moving or throughput volume of 3,850 cubic

meters (5,000 cubic yards) or more three times during the most recent 365-day period.

(22) OPEN STORAGE PILE is any accumulation of bulk material, which is not fully enclosed, covered or chemically stabilized, and which attains a height of three feet or more and a total surface area of 150 or more square feet.

(23) PARTICULATE MATTER means any material, except uncombined water, which exists in a finely divided form as a liquid or solid at standard conditions.

(24) PAVED ROAD means a public or private improved street, highway, alley, public way, or easement that is covered by typical roadway materials, but excluding access roadways that connect a facility with a public paved roadway and are not open to through traffic. Public paved roads are those open to public access and that are owned by any federal, state, county, municipal or any other governmental or quasi-governmental agencies. Private paved roads are any paved roads not defined as public.

(25) $PM_{10}$ means particulate matter with an aerodynamic diameter smaller than or equal to 10 microns as measured by the applicable State and Federal reference test methods.

(26) PROPERTY LINE means the boundaries of an area in which either a person causing the emission or a person allowing the emission has the legal use or possession of the property. Where such property is divided into one or more sub-tenancies, the property line(s) shall refer to the boundaries dividing the areas of all sub-tenancies.

(27) RULE 403 IMPLEMENTATION HANDBOOK means a guidance document that has been approved by the Governing Board on April 2, 2004 or hereafter approved by the Executive Officer and the U.S. EPA.

(28) SERVICE ROADS are paved or unpaved roads that are used by one or more public agencies for inspection or maintenance of infrastructure and which are not typically used for construction-related activity.

(29) SIMULTANEOUS SAMPLING means the operation of two $PM_{10}$ samplers in such a manner that one sampler is started within five minutes of the other, and each sampler is operated for a consecutive period which must be not less than 290 minutes and not more than 310 minutes.

(30) SOUTH COAST AIR BASIN means the non-desert portions of Los Angeles, Riverside, and San Bernardino counties and all of Orange

County as defined in California Code of Regulations, Title 17, Section 60104. The area is bounded on the west by the Pacific Ocean, on the north and east by the San Gabriel, San Bernardino, and San Jacinto Mountains, and on the south by the San Diego county line.

(31) STABILIZED SURFACE means any previously disturbed surface area or open storage pile which, through the application of dust suppressants, shows visual or other evidence of surface crusting and is resistant to wind-driven fugitive dust and is demonstrated to be stabilized. Stabilization can be demonstrated by one or more of the applicable test methods contained in the Rule 403 Implementation Handbook.

(32) TRACK-OUT means any bulk material that adheres to and agglomerates on the exterior surface of motor vehicles, haul trucks, and equipment (including tires) that have been released onto a paved road and can be removed by a vacuum sweeper or a broom sweeper under normal operating conditions.

(33) TYPICAL ROADWAY MATERIALS means concrete, asphaltic concrete, recycled asphalt, asphalt, or any other material of equivalent performance as determined by the Executive Officer, and the U.S. EPA.

(34) UNPAVED ROADS means any unsealed or unpaved roads, equipment paths, or travel ways that are not covered by typical roadway materials. Public unpaved roads are any unpaved roadway owned by federal, state, county, municipal or other governmental or quasi-governmental agencies. Private unpaved roads are all other unpaved roadways not defined as public.

(35) VISIBLE ROADWAY DUST means any sand, soil, dirt, or other solid particulate matter which is visible upon paved road surfaces and which can be removed by a vacuum sweeper or a broom sweeper under normal operating conditions.

(36) WIND-DRIVEN FUGITIVE DUST means visible emissions from any disturbed surface area which is generated by wind action alone.

(37) WIND GUST is the maximum instantaneous wind speed as measured by an anemometer.

(d) Requirements

(1) No person shall cause or allow the emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area such that:

(A) the dust remains visible in the atmosphere beyond the property line of the emission source; or

(B) the dust emission exceeds 20 percent opacity (as determined by the appropriate test method included in the Rule 403 Implementation Handbook), if the dust emission is the result of movement of a motorized vehicle.

(2) No person shall conduct active operations without utilizing the applicable best available control measures included in Table 1 of this Rule to minimize fugitive dust emissions from each fugitive dust source type within the active operation.

(3) No person shall cause or allow $PM_{10}$ levels to exceed 50 micrograms per cubic meter when determined, by simultaneous sampling, as the difference between upwind and downwind samples collected on high-volume particulate matter samplers or other U.S. EPA-approved equivalent method for $PM_{10}$ monitoring. If sampling is conducted, samplers shall be:

(A) Operated, maintained, and calibrated in accordance with 40 Code of Federal Regulations (CFR), Part 50, Appendix J, or appropriate U.S. EPA-published documents for U.S. EPA-approved equivalent method(s) for $PM_{10}$.

(B) Reasonably placed upwind and downwind of key activity areas and as close to the property line as feasible, such that other sources of fugitive dust between the sampler and the property line are minimized.

(4) No person shall allow track-out to extend 25 feet or more in cumulative length from the point of origin from an active operation. Notwithstanding the preceding, all track-out from an active operation shall be removed at the conclusion of each workday or evening shift.

(5) No person shall conduct an active operation with a disturbed surface area of five or more acres, or with a daily import or export of 100 cubic yards or more of bulk material without utilizing at least one of the measures listed in subparagraphs (d)(5)(A) through (d)(5)(E) at each vehicle egress from the site to a paved public road.

(A) Install a pad consisting of washed gravel (minimum-size: one inch) maintained in a clean condition to a depth of at least six inches and extending at least 30 feet wide and at least 50 feet long.

(B) Pave the surface extending at least 100 feet and at least 20 feet wide.

(C) Utilize a wheel shaker/wheel spreading device consisting of raised dividers (rails, pipe, or grates) at least 24 feet long and 10 feet wide to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.

(D) Install and utilize a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.

(E) Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the actions specified in subparagraphs (d)(5)(A) through (d)(5)(D).

(6) Beginning January 1, 2006, any person who operates or authorizes the operation of a confined animal facility subject to this Rule shall implement the applicable conservation management practices specified in Table 4 of this Rule.

(e) Additional Requirements for Large Operations

(1) Any person who conducts or authorizes the conducting of a large operation subject to this Rule shall implement the applicable actions specified in Table 2 of this Rule at all times and shall implement the applicable actions specified in Table 3 of this Rule when the applicable performance standards can not be met through use of Table 2 actions; and shall:

(A) submit a fully executed Large Operation Notification (Form 403 N) to the Executive Officer within 7 days of qualifying as a large operation;

(B) include, as part of the notification, the name(s), address(es), and phone number(s) of the person(s) responsible for the submittal, and a description of the operation(s), including a map depicting the location of the site;

(C) maintain daily records to document the specific dust control actions taken, maintain such records for a period of not less than three years; and make such records available to the Executive Officer upon request;

(D) install and maintain project signage with project contact signage that meets the minimum standards of the Rule 403 Implementation Handbook, prior to initiating any earthmoving activities;

(E) identify a dust control supervisor that:

(i) is employed by or contracted with the property owner or developer;

(ii) is on the site or available on-site within 30 minutes during working hours;

(iii) has the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule requirements;

(iv) has completed the AQMD Fugitive Dust Control Class and has been issued a valid Certificate of Completion for the class; and

(F) notify the Executive Officer in writing within 30 days after the site no longer qualifies as a large operation as defined by paragraph (c)(18).

(2) Any Large Operation Notification submitted to the Executive Officer or AQMD-approved dust control plan shall be valid for a period of one year from the date of written acceptance by the Executive Officer. Any Large Operation Notification accepted pursuant to paragraph (e)(1), excluding those submitted by aggregate-related plants and cement manufacturing facilities must be resubmitted annually by the person who conducts or authorizes the conducting of a large operation, at least 30 days prior to the expiration date, or the submittal shall no longer be valid as of the expiration date. If all fugitive dust sources and corresponding control measures or special circumstances remain identical to those identified in the previously accepted submittal or in an AQMD-approved dust control plan, the resubmittal may be a simple statement of no-change (Form 403NC).

(f) Compliance Schedule

The newly amended provisions of this Rule shall become effective upon adoption. Pursuant to subdivision (e), any existing site that qualifies as a large operation will have 60 days from the date of Rule adoption to comply with the notification and recordkeeping requirements for large operations. Any Large Operation

Notification or AQMD-approved dust control plan which has been accepted prior to the date of adoption of these amendments shall remain in effect and the Large Operation Notification or AQMD-approved dust control plan annual resubmittal date shall be one year from adoption of this Rule amendment.

(g) Exemptions

(1) The provisions of this Rule shall not apply to:

(A) Dairy farms.

(B) Confined animal facilities provided that the combined disturbed surface area within one continuous property line is one acre or less.

(C) Agricultural vegetative crop operations provided that the combined disturbed surface area within one continuous property line and not separated by a paved public road is 10 acres or less.

(D) Agricultural vegetative crop operations within the South Coast Air Basin, whose combined disturbed surface area includes more than 10 acres provided that the person responsible for such operations:

(i) voluntarily implements the conservation management practices contained in the Rule 403 Agricultural Handbook;

(ii) completes and maintains the self-monitoring form documenting sufficient conservation management practices, as described in the Rule 403 Agricultural Handbook; and

(iii) makes the completed self-monitoring form available to the Executive Officer upon request.

(E) Agricultural vegetative crop operations outside the South Coast Air Basin whose combined disturbed surface area includes more than 10 acres provided that the person responsible for such operations:

(i) voluntarily implements the conservation management practices contained in the Rule 403 Coachella Valley Agricultural Handbook; and

(ii) completes and maintains the self-monitoring form documenting sufficient conservation management practices, as described in the Rule 403 Coachella Valley Agricultural Handbook; and

(iii) makes the completed self-monitoring form available to the Executive Officer upon request.

(F) Active operations conducted during emergency life-threatening situations, or in conjunction with any officially declared disaster or state of emergency.

(G) Active operations conducted by essential service utilities to provide electricity, natural gas, telephone, water and sewer during periods of service outages and emergency disruptions.

(H) Any contractor subsequent to the time the contract ends, provided that such contractor implemented the required control measures during the contractual period.

(I) Any grading contractor, for a phase of active operations, subsequent to the contractual completion of that phase of earth-moving activities, provided that the required control measures have been implemented during the entire phase of earth-moving activities, through and including five days after the final grading inspection.

(J) Weed abatement operations ordered by a county agricultural commissioner or any state, county, or municipal fire department, provided that:

(i) mowing, cutting or other similar process is used which maintains weed stubble at least three inches above the soil; and

(ii) any discing or similar operation which cuts into and disturbs the soil, where watering is used prior to initiation of these activities, and a determination is made by the agency issuing the weed abatement order that, due to fire hazard conditions, rocks, or other physical obstructions, it is not practical to meet the conditions specified in clause (g)(1)(H)(i). The provisions this clause shall not exempt the owner of any property from stabilizing, in accordance with paragraph (d)(2), disturbed surface areas which have been created as a result of the weed abatement actions.

(K) sandblasting operations.

(2) The provisions of paragraphs (d)(1) and (d)(3) shall not apply:

(A) When wind gusts exceed 25 miles per hour, provided that:

(i) The required Table 3 contingency measures in this Rule are implemented for each applicable fugitive dust source type, and;

(ii) records are maintained in accordance with subparagraph (e)(1)(C).

(B) To unpaved roads, provided such roads:

(i) are used solely for the maintenance of wind-generating equipment; or

(ii) are unpaved public alleys as defined in Rule 1186; or

(iii) are service roads that meet all of the following criteria:

(a) are less than 50 feet in width at all points along the road;

(b) are within 25 feet of the property line; and

(c) have a traffic volume less than 20 vehicle-trips per day.

(C) To any active operation, open storage pile, or disturbed surface area for which necessary fugitive dust preventive or mitigative actions are in conflict with the federal Endangered Species Act, as determined in writing by the State or federal agency responsible for making such determinations.

(3) The provisions of (d)(2) shall not apply to any aggregate-related plant or cement manufacturing facility that implements the applicable actions specified in Table 2 of this Rule at all times and shall implement the applicable actions specified in Table 3 of this Rule when the applicable performance standards of paragraphs (d)(1) and (d)(3) can not be met through use of Table 2 actions.

(4) The provisions of paragraphs (d)(1), (d)(2), and (d)(3) shall not apply to:

(A) Blasting operations which have been permitted by the California Division of Industrial Safety; and

(B) Motion picture, television, and video production activities when dust emissions are required for visual effects. In order to obtain this exemption, the Executive Officer must receive notification in writing at least 72 hours in advance of any such activity and no nuisance results from such activity.

(5) The provisions of paragraph (d)(3) shall not apply if the dust control actions, as specified in Table 2, are implemented on a routine basis for

each applicable fugitive dust source type. To qualify for this exemption, a person must maintain records in accordance with subparagraph (e)(1)(C).

(6) The provisions of paragraph (d)(4) shall not apply to earth coverings of public paved roadways where such coverings are approved by a local government agency for the protection of the roadway, and where such coverings are used as roadway crossings for haul vehicles provided that such roadway is closed to through traffic and visible roadway dust is removed within one day following the cessation of activities.

(7) The provisions of subdivision (e) shall not apply to:

(A) officially-designated public parks and recreational areas, including national parks, national monuments, national forests, state parks, state recreational areas, and county regional parks.

(B) any large operation which is required to submit a dust control plan to any city or county government which has adopted a District-approved dust control ordinance.

(C) any large operation subject to Rule 1158, which has an approved dust control plan pursuant to Rule 1158, provided that all sources of fugitive dust are included in the Rule 1158 plan.

(8) The provisions of subparagraph (e)(1)(A) through (e)(1)(C) shall not apply to any large operation with an AQMD-approved fugitive dust control plan provided that there is no change to the sources and controls as identified in the AQMD-approved fugitive dust control plan.

(h) Fees

Any person conducting active operations for which the Executive Officer conducts upwind/downwind monitoring for $PM_{10}$ pursuant to paragraph (d)(3) shall be assessed applicable Ambient Air Analysis Fees pursuant to Rule 304.1. Applicable fees shall be waived for any facility which is exempted from paragraph (d)(3) or meets the requirements of paragraph (d)(3).

**TABLE 1**
**BEST AVAILABLE CONTROL MEASURES**
**(Applicable to All Construction Activity Sources)**

| Source Category | Control Measure | Guidance |
|---|---|---|
| Backfilling | 01-1 Stabilize backfill material when not actively handling; and<br>01-2 Stabilize backfill material during handling; and<br>01-3 Stabilize soil at completion of activity. | ✓ Mix backfill soil with water prior to moving<br>✓ Dedicate water truck or high capacity hose to backfilling equipment<br>✓ Empty loader bucket slowly so that no dust plumes are generated<br>✓ Minimize drop height from loader bucket |
| Clearing and grubbing | 02-1 Maintain stability of soil through pre-watering of site prior to clearing and grubbing; and<br>02-2 Stabilize soil during clearing and grubbing activities; and<br>02-3 Stabilize soil immediately after clearing and grubbing activities. | ✓ Maintain live perennial vegetation where possible<br>✓ Apply water in sufficient quantity to prevent generation of dust plumes |
| Clearing forms | 03-1 Use water spray to clear forms; or<br>03-2 Use sweeping and water spray to clear forms; or<br>03-3 Use vacuum system to clear forms. | ✓ Use of high pressure air to clear forms may cause exceedance of Rule requirements |
| Crushing | 04-1 Stabilize surface soils prior to operation of support equipment; and<br>04-2 Stabilize material after crushing. | ✓ Follow permit conditions for crushing equipment<br>✓ Pre-water material prior to loading into crusher<br>✓ Monitor crusher emissions opacity<br>✓ Apply water to crushed material to prevent dust plumes |

**TABLE 1**
**BEST AVAILABLE CONTROL MEASURES**
**(Applicable to All Construction Activity Sources)**

| Source Category | Control Measure | Guidance |
|---|---|---|
| Cut and fill | 05-1 Pre-water soils prior to cut and fill activities; and<br>05-2 Stabilize soil during and after cut and fill activities. | ✓ For large sites, pre-water with sprinklers or water trucks and allow time for penetration<br>✓ Use water trucks/pulls to water soils to depth of cut prior to subsequent cuts |
| Demolition – mechanical/manual | 06-1 Stabilize wind erodible surfaces to reduce dust; and<br>06-2 Stabilize surface soil where support equipment and vehicles will operate; and<br>06-3 Stabilize loose soil and demolition debris; and<br>06-4 Comply with AQMD Rule 1403. | ✓ Apply water in sufficient quantities to prevent the generation of visible dust plumes |
| Disturbed soil | 07-1 Stabilize disturbed soil throughout the construction site; and<br>07-2 Stabilize disturbed soil between structures | ✓ Limit vehicular traffic and disturbances on soils where possible<br>✓ If interior block walls are planned, install as early as possible<br>✓ Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes |
| Earth-moving activities | 08-1 Pre-apply water to depth of proposed cuts; and<br>08-2 Re-apply water as necessary to maintain soils in a damp condition and to ensure that visible emissions do not exceed 100 feet in any direction; and<br>08-3 Stabilize soils once earth-moving activities are complete. | ✓ Grade each project phase separately, timed to coincide with construction phase<br>✓ Upwind fencing can prevent material movement on site<br>✓ Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes |

**TABLE 1**
**BEST AVAILABLE CONTROL MEASURES**
**(Applicable to All Construction Activity Sources)**

| Source Category | Control Measure | Guidance |
|---|---|---|
| Importing/exporting of bulk materials | 09-1 Stabilize material while loading to reduce fugitive dust emissions; and<br>09-2 Maintain at least six inches of freeboard on haul vehicles; and<br>09-3 Stabilize material while transporting to reduce fugitive dust emissions; and<br>09-4 Stabilize material while unloading to reduce fugitive dust emissions; and<br>09-5 Comply with Vehicle Code Section 23114. | ✓ Use tarps or other suitable enclosures on haul trucks<br>✓ Check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage<br>✓ Comply with track-out prevention/mitigation requirements<br>✓ Provide water while loading and unloading to reduce visible dust plumes |
| Landscaping | 10-1 Stabilize soils, materials, slopes | ✓ Apply water to materials to stabilize<br>✓ Maintain materials in a crusted condition<br>✓ Maintain effective cover over materials<br>✓ Stabilize sloping surfaces using soil binders until vegetation or ground cover can effectively stabilize the slopes<br>✓ Hydroseed prior to rain season |
| Road shoulder maintenance | 11-1 Apply water to unpaved shoulders prior to clearing; and<br>11-2 Apply chemical dust suppressants and/or washed gravel to maintain a stabilized surface after completing road shoulder maintenance. | ✓ Installation of curbing and/or paving of road shoulders can reduce recurring maintenance costs<br>✓ Use of chemical dust suppressants can inhibit vegetation growth and reduce future road shoulder maintenance costs |

**TABLE 1**
**BEST AVAILABLE CONTROL MEASURES**
**(Applicable to All Construction Activity Sources)**

| Source Category | Control Measure | Guidance |
|---|---|---|
| Screening | 12-1 Pre-water material prior to screening; and<br>12-2 Limit fugitive dust emissions to opacity and plume length standards; and<br>12-3 Stabilize material immediately after screening. | ✓ Dedicate water truck or high capacity hose to screening operation<br>✓ Drop material through the screen slowly and minimize drop height<br>✓ Install wind barrier with a porosity of no more than 50% upwind of screen to the height of the drop point |
| Staging areas | 13-1 Stabilize staging areas during use; and<br>13-2 Stabilize staging area soils at project completion. | ✓ Limit size of staging area<br>✓ Limit vehicle speeds to 15 miles per hour<br>✓ Limit number and size of staging area entrances/exists |
| Stockpiles/<br>Bulk Material<br>Handling | 14-1 Stabilize stockpiled materials.<br>14-2 Stockpiles within 100 yards of off-site occupied buildings must not be greater than eight feet in height; or must have a road bladed to the top to allow water truck access or must have an operational water irrigation system that is capable of complete stockpile coverage. | ✓ Add or remove material from the downwind portion of the storage pile<br>✓ Maintain storage piles to avoid steep sides or faces |

**TABLE 1**
**BEST AVAILABLE CONTROL MEASURES**
**(Applicable to All Construction Activity Sources)**

| Source Category | Control Measure | Guidance |
|---|---|---|
| Traffic areas for construction activities | 15-1 Stabilize all off-road traffic and parking areas; and<br>15-2 Stabilize all haul routes; and<br>15-3 Direct construction traffic over established haul routes. | ✓ Apply gravel/paving to all haul routes as soon as possible to all future roadway areas<br>✓ Barriers can be used to ensure vehicles are only used on established parking areas/haul routes |
| Trenching | 16-1 Stabilize surface soils where trencher or excavator and support equipment will operate; and<br>16-2 Stabilize soils at the completion of trenching activities. | ✓ Pre-watering of soils prior to trenching is an effective preventive measure. For deep trenching activities, pre-trench to 18 inches soak soils via the pre-trench and resuming trenching<br>✓ Washing mud and soils from equipment at the conclusion of trenching activities can prevent crusting and drying of soil on equipment |
| Truck loading | 17-1 Pre-water material prior to loading; and<br>17-2 Ensure that freeboard exceeds six inches (CVC 23114) | ✓ Empty loader bucket such that no visible dust plumes are created<br>✓ Ensure that the loader bucket is close to the truck to minimize drop height while loading |
| Turf Overseeding | 18-1 Apply sufficient water immediately prior to conducting turf vacuuming activities to meet opacity and plume length standards; and<br>18-2 Cover haul vehicles prior to exiting the site. | ✓ Haul waste material immediately off-site |

**TABLE 1**
**BEST AVAILABLE CONTROL MEASURES**
**(Applicable to All Construction Activity Sources)**

| Source Category | Control Measure | | Guidance |
|---|---|---|---|
| Unpaved roads/parking lots | 19-1 | Stabilize soils to meet the applicable performance standards; and | ✓ Restricting vehicular access to established unpaved travel paths and parking lots can reduce stabilization requirements |
| | 19-2 | Limit vehicular travel to established unpaved roads (haul routes) and unpaved parking lots. | |
| Vacant land | 20-1 | In instances where vacant lots are 0.10 acre or larger and have a cumulative area of 500 square feet or more that are driven over and/or used by motor vehicles and/or off-road vehicles, prevent motor vehicle and/or off-road vehicle trespassing, parking and/or access by installing barriers, curbs, fences, gates, posts, signs, shrubs, trees or other effective control measures. | |

## Table 2
## DUST CONTROL MEASURES FOR LARGE OPERATIONS

| FUGITIVE DUST SOURCE CATEGORY | | CONTROL ACTIONS |
|---|---|---|
| **Earth-moving (except construction cutting and filling areas, and mining operations)** | (1a) | Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR |
| | (1a-1) | For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction. |
| **Earth-moving: Construction fill areas:** | (1b) | Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the Executive Officer and the California Air Resources Board and the U.S. EPA, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations. |

**Table 2 (Continued)**

| FUGITIVE DUST SOURCE CATEGORY | CONTROL ACTIONS | |
|---|---|---|
| **Earth-moving: Construction cut areas and mining operations:** | (1c) | Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors. |
| **Disturbed surface areas (except completed grading areas)** | (2a/b) | Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 percent of the unstabilized area. |
| **Disturbed surface areas: Completed grading areas** | (2c) | Apply chemical stabilizers within five working days of grading completion; OR |
| | (2d) | Take actions (3a) or (3c) specified for inactive disturbed surface areas. |
| **Inactive disturbed surface areas** | (3a) | Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR |
| | (3b) | Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR |
| | (3c) | Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR |
| | (3d) | Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas. |

**Table 2 (Continued)**

| FUGITIVE DUST SOURCE CATEGORY | CONTROL ACTIONS | |
|---|---|---|
| **Unpaved Roads** | (4a) | Water all roads used for any vehicular traffic at least once per every two hours of active operations [3 times per normal 8 hour work day]; OR |
| | (4b) | Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; OR |
| | (4c) | Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface. |
| **Open storage piles** | (5a) | Apply chemical stabilizers; OR |
| | (5b) | Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR |
| | (5c) | Install temporary coverings; OR |
| | (5d) | Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile. This option may only be used at aggregate-related plants or at cement manufacturing facilities. |
| **All Categories** | (6a) | Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 2 may be used. |

**TABLE 3**
**CONTINGENCY CONTROL MEASURES FOR LARGE OPERATIONS**

| FUGITIVE DUST SOURCE CATEGORY | CONTROL MEASURES |
|---|---|
| **Earth-moving** | (1A) Cease all active operations; OR<br>(2A) Apply water to soil not more than 15 minutes prior to moving such soil. |
| **Disturbed surface areas** | (0B) On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR<br>(1B) Apply chemical stabilizers prior to wind event; OR<br>(2B) Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR<br>(3B) Take the actions specified in Table 2, Item (3c); OR<br>(4B) Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas. |
| **Unpaved roads** | (1C) Apply chemical stabilizers prior to wind event; OR<br>(2C) Apply water twice per hour during active operation; OR<br>(3C) Stop all vehicular traffic. |
| **Open storage piles** | (1D) Apply water twice per hour; OR<br>(2D) Install temporary coverings. |
| **Paved road track-out** | (1E) Cover all haul vehicles; OR<br>(2E) Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads. |
| **All Categories** | (1F) Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 3 may be used. |

## Table 4
## (Conservation Management Practices for Confined Animal Facilities)

| SOURCE CATEGORY | CONSERVATION MANAGEMENT PRACTICES |
|---|---|
| **Manure Handling**<br><br>**(Only applicable to Commercial Poultry Ranches)** | (1a) Cover manure prior to removing material off-site; AND<br>(1b) Spread the manure before 11:00 AM and when wind conditions are less than 25 miles per hour; AND<br>(1c) Utilize coning and drying manure management by removing manure at laying hen houses at least twice per year and maintain a base of no less than 6 inches of dry manure after clean out; or in lieu of complying with conservation management practice (1c), comply with conservation management practice (1d).<br>(1d) Utilize frequent manure removal by removing the manure from laying hen houses at least every seven days and immediately thin bed dry the material. |
| **Feedstock Handling** | (2a) Utilize a sock or boot on the feed truck auger when filling feed storage bins. |
| **Disturbed Surfaces** | (3a) Maintain at least 70 percent vegetative cover on vacant portions of the facility; OR<br>(3b) Utilize conservation tillage practices to manage the amount, orientation and distribution of crop and other plant residues on the soil surface year-round, while growing crops (if applicable) in narrow slots or tilled strips; OR<br>(3c) Apply dust suppressants in sufficient concentrations and frequencies to maintain a stabilized surface. |
| **Unpaved Roads** | (4a) Restrict access to private unpaved roads either through signage or physical access restrictions and control vehicular speeds to no more than 15 miles per hour through worker notifications, signage, or any other necessary means; OR<br>(4b) Cover frequently traveled unpaved roads with low silt content material (i.e., asphalt, concrete, recycled road base, or gravel to a minimum depth of four inches); OR<br>(4c) Treat unpaved roads with water, mulch, chemical dust suppressants or other cover to maintain a stabilized surface. |
| **Equipment Parking Areas** | (5a) Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR<br>(5b) Apply material with low silt content (i.e., asphalt, concrete, recycled road base, or gravel to a depth of four inches). |