Appendix B:
Air Quality and Climate Change Analysis

Air Quality Analysis Report
LADWP Harbor Refineries Recycled Water Pipeline
City of Carson,
California

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ACRONYMS AND ABBREVIATIONS

µm	Micrometer
µg	Micrograms
AQMP	Air Quality Management Plan
ARB	California Air Resources Control Board
BACM	Best Available Control Measures
Basin	South Coast Air Basin
BMP	Best Management Practices
CalEPA	California Environmental Protection Agency
CEQA	California Environmental Quality Act
CO	Carbon Monoxide
CY	Cubic Yards
DPH	Department of Public Health
DPM	Diesel Particulate Matter
EPA	Environmental Protection Agency
GHG	Greenhouse Gas
GWP	Global Warming Potential
HDD	Horizontal Directional Drilling
IPCC	United Nations Intergovernmental Panel on Climate Change
LADWP	Los Angeles Department of Water and Power
LOS	Level of Service
LST	Localized Significance Thresholds
MBA	Michael Brandman Associates
$MTCO_2e$	Metric Tons Carbon Dioxide equivalent
$MMTCO_2e$	Million Metric Tons Carbon Dioxide equivalent
NO_x	Nitrogen oxides
OPR	Governor's Office of Planning and Research
$PM_{2.5}$	Particulate matter 2.5 microns or less in diameter
PM_{10}	Particulate matter 10 microns or less in diameter
ppm	Parts per Million
ppt	Parts per Trillion
ROG	Reactive Organic Gases
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District

SRA	Source Receptor Areas
TAC	Toxic Air Contaminant
URBEMIS	Urban Emissions Model
VOC	Volatile Organic Compounds
WBMWD	West Basin Municipal Water District
WSCMO	Weather Service Contract Meteorological Office

SECTION 1: INTRODUCTION

1.1 - Project Location and Description

The Los Angeles Department of Water and Power (LADWP) proposes to construct the Harbor Refineries Recycled Water Pipeline Project (Project), located in the Cites of Carson and Wilmington. The proposed pipeline route for the Project is shown in the Draft EIR. The project would convey recycled water from the West Basin Municipal Water District (WBMWD) Carson Regional Water Recycling Plant to potential customers in the Los Angeles Harbor Area. Total pipeline length would be 60,000 feet. The project has been designed to offset up to 15,000 acre-feet per year of potable water with Nitrified Title 22 recycled water.

There are three alternative routes between the 23rd Street/Avalon Boulevard intersection and the Lomita Boulevard/Avalon Boulevard intersection. Recycled water would be delivered to multiple end-users, including Harbor City College, Harbor Park Golf Course, ConocoPhillips Refinery, Ken Malloy Harbor Regional Park, Tesoro Refinery, Air Products Plan, Valero Refinery, and other Department of Public Health (DPH) approved uses.

The pipeline would consist of a 36-inch (or smaller) diameter pipeline installed in the ground beneath city streets. Installation of the pipeline would be accomplished using open trench excavation. However, in areas where trenching is not possible such as the Dominguez Channel, railroad crossings and major street intersections, construction of the pipeline will involve pipe jacking and/or directional drilling. The locations where either jacking and/or directional drilling construction methods may be used are shown in the Draft EIR. Pipe jacking is expected to be utilized at nine locations and the directional drilling method may be used to cross the Dominguez Channel at two locations. However, depending on the underground constraints and conditions, the number and location of the directional drilling sites may vary during construction. As the design of the pipeline route is not finalized, LADWP anticipates up to 11 pipe jacking locations may be included. It can be assumed that open trench excavation will be used for all other areas of the pipeline route. Construction of all 60,000 feet of pipeline is expected to start in October 2009 and be completed by December 2011.

1.1.1 - Construction Components

Open Trench Excavation

Open-trench excavation is a construction method typically utilized to install pipelines and its appurtenant structures, which includes maintenance holes, flow meters, valves, and vaults. The process generally consists of excavation and shoring, pipe installation and backfilling followed by street restoration (where applicable). Construction would progress along the alignment with the maximum length of open trench at one time being approximately 300 feet in length with a total work area of approximately 1,000 linear feet. The entire width of the construction zone would be approximately 20 to 24 feet in width.

- **Site Preparation.** Traffic control plans, where necessary, would be first prepared in coordination with the Los Angeles Department of Transportation and/or local agency coordination, as applicable, to detour and delineate the traffic lanes around the work area. The approved plans would then be implemented. The existing pavement along the pipeline alignment would be cut with a concrete saw or otherwise broken and then removed using jackhammers, pavement breakers, and loaders. Other similar equipment may be used. The pavement would be removed from the project site and recycled, reused as a backfill material, or disposed of at an appropriate facility.
- **Excavation and Shoring.** A trench would be excavated along the alignment using backhoes, excavators, or other types of excavation equipment. Portions of the trench adjacent to some utilities may be manually excavated. The excavated soil may be temporarily stored in single rows adjacent to the trenches, stored at off-site staging areas, or immediately hauled away off-site.

  The size of the trench for the proposed pipeline would be approximately 48 inches wide and approximately 300 feet long, at any given time for each section that is being constructed. In addition, depending on the depth of adjacent substructures along the alignment, the depth of the trench would range from approximately 5 to 10 feet below the ground surface. As the trench is excavated, the trench walls would be supported, or shored, typically with hydraulic jacks or trench boxes.
- **Pipe Installation and Backfilling.** Once the trench has been excavated and shored, pipe laying would begin. Bedding material (such as sand or slurry) would be placed on the bottom of the trench. Pipe segments would then be lowered into the trench and placed on the bedding. If pipeline segments used do not include push-on joints, the segments would be welded to one another at the joints. The amount of pipe installed in a single day would vary, but is expected to range from 40 to 300 feet per day for the proposed pipeline. After laying and attaching the pipe segments, the trench would be immediately backfilled with slurry backfill. Any open trench at the end of each work day would be covered with steel plates so that traffic could resume use of the lanes.
- **Street Restoration.** Any portion of the roadway or landscaped areas damaged as a result of construction activities would be repaved and/or restored in accordance with all applicable City of Los Angeles Department of Public Works standards. Once the pavement has been restored, traffic delineation (striping) would also be restored.

Pipe Jacking

Jacking and boring will be used at most of the constrained locations such as major street intersections and railroad crossings. The jack and bore method avoids any surface disruption by using an auger to bore the pipeline underground and across to a specified location on the other side known as a receiving pit. The jack and bore method will allow the pipeline to be installed without disrupting traffic in heavily traveled areas and without disrupting rail service. The entire width of the construction zone would be approximately 20-30 feet in width depending on the size of the jacking

pits. As with open trench excavation, the four primary phases for pipe jacking are site preparation, excavation and shoring, pipe installation, and site restoration as described below.

- **Site Preparation.** Where necessary, traffic control plans detailing methods for detour and delineation of traffic lanes around the work areas would be prepared and implemented. The Traffic Control Plans would be coordinated with the Los Angeles Department of Transportation, Caltrans, and all appropriate agencies. In preparing to construct the jacking and receiving pits, the pavement would be first cut using a concrete saw or pavement breaker. As with open-trench excavation, the pavement would be removed from the project site and recycled, reused as a backfill material, or disposed of at an appropriate facility.
- **Excavation and Shoring.** A jacking pit and a receiving pit are generally used for each jacking location, one at each end of the pipe segment. The distance between the pits would be approximately 100 feet, but may be longer or shorter depending on site conditions. The average depth of construction would be 15 to 25 feet below the grade surface. The pits would be excavated with backhoes, cranes, and other excavation equipment. The excavated soil would be immediately hauled away. As excavation occurs, the pits would be shored utilizing a beam and plate shoring system.
- **Pipe Installation.** Once the pits are constructed and shored, a horizontal hydraulic jack would be placed at the bottom of the jacking pit. The steel casing would be lowered into the pit with a crane and placed on the jack. Installation of the steel casing is expected to progress at approximately 10 feet per day. Once the casing has been installed, the carrier pipe would then be lowered and placed on the jacks that would push the pipe into the steel casing. Installation of the pipeline is expected to progress at approximately 10 linear feet per day. Per County of Los Angeles Department of Health Services requirements, the pipeline would be covered with purple plastic that contain lettering identifying the pipe as recycled water pipeline to prevent any potential potable use (County of Los Angeles 2007).
- **Street Restoration.** After completion of the pipe installation along the jacking location, the shoring system would be disassembled as the pits are backfilled, the soil compacted, and the pavement or landscaping above replaced. Once the pavement has been restored, traffic delineation (striping) would also be restored.

In sequence, the general process for both the open trench excavation and pipe jacking methods consists of site preparation, excavation, pipe (and/or appurtenant structures) installation and backfilling, and site restoration. Both construction methods would require an off-site staging area to temporarily store supplies and materials. It is anticipated that multiple staging areas will be required at various locations. While the exact locations of all staging areas are currently unknown, all staging areas are anticipated to take place within LADWP property. The primary staging areas will likely be at the LADWP's Harbor District Yard. Lane closures will occur along the pipeline route as needed. It is anticipated that construction of the proposed pipeline may result in the closing of up to two travel lanes where construction would be taking place. No complete street closures are currently

anticipated. All traffic facility closures will have prior notice and approval from the Los Angeles Department of Transportation, Caltrans, and/or any other local transportation agency.

Directional Drilling

Directional Drilling method will be used at two different locations to install a portion of the pipeline across the Dominguez Channel. However, depending on the underground constraints and conditions, the number and location of the directional drilling sites may vary during construction. This operation may require closure of two lanes.

As with open trench excavation and pipe jacking, the four primary phases for directional drilling can be defined as site preparation, excavation and shoring, pipe installation, and site restoration as described below.

- **Site Preparation.** Where necessary, traffic control plans detailing methods for detour and delineation of traffic lanes around the work areas would be prepared and implemented. The Traffic Control Plans would be coordinated with the Los Angeles Department of Transportation, Caltrans, and all appropriate agencies.
- **Excavation and Shoring.** This method requires drilling across and under the channel and/or freeway using a drill head attached to a 4-inch steel cable (may require several passes until required bore is attain). The stringed pipe on the exit point of the drill is attached to the end of the steel cable and is pulled back with the pipe through the bore and out in the drill entry point. Required fittings are installed at each end of the pipe for connection to the pipeline installed by trenching method. The average depth of construction would be 20-60 feet below the grade surface.
- **Pipe Installation.** Once the pilot bore hole under the Channel is complete, a reamer will be attached to the drill stem to increase the size of the bore hole. Once the appropriate size is achieved, the pipe will be attached to the cable and the pipe will be pulled back through the hole. Installation of the pipeline is expected to progress at approximately 5 to 50 linear feet per day.
- **Street Restoration.** After completion of the pipe installation along the directional drilling location, the pavement or landscaping as necessary will be replaced. Once the pavement has been restored, traffic delineation (striping) would also be restored.

1.1.2 - Construction Timing and Equipment

Construction activities would occur between 6:00 a.m. and 3:30 p.m. Monday through Friday along the majority of the proposed pipeline route. However, nighttime construction (i.e., between 8:00 p.m. and 6:00 a.m.) may occur in both Carson and Los Angeles, to avoid traffic congestion, per Caltrans and other agency requirements.

Construction would typically require three to four crews of approximately eight workers each on a daily basis. On a typical workday, an average of 15 to 30 workers (up to a maximum of 40 workers)

would travel directly to one of the predetermined staging areas (primarily the Harbor District Yard) nearest the work site, where they would gather equipment and proceed in work crews, to the construction site along the alignment. Additionally, construction activities would include truck trips associated with supply delivery (including pipeline sections), transport of excavated soil from trenching (soil would be transported to the closest appropriate LADWP facility, as is standard LADWP practice, for reuse or ultimate disposal), and transport of backfill and paving materials to the site. Exported material would be transported to the closest appropriate facility, likely the Harbor District Yard. Contaminated material, if encountered, will likely be hauled to a location in Irwindale, or similar facility in compliance with applicable federal, State, and local regulations. No existing or abandoned pipeline or utility infrastructure will be removed or replaced; therefore, no other material is expected to be removed during construction. Anticipated hauling trips and volumes are provided in Table 1.

Table 1: Hauling Truck Trip Estimates

Activity	Load Size (cubic yards)	Trips (two-way)	Total Quantity
Open Trench[1]			
Pipe Delivery	NA	3/day	40 ft/day
Backfill Delivery	15	29/day	427 cy/day
Soil Haul-Off	10	43/day	424 cy/day
Jacking[2]			
Pavement/Soil Haul-Off	15	45	666 cy
Soil Haul-Off	15	33	500 cy
Grout Delivery	10	100	1,000 cy
Backfill Delivery	10	66	660 cy
Horizontal Directional Drilling[3]			
Pavement/Soil Haul-Off	15	149	2,233 cy
Grout Delivery	10	100	1,000 cy

Notes:
[1] For duration of construction.
[2] For up to 11 Jacking locations
[3] For up to 2 HDD locations
Source: LADWP 2009.

Table 2 lists the construction equipment required for the project along with the equipment's fuel type and the number of hours the equipment would be in service each day. For maximum level of impact analysis, a worst-case scenario is assumed in that all equipment identified in Table 2 would be used at all times everyday of the construction period. However, the equipment would not necessarily be in operation at the same location. LADWP anticipates the equipment may be in-use at three locations along the pipeline route at any one time.

Table 2: Construction Equipment by Stage of Construction

Equipment	Quantity	Type of Fuel	Hours per Day
All Phases			
Construction Worker Vehicles	8	Light Gasoline	8
Site Preparation			
End Dump Trucks	6	Heavy Diesel	8
5-cy Dump Truck	3	Medium Diesel	6
Excavating and Shoring			
End Dump Trucks	6	Heavy Diesel	8
5-cy Dump Truck	4	Medium Diesel	6
Backhoe	4	Medium Diesel	6
Loader	4	—	6
Excavator	4	—	6
Compactor	4	—	4
15-ton Crane	4	Heavy Diesel	8
Water Trunk	2	Heavy Diesel	8
Pipe Installation & Backfilling			
Hydraulic Jack	3	Light Diesel	6
Auger Machine	3	Light Diesel	6
Welding truck with Generator	3	Light Gasoline	4
40 kW Generator	3	Light Gasoline	6
Street Restoration			
Paver	2	Light Diesel	2
Source: LADWP 2009			

1.1.3 - Operations and Maintenance

Prior to the operation of the pipeline, two tests would be performed. A Hydrostatic Pressure Test would be performed to demonstrate that the pipeline, fittings, and welded section maintain mechanical integrity without failure or leakage under pressure and a Cross Connection Test (as defined by the California Code of Regulations) would be is performed to ensure that an absolute separation exists between the recycled and potable water systems). Upon the successful completion of these tests, the project would become operational. Operation of the proposed pipeline would not require any new permanent staff at either WBMWD or LADWP. Recycled water would be moved through the pipeline by pumps at the Juanita Millender-McDonald Carson Regional Water Recycling Plant. The pumps would be electronically controlled and operated from either WBMWD or LADWP's operational control center.

The amount of recycled water pumped through the pipeline would be regulated to closely match demand in order to avoid stagnant water in the pipeline. Therefore, the quantity of water pumped

would vary with maximum flows coinciding with peak demand for irrigation water in summer and minimum flows during winter.

The type of recycled water that will be delivered is generally referred to as Nitrified Title 22 recycled water. This water is treated in accordance with the requirements established by the State of California Department of Public Health.

1.2 - Purpose and Methods of Analysis

The following air quality analysis was prepared to evaluate whether the expected criteria air pollutant emissions generated from the Project would cause significant impacts to air resources in the Project area. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000 et seq.). The methodology follows the CEQA Air Quality Handbook prepared by the South Coast Air Quality Management District (SCAQMD) for quantification of emissions and evaluation of potential impacts to air resources (SCAQMD 1993 and SCAQMD 2007a).

SECTION 2: SETTING

Pertinent air quality and greenhouse gas information is contained in the respective Draft EIR sections. Detailed background information is provide in this section for reference.

2.1 - Pollutants of Concern

The pollutant descriptions below supplement the discussions contained in the Draft EIR. The most relevant effects of criteria pollutants is provided in Table 3

Table 3: Criteria Pollutant Effects

Air Pollutant	Most Relevant Effects
Ozone	(a) Decrease of pulmonary function and localized lung edema in humans and animals; (b) risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) increased mortality risk; (d) risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) vegetation damage; (f) property damage.
Carbon monoxide (CO)	(a) Aggravation of angina pectoris (chest pain or discomfort) and other aspects of coronary heart disease; (b) decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) impairment of central nervous system functions; (d) possible increased risk to fetuses.
Nitrogen dioxide (NO_2)	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) contribution to atmospheric discoloration.
Sulfur dioxide (SO_2)	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
Particulate matter (PM_{10})	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) declines in pulmonary function growth in children; (c) increased risk of premature death from heart or lung diseases in the elderly.
Particulate matter ($PM_{2.5}$)	
Hydrogen sulfide	It can irritate the eyes and respiratory tract and cause symptoms like headache, nausea, vomiting, and cough.
Sulfates	(a) Decrease in ventilatory function; (b) aggravation of asthmatic symptoms; (c) aggravation of cardio-pulmonary disease; (d) vegetation damage; (e) degradation of visibility; (f) property damage.
Lead	(a) Learning disabilities; (b) impairment of blood formation and nerve conduction.
Sources: ARB 2008a	

2.1.1 - Ozone

Ground-level ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone can irritate lung airways and cause inflammation much like a sunburn. Other symptoms include wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise, or outdoor activities. People with respiratory problems are most vulnerable, but even healthy people who are active outdoors can be affected when ozone levels are high. Chronic ozone exposure can induce morphological (tissue) changes throughout the respiratory tract, particularly at the junction of the conducting airways and the gas exchange zone in the deep lung. Anyone who spends time outdoors in the summer is at risk, particularly children, and other people who are more active outdoors. Even at very low levels, ground-level ozone triggers a variety of health problems, including aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis.

Ozone also damages vegetation and ecosystems. It leads to reduced agricultural crop and commercial forest yields; reduced growth and survivability of tree seedlings; and increased susceptibility to diseases, pests, and other stresses such as harsh weather. In the United States alone, ozone is responsible for an estimated $500 million in reduced crop production each year. Ozone also damages the foliage of trees and other plants, affecting the landscape of cities, national parks and forests, and recreation areas. In addition, ozone causes damage to buildings, rubber, and some plastics.

2.1.2 - Particulate Matter

These particles come in many sizes and shapes and can consist of hundreds of different chemicals. Some particles, known as primary particles, are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires. Others form in complicated reactions in the atmosphere from chemicals such as sulfur dioxides and nitrogen oxides, emitted from power plants, industrial activity, and automobiles. These particles, known as secondary particles, make up most of the fine particle pollution in the United States.

Particle exposure can lead to a variety of health effects. For example, numerous studies link particle levels to increased hospital admissions and emergency room visits—and even to death from heart or lung diseases. Both long- and short-term particle exposures have been linked to health problems. Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function, the development of chronic bronchitis, and even premature death. Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may increase susceptibility to respiratory infections. For people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to suffer serious effects from short-term exposures, although they may experience temporary minor irritation when particle levels are elevated.

2.1.3 - Carbon Monoxide

CO is a public health concern because it combines readily with hemoglobin, reducing the amount of oxygen transported in the bloodstream. The health threat from lower levels of CO is most serious for those who suffer from such heart-related diseases as angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death.

Motor vehicles are the dominant source of CO emissions in most areas. CO is described as having only a local influence because it dissipates quickly. High CO levels develop primarily during winter, when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Because CO is a product of incomplete combustion, motor vehicles exhibit increased CO emission rates at low air temperatures. High CO concentrations occur in areas of limited geographic size, sometimes referred to as hot spots. Since CO concentrations are strongly associated with motor vehicle emissions, high CO concentrations generally occur in the immediate vicinity of roadways with high traffic volumes and traffic congestion, active parking lots, and in automobile tunnels. Areas adjacent to heavily traveled and congested intersections are particularly susceptible to high CO concentrations.

2.1.4 - Toxic Air Contaminants

The ARB's TAC program traces its beginning to the criteria pollutant program in the 1960s. For many years, the criteria pollutant control program has been effective at reducing TACs, since many volatile organic compounds and PM constituents are also TACs. During the 1980s, the public's concern over toxic chemicals heightened. As a result, citizens demanded protection and control over the release of toxic chemicals into the air. In response to public concerns, the California legislature enacted the Toxic Air Contaminant Identification and Control Act governing the release of TACs into the air. This law charges the CARB with the responsibility for identifying substances as TACs, setting priorities for control, adopting control strategies, and promoting alternative processes.

2.2 - Greenhouse Gas

2.2.1 - State Regulations

Title 24. Although it was not originally intended to reduce GHGs, California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible

incorporation of new energy efficient technologies and methods. The latest amendments were made in October 2005 and currently require new homes to use half the energy they used only a decade ago. The 2005 standards are in effect through July 31, 2009. The 2008 standards will become effective August 1, 2009. The requirement for when the 2008 standards must be followed is dependent on when the application for the building permit is submitted. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions.

AB 1493. California Assembly Bill 1493 (Pavley), enacted on July 22, 2002, required the ARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Regulations adopted by the ARB would apply to 2009 and later model year vehicles. The ARB estimates that the regulation would reduce climate change emissions from the light-duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030 (ARB 2004). However, the regulation has been stalled by automaker lawsuits and by the U.S. EPA's refusal to grant California an implementation waiver. California is suing the federal government over the unprecedented failure to grant the waiver. Therefore, AB 1493 is not currently in effect. However, President Obama has asked the EPA to review its denial of the waiver.

Executive Order S-3-05. California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following reduction targets for GHG emissions:

- 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 (CA 2005).

The 2050 reduction goal represents what scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be an aggressive, but achievable, mid-term target. To meet these targets, the Governor directed the Secretary of the California EPA to lead a Climate Action Team (CAT) made up of representatives from the Business, Transportation, and Housing Agency; the Department of Food and Agriculture; the Resources Agency; the ARB; the Energy Commission; and the Public Utilities Commission. The CAT's Report to the Governor in 2006 contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met (CAT 2006).

The Governor signed **Executive Order S-01-07** on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. It also requires that a Low Carbon Fuel Standard for transportation fuels be established for California.

SB 1368. In 2006, the State Legislature adopted Senate Bill 1368 (SB 1368), which was subsequently signed into law by the Governor. SB 1368 directs the California Public Utilities Commission to adopt a performance standard for GHG emissions for the future power purchases of California utilities. SB 1368 seeks to limit carbon emissions associated with electrical energy consumed in California by forbidding procurement arrangements for energy longer than five years from resources that exceed the emissions of a relatively clean, combined cycle natural gas power plant. Due to the carbon content of its fuel source, a coal-fired plant cannot meet this standard because such plants emit roughly twice as much carbon as natural gas, combined cycle plants. Accordingly, the new law will effectively prevent California's utilities from investing in, otherwise financially supporting, or purchasing power from new coal plants located in or out of the State. Thus, SB 1368 will lead to lower GHG emissions associated with California's energy demand, as SB 1368 will effectively prohibit California utilities from purchasing power from out of state producers that cannot satisfy the performance standard for GHG emissions required by SB 1368.

SB 97 was passed in August 2007 and added Section 21083.05 to the Public Resources Code. The code states "(a) On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of GHG emissions or the effects of GHG emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a)." Section 21097 was also added to the Public Resources Code. It provides CEQA protection for transportation projects funded by the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 or projects funded by the Disaster Preparedness and Flood Prevention Bond Act of 2006, in stating that the failure to adequately analyze the effects of GHGs would not violate CEQA. However, the CEQA protection section of SB 97 remains in effect only until January 1, 2010.

SB 375 passed the Senate on August 30, 2008 and was signed by the Governor on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of GHG emissions, which emits over 40 percent of the total GHG emissions in California. Automobiles and light trucks alone contribute almost 30 percent. SB 375 indicates that GHGs from automobiles and light trucks can be reduced by new vehicle technology but significant reductions from changed land use patterns and improved transportation are necessary. SB 375 states, "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: 1) requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing GHG emissions, 2) aligns planning for transportation and housing, and 3) creates specified incentives for the implementation of the strategies. Concerning CEQA, SB 375, section 21159.28 states that CEQA findings determinations for certain projects are not required to reference, describe, or discuss (1) growth inducing impacts; or

(2) any project-specific or cumulative impacts from cars and light-duty truck trips generated by the project on global warming or the regional transportation network if the project:

1. Is in an area with an approved sustainable communities strategy or an alternative planning strategy that the ARB accepts as achieving the GHG emission reduction targets;
2. Is consistent with that strategy (in designation, density, building intensity, and applicable policies); and
3. Incorporates the mitigation measures required by an applicable prior environmental document.

Non-Regulatory

Attorney General. The Office of the California Attorney General maintains a list of CEQA Mitigations for Global Warming Impacts on its website. The Attorney General's Office has listed some examples of types of mitigations that local agencies may consider to offset or reduce global warming impacts from a project. The Attorney General's Office states that the lists are examples and not intended to be exhaustive but instead are provided as measures and policies that could be undertaken. Moreover, the measures cited may not be appropriate for every project, so the Attorney General suggests that the lead agency should use its own informed judgment in deciding which measures it would analyze, and which measures it would require, for a given project. The mitigation measures are divided into two groups: generally applicable measures and general plan measures. The Attorney General presents "generally applicable" measures in the following areas:

- Energy efficiency
- Renewable energy
- Water conservation and efficiency
- Solid waste measures
- Land use measures
- Transportation and motor vehicles
- Carbon offsets

However, this Project does not involve the development of a general plan, nor does it contain the land uses targeted by the Attorney General's measures.

SECTION 3: CONSTRUCTION ANALYSIS METHODOLOGY

Construction equipment such as backhoes, dump trucks, and water trucks are expected to be used for project construction and will result in exhaust emissions consisting of NO_x, ROG, PM_{10}, and $PM_{2.5}$. Paving operations will release ROG emissions. Construction activities are carried out in discrete steps, each of which has a unique mix of equipment. Therefore, the construction emissions can vary substantially from day-to-day, depending on the level of activity, the specific type of operation, and the prevailing weather conditions. The methodology developed for the purposes of quantitative air quality analysis was based on information available at the time of analysis; actual equipment and activity intensity at the time of construction may vary from those analyzed in this document.

The main construction activities associated with the Project include trenching activity, jack and bore drilling, and Horizontal Directional Drilling (HDD). The main sources of air pollutants associated with the Project include off-road construction equipment exhaust, worker trips, and fugitive PM_{10} emissions. Each construction activity is detailed later in this section. The analysis used URBEMIS2007 v. 9.2.4 (URBEMIS) to estimate emissions from the construction activities using the construction fleet and estimated hours of operation provided in Table 2. It is unlikely that all construction equipment to be used for construction will be used during the same day. However, for the purposes of conservative analysis, Michael Brandman Associates (MBA) assumed that all construction equipment to be used for trenching, jack and bore or HDD construction would be used concurrently. The analysis assumes the equipment would be located at three different construction locations along the pipeline route.

3.1 - Construction Equipment

The estimated construction fleet for each trenching was provided by LADWP. Because of the equipment naming convention in URBEMIS, assumptions had to be made regarding the type of equipment to be modeled compared with the equipment list provided by LADWP. Table 4 provides the construction equipment assumptions for the purposes of air quality analysis. The analysis assumes that site preparation and excavation and shoring would occur at one location, pipe installation, and backfilling at another and street restoration at a third.

Table 4: Trenching Equipment

Equipment Name	Number	Peak Hours/ Day	URBEMIS Equivalent	Horsepower*
Site Preparation				
End Dump Trucks	6	8	Off Highway Trucks	479
5-cy Dump Truck	3	6	Dumpers/Tenders	16

Table 4 (cont.): Trenching Equipment

Equipment Name	Number	Peak Hours/ Day	URBEMIS Equivalent	Horsepower*
Excavating and Shoring				
End Dump Trucks	6	8	Off Highway Trucks	479
5-cy Dump Truck	4	6	Dumpers/Tenders	16
Backhoe	4	6	Tractors/Loaders/Backhoes	108
Loader	4	6	Tractors/Loaders/Backhoes	108
Excavator	4	6	Excavator	168
Compactor	4	4	Plate Compactor	8
15-ton Crane	4	8	Cranes	399
Water Trunk	2	8	Water Truck	189
Pipe Installation & Backfilling				
Hydraulic Jack	3	6	None – Runs off of Generator	-
Auger Machine	3	6	Other Equipment	190
Welding truck with Generator	3	4	Welders	45
40 kW Generator	3	6	Generator Sets	60
Street Restoration				
Paver	2	2	Paver	100

Notes:
NA = Not used in the off-road calculations.
* Horsepower provided by LADWP.
Source: LADWP 2009

The URBEMIS model was used to estimate emissions from construction worker trips. URBEMIS assumes that the number of workers is equal to 125 percent of the total construction fleet for the project, and the commute mix is 50 percent light autos and 50 percent light-duty trucks. Emissions from the end dump truck and 5-cy dump trucks were estimated using the on-road hauling component of URBEMIS, as discussed below.

3.2 - Fugitive Dust

As stated in the Project Location and Description, the maximum length of open trench at any one time would be 300 feet in length, with a total work area of approximately 1,000 linear feet. Based on disturbance width of 4 feet, the analysis conservatively assumes that up to 0.1 acre may be disturbed on any one day.

As detailed in the project description of the Draft EIR, trenches will typically be 8 to 9 feet deep and 4 feet wide. Therefore, the analysis assumes that the approximately 600 cubic yards could be moved on-site on any one day.

The analysis includes compliance with SCAQMD Regulation 403 (Fugitive Dust). Compliance with Rule 403 is required. When reviewing the URBEMIS printouts in the appendixes, please note that the URBEMIS program lists any measure that reduces emissions to be "mitigation" regardless if the measure fulfills a requirement or is truly considered mitigation by CEQA standards. The following 'source categories' identified in Table 1 of Rule 403 may be created by the project: backfilling, demolition (mechanical and manual), disturbed soil, staging areas, trenching, and truck loading. As required by the Rule 403, the project must utilize applicable best control measures from Table 1 of the rule. Therefore, the measures identified in Table 5were included in the 'unmitigated' analyses.

Table 5: Best Available Control Measures - SCAQMD Rule 403

Applicable Best Available Control (BACM) [1]	URBEMIS Equivalent
Backfill 01-1 Stabilize backfill material when not actively handling; and 01-2 Stabilize backfill material during handling; and 01-3 Stabilize soil at completion of activity	Apply soil stabilizers to inactive areas, and Water exposed surfaces 2 times daily during active construction.
Demolition (mechanical/manual) 06-1 Stabilize wind erodible surfaces to reduce dust; and 06-2 Stabilize surface soil where support equipment and vehicles will operated; and 06-3 Stabilize loose soil and demolition debris	Water exposed surfaces 2 times daily during active construction.
Disturbed Soil 07-1 Stabilize disturbed soil throughout the construction site;	Water exposed surfaces 2 times daily during active construction. Apply soil stabilizers to inactive areas.
Staging Areas 13-1 Stabilize staging areas during use; and 13-2 Stabilize staging area soils at project completion	Apply soil stabilizers or water 2 times daily Equipment loading/unloading.
Trenching 16-1 Stabilize surface soils where trencher or excavator and support equipment will operate; and 16-2 Stabilize soils at the completion of trenching activities.	Water exposed surfaces 2 times daily during active construction.
Truck Loading 17-1 Pre-water material prior to loading; and 17-2 Ensure that freeboard exceeds six inches.	Equipment loading/unloading.
Notes: 1. From Table 1 of SCAQMD Rule 403 Source: SCAQMD 2005	

In addition, it is not expected that many on or off-road trips will occur on unpaved surfaces. Therefore, the URBEMIS measures for reduced speed on unpaved surfaces and managing haul road dust were selected as part of the 'baseline' analysis to account for minimal activity on unpaved roads

3.3 - Hauling

As stated in the Project Description and Location, truck trips associated with the construction of the project include supply deliver and the transport of soil from trenching. Hauling trip rates by trip type and phase are provided in Table 1. The calculated daily trips for jacking and horizontal directional drilling are provided in Table 6, daily rates for open trench construction are shown in Table 1.

Table 6: Daily Hauling Estimates

Activity	Total				Average Daily	
	No. Locations	Load Size (CY)	Volume (CY)	Round Trips	Volume (CY)	Round Trips
Jacking[1]						
Pavement/Soil Haul-Off	11	15	666	45	30	2
Soil Haul-Off	11	15	500	33	23	2
Grout Delivery	11	10	1,000	100	45	5
Backfill Delivery	11	10	660	66	30	3
Horizontal Directional Drilling[2]						
Pavement/Soil Haul-Off	2	15	2,233	149	223	15
Grout Delivery	2	10	1,000	100	100	10

[1] Assumed duration of 2 days per location
[2] Assumed duration of 5 days per location
Source: LADWP 2009

3.3.1 - Open Trench Hauling

LADWP estimates that that supply material (including pipeline sections) will be hauled en mass to a staging area (likely the Harbor District Yard), then moved in smaller quantities to the construction sites as needed. The Harbor District Yard is an average of approximately 3 miles south of the project route. This analysis assumed the round-trip trip distance is 6 miles.

In addition, LADWP estimates soil and pavement will be removed from the pipeline route during construction. The soil would be transported to the closest appropriate LADWP facility, as is standards LADWP practice, for reuse or ultimate disposal. This analysis assumed the round-trip trip distance is 6 miles.

The soil-hauling component of the URBEMIS program was used to estimate emissions from soils and pavement hauling. Because URBEMIS calculates the number of trips as a derivative of the amount of

soil hauled, the cubic yards entered do not necessarily reflect the Project but were entered to generate the correct number of round trips.

The URBEMIS analysis includes 75 round trips per day for supply and soil hauling for Open Trench construction.

SECTION 4: THRESHOLDS

4.1 - CEQA Guideline Criteria

The following significance criteria are from Appendix G of the CEQA Guidelines. A significant impact would occur if the project would:

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

CEQA Guidelines define a significant effect on the environment as "a substantial, or potentially substantial, adverse change in the environment." To determine if a project would have a significant impact on air quality, the type, level, and impact of emissions generated by the project must be evaluated. While the final determination of whether or not a project is significant is within the purview of the lead agency pursuant to Section 15064(b) of the State CEQA Guidelines, SCAQMD recommends that its quantitative air pollution thresholds be used to determine the significance of project emissions. If the lead agency finds that the project has the potential to exceed these air pollution thresholds, the project should be considered to have significant air quality impacts.

4.2 - Regional Thresholds

The following regional significance thresholds have been established by SCAQMD. Projects within the Basin region with construction or operation related emissions in excess of any of the thresholds presented in Table 7 are considered significant. Regional thresholds were set to protect air resources within the Basin.

Table 7: SCAQMD Regional Thresholds

Pollutant	Construction (pounds per day)	Operation (pounds per day)
Nitrogen Oxides (NO_x)	100	55
Volatile Organic Compounds (VOC)	75	55
Particulate Matter (PM_{10})	150	150
Particulate Matter ($PM_{2.5}$)	55	55

Table 7 (cont.): SCAQMD Regional Thresholds

Pollutant	Construction (pounds per day)	Operation (pounds per day)
Sulfur Oxides (SO_x)	150	150
Carbon Monoxide (CO)	550	550
Source: SCAQMD 2008.		

4.3 - Localized Thresholds

4.3.1 - Localized Significance Thresholds (LST)

The SCAQMD Governing Board adopted a methodology for calculating localized air quality impacts through localized significance thresholds (LSTs), which is consistent with SCAQMD's Environmental Justice Enhancement Initiative I-4. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable state or national ambient air quality standard. The LSTs are developed based on the ambient concentrations of each pollutant of concern (NO_x, CO, PM_{10}, and $PM_{2.5}$) for each source receptor area. LSTs were developed in recognition of the fact that criteria pollutants such as CO, NO_x, and PM_{10} and $PM_{2.5}$ in particular, can have local impacts as well as regional impacts. LSTs were set to protect sensitive receptors near the on-site project emissions.

To facilitate the localized assessment process, the SCAQMD LST methodology (SCAQMD 2003) provides a series of emission rate look-up tables for projects up to 5 acres in size. If onsite construction emissions are above the emission rates listed in the look-up tables (LST), then the project would be considered to have a significant air quality impact. The current look-up tables cover the years 2005 through 2007.

The applicable LSTs were obtained from the look-up tables in the SCAQMD Final LST Methodology for a 1-acre project in Source Receptor Area (SRA) 4, with the distance to the nearest receptor as 25 meters. The LSTs are summarized in Table 8.

Table 8: SCAQMD Localized Thresholds (Construction)

Pollutant	Localized Significance Threshold (pounds/day)
Nitrogen Dioxide	46
Carbon Monoxide	574
PM_{10}	4
$PM_{2.5}$	3
Source: SCAQMD 2003 and SCAQMD 2006.	

4.3.2 - Carbon Monoxide Hotspot Analysis Threshold

Project concentrations may also be considered significant if a CO hotspot intersection analysis determines that project generated CO concentrations cause a localized violation of the state or federal CO standards.

4.3.3 - Odor Threshold

A project may be considered to have a significant impact if it creates and odor nuisance pursuant to SCAQMD Rule 402 (Nuisance). Rule 402 states:

> A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.
>
> The provisions of this rule shall not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.

4.3.4 - Health Risk Thresholds

In addition to the thresholds established above for criteria pollutants, the SCAQMD has also defined health risk thresholds as follows:

- Maximum Incremental Cancer Risk: 10 in 1 million at the nearest sensitive receptor or offsite worker;
- Hazard Index (project increment) 1.0 or greater.

Cancer risk represents the probability (in terms of risk per million individuals) that an individual will contract cancer because of exposure to TACs continuously over a period of 70 years. Thus, an individual located in an area with a cancer risk of one will experience a one chance in one million of contracting cancer over a 70-year period assuming that individual lives in that area continuously for the entire 70-year period or works in the area for a 40-year period.

4.4 - Contribution to Climate Change

The potential effect of GHG emissions on climate change is an emerging issue that warrants discussion under CEQA. Unlike the pollutants discussed previously that may have regional and/or local effects, project-generated GHG emissions do not directly produce local or regional impacts, but may contribute to an impact on global climate. Individual projects contribute relatively small amounts of GHGs that, when added to all other GHG emitting activities around the world, result in global increases in these emissions. Local or regional environmental effects may occur if the climate is changed.

Guidelines for what would constitute a significant increase in GHG emissions from projects have not been developed by the ARB, the California Environmental Protection Agency (CalEPA), the EPA, the SCAQMD, or other appropriate governmental organizations. As discussed in the Regulatory Setting, SCAQMD has developed a threshold for stationary source projects for which they are the lead agency. That threshold does not apply to this project, as it is neither a stationary source, nor is the SCAQMD the lead agency. SCAQMD is currently developing thresholds for non-stationary source projects. ARB is similarly working on thresholds for non-stationary sources. In addition, the Governor's Office of Planning and Research (OPR) has proposed a draft threshold of significance for inclusion into the CEQA Guidelines. However, as of the date of this writing, there are no adopted thresholds applicable to the project.

4.5 - Consistency with Air Quality Attainment Plan

This assessment uses the following criteria for determining Project consistency with the current AQMP. In addition, consistency with the AQMP is, in essence, a cumulative impacts assessment. Section 15130(b) of the CEQA Guidelines state:

> The following elements are necessary to an adequate discussion of significant cumulative impacts: 1) Either
>
> > (A) A list of past, present, and probably future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or
> >
> > (B) A summary of projects contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or areawide conditions contributing to the cumulative impact.

Because the AQMP is an adopted planning document that describes and evaluates the regional cumulative impact of pollutants in the Basin, consistency with the AQMP fulfills the requirements of a cumulative impacts assessment for regional and localized air pollutants.

4.5.1 - Project's Contribution to Air Quality Violations

According to the SCAQMD (1993), a project is consistent with the AQMP if a project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP (SCAQMD 1993, Page 12-3). The project's potential to contribute to an air quality standard violation is assessed by the LST and CO analysis. .

4.5.2 - Control Measures

The next criterion is compliance with the control measures in the current AQMP. The 2007 AQMP aims to attain the national $PM_{2.5}$ and 8-hour ozone standards by 2015 and 2024, respectively. This is done by building upon improvements from the previous plans and incorporating all feasible control measures while balancing costs and socioeconomic impacts. The 2007 AQMP indicates that $PM_{2.5}$ is formed primarily secondarily. Therefore, instead of reducing fugitive dust, the strategy for reducing $PM_{2.5}$ focuses on reducing precursor emissions of SOx, directly-emitted $PM_{2.5}$, NO_x, and VOC. The Final 2007 AQMP control measures consist of four components: 1) the SCAQMD's Stationary and Mobile Source Control Measures; 2) the ARB's Proposed State Strategy; 3) the SCAQMD Staff's Proposed Policy Options to Supplement the ARB's Control Strategy; and 4) Regional Transportation Strategy and Control Measures provided by Southern California Association of Governments (SCAG).

4.5.3 - Compliance with SCAQMD Regional Thresholds

Although there is no known guidance that correlates AQMP consistency with the SCAQMD regional thresholds, it is common to use the SCAQMD thresholds in assessing AQMP compliance. The project's regional impact is assessed through the regional significance thresholds.

SECTION 5: REGIONAL ANALYSIS

This section calculates the expected emissions from the construction and operation of the project as a necessary requisite for assessing the regulatory significance of project emissions on a regional level.

5.1 - Construction

Short-term impacts refer to emissions generated during construction because they occur on a short-term basis. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. Construction emissions result from onsite and offsite activities. Onsite emissions principally consist of exhaust emissions (NO_x, SO_x, CO, VOC, PM_{10}, and $PM_{2.5}$, and CO_2) from heavy-duty construction equipment, motor vehicle operation, and fugitive dust (mainly PM_{10}) from disturbed soil. Additionally, paving operations and application will release VOC emissions. Offsite emissions are caused by motor vehicle exhaust from delivery vehicles, worker traffic, and road dust (PM_{10} and $PM_{2.5}$).

Although the project construction will extend into 2010 and 2011, the 2009 model year has the most conservative emission factors and, therefore, has higher emissions estimates than the later model years. In addition, it should be noted that the worst-case day scenario used for emissions modeling assumes that all construction equipment for all phases will be utilized on the same day and for the maximum duration. Therefore, this analysis is highly conservative. Table 9 summarizes the construction-related emissions for 2009. As described in the Construction Analysis Methodology, site preparation emissions are incorporated into the excavation and shoring phase.

The information shown in Table 9 indicates that the SCAQMD regional emission thresholds will be exceeded for NO_x emissions. The single largest source of NOx is the excavation and shoring phase. Specifically, the off-road diesel activities for excavation and shoring would contribute 75.21 lbs of the total 90.97 lbs of NO_x per day. Therefore, without mitigation, the short-term emissions are considered to have a potentially significant regional impact.

Table 9: Construction Emissions (2009)

Source	Emissions (pounds per day)					
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Paving	0.50	2.86	2.03	—	0.25	0.23
Jacking (hauling)	0.18	2.46	0.94	—	0.11	0.10
HDD (hauling)	0.39	5.13	1.97	0.01	0.24	0.20
Open Trench Hauling	1.16	15.39	5.90	0.02	9.93	5.51
Excavation and Shoring	15.56	83.27	44.74	0.01	9.89	5.47

Table 9 (cont.): Construction Emissions (2009)

Source	Emissions (pounds per day)					
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Pipe Installation and Backfill.	3.31	24.33	13.24	—	1.35	1.23
Maximum Daily Emissions	21.10	133.44	68.82	0.04	12.55	7.84
Significance Threshold	75	100	550	150	150	55
Significant Impact?	No	**Yes**	No	No	No	No

Note:
The maximum daily emissions refer to the maximum emissions that would occur in one day; it was assumed that the grading activities do not occur at the same time as the other construction activities; therefore, their emissions are not summed.
VOC = volatile organic compounds NOx = nitrogen oxides CO = carbon monoxide
SO_x = sulfur oxides PM_{10} and $PM_{2.5}$ = particulate matter
Source: URBEMIS output, Appendix A.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM AQ-1 During project construction, construction equipment will be properly maintained at an offsite location; maintenance shall include proper tuning and timing of engines. Equipment maintenance records and data sheets of equipment design specifications shall be kept at that location.

MM AQ-2 In addition to the requirements of MM AQ-2b, LADWP shall incorporate into the Construction Emission Reduction Plan (Plan) a demonstration that the maximum daily activity that would occur for the project in the region (a summation of all construction site emissions) would not exceed the SCAQMD's regional NO_x threshold of 100 lbs/day. Below is a menu of specific measures that may be included in the Plan to reduce total daily NO_x emissions. The measures may be used singly or together to reduce the NO_x impact to less than significant:

- All construction diesel engines, which have a rating of 50 hp or more, shall meet, at a minimum, the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, Section 2423(b)(1) unless LADWP determines that such engine is not available or feasible for a particular type of equipment. In the event a Tier 2 engine in not available for any off-road engine larger than 50 hp, that engine shall be a Tier 1 engine, if available and feasible. In the event a Tier I engine is not available for any off-road engine larger than 50 hp, then that engine shall be a

1996 or newer engine. The LADWP may grant relief from this requirement for that engine if compliance with this requirement is infeasible.

- To the extent that equipment and technology is available and cost-effective, the LADWP is encouraged to use NO_X catalyst, and retrofit existing engines in construction equipment. This measure applies to all construction equipment, including portable diesel powered equipment holding a valid permit with the SCAQMD or ARB. As to assist the construction manager in identifying engines that implement this measure, equipment that implements the measure shall have clearly visible tags.
- To the extent feasible, utilize alternative fueled equipment instead of diesel-powered equipment. If biodiesel is selected as an alternative fuel, the construction manager shall ensure that appropriate NO_x reduction additives are utilized, as biodiesel alone would increase NO_x emissions.
- During project construction, onsite electrical hook ups shall be provided to utilize existing power sources (e.g., power poles) or clean fuel generators rather than temporary power generators for electric construction tools including saws, drills and compressors, to eliminate the need for diesel powered electric generators. To the extent that equipment and technology is available and cost-effective, the LADWP is encouraged to use electrically driven equipment instead of fossil-fueled engines.
- During project construction, restrict idling of construction equipment onsite to 5 minutes or less, unless idling is necessary for equipment use.
- To the extent practicable, construction management techniques such as timing construction to occur outside the ozone season of May through October shall be employed, or equipment use shall be scheduled to limit unnecessary concurrent operation.

Level of Significance After Mitigation

Less than significant after mitigation incorporated.

The air quality analysis assumes 36 diesel-powered off-road equipment units running for a total of 206 hours on any one day. The mitigation measure allows flexibility for the construction manager to modify the type and use of the construction fleet, while ensuring that the mix and use of the equipment does not result in an exceedance of the SCAQMD's regional NO_x threshold.

5.2 - Operational Impacts

Operational, or long-term, emissions occur over the life of the project. Operational emissions include mobile and area source emissions. Area source emissions are from consumer products, heaters that consume natural gas, gasoline-powered landscape equipment, and architectural coatings (painting).

This project consists of the construction of a pipeline to deliver existing recycled water to existing end users. The project would not result in operational emissions.

Level of Significance Before Mitigation

No impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

No impact.

SECTION 6: LOCAL ANALYSIS

6.1 - Construction Criteria Pollutants

The SCAQMD Governing Board adopted a methodology for calculating localized air quality impacts through localized significance thresholds (LSTs), which is consistent with SCAQMD's Environmental Justice Enhancement Initiative I-4. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable State or national ambient air quality standard.

On-site construction-generated emissions were estimated per the methodology in this report, and are presented in Table 10. As discussed in the Construction Analysis Methodology section, each construction phase was assumed to occur at a different location. As shown in the table, the excavation and shoring phase would exceed the SCAQMD's LST for the project location. Paving and pipe installation and backfill would not exceed the LST.

Table 10: Localized Significance Analysis (Construction)

Phase	Onsite Emissions (pounds per day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Paving	2.83	1.47	0.25	0.23
Excavation and Shoring	82.90	38.54	9.84	5.45
Pipe Installation and Backfill	24.18	10.71	1.33	1.23
Localized Significance Threshold	46	574	4	3
Exceed Threshold?	Yes	No	Yes	Yes

Note:
Excludes off-site emission such as employee trips.
Each phase assumed to occur at a different location
Source: URBEMIS Output, Appendix A

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM AQ-3 In addition to compliance with SCAQMD Regulation 402 (Fugitive Dust), the construction manager will implement the following dust control measures for all Excavation and shoring activities:

a. Expeditiously replace ground cover in disturbed areas.
b. Water disturbed surfaces at least 3x per day.
c. All stockpiles shall be covered

MM AQ-4 Prior to the start of construction, the LADWP will draft a Construction Emission Reduction Plan (Plan) that details implementation of this measure, including discussions on feasibility and the degree of implementation of specific Plan components. The construction manager shall keep a copy of the Plan on-site during construction and shall implement the components of the Plan. The Plan shall demonstrate a reduction in maximum daily NO_x emissions from the excavation and shoring phase such that the emissions will not exceed the SCAQMD's LST thresholds. The primary method of achieving emission reductions is reducing the maximum equipment use hours to occur on any one day at any one location of excavation and shoring. Total on-site (off-road equipment) horse power-hours (hp*h) allowed to occur at any one location to will be restricted to 13,825 or less.

Level of Significance After Mitigation

Less than significant impact after mitigation incorporated.

The air quality analysis assumes the following activity would occur at one location for excavation and shoring— 22 diesel-powered off-road equipment units running for a total of 136 hours on any one day (a total of 25,136 hp*h). This equipment mix excludes end dump truck and 5 cy dump truck emissions and activity, as they are mobile and associated with pipe and materials hauling. A reduction daily hours of equipment use that would occur at any one location on any one day would result in a reduction of daily emissions. Restricting hp*h to 13,825 or less at any one location reduces the total hp*h by 45 percent, thereby reducing exhaust emissions by a near-equal amount. Examples of fleet mixes and hours of equipment use for excavation and shoring that would meet the mitigation requirement are provided in Table 11 for illustrative purposes. Please note, the mitigation is a reduction in activity at any one site. Therefore, excavation and shoring activities may occur at multiple construction sites, and the total fleet in use may exceed 13,825 hp*h without generating a localized impact. Mitigated emissions are presented below in Table 12.

Table 11: Examples of Daily Fleet Use

Equipment	Number	HP	Daily Hours	HP*H
Example Scenario 1				
Backhoe	3	6	108	1,944
Loader	3	6	108	1,944
Excavator	3	6	168	3,024
Compactor	4	4	8	128
15-Ton Crane	1	8	399	3,192
Water Truck	2	8	189	3,024
			Total HP*H Scenario 1	13,256

Table 11 (cont.): Examples of Daily Fleet Use

Equipment	Number	HP	Daily Hours	HP*H
Example Scenario 2				
Backhoe	3	4	108	1,296
Loader	3	4	108	1,296
Excavator	4	6	168	4,032
Compactor	4	4	8	128
15-Ton Crane	2	6	399	4,788
Water Truck	2	6	189	2,268
			Total HP*H Scenario 2	13,808

Table 12: Mitigated Excavation and Shoring Construction Emissions

Emissions Source	Onsite Emissions (pounds per day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Dust	—	—	1.13	0.24
Equipment Exhaust*	45.60	23.51	2.62	2.41
Total Excavation and Shoring	45.60	23.51	3.75	2.41
Localized Significance Threshold	46	574	4	3
Exceed Threshold?	No	No	No	No

Note:
* 39 percent reduction in equipment exhaust applied.
Source: URBEMIS Output, Appendix A.

Mitigation measure MM AQ-2 differs from MM AQ-4, in that the former restricts the total construction activity that may occur on any one day, whereas the latter restricts the off-road equipment use that may occur at any one location for excavation and shoring.

6.2 - Health Risk

Construction activities would also involve the use of diesel-powered construction equipment, which emit diesel particulate matter (DPM). Risk assessments for residential areas exposed to toxic air contaminants (TACs) are generally based on a 70-year period of exposure. Construction emissions were modeled under 2009 conditions to provide a worst-case scenario. Since the use of construction equipment would a) be temporary and would not be close to the 70-year timeframe, and b) not occur in a single location, but be spread out geographically, exposure of sensitive receptors to TACs would not be substantial. Emissions of DPM would not be substantial enough to be considered a significant health risk. Therefore, health risks from construction-related DPM would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is required

Level of Significance After Mitigation

Less than significant impact.

6.3 - Carbon Monoxide

A CO hot spot is a localized concentration of CO that is above the state or national 1-hour or 8-hour CO ambient air standards. Localized high levels of CO are associated with traffic congestion and idling or slow-moving vehicles.

This analysis follows guidelines recommended by the CO Protocol (UCD 1997) and the SCAQMD. According to the CO Protocol, project-impacted intersections with Level of Service (LOS) E or F require detailed analysis. In addition, project-impacted intersections that operate under LOS D conditions in areas that experience meteorological conditions favorable to CO accumulation require a detailed analysis. The SCAQMD recommends that a local CO hotspot analysis be conducted if the intersection meets one of the following criteria:

1) the intersection is at LOS D or worse and where the project increases the volume to capacity ratio by 2 percent, or
2) the project decreases LOS at an intersection from C to D.

The proposed Project is the construction of a recycled water pipeline, and would not result in changes to the existing wastewater processing facilities or otherwise increase or decrease on-going roadway traffic. Although the project would generate a short-term increase in roadway traffic associated with materials and soils hauling, the project would not generate a significant number of operational trips. Therefore, the project is less than SCAQMD's screening threshold.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

No mitigation necessary.

Level of Significance After Mitigation

Less than significant.

6.4 - Odors

The CEQA Guidelines indicate that a significant impact would occur if the project would create objectionable odors affecting a substantial number of people.

Land uses typically associated with odors include wastewater treatment facilities, waste-disposal facilities, or agricultural operations. The project does not contain land uses typically associated with emitting objectionable odors.

Diesel exhaust and VOCs will be emitted during construction of the project, which are objectionable to some; however, emissions will disperse rapidly from the project site and therefore should not be at a level to induce a negative response.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

No mitigation necessary.

Level of Significance After Mitigation

Less than significant.

SECTION 7: GREENHOUSE GASES AND CLIMATE CHANGE

The project contributes to climate change impacts through its contribution of GHGs. The project would generate a variety of GHGs during construction and operation, including several defined by AB 32, such as carbon dioxide, methane, and nitrous oxide. The project would emit GHGs such as carbon dioxide, methane, and nitrous oxide from the exhaust of equipment, and exhaust of vehicles for employees and hauling trips.

The project may also emit GHGs that are not defined by AB 32. For example, the project may generate aerosols. Aerosols are short-lived GHGs, as they remain in the atmosphere for about one week. Black carbon is a component of aerosol. A couple of studies have indicated that black carbon has a high global warming potential; however, the United Nations Intergovernmental Panel on Climate Change (IPCC) states that it has a low level of scientific certainty (IPCC 2007a). Water vapor could be emitted from evaporated water used for landscaping, but this is not a significant impact because water vapor concentrations in the upper atmosphere are primarily due to climate feedbacks rather than emissions from project-related activities. The project would emit nitrogen oxides and volatile organic compounds, which are ozone precursors. Ozone is a GHG; however, unlike the other GHGs, ozone in the troposphere is relatively short-lived and can be reduced in the troposphere on a daily basis.

Certain GHGs defined by AB 32 would not be emitted by the project. Perfluorocarbons and sulfur hexafluoride are typically used in industrial applications, none of which would be used by the project. Therefore, it is not anticipated that the project would emit perfluorocarbons or sulfur hexafluoride.

An inventory of GHG emissions generated by the project is presented below. The emissions are estimated and are converted to metric tons of $MTCO_2e$ using the formula: $MTCO_2e$ = (tons of gas) x Global Warming Potential [GWP] x (0.9072 metric tons of gas). Construction-generated and on-road mobile emissions were calculated using the methodology provided in Appendix B. It should be noted that due to the available information, it is not possible to scale the emissions to determine the difference of emissions between the alternative routes. The emissions presented below represent a highly-conservative analysis scenario, where all pieces of equipment are assumed to operate every day, 5 days a week, for the full duration of the construction period. Because the analysis is conservative, it represents the worst-case construction scenario for all three potential project routes. In addition, mitigation measures applied in the Air Quality section would reduce GHG emissions. However, the measures reduce the level of daily activity, not total annual activity. It is currently infeasible to estimate the GHG emission reduction that would occur with implementation of those measures.

7.1 - Emissions Inventory

7.1.1 - Construction

The project would result in approximately 3,740 $MTCO_2e$ over the duration of construction. $MTCO_2e$ is calculated by multiplying the tons of CO_2 by 0.9072 and the global warming potential of 1. The project's calculated GHG inventory from construction is presented in Table 13.

Table 13: Construction GHG Emissions

Emission Source	CO_2 Emissions	
	Tons	Metric Tons CO_2e
2009 On and Off-Road	737	668
2010 On and Off-Road	1,764	1,600
2011 On and Off-Road	1,615	1,466
11 Jacking Locations (Hauling)	1.65	1.50
2 HDD Locations (Hauling)	3.18	2.88
Total Emissions	4,121	3,739
Source: URBEMIS Output, Appendix A.		

7.1.2 - Operations

Currently, potable water from a variety of sources is delivered to a variety of end-users in the project area. In addition, the Carson Regional Water Recycling Plant processes water to Nitrified Title 22 standards. The project would construct a pipeline to deliver the existing source of Title 22 recycle water to the existing water users, thereby reducing the consumption of potable water. The project does not propose or anticipate any additional or new operational, or long-term, emissions sources. In addition, the project is not expected increase the activity at the Carson Regional Water Recycling Plant. However, the project may inadvertently increase operational activity at the plant, thus resulting in a slight increase in operational emission. An increase in operational emissions at the plant attributable to implementation of the project is not calculated in this analysis, as the project is not anticipated to change the operation of the Carson Regional Water Recycling Plant.

The project has been designed to offset up to 15,000 acre-feet per year of potable water with Nitrified Title 22 recycled Water. Because the emissions associated with both the recycled water and the potable water are existing, the project offsets the emissions associated with the pumping, treatment and conveyance of up to 15,000 acre-feet of potable water.

Because the potable water delivered to the area comes from a variety of sources, the generalized emission factors for Southern California were used, as detailed in Appendix B, to estimate the amount

of GHGs offset by the project. As shown in Table 14, the project would reduce up to 23,263 $MTCO_2e$ per year at project buildout.

Table 14: GHG Inventory of Potable Water Reduced by Project

Source	Tons per Year			Metric Tons CO_2e
	Carbon Dioxide	Nitrous Oxide	Methane	
Potable Water	25,602	0.12	0.21	23,263
Notes: Source: Appendix B, CCAR 2007, CEC 2006.				

Level of Significance Before Mitigation

Less than significant impact.

The highest annual estimated GHG emissions associated with construction of the proposed pipeline would be approximately 1,600 $MTCO_2$ per year (year 2010). Absent any air quality regulatory agency-adopted threshold for GHG emissions, it is notable that the proposed project would generate substantially fewer emissions than the 25,000 $MTCO_2$ per year required for mandatory reporting to the California Air Resources Board, the 10,000 $MTCO_2$ per year limit under the Assembly Bill 32 cap and trade program, and the 10,000 $MTCO_2$ per year threshold used by SCAQMD for stationary sources where the SCAQMD is the Lead Agency. Because construction-related emissions would be finite in nature, below the minimum standard for reporting requirements under Assembly Bill 32, and below thresholds being considered by regulatory agencies, the GHG emissions related to construction of the proposed turbines would not be considered to make a cumulatively considerable contribution to global climate change, and, therefore, would be less than significant.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

SECTION 8: REFERENCES

The following references were used in the preparation of this analysis and are referenced in the text and/or were used to provide the author with background information necessary for the preparation of thresholds and content.

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Appendix A:URBEMIS Output

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: S:\Projects\05750010 Harbor Refineries Pipeline\Modeling\URB\LADWP Harbor Refineries Project_UNMitigated.urb924

Project Name: Harbor Refineries Recycled Water Pipeline Project - UnMitigated

Project Location: South Coast AQMD

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (lbs/day unmitigated)	16.10	133.44	68.84	0.04	71.94	7.33	79.27	15.04	6.74	21.78	14,265.83
2009 TOTALS (lbs/day mitigated)	16.10	133.44	68.84	0.04	5.21	7.33	12.54	1.11	6.74	7.85	14,265.83
2010 TOTALS (lbs/day unmitigated)	14.59	117.74	63.21	0.03	71.91	6.45	78.36	15.03	5.93	20.97	13,324.61
2010 TOTALS (lbs/day mitigated)	14.59	117.74	63.21	0.03	5.18	6.45	11.63	1.10	5.93	7.03	13,324.61
2011 TOTALS (lbs/day unmitigated)	13.49	109.03	60.60	0.03	71.91	6.10	78.01	15.03	5.61	20.64	13,324.38
2011 TOTALS (lbs/day mitigated)	13.49	109.03	60.60	0.03	5.18	6.10	11.27	1.10	5.61	6.70	13,324.38

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

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	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 8/3/2009-8/3/2009 Active Days: 1	**16.10**	**133.44**	**68.84**	**0.04**	**71.94**	**7.33**	**79.27**	**15.04**	**6.74**	**21.78**	**14,265.83**
Asphalt 08/01/2009-12/01/2011	0.50	2.86	2.03	0.00	0.00	0.25	0.25	0.00	0.23	0.23	254.93
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.48	2.83	1.47	0.00	0.00	0.25	0.25	0.00	0.23	0.23	192.64
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.02	0.03	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.22
Fine Grading 08/01/2009-08/03/2009	0.18	2.46	0.94	0.00	0.01	0.10	0.11	0.00	0.09	0.10	305.16
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.18	2.46	0.94	0.00	0.01	0.10	0.11	0.00	0.09	0.10	305.16
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading 08/01/2009-08/08/2009	0.39	5.13	1.97	0.01	0.02	0.21	0.24	0.01	0.20	0.20	635.76
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.39	5.13	1.97	0.01	0.02	0.21	0.24	0.01	0.20	0.20	635.76
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading 08/01/2009-12/01/2011	1.16	15.39	5.90	0.02	0.06	0.64	0.71	0.02	0.59	0.61	1,907.28
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	1.16	15.39	5.90	0.02	0.06	0.64	0.71	0.02	0.59	0.61	1,907.28
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Mass Grading 08/01/2009-12/01/2011	10.56	83.27	44.74	0.01	71.83	4.79	76.62	15.01	4.40	19.41	8,357.66
Mass Grading Dust	0.00	0.00	0.00	0.00	71.80	0.00	71.80	14.99	0.00	14.99	0.00
Mass Grading Off Road Diesel	10.36	82.90	38.54	0.00	0.00	4.77	4.77	0.00	4.39	4.39	7,673.29
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.20	0.37	6.20	0.01	0.03	0.02	0.05	0.01	0.02	0.03	684.37
Trenching 08/01/2009-12/01/2011	3.31	24.33	13.24	0.00	0.01	1.33	1.35	0.00	1.23	1.23	2,805.03
Trenching Off Road Diesel	3.23	24.18	10.71	0.00	0.00	1.33	1.33	0.00	1.22	1.22	2,525.06
Trenching Worker Trips	0.08	0.15	2.54	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.97
Time Slice 8/4/2009-8/7/2009 Active Days: 4	15.91	130.98	67.89	0.03	71.93	7.23	79.16	15.04	6.65	21.69	13,960.66
Asphalt 08/01/2009-12/01/2011	0.50	2.86	2.03	0.00	0.00	0.25	0.25	0.00	0.23	0.23	254.93
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.48	2.83	1.47	0.00	0.00	0.25	0.25	0.00	0.23	0.23	192.64
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.02	0.03	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.22
Fine Grading 08/01/2009-08/08/2009	0.39	5.13	1.97	0.01	0.02	0.21	0.24	0.01	0.20	0.20	635.76
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.39	5.13	1.97	0.01	0.02	0.21	0.24	0.01	0.20	0.20	635.76
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Fine Grading 08/01/2009-12/01/2011	1.16	15.39	5.90	0.02	0.06	0.64	0.71	0.02	0.59	0.61	1,907.28
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	1.16	15.39	5.90	0.02	0.06	0.64	0.71	0.02	0.59	0.61	1,907.28
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	10.56	83.27	44.74	0.01	71.83	4.79	76.62	15.01	4.40	19.41	8,357.66
Mass Grading Dust	0.00	0.00	0.00	0.00	71.80	0.00	71.80	14.99	0.00	14.99	0.00
Mass Grading Off Road Diesel	10.36	82.90	38.54	0.00	0.00	4.77	4.77	0.00	4.39	4.39	7,673.29
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.20	0.37	6.20	0.01	0.03	0.02	0.05	0.01	0.02	0.03	684.37
Trenching 08/01/2009-12/01/2011	3.31	24.33	13.24	0.00	0.01	1.33	1.35	0.00	1.23	1.23	2,805.03
Trenching Off Road Diesel	3.23	24.18	10.71	0.00	0.00	1.33	1.33	0.00	1.22	1.22	2,525.06
Trenching Worker Trips	0.08	0.15	2.54	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.97

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Time Slice 8/10/2009-12/31/2009 Active Days: 104	15.53	125.85	65.92	0.03	71.91	7.01	78.92	15.03	6.45	21.48	13,324.90
Asphalt 08/01/2009-12/01/2011	0.50	2.86	2.03	0.00	0.00	0.25	0.25	0.00	0.23	0.23	254.93
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.48	2.83	1.47	0.00	0.00	0.25	0.25	0.00	0.23	0.23	192.64
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.02	0.03	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.22
Fine Grading 08/01/2009-12/01/2011	1.16	15.39	5.90	0.02	0.06	0.64	0.71	0.02	0.59	0.61	1,907.28
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	1.16	15.39	5.90	0.02	0.06	0.64	0.71	0.02	0.59	0.61	1,907.28
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	10.56	83.27	44.74	0.01	71.83	4.79	76.62	15.01	4.40	19.41	8,357.66
Mass Grading Dust	0.00	0.00	0.00	0.00	71.80	0.00	71.80	14.99	0.00	14.99	0.00
Mass Grading Off Road Diesel	10.36	82.90	38.54	0.00	0.00	4.77	4.77	0.00	4.39	4.39	7,673.29
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.20	0.37	6.20	0.01	0.03	0.02	0.05	0.01	0.02	0.03	684.37
Trenching 08/01/2009-12/01/2011	3.31	24.33	13.24	0.00	0.01	1.33	1.35	0.00	1.23	1.23	2,805.03
Trenching Off Road Diesel	3.23	24.18	10.71	0.00	0.00	1.33	1.33	0.00	1.22	1.22	2,525.06
Trenching Worker Trips	0.08	0.15	2.54	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.97

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Time Slice 1/1/2010-12/31/2010 Active Days: 261	14.59	117.74	63.21	0.03	71.91	6.45	78.36	15.03	5.93	20.97	13,324.61
Asphalt 08/01/2009-12/01/2011	0.47	2.73	1.98	0.00	0.00	0.24	0.24	0.00	0.22	0.22	254.91
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.45	2.70	1.45	0.00	0.00	0.23	0.23	0.00	0.22	0.22	192.64
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.02	0.03	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.20
Fine Grading 08/01/2009-12/01/2011	1.08	14.02	5.38	0.02	0.06	0.57	0.64	0.02	0.53	0.55	1,907.28
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	1.08	14.02	5.38	0.02	0.06	0.57	0.64	0.02	0.53	0.55	1,907.28
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	9.89	78.00	43.20	0.01	71.83	4.39	76.23	15.01	4.04	19.05	8,357.46
Mass Grading Dust	0.00	0.00	0.00	0.00	71.80	0.00	71.80	14.99	0.00	14.99	0.00
Mass Grading Off Road Diesel	9.70	77.66	37.44	0.00	0.00	4.37	4.37	0.00	4.02	4.02	7,673.29
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.18	0.34	5.77	0.01	0.03	0.02	0.05	0.01	0.02	0.03	684.17
Trenching 08/01/2009-12/01/2011	3.16	22.99	12.65	0.00	0.01	1.25	1.26	0.00	1.15	1.15	2,804.95
Trenching Off Road Diesel	3.08	22.85	10.30	0.00	0.00	1.24	1.24	0.00	1.14	1.14	2,525.06
Trenching Worker Trips	0.07	0.14	2.36	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.89

Time Slice 1/3/2011-12/1/2011 Active Days: 239	13.49	109.03	60.60	0.03	71.91	6.10	78.01	15.03	5.61	20.64	13,324.38
Asphalt 08/01/2009-12/01/2011	0.45	2.60	1.92	0.00	0.00	0.23	0.23	0.00	0.21	0.21	254.90
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.43	2.57	1.44	0.00	0.00	0.23	0.23	0.00	0.21	0.21	192.64
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.02	0.03	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.18
Fine Grading 08/01/2009-12/01/2011	0.99	12.61	4.85	0.02	0.06	0.51	0.57	0.02	0.47	0.49	1,907.28
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.99	12.61	4.85	0.02	0.06	0.51	0.57	0.02	0.47	0.49	1,907.28
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	9.15	72.44	41.65	0.01	71.83	4.18	76.01	15.01	3.85	18.85	8,357.31
Mass Grading Dust	0.00	0.00	0.00	0.00	71.80	0.00	71.80	14.99	0.00	14.99	0.00
Mass Grading Off Road Diesel	8.98	72.13	36.28	0.00	0.00	4.16	4.16	0.00	3.83	3.83	7,673.29
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.17	0.31	5.37	0.01	0.03	0.02	0.05	0.01	0.02	0.03	684.02
Trenching 08/01/2009-12/01/2011	2.91	21.38	12.18	0.00	0.01	1.18	1.19	0.00	1.08	1.09	2,804.89
Trenching Off Road Diesel	2.84	21.25	9.98	0.00	0.00	1.17	1.17	0.00	1.08	1.08	2,525.06
Trenching Worker Trips	0.07	0.13	2.20	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.83

Phase Assumptions

Phase: Fine Grading 8/1/2009 - 8/8/2009 - HDD Example

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

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Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 150

Off-Road Equipment:

Phase: Fine Grading 8/1/2009 - 8/3/2009 - Jacking Example

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 72

Off-Road Equipment:

Phase: Fine Grading 8/1/2009 - 12/1/2011 - Site Preparation

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 450

Off-Road Equipment:

Phase: Mass Grading 8/1/2009 - 12/1/2011 - Excavation and Shoring

Total Acres Disturbed: 0.1

Maximum Daily Acreage Disturbed: 0.1

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 600 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

4 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day

4 Excavators (168 hp) operating at a 0.57 load factor for 6 hours per day

4 Plate Compactors (8 hp) operating at a 0.43 load factor for 4 hours per day

8 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

2 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 8/1/2009 - 12/1/2011 - Pipe Installation and Backfilling

Off-Road Equipment:

3 Generator Sets (60 hp) operating at a 0.74 load factor for 6 hours per day

3 Other Equipment (190 hp) operating at a 0.62 load factor for 6 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 4 hours per day

Phase: Paving 8/1/2009 - 12/1/2011 - Paving

Acres to be Paved: 0.03

Off-Road Equipment:

2 Pavers (100 hp) operating at a 0.62 load factor for 2 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 8/3/2009-8/3/2009 Active Days: 1	**16.10**	**133.44**	**68.84**	**0.04**	5.21	**7.33**	12.54	1.11	**6.74**	7.85	**14,265.83**
Asphalt 08/01/2009-12/01/2011	0.50	2.86	2.03	0.00	0.00	0.25	0.25	0.00	0.23	0.23	254.93
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.48	2.83	1.47	0.00	0.00	0.25	0.25	0.00	0.23	0.23	192.64
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.02	0.03	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.22

Fine Grading 08/01/2009-08/03/2009	0.18	2.46	0.94	0.00	0.01	0.10	0.11	0.00	0.09	0.10	305.16
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.18	2.46	0.94	0.00	0.01	0.10	0.11	0.00	0.09	0.10	305.16
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading 08/01/2009-08/08/2009	0.39	5.13	1.97	0.01	0.02	0.21	0.24	0.01	0.20	0.20	635.76
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.39	5.13	1.97	0.01	0.02	0.21	0.24	0.01	0.20	0.20	635.76
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading 08/01/2009-12/01/2011	1.16	15.39	5.90	0.02	0.06	0.64	0.71	0.02	0.59	0.61	1,907.28
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	1.16	15.39	5.90	0.02	0.06	0.64	0.71	0.02	0.59	0.61	1,907.28
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	10.56	83.27	44.74	0.01	5.10	4.79	9.89	1.07	4.40	5.47	8,357.66
Mass Grading Dust	0.00	0.00	0.00	0.00	5.07	0.00	5.07	1.06	0.00	1.06	0.00
Mass Grading Off Road Diesel	10.36	82.90	38.54	0.00	0.00	4.77	4.77	0.00	4.39	4.39	7,673.29
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.20	0.37	6.20	0.01	0.03	0.02	0.05	0.01	0.02	0.03	684.37
Trenching 08/01/2009-12/01/2011	3.31	24.33	13.24	0.00	0.01	1.33	1.35	0.00	1.23	1.23	2,805.03
Trenching Off Road Diesel	3.23	24.18	10.71	0.00	0.00	1.33	1.33	0.00	1.22	1.22	2,525.06
Trenching Worker Trips	0.08	0.15	2.54	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.97

Time Slice 8/4/2009-8/7/2009 Active Days: 4	15.91	130.98	67.89	0.03	5.20	7.23	12.43	1.10	6.65	7.75	13,960.66
Asphalt 08/01/2009-12/01/2011	0.50	2.86	2.03	0.00	0.00	0.25	0.25	0.00	0.23	0.23	254.93
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.48	2.83	1.47	0.00	0.00	0.25	0.25	0.00	0.23	0.23	192.64
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.02	0.03	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.22
Fine Grading 08/01/2009-08/08/2009	0.39	5.13	1.97	0.01	0.02	0.21	0.24	0.01	0.20	0.20	635.76
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.39	5.13	1.97	0.01	0.02	0.21	0.24	0.01	0.20	0.20	635.76
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading 08/01/2009-12/01/2011	1.16	15.39	5.90	0.02	0.06	0.64	0.71	0.02	0.59	0.61	1,907.28
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	1.16	15.39	5.90	0.02	0.06	0.64	0.71	0.02	0.59	0.61	1,907.28
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	10.56	83.27	44.74	0.01	5.10	4.79	9.89	1.07	4.40	5.47	8,357.66
Mass Grading Dust	0.00	0.00	0.00	0.00	5.07	0.00	5.07	1.06	0.00	1.06	0.00
Mass Grading Off Road Diesel	10.36	82.90	38.54	0.00	0.00	4.77	4.77	0.00	4.39	4.39	7,673.29
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.20	0.37	6.20	0.01	0.03	0.02	0.05	0.01	0.02	0.03	684.37

Trenching 08/01/2009-12/01/2011	3.31	24.33	13.24	0.00	0.01	1.33	1.35	0.00	1.23	1.23	2,805.03
Trenching Off Road Diesel	3.23	24.18	10.71	0.00	0.00	1.33	1.33	0.00	1.22	1.22	2,525.06
Trenching Worker Trips	0.08	0.15	2.54	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.97
Time Slice 8/10/2009-12/31/2009 Active Days: 104	15.53	125.85	65.92	0.03	5.18	7.01	12.19	1.10	6.45	7.55	13,324.90
Asphalt 08/01/2009-12/01/2011	0.50	2.86	2.03	0.00	0.00	0.25	0.25	0.00	0.23	0.23	254.93
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.48	2.83	1.47	0.00	0.00	0.25	0.25	0.00	0.23	0.23	192.64
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.02	0.03	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.22
Fine Grading 08/01/2009-12/01/2011	1.16	15.39	5.90	0.02	0.06	0.64	0.71	0.02	0.59	0.61	1,907.28
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	1.16	15.39	5.90	0.02	0.06	0.64	0.71	0.02	0.59	0.61	1,907.28
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	10.56	83.27	44.74	0.01	5.10	4.79	9.89	1.07	4.40	5.47	8,357.66
Mass Grading Dust	0.00	0.00	0.00	0.00	5.07	0.00	5.07	1.06	0.00	1.06	0.00
Mass Grading Off Road Diesel	10.36	82.90	38.54	0.00	0.00	4.77	4.77	0.00	4.39	4.39	7,673.29
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.20	0.37	6.20	0.01	0.03	0.02	0.05	0.01	0.02	0.03	684.37
Trenching 08/01/2009-12/01/2011	3.31	24.33	13.24	0.00	0.01	1.33	1.35	0.00	1.23	1.23	2,805.03
Trenching Off Road Diesel	3.23	24.18	10.71	0.00	0.00	1.33	1.33	0.00	1.22	1.22	2,525.06
Trenching Worker Trips	0.08	0.15	2.54	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.97

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Time Slice 1/1/2010-12/31/2010 Active Days: 261	14.59	117.74	63.21	0.03	5.18	6.45	11.63	1.10	5.93	7.03	13,324.61
Asphalt 08/01/2009-12/01/2011	0.47	2.73	1.98	0.00	0.00	0.24	0.24	0.00	0.22	0.22	254.91
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.45	2.70	1.45	0.00	0.00	0.23	0.23	0.00	0.22	0.22	192.64
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.02	0.03	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.20
Fine Grading 08/01/2009-12/01/2011	1.08	14.02	5.38	0.02	0.06	0.57	0.64	0.02	0.53	0.55	1,907.28
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	1.08	14.02	5.38	0.02	0.06	0.57	0.64	0.02	0.53	0.55	1,907.28
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	9.89	78.00	43.20	0.01	5.10	4.39	9.49	1.07	4.04	5.11	8,357.46
Mass Grading Dust	0.00	0.00	0.00	0.00	5.07	0.00	5.07	1.06	0.00	1.06	0.00
Mass Grading Off Road Diesel	9.70	77.66	37.44	0.00	0.00	4.37	4.37	0.00	4.02	4.02	7,673.29
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.18	0.34	5.77	0.01	0.03	0.02	0.05	0.01	0.02	0.03	684.17
Trenching 08/01/2009-12/01/2011	3.16	22.99	12.65	0.00	0.01	1.25	1.26	0.00	1.15	1.15	2,804.95
Trenching Off Road Diesel	3.08	22.85	10.30	0.00	0.00	1.24	1.24	0.00	1.14	1.14	2,525.06
Trenching Worker Trips	0.07	0.14	2.36	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.89

Time Slice 1/3/2011-12/1/2011 Active Days: 239	13.49	109.03	60.60	0.03	5.18	6.10	11.27	1.10	5.61	6.70	13,324.38
Asphalt 08/01/2009-12/01/2011	0.45	2.60	1.92	0.00	0.00	0.23	0.23	0.00	0.21	0.21	254.90
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.43	2.57	1.44	0.00	0.00	0.23	0.23	0.00	0.21	0.21	192.64
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.02	0.03	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.18
Fine Grading 08/01/2009-12/01/2011	0.99	12.61	4.85	0.02	0.06	0.51	0.57	0.02	0.47	0.49	1,907.28
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.99	12.61	4.85	0.02	0.06	0.51	0.57	0.02	0.47	0.49	1,907.28
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	9.15	72.44	41.65	0.01	5.10	4.18	9.28	1.07	3.85	4.91	8,357.31
Mass Grading Dust	0.00	0.00	0.00	0.00	5.07	0.00	5.07	1.06	0.00	1.06	0.00
Mass Grading Off Road Diesel	8.98	72.13	36.28	0.00	0.00	4.16	4.16	0.00	3.83	3.83	7,673.29
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.17	0.31	5.37	0.01	0.03	0.02	0.05	0.01	0.02	0.03	684.02
Trenching 08/01/2009-12/01/2011	2.91	21.38	12.18	0.00	0.01	1.18	1.19	0.00	1.08	1.09	2,804.89
Trenching Off Road Diesel	2.84	21.25	9.98	0.00	0.00	1.17	1.17	0.00	1.08	1.08	2,525.06
Trenching Worker Trips	0.07	0.13	2.20	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.83

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 8/1/2009 - 8/8/2009 - HDD Example

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

PM10: 84% PM25: 84%

6/23/2009 3:15:06 PM

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

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

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

The following mitigation measures apply to Phase: Fine Grading 8/1/2009 - 8/3/2009 - Jacking Example

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

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

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

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

The following mitigation measures apply to Phase: Fine Grading 8/1/2009 - 12/1/2011 - Site Preparation

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

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

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

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

6/23/2009 3:15:06 PM

The following mitigation measures apply to Phase: Mass Grading 8/1/2009 - 12/1/2011 - Excavation and Shoring

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

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

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

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

6/23/2009 4:00:15 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: S:\Projects\05750010 Harbor Refineries Pipeline\Modeling\URB\LADWP Harbor Refineries Project_Mitigated.urb924

Project Name: Harbor Refineries Recycled Water Pipeline Project - Mitigated

Project Location: South Coast AQMD

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	NOx	CO	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
2009 TOTALS (lbs/day unmitigated)	83.27	44.74	71.83	4.79	76.62	15.01	4.40	19.41
2009 TOTALS (lbs/day mitigated)	83.27	44.74	1.16	4.79	5.95	0.25	4.40	4.65
2010 TOTALS (lbs/day unmitigated)	78.00	43.20	71.83	4.39	76.23	15.01	4.04	19.05
2010 TOTALS (lbs/day mitigated)	78.00	43.20	1.16	4.39	5.55	0.25	4.04	4.29
2011 TOTALS (lbs/day unmitigated)	72.44	41.65	71.83	4.18	76.01	15.01	3.85	18.85
2011 TOTALS (lbs/day mitigated)	72.44	41.65	1.16	4.18	5.34	0.25	3.85	4.09

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

6/23/2009 4:00:15 PM

	NOx	CO	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
Time Slice 8/3/2009-12/31/2009 Active Days: 109	83.27	44.74	71.83	4.79	76.62	15.01	4.40	19.41
Mass Grading 08/01/2009-12/01/2011	83.27	44.74	71.83	4.79	76.62	15.01	4.40	19.41
Mass Grading Dust	0.00	0.00	71.80	0.00	71.80	14.99	0.00	14.99
Mass Grading Off Road Diesel	82.90	38.54	0.00	4.77	4.77	0.00	4.39	4.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.37	6.20	0.03	0.02	0.05	0.01	0.02	0.03
Time Slice 1/1/2010-12/31/2010 Active Days: 261	78.00	43.20	71.83	4.39	76.23	15.01	4.04	19.05
Mass Grading 08/01/2009-12/01/2011	78.00	43.20	71.83	4.39	76.23	15.01	4.04	19.05
Mass Grading Dust	0.00	0.00	71.80	0.00	71.80	14.99	0.00	14.99
Mass Grading Off Road Diesel	77.66	37.44	0.00	4.37	4.37	0.00	4.02	4.02
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.34	5.77	0.03	0.02	0.05	0.01	0.02	0.03
Time Slice 1/3/2011-12/1/2011 Active Days: 239	72.44	41.65	71.83	4.18	76.01	15.01	3.85	18.85
Mass Grading 08/01/2009-12/01/2011	72.44	41.65	71.83	4.18	76.01	15.01	3.85	18.85
Mass Grading Dust	0.00	0.00	71.80	0.00	71.80	14.99	0.00	14.99
Mass Grading Off Road Diesel	72.13	36.28	0.00	4.16	4.16	0.00	3.83	3.83
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.31	5.37	0.03	0.02	0.05	0.01	0.02	0.03

Phase Assumptions

Phase: Mass Grading 8/1/2009 - 12/1/2011 - Excavation and Shoring

Total Acres Disturbed: 0.1

6/23/2009 4:00:15 PM

Maximum Daily Acreage Disturbed: 0.1

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 600 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

4 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day

4 Excavators (168 hp) operating at a 0.57 load factor for 6 hours per day

4 Plate Compactors (8 hp) operating at a 0.43 load factor for 4 hours per day

8 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

2 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	NOx	CO	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
Time Slice 8/3/2009-12/31/2009 Active Days: 109	83.27	44.74	1.16	4.79	5.95	0.25	4.40	4.65
Mass Grading 08/01/2009-12/01/2011	83.27	44.74	1.16	4.79	5.95	0.25	4.40	4.65
Mass Grading Dust	0.00	0.00	1.13	0.00	1.13	0.24	0.00	0.24
Mass Grading Off Road Diesel	82.90	38.54	0.00	4.77	4.77	0.00	4.39	4.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.37	6.20	0.03	0.02	0.05	0.01	0.02	0.03

Time Slice 1/1/2010-12/31/2010 Active Days: 261	78.00	43.20	1.16	4.39	5.55	0.25	4.04	4.29
Mass Grading 08/01/2009-12/01/2011	78.00	43.20	1.16	4.39	5.55	0.25	4.04	4.29
Mass Grading Dust	0.00	0.00	1.13	0.00	1.13	0.24	0.00	0.24
Mass Grading Off Road Diesel	77.66	37.44	0.00	4.37	4.37	0.00	4.02	4.02
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.34	5.77	0.03	0.02	0.05	0.01	0.02	0.03
Time Slice 1/3/2011-12/1/2011 Active Days: 239	72.44	41.65	1.16	4.18	5.34	0.25	3.85	4.09
Mass Grading 08/01/2009-12/01/2011	72.44	41.65	1.16	4.18	5.34	0.25	3.85	4.09
Mass Grading Dust	0.00	0.00	1.13	0.00	1.13	0.24	0.00	0.24
Mass Grading Off Road Diesel	72.13	36.28	0.00	4.16	4.16	0.00	3.83	3.83
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.31	5.37	0.03	0.02	0.05	0.01	0.02	0.03

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2009 - 12/1/2011 - Excavation and Shoring

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

PM10: 84% PM25: 84%

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

PM10: 5% PM25: 5%

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

PM10: 61% PM25: 61%

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

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

6/23/2009 4:00:15 PM

For Unpaved Roads Measures, the Manage haul road dust Pave all haul roads mitigation reduces emissions by:

PM10: 99% PM25: 99%

6/23/2009 2:59:59 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: S:\Projects\05750010 Harbor Refineries Pipeline\Modeling\URB\LADWP Harbor Refineries Project_UNMitigated.urb924

Project Name: Harbor Refineries Recycled Water Pipeline Project - UnMitigated

Project Location: South Coast AQMD

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (tons/year unmitigated)	0.85	6.91	3.68	0.00	3.92	0.38	4.30	0.82	0.35	1.17	738.52
2009 TOTALS (tons/year mitigated)	0.85	6.91	3.68	0.00	0.28	0.38	0.67	0.06	0.35	0.41	738.52
Percent Reduction	0.00	0.00	0.00	0.00	92.79	0.00	84.49	92.69	0.00	64.73	0.00
2010 TOTALS (tons/year unmitigated)	1.92	15.45	8.43	0.00	9.39	0.85	10.23	1.96	0.78	2.74	1,764.16
2010 TOTALS (tons/year mitigated)	1.92	15.45	8.43	0.00	0.68	0.85	1.52	0.14	0.78	0.92	1,764.16
Percent Reduction	0.00	0.00	0.00	0.00	92.79	0.00	85.12	92.69	0.00	66.37	0.00
2011 TOTALS (tons/year unmitigated)	1.63	13.10	7.39	0.00	8.59	0.73	9.33	1.80	0.67	2.47	1,615.43
2011 TOTALS (tons/year mitigated)	1.63	13.10	7.39	0.00	0.62	0.73	1.35	0.13	0.67	0.81	1,615.43
Percent Reduction	0.00	0.00	0.00	0.00	92.79	0.00	85.50	92.69	0.00	67.41	0.00

6/23/2009 2:59:59 PM

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009	0.85	6.91	3.68	0.00	3.92	0.38	4.30	0.82	0.35	1.17	738.52
Asphalt 08/01/2009-12/01/2011	0.03	0.16	0.11	0.00	0.00	0.01	0.01	0.00	0.01	0.01	13.89
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.03	0.15	0.08	0.00	0.00	0.01	0.01	0.00	0.01	0.01	10.50
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.39
Fine Grading 08/01/2009-08/03/2009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading 08/01/2009-08/08/2009	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Fine Grading 08/01/2009-12/01/2011	0.06	0.84	0.32	0.00	0.00	0.04	0.04	0.00	0.03	0.03	103.95
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.06	0.84	0.32	0.00	0.00	0.04	0.04	0.00	0.03	0.03	103.95
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	0.58	4.57	2.52	0.00	3.92	0.26	4.18	0.82	0.24	1.06	466.06
Mass Grading Dust	0.00	0.00	0.00	0.00	3.91	0.00	3.91	0.82	0.00	0.82	0.00
Mass Grading Off Road Diesel	0.57	4.55	2.12	0.00	0.00	0.26	0.26	0.00	0.24	0.24	421.98
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.01	0.02	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.08
Trenching 08/01/2009-12/01/2011	0.18	1.33	0.72	0.00	0.00	0.07	0.07	0.00	0.07	0.07	152.87
Trenching Off Road Diesel	0.18	1.32	0.58	0.00	0.00	0.07	0.07	0.00	0.07	0.07	137.62
Trenching Worker Trips	0.00	0.01	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.26

2010	1.92	15.45	8.43	0.00	9.39	0.85	10.23	1.96	0.78	2.74	1,764.16
Asphalt 08/01/2009-12/01/2011	0.06	0.36	0.26	0.00	0.00	0.03	0.03	0.00	0.03	0.03	33.27
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.06	0.35	0.19	0.00	0.00	0.03	0.03	0.00	0.03	0.03	25.14
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Paving Worker Trips	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.12
Fine Grading 08/01/2009-12/01/2011	0.14	1.83	0.70	0.00	0.01	0.07	0.08	0.00	0.07	0.07	248.90
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.14	1.83	0.70	0.00	0.01	0.07	0.08	0.00	0.07	0.07	248.90
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	1.31	10.26	5.81	0.00	9.37	0.58	9.95	1.96	0.53	2.49	1,115.95
Mass Grading Dust	0.00	0.00	0.00	0.00	9.37	0.00	9.37	1.96	0.00	1.96	0.00
Mass Grading Off Road Diesel	1.28	10.21	4.93	0.00	0.00	0.58	0.58	0.00	0.53	0.53	1,010.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.03	0.05	0.89	0.00	0.00	0.00	0.01	0.00	0.00	0.00	105.52
Trenching 08/01/2009-12/01/2011	0.41	3.00	1.65	0.00	0.00	0.16	0.16	0.00	0.15	0.15	366.05
Trenching Off Road Diesel	0.40	2.98	1.34	0.00	0.00	0.16	0.16	0.00	0.15	0.15	329.52
Trenching Worker Trips	0.01	0.02	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.53

2011	1.63	13.10	7.39	0.00	8.59	0.73	9.33	1.80	0.67	2.47	1,615.43
Asphalt 08/01/2009-12/01/2011	0.05	0.31	0.23	0.00	0.00	0.03	0.03	0.00	0.03	0.03	30.46
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.05	0.31	0.17	0.00	0.00	0.03	0.03	0.00	0.03	0.03	23.02
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Paving Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.43
Fine Grading 08/01/2009-12/01/2011	0.12	1.51	0.58	0.00	0.01	0.06	0.07	0.00	0.06	0.06	227.92
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.12	1.51	0.58	0.00	0.01	0.06	0.07	0.00	0.06	0.06	227.92
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	1.11	8.73	5.13	0.00	8.58	0.50	9.09	1.79	0.46	2.26	1,021.86
Mass Grading Dust	0.00	0.00	0.00	0.00	8.58	0.00	8.58	1.79	0.00	1.79	0.00
Mass Grading Off Road Diesel	1.08	8.69	4.37	0.00	0.00	0.50	0.50	0.00	0.46	0.46	925.26
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.02	0.04	0.76	0.00	0.00	0.00	0.01	0.00	0.00	0.00	96.60
Trenching 08/01/2009-12/01/2011	0.35	2.55	1.46	0.00	0.00	0.14	0.14	0.00	0.13	0.13	335.18
Trenching Off Road Diesel	0.34	2.54	1.19	0.00	0.00	0.14	0.14	0.00	0.13	0.13	301.74
Trenching Worker Trips	0.01	0.02	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.44

Phase Assumptions

Phase: Fine Grading 8/1/2009 - 8/8/2009 - HDD Example

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

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Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 150

Off-Road Equipment:

Phase: Fine Grading 8/1/2009 - 8/3/2009 - Jacking Example

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 72

Off-Road Equipment:

Phase: Fine Grading 8/1/2009 - 12/1/2011 - Site Preparation

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 450

Off-Road Equipment:

Phase: Mass Grading 8/1/2009 - 12/1/2011 - Excavation and Shoring

Total Acres Disturbed: 0.1

Maximum Daily Acreage Disturbed: 0.1

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 600 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

4 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day

4 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 6 hours per day

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4 Excavators (168 hp) operating at a 0.57 load factor for 6 hours per day

4 Plate Compactors (8 hp) operating at a 0.43 load factor for 4 hours per day

8 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

2 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 8/1/2009 - 12/1/2011 - Pipe Installation and Backfilling

Off-Road Equipment:

3 Generator Sets (60 hp) operating at a 0.74 load factor for 6 hours per day

3 Other Equipment (190 hp) operating at a 0.62 load factor for 6 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 4 hours per day

Phase: Paving 8/1/2009 - 12/1/2011 - Paving

Acres to be Paved: 0.03

Off-Road Equipment:

2 Pavers (100 hp) operating at a 0.62 load factor for 2 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009	0.85	6.91	3.68	0.00	0.28	0.38	0.67	0.06	0.35	0.41	738.52
Asphalt 08/01/2009-12/01/2011	0.03	0.16	0.11	0.00	0.00	0.01	0.01	0.00	0.01	0.01	13.89
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.03	0.15	0.08	0.00	0.00	0.01	0.01	0.00	0.01	0.01	10.50
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.39

Fine Grading 08/01/2009-08/03/2009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading 08/01/2009-08/08/2009	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading 08/01/2009-12/01/2011	0.06	0.84	0.32	0.00	0.00	0.04	0.04	0.00	0.03	0.03	103.95
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.06	0.84	0.32	0.00	0.00	0.04	0.04	0.00	0.03	0.03	103.95
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	0.58	4.57	2.52	0.00	0.28	0.26	0.54	0.06	0.24	0.30	466.06
Mass Grading Dust	0.00	0.00	0.00	0.00	0.28	0.00	0.28	0.06	0.00	0.06	0.00
Mass Grading Off Road Diesel	0.57	4.55	2.12	0.00	0.00	0.26	0.26	0.00	0.24	0.24	421.98
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.01	0.02	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.08
Trenching 08/01/2009-12/01/2011	0.18	1.33	0.72	0.00	0.00	0.07	0.07	0.00	0.07	0.07	152.87
Trenching Off Road Diesel	0.18	1.32	0.58	0.00	0.00	0.07	0.07	0.00	0.07	0.07	137.62
Trenching Worker Trips	0.00	0.01	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.26

2010	1.92	15.45	8.43	0.00	0.68	0.85	1.52	0.14	0.78	0.92	1,764.16
Asphalt 08/01/2009-12/01/2011	0.06	0.36	0.26	0.00	0.00	0.03	0.03	0.00	0.03	0.03	33.27
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.06	0.35	0.19	0.00	0.00	0.03	0.03	0.00	0.03	0.03	25.14
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Paving Worker Trips	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.12
Fine Grading 08/01/2009-12/01/2011	0.14	1.83	0.70	0.00	0.01	0.07	0.08	0.00	0.07	0.07	248.90
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.14	1.83	0.70	0.00	0.01	0.07	0.08	0.00	0.07	0.07	248.90
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	1.31	10.26	5.81	0.00	0.67	0.58	1.24	0.14	0.53	0.67	1,115.95
Mass Grading Dust	0.00	0.00	0.00	0.00	0.66	0.00	0.66	0.14	0.00	0.14	0.00
Mass Grading Off Road Diesel	1.28	10.21	4.93	0.00	0.00	0.58	0.58	0.00	0.53	0.53	1,010.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.03	0.05	0.89	0.00	0.00	0.00	0.01	0.00	0.00	0.00	105.52
Trenching 08/01/2009-12/01/2011	0.41	3.00	1.65	0.00	0.00	0.16	0.16	0.00	0.15	0.15	366.05
Trenching Off Road Diesel	0.40	2.98	1.34	0.00	0.00	0.16	0.16	0.00	0.15	0.15	329.52
Trenching Worker Trips	0.01	0.02	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.53

2011	1.63	13.10	7.39	0.00	0.62	0.73	1.35	0.13	0.67	0.81	1,615.43
Asphalt 08/01/2009-12/01/2011	0.05	0.31	0.23	0.00	0.00	0.03	0.03	0.00	0.03	0.03	30.46
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.05	0.31	0.17	0.00	0.00	0.03	0.03	0.00	0.03	0.03	23.02
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Paving Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.43
Fine Grading 08/01/2009-12/01/2011	0.12	1.51	0.58	0.00	0.01	0.06	0.07	0.00	0.06	0.06	227.92
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.12	1.51	0.58	0.00	0.01	0.06	0.07	0.00	0.06	0.06	227.92
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading 08/01/2009-12/01/2011	1.11	8.73	5.13	0.00	0.61	0.50	1.11	0.13	0.46	0.59	1,021.86
Mass Grading Dust	0.00	0.00	0.00	0.00	0.61	0.00	0.61	0.13	0.00	0.13	0.00
Mass Grading Off Road Diesel	1.08	8.69	4.37	0.00	0.00	0.50	0.50	0.00	0.46	0.46	925.26
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.02	0.04	0.76	0.00	0.00	0.00	0.01	0.00	0.00	0.00	96.60
Trenching 08/01/2009-12/01/2011	0.35	2.55	1.46	0.00	0.00	0.14	0.14	0.00	0.13	0.13	335.18
Trenching Off Road Diesel	0.34	2.54	1.19	0.00	0.00	0.14	0.14	0.00	0.13	0.13	301.74
Trenching Worker Trips	0.01	0.02	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.44

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 8/1/2009 - 8/8/2009 - HDD Example

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

PM10: 84% PM25: 84%

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For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

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

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

The following mitigation measures apply to Phase: Fine Grading 8/1/2009 - 8/3/2009 - Jacking Example

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

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

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

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

The following mitigation measures apply to Phase: Fine Grading 8/1/2009 - 12/1/2011 - Site Preparation

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

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

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

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

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The following mitigation measures apply to Phase: Mass Grading 8/1/2009 - 12/1/2011 - Excavation and Shoring

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

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

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

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

Appendix B:
GHG Water Offset

Electricity Use in Typical Urban Water Systems

Project: Harbor Refineries Pipeline
Prepared by: Michael Brandman Associates
Prepared on: 5/29/2009

	kWh/MG	
	Northern California	**Southern California**
Water Supply and Conveyance	2,117	9,727
Water Treatment	111	111
Water Distribution	1,272	1,272
Wastewater Treatment	1,911	1,911
Totals	***5,411***	***13,021***

From CEC 2006

	Gallons per day	**Millions Gallons (MG) per year**
Water Usage	13,391,154.79	4887.771499

	kWh	**MWh**
Energy Usage	63,643,673	63,644

Greenhouse Gas	**Indirect Electricity Emission Factor (pounds per MWh/year)**	**Emissions (pounds/year)**	**Emissions (tons/year)**
Carbon dioxide	804.54	51,203,880	25,602
Methane	0.0067	426.41	0.213
Nitrous oxide	0.0037	235.48	0.118

Emission factor for electricity source:
California Climate Action Registry. General Reporting Protocol. Reporting Entity-Wide Greenhouse Gas Emissions. Version 2.2, March 2007. www.climateregistry.org

CEC 2006. Navigant Consulting, Inc. 2006. Refining Estimates of Water-Related Energy Use in California. California Energy Commission, PIER Industrial/Agricultural/Water End Use Energy Efficiency Program. CEC-500-2006-118. www.energy.ca.gov/pier/project_reports/CEC-500-2006-118.html