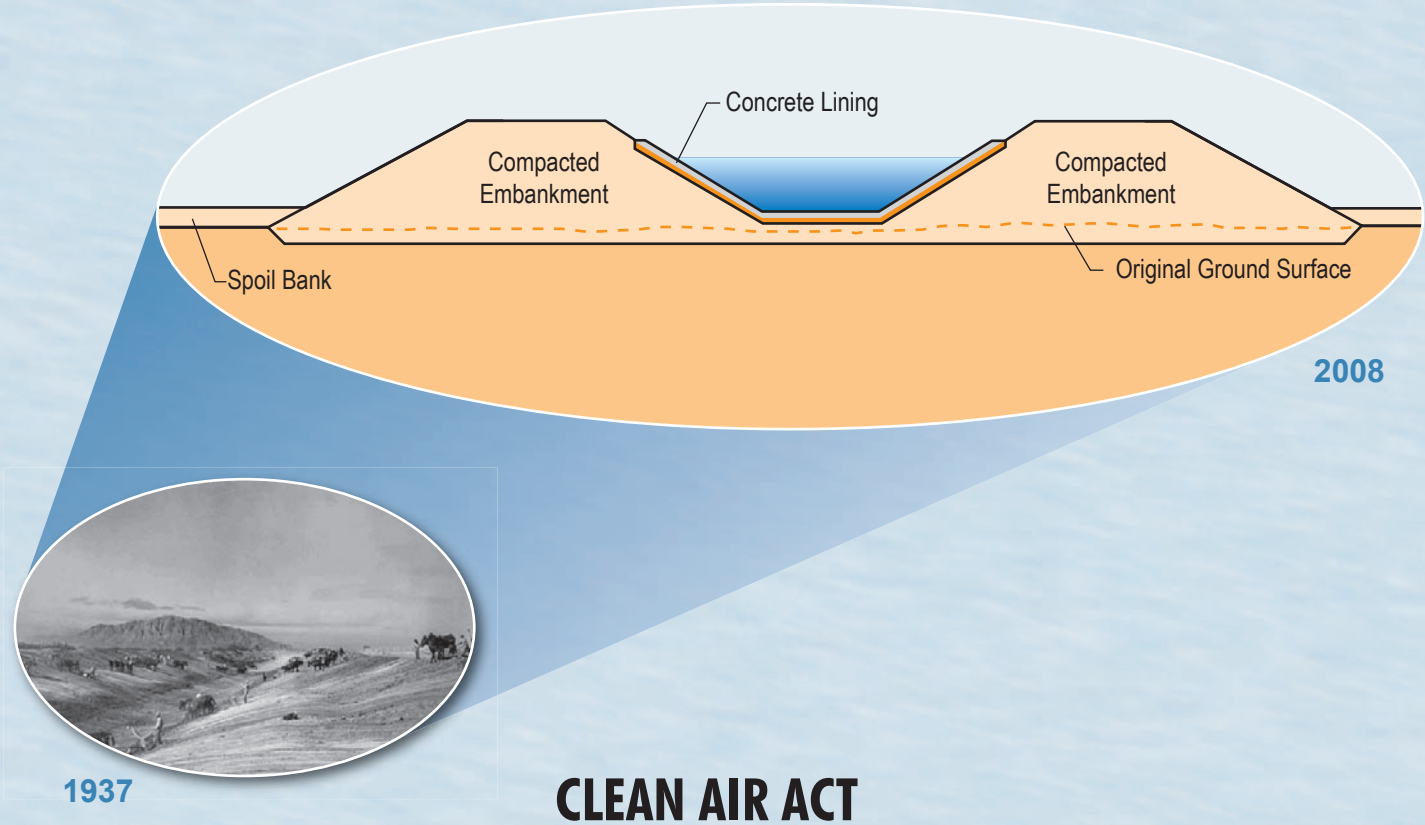

CLEAN AIR ACT

CONFORMITY ANALYSIS AND RECORD OF NON-APPLICABILITY (RONA) FOR CONSTRUCTION OF THE ALL AMERICAN CANAL LINING PROJECT

Prepared for the

U.S. BUREAU OF RECLAMATION

JANUARY 9, 2006

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EXECUTIVE SUMMARY

Construction of the All American Canal Lining Project (Project) will occur from 2006 through 2008. In each of these years, the total annual emissions of carbon monoxide, volatile organic compounds, nitrogen oxides, sulfur oxides, and PM_{10} particulate matter (with dust control in place) that result directly or indirectly from this construction project will all be lower than the federally established *de minimis* values for Clean Air Act conformity determinations. Estimated actual emission levels for all of the criteria pollutants also will be well below their respective regionally significant levels.

The total annual emissions of PM_{10} particulate matter without dust control would be higher than the *de minimis* value but below the regionally significant emission threshold. However, because particulate emission control measures defined in the emissions assessment will be enforced, emissions of PM_{10} will be below thresholds that would require a conformity analysis

This analysis found that air emissions from construction of the Project will not exceed the conformity applicability, or *de minimis*, thresholds and will not be regionally significant. Therefore, the action is exempt from further analysis under the General Conformity Rule. A record of non-applicability (RONA) documenting this finding is provided in the appendices.

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SECTION 1

ENVIRONMENTAL AND REGULATORY SETTING

1.1 PROJECT DESCRIPTION

The All American Canal (AAC) conveys water from the Colorado River to the Imperial Valley in extreme southern California. About 3.1 million acre-feet of Colorado River water are delivered annually through the AAC to nine cities and 500,000 acres of agricultural lands throughout the Imperial Valley.

The 82-mile, gravity-flow canal begins at Imperial Dam on the Colorado River 20 miles northeast of Yuma, Arizona. From there, the canal runs southwest and then west, adjacent to the Mexican border along much of its route. Between the communities of Winterhaven and Calexico, the unlined canal crosses the sandy soils of the Imperial Dunes. Part of this stretch is adjacent to the southern boundary of the Imperial Sand Dunes National Recreation Area. More than 90,000 acre-feet of water per year are lost to seepage from the canal in this area (Bureau of Reclamation, 1994).

The All American Canal Lining Project (Project) will reduce long-term seepage loss from the AAC to more effectively deliver water to customers. The Project will replace approximately 23 miles of the existing canal by constructing a concrete-lined canal parallel to the existing canal route in the area from approximately 1.6 miles west of Pilot Knob to Hydroelectric Drop 3.

The Project lies along the AAC, beginning west of Pilot Knob and extending west to Drop 3, about 2 miles west of the intersection of Interstate 8 (I-8) and California Highway 98. The project area map is provided in Figure 1-1 (two pages).

1.2 GENERAL ENVIRONMENTAL SETTING

The Project area in the Imperial Valley is a desert characterized by hot, dry summers, occasional thunderstorms, and gusty high winds with sandstorms. The Imperial Valley is one of the most arid areas in the United States. The average annual rainfall is about 3 inches and the maximum temperature exceeds 100 degrees Fahrenheit (^{o}F) more than 110 days per year (Bureau of Reclamation, 1994). The highest temperature on record, 121 degrees, occurred on July 29, 1995 (Imperial Irrigation District, 2005).

The warm climate and availability of Colorado River water make the Imperial Valley one of the most productive agricultural regions in the world. The Imperial Valley has an agriculturally based economy, producing over $1 billion in crops annually. Roughly one in three jobs is directly related to agriculture (Imperial Irrigation District, 2005).

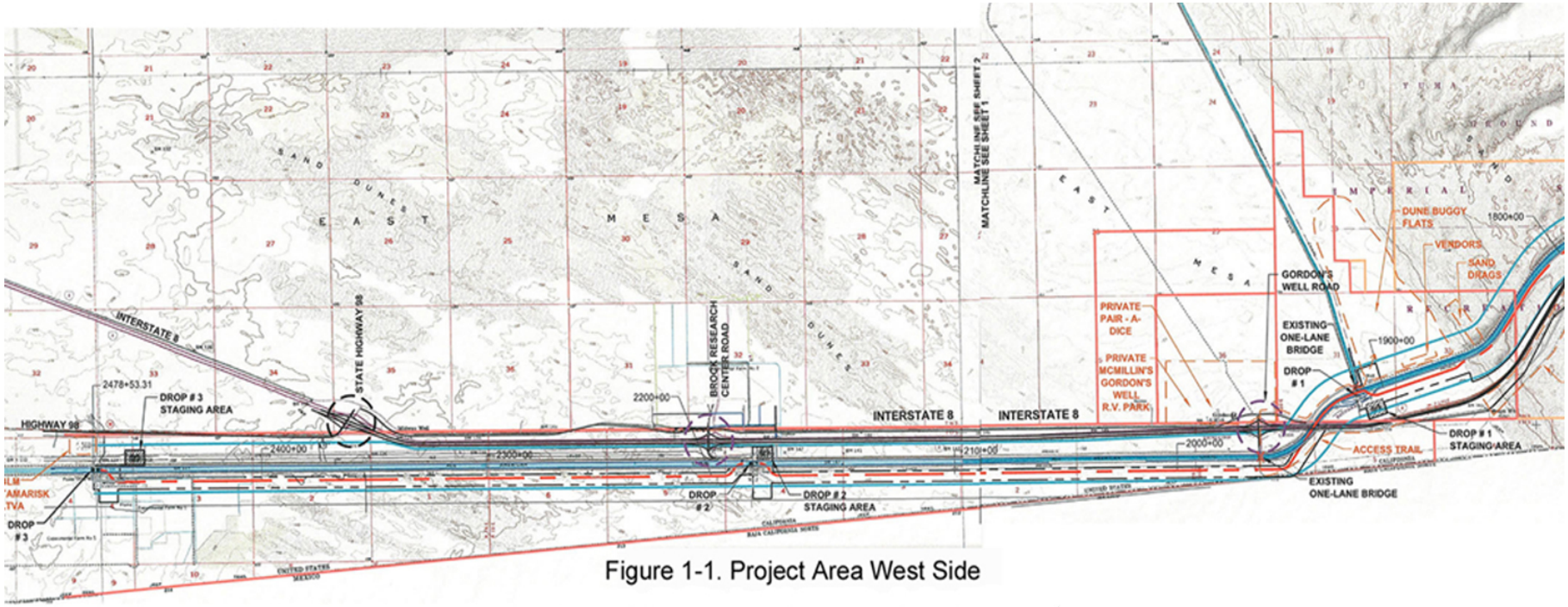

Figure 1-1. Project Area West Side

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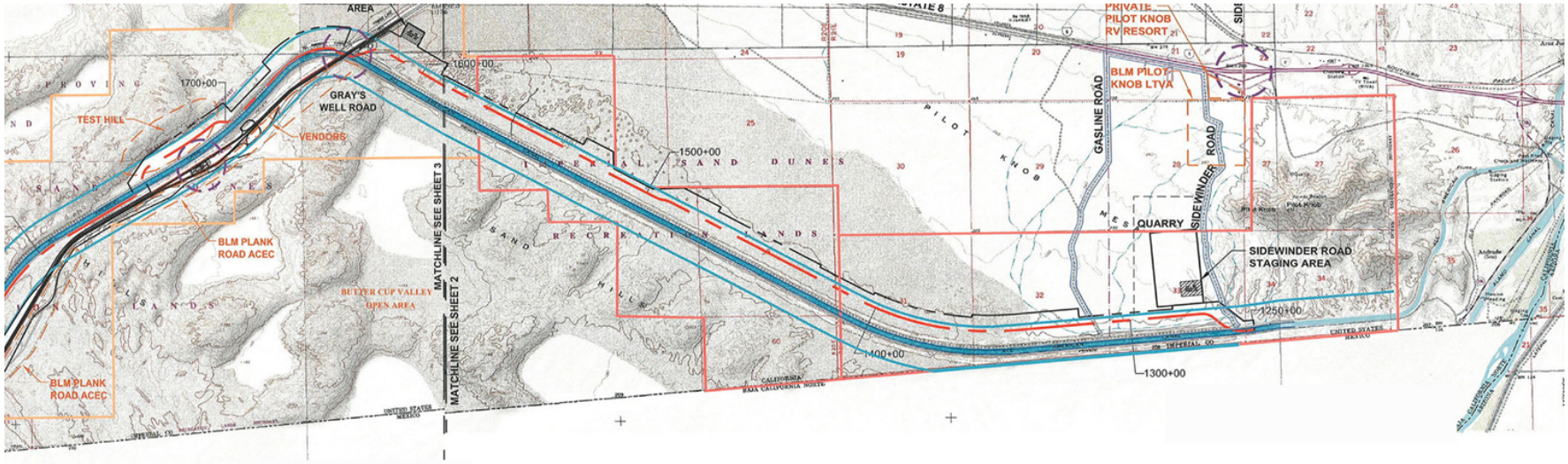

Figure 1-1. Project Area East Side

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The Project site is located in the Salton Sea Air Basin. In Imperial County, the Salton Sea Air Basin is under the jurisdiction of the Imperial County Air Pollution Control District (ICAPCD). The attainment status in the county with regard to federal and state air quality standards is addressed below under "1.4 Existing Air Quality."

1.3 APPLICABLE AIR QUALITY REGULATIONS, PLANS, AND POLICIES

1.3.1 Federal and State Standards

Information in this section is from the Bureau of Reclamation's (2000) Coachella Canal Lining Project environmental impact statement (EIS), with updates from the U.S. Environmental Protection Agency's (EPA's) "Green Book" (U.S. Environmental Protection Agency, 2005) to reflect regulatory changes that have occurred since the Coachella Canal document was prepared.

The Federal Clean Air Act (42 *United States Code* (U.S.C.) §§ 7401-7671q) requires the adoption of national ambient air quality standards (NAAQS) to protect public health and welfare from the effects of air pollution. Currently, NAAQS standards exist for the following air pollutants, collectively referred to as criteria pollutants that have been identified by the EPA as being of concern relative to protection of human health and welfare nationwide:

- Carbon monoxide (CO).
- Lead (Pb).
- Nitrogen dioxide ($N0_2$).
- Particulate matter. This includes matter sized 10 microns or less (PM_{10}), also called respirable particulates or suspended particulates; and fine particulate matter equal to or less than 2.5 microns in size ($PM_{2.5}$).
- Ozone (0_3).
- Sulfur oxides (SO_X), which are regulated by some states, including California, as sulfur dioxide ($S0_2$).

The State of California Air Resources Board (CARB) has established additional California Ambient Air Quality Standards (CAAQS) that are at least as stringent as and, in some cases, more restrictive than the NAAQS. California also regulates other air pollutants, including hydrogen sulfide, sulfates, and visibility reducing particles. The federal and California standards are shown in Table 1-1.

At the time the Clean Air Act was passed, lead was widely employed as an octane booster in gasoline and was a major air quality concern. However, the use of unleaded gasoline over several decades has substantially eliminated this material as an air pollutant. The Salton Sea Air Basin and surrounding areas are in attainment for this criteria pollutant. Therefore, although lead standards are identified in Table 1-1, lead is not considered in this analysis.

TABLE 1-1: NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	NAAQS [a/]		CAAQS [b/]
		Primary [c/]	Secondary [d/]	Concentrations
Carbon monoxide (CO)	8-hour [e/]	9 ppm (10 mg/m^3)	None	9.0 ppm (10 mg/m^3)
	1-hour [e/]	35 ppm (40 mg/m^3)	None	20 ppm (23 mg/m^3)
Lead (Pb)	30-day average	-	-	1.5 µg/m^3
	Quarterly average	1.5 µg/m^3	Same as primary	-
Nitrogen dioxide (NO_2)	Annual (arithmetic mean)	0.053 ppm (100 µg/m^3)	Same as primary	-
	1-hour	-	-	0.25 ppm (470 µg/m^3)
Particulate matter (PM_{10})	24-hour [e/]	150 µg/m^3	Same as primary	50 µg/m^3
	Annual [f/] (arithmetic mean)	50 µg/m^3	Same as primary	20 µg/m^3
Particulate matter ($PM_{2.5}$)	24-hour [g/]	65 µg/m^3	Same as primary	-
	Annual [h/] (arithmetic mean)	15.0 µg/m^3	Same as primary	12 µg/m^3
Ozone (O_3)	1-hour	-	-	0.09 ppm (180 µg/m^3)
	8-hour [i/]	0.08 ppm	Same as primary	0.070 ppm (137 µg/m^3) [j/]
Sulfur oxides (SO_x)	Annual (arithmetic mean)	0.03 ppm	-	-
	24-hour [e/]	0.14 ppm	-	0.04 ppm (105 µg/m^3) [k/]
	3-hour [e/]	-	0.5 ppm (1,300 µg/m^3)	-
	1-hour	-		0.25 ppm (665 µg/m^3) [k/]
Hydrogen sulfide (HS)	1-hour	No federal standards		0.03 ppm 42 µg/m^3)
Sulfates (SO_2)	24-hour			25 µg/m^3
Visibility reducing particles	8-hour (10 am-6 pm, Pacific Standard Time)			In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

a/ NAAQS = National Ambient Air Quality Standards. Available on the Internet at http://www.epa.gov/air/criteria.html.

Units of measure for the standards are parts per million (ppm) by volume, milligrams per cubic meter of air (mg/m^3), and micrograms per cubic meter of air (µg/m^3).

b/ CAAQS = California Ambient Air Quality Standards. Available on the Internet at http://www.arb.ca.gov/aqs/aaqs2.pdf.

California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, and suspended particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles) are values that are not to be exceeded. All others are not to be equaled or exceeded. California Ambient Air Quality Standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

Concentration is expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

c/ NAAQS primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly.

Footnotes are continued on next page.

d/ NAAQS secondary standards set limits to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings.

e/ Not to be exceeded more than once per year.

f/ To attain this standard, the 3-year average of the weighted annual mean PM_{10} concentration at each monitor within an area must not exceed 50 $\mu g/m^3$.

g/ To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 65 $\mu g/m^3$.

h/ To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 $\mu g/m^3$.

i/ To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

j/ This concentration was approved by the Air Resources Board on April 28, 2005 and is expected to become effective in early 2006.

k/ California standard is for sulfur dioxide.

1.3.2 Regional Authority

The regional air quality authority in the Project vicinity is the ICAPCD. This agency protects public health and welfare through the administration of federal and state air quality laws, regulations, and policies. The ICAPCD's responsibilities include monitoring air pollution, preparing the portion of the State Implementation Plan (SIP) for the Salton Sea Air Basin, and promulgating rules and regulations. The SIP is a formal regulatory program developed by local and state air agencies, and approved by the EPA, that includes strategies and tactics to be used to attain federal and state air quality standards in areas that are not currently "in attainment" with applicable standards for one or more pollutants.

- The ICAPCD elements of the SIP are presented in the Air Quality Management Plan (AQMP), which includes the ICAPCD plans for attaining the federal and state standards.

- The *Rules and Regulations of the Imperial County Air Pollution Control District* include procedures and requirements to implement the AQMP, control the emission of pollutants, and prevent adverse impacts (Imperial County Air Pollution Control District, 2005b).

- The ICAPCD's *CEQA Air Quality Handbook* provides assistance in assessing potential air quality impacts (Imperial County Air Pollution Control District, 2005a). While this document is focused primarily on residential and commercial developments, it provides useful direction for construction activities and other actions that could affect air quality in the county.

The AQMP for Imperial County does not specify numeric air quality thresholds. Instead, it indicates that when an action complies with the *Rules and Regulations of the Imperial County Air Pollution Control District*, it complies with the AQMP. In addition, because of the high concern within the county regarding PM_{10}, mitigation for this criteria pollutant is required even if a PM_{10} impact is not indicated (Soucier, 2005).

While the Project must comply with all elements of the *Rules and Regulations of the Imperial County Air Pollution Control District*, the rules regarding construction, stationary sources, opacity, and general conformity are particularly applicable (Romero, 2005). These rules are discussed later in Section 1.5.3.

1.3.3 Clean Air Act Conformity

The 1990 amendments to Federal Clean Air Act, Section 176 required the EPA to promulgate rules to ensure that federal actions that produce emissions of any criteria air pollutants for which an area is not in attainment with standards conform to the appropriate SIP. The resulting rules, known together as the General Conformity Rule (40 *Code of Federal Regulations* §§ 51.850-860 and 40 *Code of Federal Regulations* §§ 93.150-160), require any federal agency responsible for an action in a nonattainment area to determine that the action is either exempt from the General Conformity Rule's requirements or positively determine that the action conforms to the provisions and objectives of the applicable SIP.

In addition to the approximately 30 presumptive exemptions established and available in the General Conformity Rule, an agency may demonstrate that the emission rate for any affected pollutant from the proposed action would be less than specified emission rate thresholds, known as *de minimis* limits. An action is exempt from a conformity determination if an applicability analysis shows that the total direct and indirect emissions from the project:

- Will be below the applicable *de minimis* thresholds; AND
- Will not otherwise be "regionally significant," which is defined as representing 10 percent or more of an area's total emissions inventory for a specified pollutant.

If an action is not exempt, the federal agency must demonstrate that the total of direct and indirect emissions from the proposed action can be presumed to conform to the SIP provisions. This would occur as long as the action would not:

- Cause or contribute to any new violation of any standard in any area;
- Interfere with provisions in the applicable SIP for maintenance of any standard;
- Increase the frequency or severity of any existing violation of any standard in any area; or
- Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area including, where applicable, emission levels specified in the applicable SIP for the purposes of demonstration of reasonable further progress, a demonstration of attainment, or a maintenance plan.

For purposes of estimating a project's emissions, "direct emissions" are those directly associated with project activities at the time and location of the project. For the Project, direct emissions include those from actual construction activities, construction vehicles and equipment, and any ancillary emissions sources.

"Indirect emissions" may be related to a project, but occur in a different place or at a different time. For example, these would include emissions that continue after project completion. For this Project, the only indirect emissions will be associated with the vehicular transport of workers, construction equipment, and materials to and from the job site, and will involve travel distances up to about 50 miles. These indirect emissions have been included in the estimates of overall Project emissions. Once the Project is completed, there will not be indirect emissions from this action. (Although there will be low levels of emissions from light truck traffic conducting periodic inspection and maintenance work along the canal, these emissions would be no different from those that would occur if the Project were not implemented.)

1.4 EXISTING AIR QUALITY

Specific geographic areas are classified by the EPA and the CARB as either *attainment* or *nonattainment* for each criteria pollutant, based on actual, measured air quality levels relative to federal and state ambient air quality standards. The attainment status for each pollutant in Imperial County is shown in Table 1-2.

TABLE 1-2: NONATTAINMENT CLASSIFICATIONS FOR IMPERIAL COUNTY, CALIFORNIA

Pollutant	EPA Designation [a/]	CARB Designation [b/]
Carbon monoxide	Attainment	Unclassified
Nitrogen dioxide	Attainment	Attainment
PM_{10}	Nonattainment – serious	Nonattainment
Ozone	Nonattainment – marginal	Nonattainment – moderate
Sulfur oxides	Attainment	Attainment

a/ Source: EPA's *Green Book*, available on the Internet at http://www.epa.gov/oar/oaqps/greenbk/.
b/ Source: http://www.arb.ca.gov/desig/adm/adm.htm

As shown in the table, the Project is in an area classified as moderate nonattainment for ozone and serious nonattainment for particulate matter less than 10 microns in diameter (PM_{10}). The area is in attainment for all other pollutants. Actual measured levels of ozone and particulate matter that have led to the nonattainment designations are discussed below. The information on actual measured air quality levels is from the CARB's interactive Internet site at http://www.arb.ca.gov/aqd/aqdpage.htm.

The Project is located within the Salton Sea Air Basin. There are 12 air quality monitoring stations within this basin, including 10 in Imperial County and two in Riverside County.

- The monitoring site closest to the Project is the Calexico-East station, located at 32.6742 degrees latitude and -115.3911 degrees longitude. It is near the AAC about 10 miles west of the west end of the Project. Criteria pollutants currently sampled at this station include ozone, carbon monoxide, and nitrogen dioxide.

- The next closest monitoring site is the Calexico-Ethel Street station, located at 32.6761 degrees latitude and -115.4831 degrees longitude, about 16 miles west of the west end of the Project. Criteria pollutants currently sampled at this station

include ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulates, and lead.

Both of these stations were used to characterize existing air quality in the Project area. Both are operated by the CARB.

Because the Salton Sea Air Basin is in attainment for carbon monoxide and sulfur dioxide, these criteria pollutants were not characterized in this section. Nitrogen oxides and reactive organic compounds (also known as volatile organic compounds) are designated as precursors to ozone formation and, therefore, are considered in this section for their contribution to ambient ozone concentrations, for which the area is classified as marginal nonattainment. Because the area is classified as serious nonattainment for particulate matter, existing emissions of particulates also are characterized below.

1.4.1 Ozone

A summary of ozone trends at the Calexico-East Station from 1996 through 2004 is provided in Table 1-3. The summary includes the maximum 1-hour, maximum 8-hour, and 3-year average 4th high concentrations, plus the numbers of days with readings over the 1- and 8-hour standards, in each year in the monitoring record.

TABLE 1-3: OZONE SUMMARY, CALEXICO-EAST STATION, 1996-2004. ALL CONCENTRATIONS ARE IN PARTS PER MILLION

Year	Days Exceeding Standard		1-Hour Observations	8-Hour Averages	
	1-Hour State [a/] (0.09 ppm)	8-Hour National [a/] (0.08 ppm)	Maximum [a/] (0.09 ppm)	Maximum [a/] (0.07 ppm)	3-Year Average 4th High [a/] (0.08 ppm)
2004	1	1	0.124	0.090	0.078
2003	2	0	0.100	0.078	[b/]
2002	6	4	0.133	0.089	
2001	13	7	0.138	0.108	0.085
2000	7	0	0.108	0.079	0.087
1999	13	5	0.156	0.110	0.088
1998	27	13	0.236	0.101	0.091
1997	6	2	0.121	0.092	0.088
1996	22	12	0.162	0.117	0.097

a/ Applicable state or federal standard is provided in parentheses. Maximum 8-hour average refers to the California 8-hour standard of 0.07 ppm, which is "not to be equaled or exceeded" – see footnote b of Table 1-1. See footnote i in Table 1-1 for the definition of the 3-Year Average 4th High, which how the federal 8-hour standard is expressed.

b/ Blanks mean that there was insufficient data available to determine the value.

Despite the numbers of exceedences shown in the table, ozone levels at the Calexico-East Station are improving. Both the magnitude of peak recorded values and the number of days with measured concentrations over the standards have decreased noticeably during the period. Figure 1-2 shows the general decreasing trend in the number of days in each year where the more stringent state standard was exceeded. A similar decrease has been recorded at the Calexico-Ethel Street Station, as demonstrated in Figure 1-3.

FIGURE 1-2: DAYS PER YEAR THAT EXCEEDED THE STATE OZONE STANDARD HAVE BEEN DECREASING AT THE CALEXICO-EAST STATION

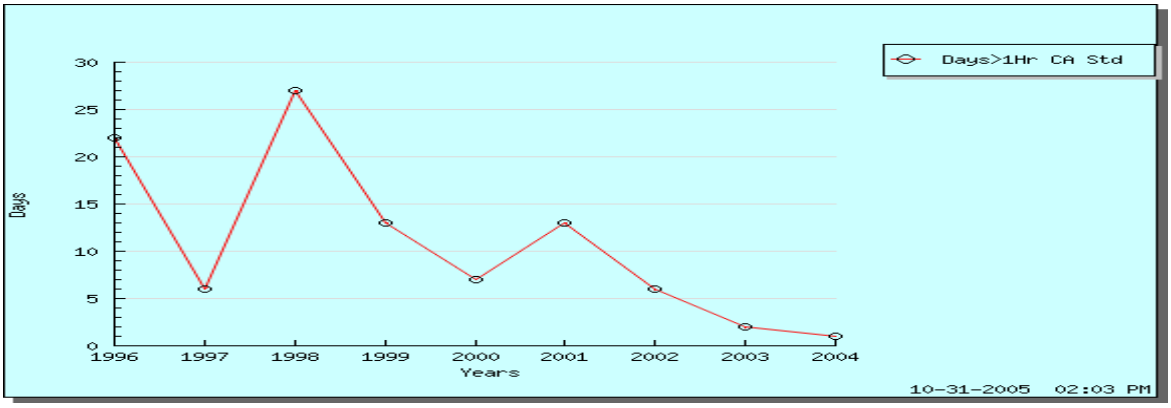
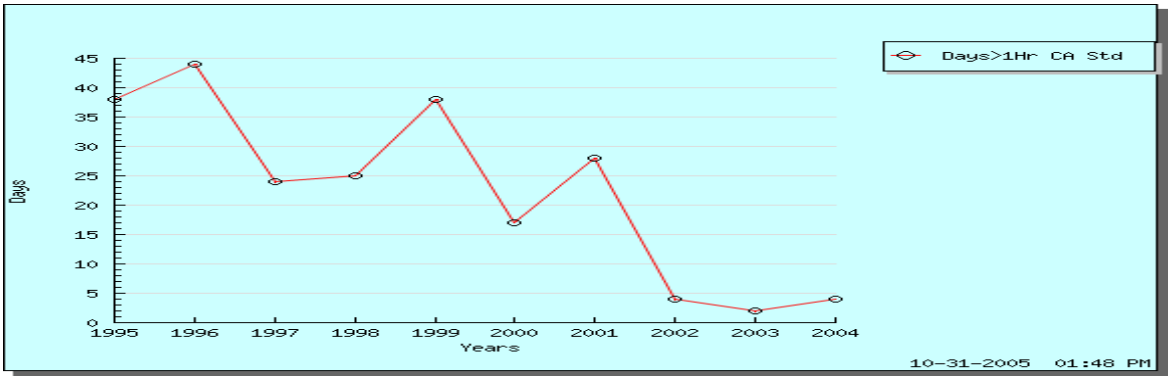


FIGURE 1-3: SIMILAR DECREASES IN DAYS WITH OZONE EXCEEDENCES HAVE BEEN RECORDED AT THE CALEXICO-ETHEL STREET STATION

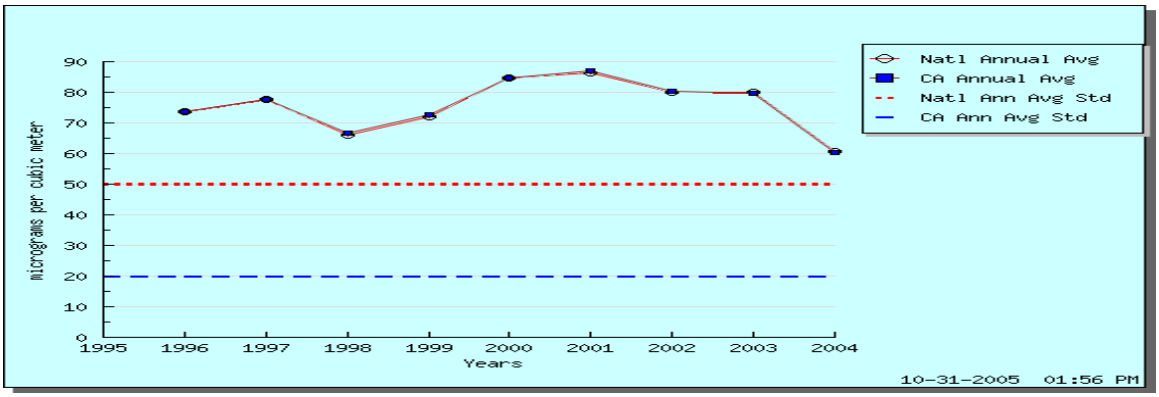


1.4.2 Particulate Matter (PM_{10})

Data for particulate matter are not collected at the Calexico-East Station. Therefore, information for this criteria pollutant is based on PM_{10} readings from the Calexico-Ethel Street Station.

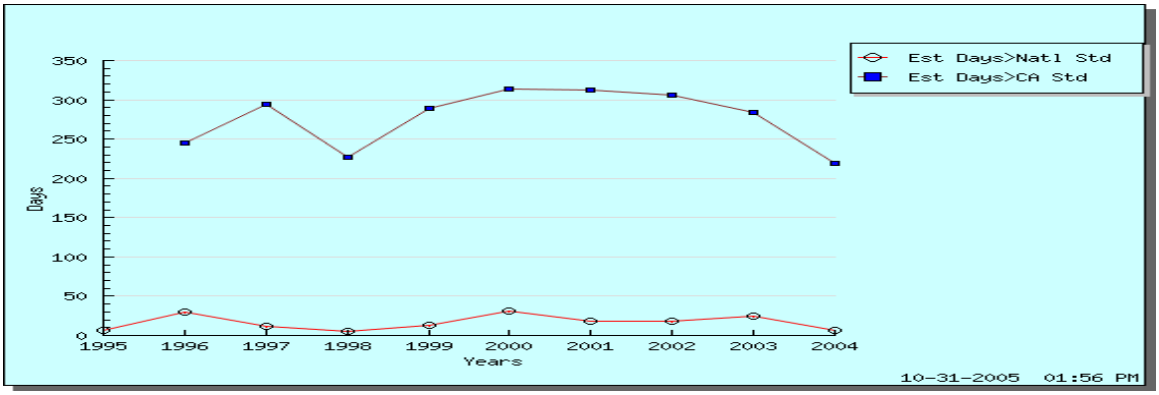
Figure 1-4 presents measured annual average PM_{10} concentrations for the years 1996 through 2004 compared to the national annual standard of 50 micrograms per cubic meter and the California annual standard of 20 micrograms per cubic meter. As shown in the figure, PM_{10} concentrations consistently exceed both the state and federal standards for this criteria pollutant at this monitoring site.

FIGURE 1-4: ANNUAL AVERAGE CONCENTRATIONS OF PARTICULATE MATTER AT THE CALEXICO-ETHEL STREET STATION CONSISTENTLY EXCEED FEDERAL AND STATE STANDARDS



The numbers of days per year in which the federal and state short-term (that is, 24-hour) PM_{10} standards were exceeded are graphed in Figure 1-5. The shapes of the curves are similar to the plot of actual measured concentrations shown in Figure 1-4. These consistently elevated PM_{10} levels occur because particulates in southern Imperial County primarily are the result of dust that is picked up and transported by strong winds blowing across agricultural fields and lightly vegetated deserts (Bureau of Reclamation, 1994). Because the area is classified as "serious nonattainment" for PM_{10}, mitigation is required for all actions that could produce dust (Imperial County Air Pollution Control District, 2005a).

FIGURE 1-5: NUMBERS OF DAYS PER YEAR WHEN STATE AND NATIONAL STANDARDS FOR PARTICULATE MATTER WERE EXCEEDED ARE RELATIVELY CONSTANT



1.5 SIGNIFICANCE CRITERIA

The U.S. Army's *Technical Guide for Compliance with the General Conformity Rule* (Polyak and Webber, 2002) is a useful reference for conducting air quality conformity analyses. Unless otherwise noted, information in this section is taken from that source.

The General Conformity Rule was designed to ensure that federal actions do not impede local efforts to control air pollution and achieve and/or maintain ambient air quality standards. Criteria for determining the significance of air emissions from an

action are based on a two-step conformity analyses. Estimated emissions of criteria pollutants are first evaluated to determine if they exceed criteria thresholds. They are then evaluated relative to the regional level of significance. These evaluations are conducted on a pollutant-by-pollutant basis.

1.5.1 Potential to Aggravate a Nonattainment Problem or Jeopardize Maintenance Status

The proposed action first is evaluated to determine if it will generate air pollutant emissions that could aggravate a nonattainment problem or jeopardize the maintenance status of the area. Specific NAAQS air pollutants that must be evaluated in nonattainment areas and their associated federal threshold levels are shown in Table 1-4. Similar information for maintenance areas is presented in Table 1-5. These are the *de minimis* limits that were referenced in Section 1.3.3. Based on the nonattainment classifications for the Salton Sea Air Basin that were shown in Table 1-2, the applicable *de minimis* limits that would apply to the Project are shown as shaded.

TABLE 1-4: NAAQS NONATTAINMENT AREA POLLUTANTS AND GENERAL FEDERAL CONFORMITY THRESHOLDS

Nonattainment Pollutant	Nonattainment Area Classification	Applicable Pollutant	*De Minimis* Emission Rate Threshold (tons/year)
Ozone	Extreme	VOC or NO_X	10
Ozone	Severe	VOC or NO_X	25
Ozone	Serious	VOC or NO_X	50
Ozone	Moderate or Marginal	VOC or NO_X	100
Ozone	Ozone Transport Region	VOC	50
Ozone	Ozone Transport Region	NO_X	100
Carbon monoxide	Nonattainment	CO	100
Sulfur dioxide	Nonattainment	SO_2	100
Nitrogen dioxide	Nonattainment	NO_2	100
PM_{10}	Serious	PM_{10}	70
PM_{10}	Moderate	PM_{10}	100
Lead	Nonattainment	lead	25

Source: 40 *Code of Federal Regulations* 93.153(b)(1).
Shading indicates classifications and thresholds that are applicable to the Project.

If direct and indirect emissions from a project do not equal or exceed any of these rates, a conformity determination is not required on this basis. The evaluation then proceeds to assess criteria pollutant emissions on a regional significance basis.

TABLE 1-5: NAAQS MAINTENANCE AREA POLLUTANTS AND GENERAL FEDERAL CONFORMITY THRESHOLDS

Maintenance Pollutant	Maintenance Area Classification	Applicable Pollutant	*De Minimis* Emission Rate Threshold (tons/year)
Ozone	Ozone Transport Region	VOC	50
Ozone	Non-Ozone Transport Region	VOC	100
Ozone	Maintenance	NO_X	100
Carbon monoxide	Maintenance	CO	100
Sulfur dioxide	Maintenance	SO_2	100
Nitrogen dioxide	Maintenance	NO_2	100
PM_{10}	Maintenance	PM_{10}	100
Lead	Maintenance	lead	25

Source: 40 *Code of Federal Regulations* 93.153(b)(2).
Shading indicates classifications and thresholds that are applicable to the Project.

1.5.2 Potential to Be Regionally Significant

An action is "regionally significant" if the total direct and indirect emissions of an individual pollutant (as calculated for the threshold determination described in Section 1.5.1) amount to 10 percent or more of a nonattainment or maintenance area's total emissions inventory or emissions budget of that pollutant, as published in the California SIP. If the proposed action is regionally significant, it must undergo a full general conformity determination.

If an action is not regionally significant, and it previously was shown to not exceed the *de minimis* threshold levels, then the action is exempt from further analysis under the General Conformity Rule. Calculations demonstrating that the proposed action's emissions do not exceed threshold levels, and that emissions are not regionally significant, must be documented in a record of non-applicability (RONA).

Table 1-6 presents the estimated total 2004 emissions, in tons per day and tons per year, for the Salton Sea Air Basin. The tons per day values are from the California Air Resources Board, Almanac Emission Projection Data (published on the Internet in 2005). These values were used to calculate basin-wide emissions in tons per year. They also were the basis for determining the regionally significant emission thresholds shown in the table (representing 10 percent of basin-wide emissions), which were used for the conformity assessment.

1.5.3 Potential to Be Significant Based on *Rules and Regulations of the Imperial County Air Pollution Control District*

The Project must comply with the *Rules and Regulations of the Imperial County Air Pollution Control District* (Imperial County Air Pollution Control District, 2005b). Romero (2005) identified the following rules as being particularly applicable to the Project and, potentially, the Clean Air Act conformity analysis.

TABLE 1-6: 2004 ESTIMATED AVERAGE EMISSIONS AND REGIONALLY SIGNIFICANT THRESHOLDS, SALTON SEA AIR BASIN

Criteria Pollutant	Basin-Wide Emissions		Regionally Significant Threshold	
	Tons per Day [a/]	Tons per Year	Tons per Day	Tons per Year
Reactive organic gas (ROG)	46.7	17,045.5	4.7	1,704.6
Carbon monoxide	195.5	71,357.5	19.6	7,135.8
Nitrogen oxides	56.9	20,768.5	5.7	2,076.8
Sulfur oxides	1.7	620.5	0.2	62.0
Particulate matter, PM_{10}	260.8	95,192.0	26.1	9,519.2
Particulate matter, $PM_{2.5}$	61.3	22,374.5	6.1	2,237.4

a/ Basin-wide emissions in tons per day are from the California Air Resources Board Internet wet site at http://www.arb.ca.gov/ei/maps/basins/abssmap.htm. All other values in this table are calculated from the basin-wide emissions in tons per day.

Rule 207: New and Modified Stationary Source Review. The only stationary sources associated with the Project are two onsite batch plants, which will produce the concrete to line the canal (see equipment profile in Appendix A). Elements of this rule with numeric values that can be applied to these components of the project include the following.

- An applicant shall apply best applicable control technology to any new emissions unit which has a potential to emit 25 pounds per day or more of any nonattainment pollutant or its precursors.

- An applicant shall apply best applicable control technology to any new or modified emissions unit which has a potential to emit 550 or more pounds per day of carbon monoxide.

- Offsets shall be required for a new or modified stationary source with a daily potential to emit volumes equal to or exceeding the following:
  - Reactive organic compounds 137 pounds per day.
  - Nitrogen oxides 137 pounds per day.
  - Sulfur oxides 137 pounds per day.
  - PM_{10} 137 pounds per day.
  - Carbon monoxide 137 pounds per day.

- In no case shall emissions from a new or modified emissions unit cause or make worse the violation of an ambient air quality standard.

Rule 401: Opacity of Emissions. The opacity rule also would apply only to the batch plants, which are the only point sources of emissions. The rule identifies limits on the opacity of emissions from stationary sources based on a specified comparison tool.

This requirement does not apply to the amount or rate of emissions, only the opacity. Therefore, it is not applicable to the determination of whether the project meets the General Conformity Rule requirements. However, during implementation of the project, the batch plants will be designed and operated to comply with the provisions of Rule 401.

Rules 800 through 805: Control of Fine Particulate Matter. These rules implement Regulation VIII, which addresses fugitive dust control. These rules address the management of PM_{10}, primarily in association with construction and earthmoving activities.

- The purpose of Rule 801 is to reduce the emissions of fine particulate matter or fugitive dust that is entrained in the ambient air from these activities.
- Reduced emissions of fine particulate matter from handling bulk materials are addressed by Rule 802.
- The emission of fine particulate matter by vehicles carrying materials into and out of a construction area is addressed by Rule 803.
- The emissions of fine particulate matter from open areas and roads (both unpaved and paved) are addressed by Rules 804 and 805, respectively.

Best available control measures are identified for each type of emission source or activity.

Rule 925: General Conformity. Rule 925 provides for implementation of the General Conformity Rule for federal actions occurring within Imperial County. Its provisions mirror the federal conformity rules in 40 *Code of Federal Regulations* 93.151 through 93.160. In addition to meeting the requirements of the General Conformity Rule, this report and its supporting analysis will provide compliance with Rule 925.

SECTION 2

METHODS FOR ESTIMATING AIR EMISSIONS

2.1 EMISSIONS FROM CONSTRUCTION ACTIVITIES

Emissions from the Project were estimated based on the current construction cost estimate and nearly 100 percent complete design drawings, as of November 1, 2005. Appendix A includes the design engineer's summary of key Project features, equipment profile, schedule, and vehicle travel. Appendix B provides the anticipated Project schedule. The design engineer's summary served as the basis for the emissions estimates developed for the Project.

Construction of the Project has been divided into two components, referred to as Schedule A and Schedule B, based on location. Bidders will be invited to bid one or both schedules.

Schedule A: Includes all work from the beginning of the Project at station 1250 to Drop 1 near station 1910, nearly 13 miles. This work traverses shifting sands, and requires excavation of more than 20 million cubic yards of earth and the construction of 65,000 cubic yards of compacted embankments. Concrete placement will include approximately 1,350,000 square yards of 4.25-inch-thick lining and construction of three reinforced concrete transition structures.

Schedule B: Includes all work from Drop 1 at station 1934 to Drop 3 near station 2474, about 10 miles. This work is outside of the shifting sands, and requires the excavation of about 3.4 million cubic yards of earth and the construction of 535,000 cubic yards of compacted embankments. Concrete placement work includes 900,000 square yards of 4-inch-thick concrete lining and 6 significant concrete structures. It also includes polyvinyl chloride (PVC) membrane lining of approximately 23,000 linear feet of the existing canal to create an off-line storage reservoir.

The current Project schedule shows Schedule A activities starting in April 2006 and proceeding through the early spring of 2007. They will decrease through late spring and summer, and most will be completed by August 2007. Schedule B activities will begin in June 2007 as Schedule A activities are declining. Schedule B activities will occur at the highest levels in late fall and throughout the winter, and most will be completed by the spring of 2008.

General assumptions are as follows:

- Preconstruction clearance of vegetation will occur prior to February 15, 2006. All other construction will occur in the 33-month period from April 1, 2006 through December 31, 2008.

- Generally, Schedule A will involve use of dozer/scraper and backhoe/bottom dump truck spreads, but also will use an extra large, bulldozer-powered (Holland) loader. Schedule B will be accomplished by the use of scrapers and backhoe only. Haul distance for the scrapers and trucks will average 1,200 feet one-way for Schedule A, and 1,000 feet one-way for Schedule B.

- Trimming and lining will be accomplished by specialized, automated, self-powered canal machines.

- Two concrete batch plants will be utilized, including one each for Schedules A and B. Each will have an approximate capacity of 500 cubic yards per hour. Haul distance from the batching location to the placement location will average about 6 miles one-way.

- All equipment will receive regular maintenance, will be maintained in good condition, will meet state of California emission requirements, and will apply standard best management practices (BMPs) for emissions controls. Stipulations to this effect will be included in the specifications.

- All cement and concrete aggregate will be imported from outside of Imperial County and carried by highway-rated, 18-wheeler trucks. (This evaluation used Bookman-Edmonston's identification of possible cement sources in the Mojave Desert area or Mexico and an aggregate source near Yuma, Arizona.) Estimated haul distances on major paved highways within the Salton Sea Air Basin are 50 miles one-way for cement and 15 miles one-way for aggregate. Each load also will travel approximately 0.5 miles one-way on an unpaved road to the jobsite. The mix of vehicles will match the South Coast Air Quality Management District's (SCAQMD's) estimates in "Emission Factors for On-Road Heavy Heavy [sic] Duty Diesel Trucks" for the years 2006, 2007, and 2008 (South Coast Air Quality Management District 2003a).

- Work will be done in two consecutive shifts, 9 hours per shift, 5 days per week.

- Adequate water is available for dust control and other operational considerations.

- Worker commutes will originate from El Centro, Calexico, or Yuma and average about 30 miles one-way on paved roads and another 1 mile one-way on an unpaved road into the jobsite. An overestimating assumption was made that each worker will travel in their own vehicle (no ride-sharing). All privately owned vehicles will remain parked with engines off when they are not being used for the commute. The mix of vehicles, including age, make, model, and fuel type (gasoline or diesel) will match the SCAQMD's estimates in "Emission Factors for On-Road Vehicles"

for the years 2006, 2007, and 2008 (South Coast Air Quality Management District 2003b).

- All contractor-owned pickup trucks will have 325 horsepower (HP) diesel-fueled engines.

- Construction equipment (for example, the models and ages of cranes, graders, and forklifts) will match those listed in Appendix G of *Sample Construction Scenarios for Projects Less than Five Acres in Size* (Koizumi 2005). (Despite the title, the Appendix G information in this source is not limited to small equipment for small projects. For most equipment types, it provides emissions for ranges of engines of up to 750 horsepower or more.) Emissions from construction equipment will match those listed in Table G-1, ARB Off-Road Emissions Factors, in Koizumi (2005).

- Specifications will require contractors to water all areas of active construction, including dirt roads, for dust control at least every 45 minutes so that the soil is maintained in a moist condition. Compliance with this requirement will be monitored and enforced.

- Prior to lining, the new canal trench sidewalls will be maintained in a moist condition. This action is required to prevent potential sloughing, but it also will provide fugitive dust control.

2.2 EMISSIONS CONSIDERED

The emissions considered in this evaluation are consistent with the requirements of the General Conformity Rule, found in 40 *Code of Federal Regulations* 51 Subpart W and 40 *Code of Federal Regulations* 93 Subpart B.

- The annual emission rates (in tons/year) for each pollutant reflect the estimated *actual emissions* for the proposed action

- The annual emission rates include both direct and indirect emissions

- The annual emission rate includes emissions from both mobile and stationary sources associated with the proposed action

- Emissions were calculated separately for each calendar year of this multi-year Project. This allowed consideration of the annual emission rate in the year for which air emissions are expected to be highest.

2.3 EMISSIONS CALCULATION METHOD

The ICAPCD's *CEQA Air Quality Handbook* (Imperial County Air Pollution Control District 2005a) states that "A thorough emissions analysis should be performed on all relevant emissions sources, using emission factors from EPA document AP 42, *Compilation of Air Pollutant Emissions Factors*, the latest version of EMFAC, or other approved source(s). The emission analysis should include calculations for estimated

emissions of all criteria pollutants and toxic substances released from the project. Documentation of emission factors and all assumptions should be provided."

Consistent with this guidance:

- Detailed calculations for estimated emissions of all criteria pollutants are provided in Appendix C. (The Project will not result in emissions of toxic substances.) This methods section and Appendix C include all emissions factors and assumptions that were used.

- AP 42 (U.S. Environmental Protection Agency, 1995) was used to estimate emissions from stationary point and area sources.

- The SCAQMD's Table G-1, ARB Off-Road Emission Factors, from Koizumi (2005) was used to estimate emissions from construction equipment. Romero (2005) stated that information sources that are generated by or are acceptable to SCAQMD are acceptable to the ICAPCD. A copy of the emissions factors from this source is included in Appendix D.

- The latest versions of emissions factors (EMFAC) for heavy diesel trucks and on road vehicles (South Coast Air Quality Management District, 2003a and 2003b) were used to estimate emissions from project-related vehicles operating on roadways. Copies of these documents are included in Appendix E.

The EPA's *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling--Compression-Ignition* (U.S. Environmental Protection Agency 2004) was used as a general resource. However, the California-specific emissions factors that were available from the sources identified in the preceding bullets were used instead of the more general factors that could be calculated using this source.

The Project will include the temporary set-up and use of two concrete batch plants, each of which will be capable of producing up to 500 cubic yards per hour of concrete. Estimated emissions from these sources are based on EPA emission factors in "Section 11.12, Concrete Batching" of AP 42 (U.S. Environmental Protection Agency 1995).

2.3.1 Calculation of Engine Emissions from Construction Activities

Microsoft® Excel® was used to calculate emissions from Project construction activities, as follows.

- The activities associated with each element of Schedules A and B were listed, and the equipment required to perform each activity was identified. The equipment list for construction of the Project is provided in Appendix A.

- Unless otherwise noted, it was assumed that all heavy construction equipment would be like that manufactured by Caterpillar. This was done only for determining horsepower ranges, and does not reflect any preference with regard to the make of equipment that will be used on this Project. Horsepower values for each piece of equipment were obtained from the Internet version of the Caterpillar

(or other, as appropriate) catalog. Horsepower values are shown in Appendix A and the Appendix C spreadsheet.

- Hours of use in each of the three Project years (2006, 2007, and 2008) from the design engineer's summary were incorporated in the spreadsheet.

- Emissions factors in pounds per day for carbon monoxide, nitrogen oxides, PM_{10}, sulfur oxides, and volatile organic compounds, based on horsepower of diesel engines, were obtained from the South Coast Air Quality Management District's Table G-1, ARB Off-Road Emission Factors (Koizumi, 2005). Copies of the emissions factor tables from this source are included as Appendix D to this Clean Air Act conformity analysis.

  The Appendix E spreadsheet from Koizumi (2005), which is available on the Internet at http://www.aqmd.gov/ceqa/handbook/LST/AppE5_acre.xls, was used to confirm that the standard workday used in the emissions factors typically was 8 hours long. These pound per day factors were first converted to pounds per hour values (based on an 8-hour workday). The hourly emissions factors were then used to estimate emissions from the Project, which could involve workdays up to 18 hours long, performed in two consecutive, 9-hour shifts.

The tailored spreadsheet was used to calculate emissions in pounds per day for peak daily emissions, and in pounds per year, tons per year, and tons per quarter.

2.3.2 Calculation of Engine Emissions from Road Travel

This calculation included all onroad and offroad travel associated with the Project. Primary inputs included travel by workers commuting to and from the site, hauling of aggregate and cement to the batch plants, and transport of concrete to the placement site.

Microsoft® Excel® was used to calculate engine emissions from Project-related road travel. This included direct emissions, such as emissions from trucks hauling aggregate and cement, and indirect emissions, such as emissions from the vehicles that employees use to commute from their places of residence to the Project site. Key inputs included:

- Estimated numbers and distances of round trips by each vehicle type.

- Emissions factors (EMFAC) in pounds per mile for passenger vehicles (South Coast Air Quality Management District, 2003b) and heavy trucks (South Coast Air Quality Management District, 2003a).

2.3.3 Calculations of Dust Emissions from Construction Activities and Travel on Dirt Roads

This calculation included all travel on dirt roads and all movement of nonroad construction equipment associated with the Project. Primary inputs included movement of equipment in scraper and backhoe spreads, truck hauling of materials on dirt roads, travel by commuting workers on dirt roads, and contractor light-truck travel on unpaved surfaces.

Microsoft® Excel® was used to calculate dust emissions from construction activities. Key inputs included:

- Estimated numbers and distances of round trips by each vehicle type. This information is included in Appendix A and the spreadsheets in Appendix C.

- An emission factor that was recommended for use for all unpaved roads statewide in California of 2.0 pounds of PM_{10} per vehicle mile traveled (Gaffney, 2004). This value was slightly higher than the emission rate of 1.89 pounds of PM_{10} per vehicle mile traveled that can be calculated from AP 42 (U.S. Environmental Protection Agency 1995).

Dust emissions were calculated both in an uncontrolled condition and with dust control in place. The Project specifications will require contractors to water all areas of active construction, including dirt roads and the trench sidewalls, so that the soil is maintained in a moist condition (estimated to be approximately every 60 minutes). Compliance with this requirement will be monitored and enforced. Consistent with the conformity rule analysis for the Coachella Canal (Bureau of Reclamation 2000), it was assumed that this method of dust control would result in a 90 percent reduction in PM_{10} emissions compared to an uncontrolled (unwetted) condition.

2.3.4 Calculation of Dust Emissions from Excavation of the New Canal Alignment

This calculation in Microsoft® Excel® was based on the estimated volumes of excavated material for Schedule A (20 million cubic yards) and Schedule B (3.4 million cubic yards), by year. The calculation used the equation for fugitive particulates from excavation from AP 42 (U.S. Environmental Protection Agency, 1995), with a wind speed of 15 miles per hour. It also used a moisture factor of 10 percent, which is considerably lower than the moisture content of the saturated sand that will be removed from the new ditch parallel to the existing canal. Based on the use of these factors, it is expected that the results will be an overestimate, compared to actual dust emissions from Project excavation.

2.3.5 Calculation of Dust Emissions from Concrete Batch Plants

Dust emissions from the operation of the concrete batch plants were estimated in Microsoft® Excel® using the AP 42 (U.S. Environmental Protection Agency, 1995) emissions factor, expressed in pounds per cubic yard, for a central mix operation. This factor was multiplied by the estimated volumes of concrete placement by year for lining the canal and constructing appurtenant facilities.

2.3.6 Emissions from Operation and Maintenance (O&M) Elements

Operations and maintenance (O&M) activities associated with operation of the AAC following the completion of the Project would be similar to those that occurred with the unlined canal. Engine and dust emissions from periodic inspection, maintenance, and repair of the lined canal would be the same as, or potentially lower than, those that occurred previously. Therefore, emissions following the completion of construction were not included in this Clean Air Act conformity analysis.

SECTION 3

RESULTS AND DISCUSSION

A list of the equipment expected to be used on the Project and hours of use for each activity are provided in Appendix A. These data were provided by the design consultant, Bookman-Edmonston. Horsepower levels for each piece of equipment were taken from equipment manufacturers' catalogs on the Internet. Unless otherwise noted, equipment was assumed to be similar to that manufactured by Caterpillar. This was done only for determining horsepower ranges, and does not reflect any preference with regard to the make of equipment that should be used on this Project.

Appendix B shows the current schedule for this Project. This schedule was prepared by the Project design consultant.

Based on the schedule and equipment mix, it was determined that the highest levels of emissions from construction of the Project would occur in the year 2007. Emissions in 2006 would be approximately 50 percent of those occurring in 2007, and year 2008 emissions would be about 55 percent of the 2007 levels.

3.1 ESTIMATED ENGINE EMISSIONS

A summary of year 2007 estimated engine emissions of carbon monoxide, volatile organic compounds, nitrogen oxides, and sulfur oxides from the Project is provided in Table 3-1. Table C-1 in Appendix C is the summary worksheet supporting this air conformity analysis. Additional information is provided in Tables C-2 through C-31.

Table 3-1 does not include the results of the calculation of emissions of particulate matter (PM_{10}). This material is produced both by engines and by dust. Therefore, particulates are addressed separately in the Section 3.2.

As shown in the table, total annual emissions of carbon monoxide, volatile organic compounds, sulfur oxides, and nitrogen oxides in 2007 all will be well below the applicable *de minimis* values, taken from 40 *Code of Federal Regulations* 93.153(b)(1) and (2) and based on each pollutant's attainment status. (These *de minimis* values were provided previously in Tables 1-4 and 1-5.) As a result of this finding, a conformity determination is not required in relation to the regulatory *de minimis* threshold values for these four pollutants.

The emission levels for these pollutants were then evaluated based on regional significance. This analysis for the year with the greatest amount of construction, 2007, is included in Table 3-1. The comparison shows that emissions of criteria pollutants from the Project will be much lower than the regionally significant thresholds, which represent

TABLE 3-1: ESTIMATED ANNUAL ENGINE EMISSIONS IN 2007 COMPARED TO FEDERAL *DE MINIMIS* AND SALTON SEA AIR BASIN THRESHOLDS

Parameter	Emissions			
	CO	**VOC**	**NO_X**	**SO_X**
Construction equipment emissions (tons per year)	12.24	3.86	50.14	5.96
Commuter and delivery vehicles emissions (tons per year)	9.61	1.17	8.69	0.02
Total 2007 emissions (tons per year)	**21.85**	**5.03**	**58.83**	**5.97**
General conformity *de minimis* emissions (tons per year) [a/]	100	100	100	100
De minimis threshold exceeded?	No	No	No	No
Salton Sea Air Basin emissions in 2004 (tons per year) [b/]	71,357.5	17,045.5 [c/]	20,768.5	620.5
Regionally significant threshold (tons per year)	7,135.8	1,704.6 [c/]	2,076.8	62.0
Project emissions as part of regional total (percent)	0.03	0.03	0.27	0.96
Regionally significant threshold exceeded?	**No**	**No**	**No**	**No**

a/ See Tables 1-4 and 1-5.
b/ See Table 1-6.
c/ Expressed by the state as reactive organic gas.

10 percent of the existing regional emissions for each pollutant. In fact, for all of the criteria pollutants, emissions from the Project will represent less than one percent of the regional totals. These findings also apply to Project construction occurring in 2006 and 2008, which will have lower emissions levels than those that will occur in 2007.

Based on the above, the Project is exempt from further conformity analyses for these four pollutants.

3.2 ESTIMATED EMISSIONS OF PARTICULATE MATTER FROM ENGINE AND DUST EMISSIONS

A summary of the emissions of particulate matter from all sources associated with the Project in 2007 is provided in Table 3-2. Table C-1 in Appendix C is the summary worksheet supporting this air conformity analysis. Additional information is provided in Tables C-2 through C-31.

As described in Section 2.1, Project specifications will require contractors to water all dirt roads being used, the trench sidewalls, and all other areas of active construction for dust control approximately every 60 minutes so that the soil is maintained in a moist condition. Compliance with this requirement will be monitored and enforced. Consistent with information provided in AP 42, Section 13.2.2, "Miscellaneous Sources, Unpaved Roads" (U.S. Environmental Protection Agency, 1995) and data in the conformity rule analysis for the Coachella Canal (Bureau of Reclamation 2000), it is expected that watering the unpaved access roads and work areas at this frequency will result in a 90 percent reduction in PM_{10} emissions compared to an uncontrolled (unwetted) condition.

TABLE 3-2: ESTIMATED ANNUAL PM_{10} ENGINE AND DUST EMISSIONS IN 2007 COMPARED TO FEDERAL *DE MINIMIS* AND SALTON SEA AIR BASIN THRESHOLDS

Parameter	PM_{10} Emissions	
	Uncontrolled Dust	Engine and/or Controlled Dust [a/]
Construction equipment engine emissions (tons per year)	2.05	2.05
Construction, delivery, and commuter dust emissions, Schedule A (tons per year)	177.67	17.77
Construction, delivery, and commuter dust emissions, Schedule B (tons per year)	109.05	10.90
Cement plant (central mix), Schedule A (tons per year)	0.68	0.68
Cement plant (central mix), Schedule B (tons per year)	0.38	0.38
Canal excavation, Schedule A (tons per year)	3.97	3.97
Canal excavation, Schedule B (tons per year)	0.61	0.61
Delivery and commuter vehicle engine emissions (tons per year)	0.20	0.20
Total 2007 emissions (tons per year)	**294.61**	**36.56**
General conformity *de minimis* emissions (tons per year)	70	70
De minimis threshold exceeded?	Yes	No
Salton Sea Air Basin emissions in 2004 (tons per year) [b/]	95,192.0	95,192.0
Regionally significant threshold (tons per year)	9,519.2	9,519.2
Project emissions as part of regional total (percent)	0.3	0.04
Regionally significant threshold exceeded?	**No**	**No**

a/ Assumes a 90 percent reduction in dust emissions because dirt haul roads and active work areas will be maintained in a moist condition during work periods.
b/ See Table 1-6.

The analysis included emissions of particulates from the engines of construction equipment, trucks delivering materials such as cement and aggregate, and personal vehicles used to commute to and from residences to the work site. Dust emissions, all of which will be controlled by watering, include dust raised by construction activities such as the movement of scrapers and bulldozers, and travel on dirt roads by delivery trucks and personal vehicles used for commuting. Other dust emissions include dust produced by cement mixing operations and dust from the excavation of the new canal. Some of the dust from canal excavation may be double-counted as dust from the movement of scrapers and bulldozers, but it was included in this overestimating approach to ensure that all Project-related emissions were considered.

Engine Emissions and Uncontrolled Dust. As shown in the table, total annual emissions of particulate matter (PM_{10}) in an uncontrolled dust situation, which would total about 295 tons per year in 2007, would be greater than the PM_{10} *de minimis* value listed in 40 *Code of Federal Regulations* 93.153(b)(1). However, as shown in Table 3-2, uncontrolled particulate emissions from the Project in 2007 will be well below the regional significance threshold of more than 9,500 tons per year.

Engine Emissions and Controlled Dust. Because dust emissions will be controlled by an enforced watering requirement, actual dust emissions in the year 2007 from all sources will total about 36.6 tons per year. This value is below the 70 tons per year *de minimis* value listed in 40 *Code of Federal Regulations* 93.153(b)(1), and is also much lower than the total regional emissions level for PM_{10}, representing only 0.04 percent of the regional total. Based on these findings for controlled dust, a conformity determination is not required for PM_{10}. These findings also apply to Project construction occurring in 2006 and 2008, which will have lower emissions levels than those that will occur in 2007.

3.3 CONFORMANCE WITH *RULES AND REGULATIONS OF THE IMPERIAL COUNTY AIR POLLUTION CONTROL DISTRICT*

Section 1.5.3 summarized the components of the *Rules and Regulations of the Imperial County Air Pollution Control District* (Imperial County Air Pollution Control District, 2005b) that were identified by ICAPCD personnel as potentially being most applicable to the Project (Romero 2005). This section considers each of those rules and the potential of the Project to be significant based on their provisions.

3.3.1 Rule 207

Rule 207 will address emissions from the batch plants. This evaluation considered emissions from these facilities in 2007, when the highest project-related emissions would occur.

Any of the criteria pollutants would require offsets if its emissions exceeded 137 pounds per day. In addition, the nonattainment criteria pollutants and precursors, which in Imperial County include PM_{10}, nitrogen oxides, and volatile organic compounds, require the application of best applicable control technology if a new emissions unit has a potential to emit 25 pounds per day of the pollutant. Best applicable control technology for carbon monoxide is required if emissions from this criteria pollutant exceed 550 pounds per day.

PM_{10}: Table C-3 shows that in 2007, the 250-kilowatt and 500-kilowatt generators for the Schedule A batch plant will respectively have peak daily emissions of 0.30 and 0.49 pounds of PM_{10}; The same volumes of PM_{10} emissions will be associated with the Schedule B batch plant during the 2007 peak day. Therefore, the peak day emissions from the Project's stationary sources will total approximately 1.6 pounds of PM_{10}, which is well below the value that would require offsets based on Rule 207.

Carbon Monoxide: As shown in Table C-9, the peak daily carbon monoxide emissions in 2007 from the generators at each batch plant will be 0.14 pounds per day, or 0.28 pounds per day for both sources. This emissions rate is well below the Rule 207 triggers for this pollutant.

Sulfur Oxides: Table C-15 provides emissions for sulfur oxides in 2007. The combined emissions of this criteria pollutant from the two batch plants will be about 0.02 pounds per day, well below the Rule 207 concern level of 137 pounds per day.

Nitrogen Oxides: Peak day emissions of nitrogen oxides in 2007 are provided in Table C-21. Data from this table show that peak daily emissions from the two generators at each batch plant total 22.97 pounds per day. Together, the two batch plants could produce approximately 46 pounds of nitrogen oxides. As a result, the best applicable control technology for nitrogen oxides will need to be applied to the batch plant generators to comply with Rule 207.

Volatile Organic Compounds: Table C-27 shows emissions in 2007 for volatile organic compounds. During the peak day, each batch plant will generate about 1.59 pounds, for a total of 3.2 pounds per day, which is below the Rule 207 concern level.

Summary: Except for nitrogen oxides, the batch plants will not be significant based on Rule 207. Best applicable control technology will be required for nitrogen oxides to comply with this rule.

3.3.2 Rule 401

As described in Section 1.5.3, this requirement does not apply to the amount or rate of emissions, only the opacity. During implementation of the project, the batch plants will be designed and operated to comply with the provisions of Rule 401.

3.3.3 Rules 800 through 805

The analysis in Section 3.2 demonstrated that emissions of particulate matter will not exceed the *de minimis* values for PM_{10} or the regionally significant threshold for this criteria pollutant. Regardless, because the Salton Sea Air Basin is in serious nonattainment, the ICAPCD will require mitigation to control particulates (Imperial County Air Pollution Control District, 2005a).

Detailed measures to control emissions of particulates will be included in the Project dust control plan. Section 3.4 identifies the measures that are most likely to be incorporated.

3.3.4 Rule 925

This report and its supporting analysis provide compliance with Rule 925.

3.4 MITIGATION MEASURES

Fugitive dust (PM_{10}) control and mitigation measures will be used during project construction. The detailed measures will be described in the project dust control plan that will be prepared by the selected contractor. The air conformity analysis accounted for the control efficiency of watering unpaved roads and other high-use areas. Based the analysis, this measure will be effective in keeping dust emissions below *de minimis* levels. The additional measures listed below may further reduce emissions and may be adjusted, if needed. These measures are derived from the standard and discretionary fugitive PM_{10} control measures presented in the *CEQA Air Quality Handbook* (Imperial County Air Pollution Control District, 2005a).

- A project dust control plan meeting the requirements of ICAPCD Regulation VIII will be developed before construction activities begin and will be fully implemented during construction activities.

- Unpaved road surfaces, active staging areas, and parking areas will be watered sufficiently to keep the surface layer moist.

- When wind speeds (as instantaneous gusts) exceed 25 miles per hour (mph), the operators will increase the watering frequency to maintain moist road surfaces.

- Areas anticipated to be disturbed by new construction activities will be watered approximately 24 hours prior to the start of clearing and grubbing activities.

- The amount of disturbed area will be minimized, consistent with Project requirements.

- Active construction areas will be watered at least twice daily to reduce the potential for fugitive dust emissions. Soils excavated to create the new canal depression are anticipated to be kept wet or moist by construction-related soil wetting.

- Human and equipment activities will be limited on spoil piles of excavated materials to reduce the level of soil surface disturbance and exposure of the materials to wind erosion. Public access will not be permitted in the construction right-of-way.

- Vehicle speed for construction vehicles will not exceed 30 mph on any unpaved surface at the construction site and will incorporate the appropriate dust suppression measures.

- Paved roads will be swept at the end of each day, or more often if warranted by the build-up of materials, if visible soil material is carried onto adjacent paved roads.

- Depending on the number of vehicle trips associated with the construction plan, "track-out control" devices or measures may be required at locations where haul trucks entering a paved public road number greater than either 150 average vehicle trips (AVT) per day or 20 AVT per day by vehicles with 3 or more axles. "Track-out control" measures may include paving unpaved roads for at least 50 consecutive feet from the point where the unpaved road section joins the paved road, treating the unpaved road section with chemical stabilization compounds, or covering the unpaved road section with at least a 3-inch depth of gravel with low silt content (less than 5 percent).

3.5 SUMMARY

Construction of the Project will occur from 2006 through 2008. In each of these years, the total annual emissions of carbon monoxide, volatile organic compounds, nitrogen oxides, sulfur oxides, and PM_{10} particulate matter (with dust control in place) that result directly or indirectly from this construction project will all be lower than the federally established *de minimis* values for Clean Air Act conformity determinations. Estimated

actual emission levels for all of the criteria pollutants also will be well below their respective regionally significant levels.

The total annual emissions of PM_{10} particulate matter without dust control would be higher than the *de minimis* value but below the regionally significant emission threshold. However, because particulate emission control measures defined in the emissions assessment will be enforced, emissions of PM_{10} will be below thresholds that would require a conformity analysis

This analysis found that air emissions from construction of the Project will not exceed the conformity applicability, or *de minimis*, thresholds and will not be regionally significant. Therefore, the action is exempt from further analysis under the General Conformity Rule. A record of non-applicability (RONA) documenting this finding is provided in Appendix F.

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APPENDIX A
EQUIPMENT PROFILE FOR CONSTRUCTION OF THE ALL AMERICAN CANAL LINING PROJECT

APPENDIX A
EQUIPMENT PROFILE FOR CONSTRUCTION OF THE ALL AMERICAN CANAL LINING PROJECT

A detailed construction cost estimate was prepared by Bookman-Edmonston from the nearly 100 percent complete design drawings. The equipment profile, including types and hours of use, was derived by Bookman-Edmonston from the cost estimate.

The work is 23 miles of concrete lined canal parallel to the existing All American Canal, and appurtenant facilities.

The construction contract bid set is geographically divided into Schedules A and B. The bidders will be invited to bid one or both Schedules.

1. **Schedule A**

   All work from the beginning of the Project at station 1250 to Drop 1 near station 1920, nearly 13 miles. This work traverses shifting sands, and requires excavation of more than 20 million cubic yards of earth excavation and the construction of 65,000 cubic yards of compacted embankments.. Concrete placement is approximately 1,350,000 square yards of 4.25 inch thick lining and construction of three reinforced concrete transition structures.

2. **Schedule B**

   All work from Drop 1 at station 1933 to Drop 3 near station 2474, about 10 miles. This work is outside of the shifting sands. It includes PVC membrane lining approximately 23,000 linear feet of the existing canal for off-line storage. Work in this area involves the excavation of about 3.4 million cubic yards of earth and the construction of 535,000 cubic yards of compacted embankments. Concrete placement work includes 900,000 square yards of 4” thick concrete lining and 6 significant concrete structures.

Dewatering of the job site is significant.

Resource Use

The major work activities and resource loading is as follows:

Activity	**Equipment (combined horsepower and hours)**	**Crew size**
Pre-construction plant clearance (360 hours)		5 persons

- 2 - D8 dozers 350 HP
- 1 - Water pull 425 HP
- 2 - Pick-up trucks such as Ford F250 diesel 325 HP
- 1 - Brush/tree flailing/chipping machine 300 HP

SCHEDULE A (13 miles)

Excavation (3 different spreads depending upon excavation depth):

- Large loader/spoil conveyor (3,000 hours) 9 persons
  - 1 - Holland loader (D9 464 HP and D10 661 HP dozer at each end)
  - 1 - Blade (motor grader) such as model 14 H 220 HP
  - 1 - Water tanker 375 HP
  - 1 - 250-foot traveling conveyor (powered by 2 D9s at 464 HP each)
  - 2 - Pick-up trucks such as diesel engine Ford F250 325 HP
  - 4 - Light plants 15 HP
- Scraper spread (3,420 hours) 18 persons
  - 2 - D11 dozers 710 HP
  - 1 - D9 410 HP
  - 8 – Model 651 scrapers 550 HP
  - 1 - Blade 14H 220 HP
  - 1 - Compactor Model 815F 254 HP
  - 1 - Water tanker 325 HP
  - 2 - Pick-up trucks 325 HP
  - 4 - Light plants 15 HP
- Scraper spread (250 hours) 14 persons
  - 6 - 623 Scrapers 330 HP
  - 1 - D9 410 HP
  - 1 - Water pull 425 HP
  - 1 - Blade Model 12H 145 HP
  - 1 - Compactor 815F 254 HP
  - 1 - Pick-up truck 325 HP
  - 4 - Light plants 15 HP
- Backhoe operation (1,980 hours) 5 persons
  - 1 - Backhoe (7 cubic yard) Hitachi Model 1900 1,025 HP
  - 3 - Bottom dump trucks (18-wheel highway) 325 HP

Dust control: (1,000 hours) 2 persons

- 1 - Blade 12 H 145 HP
- 1 - Water pull 425 HP

Dewatering: (5,760 hours) 2 persons

- 25 - Generator set for pump (100 KW) 135 HP
- 1 - Pick-up truck 325 HP

Contractor overhead and maintenance (5,760 hours): 12 persons

- 2 - Mechanics trucks 325 HP
- 8 - Pick-up trucks 325 HP
- 3 - Other trucks/vehicles (flatbed 325 HP, forklift 120 HP, support 250 HP)
- 1 - Office trailer (100 KW generator) 150 HP

Concrete batch, trim canal and place lining:

- Concrete batch plant (720 hours) 6 persons
  - 2 - Generators (250 KW, 375 HP and 500 KW, 750 HP)
- Trim, line, haul (720 hours) 39 persons
  - 1 - Set self-powered trim and lining canal machine with four engines, running at 250 HP each
  - 8 - Bottom dump trucks 325 HP

Tie-ins (900 hours): 10 persons

- 1 - Barge, self powered by winches (100 KW generator) 150 HP
- 1 - 60 ton crane 380 HP
- 1 - Vibrating sheet pile hammer (powered by CAT generator) 175 HP
- 3 - Pick-up trucks 325 HP

Construction management, owner, police, emergency (5,940 hours) 10 persons

- 5 - Pick-up trucks 325 HP
- 1 - Emergency response (police car/ambulance) 250 H

SCHEDULE B (10 miles)

Excavation (2 spreads depending upon excavation depth):

- Scraper spread (630 hours) 16 persons
  - 3 - D11 dozers 710 HP
  - 7 - 651 scrapers 550 HP
  - 1 - Blade 14H 220 HP
  - 1 - Compactor 254 HP
  - 1 - Water tank 375 HP
  - 2 - Pick-up trucks 325 HP
  - 4 - Light plants 15 HP
- Backhoe operation (360 hours) 7 persons
  - 1 - Backhoe (7 cubic yard) Hitachi 1900 1,025 HP
  - 1 - Bottom dump trucks (18-wheel highway) 325 HP
  - 2 - Light plants 15 HP

Concrete batch, trim canal and place lining:

- Concrete batch plant (540 hours) 6 persons
  - 2 - Generators (250 KW, 375 HP and 500 KW, 750 HP)
- Trim, line, haul (540 hours) 39 persons
  - 1 - Set self-powered trim and lining canal machine with four engines, running at 250 HP each
  - 8 - Bottom dump trucks 325 HP

Dewatering (2,520 hours): 2 persons

- 25 - Generator set for pump (100 KW) 150 HP
- 1 - Pick-up truck 325 HP

Dust control (5,000 hours): 2 persons

- 1 - Blade 12H 145 HP
- 1 - Water pull 425 HP

Off-line storage PVC liner and fill:

- Scraper spread (1,530 hours) 18 persons
  - 3 - 623 scrapers 330 HP
  - 1 - Water pull 425 HP
  - 1 - Blade 14H 220 HP
  - 2 - D8 dozer 350 HP
  - 1 - Compactor 254 HP
  - 1 - Water tanker 375 HP
  - 2 - Pick-up trucks 325 HP
  - 3 - Light plants 15 HP
- Install liner (1,400 hours) 15 persons
  - 2 - Forklifts 120 HP
  - 2 - Pick-ups 325 HP
  - 1 - 1-ton truck 325 HP

Tie-ins (360 hours): 10 persons

- 1 - Barge, self-powered by winches (100 KW, 150 HP generator)
- 1 – 60-ton crane 380 HP
- 1 - Vibrating sheet pile hammer (powered by CAT generator) 175 HP
- 2 - Pick-up trucks 325 HP

Structures/flume/pipeline/inlet/outlet: (1,300 hours) 20 persons

- 1 - Backhoe (7 cubic yard) 1,025 HP
- 1 – 60-ton crane 380 HP
- 1 - Flatbed highway semi truck 375 HP
- 2 - Pick-up trucks 325 HP
- 1 - Loader 225 HP
- 1 - Concrete pump 60 HP
- 2 - Forklift 120 HP

Contractor overhead and maintenance (5,400 hours) 10 persons

- 2 - Mechanic trucks 325 HP
- 4 - Pick-up trucks 325 HP
- 3 - Other trucks/vehicles 325 HP/120 HP/250 HP
- 1 - Office trailer (100 KW generator) 150 HP

Construction management, owner, police, emergency (5,760 hours) 7 persons

- 3 - Pick-up trucks 325 HP
- 1 - Emergency response vehicle (car/ambulance) 250 HP

Schedule

Approximate calendar durations based on scenario that all work in both Schedules is done by one contractor working continuously from Project beginning to end and completes all work by 12/08.

Activity	# Workweeks	Dates
Pre-construction Vegetation clearance	**8**	12/05-02/06
Schedule A		
• Excavation		
– Large loader	33	05/06-01/07
– Scraper 1	38	06/06-04/07
– Scraper 2	3	03/07-05/07
– Backhoe	22	02/07-07/07
• Dust	64	04/06-08/07
• Dewater	64	04/06-08/07
• O/H	64	04/06-08/07
• Lining	8	05/07-08/07
• Tie-ins	10	02/07-05/07
• CM/other	66	04/06-10/07
Schedule B		
• Excavation		
– Scraper 1	7	07/07-09/07
– Backhoe	4	09/07-11/07
• Dust	60	06/07-09/08
• Dewater	28	06/07-01/08
• Off-line storage	17	09/07-05/08
• Tie-ins	4	10/07-12/07
• Structures / misc.	26	01/08-09/08
• O/H	60	06/07-09/08
• CM/other	64	06/07-10/08

Vehicle Travel

Assumptions:

Off-highway travel (dirt roads):

- Schedule A excavation average haul distance 2,400 feet round trip
- Schedule B excavation average haul distance 2,000 feet round trip
- Haul distance average from batch plant to point of placement 12 miles round trip
- Typical field trip by CM/other and supervisory personnel 10,000 feet round trip with 4 trips/day each person
- Distance traveled by water pull for dust control daily 250,000 feet.(1 trip)
- Typical distance for dewatering operations by pick-up truck daily 30,000 feet (1 trip)

- Truck material delivery distance from paved highway to batch plant or stockpile is 6,000 round trip
- Commute distance for workers from paved highway to office/parking is 10,000 feet roundtrip daily each worker.
- Haul distance from the batch location to placement location is 1.5 miles average.

Highway travel (paved roads within Imperial County):

- Cement delivery by highway trucks is 100 miles round trip on county highways.
- Aggregate delivery by highway trucks is 30 miles round trip on county highways
- Project personnel commute by personal vehicle 60 miles roundtrip

Travel Summary:

1. Personal vehicle by workers and staff

Activity	Weeks	Commutes	Dates
Pre-construction vegetation clearance	8	225	12/05-02/06
Schedule A			
• Excavation			
– Large loader	33	2,970	05/06-01/07
– Scraper 1	38	6,840	06/06-04/07
– Scraper 2	3	420	03/07-05/07
– Backhoe	22	1,100	02/07-07/07
• Dust	64	1,280	04/06-08/07
• Dewater	64	1,280	04/06-08/07
• O/H	64	7,680	04/06-08/07
• Lining	8	3,600	05/07-08/07
• Tie-ins	10	1,000	02/07-05/07
• CM/other	66	6,600	04/06-10/07
Schedule B			
• Excavation			
– Scraper 1	7	1,120	07/07-09/07
– Backhoe	4	280	09/07-11/07
• Lining	6	1,350	11/07-01/08
• Dust	60	1,200	06/07-09/08
• Dewater	28	560	06/07-01/08
• Off-line storage	17	2,800	09/07-05/08
• Tie-ins	4	400	10/07-12/07
• Structures / misc.	26	5,200	01/08-09/08
• O/H	60	6,000	06/07-09/08
• CM/other	64	4,480	06/07-10/08
Total roundtrip, personnel commutes		56,385 (personal auto)	

Each roundtrip commute includes 60 miles of county highway travel and 10,000 feet of dirt.

2. Excavation travel all on dirt surfaces

- Schedule A
  - Large loader – localized travel
  - 651 scrapers – 180,000 trips of 2,400 feet
  - 623 scrapers – 12,000 trips of 2,400 feet
  - Bottom dumps – 39,600 trips of 2,400 feet
- Schedule B
  - 651 scrapers – 29,000 trips of 2,000 feet
  - Bottom dumps – 9,600 trips of 2,000 feet
  - 623 scrapers – 80,000 trips 2,000 feet

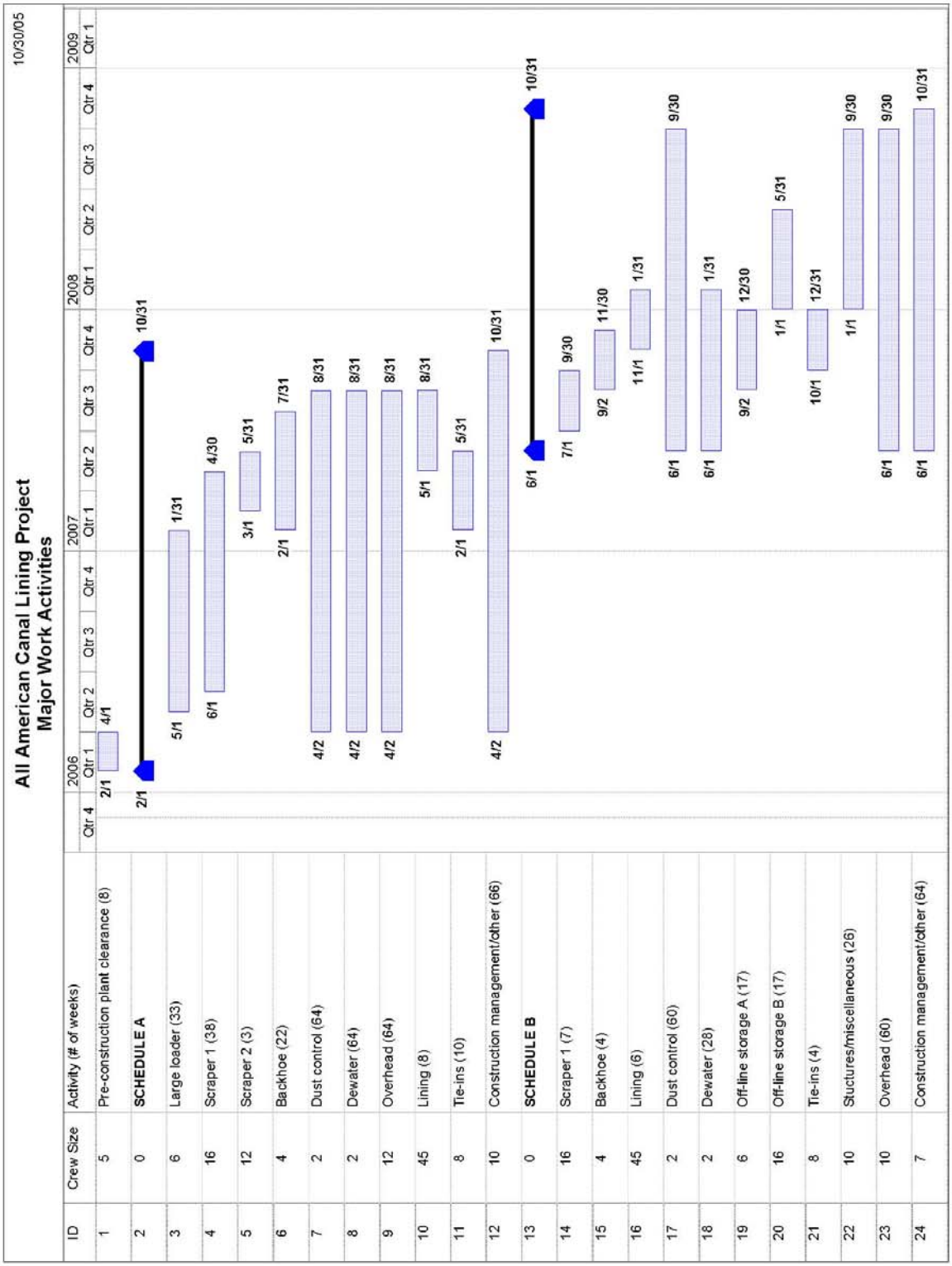
3. Concrete batch and lining travel mix of highway and dirt travel including haul from batch plant to placement location.

- Schedule A
  - Truck highway rated aggregate delivery – 5,600 trips of 30 miles highway, 5,600 trips of 6,000 feet dirt
  - Truck highway rated cement delivery – 2,500 trips of 100 miles highway and 2,500 trips of 6,000 feet dirt
  - Bottom dump delivery batch to placement – 10,500 trips of 12 miles dirt
- Schedule B
  - Truck highway rated aggregate delivery – 3,200 trips of 30 miles highway and 3,200 trips of 6,000 feet dirt
  - Truck highway rated cement delivery – 1,800 trips of 100 miles highway and 1,800 of 6,000 feet dirt
  - Bottom dump delivery batch to placement – 6,500 trips of 12 miles dirt

4. Contractor O/H personnel and CM/other light truck travel on dirt

Average of 15 persons for 31 months ……37,500 trips of 10,000 feet

APPENDIX B
SCHEDULE FOR CONSTRUCTION OF THE ALL AMERICAN CANAL LINING PROJECT


10/30/05
All American Canal Lining Project
Major Work Activities
ID
Crew Size
Activity (# of weeks)
2006
2007
2008
2009
Qtr 4
Qtr 1
Qtr 2
Qtr 3
Qtr 4
1 5 Pre-construction plant clearance (8)
2 0 SCHEDULE A
3 6 Large loader (33)
4 16 Scraper 1 (38)
5 12 Scraper 2 (3)
6 4 Backhoe (22)
7 2 Dust control (64)
8 2 Dewater (64)
9 12 Overhead (64)
10 45 Lining (8)
11 8 Tie-ins (10)
12 10 Construction management/other (66)
13 0 SCHEDULE B
14 16 Scraper 1 (7)
15 4 Backhoe (4)
16 45 Lining (6)
17 2 Dust control (60)
18 2 Dewater (28)
19 6 Off-line storage A (17)
20 16 Off-line storage B (17)
21 8 Tie-ins (4)
22 10 Stuctures/miscellaneous (26)
23 10 Overhead (60)
24 7 Construction management/other (64)
2/1
4/1
10/31
5/1
1/31
6/1
4/30
3/1
5/31
2/1
7/31
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1/1
5/31
10/1
12/31
1/1
9/30
6/1
9/30
6/1
10/31

APPENDIX C
AIR CONFORMITY ANALYSIS WORKSHEETS

Table C-1
All American Canal Lining Project (AACLP) , Imperial, CA
Summary of Total Emissions from On-Site Construction for 2006 to 2008
Comparison to Emission Thresholds and Guidelines

Emission Type	Air Parameter	Total Annual Emissions (lbs/year)			Total Annual Emissions (tons/year)			Total Daily Emissions (lbs/day)			Threshold Limits for General Conformity			
		2006	2007	2008	2006	2007	2008	2006	2007	2008	*de minimus* Non-attainment (tons/year)	*de minimus* Maintenance (tons/year)	Significance Threshold for Salton Sea Air Basin Emissions (tons/day)/(tons/yr)	
Construction Equipment	PM10	2724.63	4106.34	1736.61	1.36	2.05	0.87	32.39	61.05	30.62	---	---	---	---
	CO	21369.14	561.89	234.45	10.68	0.28	0.12	265.49	8.62	4.27	---	---	---	---
	SOx	7701.79	11913.60	5336.69	3.85	5.96	2.67	107.75	201.11	101.09	---	---	---	---
	NOx	66288.75	100273.52	42779.94	33.14	50.14	21.39	818.55	1540.27	772.57	---	---	---	---
	VOC	5142.33	7718.79	3238.65	2.57	3.86	1.62	61.35	114.09	56.41	---	---	---	---
Excavation, Production, and Commuter and Delivery Vehicles	PM10	50738.12	69004.85	29299.58	25.37	34.50	14.65	116.09	114.86	17.60	---	---	---	---
	CO	13807.53	19221.95	16476.95	6.90	9.61	8.24	37.83	52.66	45.14	---	---	---	---
	SOx	119.67	31.80	20.88	0.06	0.02	0.01	0.33	0.09	0.06	---	---	---	---
	NOx	12047.96	17378.08	8037.81	6.02	8.69	4.02	33.01	47.61	22.02	---	---	---	---
	VOC	1672.99	2349.98	1897.80	0.84	1.17	0.95	4.58	6.44	5.20	---	---	---	---
Total	PM10	53462.75	73111.19	31036.20	26.73	36.56	15.52	148.48	175.91	48.22	70	NA (1)	26.1	9519
	CO	35176.66	19783.83	16711.40	17.59	9.89	8.36	303.32	61.28	49.42	NA	100	19.6	7136
	SOx	7821.46	11945.40	5357.58	3.91	5.97	2.68	108.08	201.20	101.15	NA	100	0.2	62
	NOx	78336.72	117651.60	50817.75	39.17	58.83	25.41	851.56	1587.88	794.59	100	NA	5.7	2077
	VOC	6815.32	10068.77	5136.44	3.41	5.03	2.57	65.93	120.53	61.61	50	NA	4.7	1705

(1) Not Applicable. Parameters for an attainment area are based on achieving the maintenance threshold, while parameters for a non-attainment area are based on achieving the *de minimus* threshold.

Table C-2
All American Canal Lining Project, Imperial, CA
Emissions of PM10 from Construction Phase for 2006

								PM10 Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	360	360.00	0.131	0.0164	350	11.79	0.01	0.59	0.00
	Water Pull	1	360	360.00	0.274	0.0343	425	12.33	0.01	0.62	0.00
	Pickup Truck Ford F250 Diesel	2	360	360.00	0.111	0.0139	325	9.99	0.00	0.50	0.00
	Brush/Tree Flailing/Chipping Machine	1	360	360.00	0.112	0.0140	300	5.04	0.00	0.25	0.00
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	3000	1500.00	0.131	0.0164	464	24.56	0.01	0.29	0.00
	Holland Loader (D-10 dozer)	1	3000	1500.00	0.229	0.0286	661	42.94	0.02	0.52	0.01
	Blade (motor grader 14H)	1	3000	1500.00	0.064	0.0080	220	12.00	0.01	0.14	0.00
	Water Tanker	1	3000	1500.00	0.111	0.0139	375	20.81	0.01	0.25	0.00
	D-9 dozers powering conveyor	2	3000	1500.00	0.131	0.0164	464	49.13	0.02	0.59	0.01
	Pickup Truck Ford F250 Diesel	2	3000	1500.00	0.111	0.0139	325	41.63	0.02	0.50	0.01
	Light Plants	4	3000	1500.00	0.008	0.0010	15	6.00	0.00	0.07	0.00
Schedule A Excavation Scraper Spread	D11 Dozer	2	3420	1710.00	0.229	0.0286	710	97.90	0.05	1.03	0.01
	D9 Dozer	1	3420	1710.00	0.131	0.0164	464	28.00	0.01	0.29	0.00
	651 Scraper	8	3420	1710.00	0.248	0.0310	550	424.08	0.21	4.46	0.05
	Blade 14H	1	3420	1710.00	0.064	0.0080	220	13.68	0.01	0.14	0.00
	Compactor Model 815F	1	3420	1710.00	0.112	0.0140	254	23.94	0.01	0.25	0.00
	Water Tanker	1	3420	1710.00	0.111	0.0139	375	23.73	0.01	0.25	0.00
	Pickup Truck Ford F250 Diesel	2	3420	1710.00	0.111	0.0139	325	47.45	0.02	0.50	0.01
	Light Plants	4	3420	1710.00	0.008	0.0010	15	6.84	0.00	0.07	0.00
Schedule A Excavation Scraper Spread	623 Scrapers	6	250	125.00	0.142	0.0178	330	13.31	0.01	1.92	0.00
	D9 Dozer	1	250	125.00	0.131	0.0164	464	2.05	0.00	0.29	0.00
	Water Pull	1	250	125.00	0.274	0.0343	425	4.28	0.00	0.62	0.00
	Blade 12H	1	250	125.00	0.092	0.0115	145	1.44	0.00	0.21	0.00
	Compactor Model 815F	1	250	125.00	0.112	0.0140	254	1.75	0.00	0.25	0.00
	Pickup Truck Ford F250 Diesel	1	250	125.00	0.111	0.0139	325	1.73	0.00	0.25	0.00
	Light Plants	4	250	125.00	0.008	0.0010	15	0.50	0.00	0.07	0.00
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	1980	990.00	0.191	0.0239	1025	23.64	0.01	0.43	0.00
	Bottom Dump Truck (18-wheel highway)	3	1980	990.00	0.111	0.0139	325	41.21	0.02	0.75	0.01
Schedule A Dust Control	Blade 12H	1	1000	500.00	0.092	0.0115	145	5.75	0.00	0.21	0.00
	Water Pull	1	1000	500.00	0.274	0.0343	425	17.13	0.01	0.62	0.00

Table C-2 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of PM10 from Construction Phase for 2006

								PM10 Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Dewatering	Generator Set for Pump (100KW)	25	5760	2880.00	0.096	0.0120	135	864.00	0.43	5.40	0.11
	Pickup Truck Ford F250 Diesel	1	5760	2880.00	0.111	0.0139	325	39.96	0.02	0.25	0.00
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	5760	2880.00	0.111	0.0139	325	79.92	0.04	0.50	0.01
	Pickup Truck Ford F250 Diesel	8	5760	2880.00	0.111	0.0139	325	319.68	0.16	2.00	0.04
	Flatbed Truck	1	1920	960.00	0.111	0.0139	325	13.32	0.01	0.25	0.00
	Forklift	1	1920	960.00	0.06	0.0075	120	7.20	0.00	0.14	0.00
	Support Vehicle	1	1920	960.00	0.074	0.0093	250	8.88	0.00	0.17	0.00
	Office Trailer (100 KW Generator)	1	5760	2880.00	0.096	0.0120	150	34.56	0.02	0.22	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	720	360.00	0.134	0.0168	375	6.03	0.00	0.30	0.00
	Generator (500 KW)	1	720	360.00	0.218	0.0273	750	9.81	0.00	0.49	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	720	360.00	0.112	0.0140	250	20.16	0.01	1.01	0.00
	Bottom Dump Truck	8	720	360.00	0.111	0.0139	325	39.96	0.02	2.00	0.00
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	900	450.00	0.0960	0.0120	150	5.40	0.00	0.22	0.00
	60-Ton Crane	1	900	450.00	0.062	0.0078	380	3.49	0.00	0.14	0.00
	Vibrating Sheet Pile Hammer	1	900	450.00	0.096	0.0120	175	5.40	0.00	0.22	0.00
	Pickup Truck Ford F250 Diesel	3	900	450.00	0.111	0.0139	325	18.73	0.01	0.75	0.00
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	5940	2970.00	0.111	0.0139	325	206.04	0.10	1.25	0.03
	Emergency Response (Police car/Ambulance)	1	5940	2970.00	0.074	0.0093	250	27.47	0.01	0.17	0.00
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	0	0.00	0.229	0.0286	710	0.00	0.00	0.00	0.00
	651 Scrapers	7	0	0.00	0.248	0.0310	550	0.00	0.00	0.00	0.00
	Blade 14H	1	0	0.00	0.064	0.0080	220	0.00	0.00	0.00	0.00
	Compactor Model 815F	1	0	0.00	0.112	0.0140	254	0.00	0.00	0.00	0.00
	Water Tanker	1	0	0.00	0.111	0.0139	375	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Light Plants	4	0	0.00	0.008	0.0010	15	0.00	0.00	0.00	0.00

Table C-2 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of PM10 from Construction Phase for 2006

								PM10 Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	0	0.00	0.191	0.0239	1025	0.00	0.00	0.00	0.00
	Bottom Dump Truck (18-wheel highway)	4	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Light Plants	5	0	0.00	0.008	0.0010	15	0.00	0.00	0.00	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	0	0.00	0.134	0.0168	375	0.00	0.00	0.00	0.00
	Generator (500 KW)	1	0	0.00	0.218	0.0273	750	0.00	0.00	0.00	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	0	0.00	0.112	0.0140	250	0.00	0.00	0.00	0.00
	Bottom Dump Truck	8	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	0	0.00	0.096	0.0120	150	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	1	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
Schedule B - Dust Control	Blade 12H	1	0	0.00	0.092	0.0115	145	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	0.274	0.0343	425	0.00	0.00	0.00	0.00
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	0	0.00	0.142	0.0178	330	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	0.274	0.0343	425	0.00	0.00	0.00	0.00
	D8 Dozer	2	0	0.00	0.131	0.0164	350	0.00	0.00	0.00	0.00
	Blade 14H	1	0	0.00	0.064	0.0080	220	0.00	0.00	0.00	0.00
	Compactor Model 815F	1	0	0.00	0.112	0.0140	254	0.00	0.00	0.00	0.00
	Water Tanker	1	0	0.00	0.111	0.0139	375	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Light Plants	3	0	0.00	0.008	0.0010	15	0.00	0.00	0.00	0.00
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	0	0.00	0.06	0.0075	120	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	1-Ton Truck	1	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
Schedule B - Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	0	0.00	0.096	0.0120	150	0.00	0.00	0.00	0.00
	60-Ton Crane	1	0	0.00	0.062	0.0078	380	0.00	0.00	0.00	0.00
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	0	0.00	0.096	0.0120	175	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00

Table C-2 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of PM10 from Construction Phase for 2006

								PM10 Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	0	0.00	0.191	0.0239	1025	0.00	0.00	0.00	0.00
	60-Ton Crane	1	0	0.00	0.062	0.0078	380	0.00	0.00	0.00	0.00
	Flatbed Truck	1	0	0.00	0.111	0.0139	375	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Loader	1	0	0.00	0.05	0.0063	225	0.00	0.00	0.00	0.00
	Concrete Pump	1	0	0.00	0.111	0.0139	60	0.00	0.00	0.00	0.00
	Forklift	1	0	0.00	0.06	0.0075	120	0.00	0.00	0.00	0.00
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	7	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Flatbed Truck	1	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Forklift	1	0	0.00	0.06	0.0075	120	0.00	0.00	0.00	0.00
	Support Vehicle	1	0	0.00	0.074	0.0093	250	0.00	0.00	0.00	0.00
	Office Trailer (100 KW Generator)	1	0	0.00	0.096	0.0120	150	0.00	0.00	0.00	0.00
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Emergency Response (Police car/Ambulance)	1	0	0.00	0.074	0.0093	250	0.00	0.00	0.00	0.00
Total								**2724.63**	**1.36**	**32.39**	**0.34**

(1) Equipment emissions from Koizumi, 2005.

Table C-3
All American Canal Lining Project, Imperial, CA
Emissions of PM10 from Construction Phase for 2007

								PM10 Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	0	0.00	0.131	0.0164	350	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	0.274	0.0343	425	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Deisel	2	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Brush/Tree Flailing/Chipping Machine	1	0	0.00	0.112	0.0140	300	0.00	0.00	0.00	0.00
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	3000	1500.00	0.131	0.0164	464	24.56	0.01	0.29	0.00
	Holland Loader (D-10 dozer)	1	3000	1500.00	0.229	0.0286	661	42.94	0.02	0.52	0.01
	Blade (motor grader 14H)	1	3000	1500.00	0.064	0.0080	220	12.00	0.01	0.14	0.00
	Water Tanker	1	3000	1500.00	0.111	0.0139	375	20.81	0.01	0.25	0.00
	D-9 dozers powering conveyor	2	3000	1500.00	0.131	0.0164	464	49.13	0.02	0.59	0.01
	Pickup Truck Ford F250 Deisel	2	3000	1500.00	0.111	0.0139	325	41.63	0.02	0.50	0.01
	Light Plants	4	3000	1500.00	0.008	0.0010	15	6.00	0.00	0.07	0.00
Schedule A Excavation Scraper Spread	D11 Dozer	2	3420	1710.00	0.229	0.0286	710	97.90	0.05	1.03	0.01
	D9 Dozer	1	3420	1710.00	0.131	0.0164	464	28.00	0.01	0.29	0.00
	651 Scraper	8	3420	1710.00	0.248	0.0310	550	424.08	0.21	4.46	0.05
	Blade 14H	1	3420	1710.00	0.064	0.0080	220	13.68	0.01	0.14	0.00
	Compactor Model 815F	1	3420	1710.00	0.112	0.0140	254	23.94	0.01	0.25	0.00
	Water Tanker	1	3420	1710.00	0.111	0.0139	375	23.73	0.01	0.25	0.00
	Pickup Truck Ford F250 Deisel	2	3420	1710.00	0.111	0.0139	325	47.45	0.02	0.50	0.01
	Light Plants	4	3420	1710.00	0.008	0.0010	15	6.84	0.00	0.07	0.00
Schedule A Excavation Scraper Spread	623 Scrapers	6	250	125.00	0.142	0.0178	330	13.31	0.01	1.92	0.00
	D9 Dozer	1	250	125.00	0.131	0.0164	464	2.05	0.00	0.29	0.00
	Water Pull	1	250	125.00	0.274	0.0343	425	4.28	0.00	0.62	0.00
	Blade 12H	1	250	125.00	0.092	0.0115	145	1.44	0.00	0.21	0.00
	Compactor Model 815F	1	250	125.00	0.112	0.0140	254	1.75	0.00	0.25	0.00
	Pickup Truck Ford F250 Deisel	1	250	125.00	0.111	0.0139	325	1.73	0.00	0.25	0.00
	Light Plants	4	250	125.00	0.008	0.0010	15	0.50	0.00	0.07	0.00
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	1980	990.00	0.191	0.0239	1025	23.64	0.01	0.43	0.00
	Bottom Dump Truck (18-wheel highway)	3	1980	990.00	0.111	0.0139	325	41.21	0.02	0.75	0.01
Schedule A Dust Control	Blade 12H	1	1000	500.00	0.092	0.0115	145	5.75	0.00	0.21	0.00
	Water Pull	1	1000	500.00	0.274	0.0343	425	17.13	0.01	0.62	0.00
Schedule A Dewatering	Generator Set for Pump (100KW)	25	5760	2880.00	0.096	0.0120	135	864.00	0.43	5.40	0.11
	Pickup Truck Ford F250 Deisel	1	5760	2880.00	0.111	0.0139	325	39.96	0.02	0.25	0.00

Table C-3 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of PM10 from Construction Phase for 2007

								PM10 Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	5760	2880.00	0.111	0.0139	325	79.92	0.04	0.50	0.01
	Pickup Truck Ford F250 Diesel	8	5760	2880.00	0.111	0.0139	325	319.68	0.16	2.00	0.04
	Flatbed Truck	1	1920	960.00	0.111	0.0139	325	13.32	0.01	0.25	0.00
	Forklift	1	1920	960.00	0.06	0.0075	120	7.20	0.00	0.14	0.00
	Support Vehicle	1	1920	960.00	0.074	0.0093	250	8.88	0.00	0.17	0.00
	Office Trailer (100 KW Generator)	1	5760	2880.00	0.096	0.0120	150	34.56	0.02	0.22	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	720	360.00	0.134	0.0168	375	6.03	0.00	0.30	0.00
	Generator (500 KW)	1	720	360.00	0.218	0.0273	750	9.81	0.00	0.49	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	720	360.00	0.112	0.0140	250	20.16	0.01	1.01	0.00
	Bottom Dump Truck	8	720	360.00	0.111	0.0139	325	39.96	0.02	2.00	0.00
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	900	450.00	0.0960	0.0120	150	5.40	0.00	0.22	0.00
	60-Ton Crane	1	900	450.00	0.062	0.0078	380	3.49	0.00	0.14	0.00
	Vibrating Sheet Pile Hammer	1	900	450.00	0.096	0.0120	175	5.40	0.00	0.22	0.00
	Pickup Truck Ford F250 Diesel	3	900	450.00	0.111	0.0139	325	18.73	0.01	0.75	0.00
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	5940	2970.00	0.111	0.0139	325	206.04	0.10	1.25	0.03
	Emergency Response (Police car/Ambulance)	1	5940	2970.00	0.074	0.0093	250	27.47	0.01	0.17	0.00
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	630	283.50	0.229	0.0286	710	24.35	0.01	1.55	0.00
	651 Scrapers	7	630	283.50	0.248	0.0310	550	61.52	0.03	3.91	0.01
	Blade 14H	1	630	283.50	0.064	0.0080	220	2.27	0.00	0.14	0.00
	Compactor Model 815F	1	630	283.50	0.112	0.0140	254	3.97	0.00	0.25	0.00
	Water Tanker	1	630	283.50	0.111	0.0139	375	3.93	0.00	0.25	0.00
	Pickup Truck Ford F250 Diesel	2	630	283.50	0.111	0.0139	325	7.87	0.00	0.50	0.00
	Light Plants	4	630	283.50	0.008	0.0010	15	1.13	0.00	0.07	0.00

Table C-3 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of PM10 from Construction Phase for 2007

								PM10 Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	360	162.00	0.191	0.0239	1025	3.87	0.00	0.43	0.00
	Bottom Dump Truck (18-wheel highway)	4	360	162.00	0.111	0.0139	325	8.99	0.00	1.00	0.00
	Light Plants	5	360	162.00	0.008	0.0010	15	0.81	0.00	0.09	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	540	243.00	0.134	0.0168	375	4.07	0.00	0.30	0.00
	Generator (500 KW)	1	540	243.00	0.218	0.0273	750	6.62	0.00	0.49	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	540	243.00	0.112	0.0140	250	13.61	0.01	1.01	0.00
	Bottom Dump Truck	8	540	243.00	0.111	0.0139	325	26.97	0.01	2.00	0.00
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	2520	1134.00	0.096	0.0120	150	340.20	0.17	5.40	0.04
	Pickup Truck Ford F250 Diesel	1	2520	1134.00	0.111	0.0139	325	15.73	0.01	0.25	0.00
Schedule B - Dust Control	Blade 12H	1	5000	2250.00	0.092	0.0115	145	25.88	0.01	0.21	0.00
	Water Pull	1	5000	2250.00	0.274	0.0343	425	77.06	0.04	0.62	0.01
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	1530	688.50	0.142	0.0178	330	73.33	0.04	1.92	0.01
	Water Pull	1	1530	688.50	0.274	0.0343	425	23.58	0.01	0.62	0.00
	D8 Dozer	2	1530	688.50	0.131	0.0164	350	22.55	0.01	0.59	0.00
	Blade 14H	1	1530	688.50	0.064	0.0080	220	5.51	0.00	0.14	0.00
	Compactor Model 815F	1	1530	688.50	0.112	0.0140	254	9.64	0.00	0.25	0.00
	Water Tanker	1	1530	688.50	0.111	0.0139	375	9.55	0.00	0.25	0.00
	Pickup Truck Ford F250 Diesel	2	1530	688.50	0.111	0.0139	325	19.11	0.01	0.50	0.00
	Light Plants	3	1530	688.50	0.008	0.0010	15	2.07	0.00	0.05	0.00
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	1400	630.00	0.06	0.0075	120	9.45	0.00	0.27	0.00
	Pickup Truck Ford F250 Diesel	2	1400	630.00	0.111	0.0139	325	17.48	0.01	0.50	0.00
	1-Ton Truck	1	1400	630.00	0.111	0.0139	325	8.74	0.00	0.25	0.00
Schedule B - Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	360	162.00	0.096	0.0120	150	1.94	0.00	0.22	0.00
	60-Ton Crane	1	360	162.00	0.062	0.0078	380	1.26	0.00	0.14	0.00
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	360	162.00	0.096	0.0120	175	1.94	0.00	0.22	0.00
	Pickup Truck Ford F250 Diesel	2	360	162.00	0.111	0.0139	325	4.50	0.00	0.50	0.00

Table C-3 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of PM10 from Construction Phase for 2007

								PM10 Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	1300	585.00	0.191	0.0239	1025	13.97	0.01	0.43	0.00
	60-Ton Crane	1	1300	585.00	0.062	0.0078	380	4.53	0.00	0.14	0.00
	Flatbed Truck	1	1300	585.00	0.111	0.0139	375	8.12	0.00	0.25	0.00
	Pickup Truck Ford F250 Diesel	2	1300	585.00	0.111	0.0139	325	16.23	0.01	0.50	0.00
	Loader	1	1300	585.00	0.05	0.0063	225	3.66	0.00	0.11	0.00
	Concrete Pump	1	1300	585.00	0.111	0.0139	60	8.12	0.00	0.25	0.00
	Forklift	1	1300	585.00	0.06	0.0075	120	4.39	0.00	0.14	0.00
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	5900	2655.00	0.111	0.0139	325	73.68	0.04	0.50	0.01
	Pickup Truck Ford F250 Diesel	7	5900	2655.00	0.111	0.0139	325	257.87	0.13	1.75	0.03
	Flatbed Truck	1	1966	884.70	0.111	0.0139	325	12.28	0.01	0.25	0.00
	Forklift	1	1966	884.70	0.06	0.0075	120	6.64	0.00	0.14	0.00
	Support Vehicle	1	1966	884.70	0.074	0.0093	250	8.18	0.00	0.17	0.00
	Office Trailer (100 KW Generator)	1	5900	2655.00	0.096	0.0120	150	31.86	0.02	0.22	0.00
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	5760	2592.00	0.111	0.0139	325	107.89	0.05	0.75	0.01
	Emergency Response (Police car/Ambulance)	1	5760	2592.00	0.074	0.0093	250	23.98	0.01	0.17	0.00
Total								**4106.34**	**2.05**	**61.05**	**0.51**

(1) Equipment emissions from Koizumi, 2005.

Table C-4
All American Canal Lining Project, Imperial, CA
Emissions of PM10 from Construction Phase for 2008

								PM10 Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	0	0.00	0.131	0.0164	350	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	0.274	0.0343	425	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Brush/Tree Flailing/Chipping Machine	1	0	0.00	0.112	0.0140	300	0.00	0.00	0.00	0.00
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	0	0.00	0.131	0.0164	464	0.00	0.00	0.00	0.00
	Holland Loader (D-10 dozer)	1	0	0.00	0.229	0.0286	661	0.00	0.00	0.00	0.00
	Blade (motor grader 14H)	1	0	0.00	0.064	0.0080	220	0.00	0.00	0.00	0.00
	Water Tanker	1	0	0.00	0.111	0.0139	375	0.00	0.00	0.00	0.00
	D-9 dozers powering conveyor	2	0	0.00	0.131	0.0164	464	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Light Plants	4	0	0.00	0.008	0.0010	15	0.00	0.00	0.00	0.00
Schedule A Excavation Scraper Spread	D11 Dozer	2	0	0.00	0.229	0.0286	710	0.00	0.00	0.00	0.00
	D9 Dozer	1	0	0.00	0.131	0.0164	464	0.00	0.00	0.00	0.00
	651 Scraper	8	0	0.00	0.248	0.0310	550	0.00	0.00	0.00	0.00
	Blade 14H	1	0	0.00	0.064	0.0080	220	0.00	0.00	0.00	0.00
	Compactor Model 815F	1	0	0.00	0.112	0.0140	254	0.00	0.00	0.00	0.00
	Water Tanker	1	0	0.00	0.111	0.0139	375	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Light Plants	4	0	0.00	0.008	0.0010	15	0.00	0.00	0.00	0.00
Schedule A Excavation Scraper Spread	623 Scrapers	6	0	0.00	0.142	0.0178	330	0.00	0.00	0.00	0.00
	D9 Dozer	1	0	0.00	0.131	0.0164	464	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	0.274	0.0343	425	0.00	0.00	0.00	0.00
	Blade 12H	1	0	0.00	0.092	0.0115	145	0.00	0.00	0.00	0.00
	Compactor Model 815F	1	0	0.00	0.112	0.0140	254	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	1	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Light Plants	4	0	0.00	0.008	0.0010	15	0.00	0.00	0.00	0.00
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	0	0.00	0.191	0.0239	1025	0.00	0.00	0.00	0.00
	Bottom Dump Truck (18-wheel highway)	3	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
Schedule A Dust Control	Blade 12H	1	0	0.00	0.092	0.0115	145	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	0.274	0.0343	425	0.00	0.00	0.00	0.00
Schedule A Dewatering	Generator Set for Pump (100KW)	25	0	0.00	0.096	0.0120	135	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	1	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00

Table C-4 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of PM10 from Construction Phase for 2008

								PM10 Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	8	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Flatbed Truck	1	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Forklift	1	0	0.00	0.06	0.0075	120	0.00	0.00	0.00	0.00
	Support Vehicle	1	0	0.00	0.074	0.0093	250	0.00	0.00	0.00	0.00
	Office Trailer (100 KW Generator)	1	0	0.00	0.096	0.0120	150	0.00	0.00	0.00	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	0	0.00	0.134	0.0168	375	0.00	0.00	0.00	0.00
	Generator (500 KW)	1	0	0.00	0.218	0.0273	750	0.00	0.00	0.00	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	0	0.00	0.112	0.0140	250	0.00	0.00	0.00	0.00
	Bottom Dump Truck	8	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	0	0.00	0.0960	0.0120	150	0.00	0.00	0.00	0.00
	60-Ton Crane	1	0	0.00	0.062	0.0078	380	0.00	0.00	0.00	0.00
	Vibrating Sheet Pile Hammer	1	0	0.00	0.096	0.0120	175	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	3	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	0	0.00	0.111	0.0139	325	0.00	0.00	0.00	0.00
	Emergency Response (Police car/Ambulance)	1	0	0.00	0.074	0.0093	250	0.00	0.00	0.00	0.00
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	630	346.50	0.229	0.0286	710	29.76	0.01	1.55	0.00
	651 Scrapers	7	630	346.50	0.248	0.0310	550	75.19	0.04	3.91	0.01
	Blade 14H	1	630	346.50	0.064	0.0080	220	2.77	0.00	0.14	0.00
	Compactor Model 815F	1	630	346.50	0.112	0.0140	254	4.85	0.00	0.25	0.00
	Water Tanker	1	630	346.50	0.111	0.0139	375	4.81	0.00	0.25	0.00
	Pickup Truck Ford F250 Diesel	2	630	346.50	0.111	0.0139	325	9.62	0.00	0.50	0.00
	Light Plants	4	630	346.50	0.008	0.0010	15	1.39	0.00	0.07	0.00
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	360	198.00	0.191	0.0239	1025	4.73	0.00	0.43	0.00
	Bottom Dump Truck (18-wheel highway)	4	360	198.00	0.111	0.0139	325	10.99	0.01	1.00	0.00
	Light Plants	5	360	198.00	0.008	0.0010	15	0.99	0.00	0.09	0.00

Table C-4 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of PM10 from Construction Phase for 2008

								PM10 Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Concrete Batch, Trim Canal, and Place Lining Concrete Batch Plant	Generator (250 KW)	1	540	297.00	0.134	0.0168	375	4.97	0.00	0.30	0.00
	Generator (500 KW)	1	540	297.00	0.218	0.0273	750	8.09	0.00	0.49	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	540	297.00	0.112	0.0140	250	16.63	0.01	1.01	0.00
	Bottom Dump Truck	8	540	297.00	0.111	0.0139	325	32.97	0.02	2.00	0.00
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	2520	1386.00	0.096	0.0120	150	415.80	0.21	5.40	0.05
	Pickup Truck Ford F250 Diesel	1	2520	1386.00	0.111	0.0139	325	19.23	0.01	0.25	0.00
Schedule B - Dust Control	Blade 12H	1	5000	2750.00	0.092	0.0115	145	31.63	0.02	0.21	0.00
	Water Pull	1	5000	2750.00	0.274	0.0343	425	94.19	0.05	0.62	0.01
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	1530	841.50	0.142	0.0178	330	89.62	0.04	1.92	0.01
	Water Pull	1	1530	841.50	0.274	0.0343	425	28.82	0.01	0.62	0.00
	D8 Dozer	2	1530	841.50	0.131	0.0164	350	27.56	0.01	0.59	0.00
	Blade 14H	1	1530	841.50	0.064	0.0080	220	6.73	0.00	0.14	0.00
	Compactor Model 815F	1	1530	841.50	0.112	0.0140	254	11.78	0.01	0.25	0.00
	Water Tanker	1	1530	841.50	0.111	0.0139	375	11.68	0.01	0.25	0.00
	Pickup Truck Ford F250 Diesel	2	1530	841.50	0.111	0.0139	325	23.35	0.01	0.50	0.00
	Light Plants	3	1530	841.50	0.008	0.0010	15	2.52	0.00	0.05	0.00
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	1400	770.00	0.06	0.0075	120	11.55	0.01	0.27	0.00
	Pickup Truck Ford F250 Diesel	2	1400	770.00	0.111	0.0139	325	21.37	0.01	0.50	0.00
	1-Ton Truck	1	1400	770.00	0.111	0.0139	325	10.68	0.01	0.25	0.00
Schedule B - Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	360	198.00	0.096	0.0120	150	2.38	0.00	0.22	0.00
	60-Ton Crane	1	360	198.00	0.062	0.0078	380	1.53	0.00	0.14	0.00
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	360	198.00	0.096	0.0120	175	2.38	0.00	0.22	0.00
	Pickup Truck Ford F250 Diesel	2	360	198.00	0.111	0.0139	325	5.49	0.00	0.50	0.00

Table C-4 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of PM10 from Construction Phase for 2008

								PM10 Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	1300	715.00	0.191	0.0239	1025	17.07	0.01	0.43	0.00
	60-Ton Crane	1	1300	715.00	0.062	0.0078	380	5.54	0.00	0.14	0.00
	Flatbed Truck	1	1300	715.00	0.111	0.0139	375	9.92	0.00	0.25	0.00
	Pickup Truck Ford F250 Diesel	2	1300	715.00	0.111	0.0139	325	19.84	0.01	0.50	0.00
	Loader	1	1300	715.00	0.05	0.0063	225	4.47	0.00	0.11	0.00
	Concrete Pump	1	1300	715.00	0.111	0.0139	60	9.92	0.00	0.25	0.00
	Forklift	1	1300	715.00	0.06	0.0075	120	5.36	0.00	0.14	0.00
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	5900	3245.00	0.111	0.0139	325	90.05	0.05	0.50	0.01
	Pickup Truck Ford F250 Diesel	7	5900	3245.00	0.111	0.0139	325	315.17	0.16	1.75	0.04
	Flatbed Truck	1	1966	1081.30	0.111	0.0139	325	15.00	0.01	0.25	0.00
	Forklift	1	1966	1081.30	0.06	0.0075	120	8.11	0.00	0.14	0.00
	Support Vehicle	1	1966	1081.30	0.074	0.0093	250	10.00	0.01	0.17	0.00
	Office Trailer (100 KW Generator)	1	5900	3245.00	0.096	0.0120	150	38.94	0.02	0.22	0.00
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	5760	3168.00	0.111	0.0139	325	131.87	0.07	0.75	0.02
	Emergency Response (Police car/Ambulance)	1	5760	3168.00	0.074	0.0093	250	29.30	0.01	0.17	0.00
Total								**1736.61**	**0.87**	**30.62**	**0.22**

(1) Equipment emissions from Koizumi, 2005.

Table C-5
All American Canal Lining Project, Imperial, CA
Vehicle Miles Traveled (VTM) and Other Emissions of PM10 from Construction Phase for 2006

								PM10 Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Sand/Cement Production (cubic yards)**	**Emission Factor (lbs/cubic yard)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)											
Schedules A/B	Personal Vehicles	14096	62	873968	0.000080	0.0	0.0	69.92	0.0350	0.1916	0.0087
Schedule A	Aggregate Haul Trucks	2800	31	86800	0.000730	0.0	0.0	63.36	0.0317	0.1736	0.0079
	Cement Haul Trucks	1250	101	126250	0.000730	0.0	0.0	92.16	0.0461	0.2525	0.0115
	Concrete Haul Trucks	5250	12	63000	0.000730	0.0	0.0	45.99	0.0230	0.1260	0.0057
Schedule B	Aggregate Haul Trucks	0	31	0	0.000730	0.0	0.0	0.00	0.0000	0.0000	0.0000
	Cement Haul Trucks	0	101	0	0.000730	0.0	0.0	0.00	0.0000	0.0000	0.0000
	Concrete Haul Trucks	0	12	0	0.000730	0.0	0.0	0.00	0.0000	0.0000	0.0000
	Subtotal							**271.43**	**0.1357**	**0.7437**	**0.0339**
DUST EMISSIONS (3)											
Schedule A All Sources	Personal Vehicles	28193	2	56385	2.0	0.0	0.000	112770.00	56.3850	308.9589	14.0963
	Scrapers/Dump Trucks	115800	1	115800	2.0	0.0	0.000	231600.00	115.8000	634.5205	28.9500
	Aggregate Haul Trucks	2800	1	2800	2.0	0.0	0.000	5600.00	2.8000	15.3425	0.7000
	Cement Haul Trucks	1250	1	1250	2.0	0.0	0.000	2500.00	1.2500	6.8493	0.3125
	Concrete Haul Trucks	5250	1	5250	2.0	0.0	0.000	10500.00	5.2500	28.7671	1.3125
	Cement Plant (Central Mix, 4)	0	0	0	0.0	159375.0	0.017	1354.69	0.6773	3.7115	0.1693
	Sand Excavation (4)	0	0	0	0.0	20000000.0	0.001	7940.00	3.9700	21.7534	0.9925
	Light Trucks	12188	2	24375	2.0	0.0	0.000	48750.00	24.3750	133.5616	6.0938
	Subtotal							**421014.69**	**210.5073**	**1153.4649**	**52.6268**
Schedule B All Sources	Personal Vehicles	0	2	0	2.0	0.0	0.000	0.00	0.0000	0.0000	0.0000
	Scrapers/Dump Trucks	0	1	0	2.0	0.0	0.000	0.00	0.0000	0.0000	0.0000
	Aggregate Haul Trucks	0	1	0	2.0	0.0	0.000	0.00	0.0000	0.0000	0.0000
	Cement Haul Trucks	0	1	0	2.0	0.0	0.000	0.00	0.0000	0.0000	0.0000
	Concrete Haul Trucks	0	1	0	2.0	0.0	0.000	0.00	0.0000	0.0000	0.0000
	Cement Plant (Central Mix, 4)	0	0	0	0.0	0.0	0.017	0.00	0.0000	0.0000	0.0000
	Sand Excavation (4)	0	0	0	0.0	0.0	0.001	0.00	0.0000	0.0000	0.0000
	Light Trucks	0	2	0	2.0	0.0	0.000	0.00	0.0000	0.0000	0.0000
	Subtotal							**0.00**	**0.0000**	**0.0000**	**0.0000**
	Subtotal Dust							**421014.69**	**210.51**	**1153.46**	**52.63**
	Total Dust PM10 w/ Controls							**41172.00**	**20.59**	**115.35**	**5.26**
	Total PM10 Emissions and Controlled Dust							**50738.12**	**25.37**	**116.09**	**5.30**

(1) Truck emissions from SCAQMD, 2003a; (2) Personal vehicle emissions from SCAQMD, 2003b; (3) Dust emission from Gaffney, 2004; (4) USEPA AP-42, 1995.

Table C-6
All American Canal Lining Project, Imperial, CA
Vehicle Miles Traveled (VTM) and Other Emissions of PM10 from Construction Phase for 2007

								PM10 Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Sand/Cement Production (cubic yards)**	**Emission Factor (lbs/cubic yard)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)											
Schedules A/B	Personal Vehicles	21144	62	1310951	0.000080	0.0	0.0	104.88	0.0524	0.2873	0.0131
Schedule A	Aggregate Haul Trucks	2800	31	86800	0.000644	0.0	0.0	55.90	0.0279	0.1531	0.0070
	Cement Haul Trucks	1250	101	126250	0.000644	0.0	0.0	81.31	0.0407	0.2228	0.0102
	Concrete Haul Trucks	5250	12	63000	0.000644	0.0	0.0	40.57	0.0203	0.1112	0.0051
Schedule B	Aggregate Haul Trucks	1440	31	44640	0.000644	0.0	0.0	28.75	0.0144	0.0788	0.0036
	Cement Haul Trucks	810	101	81810	0.000644	0.0	0.0	52.69	0.0263	0.1443	0.0066
	Concrete Haul Trucks	2925	12	35100	0.000644	0.0	0.0	22.60	0.0113	0.0619	0.0028
	Subtotal							**386.69**	**0.1933**	**1.0594**	**0.0483**
DUST EMISSIONS (3)											
Schedule A All Sources	Personal Vehicles	14096	2	28193	2.0	0.0	0.000	56385.00	28.1925	154.4795	7.0481
	Scrapers/Dump Trucks	115800	1	115800	2.0	0.0	0.000	231600.00	115.8000	634.5205	28.9500
	Aggregate Haul Trucks	2800	1	2800	2.0	0.0	0.000	5600.00	2.8000	15.3425	0.7000
	Cement Haul Trucks	1250	1	1250	2.0	0.0	0.000	2500.00	1.2500	6.8493	0.3125
	Concrete Haul Trucks	5250	1	5250	2.0	0.0	0.000	10500.00	5.2500	28.7671	1.3125
	Cement Plant (Central Mix, 4)	0	0	0	0.0	159375.0	0.017	1354.69	0.6773	3.7115	0.1693
	Sand Excavation (4)	0	0	0	0.0	20000000.0	0.001	7940.00	3.9700	21.7534	0.9925
	Light Trucks	12188	2	24375	2.0	0.0	0.000	48750.00	24.3750	133.5616	6.0938
	Subtotal							**364629.69**	**182.3148**	**998.9854**	**45.5787**
Schedule B All Sources	Personal Vehicles	12687	2	25373	2.0	0.0	0.000	50746.50	25.3733	139.0315	6.3433
	Scrapers/Dump Trucks	53370	1	53370	2.0	0.0	0.000	106740.00	53.3700	292.4384	13.3425
	Aggregate Haul Trucks	2520	1	2520	2.0	0.0	0.000	5040.00	2.5200	13.8082	0.6300
	Cement Haul Trucks	1125	1	1125	2.0	0.0	0.000	2250.00	1.1250	6.1644	0.2813
	Concrete Haul Trucks	4725	1	4725	2.0	0.0	0.000	9450.00	4.7250	25.8904	1.1813
	Cement Plant (Central Mix, 4)	0	0	0	0.0	100000.0	0.017	765.00	0.3825	2.0959	0.0956
	Sand Excavation (4)	0	0	0	0.0	3400000.0	0.001	1214.82	0.6074	3.3283	0.1519
	Light Trucks	10969	2	21938	2.0	0.0	0.000	43875.00	21.9375	120.2055	5.4844
	Subtotal							**220081.32**	**110.0407**	**139.0315**	**27.5102**
	Subtotal Dust							**584711.01**	**292.36**	**1138.02**	**73.09**
	Total Dust PM10 w/ Controls							**57343.65**	**28.67**	**113.80**	**7.31**
	Total PM10 Emissions and Controlled Dust							**69004.85**	**34.50**	**114.86**	**7.36**

(1) Truck emissions from SCAQMD, 2003a; (2) Personal vehicle emissions from SCAQMD, 2003b; (3) Dust emission from Gaffney, 2004; (4) USEPA AP-42, 1995.

Table C-7
All American Canal Lining Project, Imperial, CA
Vehicle Miles Traveled (VTM) and Other Emissions of PM10 from Construction Phase for 2008

								PM10 Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Sand/Cement Production (cubic yards)**	**Emission Factor (lbs/cubic yard)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)											
Schedules A/B	Personal Vehicles	21144	62	1310951	0.000080	0.0	0.0	104.88	0.0524	0.2873	0.0131
Schedule A	Aggregate Haul Trucks	0	31	0	0.000598	0.0	0.0	0.00	0.0000	0.0000	0.0000
	Cement Haul Trucks	0	101	0	0.000598	0.0	0.0	0.00	0.0000	0.0000	0.0000
	Concrete Haul Trucks	0	12	0	0.000598	0.0	0.0	0.00	0.0000	0.0000	0.0000
Schedule B	Aggregate Haul Trucks	1760	31	54560	0.000598	0.0	0.0	32.63	0.0163	0.0894	0.0041
	Cement Haul Trucks	990	101	99990	0.000598	0.0	0.0	59.79	0.0299	0.1638	0.0075
	Concrete Haul Trucks	3575	12	42900	0.000598	0.0	0.0	25.65	0.0128	0.0703	0.0032
	Subtotal							**222.95**	**0.1115**	**0.6108**	**0.0279**
DUST EMISSIONS (3)											
Schedule A All Sources	Personal Vehicles	0	2	0	2.0	0.0	0.000	0.00	0.0000	0.0000	0.0000
	Scrapers/Dump Trucks	0	1	0	2.0	0.0	0.000	0.00	0.0000	0.0000	0.0000
	Aggregate Haul Trucks	0	1	0	2.0	0.0	0.000	0.00	0.0000	0.0000	0.0000
	Cement Haul Trucks	0	1	0	2.0	0.0	0.000	0.00	0.0000	0.0000	0.0000
	Concrete Haul Trucks	0	1	0	2.0	0.0	0.000	0.00	0.0000	0.0000	0.0000
	Cement Plant (Central Mix, 4)	0	0	0	0.0	0.0	0.017	0.00	0.0000	0.0000	0.0000
	Sand Excavation (4)	0	0	0	0.0	0.0	0.001	0.00	0.0000	0.0000	0.0000
	Light Trucks	0	2	0	2.0	0.0	0.000	0.00	0.0000	0.0000	0.0000
	Subtotal							**0.00**	**0.0000**	**0.0000**	**0.0000**
Schedule B All Sources	Personal Vehicles	15506	2	31012	2.0	0.0	0.000	62023.50	31.0118	169.9274	7.7529
	Scrapers/Dump Trucks	65230	1	65230	2.0	0.0	0.000	130460.00	65.2300	357.4247	16.3075
	Aggregate Haul Trucks	3080	1	3080	2.0	0.0	0.000	6160.00	3.0800	16.8767	0.7700
	Cement Haul Trucks	1375	1	1375	2.0	0.0	0.000	2750.00	1.3750	7.5342	0.3438
	Concrete Haul Trucks	5775	1	5775	2.0	0.0	0.000	11550.00	5.7750	31.6438	1.4438
	Cement Plant (Central Mix, 4)	0	0	0	0.0	100000.0	0.017	935.00	0.4675	2.5616	0.1169
	Sand Excavation (4)	0	0	0	0.0	3400000.0	0.001	1484.78	0.7424	4.0679	0.1856
	Light Trucks	13406	2	26813	2.0	0.0	0.000	53625.00	26.8125	146.9178	6.7031
	Subtotal							**268988.28**	**134.4941**	**169.9274**	**33.6235**
	Subtotal Dust							**268988.28**	**134.49**	**169.93**	**33.62**
	Total Dust PM10 w/ Controls							**26656.85**	**13.33**	**16.99**	**3.36**
	Total PM10 Emissions and Controlled Dust							**29299.58**	**14.65**	**17.60**	**3.39**

(1) Truck emissions from SCAQMD, 2003a; (2) Personal vehicle emissions from SCAQMD, 2003b; (3) Dust emission from Gaffney, 2004; (4) USEPA AP-42, 1995.

Table C-8
All American Canal Lining Project, Imperial, CA
Emissions of CO from Construction Phase for 2006

								CO Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	360	360.00	1.502	0.1878	350	135.18	0.07	6.76	0.02
	Water Pull	1	360	360.00	2.896	0.3620	425	130.32	0.07	6.52	0.02
	Pickup Truck Ford F250 Diesel	2	360	360.00	0.742	0.0928	325	66.78	0.03	3.34	0.01
	Brush/Tree Flailing/Chipping Machine	1	360	360.00	1.203	0.1504	300	54.14	0.03	2.71	0.01
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	3000	1500.00	1.502	0.1878	464	281.63	0.14	3.38	0.04
	Holland Loader (D-10 dozer)	1	3000	1500.00	2.47	0.3088	661	463.13	0.23	5.56	0.06
	Blade (motor grader 14H)	1	3000	1500.00	0.414	0.0518	220	77.63	0.04	0.93	0.01
	Water Tanker	1	3000	1500.00	0.742	0.0928	375	139.13	0.07	1.67	0.02
	D9 dozers powering conveyor	2	3000	1500.00	1.502	0.1878	464	563.25	0.28	6.76	0.07
	Pickup Truck Ford F250 Diesel	2	3000	1500.00	0.742	0.0928	325	278.25	0.14	3.34	0.03
	Light Plants	4	3000	1500.00	0.037	0.0046	15	27.75	0.01	0.33	0.00
Schedule A Excavation Scraper Spread	D11 Dozer	2	3420	1710.00	2.47	0.3088	710	1055.93	0.53	11.12	0.13
	D9 Dozer	1	3420	1710.00	1.502	0.1878	464	321.05	0.16	3.38	0.04
	651 Scraper	8	3420	1710.00	1.912	0.2390	550	3269.52	1.63	34.42	0.41
	Blade 14H	1	3420	1710.00	0.414	0.0518	220	88.49	0.04	0.93	0.01
	Compactor Model 815F	1	3420	1710.00	1.203	0.1504	254	257.14	0.13	2.71	0.03
	Water Tanker	1	3420	1710.00	0.742	0.0928	375	158.60	0.08	1.67	0.02
	Pickup Truck Ford F250 Diesel	2	3420	1710.00	0.742	0.0928	325	317.21	0.16	3.34	0.04
	Light Plants	4	3420	1710.00	0.037	0.0046	15	31.64	0.02	0.33	0.00
Schedule A Excavation Scraper Spread	623 Scrapers	6	250	125.00	1.166	0.1458	330	109.31	0.05	15.74	0.01
	D9 Dozer	1	250	125.00	1.502	0.1878	464	23.47	0.01	3.38	0.00
	Water Pull	1	250	125.00	2.896	0.3620	425	45.25	0.02	6.52	0.01
	Blade 12H	1	250	125.00	0.676	0.0845	145	10.56	0.01	1.52	0.00
	Compactor Model 815F	1	250	125.00	1.203	0.1504	254	18.80	0.01	2.71	0.00
	Pickup Truck Ford F250 Diesel	1	250	125.00	0.742	0.0928	325	11.59	0.01	1.67	0.00
	Light Plants	4	250	125.00	0.037	0.0046	15	2.31	0.00	0.33	0.00
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	1980	990.00	1.862	0.2328	1025	230.42	0.12	4.19	0.03
	Bottom Dump Truck (18-wheel highway)	3	1980	990.00	0.742	0.0928	325	275.47	0.14	5.01	0.03
Schedule A Dust Control	Blade 12H	1	1000	500.00	0.676	0.0845	145	42.25	0.02	1.52	0.01
	Water Pull	1	1000	500.00	2.896	0.3620	425	181.00	0.09	6.52	0.02
Schedule A Dewatering	Generator Set for Pump (100KW)	25	5760	2880.00	0.766	0.0958	135	6894.00	3.45	43.09	0.86
	Pickup Truck Ford F250 Diesel	1	5760	2880.00	0.742	0.0928	325	267.12	0.13	1.67	0.03

Table C-8 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of CO from Construction Phase for 2006

								CO Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	5760	2880.00	0.742	0.0928	325	534.24	0.27	3.34	0.07
	Pickup Truck Ford F250 Diesel	8	5760	2880.00	0.742	0.0928	325	2136.96	1.07	13.36	0.27
	Flatbed Truck	1	1920	960.00	0.742	0.0928	325	89.04	0.04	1.67	0.01
	Forklift	1	1920	960.00	0.257	0.0321	120	30.84	0.02	0.58	0.00
	Support Vehicle	1	1920	960.00	0.443	0.0554	250	53.16	0.03	1.00	0.01
	Office Trailer (100 KW Generator)	1	5760	2880.00	0.776	0.0970	150	279.36	0.14	1.75	0.03
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	720	360.00	1.333	0.1666	375	59.99	0.03	3.00	0.01
	Generator (500 KW)	1	720	360.00	2.157	0.2696	750	97.07	0.05	4.85	0.01
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	720	360.00	1.203	0.1504	250	216.54	0.11	10.83	0.03
	Bottom Dump Truck	8	720	360.00	0.742	0.0928	325	267.12	0.13	13.36	0.03
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	900	450.00	0.766	0.0958	150	43.09	0.02	1.72	0.01
	60-Ton Crane	1	900	450.00	0.405	0.0506	380	22.78	0.01	0.91	0.00
	Vibrating Sheet Pile Hammer	1	900	450.00	0.776	0.0970	175	43.65	0.02	1.75	0.01
	Pickup Truck Ford F250 Diesel	3	900	450.00	0.742	0.0928	325	125.21	0.06	5.01	0.02
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	5940	2970.00	0.742	0.0928	325	1377.34	0.69	8.35	0.17
	Emergency Response (Police car/Ambulance)	1	5940	2970.00	0.443	0.0554	250	164.46	0.08	1.00	0.02
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	0	0.00	2.47	0.3088	710	0.00	0.00	0.00	0.00
	651 Scrapers	7	0	0.00	1.912	0.2390	550	0.00	0.00	0.00	0.00
	Blade 14H	1	0	0.00	0.414	0.0518	220	0.00	0.00	0.00	0.00
	Compactor Model 815F	1	0	0.00	1.203	0.1504	254	0.00	0.00	0.00	0.00
	Water Tanker	1	0	0.00	0.742	0.0928	375	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.742	0.0928	325	0.00	0.00	0.00	0.00
	Light Plants	4	0	0.00	0.037	0.0046	15	0.00	0.00	0.00	0.00

Table C-8 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of CO from Construction Phase for 2006

								CO Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	0	0.00	1.862	0.2328	1025	0.00	0.00	0.00	0.00
	Bottom Dump Truck (18-wheel highway)	4	0	0.00	0.742	0.0928	325	0.00	0.00	0.00	0.00
	Light Plants	5	0	0.00	0.037	0.0046	15	0.00	0.00	0.00	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	0	0.00	1.333	0.1666	375	0.00	0.00	0.00	0.00
	Generator (500 KW)	1	0	0.00	2.157	0.2696	750	0.00	0.00	0.00	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	0	0.00	1.203	0.1504	250	0.00	0.00	0.00	0.00
	Bottom Dump Truck	8	0	0.00	0.742	0.0928	325	0.00	0.00	0.00	0.00
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	0	0.00	0.766	0.0958	150	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	1	0	0.00	0.742	0.0928	325	0.00	0.00	0.00	0.00
Schedule B - Dust Control	Blade 12H	1	0	0.00	0.676	0.0845	145	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	2.896	0.3620	425	0.00	0.00	0.00	0.00
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	0	0.00	1.166	0.1458	330	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	2.896	0.3620	425	0.00	0.00	0.00	0.00
	D-8 Dozer	2	0	0.00	1.502	0.1878	350	0.00	0.00	0.00	0.00
	Blade 14H	1	0	0.00	0.414	0.0518	220	0.00	0.00	0.00	0.00
	Compactor Model 815F	1	0	0.00	1.203	0.1504	254	0.00	0.00	0.00	0.00
	Water Tanker	1	0	0.00	0.742	0.0928	375	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.742	0.0928	325	0.00	0.00	0.00	0.00
	Light Plants	3	0	0.00	0.037	0.0046	15	0.00	0.00	0.00	0.00
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	0	0.00	0.257	0.0321	120	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.742	0.0928	325	0.00	0.00	0.00	0.00
	1-Ton Truck	1	0	0.00	0.742	0.0928	325	0.00	0.00	0.00	0.00
Schedule B - Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	0	0.00	0.766	0.0958	150	0.00	0.00	0.00	0.00
	60-Ton Crane	1	0	0.00	0.405	0.0506	380	0.00	0.00	0.00	0.00
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	0	0.00	0.766	0.0958	175	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.742	0.0928	325	0.00	0.00	0.00	0.00

Table C-8 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of CO from Construction Phase for 2006

								CO Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	0	0.00	1.862	0.2328	1025	0.00	0.00	0.00	0.00
	60-Ton Crane	1	0	0.00	0.405	0.0506	380	0.00	0.00	0.00	0.00
	Flatbed Truck	1	0	0.00	0.742	0.0928	375	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.742	0.0928	325	0.00	0.00	0.00	0.00
	Loader	1	0	0.00	0.319	0.0399	225	0.00	0.00	0.00	0.00
	Concrete Pump	1	0	0.00	0.578	0.0723	60	0.00	0.00	0.00	0.00
	Forklift	1	0	0.00	0.257	0.0321	120	0.00	0.00	0.00	0.00
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	0	0.00	0.742	0.0928	325	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	7	0	0.00	0.742	0.0928	325	0.00	0.00	0.00	0.00
	Flatbed Truck	1	0	0.00	0.742	0.0928	325	0.00	0.00	0.00	0.00
	Forklift	1	0	0.00	0.257	0.0321	120	0.00	0.00	0.00	0.00
	Support Vehicle	1	0	0.00	0.443	0.0554	250	0.00	0.00	0.00	0.00
	Office Trailer (100 KW Generator)	1	0	0.00	0.766	0.0958	150	0.00	0.00	0.00	0.00
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	0	0.00	0.742	0.0928	325	0.00	0.00	0.00	0.00
	Emergency Response (Police car/Ambulance)	1	0	0.00	0.433	0.0541	250	0.00	0.00	0.00	0.00
Total								**21369.14**	**10.68**	**265.49**	**2.67**

(1) Equipment emissions from Koizumi, 2005.

Table C-9
All American Canal Lining Project, Imperial, CA
Emissions of CO from Construction Phase for 2007

								CO Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	0	0.00	1.502	0.1878	350	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	2.896	0.0064	425	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.742	0.0016	325	0.00	0.00	0.00	0.00
	Brush/Tree Flailing/Chipping Machine	1	0	0.00	1.203	0.0027	300	0.00	0.00	0.00	0.00
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	3000	1500.00	1.502	0.0033	464	4.97	0.00	0.06	0.00
	Holland Loader (D-10 dozer)	1	3000	1500.00	2.47	0.0054	661	8.17	0.00	0.10	0.00
	Blade (motor grader 14H)	1	3000	1500.00	0.414	0.0009	220	1.37	0.00	0.02	0.00
	Water Tanker	1	3000	1500.00	0.742	0.0016	375	2.45	0.00	0.03	0.00
	D9 dozers powering conveyor	2	3000	1500.00	1.502	0.0033	464	9.93	0.00	0.12	0.00
	Pickup Truck Ford F250 Diesel	2	3000	1500.00	0.742	0.0016	325	4.91	0.00	0.06	0.00
	Light Plants	4	3000	1500.00	0.037	0.0001	15	0.49	0.00	0.01	0.00
Schedule A Excavation Scraper Spread	D11 Dozer	2	3420	1710.00	2.47	0.0054	710	18.62	0.01	0.20	0.00
	D9 Dozer	1	3420	1710.00	1.502	0.0033	464	5.66	0.00	0.06	0.00
	651 Scraper	8	3420	1710.00	1.912	0.0042	550	57.66	0.03	0.61	0.01
	Blade 14H	1	3420	1710.00	0.414	0.0009	220	1.56	0.00	0.02	0.00
	Compactor Model 815F	1	3420	1710.00	1.203	0.0027	254	4.54	0.00	0.05	0.00
	Water Tanker	1	3420	1710.00	0.742	0.0016	375	2.80	0.00	0.03	0.00
	Pickup Truck Ford F250 Diesel	2	3420	1710.00	0.742	0.0016	325	5.59	0.00	0.06	0.00
	Light Plants	4	3420	1710.00	0.037	0.0001	15	0.56	0.00	0.01	0.00
Schedule A Excavation Scraper Spread	623 Scrapers	6	250	125.00	1.166	0.0026	330	1.93	0.00	0.28	0.00
	D9 Dozer	1	250	125.00	1.502	0.0033	464	0.41	0.00	0.06	0.00
	Water Pull	1	250	125.00	2.896	0.0064	425	0.80	0.00	0.11	0.00
	Blade 12H	1	250	125.00	0.676	0.0015	145	0.19	0.00	0.03	0.00
	Compactor Model 815F	1	250	125.00	1.203	0.0027	254	0.33	0.00	0.05	0.00
	Pickup Truck Ford F250 Diesel	1	250	125.00	0.742	0.0016	325	0.20	0.00	0.03	0.00
	Light Plants	4	250	125.00	0.037	0.0001	15	0.04	0.00	0.01	0.00
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	1980	990.00	1.862	0.0041	1025	4.06	0.00	0.07	0.00
	Bottom Dump Truck (18-wheel highway)	3	1980	990.00	0.742	0.0016	325	4.86	0.00	0.09	0.00
Schedule A Dust Control	Blade 12H	1	1000	500.00	0.676	0.0015	145	0.75	0.00	0.03	0.00
	Water Pull	1	1000	500.00	2.896	0.0064	425	3.19	0.00	0.11	0.00
Schedule A Dewatering	Generator Set for Pump (100KW)	25	5760	2880.00	0.766	0.0017	135	121.59	0.06	0.76	0.02
	Pickup Truck Ford F250 Diesel	1	5760	2880.00	0.742	0.0016	325	4.71	0.00	0.03	0.00

Table C-9 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of CO from Construction Phase for 2007

								CO Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	5760	2880.00	0.742	0.0016	325	9.42	0.00	0.06	0.00
	Pickup Truck Ford F250 Diesel	8	5760	2880.00	0.742	0.0016	325	37.69	0.02	0.24	0.00
	Flatbed Truck	1	1920	960.00	0.742	0.0016	325	1.57	0.00	0.03	0.00
	Forklift	1	1920	960.00	0.257	0.0006	120	0.54	0.00	0.01	0.00
	Support Vehicle	1	1920	960.00	0.443	0.0010	250	0.94	0.00	0.02	0.00
	Office Trailer (100 KW Generator)	1	5760	2880.00	0.776	0.0017	150	4.93	0.00	0.03	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	720	360.00	1.333	0.0029	375	1.06	0.00	0.05	0.00
	Generator (500 KW)	1	720	360.00	2.157	0.0048	750	1.71	0.00	0.09	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	720	360.00	1.203	0.0027	250	3.82	0.00	0.19	0.00
	Bottom Dump Truck	8	720	360.00	0.742	0.0016	325	4.71	0.00	0.24	0.00
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	900	450.00	0.766	0.0017	150	0.76	0.00	0.03	0.00
	60-Ton Crane	1	900	450.00	0.405	0.0009	380	0.40	0.00	0.02	0.00
	Vibrating Sheet Pile Hammer	1	900	450.00	0.776	0.0017	175	0.77	0.00	0.03	0.00
	Pickup Truck Ford F250 Diesel	3	900	450.00	0.742	0.0016	325	2.21	0.00	0.09	0.00
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	5940	2970.00	0.742	0.0016	325	24.29	0.01	0.15	0.00
	Emergency Response (Police car/Ambulance)	1	5940	2970.00	0.443	0.0010	250	2.90	0.00	0.02	0.00
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	630	283.50	2.47	0.0054	710	4.63	0.00	0.29	0.00
	651 Scrapers	7	630	283.50	1.912	0.0042	550	8.37	0.00	0.53	0.00
	Blade 14H	1	630	283.50	0.414	0.0009	220	0.26	0.00	0.02	0.00
	Compactor Model 815F	1	630	283.50	1.203	0.0027	254	0.75	0.00	0.05	0.00
	Water Tanker	1	630	283.50	0.742	0.0016	375	0.46	0.00	0.03	0.00
	Pickup Truck Ford F250 Diesel	2	630	283.50	0.742	0.0016	325	0.93	0.00	0.06	0.00
	Light Plants	4	630	283.50	0.037	0.0001	15	0.09	0.00	0.01	0.00

Table C-9 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of CO from Construction Phase for 2007

								CO Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	360	162.00	1.862	0.0041	1025	0.67	0.00	0.07	0.00
	Bottom Dump Truck (18-wheel highway)	4	360	162.00	0.742	0.0016	325	1.06	0.00	0.12	0.00
	Light Plants	5	360	162.00	0.037	0.0001	15	0.07	0.00	0.01	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	540	243.00	1.333	0.0029	375	0.71	0.00	0.05	0.00
	Generator (500 KW)	1	540	243.00	2.157	0.0048	750	1.16	0.00	0.09	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	540	243.00	1.203	0.0027	250	2.58	0.00	0.19	0.00
	Bottom Dump Truck	8	540	243.00	0.742	0.0016	325	3.18	0.00	0.24	0.00
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	2520	1134.00	0.766	0.0017	150	47.88	0.02	0.76	0.01
	Pickup Truck Ford F250 Diesel	1	2520	1134.00	0.742	0.0016	325	1.86	0.00	0.03	0.00
Schedule B - Dust Control	Blade 12H	1	5000	2250.00	0.676	0.0015	145	3.35	0.00	0.03	0.00
	Water Pull	1	5000	2250.00	2.896	0.0064	425	14.37	0.01	0.11	0.00
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	1530	688.50	1.166	0.0026	330	10.62	0.01	0.28	0.00
	Water Pull	1	1530	688.50	2.896	0.0064	425	4.40	0.00	0.11	0.00
	D-8 Dozer	2	1530	688.50	1.502	0.0033	350	4.56	0.00	0.12	0.00
	Blade 14H	1	1530	688.50	0.414	0.0009	220	0.63	0.00	0.02	0.00
	Compactor Model 815F	1	1530	688.50	1.203	0.0027	254	1.83	0.00	0.05	0.00
	Water Tanker	1	1530	688.50	0.742	0.0016	375	1.13	0.00	0.03	0.00
	Pickup Truck Ford F250 Diesel	2	1530	688.50	0.742	0.0016	325	2.25	0.00	0.06	0.00
	Light Plants	3	1530	688.50	0.037	0.0001	15	0.17	0.00	0.00	0.00
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	1400	630.00	0.257	0.0006	120	0.71	0.00	0.02	0.00
	Pickup Truck Ford F250 Diesel	2	1400	630.00	0.742	0.0016	325	2.06	0.00	0.06	0.00
	1-Ton Truck	1	1400	630.00	0.742	0.0016	325	1.03	0.00	0.03	0.00
Schedule B - Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	360	162.00	0.766	0.0017	150	0.27	0.00	0.03	0.00
	60-Ton Crane	1	360	162.00	0.405	0.0009	380	0.14	0.00	0.02	0.00
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	360	162.00	0.766	0.0017	175	0.27	0.00	0.03	0.00
	Pickup Truck Ford F250 Diesel	2	360	162.00	0.742	0.0016	325	0.53	0.00	0.06	0.00

Table C-9 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of CO from Construction Phase for 2007

								CO Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	1300	585.00	1.862	0.0041	1025	2.40	0.00	0.07	0.00
	60-Ton Crane	1	1300	585.00	0.405	0.0009	380	0.52	0.00	0.02	0.00
	Flatbed Truck	1	1300	585.00	0.742	0.0016	375	0.96	0.00	0.03	0.00
	Pickup Truck Ford F250 Diesel	2	1300	585.00	0.742	0.0016	325	1.91	0.00	0.06	0.00
	Loader	1	1300	585.00	0.319	0.0007	225	0.41	0.00	0.01	0.00
	Concrete Pump	1	1300	585.00	0.578	0.0013	60	0.75	0.00	0.02	0.00
	Forklift	1	1300	585.00	0.257	0.0006	120	0.33	0.00	0.01	0.00
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	5900	2655.00	0.742	0.0016	325	8.69	0.00	0.06	0.00
	Pickup Truck Ford F250 Diesel	7	5900	2655.00	0.742	0.0016	325	30.40	0.02	0.21	0.00
	Flatbed Truck	1	1966	884.70	0.742	0.0016	325	1.45	0.00	0.03	0.00
	Forklift	1	1966	884.70	0.257	0.0006	120	0.50	0.00	0.01	0.00
	Support Vehicle	1	1966	884.70	0.443	0.0010	250	0.86	0.00	0.02	0.00
	Office Trailer (100 KW Generator)	1	5900	2655.00	0.766	0.0017	150	4.48	0.00	0.03	0.00
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	5760	2592.00	0.742	0.0016	325	12.72	0.01	0.09	0.00
	Emergency Response (Police car/Ambulance)	1	5760	2592.00	0.433	0.0010	250	2.47	0.00	0.02	0.00
Total								**561.89**	**0.28**	**8.62**	**0.07**

(1) Equipment emissions from Koizumi, 2005.

Table C-10
All American Canal Lining Project, Imperial, CA
Emissions of CO from Construction Phase for 2008

								CO Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	0	0.00	1.502	0.1878	350	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	2.896	0.0064	425	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.742	0.0016	325	0.00	0.00	0.00	0.00
	Brush/Tree Flailing/Chipping Machine	1	0	0.00	1.203	0.0027	300	0.00	0.00	0.00	0.00
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	0	0.00	1.502	0.0033	464	0.00	0.00	0.00	0.00
	Holland Loader (D-10 dozer)	1	0	0.00	2.47	0.0054	661	0.00	0.00	0.00	0.00
	Blade (motor grader 14H)	1	0	0.00	0.414	0.0009	220	0.00	0.00	0.00	0.00
	Water Tanker	1	0	0.00	0.742	0.0016	375	0.00	0.00	0.00	0.00
	D9 dozers powering conveyor	2	0	0.00	1.502	0.0033	464	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.742	0.0016	325	0.00	0.00	0.00	0.00
	Light Plants	4	0	0.00	0.037	0.0001	15	0.00	0.00	0.00	0.00
Schedule A Excavation Scraper Spread	D11 Dozer	2	0	0.00	2.47	0.0054	710	0.00	0.00	0.00	0.00
	D9 Dozer	1	0	0.00	1.502	0.0033	464	0.00	0.00	0.00	0.00
	651 Scraper	8	0	0.00	1.912	0.0042	550	0.00	0.00	0.00	0.00
	Blade 14H	1	0	0.00	0.414	0.0009	220	0.00	0.00	0.00	0.00
	Compactor Model 815F	1	0	0.00	1.203	0.0027	254	0.00	0.00	0.00	0.00
	Water Tanker	1	0	0.00	0.742	0.0016	375	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.742	0.0016	325	0.00	0.00	0.00	0.00
	Light Plants	4	0	0.00	0.037	0.0001	15	0.00	0.00	0.00	0.00
Schedule A Excavation Scraper Spread	623 Scrapers	6	0	0.00	1.166	0.0026	330	0.00	0.00	0.00	0.00
	D9 Dozer	1	0	0.00	1.502	0.0033	464	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	2.896	0.0064	425	0.00	0.00	0.00	0.00
	Blade 12H	1	0	0.00	0.676	0.0015	145	0.00	0.00	0.00	0.00
	Compactor Model 815F	1	0	0.00	1.203	0.0027	254	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	1	0	0.00	0.742	0.0016	325	0.00	0.00	0.00	0.00
	Light Plants	4	0	0.00	0.037	0.0001	15	0.00	0.00	0.00	0.00
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	0	0.00	1.862	0.0041	1025	0.00	0.00	0.00	0.00
	Bottom Dump Truck (18-wheel highway)	3	0	0.00	0.742	0.0016	325	0.00	0.00	0.00	0.00
Schedule A Dust Control	Blade 12H	1	0	0.00	0.676	0.0015	145	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	2.896	0.0064	425	0.00	0.00	0.00	0.00
Schedule A Dewatering	Generator Set for Pump (100KW)	25	0	0.00	0.766	0.0017	135	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	1	0	0.00	0.742	0.0016	325	0.00	0.00	0.00	0.00

Table C-10 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of CO from Construction Phase for 2008

								CO Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	0	0.00	0.742	0.0016	325	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	8	0	0.00	0.742	0.0016	325	0.00	0.00	0.00	0.00
	Flatbed Truck	1	0	0.00	0.742	0.0016	325	0.00	0.00	0.00	0.00
	Forklift	1	0	0.00	0.257	0.0006	120	0.00	0.00	0.00	0.00
	Support Vehicle	1	0	0.00	0.443	0.0010	250	0.00	0.00	0.00	0.00
	Office Trailer (100 KW Generator)	1	0	0.00	0.776	0.0017	150	0.00	0.00	0.00	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	0	0.00	1.333	0.0029	375	0.00	0.00	0.00	0.00
	Generator (500 KW)	1	0	0.00	2.157	0.0048	750	0.00	0.00	0.00	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	0	0.00	1.203	0.0027	250	0.00	0.00	0.00	0.00
	Bottom Dump Truck	8	0	0.00	0.742	0.0016	325	0.00	0.00	0.00	0.00
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	0	0.00	0.766	0.0017	150	0.00	0.00	0.00	0.00
	60-Ton Crane	1	0	0.00	0.405	0.0009	380	0.00	0.00	0.00	0.00
	Vibrating Sheet Pile Hammer	1	0	0.00	0.776	0.0017	175	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	3	0	0.00	0.742	0.0016	325	0.00	0.00	0.00	0.00
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	0	0.00	0.742	0.0016	325	0.00	0.00	0.00	0.00
	Emergency Response (Police car/Ambulance)	1	0	0.00	0.443	0.0010	250	0.00	0.00	0.00	0.00
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	630	346.50	2.47	0.0054	710	5.66	0.00	0.29	0.00
	651 Scrapers	7	630	346.50	1.912	0.0042	550	10.22	0.01	0.53	0.00
	Blade 14H	1	630	346.50	0.414	0.0009	220	0.32	0.00	0.02	0.00
	Compactor Model 815F	1	630	346.50	1.203	0.0027	254	0.92	0.00	0.05	0.00
	Water Tanker	1	630	346.50	0.742	0.0016	375	0.57	0.00	0.03	0.00
	Pickup Truck Ford F250 Diesel	2	630	346.50	0.742	0.0016	325	1.13	0.00	0.06	0.00
	Light Plants	4	630	346.50	0.037	0.0001	15	0.11	0.00	0.01	0.00

Table C-10 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of CO from Construction Phase for 2008

								CO Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	360	198.00	1.862	0.0041	1025	0.81	0.00	0.07	0.00
	Bottom Dump Truck (18-wheel highway)	4	360	198.00	0.742	0.0016	325	1.30	0.00	0.12	0.00
	Light Plants	5	360	198.00	0.037	0.0001	15	0.08	0.00	0.01	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	540	297.00	1.333	0.0029	375	0.87	0.00	0.05	0.00
	Generator (500 KW)	1	540	297.00	2.157	0.0048	750	1.41	0.00	0.09	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	540	297.00	1.203	0.0027	250	3.15	0.00	0.19	0.00
	Bottom Dump Truck	8	540	297.00	0.742	0.0016	325	3.89	0.00	0.24	0.00
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	2520	1386.00	0.766	0.0017	150	58.51	0.03	0.76	0.01
	Pickup Truck Ford F250 Diesel	1	2520	1386.00	0.742	0.0016	325	2.27	0.00	0.03	0.00
Schedule B - Dust Control	Blade 12H	1	5000	2750.00	0.676	0.0015	145	4.10	0.00	0.03	0.00
	Water Pull	1	5000	2750.00	2.896	0.0064	425	17.56	0.01	0.11	0.00
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	1530	841.50	1.166	0.0026	330	12.98	0.01	0.28	0.00
	Water Pull	1	1530	841.50	2.896	0.0064	425	5.37	0.00	0.11	0.00
	D-8 Dozer	2	1530	841.50	1.502	0.0033	350	5.57	0.00	0.12	0.00
	Blade 14H	1	1530	841.50	0.414	0.0009	220	0.77	0.00	0.02	0.00
	Compactor Model 815F	1	1530	841.50	1.203	0.0027	254	2.23	0.00	0.05	0.00
	Water Tanker	1	1530	841.50	0.742	0.0016	375	1.38	0.00	0.03	0.00
	Pickup Truck Ford F250 Diesel	2	1530	841.50	0.742	0.0016	325	2.75	0.00	0.06	0.00
	Light Plants	3	1530	841.50	0.037	0.0001	15	0.21	0.00	0.00	0.00
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	1400	770.00	0.257	0.0006	120	0.87	0.00	0.02	0.00
	Pickup Truck Ford F250 Diesel	2	1400	770.00	0.742	0.0016	325	2.52	0.00	0.06	0.00
	1-Ton Truck	1	1400	770.00	0.742	0.0016	325	1.26	0.00	0.03	0.00
Schedule B - Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	360	198.00	0.766	0.0017	150	0.33	0.00	0.03	0.00
	60-Ton Crane	1	360	198.00	0.405	0.0009	380	0.18	0.00	0.02	0.00
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	360	198.00	0.766	0.0017	175	0.33	0.00	0.03	0.00
	Pickup Truck Ford F250 Diesel	2	360	198.00	0.742	0.0016	325	0.65	0.00	0.06	0.00

Table C-10 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of CO from Construction Phase for 2008

								CO Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	1300	715.00	1.862	0.0041	1025	2.94	0.00	0.07	0.00
	60-Ton Crane	1	1300	715.00	0.405	0.0009	380	0.64	0.00	0.02	0.00
	Flatbed Truck	1	1300	715.00	0.742	0.0016	375	1.17	0.00	0.03	0.00
	Pickup Truck Ford F250 Diesel	2	1300	715.00	0.742	0.0016	325	2.34	0.00	0.06	0.00
	Loader	1	1300	715.00	0.319	0.0007	225	0.50	0.00	0.01	0.00
	Concrete Pump	1	1300	715.00	0.578	0.0013	60	0.91	0.00	0.02	0.00
	Forklift	1	1300	715.00	0.257	0.0006	120	0.41	0.00	0.01	0.00
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	5900	3245.00	0.742	0.0016	325	10.62	0.01	0.06	0.00
	Pickup Truck Ford F250 Diesel	7	5900	3245.00	0.742	0.0016	325	37.16	0.02	0.21	0.00
	Flatbed Truck	1	1966	1081.30	0.742	0.0016	325	1.77	0.00	0.03	0.00
	Forklift	1	1966	1081.30	0.257	0.0006	120	0.61	0.00	0.01	0.00
	Support Vehicle	1	1966	1081.30	0.443	0.0010	250	1.06	0.00	0.02	0.00
	Office Trailer (100 KW Generator)	1	5900	3245.00	0.766	0.0017	150	5.48	0.00	0.03	0.00
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	5760	3168.00	0.742	0.0016	325	15.55	0.01	0.09	0.00
	Emergency Response (Police car/Ambulance)	1	5760	3168.00	0.433	0.0010	250	3.02	0.00	0.02	0.00
Total								**234.45**	**0.12**	**4.27**	**0.03**

(1) Equipment emissions from Koizumi, 2005.

Table C-11
All American Canal Lining Project, Imperial, CA
VMT Emissions of CO from Construction Phase for 2006
Vehicle Miles Traveled (VMT)

						CO Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)									
Schedules A/B	Personal Vehicles	14096	62	873968	0.013925	12170.00	6.08	33.34	1.52
Schedule A	Aggregate Haul Trucks	2800	31	86800	0.005932	514.90	0.26	1.41	0.06
	Cement Haul Trucks	1250	101	126250	0.005932	748.92	0.37	2.05	0.09
	Concrete Haul Trucks	5250	12	63000	0.005932	373.72	0.19	1.02	0.05
Schedule B	Aggregate Haul Trucks	0	31	0	0.005932	0.00	0.00	0.00	0.00
	Cement Haul Trucks	0	101	0	0.005932	0.00	0.00	0.00	0.00
	Concrete Haul Trucks	0	12	0	0.005932	0.00	0.00	0.00	0.00
	Subtotal					**13807.53**	**6.90**	**37.83**	**1.73**

(1) Personal vehicle emissions from SCAQMD, 2003b; (2) Truck emissions from SCAQMD, 2003a.

Table C-12
All American Canal Lining Project, Imperial, CA
VMT Emissions of CO from Construction Phase for 2007
Vehicle Miles Traveled (VMT)

						CO Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)									
Schedules A/B	Personal Vehicles	21144	62	1310951	0.012820	16806.40	8.40	46.04	2.10
Schedule A	Aggregate Haul Trucks	2800	31	86800	0.005520	479.14	0.24	1.31	0.06
	Cement Haul Trucks	1250	101	126250	0.005520	696.90	0.35	1.91	0.09
	Concrete Haul Trucks	5250	12	63000	0.005520	347.76	0.17	0.95	0.04
Schedule B	Aggregate Haul Trucks	1440	31	44640	0.005520	246.41	0.12	0.68	0.03
	Cement Haul Trucks	810	101	81810	0.005520	451.59	0.23	1.24	0.06
	Concrete Haul Trucks	2925	12	35100	0.005520	193.75	0.10	0.53	0.02
	Subtotal					**19221.95**	**9.61**	**52.66**	**2.40**

(1) Personal vehicle emissions from SCAQMD, 2003b; (2) Truck emissions from SCAQMD, 2003a.

Table C-13
All American Canal Lining Project, Imperial, CA
VMT Emissions of CO from Construction Phase for 2008
Vehicle Miles Traveled (VMT)

						CO Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)									
Schedules A/B	Personal Vehicles	21144	62	1310951	0.011798	15466.60	7.73	42.37	1.93
Schedule A	Aggregate Haul Trucks	0	31	0	0.005117	0.00	0.00	0.00	0.00
	Cement Haul Trucks	0	101	0	0.005117	0.00	0.00	0.00	0.00
	Concrete Haul Trucks	0	12	0	0.005117	0.00	0.00	0.00	0.00
Schedule B	Aggregate Haul Trucks	1760	31	54560	0.005117	279.18	0.14	0.76	0.03
	Cement Haul Trucks	990	101	99990	0.005117	511.65	0.26	1.40	0.06
	Concrete Haul Trucks	3575	12	42900	0.005117	219.52	0.11	0.60	0.03
	Subtotal					**16476.95**	**8.24**	**45.14**	**2.06**

(1) Personal vehicle emissions from SCAQMD, 2003b; (2) Truck emissions from SCAQMD, 2003a.

Table C-14
All American Canal Lining Project, Imperial, CA
Emissions of SOx from Construction Phase for 2006

								SOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	360	360.00	0.4690	0.0586	350	42.21	0.02	2.11	0.01
	Water Pull	1	360	360.00	1.0520	0.1315	425	47.34	0.02	2.37	0.01
	Pickup Truck Ford F250 Diesel	2	360	360.00	0.4930	0.0616	325	44.37	0.02	2.22	0.01
	Brush/Tree Flailing/Chipping Machine	1	360	360.00	0.4590	0.0574	300	20.66	0.01	1.03	0.00
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	3000	1500.00	0.4690	0.0586	464	87.94	0.04	1.06	0.01
	Holland Loader (D-10 dozer)	1	3000	1500.00	0.8600	0.1075	661	161.25	0.08	1.94	0.02
	Blade (motor grader 14H)	1	3000	1500.00	0.3570	0.0446	220	66.94	0.03	0.80	0.01
	Water Tanker	1	3000	1500.00	0.4930	0.0616	375	92.44	0.05	1.11	0.01
	D-9 dozers powering conveyor	2	3000	1500.00	0.6750	0.0844	464	253.13	0.13	3.04	0.03
	Pickup Truck Ford F250 Diesel	2	3000	1500.00	0.4930	0.0616	325	184.88	0.09	2.22	0.02
	Light Plants	4	3000	1500.00	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule A Excavation Scraper Spread	D11 Dozer	2	3420	1710.00	0.8600	0.1075	710	367.65	0.18	3.87	0.05
	D9 Dozer	1	3420	1710.00	0.4690	0.0586	410	100.25	0.05	1.06	0.01
	651 Scraper	8	3420	1710.00	1.0300	0.1288	550	1761.30	0.88	18.54	0.22
	Blade 14H	1	3420	1710.00	0.3570	0.0446	220	76.31	0.04	0.80	0.01
	Compactor Model 815F	1	3420	1710.00	0.4590	0.0574	254	98.11	0.05	1.03	0.01
	Water Tanker	1	3420	1710.00	0.4930	0.0616	375	105.38	0.05	1.11	0.01
	Pickup Truck Ford F250 Diesel	2	3420	1710.00	0.4930	0.0616	325	210.76	0.11	2.22	0.03
	Light Plants	4	3420	1710.00	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule A Excavation Scraper Spread	623 Scrapers	6	250	125.00	0.5820	0.0728	330	54.56	0.03	7.86	0.01
	D9 Dozer	1	250	125.00	0.8600	0.1075	410	13.44	0.01	1.94	0.00
	Water Pull	1	250	125.00	1.0520	0.1315	425	16.44	0.01	2.37	0.00
	Blade 12H	1	250	125.00	0.2570	0.0321	145	4.02	0.00	0.58	0.00
	Compactor Model 815F	1	250	125.00	0.4590	0.0574	254	7.17	0.00	1.03	0.00
	Pickup Truck Ford F250 Diesel	1	250	125.00	0.4930	0.0616	325	7.70	0.00	1.11	0.00
	Light Plants	4	250	125.00	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	1980	990.00	1.0980	0.1373	1025	135.88	0.07	2.47	0.02
	Bottom Dump Truck (18-wheel highway)	3	1980	990.00	0.4930	0.0616	325	183.03	0.09	3.33	0.02
Schedule A Dust Control	Blade 12H	1	1000	500.00	0.2570	0.0321	145	16.06	0.01	0.58	0.00
	Water Pull	1	1000	500.00	1.0520	0.1315	425	65.75	0.03	2.37	0.01
Schedule A Dewatering	Generator Set for Pump (100KW)	25	5760	2880.00	0.0020	0.0003	135	18.00	0.01	0.11	0.00
	Pickup Truck Ford F250 Diesel	1	5760	2880.00	0.4930	0.0616	325	177.48	0.09	1.11	0.02

Table C-14 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of SOx from Construction Phase for 2006

								SOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	5760	2880.00	0.4930	0.0616	325	354.96	0.18	2.22	0.04
	Pickup Truck Ford F250 Diesel	8	5760	2880.00	0.4930	0.0616	325	1419.84	0.71	8.87	0.18
	Flatbed Truck	1	1920	960.00	0.4930	0.0616	325	59.16	0.03	1.11	0.01
	Forklift	1	1920	960.00	0.0000	0.0000	120	0.00	0.00	0.00	0.00
	Support Vehicle	1	1920	960.00	0.3450	0.0431	250	41.40	0.02	0.78	0.01
	Office Trailer (100 KW Generator)	1	5760	2880.00	0.0020	0.0003	150	0.72	0.00	0.00	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	720	360.00	0.0020	0.0003	375	0.09	0.00	0.00	0.00
	Generator (500 KW)	1	720	360.00	0.0030	0.0004	750	0.14	0.00	0.01	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	720	360.00	0.4590	0.0574	250	82.62	0.04	4.13	0.01
	Bottom Dump Truck	8	720	360.00	0.4930	0.0616	325	177.48	0.09	8.87	0.02
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	900	450.00	0.0020	0.0003	150	0.11	0.00	0.00	0.00
	60-Ton Crane	1	900	450.00	0.3260	0.0408	380	18.34	0.01	0.73	0.00
	Vibrating Sheet Pile Hammer	1	900	450.00	0.0020	0.0003	175	0.11	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	3	900	450.00	0.4930	0.0616	325	83.19	0.04	3.33	0.01
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	5940	2970.00	0.4930	0.0616	325	915.13	0.46	5.55	0.11
	Emergency Response (Police car/Ambulance)	1	5940	2970.00	0.3450	0.0431	250	128.08	0.06	0.78	0.02
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	0	0.00	1.2190	0.1524	710	0.00	0.00	0.00	0.00
	651 Scrapers	7	0	0.00	1.0300	0.1288	550	0.00	0.00	0.00	0.00
	Blade 14H	1	0	0.00	0.3570	0.0446	220	0.00	0.00	0.00	0.00
	Compactor Model 815F	1	0	0.00	0.4590	0.0574	254	0.00	0.00	0.00	0.00
	Water Tanker	1	0	0.00	0.4930	0.0616	375	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Light Plants	4	0	0.00	0.0000	0.0000	15	0.00	0.00	0.00	0.00

Table C-14 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of SOx from Construction Phase for 2006

								SOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	0	0.00	1.0980	0.1373	1025	0.00	0.00	0.00	0.00
	Bottom Dump Truck (18-wheel highway)	4	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Light Plants	5	0	0.00	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	0	0.00	0.0020	0.0003	375	0.00	0.00	0.00	0.00
	Generator (500 KW)	1	0	0.00	0.0030	0.0004	750	0.00	0.00	0.00	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	0	0.00	0.4590	0.0574	250	0.00	0.00	0.00	0.00
	Bottom Dump Truck	8	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	0	0.00	0.0020	0.0003	150	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	1	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
Schedule B - Dust Control	Blade 12H	1	0	0.00	0.2570	0.0321	145	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	1.0520	0.1315	425	0.00	0.00	0.00	0.00
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	0	0.00	0.5820	0.0728	330	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	1.0520	0.1315	425	0.00	0.00	0.00	0.00
	D-8 Dozer	2	0	0.00	0.4690	0.0586	350	0.00	0.00	0.00	0.00
	Blade 14H	1	0	0.00	0.3570	0.0446	220	0.00	0.00	0.00	0.00
	Compactor Model 815F	1	0	0.00	0.4590	0.0574	254	0.00	0.00	0.00	0.00
	Water Tanker	1	0	0.00	0.4930	0.0616	375	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Light Plants	3	0	0.00	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	0	0.00	0.0000	0.0000	120	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	1-Ton Truck	1	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
Schedule B - Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	0	0.00	0.0020	0.0003	150	0.00	0.00	0.00	0.00
	60-Ton Crane	1	0	0.00	0.3260	0.0408	380	0.00	0.00	0.00	0.00
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	0	0.00	0.0020	0.0003	175	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00

Table C-14 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of SOx from Construction Phase for 2006

								SOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	0	0.00	1.0980	0.1373	1025	0.00	0.00	0.00	0.00
	60-Ton Crane	1	0	0.00	0.3260	0.0408	380	0.00	0.00	0.00	0.00
	Flatbed Truck	1	0	0.00	0.4930	0.0616	375	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Loader	1	0	0.00	0.3090	0.0386	225	0.00	0.00	0.00	0.00
	Concrete Pump	1	0	0.00	0.1750	0.0219	60	0.00	0.00	0.00	0.00
	Forklift	1	0	0.00	0.0000	0.0000	120	0.00	0.00	0.00	0.00
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	7	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Flatbed Truck	1	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Forklift	1	0	0.00	0.0000	0.0000	120	0.00	0.00	0.00	0.00
	Support Vehicle	1	0	0.00	0.3450	0.0431	250	0.00	0.00	0.00	0.00
	Office Trailer (100 KW Generator)	1	0	0.00	0.0020	0.0003	150	0.00	0.00	0.00	0.00
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Emergency Response (Police car/Ambulance)	1	0	0.00	0.3450	0.0431	250	0.00	0.00	0.00	0.00
Total								**7701.79**	**3.85**	**107.75**	**0.96**

(1) Equipment emissions from Koizumi, 2005.

Table C-15
All American Canal Lining Project, Imperial, CA
Emissions of SOx from Construction Phase for 2007

								SOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	0	0.00	0.4690	0.0586	350	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	1.0520	0.1315	425	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Brush/Tree Flailing/Chipping Machine	1	0	0.00	0.4590	0.0574	300	0.00	0.00	0.00	0.00
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	3000	1500.00	0.4690	0.0586	464	87.94	0.04	1.06	0.01
	Holland Loader (D-10 dozer)	1	3000	1500.00	0.8600	0.1075	661	161.25	0.08	1.94	0.02
	Blade (motor grader 14H)	1	3000	1500.00	0.3570	0.0446	220	66.94	0.03	0.80	0.01
	Water Tanker	1	3000	1500.00	0.4930	0.0616	375	92.44	0.05	1.11	0.01
	D-9 dozers powering conveyor	2	3000	1500.00	0.6750	0.0844	464	253.13	0.13	3.04	0.03
	Pickup Truck Ford F250 Diesel	2	3000	1500.00	0.4930	0.0616	325	184.88	0.09	2.22	0.02
	Light Plants	4	3000	1500.00	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule A Excavation Scraper Spread	D11 Dozer	2	3420	1710.00	0.8600	0.1075	710	367.65	0.18	3.87	0.05
	D9 Dozer	1	3420	1710.00	0.4690	0.0586	410	100.25	0.05	1.06	0.01
	651 Scraper	8	3420	1710.00	1.0300	0.1288	550	1761.30	0.88	18.54	0.22
	Blade 14H	1	3420	1710.00	0.3570	0.0446	220	76.31	0.04	0.80	0.01
	Compactor Model 815F	1	3420	1710.00	0.4590	0.0574	254	98.11	0.05	1.03	0.01
	Water Tanker	1	3420	1710.00	0.4930	0.0616	375	105.38	0.05	1.11	0.01
	Pickup Truck Ford F250 Diesel	2	3420	1710.00	0.4930	0.0616	325	210.76	0.11	2.22	0.03
	Light Plants	4	3420	1710.00	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule A Excavation Scraper Spread	623 Scrapers	6	250	125.00	0.5820	0.0728	330	54.56	0.03	7.86	0.01
	D9 Dozer	1	250	125.00	0.8600	0.1075	410	13.44	0.01	1.94	0.00
	Water Pull	1	250	125.00	1.0520	0.1315	425	16.44	0.01	2.37	0.00
	Blade 12H	1	250	125.00	0.2570	0.0321	145	4.02	0.00	0.58	0.00
	Compactor Model 815F	1	250	125.00	0.4590	0.0574	254	7.17	0.00	1.03	0.00
	Pickup Truck Ford F250 Diesel	1	250	125.00	0.4930	0.0616	325	7.70	0.00	1.11	0.00
	Light Plants	4	250	125.00	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	1980	990.00	1.0980	0.1373	1025	135.88	0.07	2.47	0.02
	Bottom Dump Truck (18-wheel highway)	3	1980	990.00	0.4930	0.0616	325	183.03	0.09	3.33	0.02
Schedule A Dust Control	Blade 12H	1	1000	500.00	0.2570	0.0321	145	16.06	0.01	0.58	0.00
	Water Pull	1	1000	500.00	1.0520	0.1315	425	65.75	0.03	2.37	0.01
Schedule A Dewatering	Generator Set for Pump (100KW)	25	5760	2880.00	0.0020	0.0003	135	18.00	0.01	0.11	0.00
	Pickup Truck Ford F250 Diesel	1	5760	2880.00	0.4930	0.0616	325	177.48	0.09	1.11	0.02

Table C-15 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of SOx from Construction Phase for 2007

								SOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	5760	2880.00	0.4930	0.0616	325	354.96	0.18	2.22	0.04
	Pickup Truck Ford F250 Diesel	8	5760	2880.00	0.4930	0.0616	325	1419.84	0.71	8.87	0.18
	Flatbed Truck	1	1920	960.00	0.4930	0.0616	325	59.16	0.03	1.11	0.01
	Forklift	1	1920	960.00	0.0000	0.0000	120	0.00	0.00	0.00	0.00
	Support Vehicle	1	1920	960.00	0.3450	0.0431	250	41.40	0.02	0.78	0.01
	Office Trailer (100 KW Generator)	1	5760	2880.00	0.0020	0.0003	150	0.72	0.00	0.00	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	720	360.00	0.0020	0.0003	375	0.09	0.00	0.00	0.00
	Generator (500 KW)	1	720	360.00	0.0030	0.0004	750	0.14	0.00	0.01	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	720	360.00	0.4590	0.0574	250	82.62	0.04	4.13	0.01
	Bottom Dump Truck	8	720	360.00	0.4930	0.0616	325	177.48	0.09	8.87	0.02
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	900	450.00	0.0020	0.0003	150	0.11	0.00	0.00	0.00
	60-Ton Crane	1	900	450.00	0.3260	0.0408	380	18.34	0.01	0.73	0.00
	Vibrating Sheet Pile Hammer	1	900	450.00	0.0020	0.0003	175	0.11	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	3	900	450.00	0.4930	0.0616	325	83.19	0.04	3.33	0.01
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	5940	2970.00	0.4930	0.0616	325	915.13	0.46	5.55	0.11
	Emergency Response (Police car/Ambulance)	1	5940	2970.00	0.3450	0.0431	250	128.08	0.06	0.78	0.02
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	630	283.50	1.2190	0.1524	710	129.59	0.06	8.23	0.02
	651 Scrapers	7	630	283.50	1.0300	0.1288	550	255.50	0.13	16.22	0.03
	Blade 14H	1	630	283.50	0.3570	0.0446	220	12.65	0.01	0.80	0.00
	Compactor Model 815F	1	630	283.50	0.4590	0.0574	254	16.27	0.01	1.03	0.00
	Water Tanker	1	630	283.50	0.4930	0.0616	375	17.47	0.01	1.11	0.00
	Pickup Truck Ford F250 Diesel	2	630	283.50	0.4930	0.0616	325	34.94	0.02	2.22	0.00
	Light Plants	4	630	283.50	0.0000	0.0000	15	0.00	0.00	0.00	0.00

Table C-15 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of SOx from Construction Phase for 2007

								SOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	360	162.00	1.0980	0.1373	1025	22.23	0.01	2.47	0.00
	Bottom Dump Truck (18-wheel highway)	4	360	162.00	0.4930	0.0616	325	39.93	0.02	4.44	0.00
	Light Plants	5	360	162.00	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining Concrete Batch Plant	Generator (250 KW)	1	540	243.00	0.0020	0.0003	375	0.06	0.00	0.00	0.00
	Generator (500 KW)	1	540	243.00	0.0030	0.0004	750	0.09	0.00	0.01	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	540	243.00	0.4590	0.0574	250	55.77	0.03	4.13	0.01
	Bottom Dump Truck	8	540	243.00	0.4930	0.0616	325	119.80	0.06	8.87	0.01
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	2520	1134.00	0.0020	0.0003	150	7.09	0.00	0.11	0.00
	Pickup Truck Ford F250 Diesel	1	2520	1134.00	0.4930	0.0616	325	69.88	0.03	1.11	0.01
Schedule B - Dust Control	Blade 12H	1	5000	2250.00	0.2570	0.0321	145	72.28	0.04	0.58	0.01
	Water Pull	1	5000	2250.00	1.0520	0.1315	425	295.88	0.15	2.37	0.04
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	1530	688.50	0.5820	0.0728	330	300.53	0.15	7.86	0.04
	Water Pull	1	1530	688.50	1.0520	0.1315	425	90.54	0.05	2.37	0.01
	D-8 Dozer	2	1530	688.50	0.4690	0.0586	350	80.73	0.04	2.11	0.01
	Blade 14H	1	1530	688.50	0.3570	0.0446	220	30.72	0.02	0.80	0.00
	Compactor Model 815F	1	1530	688.50	0.4590	0.0574	254	39.50	0.02	1.03	0.00
	Water Tanker	1	1530	688.50	0.4930	0.0616	375	42.43	0.02	1.11	0.01
	Pickup Truck Ford F250 Diesel	2	1530	688.50	0.4930	0.0616	325	84.86	0.04	2.22	0.01
	Light Plants	3	1530	688.50	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	1400	630.00	0.0000	0.0000	120	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	1400	630.00	0.4930	0.0616	325	77.65	0.04	2.22	0.01
	1-Ton Truck	1	1400	630.00	0.4930	0.0616	325	38.82	0.02	1.11	0.00
Schedule B - Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	360	162.00	0.0020	0.0003	150	0.04	0.00	0.00	0.00
	60-Ton Crane	1	360	162.00	0.3260	0.0408	380	6.60	0.00	0.73	0.00
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	360	162.00	0.0020	0.0003	175	0.04	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	360	162.00	0.4930	0.0616	325	19.97	0.01	2.22	0.00

Table C-15 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of SOx from Construction Phase for 2007

								SOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	1300	585.00	1.0980	0.1373	1025	80.29	0.04	2.47	0.01
	60-Ton Crane	1	1300	585.00	0.3260	0.0408	380	23.84	0.01	0.73	0.00
	Flatbed Truck	1	1300	585.00	0.4930	0.0616	375	36.05	0.02	1.11	0.00
	Pickup Truck Ford F250 Diesel	2	1300	585.00	0.4930	0.0616	325	72.10	0.04	2.22	0.01
	Loader	1	1300	585.00	0.3090	0.0386	225	22.60	0.01	0.70	0.00
	Concrete Pump	1	1300	585.00	0.1750	0.0219	60	12.80	0.01	0.39	0.00
	Forklift	1	1300	585.00	0.0000	0.0000	120	0.00	0.00	0.00	0.00
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	5900	2655.00	0.4930	0.0616	325	327.23	0.16	2.22	0.04
	Pickup Truck Ford F250 Diesel	7	5900	2655.00	0.4930	0.0616	325	1145.30	0.57	7.76	0.14
	Flatbed Truck	1	1966	884.70	0.4930	0.0616	325	54.52	0.03	1.11	0.01
	Forklift	1	1966	884.70	0.0000	0.0000	120	0.00	0.00	0.00	0.00
	Support Vehicle	1	1966	884.70	0.3450	0.0431	250	38.15	0.02	0.78	0.00
	Office Trailer (100 KW Generator)	1	5900	2655.00	0.0020	0.0003	150	0.66	0.00	0.00	0.00
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	5760	2592.00	0.4930	0.0616	325	479.20	0.24	3.33	0.06
	Emergency Response (Police car/Ambulance)	1	5760	2592.00	0.3450	0.0431	250	111.78	0.06	0.78	0.01
Total								**11913.60**	**5.96**	**201.11**	**1.49**

(1) Equipment emissions from Koizumi, 2005.

Table C-16
All American Canal Lining Project, Imperial, CA
Emissions of SOx from Construction Phase for 2008

								SOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	0	0.00	0.4690	0.0586	350	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	1.0520	0.1315	425	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Brush/Tree Flailing/Chipping Machine	1	0	0.00	0.4590	0.0574	300	0.00	0.00	0.00	0.00
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	0	0.00	0.4690	0.0586	464	0.00	0.00	0.00	0.00
	Holland Loader (D-10 dozer)	1	0	0.00	0.8600	0.1075	661	0.00	0.00	0.00	0.00
	Blade (motor grader 14H)	1	0	0.00	0.3570	0.0446	220	0.00	0.00	0.00	0.00
	Water Tanker	1	0	0.00	0.4930	0.0616	375	0.00	0.00	0.00	0.00
	D-9 dozers powering conveyor	2	0	0.00	0.6750	0.0844	464	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Light Plants	4	0	0.00	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule A Excavation Scraper Spread	D11 Dozer	2	0	0.00	0.8600	0.1075	710	0.00	0.00	0.00	0.00
	D9 Dozer	1	0	0.00	0.4690	0.0586	410	0.00	0.00	0.00	0.00
	651 Scraper	8	0	0.00	1.0300	0.1288	550	0.00	0.00	0.00	0.00
	Blade 14H	1	0	0.00	0.3570	0.0446	220	0.00	0.00	0.00	0.00
	Compactor Model 815F	1	0	0.00	0.4590	0.0574	254	0.00	0.00	0.00	0.00
	Water Tanker	1	0	0.00	0.4930	0.0616	375	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Light Plants	4	0	0.00	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule A Excavation Scraper Spread	623 Scrapers	6	0	0.00	0.5820	0.0728	330	0.00	0.00	0.00	0.00
	D9 Dozer	1	0	0.00	0.8600	0.1075	410	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	1.0520	0.1315	425	0.00	0.00	0.00	0.00
	Blade 12H	1	0	0.00	0.2570	0.0321	145	0.00	0.00	0.00	0.00
	Compactor Model 815F	1	0	0.00	0.4590	0.0574	254	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	1	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Light Plants	4	0	0.00	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	0	0.00	1.0980	0.1373	1025	0.00	0.00	0.00	0.00
	Bottom Dump Truck (18-wheel highway)	3	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
Schedule A Dust Control	Blade 12H	1	0	0.00	0.2570	0.0321	145	0.00	0.00	0.00	0.00
	Water Pull	1	0	0.00	1.0520	0.1315	425	0.00	0.00	0.00	0.00
Schedule A Dewatering	Generator Set for Pump (100KW)	25	0	0.00	0.0020	0.0003	135	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	1	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00

Table C-16 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of SOx from Construction Phase for 2008

								SOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	8	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Flatbed Truck	1	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Forklift	1	0	0.00	0.0000	0.0000	120	0.00	0.00	0.00	0.00
	Support Vehicle	1	0	0.00	0.3450	0.0431	250	0.00	0.00	0.00	0.00
	Office Trailer (100 KW Generator)	1	0	0.00	0.0020	0.0003	150	0.00	0.00	0.00	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	0	0.00	0.0020	0.0003	375	0.00	0.00	0.00	0.00
	Generator (500 KW)	1	0	0.00	0.0030	0.0004	750	0.00	0.00	0.00	0.00
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	0	0.00	0.4590	0.0574	250	0.00	0.00	0.00	0.00
	Bottom Dump Truck	8	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	0	0.00	0.0020	0.0003	150	0.00	0.00	0.00	0.00
	60-Ton Crane	1	0	0.00	0.3260	0.0408	380	0.00	0.00	0.00	0.00
	Vibrating Sheet Pile Hammer	1	0	0.00	0.0020	0.0003	175	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	3	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	0	0.00	0.4930	0.0616	325	0.00	0.00	0.00	0.00
	Emergency Response (Police car/Ambulance)	1	0	0.00	0.3450	0.0431	250	0.00	0.00	0.00	0.00
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	630	346.50	1.2190	0.1524	710	158.39	0.08	8.23	0.02
	651 Scrapers	7	630	346.50	1.0300	0.1288	550	312.28	0.16	16.22	0.04
	Blade 14H	1	630	346.50	0.3570	0.0446	220	15.46	0.01	0.80	0.00
	Compactor Model 815F	1	630	346.50	0.4590	0.0574	254	19.88	0.01	1.03	0.00
	Water Tanker	1	630	346.50	0.4930	0.0616	375	21.35	0.01	1.11	0.00
	Pickup Truck Ford F250 Diesel	2	630	346.50	0.4930	0.0616	325	42.71	0.02	2.22	0.01
	Light Plants	4	630	346.50	0.0000	0.0000	15	0.00	0.00	0.00	0.00

Table C-16 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of SOx from Construction Phase for 2008

								SOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	360	198.00	1.0980	0.1373	1025	27.18	0.01	2.47	0.00
	Bottom Dump Truck (18-wheel highway)	4	360	198.00	0.4930	0.0616	325	48.81	0.02	4.44	0.01
	Light Plants	5	360	198.00	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining Concrete Batch Plant	Generator (250 KW)	1	540	297.00	0.0020	0.0003	375	0.07	0.00	0.00	0.00
	Generator (500 KW)	1	540	297.00	0.0030	0.0004	750	0.11	0.00	0.01	0.00
Schedule B Concrete Batch, Trim Canal, and Place Lining Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	540	297.00	0.4590	0.0574	250	68.16	0.03	4.13	0.01
	Bottom Dump Truck	8	540	297.00	0.4930	0.0616	325	146.42	0.07	8.87	0.02
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	2520	1386.00	0.0020	0.0003	150	8.66	0.00	0.11	0.00
	Pickup Truck Ford F250 Diesel	1	2520	1386.00	0.4930	0.0616	325	85.41	0.04	1.11	0.01
Schedule B - Dust Control	Blade 12H	1	5000	2750.00	0.2570	0.0321	145	88.34	0.04	0.58	0.01
	Water Pull	1	5000	2750.00	1.0520	0.1315	425	361.63	0.18	2.37	0.05
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	1530	841.50	0.5820	0.0728	330	367.31	0.18	7.86	0.05
	Water Pull	1	1530	841.50	1.0520	0.1315	425	110.66	0.06	2.37	0.01
	D-8 Dozer	2	1530	841.50	0.4690	0.0586	350	98.67	0.05	2.11	0.01
	Blade 14H	1	1530	841.50	0.3570	0.0446	220	37.55	0.02	0.80	0.00
	Compactor Model 815F	1	1530	841.50	0.4590	0.0574	254	48.28	0.02	1.03	0.01
	Water Tanker	1	1530	841.50	0.4930	0.0616	375	51.86	0.03	1.11	0.01
	Pickup Truck Ford F250 Diesel	2	1530	841.50	0.4930	0.0616	325	103.71	0.05	2.22	0.01
	Light Plants	3	1530	841.50	0.0000	0.0000	15	0.00	0.00	0.00	0.00
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	1400	770.00	0.0000	0.0000	120	0.00	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	1400	770.00	0.4930	0.0616	325	94.90	0.05	2.22	0.01
	1-Ton Truck	1	1400	770.00	0.4930	0.0616	325	47.45	0.02	1.11	0.01
Schedule B - Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	360	198.00	0.0020	0.0003	150	0.05	0.00	0.00	0.00
	60-Ton Crane	1	360	198.00	0.3260	0.0408	380	8.07	0.00	0.73	0.00
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	360	198.00	0.0020	0.0003	175	0.05	0.00	0.00	0.00
	Pickup Truck Ford F250 Diesel	2	360	198.00	0.4930	0.0616	325	24.40	0.01	2.22	0.00

Table C-16 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of SOx from Construction Phase for 2008

								SOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	1300	715.00	1.0980	0.1373	1025	98.13	0.05	2.47	0.01
	60-Ton Crane	1	1300	715.00	0.3260	0.0408	380	29.14	0.01	0.73	0.00
	Flatbed Truck	1	1300	715.00	0.4930	0.0616	375	44.06	0.02	1.11	0.01
	Pickup Truck Ford F250 Diesel	2	1300	715.00	0.4930	0.0616	325	88.12	0.04	2.22	0.01
	Loader	1	1300	715.00	0.3090	0.0386	225	27.62	0.01	0.70	0.00
	Concrete Pump	1	1300	715.00	0.1750	0.0219	60	15.64	0.01	0.39	0.00
	Forklift	1	1300	715.00	0.0000	0.0000	120	0.00	0.00	0.00	0.00
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	5900	3245.00	0.4930	0.0616	325	399.95	0.20	2.22	0.05
	Pickup Truck Ford F250 Diesel	7	5900	3245.00	0.4930	0.0616	325	1399.81	0.70	7.76	0.17
	Flatbed Truck	1	1966	1081.30	0.4930	0.0616	325	66.64	0.03	1.11	0.01
	Forklift	1	1966	1081.30	0.0000	0.0000	120	0.00	0.00	0.00	0.00
	Support Vehicle	1	1966	1081.30	0.3450	0.0431	250	46.63	0.02	0.78	0.01
	Office Trailer (100 KW Generator)	1	5900	3245.00	0.0020	0.0003	150	0.81	0.00	0.00	0.00
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	5760	3168.00	0.4930	0.0616	325	585.68	0.29	3.33	0.07
	Emergency Response (Police car/Ambulance)	1	5760	3168.00	0.3450	0.0431	250	136.62	0.07	0.78	0.02
Total								**5336.69**	**2.67**	**101.09**	**0.67**

(1) Equipment emissions from Koizumi, 2005.

Table C-17
All American Canal Lining Project, Imperial, CA
VMT Emissions of SOx from Construction Phase for 2006
Vehicle Miles Traveled (VMT)

						SOx Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)									
Schedules A/B	Personal Vehicles	14096	62	873968	0.000009	7.87	0.0039	0.0215	0.0010
Schedule A	Aggregate Haul Trucks	2800	31	86800	0.000405	35.15	0.0176	0.0963	0.0044
	Cement Haul Trucks	1250	101	126250	0.000405	51.13	0.0256	0.1401	0.0064
	Concrete Haul Trucks	5250	12	63000	0.000405	25.52	0.0128	0.0699	0.0032
Schedule B	Aggregate Haul Trucks	0	31	0	0.000405	0.00	0.0000	0.0000	0.0000
	Cement Haul Trucks	0	101	0	0.000405	0.00	0.0000	0.0000	0.0000
	Concrete Haul Trucks	0	12	0	0.000405	0.00	0.0000	0.0000	0.0000
	Subtotal					**119.67**	**0.06**	**0.33**	**0.01**

(1) Personal vehicle emissions from SCAQMD, 2003b; (2) Truck emissions from SCAQMD, 2003a.

Table C-18
All American Canal Lining Project, Imperial, CA
VMT Emissions of SOx from Construction Phase for 2007
Vehicle Miles Traveled (VMT)

						SOx Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)									
Schedules A/B	Personal Vehicles	21144	62	1310951	0.000009	11.80	0.0059	0.0323	0.0015
Schedule A	Aggregate Haul Trucks	2800	31	86800	0.000046	3.97	0.0020	0.0109	0.0005
	Cement Haul Trucks	1250	101	126250	0.000046	5.77	0.0029	0.0158	0.0007
	Concrete Haul Trucks	5250	12	63000	0.000046	2.88	0.0014	0.0079	0.0004
Schedule B	Aggregate Haul Trucks	1440	31	44640	0.000046	2.04	0.0010	0.0056	0.0003
	Cement Haul Trucks	810	101	81810	0.000046	3.74	0.0019	0.0102	0.0005
	Concrete Haul Trucks	2925	12	35100	0.000046	1.60	0.0008	0.0044	0.0002
	Subtotal					**31.80**	**0.02**	**0.09**	**0.00**

(1) Personal vehicle emissions from SCAQMD, 2003b; (2) Truck emissions from SCAQMD, 2003a.

Table C-19
All American Canal Lining Project, Imperial, CA
VMT Emissions of SOx from Construction Phase for 2008
Vehicle Miles Traveled (VMT)

						SOx Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)									
Schedules A/B	Personal Vehicles	21144	62	1310951	0.000009	11.80	0.0059	0.0323	0.0015
Schedule A	Aggregate Haul Trucks	0	31	0	0.000046	0.00	0.0000	0.0000	0.0000
	Cement Haul Trucks	0	101	0	0.000046	0.00	0.0000	0.0000	0.0000
	Concrete Haul Trucks	0	12	0	0.000046	0.00	0.0000	0.0000	0.0000
Schedule B	Aggregate Haul Trucks	1760	31	54560	0.000046	2.51	0.0013	0.0069	0.0003
	Cement Haul Trucks	990	101	99990	0.000046	4.60	0.0023	0.0126	0.0006
	Concrete Haul Trucks	3575	12	42900	0.000046	1.97	0.0010	0.0054	0.0002
	Subtotal					**20.88**	**0.01**	**0.06**	**0.00**

(1) Personal vehicle emissions from SCAQMD, 2003b; (2) Truck emissions from SCAQMD, 2003a.

Table C-20
All American Canal Lining Project, Imperial, CA
Emissions of NOx from Construction Phase for 2006

								NOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	360	360.00	3.218	0.4023	350	289.62	0.145	14.481	0.036
	Water Pull	1	360	360.00	7.029	0.8786	425	316.31	0.158	15.815	0.040
	Pickup Truck Ford F250 Diesel	2	360	360.00	3.062	0.3828	325	275.58	0.138	13.779	0.034
	Brush/Tree Flailing/Chipping Machine	1	360	360.00	3.011	0.3764	300	135.50	0.068	6.775	0.017
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	3000	1500.00	3.218	0.4023	464	603.38	0.302	7.241	0.075
	Holland Loader (D-10 dozer)	1	3000	1500.00	5.819	0.7274	661	1091.06	0.546	13.093	0.136
	Blade (motor grader 14H)	1	3000	1500.00	1.988	0.2485	220	372.75	0.186	4.473	0.047
	Water Tanker	1	3000	1500.00	3.062	0.3828	375	574.13	0.287	6.890	0.072
	D-9 dozers powering conveyor	2	3000	1500.00	3.218	0.4023	464	1206.75	0.603	14.481	0.151
	Pickup Truck Ford F250 Diesel	2	3000	1500.00	3.062	0.3828	325	1148.25	0.574	13.779	0.144
	Light Plants	4	3000	1500.00	0.067	0.0084	15	50.25	0.025	0.603	0.006
Schedule A Excavation Scraper Spread	D11 Dozer	2	3420	1710.00	5.819	0.7274	710	2487.62	1.244	26.186	0.311
	D9 Dozer	1	3420	1710.00	3.218	0.4023	464	687.85	0.344	7.241	0.086
	651 Scraper	8	3420	1710.00	6.595	0.8244	550	11277.45	5.639	118.710	1.410
	Blade 14H	1	3420	1710.00	1.988	0.2485	220	424.94	0.212	4.473	0.053
	Compactor Model 815F	1	3420	1710.00	3.011	0.3764	254	643.60	0.322	6.775	0.080
	Water Tanker	1	3420	1710.00	3.062	0.3828	375	654.50	0.327	6.890	0.082
	Pickup Truck Ford F250 Diesel	2	3420	1710.00	3.062	0.3828	325	1309.01	0.655	13.779	0.164
	Light Plants	4	3420	1710.00	0.067	0.0084	15	57.29	0.029	0.603	0.007
Schedule A Excavation Scraper Spread	623 Scrapers	6	250	125.00	3.768	0.4710	330	353.25	0.177	50.868	0.044
	D9 Dozer	1	250	125.00	3.218	0.4023	464	50.28	0.025	7.241	0.006
	Water Pull	1	250	125.00	7.029	0.8786	425	109.83	0.055	15.815	0.014
	Blade 12H	1	250	125.00	1.562	0.1953	145	24.41	0.012	3.515	0.003
	Compactor Model 815F	1	250	125.00	3.011	0.3764	254	47.05	0.024	6.775	0.006
	Pickup Truck Ford F250 Diesel	1	250	125.00	3.062	0.3828	325	47.84	0.024	6.890	0.006
	Light Plants	4	250	125.00	0.067	0.0084	15	4.19	0.002	0.603	0.001
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	1980	990.00	7.542	0.9428	1025	933.32	0.467	16.970	0.117
	Bottom Dump Truck (18-wheel highway)	3	1980	990.00	3.062	0.3828	325	1136.77	0.568	20.669	0.142
Schedule A Dust Control	Blade 12H	1	1000	500.00	1.562	0.1953	145	97.63	0.049	3.515	0.012
	Water Pull	1	1000	500.00	7.029	0.8786	425	439.31	0.220	15.815	0.055

Table C-20 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of NOx from Construction Phase for 2006

								NOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Dewatering	Generator Set for Pump (100KW)	25	5760	2880.00	1.842	0.2303	135	16578.00	8.289	103.613	2.072
	Pickup Truck Ford F250 Diesel	1	5760	2880.00	3.062	0.3828	325	1102.32	0.551	6.890	0.138
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	5760	2880.00	3.062	0.3828	325	2204.64	1.102	13.779	0.276
	Pickup Truck Ford F250 Diesel	8	5760	2880.00	3.062	0.3828	325	8818.56	4.409	55.116	1.102
	Flatbed Truck	1	1920	960.00	3.062	0.3828	325	367.44	0.184	6.890	0.046
	Forklift	1	1920	960.00	0.521	0.0651	120	62.52	0.031	1.172	0.008
	Support Vehicle	1	1920	960.00	2.087	0.2609	250	250.44	0.125	4.696	0.031
	Office Trailer (100 KW Generator)	1	5760	2880.00	1.842	0.2303	150	663.12	0.332	4.145	0.083
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	720	360.00	3.853	0.4816	375	173.39	0.087	8.669	0.022
	Generator (500 KW)	1	720	360.00	6.356	0.7945	750	286.02	0.143	14.301	0.036
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	720	360.00	3.011	0.3764	250	541.98	0.271	27.099	0.068
	Bottom Dump Truck	8	720	360.00	3.062	0.3828	325	1102.32	0.551	55.116	0.138
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	900	450.00	1.842	0.2303	150	103.61	0.052	4.145	0.013
	60-Ton Crane	1	900	450.00	1.88	0.2350	380	105.75	0.053	4.230	0.013
	Vibrating Sheet Pile Hammer	1	900	450.00	1.842	0.2303	175	103.61	0.052	4.145	0.013
	Pickup Truck Ford F250 Diesel	3	900	450.00	3.062	0.3828	325	516.71	0.258	20.669	0.065
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	5940	2970.00	3.062	0.3828	325	5683.84	2.842	34.448	0.710
	Emergency Response (Police car/Ambulance)	1	5940	2970.00	2.087	0.2609	250	774.80	0.387	4.696	0.097
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	0	0.00	5.819	0.7274	710	0.00	0.000	0.000	0.000
	651 Scrapers	7	0	0.00	6.595	0.8244	550	0.00	0.000	0.000	0.000
	Blade 14H	1	0	0.00	1.988	0.2485	220	0.00	0.000	0.000	0.000
	Compactor Model 815F	1	0	0.00	3.011	0.3764	254	0.00	0.000	0.000	0.000
	Water Tanker	1	0	0.00	3.062	0.3828	375	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Light Plants	4	0	0.00	0.067	0.0084	15	0.00	0.000	0.000	0.000

Table C-20 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of NOx from Construction Phase for 2006

								NOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	0	0.00	7.542	0.9428	1025	0.00	0.000	0.000	0.000
	Bottom Dump Truck (18-wheel highway)	4	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Light Plants	5	0	0.00	0.067	0.0084	15	0.00	0.000	0.000	0.000
Schedule B Concrete Batch, Trim Canal, and Place Lining Concrete Batch Plant	Generator (250 KW)	1	0	0.00	3.853	0.4816	375	0.00	0.000	0.000	0.000
	Generator (500 KW)	1	0	0.00	6.356	0.7945	750	0.00	0.000	0.000	0.000
Schedule B Concrete Batch, Trim Canal, and Place Lining Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	0	0.00	3.011	0.3764	250	0.00	0.000	0.000	0.000
	Bottom Dump Truck	8	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	0	0.00	1.842	0.2303	150	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	1	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
Schedule B - Dust Control	Blade 12H	1	0	0.00	1.562	0.1953	145	0.00	0.000	0.000	0.000
	Water Pull	1	0	0.00	7.029	0.8786	425	0.00	0.000	0.000	0.000
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	0	0.00	3.768	0.4710	330	0.00	0.000	0.000	0.000
	Water Pull	1	0	0.00	7.029	0.8786	425	0.00	0.000	0.000	0.000
	D-8 Dozer	2	0	0.00	3.218	0.4023	350	0.00	0.000	0.000	0.000
	Blade 14H	1	0	0.00	1.988	0.2485	220	0.00	0.000	0.000	0.000
	Compactor Model 815F	1	0	0.00	3.011	0.3764	254	0.00	0.000	0.000	0.000
	Water Tanker	1	0	0.00	3.062	0.3828	375	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Light Plants	3	0	0.00	0.067	0.0084	15	0.00	0.000	0.000	0.000
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	0	0.00	0.521	0.0651	120	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	1-Ton Truck	1	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
Schedule B Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	0	0.00	1.842	0.2303	150	0.00	0.000	0.000	0.000
	60-Ton Crane	1	0	0.00	1.88	0.2350	380	0.00	0.000	0.000	0.000
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	0	0.00	1.842	0.2303	175	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000

Table C-20 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of NOx from Construction Phase for 2006

								NOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	0	0.00	7.542	0.9428	1025	0.00	0.000	0.000	0.000
	60-Ton Crane	1	0	0.00	1.88	0.2350	380	0.00	0.000	0.000	0.000
	Flatbed Truck	1	0	0.00	3.062	0.3828	375	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Loader	1	0	0.00	1.658	0.2073	225	0.00	0.000	0.000	0.000
	Concrete Pump	1	0	0.00	1.206	0.1508	60	0.00	0.000	0.000	0.000
	Forklift	1	0	0.00	0.521	0.0651	120	0.00	0.000	0.000	0.000
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	7	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Flatbed Truck	1	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Forklift	1	0	0.00	0.521	0.0651	120	0.00	0.000	0.000	0.000
	Support Vehicle	1	0	0.00	2.087	0.2609	250	0.00	0.000	0.000	0.000
	Office Trailer (100 KW Generator)	1	0	0.00	1.842	0.2303	150	0.00	0.000	0.000	0.000
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Emergency Response (Police car/Ambulance)	1	0	0.00	2.087	0.2609	250	0.00	0.000	0.000	0.000
Total								**66288.75**	**33.14**	**818.55**	**8.29**

(1) Equipment emissions from Koizumi, 2005.

Table C-21
All American Canal Lining Project, Imperial, CA
Emissions of NOx from Construction Phase for 2007

								NOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	0	0.00	3.218	0.4023	350	0.00	0.000	0.000	0.000
	Water Pull	1	0	0.00	7.029	0.8786	425	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Brush/Tree Flailing/Chipping Machine	1	0	0.00	3.011	0.3764	300	0.00	0.000	0.000	0.000
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	3000	1500.00	3.218	0.4023	464	603.38	0.302	7.241	0.075
	Holland Loader (D-10 dozer)	1	3000	1500.00	5.819	0.7274	661	1091.06	0.546	13.093	0.136
	Blade (motor grader 14H)	1	3000	1500.00	1.988	0.2485	220	372.75	0.186	4.473	0.047
	Water Tanker	1	3000	1500.00	3.062	0.3828	375	574.13	0.287	6.890	0.072
	D-9 dozers powering conveyor	2	3000	1500.00	3.218	0.4023	464	1206.75	0.603	14.481	0.151
	Pickup Truck Ford F250 Diesel	2	3000	1500.00	3.062	0.3828	325	1148.25	0.574	13.779	0.144
	Light Plants	4	3000	1500.00	0.067	0.0084	15	50.25	0.025	0.603	0.006
Schedule A Excavation Scraper Spread	D11 Dozer	2	3420	1710.00	5.819	0.7274	710	2487.62	1.244	26.186	0.311
	D9 Dozer	1	3420	1710.00	3.218	0.4023	464	687.85	0.344	7.241	0.086
	651 Scraper	8	3420	1710.00	6.595	0.8244	550	11277.45	5.639	118.710	1.410
	Blade 14H	1	3420	1710.00	1.988	0.2485	220	424.94	0.212	4.473	0.053
	Compactor Model 815F	1	3420	1710.00	3.011	0.3764	254	643.60	0.322	6.775	0.080
	Water Tanker	1	3420	1710.00	3.062	0.3828	375	654.50	0.327	6.890	0.082
	Pickup Truck Ford F250 Diesel	2	3420	1710.00	3.062	0.3828	325	1309.01	0.655	13.779	0.164
	Light Plants	4	3420	1710.00	0.067	0.0084	15	57.29	0.029	0.603	0.007
Schedule A Excavation Scraper Spread	623 Scrapers	6	250	125.00	3.768	0.4710	330	353.25	0.177	50.868	0.044
	D9 Dozer	1	250	125.00	3.218	0.4023	464	50.28	0.025	7.241	0.006
	Water Pull	1	250	125.00	7.029	0.8786	425	109.83	0.055	15.815	0.014
	Blade 12H	1	250	125.00	1.562	0.1953	145	24.41	0.012	3.515	0.003
	Compactor Model 815F	1	250	125.00	3.011	0.3764	254	47.05	0.024	6.775	0.006
	Pickup Truck Ford F250 Diesel	1	250	125.00	3.062	0.3828	325	47.84	0.024	6.890	0.006
	Light Plants	4	250	125.00	0.067	0.0084	15	4.19	0.002	0.603	0.001
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	1980	990.00	7.542	0.9428	1025	933.32	0.467	16.970	0.117
	Bottom Dump Truck (18-wheel highway)	3	1980	990.00	3.062	0.3828	325	1136.77	0.568	20.669	0.142
Schedule A Dust Control	Blade 12H	1	1000	500.00	1.562	0.1953	145	97.63	0.049	3.515	0.012
	Water Pull	1	1000	500.00	7.029	0.8786	425	439.31	0.220	15.815	0.055

Table C-21 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of NOx from Construction Phase for 2007

								NOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Dewatering	Generator Set for Pump (100KW)	25	5760	2880.00	1.842	0.2303	135	16578.00	8.289	103.613	2.072
	Pickup Truck Ford F250 Diesel	1	5760	2880.00	3.062	0.3828	325	1102.32	0.551	6.890	0.138
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	5760	2880.00	3.062	0.3828	325	2204.64	1.102	13.779	0.276
	Pickup Truck Ford F250 Diesel	8	5760	2880.00	3.062	0.3828	325	8818.56	4.409	55.116	1.102
	Flatbed Truck	1	1920	960.00	3.062	0.3828	325	367.44	0.184	6.890	0.046
	Forklift	1	1920	960.00	0.521	0.0651	120	62.52	0.031	1.172	0.008
	Support Vehicle	1	1920	960.00	2.087	0.2609	250	250.44	0.125	4.696	0.031
	Office Trailer (100 KW Generator)	1	5760	2880.00	1.842	0.2303	150	663.12	0.332	4.145	0.083
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	720	360.00	3.853	0.4816	375	173.39	0.087	8.669	0.022
	Generator (500 KW)	1	720	360.00	6.356	0.7945	750	286.02	0.143	14.301	0.036
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	720	360.00	3.011	0.3764	250	541.98	0.271	27.099	0.068
	Bottom Dump Truck	8	720	360.00	3.062	0.3828	325	1102.32	0.551	55.116	0.138
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	900	450.00	1.842	0.2303	150	103.61	0.052	4.145	0.013
	60-Ton Crane	1	900	450.00	1.88	0.2350	380	105.75	0.053	4.230	0.013
	Vibrating Sheet Pile Hammer	1	900	450.00	1.842	0.2303	175	103.61	0.052	4.145	0.013
	Pickup Truck Ford F250 Diesel	3	900	450.00	3.062	0.3828	325	516.71	0.258	20.669	0.065
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	5940	2970.00	3.062	0.3828	325	5683.84	2.842	34.448	0.710
	Emergency Response (Police car/Ambulance)	1	5940	2970.00	2.087	0.2609	250	774.80	0.387	4.696	0.097
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	630	283.50	5.819	0.7274	710	618.63	0.309	39.278	0.077
	651 Scrapers	7	630	283.50	6.595	0.8244	550	1635.97	0.818	103.871	0.204
	Blade 14H	1	630	283.50	1.988	0.2485	220	70.45	0.035	4.473	0.009
	Compactor Model 815F	1	630	283.50	3.011	0.3764	254	106.70	0.053	6.775	0.013
	Water Tanker	1	630	283.50	3.062	0.3828	375	108.51	0.054	6.890	0.014
	Pickup Truck Ford F250 Diesel	2	630	283.50	3.062	0.3828	325	217.02	0.109	13.779	0.027
	Light Plants	4	630	283.50	0.067	0.0084	15	9.50	0.005	0.603	0.001

Table C-21 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of NOx from Construction Phase for 2007

								NOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	360	162.00	7.542	0.9428	1025	152.73	0.076	16.970	0.019
	Bottom Dump Truck (18-wheel highway)	4	360	162.00	3.062	0.3828	325	248.02	0.124	27.558	0.031
	Light Plants	5	360	162.00	0.067	0.0084	15	6.78	0.003	0.754	0.001
Schedule B Concrete Batch, Trim Canal, and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	540	243.00	3.853	0.4816	375	117.03	0.059	8.669	0.015
	Generator (500 KW)	1	540	243.00	6.356	0.7945	750	193.06	0.097	14.301	0.024
Schedule B Concrete Batch, Trim Canal, and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	540	243.00	3.011	0.3764	250	365.84	0.183	27.099	0.046
	Bottom Dump Truck	8	540	243.00	3.062	0.3828	325	744.07	0.372	55.116	0.093
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	2520	1134.00	1.842	0.2303	150	6527.59	3.264	103.613	0.816
	Pickup Truck Ford F250 Diesel	1	2520	1134.00	3.062	0.3828	325	434.04	0.217	6.890	0.054
Schedule B - Dust Control	Blade 12H	1	5000	2250.00	1.562	0.1953	145	439.31	0.220	3.515	0.055
	Water Pull	1	5000	2250.00	7.029	0.8786	425	1976.91	0.988	15.815	0.247
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	1530	688.50	3.768	0.4710	330	1945.70	0.973	50.868	0.243
	Water Pull	1	1530	688.50	7.029	0.8786	425	604.93	0.302	15.815	0.076
	D-8 Dozer	2	1530	688.50	3.218	0.4023	350	553.90	0.277	14.481	0.069
	Blade 14H	1	1530	688.50	1.988	0.2485	220	171.09	0.086	4.473	0.021
	Compactor Model 815F	1	1530	688.50	3.011	0.3764	254	259.13	0.130	6.775	0.032
	Water Tanker	1	1530	688.50	3.062	0.3828	375	263.52	0.132	6.890	0.033
	Pickup Truck Ford F250 Diesel	2	1530	688.50	3.062	0.3828	325	527.05	0.264	13.779	0.066
	Light Plants	3	1530	688.50	0.067	0.0084	15	17.30	0.009	0.452	0.002
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	1400	630.00	0.521	0.0651	120	82.06	0.041	2.345	0.010
	Pickup Truck Ford F250 Diesel	2	1400	630.00	3.062	0.3828	325	482.27	0.241	13.779	0.060
	1-Ton Truck	1	1400	630.00	3.062	0.3828	325	241.13	0.121	6.890	0.030
Schedule B Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	360	162.00	1.842	0.2303	150	37.30	0.019	4.145	0.005
	60-Ton Crane	1	360	162.00	1.88	0.2350	380	38.07	0.019	4.230	0.005
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	360	162.00	1.842	0.2303	175	37.30	0.019	4.145	0.005
	Pickup Truck Ford F250 Diesel	2	360	162.00	3.062	0.3828	325	124.01	0.062	13.779	0.016

Table C-21 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of NOx from Construction Phase for 2007

								NOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	1300	585.00	7.542	0.9428	1025	551.51	0.276	16.970	0.069
	60-Ton Crane	1	1300	585.00	1.88	0.2350	380	137.48	0.069	4.230	0.017
	Flatbed Truck	1	1300	585.00	3.062	0.3828	375	223.91	0.112	6.890	0.028
	Pickup Truck Ford F250 Diesel	2	1300	585.00	3.062	0.3828	325	447.82	0.224	13.779	0.056
	Loader	1	1300	585.00	1.658	0.2073	225	121.24	0.061	3.731	0.015
	Concrete Pump	1	1300	585.00	1.206	0.1508	60	88.19	0.044	2.714	0.011
	Forklift	1	1300	585.00	0.521	0.0651	120	38.10	0.019	1.172	0.005
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	5900	2655.00	3.062	0.3828	325	2032.40	1.016	13.779	0.254
	Pickup Truck Ford F250 Diesel	7	5900	2655.00	3.062	0.3828	325	7113.41	3.557	48.227	0.889
	Flatbed Truck	1	1966	884.70	3.062	0.3828	325	338.62	0.169	6.890	0.042
	Forklift	1	1966	884.70	0.521	0.0651	120	57.62	0.029	1.172	0.007
	Support Vehicle	1	1966	884.70	2.087	0.2609	250	230.80	0.115	4.696	0.029
	Office Trailer (100 KW Generator)	1	5900	2655.00	1.842	0.2303	150	611.31	0.306	4.145	0.076
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	5760	2592.00	3.062	0.3828	325	2976.26	1.488	20.669	0.372
	Emergency Response (Police car/Ambulance)	1	5760	2592.00	2.087	0.2609	250	676.19	0.338	4.696	0.085
Total								**100273.52**	**50.14**	**1540.27**	**12.53**

(1) Equipment emissions from Koizumi, 2005.

Table C-22
All American Canal Lining Project, Imperial, CA
Emissions of NOx from Construction Phase for 2008

								NOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	0	0.00	3.218	0.4023	350	0.00	0.000	0.000	0.000
	Water Pull	1	0	0.00	7.029	0.8786	425	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Brush/Tree Flailing/Chipping Machine	1	0	0.00	3.011	0.3764	300	0.00	0.000	0.000	0.000
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	0	0.00	3.218	0.4023	464	0.00	0.000	0.000	0.000
	Holland Loader (D-10 dozer)	1	0	0.00	5.819	0.7274	661	0.00	0.000	0.000	0.000
	Blade (motor grader 14H)	1	0	0.00	1.988	0.2485	220	0.00	0.000	0.000	0.000
	Water Tanker	1	0	0.00	3.062	0.3828	375	0.00	0.000	0.000	0.000
	D-9 dozers powering conveyor	2	0	0.00	3.218	0.4023	464	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Light Plants	4	0	0.00	0.067	0.0084	15	0.00	0.000	0.000	0.000
Schedule A Excavation Scraper Spread	D11 Dozer	2	0	0.00	5.819	0.7274	710	0.00	0.000	0.000	0.000
	D9 Dozer	1	0	0.00	3.218	0.4023	464	0.00	0.000	0.000	0.000
	651 Scraper	8	0	0.00	6.595	0.8244	550	0.00	0.000	0.000	0.000
	Blade 14H	1	0	0.00	1.988	0.2485	220	0.00	0.000	0.000	0.000
	Compactor Model 815F	1	0	0.00	3.011	0.3764	254	0.00	0.000	0.000	0.000
	Water Tanker	1	0	0.00	3.062	0.3828	375	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Light Plants	4	0	0.00	0.067	0.0084	15	0.00	0.000	0.000	0.000
Schedule A Excavation Scraper Spread	623 Scrapers	6	0	0.00	3.768	0.4710	330	0.00	0.000	0.000	0.000
	D9 Dozer	1	0	0.00	3.218	0.4023	464	0.00	0.000	0.000	0.000
	Water Pull	1	0	0.00	7.029	0.8786	425	0.00	0.000	0.000	0.000
	Blade 12H	1	0	0.00	1.562	0.1953	145	0.00	0.000	0.000	0.000
	Compactor Model 815F	1	0	0.00	3.011	0.3764	254	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	1	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Light Plants	4	0	0.00	0.067	0.0084	15	0.00	0.000	0.000	0.000
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	0	0.00	7.542	0.9428	1025	0.00	0.000	0.000	0.000
	Bottom Dump Truck (18-wheel highway)	3	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
Schedule A Dust Control	Blade 12H	1	0	0.00	1.562	0.1953	145	0.00	0.000	0.000	0.000
	Water Pull	1	0	0.00	7.029	0.8786	425	0.00	0.000	0.000	0.000

Table C-22 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of NOx from Construction Phase for 2008

								NOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Dewatering	Generator Set for Pump (100KW)	25	0	0.00	1.842	0.2303	135	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	1	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	8	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Flatbed Truck	1	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Forklift	1	0	0.00	0.521	0.0651	120	0.00	0.000	0.000	0.000
	Support Vehicle	1	0	0.00	2.087	0.2609	250	0.00	0.000	0.000	0.000
	Office Trailer (100 KW Generator)	1	0	0.00	1.842	0.2303	150	0.00	0.000	0.000	0.000
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	0	0.00	3.853	0.4816	375	0.00	0.000	0.000	0.000
	Generator (500 KW)	1	0	0.00	6.356	0.7945	750	0.00	0.000	0.000	0.000
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	0	0.00	3.011	0.3764	250	0.00	0.000	0.000	0.000
	Bottom Dump Truck	8	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	0	0.00	1.842	0.2303	150	0.00	0.000	0.000	0.000
	60-Ton Crane	1	0	0.00	1.88	0.2350	380	0.00	0.000	0.000	0.000
	Vibrating Sheet Pile Hammer	1	0	0.00	1.842	0.2303	175	0.00	0.000	0.000	0.000
	Pickup Truck Ford F250 Diesel	3	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	0	0.00	3.062	0.3828	325	0.00	0.000	0.000	0.000
	Emergency Response (Police car/Ambulance)	1	0	0.00	2.087	0.2609	250	0.00	0.000	0.000	0.000
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	630	346.50	5.819	0.7274	710	756.11	0.378	39.278	0.095
	651 Scrapers	7	630	346.50	6.595	0.8244	550	1999.52	1.000	103.871	0.250
	Blade 14H	1	630	346.50	1.988	0.2485	220	86.11	0.043	4.473	0.011
	Compactor Model 815F	1	630	346.50	3.011	0.3764	254	130.41	0.065	6.775	0.016
	Water Tanker	1	630	346.50	3.062	0.3828	375	132.62	0.066	6.890	0.017
	Pickup Truck Ford F250 Diesel	2	630	346.50	3.062	0.3828	325	265.25	0.133	13.779	0.033
	Light Plants	4	630	346.50	0.067	0.0084	15	11.61	0.006	0.603	0.001

Table C-22 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of NOx from Construction Phase for 2008

								NOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	360	198.00	7.542	0.9428	1025	186.66	0.093	16.970	0.023
	Bottom Dump Truck (18-wheel highway)	4	360	198.00	3.062	0.3828	325	303.14	0.152	27.558	0.038
	Light Plants	5	360	198.00	0.067	0.0084	15	8.29	0.004	0.754	0.001
Schedule B Concrete Batch, Trim Canal, and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	540	297.00	3.853	0.4816	375	143.04	0.072	8.669	0.018
	Generator (500 KW)	1	540	297.00	6.356	0.7945	750	235.97	0.118	14.301	0.029
Schedule B Concrete Batch, Trim Canal, and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	540	297.00	3.011	0.3764	250	447.13	0.224	27.099	0.056
	Bottom Dump Truck	8	540	297.00	3.062	0.3828	325	909.41	0.455	55.116	0.114
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	2520	1386.00	1.842	0.2303	150	7978.16	3.989	103.613	0.997
	Pickup Truck Ford F250 Diesel	1	2520	1386.00	3.062	0.3828	325	530.49	0.265	6.890	0.066
Schedule B - Dust Control	Blade 12H	1	5000	2750.00	1.562	0.1953	145	536.94	0.268	3.515	0.067
	Water Pull	1	5000	2750.00	7.029	0.8786	425	2416.22	1.208	15.815	0.302
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	1530	841.50	3.768	0.4710	330	2378.08	1.189	50.868	0.297
	Water Pull	1	1530	841.50	7.029	0.8786	425	739.36	0.370	15.815	0.092
	D-8 Dozer	2	1530	841.50	3.218	0.4023	350	676.99	0.338	14.481	0.085
	Blade 14H	1	1530	841.50	1.988	0.2485	220	209.11	0.105	4.473	0.026
	Compactor Model 815F	1	1530	841.50	3.011	0.3764	254	316.72	0.158	6.775	0.040
	Water Tanker	1	1530	841.50	3.062	0.3828	375	322.08	0.161	6.890	0.040
	Pickup Truck Ford F250 Diesel	2	1530	841.50	3.062	0.3828	325	644.17	0.322	13.779	0.081
	Light Plants	3	1530	841.50	0.067	0.0084	15	21.14	0.011	0.452	0.003
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	1400	770.00	0.521	0.0651	120	100.29	0.050	2.345	0.013
	Pickup Truck Ford F250 Diesel	2	1400	770.00	3.062	0.3828	325	589.44	0.295	13.779	0.074
	1-Ton Truck	1	1400	770.00	3.062	0.3828	325	294.72	0.147	6.890	0.037
Schedule B Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	360	198.00	1.842	0.2303	150	45.59	0.023	4.145	0.006
	60-Ton Crane	1	360	198.00	1.88	0.2350	380	46.53	0.023	4.230	0.006
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	360	198.00	1.842	0.2303	175	45.59	0.023	4.145	0.006
	Pickup Truck Ford F250 Diesel	2	360	198.00	3.062	0.3828	325	151.57	0.076	13.779	0.019

Table C-22 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of NOx from Construction Phase for 2008

								NOx Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	1300	715.00	7.542	0.9428	1025	674.07	0.337	16.970	0.084
	60-Ton Crane	1	1300	715.00	1.88	0.2350	380	168.03	0.084	4.230	0.021
	Flatbed Truck	1	1300	715.00	3.062	0.3828	375	273.67	0.137	6.890	0.034
	Pickup Truck Ford F250 Diesel	2	1300	715.00	3.062	0.3828	325	547.33	0.274	13.779	0.068
	Loader	1	1300	715.00	1.658	0.2073	225	148.18	0.074	3.731	0.019
	Concrete Pump	1	1300	715.00	1.206	0.1508	60	107.79	0.054	2.714	0.013
	Forklift	1	1300	715.00	0.521	0.0651	120	46.56	0.023	1.172	0.006
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	5900	3245.00	3.062	0.3828	325	2484.05	1.242	13.779	0.311
	Pickup Truck Ford F250 Diesel	7	5900	3245.00	3.062	0.3828	325	8694.17	4.347	48.227	1.087
	Flatbed Truck	1	1966	1081.30	3.062	0.3828	325	413.87	0.207	6.890	0.052
	Forklift	1	1966	1081.30	0.521	0.0651	120	70.42	0.035	1.172	0.009
	Support Vehicle	1	1966	1081.30	2.087	0.2609	250	282.08	0.141	4.696	0.035
	Office Trailer (100 KW Generator)	1	5900	3245.00	1.842	0.2303	150	747.16	0.374	4.145	0.093
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	5760	3168.00	3.062	0.3828	325	3637.66	1.819	20.669	0.455
	Emergency Response (Police car/Ambulance)	1	5760	3168.00	2.087	0.2609	250	826.45	0.413	4.696	0.103
Total								**42779.94**	**21.39**	**772.57**	**5.35**

(1) Equipment emissions from Koizumi, 2005.

Table C-23
All American Canal Lining Project, Imperial, CA
VMT Emissions of NOx from Construction Phase for 2006
Vehicle Miles Traveled (VMT)

						NOx Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)									
Schedules A/B	Personal Vehicles	14096	62	873968	0.001489	1301.34	0.65	3.57	0.16
Schedule A	Aggregate Haul Trucks	2800	31	86800	0.038930	3379.12	1.69	9.26	0.42
	Cement Haul Trucks	1250	101	126250	0.038930	4914.91	2.46	13.47	0.61
	Concrete Haul Trucks	5250	12	63000	0.038930	2452.59	1.23	6.72	0.31
Schedule B	Aggregate Haul Trucks	0	31	0	0.038930	0.00	0.00	0.00	0.00
	Cement Haul Trucks	0	101	0	0.038930	0.00	0.00	0.00	0.00
	Concrete Haul Trucks	0	12	0	0.038930	0.00	0.00	0.00	0.00
	Subtotal					**12047.96**	**6.02**	**33.01**	**1.51**

(1) Personal vehicle emissions from SCAQMD, 2003b; (2) Truck emissions from SCAQMD, 2003a.

Table C-24
All American Canal Lining Project, Imperial, CA
VMT Emissions of NOx from Construction Phase for 2007
Vehicle Miles Traveled (VMT)

						NOx Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)									
Schedules A/B	Personal Vehicles	21144	62	1310951	0.001361	1784.20	0.89	4.89	0.22
Schedule A	Aggregate Haul Trucks	2800	31	86800	0.035635	3093.12	1.55	8.47	0.39
	Cement Haul Trucks	1250	101	126250	0.035635	4498.92	2.25	12.33	0.56
	Concrete Haul Trucks	5250	12	63000	0.035635	2245.01	1.12	6.15	0.28
Schedule B	Aggregate Haul Trucks	1440	31	44640	0.035635	1590.75	0.80	4.36	0.20
	Cement Haul Trucks	810	101	81810	0.035635	2915.30	1.46	7.99	0.36
	Concrete Haul Trucks	2925	12	35100	0.035635	1250.79	0.63	3.43	0.16
	Subtotal					**17378.08**	**8.69**	**47.61**	**2.17**

(1) Personal vehicle emissions from SCAQMD, 2003b; (2) Truck emissions from SCAQMD, 2003a.

Table C-25
All American Canal Lining Project, Imperial, CA
VMT Emissions of NOx from Construction Phase for 2008
Vehicle Miles Traveled (VMT)

						NOx Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)									
Schedules A/B	Personal Vehicles	21144	62	1310951	0.001245	1632.13	0.82	4.47	0.20
Schedule A	Aggregate Haul Trucks	0	31	0	0.032442	0.00	0.00	0.00	0.00
	Cement Haul Trucks	0	101	0	0.032442	0.00	0.00	0.00	0.00
	Concrete Haul Trucks	0	12	0	0.032442	0.00	0.00	0.00	0.00
Schedule B	Aggregate Haul Trucks	1760	31	54560	0.032442	1770.04	0.89	4.85	0.22
	Cement Haul Trucks	990	101	99990	0.032442	3243.88	1.62	8.89	0.41
	Concrete Haul Trucks	3575	12	42900	0.032442	1391.76	0.70	3.81	0.17
					Subtotal	**8037.81**	**4.02**	**22.02**	**1.00**

(1) Personal vehicle emissions from SCAQMD, 2003b; (2) Truck emissions from SCAQMD, 2003a.

Table C-26
All American Canal Lining Project, Imperial, CA
Emissions of VOC from Construction Phase for 2006

								VOC Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	360	360.00	0.2430	0.0304	350	21.87	0.011	1.09	0.003
	Water Pull	1	360	360.00	0.5140	0.0643	425	23.13	0.012	1.16	0.003
	Pickup Truck Ford F250 Diesel	2	360	360.00	0.2090	0.0261	325	18.81	0.009	0.94	0.002
	Brush/Tree Flailing/Chipping Machine	1	360	360.00	0.2120	0.0265	300	9.54	0.005	0.48	0.001
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	3000	1500.00	0.2430	0.0304	464	45.56	0.023	0.55	0.006
	Holland Loader (D-10 dozer)	1	3000	1500.00	0.4330	0.0541	661	81.19	0.041	0.97	0.010
	Blade (motor grader 14H)	1	3000	1500.00	0.1300	0.0163	220	24.38	0.012	0.29	0.003
	Water Tanker	1	3000	1500.00	0.2090	0.0261	375	39.19	0.020	0.47	0.005
	D-9 dozers powering conveyor	2	3000	1500.00	0.2430	0.0304	464	91.13	0.046	1.09	0.011
	Pickup Truck Ford F250 Diesel	2	3000	1500.00	0.2090	0.0261	325	78.38	0.039	0.94	0.010
	Light Plants	4	3000	1500.00	0.0170	0.0021	15	12.75	0.006	0.15	0.002
Schedule A Excavation Scraper Spread	D11 Dozer	2	3420	1710.00	0.4330	0.0541	710	185.11	0.093	1.95	0.023
	D9 Dozer	1	3420	1710.00	0.2430	0.0304	410	51.94	0.026	0.55	0.006
	651 Scraper	8	3420	1710.00	0.4770	0.0596	550	815.67	0.408	8.59	0.102
	Blade 14H	1	3420	1710.00	0.1300	0.0163	220	27.79	0.014	0.29	0.003
	Compactor Model 815F	1	3420	1710.00	0.2120	0.0265	254	45.32	0.023	0.48	0.006
	Water Tanker	1	3420	1710.00	0.2090	0.0261	375	44.67	0.022	0.47	0.006
	Pickup Truck Ford F250 Diesel	2	3420	1710.00	0.2090	0.0261	325	89.35	0.045	0.94	0.011
	Light Plants	4	3420	1710.00	0.0170	0.0021	15	14.54	0.007	0.15	0.002
Schedule A Excavation Scraper Spread	623 Scrapers	6	250	125.00	0.2700	0.0338	330	25.31	0.013	3.65	0.003
	D9 Dozer	1	250	125.00	0.2430	0.0304	410	3.80	0.002	0.55	0.000
	Water Pull	1	250	125.00	0.5140	0.0643	425	8.03	0.004	1.16	0.001
	Blade 12H	1	250	125.00	0.1590	0.0199	145	2.48	0.001	0.36	0.000
	Compactor Model 815F	1	250	125.00	0.2120	0.0265	254	3.31	0.002	0.48	0.000
	Pickup Truck Ford F250 Diesel	1	250	125.00	0.2090	0.0261	325	3.27	0.002	0.47	0.000
	Light Plants	4	250	125.00	0.0170	0.0021	15	1.06	0.001	0.15	0.000
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	1980	990.00	0.4770	0.0596	1025	59.03	0.030	1.07	0.007
	Bottom Dump Truck (18-wheel highway)	3	1980	990.00	0.2090	0.0261	325	77.59	0.039	1.41	0.010
Schedule A Dust Control	Blade 12H	1	1000	500.00	0.1590	0.0199	145	9.94	0.005	0.36	0.001
	Water Pull	1	1000	500.00	0.5140	0.0643	425	32.13	0.016	1.16	0.004
Schedule A Dewatering	Generator Set for Pump (100KW)	25	5760	2880.00	0.1780	0.0223	135	1602.00	0.801	10.01	0.200
	Pickup Truck Ford F250 Diesel	1	5760	2880.00	0.2090	0.0261	325	75.24	0.038	0.47	0.009

Table C-26 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of VOC from Construction Phase for 2006

								VOC Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	5760	2880.00	0.2090	0.0261	325	150.48	0.075	0.94	0.019
	Pickup Truck Ford F250 Diesel	8	5760	2880.00	0.2090	0.0261	325	601.92	0.301	3.76	0.075
	Flatbed Truck	1	1920	960.00	0.2090	0.0261	325	25.08	0.013	0.47	0.003
	Forklift	1	1920	960.00	0.0840	0.0105	120	10.08	0.005	0.19	0.001
	Support Vehicle	1	1920	960.00	0.1470	0.0184	250	17.64	0.009	0.33	0.002
	Office Trailer (100 KW Generator)	1	5760	2880.00	0.1780	0.0223	150	64.08	0.032	0.40	0.008
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	720	360.00	0.2650	0.0331	375	11.93	0.006	0.60	0.001
	Generator (500 KW)	1	720	360.00	0.4410	0.0551	750	19.85	0.010	0.99	0.002
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	720	360.00	0.2120	0.0265	250	38.16	0.019	1.91	0.005
	Bottom Dump Truck	8	720	360.00	0.2090	0.0261	325	75.24	0.038	3.76	0.009
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	900	450.00	0.1780	0.0223	150	10.01	0.005	0.40	0.001
	60-Ton Crane	1	900	450.00	0.1170	0.0146	380	6.58	0.003	0.26	0.001
	Vibrating Sheet Pile Hammer	1	900	450.00	0.1780	0.0223	175	10.01	0.005	0.40	0.001
	Pickup Truck Ford F250 Diesel	3	900	450.00	0.2090	0.0261	325	35.27	0.018	1.41	0.004
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	5940	2970.00	0.2090	0.0261	325	387.96	0.194	2.35	0.048
	Emergency Response (Police car/Ambulance)	1	5940	2970.00	0.1470	0.0184	250	54.57	0.027	0.33	0.007
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	0	0.00	0.4330	0.0541	710	0.00	0.000	0.00	0.000
	651 Scrapers	7	0	0.00	0.4770	0.0596	550	0.00	0.000	0.00	0.000
	Blade 14H	1	0	0.00	0.1300	0.0163	220	0.00	0.000	0.00	0.000
	Compactor Model 815F	1	0	0.00	0.3085	0.0386	254	0.00	0.000	0.00	0.000
	Water Tanker	1	0	0.00	0.2090	0.0261	375	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Light Plants	4	0	0.00	0.0170	0.0021	15	0.00	0.000	0.00	0.000

Table C-26 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of VOC from Construction Phase for 2006

								VOC Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	0	0.00	0.4770	0.0596	1025	0.00	0.000	0.00	0.000
	Bottom Dump Truck (18-wheel highway)	4	0	0.00	0.0290	0.0036	325	0.00	0.000	0.00	0.000
	Light Plants	5	0	0.00	0.0170	0.0021	15	0.00	0.000	0.00	0.000
Schedule B Concrete Batch, Trim Canal, and Place Lining Concrete Batch Plant	Generator (250 KW)	1	0	0.00	0.2650	0.0331	375	0.00	0.000	0.00	0.000
	Generator (500 KW)	1	0	0.00	0.4410	0.0551	750	0.00	0.000	0.00	0.000
Schedule B Concrete Batch, Trim Canal, and Place Lining Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	0	0.00	0.2120	0.0265	250	0.00	0.000	0.00	0.000
	Bottom Dump Truck	8	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	0	0.00	0.1780	0.0223	150	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	1	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
Schedule B - Dust Control	Blade 12H	1	0	0.00	0.1590	0.0199	145	0.00	0.000	0.00	0.000
	Water Pull	1	0	0.00	0.5140	0.0643	425	0.00	0.000	0.00	0.000
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	0	0.00	0.2700	0.0338	330	0.00	0.000	0.00	0.000
	Water Pull	1	0	0.00	0.5140	0.0643	425	0.00	0.000	0.00	0.000
	D8 Dozer	2	0	0.00	0.2430	0.0304	350	0.00	0.000	0.00	0.000
	Blade 14H	1	0	0.00	0.1300	0.0163	220	0.00	0.000	0.00	0.000
	Compactor Model 815F	1	0	0.00	0.2120	0.0265	254	0.00	0.000	0.00	0.000
	Water Tanker	1	0	0.00	0.2090	0.0261	375	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Light Plants	3	0	0.00	0.0170	0.0021	15	0.00	0.000	0.00	0.000
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	0	0.00	0.0840	0.0105	120	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	1-Ton Truck	1	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
Schedule B - Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	0	0.00	0.1780	0.0223	150	0.00	0.000	0.00	0.000
	60-Ton Crane	1	0	0.00	0.1170	0.0146	380	0.00	0.000	0.00	0.000
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	0	0.00	0.1780	0.0223	175	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000

Table C-26 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of VOC from Construction Phase for 2006

								VOC Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2006 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	0	0.00	0.4770	0.0596	1025	0.00	0.000	0.00	0.000
	60-Ton Crane	1	0	0.00	0.0117	0.0015	380	0.00	0.000	0.00	0.000
	Flatbed Truck	1	0	0.00	0.2090	0.0261	375	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Loader	1	0	0.00	0.1010	0.0126	225	0.00	0.000	0.00	0.000
	Concrete Pump	1	0	0.00	0.1650	0.0206	60	0.00	0.000	0.00	0.000
	Forklift	1	0	0.00	0.0840	0.0105	120	0.00	0.000	0.00	0.000
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	7	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Flatbed Truck	1	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Forklift	1	0	0.00	0.0840	0.0105	120	0.00	0.000	0.00	0.000
	Support Vehicle	1	0	0.00	0.1470	0.0184	250	0.00	0.000	0.00	0.000
	Office Trailer (100 KW Generator)	1	0	0.00	0.1780	0.0223	150	0.00	0.000	0.00	0.000
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Emergency Response (Police car/Ambulance)	1	0	0.00	0.1470	0.0184	250	0.00	0.000	0.00	0.000
Total								**5142.33**	**2.57**	**61.35**	**0.64**

(1) Equipment emissions from Koizumi, 2005.

Table C-27
All American Canal Lining Project, Imperial, CA
Emissions of VOC from Construction Phase for 2007

								VOC Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	0	0.00	0.2430	0.0304	350	0.00	0.000	0.00	0.000
	Water Pull	1	0	0.00	0.5140	0.0643	425	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Brush/Tree Flailing/Chipping Machine	1	0	0.00	0.2120	0.0265	300	0.00	0.000	0.00	0.000
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	3000	1500.00	0.2430	0.0304	464	45.56	0.023	0.55	0.006
	Holland Loader (D-10 dozer)	1	3000	1500.00	0.4330	0.0541	661	81.19	0.041	0.97	0.010
	Blade (motor grader 14H)	1	3000	1500.00	0.1300	0.0163	220	24.38	0.012	0.29	0.003
	Water Tanker	1	3000	1500.00	0.2090	0.0261	375	39.19	0.020	0.47	0.005
	D-9 dozers powering conveyor	2	3000	1500.00	0.2430	0.0304	464	91.13	0.046	1.09	0.011
	Pickup Truck Ford F250 Diesel	2	3000	1500.00	0.2090	0.0261	325	78.38	0.039	0.94	0.010
	Light Plants	4	3000	1500.00	0.0170	0.0021	15	12.75	0.006	0.15	0.002
Schedule A Excavation Scraper Spread	D11 Dozer	2	3420	1710.00	0.4330	0.0541	710	185.11	0.093	1.95	0.023
	D9 Dozer	1	3420	1710.00	0.2430	0.0304	410	51.94	0.026	0.55	0.006
	651 Scraper	8	3420	1710.00	0.4770	0.0596	550	815.67	0.408	8.59	0.102
	Blade 14H	1	3420	1710.00	0.1300	0.0163	220	27.79	0.014	0.29	0.003
	Compactor Model 815F	1	3420	1710.00	0.2120	0.0265	254	45.32	0.023	0.48	0.006
	Water Tanker	1	3420	1710.00	0.2090	0.0261	375	44.67	0.022	0.47	0.006
	Pickup Truck Ford F250 Diesel	2	3420	1710.00	0.2090	0.0261	325	89.35	0.045	0.94	0.011
	Light Plants	4	3420	1710.00	0.0170	0.0021	15	14.54	0.007	0.15	0.002
Schedule A Excavation Scraper Spread	623 Scrapers	6	250	125.00	0.2700	0.0338	330	25.31	0.013	3.65	0.003
	D9 Dozer	1	250	125.00	0.2430	0.0304	410	3.80	0.002	0.55	0.000
	Water Pull	1	250	125.00	0.5140	0.0643	425	8.03	0.004	1.16	0.001
	Blade 12H	1	250	125.00	0.1590	0.0199	145	2.48	0.001	0.36	0.000
	Compactor Model 815F	1	250	125.00	0.2120	0.0265	254	3.31	0.002	0.48	0.000
	Pickup Truck Ford F250 Diesel	1	250	125.00	0.2090	0.0261	325	3.27	0.002	0.47	0.000
	Light Plants	4	250	125.00	0.0170	0.0021	15	1.06	0.001	0.15	0.000
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	1980	990.00	0.4770	0.0596	1025	59.03	0.030	1.07	0.007
	Bottom Dump Truck (18-wheel highway)	3	1980	990.00	0.2090	0.0261	325	77.59	0.039	1.41	0.010
Schedule A Dust Control	Blade 12H	1	1000	500.00	0.1590	0.0199	145	9.94	0.005	0.36	0.001
	Water Pull	1	1000	500.00	0.5140	0.0643	425	32.13	0.016	1.16	0.004
Schedule A Dewatering	Generator Set for Pump (100KW)	25	5760	2880.00	0.1780	0.0223	135	1602.00	0.801	10.01	0.200
	Pickup Truck Ford F250 Diesel	1	5760	2880.00	0.2090	0.0261	325	75.24	0.038	0.47	0.009

Table C-27 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of VOC from Construction Phase for 2007

								VOC Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	5760	2880.00	0.2090	0.0261	325	150.48	0.075	0.94	0.019
	Pickup Truck Ford F250 Diesel	8	5760	2880.00	0.2090	0.0261	325	601.92	0.301	3.76	0.075
	Flatbed Truck	1	1920	960.00	0.2090	0.0261	325	25.08	0.013	0.47	0.003
	Forklift	1	1920	960.00	0.0840	0.0105	120	10.08	0.005	0.19	0.001
	Support Vehicle	1	1920	960.00	0.1470	0.0184	250	17.64	0.009	0.33	0.002
	Office Trailer (100 KW Generator)	1	5760	2880.00	0.1780	0.0223	150	64.08	0.032	0.40	0.008
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	720	360.00	0.2650	0.0331	375	11.93	0.006	0.60	0.001
	Generator (500 KW)	1	720	360.00	0.4410	0.0551	750	19.85	0.010	0.99	0.002
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	720	360.00	0.2120	0.0265	250	38.16	0.019	1.91	0.005
	Bottom Dump Truck	8	720	360.00	0.2090	0.0261	325	75.24	0.038	3.76	0.009
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	900	450.00	0.1780	0.0223	150	10.01	0.005	0.40	0.001
	60-Ton Crane	1	900	450.00	0.1170	0.0146	380	6.58	0.003	0.26	0.001
	Vibrating Sheet Pile Hammer	1	900	450.00	0.1780	0.0223	175	10.01	0.005	0.40	0.001
	Pickup Truck Ford F250 Diesel	3	900	450.00	0.2090	0.0261	325	35.27	0.018	1.41	0.004
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	5940	2970.00	0.2090	0.0261	325	387.96	0.194	2.35	0.048
	Emergency Response (Police car/Ambulance)	1	5940	2970.00	0.1470	0.0184	250	54.57	0.027	0.33	0.007
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	630	283.50	0.4330	0.0541	710	46.03	0.023	2.92	0.006
	651 Scrapers	7	630	283.50	0.4770	0.0596	550	118.33	0.059	7.51	0.015
	Blade 14H	1	630	283.50	0.1300	0.0163	220	4.61	0.002	0.29	0.001
	Compactor Model 815F	1	630	283.50	0.3085	0.0386	254	10.93	0.005	0.69	0.001
	Water Tanker	1	630	283.50	0.2090	0.0261	375	7.41	0.004	0.47	0.001
	Pickup Truck Ford F250 Diesel	2	630	283.50	0.2090	0.0261	325	14.81	0.007	0.94	0.002
	Light Plants	4	630	283.50	0.0170	0.0021	15	2.41	0.001	0.15	0.000

Table C-27 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of VOC from Construction Phase for 2007

								VOC Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	360	162.00	0.4770	0.0596	1025	9.66	0.005	1.07	0.001
	Bottom Dump Truck (18-wheel highway)	4	360	162.00	0.0290	0.0036	325	2.35	0.001	0.26	0.000
	Light Plants	5	360	162.00	0.0170	0.0021	15	1.72	0.001	0.19	0.000
Schedule B Concrete Batch, Trim Canal, and Place Lining Concrete Batch Plant	Generator (250 KW)	1	540	243.00	0.2650	0.0331	375	8.05	0.004	0.60	0.001
	Generator (500 KW)	1	540	243.00	0.4410	0.0551	750	13.40	0.007	0.99	0.002
Schedule B Concrete Batch, Trim Canal, and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	540	243.00	0.2120	0.0265	250	25.76	0.013	1.91	0.003
	Bottom Dump Truck	8	540	243.00	0.2090	0.0261	325	50.79	0.025	3.76	0.006
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	2520	1134.00	0.1780	0.0223	150	630.79	0.315	10.01	0.079
	Pickup Truck Ford F250 Diesel	1	2520	1134.00	0.2090	0.0261	325	29.63	0.015	0.47	0.004
Schedule B - Dust Control	Blade 12H	1	5000	2250.00	0.1590	0.0199	145	44.72	0.022	0.36	0.006
	Water Pull	1	5000	2250.00	0.5140	0.0643	425	144.56	0.072	1.16	0.018
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	1530	688.50	0.2700	0.0338	330	139.42	0.070	3.65	0.017
	Water Pull	1	1530	688.50	0.5140	0.0643	425	44.24	0.022	1.16	0.006
	D8 Dozer	2	1530	688.50	0.2430	0.0304	350	41.83	0.021	1.09	0.005
	Blade 14H	1	1530	688.50	0.1300	0.0163	220	11.19	0.006	0.29	0.001
	Compactor Model 815F	1	1530	688.50	0.2120	0.0265	254	18.25	0.009	0.48	0.002
	Water Tanker	1	1530	688.50	0.2090	0.0261	375	17.99	0.009	0.47	0.002
	Pickup Truck Ford F250 Diesel	2	1530	688.50	0.2090	0.0261	325	35.97	0.018	0.94	0.004
	Light Plants	3	1530	688.50	0.0170	0.0021	15	4.39	0.002	0.11	0.001
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	1400	630.00	0.0840	0.0105	120	13.23	0.007	0.38	0.002
	Pickup Truck Ford F250 Diesel	2	1400	630.00	0.2090	0.0261	325	32.92	0.016	0.94	0.004
	1-Ton Truck	1	1400	630.00	0.2090	0.0261	325	16.46	0.008	0.47	0.002
Schedule B - Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	360	162.00	0.1780	0.0223	150	3.60	0.002	0.40	0.000
	60-Ton Crane	1	360	162.00	0.1170	0.0146	380	2.37	0.001	0.26	0.000
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	360	162.00	0.1780	0.0223	175	3.60	0.002	0.40	0.000
	Pickup Truck Ford F250 Diesel	2	360	162.00	0.2090	0.0261	325	8.46	0.004	0.94	0.001

Table C-27 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of VOC from Construction Phase for 2007

								VOC Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2007 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	1300	585.00	0.4770	0.0596	1025	34.88	0.017	1.07	0.004
	60-Ton Crane	1	1300	585.00	0.0117	0.0015	380	0.86	0.000	0.03	0.000
	Flatbed Truck	1	1300	585.00	0.2090	0.0261	375	15.28	0.008	0.47	0.002
	Pickup Truck Ford F250 Diesel	2	1300	585.00	0.2090	0.0261	325	30.57	0.015	0.94	0.004
	Loader	1	1300	585.00	0.1010	0.0126	225	7.39	0.004	0.23	0.001
	Concrete Pump	1	1300	585.00	0.1650	0.0206	60	12.07	0.006	0.37	0.002
	Forklift	1	1300	585.00	0.0840	0.0105	120	6.14	0.003	0.19	0.001
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	5900	2655.00	0.2090	0.0261	325	138.72	0.069	0.94	0.017
	Pickup Truck Ford F250 Diesel	7	5900	2655.00	0.2090	0.0261	325	485.53	0.243	3.29	0.061
	Flatbed Truck	1	1966	884.70	0.2090	0.0261	325	23.11	0.012	0.47	0.003
	Forklift	1	1966	884.70	0.0840	0.0105	120	9.29	0.005	0.19	0.001
	Support Vehicle	1	1966	884.70	0.1470	0.0184	250	16.26	0.008	0.33	0.002
	Office Trailer (100 KW Generator)	1	5900	2655.00	0.1780	0.0223	150	59.07	0.030	0.40	0.007
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	5760	2592.00	0.2090	0.0261	325	203.15	0.102	1.41	0.025
	Emergency Response (Police car/Ambulance)	1	5760	2592.00	0.1470	0.0184	250	47.63	0.024	0.33	0.006
Total								**7718.79**	**3.86**	**114.09**	**0.96**

(1) Equipment emissions from Koizumi, 2005.

Table C-28
All American Canal Lining Project, Imperial, CA
Emissions of VOC from Construction Phase for 2008

								VOC Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Pre-Construction Plant Clearance	D8 dozer	2	0	0.00	0.2430	0.0304	350	0.00	0.000	0.00	0.000
	Water Pull	1	0	0.00	0.5140	0.0643	425	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Brush/Tree Flailing/Chipping Machine	1	0	0.00	0.2120	0.0265	300	0.00	0.000	0.00	0.000
Schedule A Excavation Large Loader Spoil Conveyer	Holland Loader (D-9 dozer)	1	0	0.00	0.2430	0.0304	464	0.00	0.000	0.00	0.000
	Holland Loader (D-10 dozer)	1	0	0.00	0.4330	0.0541	661	0.00	0.000	0.00	0.000
	Blade (motor grader 14H)	1	0	0.00	0.1300	0.0163	220	0.00	0.000	0.00	0.000
	Water Tanker	1	0	0.00	0.2090	0.0261	375	0.00	0.000	0.00	0.000
	D-9 dozers powering conveyor	2	0	0.00	0.2430	0.0304	464	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Light Plants	4	0	0.00	0.0170	0.0021	15	0.00	0.000	0.00	0.000
Schedule A Excavation Scraper Spread	D11 Dozer	2	0	0.00	0.4330	0.0541	710	0.00	0.000	0.00	0.000
	D9 Dozer	1	0	0.00	0.2430	0.0304	410	0.00	0.000	0.00	0.000
	651 Scraper	8	0	0.00	0.4770	0.0596	550	0.00	0.000	0.00	0.000
	Blade 14H	1	0	0.00	0.1300	0.0163	220	0.00	0.000	0.00	0.000
	Compactor Model 815F	1	0	0.00	0.2120	0.0265	254	0.00	0.000	0.00	0.000
	Water Tanker	1	0	0.00	0.2090	0.0261	375	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	2	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Light Plants	4	0	0.00	0.0170	0.0021	15	0.00	0.000	0.00	0.000
Schedule A Excavation Scraper Spread	623 Scrapers	6	0	0.00	0.2700	0.0338	330	0.00	0.000	0.00	0.000
	D9 Dozer	1	0	0.00	0.2430	0.0304	410	0.00	0.000	0.00	0.000
	Water Pull	1	0	0.00	0.5140	0.0643	425	0.00	0.000	0.00	0.000
	Blade 12H	1	0	0.00	0.1590	0.0199	145	0.00	0.000	0.00	0.000
	Compactor Model 815F	1	0	0.00	0.2120	0.0265	254	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	1	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Light Plants	4	0	0.00	0.0170	0.0021	15	0.00	0.000	0.00	0.000
Schedule A Excavation Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	0	0.00	0.4770	0.0596	1025	0.00	0.000	0.00	0.000
	Bottom Dump Truck (18-wheel highway)	3	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
Schedule A Dust Control	Blade 12H	1	0	0.00	0.1590	0.0199	145	0.00	0.000	0.00	0.000
	Water Pull	1	0	0.00	0.5140	0.0643	425	0.00	0.000	0.00	0.000
Schedule A Dewatering	Generator Set for Pump (100KW)	25	0	0.00	0.1780	0.0223	135	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	1	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000

Table C-28 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of VOC from Construction Phase for 2008

								VOC Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule A Contractor O/H and Maintenance	Mechanics Trucks	2	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	8	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Flatbed Truck	1	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Forklift	1	0	0.00	0.0840	0.0105	120	0.00	0.000	0.00	0.000
	Support Vehicle	1	0	0.00	0.1470	0.0184	250	0.00	0.000	0.00	0.000
	Office Trailer (100 KW Generator)	1	0	0.00	0.1780	0.0223	150	0.00	0.000	0.00	0.000
Schedule A Concrete Batch, Trim Canal and Place Lining - Concrete Batch Plant	Generator (250 KW)	1	0	0.00	0.2650	0.0331	375	0.00	0.000	0.00	0.000
	Generator (500 KW)	1	0	0.00	0.4410	0.0551	750	0.00	0.000	0.00	0.000
Schedule A Concrete Batch, Trim Canal and Place Lining - Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	0	0.00	0.2120	0.0265	250	0.00	0.000	0.00	0.000
	Bottom Dump Truck	8	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
Schedule A Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	0	0.00	0.1780	0.0223	150	0.00	0.000	0.00	0.000
	60-Ton Crane	1	0	0.00	0.1170	0.0146	380	0.00	0.000	0.00	0.000
	Vibrating Sheet Pile Hammer	1	0	0.00	0.1780	0.0223	175	0.00	0.000	0.00	0.000
	Pickup Truck Ford F250 Diesel	3	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
Schedule A - Construction Management, owner, Police, Emergency	Pickup Truck Ford F250 Diesel	5	0	0.00	0.2090	0.0261	325	0.00	0.000	0.00	0.000
	Emergency Response (Police car/Ambulance)	1	0	0.00	0.1470	0.0184	250	0.00	0.000	0.00	0.000
Schedule B Excavation - Scraper Spread	D-11 Dozers	3	630	346.50	0.4330	0.0541	710	56.26	0.028	2.92	0.007
	651 Scrapers	7	630	346.50	0.4770	0.0596	550	144.62	0.072	7.51	0.018
	Blade 14H	1	630	346.50	0.1300	0.0163	220	5.63	0.003	0.29	0.001
	Compactor Model 815F	1	630	346.50	0.3085	0.0386	254	13.36	0.007	0.69	0.002
	Water Tanker	1	630	346.50	0.2090	0.0261	375	9.05	0.005	0.47	0.001
	Pickup Truck Ford F250 Diesel	2	630	346.50	0.2090	0.0261	325	18.10	0.009	0.94	0.002
	Light Plants	4	630	346.50	0.0170	0.0021	15	2.95	0.001	0.15	0.000

Table C-28 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of VOC from Construction Phase for 2008

								VOC Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B Excavation - Backhoe Operation	Backhoe (7 cubic yard) Hitachi (1900)	1	360	198.00	0.4770	0.0596	1025	11.81	0.006	1.07	0.001
	Bottom Dump Truck (18-wheel highway)	4	360	198.00	0.0290	0.0036	325	2.87	0.001	0.26	0.000
	Light Plants	5	360	198.00	0.0170	0.0021	15	2.10	0.001	0.19	0.000
Schedule B Concrete Batch, Trim Canal, and Place Lining Concrete Batch Plant	Generator (250 KW)	1	540	297.00	0.2650	0.0331	375	9.84	0.005	0.60	0.001
	Generator (500 KW)	1	540	297.00	0.4410	0.0551	750	16.37	0.008	0.99	0.002
Schedule B Concrete Batch, Trim Canal, and Place Lining Trim, Line, Haul	Set Self-Powered Trim and Lining Canal Machine - 4 engines running @250 HP ea. Totaling 1000 HP	4	540	297.00	0.2120	0.0265	250	31.48	0.016	1.91	0.004
	Bottom Dump Truck	8	540	297.00	0.2090	0.0261	325	62.07	0.031	3.76	0.008
Schedule B - Dewatering	Generator Set for Pump (100KW)	25	2520	1386.00	0.1780	0.0223	150	770.96	0.385	10.01	0.096
	Pickup Truck Ford F250 Diesel	1	2520	1386.00	0.2090	0.0261	325	36.21	0.018	0.47	0.005
Schedule B - Dust Control	Blade 12H	1	5000	2750.00	0.1590	0.0199	145	54.66	0.027	0.36	0.007
	Water Pull	1	5000	2750.00	0.5140	0.0643	425	176.69	0.088	1.16	0.022
Schedule B - Off-Line Storage PVC Liner and Fill - Scraper Spread	623 Scrapers	6	1530	841.50	0.2700	0.0338	330	170.40	0.085	3.65	0.021
	Water Pull	1	1530	841.50	0.5140	0.0643	425	54.07	0.027	1.16	0.007
	D8 Dozer	2	1530	841.50	0.2430	0.0304	350	51.12	0.026	1.09	0.006
	Blade 14H	1	1530	841.50	0.1300	0.0163	220	13.67	0.007	0.29	0.002
	Compactor Model 815F	1	1530	841.50	0.2120	0.0265	254	22.30	0.011	0.48	0.003
	Water Tanker	1	1530	841.50	0.2090	0.0261	375	21.98	0.011	0.47	0.003
	Pickup Truck Ford F250 Diesel	2	1530	841.50	0.2090	0.0261	325	43.97	0.022	0.94	0.005
	Light Plants	3	1530	841.50	0.0170	0.0021	15	5.36	0.003	0.11	0.001
Schedule B - Off-Line Storage PVC Liner and Fill - Install Liner	Forklift	2	1400	770.00	0.0840	0.0105	120	16.17	0.008	0.38	0.002
	Pickup Truck Ford F250 Diesel	2	1400	770.00	0.2090	0.0261	325	40.23	0.020	0.94	0.005
	1-Ton Truck	1	1400	770.00	0.2090	0.0261	325	20.12	0.010	0.47	0.003
Schedule B - Tie-Ins	Barge, Self Powered by Winches (100 KW Gen)	1	360	198.00	0.1780	0.0223	150	4.41	0.002	0.40	0.001
	60-Ton Crane	1	360	198.00	0.1170	0.0146	380	2.90	0.001	0.26	0.000
	Vibrating Sheet Pile Hammer (powered by CAT generator)	1	360	198.00	0.1780	0.0223	175	4.41	0.002	0.40	0.001
	Pickup Truck Ford F250 Diesel	2	360	198.00	0.2090	0.0261	325	10.35	0.005	0.94	0.001

Table C-28 (Continued)
All American Canal Lining Project, Imperial, CA
Emissions of VOC from Construction Phase for 2008

								VOC Emissions			
Job	**Equipment**	**Qty**	**Hours**	**2008 Work Hours**	**Emission Factor (lbs/day) (Reference 1)**	**Emission Factor (lbs/hr)**	**Size (hp)**	**Annual (lbs)**	**Annual (tons)**	**Peak Daily (lbs)**	**Quarterly (tons)**
Schedule B - Structures/ Flume/Pipeline/ Inlet/Outlet	Backhoe (7 cubic yard) Hitachi	1	1300	715.00	0.4770	0.0596	1025	42.63	0.021	1.07	0.005
	60-Ton Crane	1	1300	715.00	0.0117	0.0015	380	1.05	0.001	0.03	0.000
	Flatbed Truck	1	1300	715.00	0.2090	0.0261	375	18.68	0.009	0.47	0.002
	Pickup Truck Ford F250 Diesel	2	1300	715.00	0.2090	0.0261	325	37.36	0.019	0.94	0.005
	Loader	1	1300	715.00	0.1010	0.0126	225	9.03	0.005	0.23	0.001
	Concrete Pump	1	1300	715.00	0.1650	0.0206	60	14.75	0.007	0.37	0.002
	Forklift	1	1300	715.00	0.0840	0.0105	120	7.51	0.004	0.19	0.001
Schedule B - Contractor O/H and Maintenance	Mechanic Trucks	2	5900	3245.00	0.2090	0.0261	325	169.55	0.085	0.94	0.021
	Pickup Truck Ford F250 Diesel	7	5900	3245.00	0.2090	0.0261	325	593.43	0.297	3.29	0.074
	Flatbed Truck	1	1966	1081.30	0.2090	0.0261	325	28.25	0.014	0.47	0.004
	Forklift	1	1966	1081.30	0.0840	0.0105	120	11.35	0.006	0.19	0.001
	Support Vehicle	1	1966	1081.30	0.1470	0.0184	250	19.87	0.010	0.33	0.002
	Office Trailer (100 KW Generator)	1	5900	3245.00	0.1780	0.0223	150	72.20	0.036	0.40	0.009
Schedule B - Construction Management, Owner, Police, Emergency	Pickup Truck Ford F250 Diesel	3	5760	3168.00	0.2090	0.0261	325	248.29	0.124	1.41	0.031
	Emergency Response (Police car/Ambulance)	1	5760	3168.00	0.1470	0.0184	250	58.21	0.029	0.33	0.007
Total								**3238.65**	**1.62**	**56.41**	**0.40**

(1) Equipment emissions from Koizumi, 2005.

Table C-29
All American Canal Lining Project, Imperial, CA
VMT Emissions of VOC from Construction Phase for 2006
Vehicle Miles Traveled (VMT)

						VOC Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)									
Schedules A/B	Personal Vehicles	14096	62	873968	0.001497	1308.33	0.65	3.58	0.16
Schedule A	Aggregate Haul Trucks	2800	31	86800	0.001321	114.66	0.06	0.31	0.01
	Cement Haul Trucks	1250	101	126250	0.001321	166.78	0.08	0.46	0.02
	Concrete Haul Trucks	5250	12	63000	0.001321	83.22	0.04	0.23	0.01
Schedule B	Aggregate Haul Trucks	0	31	0	0.001321	0.00	0.00	0.00	0.00
	Cement Haul Trucks	0	101	0	0.001321	0.00	0.00	0.00	0.00
	Concrete Haul Trucks	0	12	0	0.001321	0.00	0.00	0.00	0.00
	Subtotal					**1672.99**	**0.84**	**4.58**	**0.21**

(1) Personal vehicle emissions from SCAQMD, 2003b; (2) Truck emissions from SCAQMD, 2003a.

Table C-30
All American Canal Lining Project, Imperial, CA
VMT Emissions of VOC from Construction Phase for 2007
Vehicle Miles Traveled (VMT)

						VOC Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)									
Schedules A/B	Personal Vehicles	21144	62	1310951	0.001383	1813.05	0.91	4.97	0.23
Schedule A	Aggregate Haul Trucks	2800	31	86800	0.001227	106.50	0.05	0.29	0.01
	Cement Haul Trucks	1250	101	126250	0.001227	154.91	0.08	0.42	0.02
	Concrete Haul Trucks	5250	12	63000	0.001227	77.30	0.04	0.21	0.01
Schedule B	Aggregate Haul Trucks	1440	31	44640	0.001227	54.77	0.03	0.15	0.01
	Cement Haul Trucks	810	101	81810	0.001227	100.38	0.05	0.28	0.01
	Concrete Haul Trucks	2925	12	35100	0.001227	43.07	0.02	0.12	0.01
	Subtotal					**2349.98**	**1.17**	**6.44**	**0.29**

(1) Personal vehicle emissions from SCAQMD, 2003b; (2) Truck emissions from SCAQMD, 2003a.

Table C-31
All American Canal Lining Project, Imperial, CA
VMT Emissions of VOC from Construction Phase for 2008
Vehicle Miles Traveled (VMT)

						VOC Emissions			
Job	**Equipment**	**Trips (no.)**	**Miles per Round Trip**	**Total VTM (miles)**	**Emission Factor (lbs/mile)**	**Annual (lbs/year)**	**Annual (tons/year)**	**Daily (lbs/day)**	**Quarterly (tons)**
ENGINE EMISSIONS (1, 2)									
Schedules A/B	Personal Vehicles	21144	62	1310951	0.001277	1674.08	0.84	4.59	0.21
Schedule A	Aggregate Haul Trucks	0	31	0	0.001133	0.00	0.00	0.00	0.00
	Cement Haul Trucks	0	101	0	0.001133	0.00	0.00	0.00	0.00
	Concrete Haul Trucks	0	12	0	0.001133	0.00	0.00	0.00	0.00
Schedule B	Aggregate Haul Trucks	1760	31	54560	0.001133	61.82	0.03	0.17	0.01
	Cement Haul Trucks	990	101	99990	0.001133	113.29	0.06	0.31	0.01
	Concrete Haul Trucks	3575	12	42900	0.001133	48.61	0.02	0.13	0.01
	Subtotal					**1897.80**	**0.95**	**5.20**	**0.24**

(1) Personal vehicle emissions from SCAQMD, 2003b; (2) Truck emissions from SCAQMD, 2003a.

APPENDIX D
ARB OFF-ROAD EMISSIONS FACTORS FOR CONSTRUCTION EQUIPMENT (FROM APPENDIX G OF KOIZUMI, 2005)

Table G-1
ARB Off-Road Emission Factors

Year - 2005		Pollutant				
		CO	NOx	PM10	SOx	VOC
Equipment Name	Hp	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)
Bore/Drill Rigs	15	0.035	0.07	0	0	0
	25	0.067	0.123	0	0	0
	50	0.228	0.28	0.027	0.073	0.058
	120	0.471	0.822	0.072	0.166	0.101
	175	0.693	1.295	0.062	0.291	0.109
	250	0.316	1.632	0.038	0.388	0.063
	500	0.516	2.294	0.06	0.563	0.085
	750	1.035	4.806	0.111	1.146	0.123
	9999	1.549	9.819	0.214	1.719	0.516
	Composite	0.492	1.512	0.063	0.327	0.102
Cement and Mortar Mixers	15	0.032	0.058	0.005	0	0.012
	25	0.116	0.18	0.013	0	0
	Composite	0.039	0.068	0.005	0	0.011
Concrete/Industrial Saws	25	0	0.143	0	0	0
	50	0.354	0.337	0.044	0.08	0.177
	120	0.529	1.099	0.101	0.161	0.151
	175	1.029	2.353	0	0.294	0
	Composite	0.458	0.825	0.075	0.129	0.151
Cranes	50	0.313	0.252	0.034	0.055	0.136
	120	0.362	0.698	0.076	0.109	0.105
	175	0.456	1.024	0.065	0.167	0.108
	250	0.26	1.31	0.042	0.233	0.085
	500	0.405	1.88	0.062	0.326	0.117
	750	0.664	3.259	0.103	0.56	0.172
	Composite	0.368	1.157	0.059	0.196	0.102
Crawler Tractors	50	0.354	0.284	0.047	0.055	0.158
	120	0.501	1.043	0.103	0.142	0.153
	175	0.735	1.752	0.106	0.251	0.184
	250	0.599	2.256	0.095	0.345	0.179
	500	1.502	3.218	0.131	0.469	0.243
	750	2.47	5.819	0.229	0.86	0.433
	9999	4.253	9.458	0.334	1.219	0.743
	Composite	0.675	1.617	0.106	0.232	0.174
Crushing/Proc. Equipment	50	0.636	0.512	0.071	0.104	0.244
	120	0.634	1.322	0.131	0.18	0.194
	175	1.018	2.426	0.147	0.346	0.254
	250	0.888	3.335	0.138	0.513	0.296
	500	2.19	4.649	0.19	0.675	0.348
	750	3.148	7.222	0.185	0.926	0
	9999	8.704	18.889	0.556	2.407	1.852
	Composite	0.909	1.857	0.131	0.268	0.236

Table G-1 (Cont.)
ARB Off-Road Emission Factors

Year - 2005		Pollutant				
		CO	NOx	PM10	SOx	VOC
Equipment Name	Hp	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)
Dumpers/Tenders	25	0.045	0.078	0	0	0
	Composite	0.045	0.078	0	0	0
Excavators	25	0.049	0.113	0.007	0	0.07
	50	0.266	0.254	0.031	0.06	0.094
	120	0.497	0.917	0.096	0.159	0.135
	175	0.596	1.291	0.076	0.233	0.128
	250	0.312	1.681	0.047	0.329	0.096
	500	0.446	2.168	0.063	0.423	0.117
	750	0.722	3.783	0.095	0.722	0.19
	Composite	0.481	1.302	0.07	0.243	0.12
Forklifts	50	0.271	0.182	0.029	0	0.109
	120	0.257	0.521	0.06	0	0.084
	175	0.362	0.863	0.059	0.001	0.1
	250	0.271	1.103	0.048	0.001	0.091
	500	0.51	1.415	0.062	0.001	0.113
	Composite	0.268	0.508	0.054	0	0.09
Generator Sets	15	0.037	0.067	0.008	0	0.017
	25	0.057	0.101	0.013	0	0.036
	50	0.313	0.33	0.037	0	0.116
	120	0.529	1.108	0.094	0.001	0.152
	175	0.766	1.842	0.096	0.002	0.178
	250	0.666	2.588	0.09	0.002	0.185
	500	1.333	3.853	0.134	0.003	0.265
	750	2.157	6.356	0.218	0.005	0.441
	9999	5.189	14.059	0.487	0.01	1.109
	Composite	0.338	0.699	0.051	0.001	0.101
Graders	50	0.339	0.301	0.025	0.075	0.126
	120	0.521	1.029	0.103	0.162	0.148
	175	0.676	1.562	0.092	0.257	0.159
	250	0.414	1.988	0.064	0.357	0.13
	500	0.565	2.426	0.078	0.414	0.157
	750	0.976	5.366	0	0.732	0
	Composite	0.567	1.623	0.084	0.276	0.148
Off-Highway Tractors	120	0.6	1.4	0	0	0
	175	0.779	1.858	0.111	0.27	0.194
	250	0.461	1.745	0.072	0.27	0.137
	750	2.896	7.029	0.274	1.052	0.514
	9999	5.054	11.583	0.414	1.529	0.899
	Composite	0.744	2.076	0.101	0.31	0.184

Table G-1 (Cont.)
ARB Off-Road Emission Factors

Year - 2005		Pollutant				
		CO	NOx	PM10	SOx	VOC
Equipment Name	Hp	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)
Off-Highway Trucks	175	0.743	1.712	0.113	0.258	0.183
	250	0.443	2.087	0.074	0.345	0.147
	500	0.742	3.062	0.111	0.493	0.209
	750	1.172	5.069	0.179	0.819	0.341
	9999	2.58	8.709	0.265	1.157	0.659
	Composite	0.765	3.119	0.112	0.493	0.22
Other Construction Equipment	15	0.039	0.062	0.006	0.001	0.026
	25	0.047	0.105	0.01	0	0.052
	50	0.338	0.307	0.041	0.068	0.136
	120	0.578	1.206	0.111	0.175	0.165
	175	0.605	1.45	0.081	0.221	0.15
	500	1.203	3.011	0.112	0.459	0.212
	Composite	0.625	1.481	0.07	0.223	0.136
Pavers	25	0.092	0.214	0	0	0
	50	0.287	0.286	0.034	0.066	0.102
	120	0.458	0.865	0.086	0.15	0.123
	175	0.667	1.472	0.083	0.266	0.143
	250	0.389	2.057	0.058	0.401	0.115
	500	0.457	2.208	0.065	0.424	0.112
	Composite	0.449	0.894	0.067	0.165	0.12
Paving Equipment	25	0.049	0.098	0.01	0	0.041
	50	0.291	0.265	0.034	0.054	0.112
	120	0.39	0.815	0.075	0.118	0.114
	175	0.577	1.379	0.077	0.21	0.138
	250	0.407	1.566	0.061	0.254	0.117
	Composite	0.419	0.961	0.069	0.144	0.117
Plate Compactors	15	0.018	0.029	0.002	0	0.009
	Composite	0.018	0.029	0.002	0	0.009
Rollers	15	0.025	0.039	0.004	0.001	0.016
	25	0.051	0.103	0.009	0.001	0.038
	50	0.259	0.264	0.031	0.062	0.09
	120	0.387	0.732	0.071	0.127	0.104
	175	0.558	1.231	0.069	0.224	0.119
	250	0.306	1.606	0.044	0.317	0.089
	500	0.428	2.061	0.061	0.397	0.113
	Composite	0.371	0.774	0.059	0.139	0.097
Rough Terrain Forklifts	50	0.393	0.356	0.046	0.081	0.143
	120	0.43	0.81	0.085	0.135	0.119
	175	0.675	1.487	0.089	0.259	0.151
	250	0.366	1.869	0.054	0.354	0.125
	500	0.521	2.496	0.077	0.463	0.129
	Composite	0.456	0.89	0.084	0.15	0.123

Table G-1 (Cont.)
ARB Off-Road Emission Factors

Year - 2005		Pollutant				
		CO	NOx	PM10	SOx	VOC
Equipment Name	Hp	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)
Rubber Tired Dozers	175	0.66	1.396	0.075	0.264	0.189
	250	0.656	2.475	0.103	0.38	0.193
	500	1.503	3.271	0.132	0.479	0.246
	750	2.079	4.957	0.191	0.738	0.342
	9999	3.645	8.571	0.296	1.084	0.985
	Composite	1.209	3.037	0.123	0.453	0.232
Rubber Tired Loaders	25	0.06	0.134	0	0	0
	50	0.377	0.33	0.044	0.074	0.137
	120	0.412	0.775	0.083	0.127	0.116
	175	0.584	1.284	0.079	0.221	0.132
	250	0.319	1.658	0.05	0.309	0.101
	500	0.488	2.332	0.073	0.429	0.137
	750	0.989	4.965	0.15	0.904	0.3
	9999	1.862	7.542	0.191	1.098	0.477
	Composite	0.438	1.253	0.073	0.221	0.119
Scrapers	120	0.69	1.404	0.147	0.202	0.21
	175	0.857	2.053	0.126	0.307	0.219
	250	0.638	2.692	0.102	0.435	0.201
	500	1.166	3.768	0.142	0.582	0.27
	750	1.912	6.595	0.248	1.03	0.477
	Composite	1.001	3.203	0.133	0.496	0.249
Signal Boards	15	0.024	0.037	0.004	0.001	0.013
	50	0.415	0.39	0.049	0.073	0.244
	120	0.566	1.179	0.107	0.172	0.159
	175	0.865	2.076	0.114	0.319	0.21
	250	0.688	2.665	0.098	0.448	0.218
	Composite	0.086	0.183	0.013	0.024	0.03
Skid Steer Loaders	25	0.047	0.101	0.01	0.002	0.04
	50	0.216	0.241	0.026	0.061	0.071
	120	0.271	0.487	0.047	0.092	0.067
	Composite	0.222	0.31	0.032	0.067	0.068
Surfacing Equipment	50	0.159	0.143	0.016	0.032	0
	120	0.53	0.985	0.076	0.152	0
	175	0.505	1.212	0	0.202	0
	250	0.452	1.709	0.05	0.302	0
	500	1.014	2.602	0.101	0.403	0.189
	750	1.456	4.175	0.146	0.631	0
	Composite	0.778	1.988	0.077	0.312	0.105

Table G-1 (Cont.)
ARB Off-Road Emission Factors

Year - 2005		Pollutant				
		CO	NOx	PM10	SOx	VOC
Equipment Name	Hp	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)
Tractors/Loaders/Backhoes	25	0.079	0.138	0.013	0	0.05
	50	0.476	0.36	0.052	0.072	0.185
	120	0.408	0.849	0.087	0.112	0.127
	175	0.638	1.517	0.096	0.21	0.163
	250	0.648	2.441	0.1	0.349	0.249
	Composite	0.424	0.858	0.086	0.115	0.132
Trenchers	15	0.036	0.051	0.004	0	0.04
	25	0.11	0.242	0.026	0	0.076
	50	0.296	0.322	0.036	0.078	0.101
	120	0.416	0.771	0.074	0.14	0.109
	175	0.726	1.577	0.085	0.298	0.152
	250	0.406	2.243	0.055	0.461	0.156
	500	0.565	2.783	0.073	0.565	0.122
	750	0.845	5.915	0	0.845	0
	Composite	0.381	0.652	0.059	0.127	0.108
Welders	15	0.043	0.079	0.007	0	0.016
	25	0.073	0.112	0.011	0	0.035
	50	0.321	0.291	0.037	0	0.123
	120	0.285	0.596	0.055	0	0.086
	175	0.571	1.349	0.063	0.001	0.143
	Composite	0.236	0.333	0.035	0	0.084
Emission factors for 2006 through 2020 may be downloaded from the SCAQMD web page at http://www.aqmd.gov/ceqa/handbook/offroadEF05_20.xls.						

APPENDIX E
EMISSIONS FACTORS FOR ON-ROAD VEHICLES
(SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT, 2003A AND 2003B)

Highest (Most Conservative) EMFAC 2002 (version 2.2, April 23, 2003) Emission Factors for On-Road Heavy Heavy Duty Diesel Trucks

Projects in the SCAQMD (Scenario Years 2005 - 2025)

Derived from Wintertime Emissions Inventory

Heavy Heavy Duty Diesel Trucks (33,001 to 60,000 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2002 (version 2.2) Burden Model and extracting the Heavy Heavy Duty Diesel Truck (HHDT) Emission Factors. When calculating on-road mobile source emissions from HHDT, use the following equation:

Emissions (pounds per day) = N x TL x EF

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

The emission factors account for all emissions from start, running and idling exhaust. In addition, the ROG emission factors take into account diurnal, hot soak, running and resting emissions, and PM10 emission factor takes into account the tire and brake wear.

Scenario Year: 2005 -- Model Years: 1965 to 2005

HHDT-DSL (pounds/mile)	
ROG	0.001403
CO	0.006308
NOx	0.041541
PM10	0.000774
SOx	0.000404

Scenario Year: 2006 -- Model Years: 1965 to 2006

HHDT-DSL (pounds/mile)	
ROG	0.001321
CO	0.005932
NOx	0.03893
PM10	0.00073
SOx	0.000405

Scenario Year: 2007 -- Model Years: 1965 to 2007

HHDT-DSL (pounds/mile)	
ROG	0.001227
CO	0.00552
NOx	0.035635
PM10	0.000644
SOx	4.57E-05

Scenario Year: 2008 -- Model Years: 1965 to 2008

HHDT-DSL (pounds/mile)	
ROG	0.001133
CO	0.005117
NOx	0.032442
PM10	0.000598
SOx	4.6E-05

Scenario Year: 2009 -- Model Years: 1965 to 2009

HHDT-DSL (pounds/mile)	
ROG	0.001042
CO	0.004738
NOx	0.029455
PM10	0.000559
SOx	4.61E-05

Scenario Year: 2010 -- Model Years: 1965 to 2010

HHDT-DSL (pounds/mile)	
ROG	0.000948
CO	0.004335
NOx	0.025802
PM10	0.000507
SOx	4.61E-05

Scenario Year: 2011 -- Model Years: 1966 to 2011

HHDT-DSL (pounds/mile)	
ROG	0.000888
CO	0.004069
NOx	0.022117
PM10	0.000475
SOx	4.61E-05

Scenario Year: 2012 -- Model Years: 1967 to 2012

HHDT-DSL (pounds/mile)	
ROG	0.000813
CO	0.003783
NOx	0.01938
PM10	0.000438
SOx	4.63E-05

Scenario Year: 2013 -- Model Years: 1968 to 2013

HHDT-DSL (pounds/mile)	
ROG	0.000749
CO	0.003551
NOx	0.017054
PM10	0.000408
SOx	4.66E-05

Scenario Year: 2014 -- Model Years: 1969 to 2014

HHDT-DSL (pounds/mile)	
ROG	0.000696
CO	0.003364
NOx	0.0151
PM10	0.000383
SOx	4.71E-05

Highest (Most Conservative) EMFAC 2002 (version 2.2)
Emission Factors for On-Road Vehicles

Projects in the SCAQMD (Scenario Years 2003 - 2025)

Derived from Wintertime Emissions Inventory (except Annual Average CO for passenger vehicles)

Passenger Vehicles (<8500 pounds), Delivery Trucks (>8500 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2002 (version 2.2) Burden Model, taking the weighted average of vehicle types and simplifying into two categories which can be used to calculate on-road mobile source emissions. Use the following equation:

Emissions (pounds per day) = N x TL x EF

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

This methodology replaces the old EMFAC emission factors in Tables A-9-5-J-1 through A-9-5-L in Appendix A9 of the current SCAQMD CEQA Handbook. All the emission factors account for the emissions from start, running and idling exhaust. In addition, the ROG emission factors take into account diurnal, hot soak, running and resting emissions, and PM10 emission factor takes into account the tire and brake wear.

Scenario Year: 2003 -- Model Years: 1965 to 2003

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.01815	CO	0.025508
NOx	0.002014	NOx	0.031208
ROG	0.001935	ROG	0.003362
SOx	0.00001	SOx	0.000241
PM10	0.000078	PM10	0.000540

Scenario Year: 2004 -- Model Years: 1965 to 2004

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.016559	CO	0.02309
NOx	0.0018	NOx	0.029607
ROG	0.001771	ROG	0.003148
SOx	0.00001	SOx	0.000243
PM10	0.000079	PM10	0.000519

Scenario Year: 2005 -- Model Years: 1965 to 2005

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.015165	CO	0.020984
NOx	0.001634	NOx	0.028142
ROG	0.001626	ROG	0.002955
SOx	0.00001	SOx	0.000246
PM10	0.000079	PM10	0.000500

Scenario Year: 2006 -- Model Years: 1965 to 2006

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.013925	CO	0.019135
NOx	0.001489	NOx	0.026756
ROG	0.001497	ROG	0.002779
SOx	0.000009	SOx	0.000248
PM10	0.000080	PM10	0.000483

EMFAC 2002 Emission Factors for On-Road Mobile Sources (continued)

Scenario Year: 2007 -- Model Years: 1965 to 2007

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.01282	CO	0.017455
NOx	0.001361	NOx	0.024978
ROG	0.001383	ROG	0.002608
SOx	0.000009	SOx	0.000033
PM10	0.000080	PM10	0.000440

Scenario Year: 2008 -- Model Years: 1965 to 2008

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.011798	CO	0.015942
NOx	0.001245	NOx	0.023199
ROG	0.001277	ROG	0.00245
SOx	0.000009	SOx	0.000033
PM10	0.000080	PM10	0.000419

Scenario Year: 2009 -- Model Years: 1965 to 2009

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.010849	CO	0.01454
NOx	0.001138	NOx	0.021501
ROG	0.001179	ROG	0.002295
SOx	0.000009	SOx	0.000033
PM10	0.000081	PM10	0.000400

Scenario Year: 2010 -- Model Years: 1965 to 2010

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.009954	CO	0.013168
NOx	0.001038	NOx	0.019339
ROG	0.001087	ROG	0.002141
SOx	0.000009	SOx	0.000033
PM10	0.000081	PM10	0.000374

Scenario Year: 2011 -- Model Years: 1966 to 2011

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.009268	CO	0.012065
NOx	0.000952	NOx	0.01704
ROG	0.001015	ROG	0.002031
SOx	0.000009	SOx	0.000033
PM10	0.000083	PM10	0.000357

APPENDIX F
GENERAL CONFORMITY RULE
RECORD OF NON-APPLICABILITY (RONA) FOR THE ALL AMERICAN CANAL LINING PROJECT

GENERAL CONFORMITY RULE – RECORD OF NON-APPLICABILITY

Project/Action Name: Construction of the All American Canal Lining Project

Project/ Action
Identification Number:

Project/Action
Point of Contact:

Begin Date: February 2006 End Date: December 2008

General Conformity under the Clean Air Act, Section 176 has been evaluated for the project described above according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to this project/action because:

___ The project/action is an exempt action under 40 CFR 93.153(c) or (d), (SPECIFY APPLICABLE EXEMPTION CATEGORY AND REGULATORY CITATION)

OR

_X_ Total direct and indirect annual emissions of criteria pollutants from this project/action have been estimated at the volumes shown below. These volumes are less than the applicable conformity threshold value established at 40 *Code of Federal Regulations* 93.153(b)(1) and (2), shown below, AND the project/action is not considered regionally significant under 40 *Code of Federal Regulations* 93.153(i) thresholds, shown below.

Criteria Pollutant	Highest Annual Estimated Emissions from Project (tons per year)	40 CFR 93.153(b) (1) and (2) Conformity Threshold (tons per year)	Regionally Significant Threshold (tons per year)
Ozone precursor: volatile organic compounds	5.0	100	1,704.6
Ozone precursor: nitrogen oxides	58.8	100	2,076.8
Carbon monoxide	21.8	100	7,135.8
Nitrogen dioxide	58.8	100	2,076.8
Sulfur dioxide	6.0	100	62.0
PM_{10} (controlled)	13.6	70	9,519.2

Supporting documentation and emissions estimates are attached.

Signed: _____