APPENDIX I

Annotated Air Quality Analysis

Environmental Impact Statement &
Environmental Impact Report
for the proposed

Mesquite Regional Landfill

Imperial County, California

SCH. No. 92051024
BLM No. CA-060-02-5440-10-B026

Prepared by the
Bureau of Land Management
California Desert District

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

and the
County of Imperial
Planning & Building Department

IMPERIAL COUNTY CALIFORNIA 1907

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TECHNICAL APPENDIX I

ANNOTATED AIR QUALITY SECTION

ENVIRONMENTAL IMPACT STATEMENT ENVIRONMENTAL IMPACT REPORT

for the proposed

MESQUITE REGIONAL LANDFILL

IMPERIAL COUNTY, CALIFORNIA

SCH. No. 92051024
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prepared for

BUREAU OF LAND MANAGEMENT
California Desert District
1661 S. 4th Street
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939 Main Street
El Centro, California

May 1995

FOREWORD

A number of changes have been made to the air quality emissions data presented in the Final EIS/EIR for the proposed Mesquite Regional Landfill Project. These changes are predominantly due to the following assumption corrections:

- The American Association of Railroads' proposal for 55 percent NO_X emissions reductions over the next ten years;
- Improved train emissions modeling along the rail haul route;
- Corrections to errors found in modeling; input data and assumptions for site emissions;
- Updated monitoring data; and,
- Corrections of computational errors.

The purpose of this document, Appendix I to the Mesquite Regional Landfill EIS/EIR, is to provide the public with an explanation of each of these changes. This document presents Air Quality Sections 3.1.8 and 4.1.8 in their entirety, with annotations that indicate changes. The annotations correspond to endnotes, which can be found at the back of this Appendix, and are indicated by a "<--" in the margin. Pages with changes to the air quality emissions data for sections 4.4.8, 4.6.8, and 4.7.3.5 are also included in this Appendix. These changes are also annotated. The endnotes that follow these sections correspond to the annotations, and provide the explanation of why each specific change occurred.

APPENDIX I

ANNOTATED AIR QUALITY SECTION

TABLE OF CONTENTS

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LIST OF TABLES

LIST OF TABLES
(Continued)

LIST OF FIGURES

3.1.8 AIR QUALITY

3.1.8.1 General

Scope

The Air Quality Technical Report in Appendix F (Environmental Solutions, Inc., 1994) provides a detailed description of the existing air quality environment and an analysis of related impacts associated with the proposed Mesquite Regional Landfill. This section is a comprehensive summary of the existing environment portion of that appendix.

The primary air quality issues directly associated with the Proposed Action are those related to on-site activities. These would include:

- Unloading MSW residue containers from trains at the site intermodal facility.
- Truck-hauling sealed containers from the intermodal facility to the active face of the landfill.
- Emptying containers by a tipper at the active face.
- Placing and compacting the MSW residue.
- Placing cover materials.
- Controlling and destroying or reusing (e.g., through energy recovery) LFG.
- Expanding the disposal area and closing completed portions through ongoing construction activities.

Each of these activities are evaluated in this EIS/EIR.

Off-site air quality considerations related to the Proposed Action are associated with trains that would be used to deliver MSW residue to the regional landfill. The rail haul route would be along the SP Main Line as shown in Figure 3-24. An intermodal facility in downtown Los Angeles is assumed to be the starting point for all or the majority of rail traffic on this existing main line to the proposed Mesquite Regional Landfill spur. The air quality aspects of this rail transportation and associated increases in at-grade railroad crossing vehicular delays are also analyzed.

Employee commutes, potential Imperial County MSW residue delivery truck trips, and other delivery and pickup truck trips would also contribute off-site emissions. These emissions are also considered in this analysis.

Local curbside-packer-truck traffic to new transfer stations and MRFs in Los Angeles County or other Southern California counties would not result in emissions that are related to the Proposed Action. These MSW collection activities would occur regardless of the Proposed Action and are not analyzed in this EIS/EIR.

Transfer trucks hauling containers of compacted MSW residue from transfer stations and MRFs to the LATC intermodal facility could potentially be considered a project-related activity. However, the mileage associated with this haul would be less than that associated with the transport of MSW residue by transfer trucks to future landfills located in more remote Los Angeles County areas and similar to that required to haul containers for shipment to any other regional landfill that could be implemented under the No Action Alternative. Therefore, the air emissions for transfer to the LATC would not be increased compared to the No Action Alternative and this is considered in evaluating the No Action Alternative.

At the LATC intermodal facility, the containers of MSW residue would be unloaded from the trucks by cranes and loaded on the train. An average train would have 16 articulated rail cars. Each articulated car would consist of five sections. Each section would carry two MSW residue containers. Thus, each train would carry 160 MSW residue containers. Each container would hold 25 tons of MSW residue. The 16 rail cars would be kept together during the haul to

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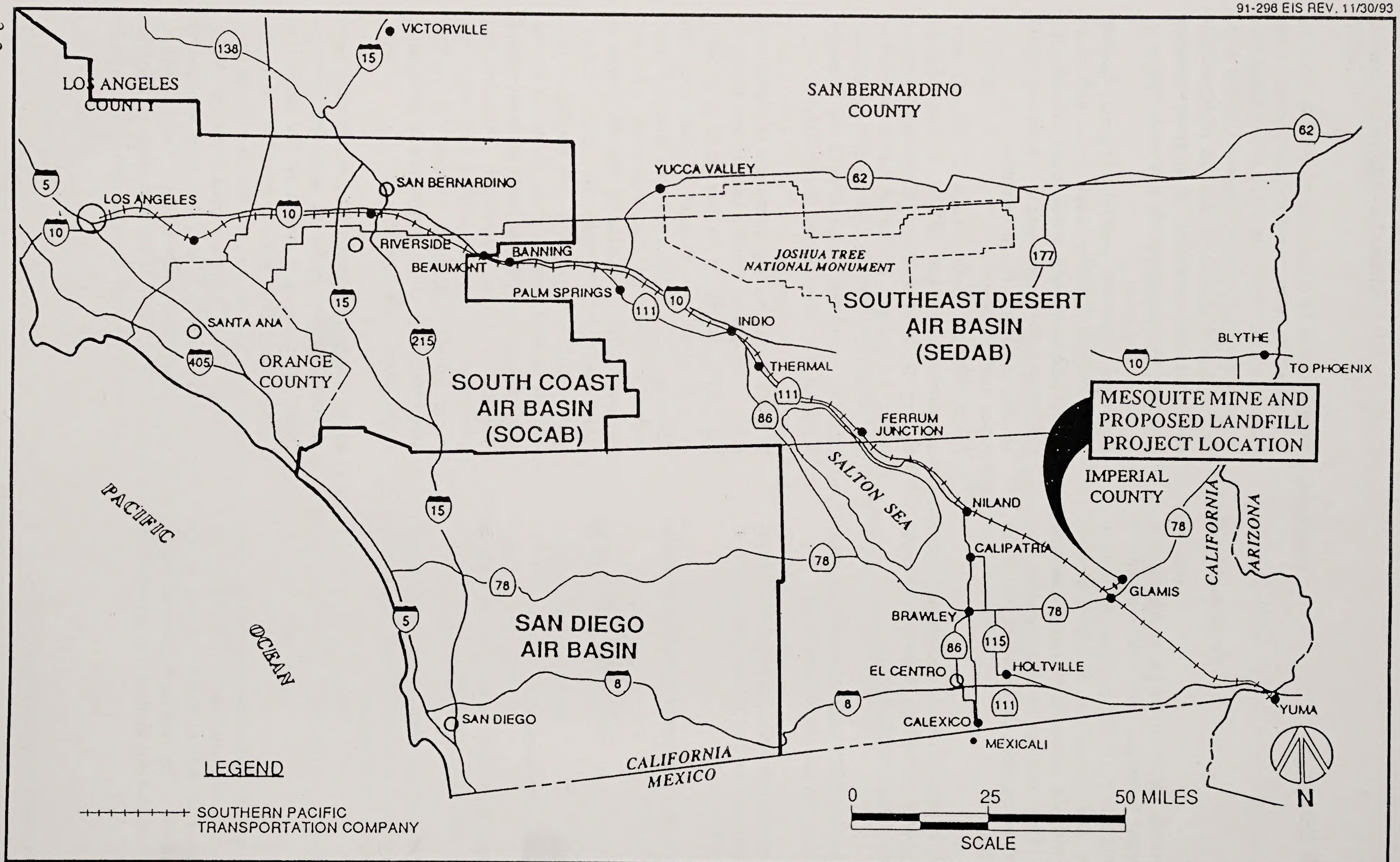

SOURCE: Environmental Solutions, Inc. 1992

Proposed Mesquite Regional Landfill

Regional Location Map

FIGURE **3-24**

and from the landfill. At the LATC, the train would be delivered to the unloading/loading area by SP's line-haul locomotives. Switching engines would not normally be used for these MSW residue trains.

For analysis of on-site and off-site air quality, the affected environment is described in terms of: (1) the project site; and (2) the following geographic areas (Figure 3-24):

- South Coast Air Basin (SOCAB), including:
  - The Los Angeles Basin from the ocean to the Banning and Cajon passes, including most of Los Angeles County, Orange County, the southwestern corner of San Bernardino County and the western third of Riverside County.
- The Salton Trough part of the Southeast Desert Air Basin (SEDAB), including:
  - The Coachella Valley, extending from Banning Pass to the Salton Sea, primarily in Riverside County.
  - Imperial Valley and the rest of Imperial County, extending southeast from the Salton Sea to the border with Arizona and Federal Republic of Mexico.

Although the Salton Trough is a single, long, linear geologic feature or "valley" that channels air flow, it is divided into the Coachella Valley and Imperial County because of political and air quality control jurisdictions discussed in the following section.

An important introductory scoping consideration is related to ozone (O_3), which is the key pollutant in smog. O_3 itself is not emitted directly from cars, factories, and other sources, but instead is formed in the presence of sunlight from two "precursor" pollutants that are emitted from these sources: oxides of nitrogen (NO_x) and reactive organic gases (ROG). Exceedances of state and federal ambient air quality standards for O_3 in the SOCAB are considered to be the worst in the country. Exceedances of these O_3 standards occur less frequently in the Coachella Valley, and only a few times a year in Imperial County, where only the state O_3 standards are exceeded. The causes of O_3 exceedances in Imperial County are not clear, but appear to be pollutant transport from Mexicali (Mexico), SOCAB, and possibly San Diego County (CARB, 1989a). Local emissions also contribute to O_3 exceedances in Imperial County (Sonoma Technology, Inc., 1992). The importance of transport requires that both the SOCAB and the Salton Trough be evaluated with respect to O_3.

Transport is also important to particulate exceedances in Imperial County. A study by the Desert Research Institute, underway since 1992, is attempting to determine what sources account for the particulates measured at Calexico, El Centro, and Brawley. Results are not yet available. Finally, in addition to air pollutant emissions, odor is considered in this analysis as an air quality issue.

<u>Regulatory Status</u>

<u>General</u>

Primary air quality regulatory jurisdiction for the proposed Mesquite Regional Landfill resides locally through the Imperial County Air Pollution Control District (ICAPCD). The ICAPCD rules, which would be used for project air quality control permitting, have been developed as a result of federal and state laws and regulations. The following paragraphs summarize general federal and state requirements, site-specific ICAPCD permitting requirements, and the indirect interest of the South Coast Air Quality Management District (SCAQMD), which has local jurisdiction in SOCAB and the Riverside County portion of SEDAB.

Portions of the following federal air quality regulations, administered by Region 9 of the U.S. EPA, apply to the proposed project:

- The Clean Air Act of 1970 (CAA) established National Ambient Air Quality Standards (NAAQS) that set maximum allowable ambient concentrations, given in Table 3-13, for the following "criteria" air pollutants: O_3, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter with aerodynamic diameter less than or equal to 10 micrometers (PM_{10}), and lead (Pb). Areas violating the primary, or health-related, standard of a criteria pollutant are termed "nonattainment areas" for that pollutant. The Clean Air Act Amendments of 1990 (CAAA) defined five classes of increasing nonattainment: marginal, moderate, serious, severe, and extreme. (Note that SOCAB is the only area in the United States that is classified as "extreme," with respect to a particular air pollutant; in this case O_3.) Emissions of criteria air pollutants or any important precursors (e.g., NO_x or ROG) in nonattainment areas generally cannot be permitted without elimination of an equal or greater amount of the same pollutant or its precursors through "offsets." Areas that do not attain the NAAQS are required by the CAA to prepare Air Quality Attainment Plans (AQAPs) to control existing and proposed sources of air pollutant emissions, such that the NAAQS may be attained by a certain target date. Regulations must be developed by state and local air pollution control agencies to review new and modified stationary sources for their emissions. These regulations must require appropriate offsets. SCAQMD published a Final Air Quality Management Plan (AQMP) in July 1991, which includes 134 measures to reduce criteria pollutant concentrations below federal and state standards, including waste-by-rail disposal of MSW at remote sites outside of the Los Angeles Basin.

- New and modified stationary sources must be reviewed to bring federal nonattainment areas into attainment. This review requires that new emissions proposed for a criteria pollutant or its precursors from a stationary source in a nonattainment area cannot be permitted without elimination of an equal or greater amount of the same pollutant or its precursors through offsets. The offset required usually increases with the distance between the proposed and eliminated source. The offset amount is never less than 1.0 to assure that no net increase occurs.

- Title II of the CAAA contains provisions relating to mobile sources. Heavy-duty trucks are subject to NO_x engine emission limitations, beginning with the 1988 model year. Light-duty trucks will be subject to stricter emissions limitations on NO_x, nonmethane hydrocarbons, and CO, beginning with the 1994 model year. Diesel fuel for highway vehicles is required to have a sulfur content less than 0.05 percent. Title II does not contain provisions relating to locomotives. It is assumed that low-sulfur diesel fuel will also be used for trains after 1993.

- The Prevention of Significant Deterioration (PSD) program is aimed at maintaining air quality better than the NAAQS by controlling emissions from stationary sources in areas that presently do not have exceedances ("attainment" areas). A PSD review for the Proposed Action by the U.S. EPA is not required if emissions of each attainment pollutant from stationary sources would be less than the threshold rate of 250 tons per year (U.S. EPA, 1994).

- Currently proposed federal New Source Performance Standards for MSW landfills, if promulgated, will specify that

TABLE 3-13

Ambient Air Quality Standards
Proposed Mesquite Regional Landfill

Pollutant	Averaging Time	California Standards (CAAQS)(1)		National Standards (NAAQS)(2)		
		Concentration (3)	Method(4)	Primary(3,5)	Secondary (3,4,6)	Method(7)
O_3	1 Hour	90 ppbv (180 µg/m³)	Ultraviolet Photometry	120 ppbv (235 µg/m³)	Same as Primary Standards	Ethylene Chemiluminescence
CO	8 Hour	9 ppmv (10 mg/m³)	Nondispersive Infrared Spectroscopy (NDIR)	9 ppmv (10 mg/m³)	–	NDIR
	1 Hour	20 ppmv (23 mg/m³)		35 ppmv (40 mg/m³)		
NO_2	Annual Average	–	Gas Phase Chemiluminescence	53 ppbv (100 µg/m³)	Same as Primary Standards	Gas Phase Chemiluminescence
	1 Hour	250 ppbv (470 µg/m³)		–		
SO_2	Annual Average	–	Ultraviolet Fluorescence	30 ppbv (80 µg/m³)	–	Pararosoaniline
	24 Hour	40(b) ppbv (105(b) µg/m³)(8)		140 ppbv (365 µg/m³)	–	
	3 Hour	–		–	500 ppbv (1,300 µg/m³)	
	1 Hour	250 ppbv (655 µg/m³)		–	–	
PM_{10}	Annual Geometric Mean	30 µg/m³	Size Selective Inlet High Volume Sampler and Gravimetric Analysis	–	–	Inertial Separation and Gravimetric Analysis
	24 Hour	50 µg/m³		150 µg/m³	Same as Primary Standards	
	Annual Arithmetic Mean	–		50 µg/m³		
SO_4	24 Hour	25 µg/m³	Turbidimetric Barium Sulfate	–	–	–
Pb	30 Day Average	1.5 µg/m³	Atomic Absorption	–	–	Atomic Absorption
	Calendar Quarter	–		1.5 µg/m³	Same as Primary Standards	
H_2S	1 Hour	30 ppbv (42 µg/m³)	Cadmium Hydroxide	–	–	–
Vinyl Chloride (chloroethene)	24 Hour	10 ppbv (26 µg/m³)	Tedlar Bag Collection, Gas Chromatography	–	–	–
Visibility Reducing Particles(9)	8 hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent. Measurement in accordance with CARB Method V.		–	–	–

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Notes:

(1) California ambient air quality standards for O_3, CO, SO_2 (1 hour), NO_2, PM_{10}, and visibility reducing particles are values that are not to be equaled or exceeded.

(2) National ambient air quality standards, other than O_3 and those based on annual averages or arithmetic means, are not to be exceeded more than once a year. The O_3 standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

(3) Equivalent units given in parentheses are based upon a reference temperature of 25° C and a reference pressure of 760 mm mercury. Measurements of air quality are corrected to a reference temperature of 25° C and a reference pressure of 760 mm mercury (1,013.2 millibar); ppmv and ppbv in this table refer to ppm and ppb by volume, respectively, or micromoles of pollutant per mole of gas.

(4) Equivalent procedure, which can be shown to satisfy CARB by providing equivalent results at or near the level of the air quality standard, may be used.

(5) National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by EPA.

(6) National Secondary Standards: The levels of air quality necessary to protect public welfare from any known or anticipated adverse effect of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the state implementation plan is approved by EPA.

(7) Reference method as described by EPA. An "equivalent method" of measurement may be used, but must have a "consistent relationship to the reference method" and must be approved by EPA.

(8) At locations where state standards for oxidant and/or PM_{10} are violated. National standards apply elsewhere.

(9) This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range when relative humidity is less than 70 percent.

landfill gas control systems must use Best Demonstrated Technology (BDT), destroy 98 percent of nonmethane organic compounds, and abide by certain monitoring requirements.

The California Clean Air Act (CCAA) of 1988 established state ambient air quality standards (CAAQS) as summarized in Table 3-13. The state standards are stricter than the NAAQS, and also cover sulfate, hydrogen sulfide (H_2S), vinyl chloride, and visibility. California Air Resources Board (CARB) is responsible for enforcing state air pollution regulations, but delegates the actual rule-making, permitting and enforcement --> activities for stationary sources to 34[c] local districts including ICAPCD and SCAQMD. The CCAA recognized that transported emissions and atmospheric chemical reactions affect, and may even dominate, the air quality in downwind air basins. CARB (1989a) identified SOCAB and the San Joaquin Valley Unified Air Basin as areas of origin for the transport of O_3 and its precursors into Coachella Valley and Imperial County, and listed San Diego County and Mexicali as potential source areas for transport impacts. Additional responsibilities of CARB that have applicability to the analysis performed for the Proposed Action include:

- Requiring local districts to develop plans to attain CAAQS .
- Establishing state emission standards for on-highway, gasoline-powered mobile sources, and the sulfur content of diesel fuel.
- Requiring retrofit technology on locomotives over the period 1992-1997, according to Measure ARB-16 in the SCAQMD AQMP.

Imperial County Air Pollution Control District

Imperial County does not have exceedances of federal O_3 standards (120 parts per billion by volume [ppbv]), but is classified as nonattainment for the stricter CAAQS O_3 standard (90 ppbv) because of a few, slight exceedances each year. The county is also nonattainment for PM_{10}, according to both federal and state standards. PM_{10}, is emitted directly by sources and is created indirectly in the atmosphere from chemical reactions that convert gaseous precursors into small particles. Sources of PM_{10} are both natural and related to man. PM_{10} sources related to man include point (smoke stack), area (empty agricultural land), and fugitive (dust from the wheels of a truck) types. PM_{10} precursors include NO_x, ROG, and SO_x emissions. Hence, certain criteria pollutants must be evaluated as both attainment and nonattainment pollutants as shown in Table 3-14.

The ICAPCD issued its Final AQAP on April 14, 1992, and requires that offsets be obtained for emissions of the nonattainment pollutants and their precursors from stationary sources.

Some of the O_3 in Imperial County is transported from other areas and this O_3 causes some of the exceedances of the state standard. A portion of the O_3 in SEDAB is transported from SOCAB, according to CARB (1989a and 1993b). Back trajectories track SOCAB emissions all the way to Imperial County. CARB (1993a) states that Mexico is also a source of the O_3 and precursors transported into Imperial County, which are monitored at Calexico-Grant and El Centro. Such transport means that control of O_3 in Imperial County should be coordinated with the control of O_3 in the SOCAB and Mexico, especially Mexicali, (just across the international border from Calexico). A possible result of such coordination is that attainment of the CAAQS for O_3 may have to be delayed from 1994 to beyond 2010, when SCAQMD will reduce emissions in SOCAB enough to attain the federal O_3 standard. Even then, the O_3 CAAQS may not be attained in Imperial County if Mexicali sources of O_3 precursors are not sufficiently controlled by that time.

Air quality control permits required from the ICAPCD would include:

TABLE 3-14

Ambient Air Quality Standard Attainment Status[d] <--

CRITERIA POLLUTANT	AIR BASIN/GEOGRAPHIC AREA						PRECURSORS POLLUTANTS
	SOCAB		SEDAB				
			Coachella Valley		Imperial County		
	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	
O_3	Nonattainment (extreme)	Nonattainment (extreme)	Nonattainment (severe)	Nonattainment (severe)	Nonattainment (moderate)	Nonattainment (transitional)	NO_x ROG
NO_2	Nonattainment	Nonattainment	Attainment	Unclassified/ Attainment	Attainment	Unclassified/ Attainment	NO_x
PM_{10}	Nonattainment	Nonattainment	Nonattainment	Nonattainment	Nonattainment	Nonattainment	PM_{10} NO_x ROG SO_x
SO_2	Attainment	Attainment	Attainment	Unclassified	Attainment	Attainment	SO_x
Sulfate	Attainment	NA	Attainment	NA	Attainment	NA	SO_x
CO	Nonattainment in Los Angeles County only. Attainment elsewhere.	Nonattainment	Attainment	Unclassified/ Attainment	Unclassified	Unclassified/ Attainment	CO

NA = Not Applicable

- An Authority to Construct (ATC) permit. Under Rule 207, this permit would require that:
  - CAAQS be met at points of potential public exposure (beyond the fence line).
  - Best Available Control Technology (BACT) be used to control site emissions.
  - Nonattainment pollutant emissions above 137 pounds per day be offset with an offset ratio that increases with upwind distance between the site and the offset credit location.
- A health risk assessment of toxic emissions from the landfill site (requested by the ICAPCD for the ATC permit).
- Permits to operate each stationary source (e.g., flare).

South Coast Air Quality Management District

The SCAQMD has an interest in the proposed project because of rail haul emissions and reductions in SOCAB emissions that would occur by eliminating future landfills in SOCAB. SCAQMD would not have any direct permitting authority for the project.

In 1991, the SCAQMD adopted a Final AQMP that provides for the attainment of all federal, but not state, standards by the year 2010. The following year (2011) is used as one analytical year for evaluating air quality effects associated with the Proposed Action in Chapter 4.0 of this EIS/EIR because by 2011 the effects of O_3 transport from SOCAB to the Coachella Valley and Imperial County would be substantially reduced from present conditions.

The 1991 AQMP contained 134 measures designed to reduce emissions of O_3 precursors in order to attain the NAAQS for O_3. Measure No. A-D-1 was titled Out-of-Basin Transport of Biodegradable Solid Waste, and would remove landfill emissions from SOCAB. The Proposed Action would start implementing the measure once it begins receiving MSW residue.

3.1.8.2 Existing Air Resource Environment

General

This discussion is divided into two parts. The first part describes the potentially affected environment in the vicinity of the proposed project. This information is important, both for evaluating the air quality impacts of the project site activities and for air quality permitting through the ICAPCD.

The second part describes conditions in the air basins along the proposed rail haul route. This information is necessary to: (1) evaluate effects of rail haul activities related to the Proposed Action ; and (2) provide comparisons of effects with the No Action Alternative, which would result in the disposal of the MSW residue at existing and new landfills in SOCAB or at other regional landfills.

Proposed Project Site Area

Regional Characteristics

Existing air quality characteristics in the proposed site vicinity are described in this section, based upon previous environmental analyses of the area (St. Clair Research Systems, Inc., 1984; Environmental Solutions, Inc., 1987a) and more recent monitoring conducted by the ICAPCD and the Mesquite Mine. The following section describes the climatic conditions in the project general area:

- The desert environment is very hot in summer and mild in winter. Humidity is generally low except in July and August when the monsoon wind blows from the Gulf of California (southeast). Precipitation is low (about 3 inches per year), and a limited amount of cloudiness occurs during the winter rainy season.

- Wind directions follow two patterns, as follows:

  - From October through May, prevailing winds are from the west and northwest. The humidity is lowest under these conditions. Some of these winds originate in SOCAB, enter the Coachella Valley at the Banning Pass (Figure 3-24) and travel southeasterly through the Salton Sea Trough.

  - July and August weather patterns are often dominated by a heating-induced low-pressure area that forms over the hot interior deserts, drawing air from the Gulf of California (southeast of the site) and northern portion of Mexico. The humidity is highest during these conditions. June and September are transition months between the two seasonal patterns.

- Wind speeds in the region are above levels necessary to promote good mixing so that air mass stagnation does not occur. Winds at night average 5 to 8 mph (weakest in late spring and strongest in winter), while daytime winds average 9 to 13 mph (strongest in winter and early spring, and weakest in fall). Such moderate winds (by both day and night) generally carry away locally generated emissions.

- Vertical mixing and dilution in the area is very good, with afternoon mixing heights reaching 16,000 feet above ground level in summer. Strong daytime thermal mixing generally disperses nighttime ground-based thermal inversions.

Air quality characteristics are:

- The area is state nonattainment for O_3 and PM_{10}, and federal nonattainment for PM_{10}. Both of these pollutants are measured at El Centro, and PM_{10} is measured at Brawley. Exceedances are shown in Table 3-15.

- The O_3 nonattainment status is based on a few exceedances of state standards (CAAQS), but not of federal (NAAQS) standards.

- The area is attainment for NO_x, SO_2, CO, and sulfates; monitored levels of these pollutants are generally well below standards.

The source of the O_3 exceedances at El Centro for a few days each year are not the result of emissions of the NO_x and ROG precursors from El Centro. Instead, the exceedances are the result of the transport of O_3, NO_x, and ROG from outside of the area. The primary source during the summer appears to be the large city of Mexicali with a population of 800,000 (in comparison with about 120,000 for all of Imperial County), located just south of the United States of America/Federal Republic of Mexico International Border. For example, Figure 3-25 shows the daily O_3 concentration cycle for El Centro on October 9, 1992, when a light wind was blowing from the southeast. This plot shows a "background" concentration well below standards, but a midday peak when the state standard was equaled at 1:00 p.m.[e] The most plausible explanation for this peak is transport of emissions from traffic and industrial activities in Mexicali. Figure 3-25 also shows the same peak when it passed Calexico approximately three hours earlier. The three-hour delay agrees with the two to three mile-per-hour wind speeds measured at El Centro and Calexico that day and the 10-mile distance between these cities. <--

The SOCAB is also a source of O_3 exceedances and background O_3 concentrations in Imperial County. On days when northwesterly winds prevail, O_3 precursors are transported from the SOCAB, through the Banning Pass, and into the Salton Trough. That same transport often continues into Imperial County, but the peak condition decreases with distance from SOCAB.

TABLE 3-15

O_3 and PM_{10} Exceedances in Imperial County

O_3 EXCEEDANCES[1] AT EL CENTRO

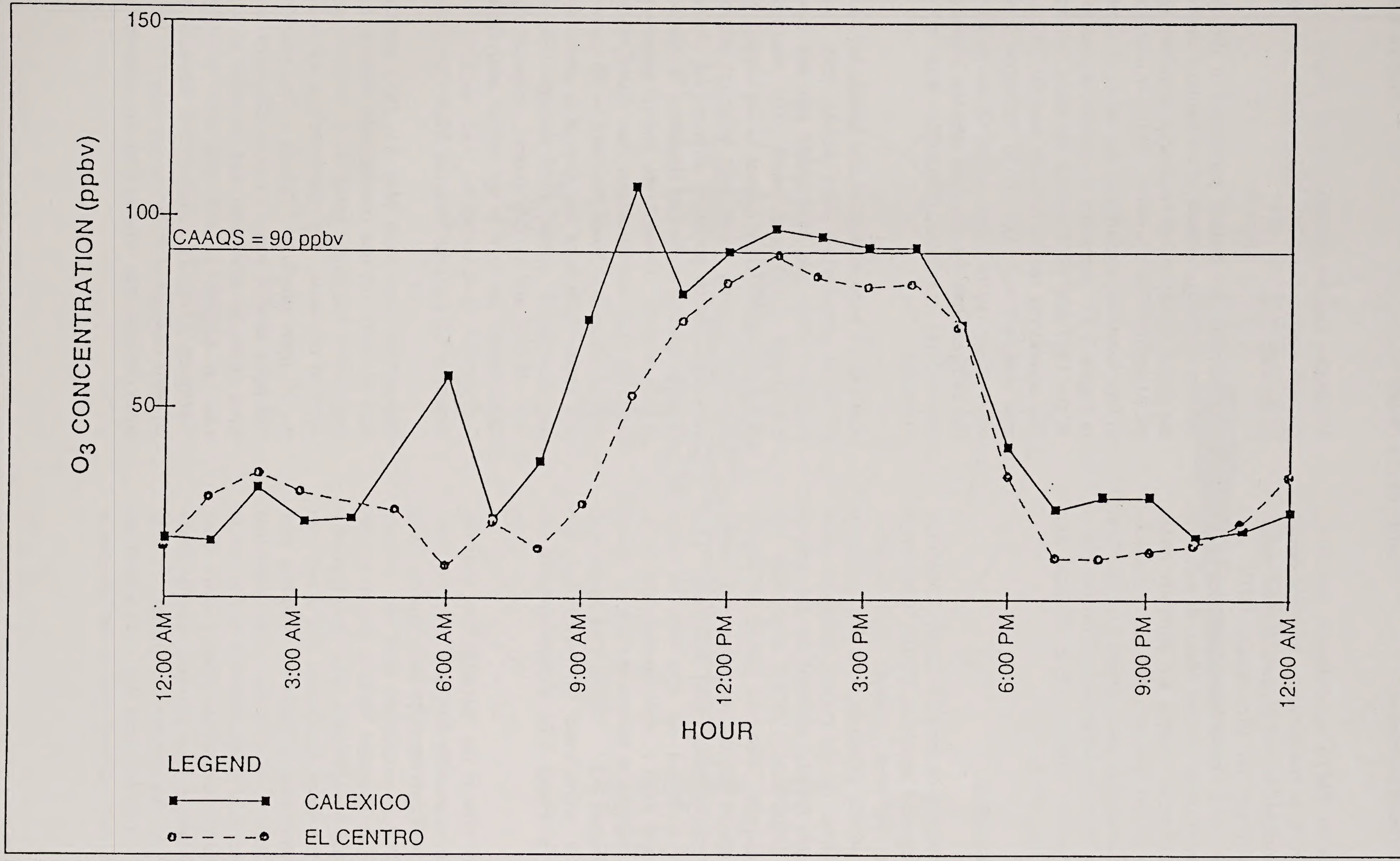
VARIABLE	YEAR[2]								
	1986	1987	1988	1989	1990	1991	1992	1993[f]	<--
Number of Exceedance Hours	0	0	28	8	8	5	28	62	
Number of Exceedance Days	0	0	17	4	6	3	10	25	
Highest Concentration (ppbv)	90	90	120	110	110	110	120	150	
O_3 Exceedance "Season"	No data	No data	Mar-Nov	Feb-May	Mar-Jun	Jun-Oct	Apr-Dec	Mar-Dec	

(1) CAAQS = 90 ppbv, one-hour average.
(2) CARB, 1987, 1988, 1989b, 1990, 1991c, 1992, 1993c, 1994b.
(3) Prior to CAAQS ppbv standard.

PM_{10} EXCEEDANCES[1,2] AT EL CENTRO AND BRAWLEY

VARIABLE	YEAR[2]								
	1986	1987	1988	1989	1990	1991	1992	1993[f]	<--
Number of Exceedance Days									
Brawley	20	31	17	35	33	33	23	24	
El Centro	12	24	24	31	22	31	14	21	
Highest Concentration (µg/m3)									
Brawley	191	148	368	676	258	229	103	175	
El Centro	230	157	192	287	100	243	80	166	

(1) CAAQS = 50 (µg/m3), 24-hour average
(2) CARB, 1987, 1988, 1989b, 1990, 1991c, 1992, 1993c, 1994b.



SOURCE: Environmental Solutions, Inc., 1994.

Proposed Mesquite Regional Landfill

Daily O_3 Concentration Cycle for an Exceedance at Calexico and El Centro on October 9, 1992

FIGURE 3-25

The sources of PM_{10} exceedances are local, primarily from a combination of wind-blown dust from activities on disturbed land areas, including driving on dirt roads, OHV use, construction, and agricultural practices. The contributions of these sources, Mexicali industrial activities, and other sources are currently under study by the Desert Research Institute. Emissions and control strategies are presented in the Final Draft of the State Implementation Plan for PM_{10} in the Imperial Valley (E.H. Pechan and Associates, Inc., 1993).

Local Characteristics

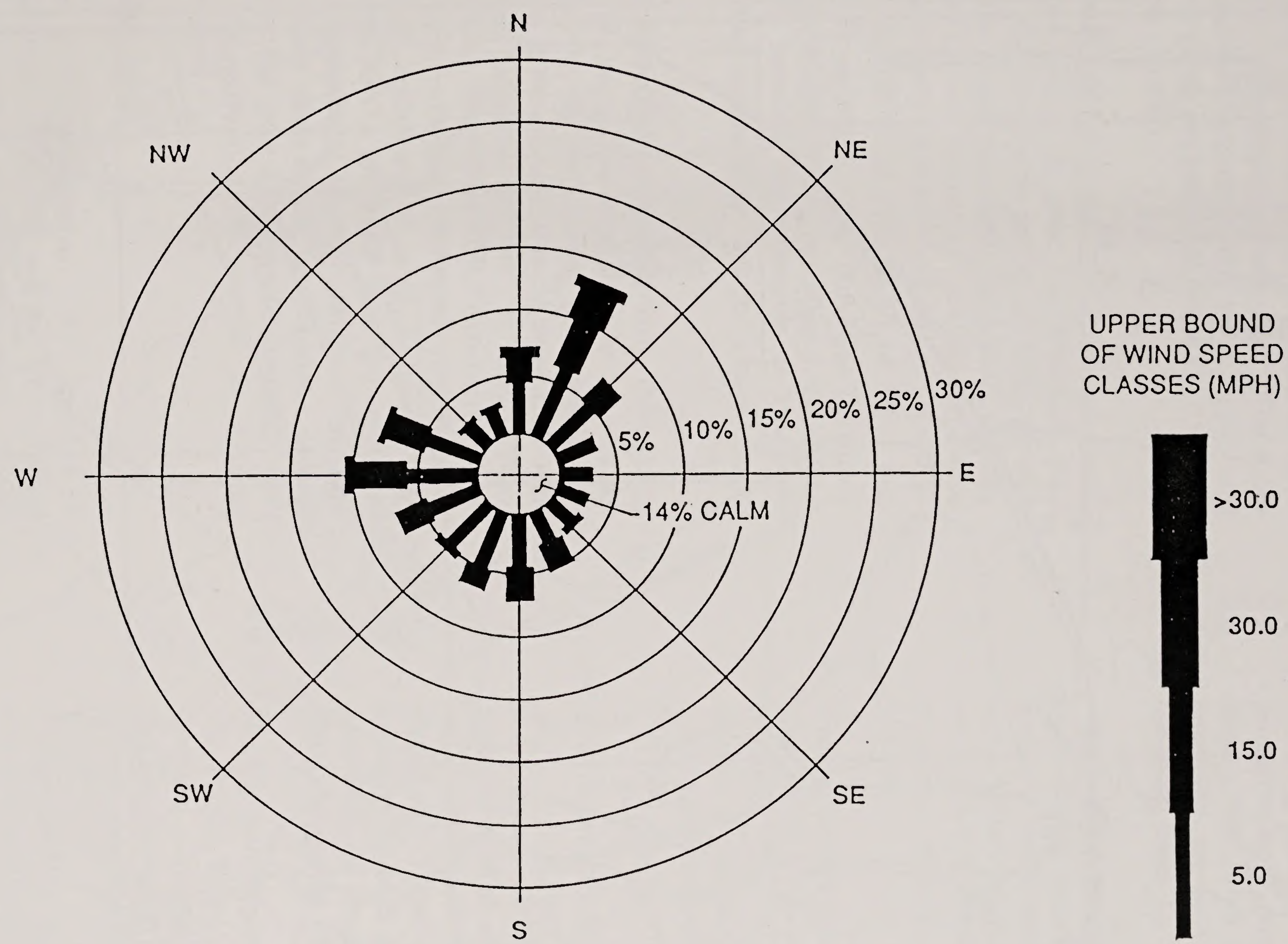
Analysis of wind data from El Centro, California; Imperial Airport, California; Blythe, California; and Yuma, Arizona indicate that weather conditions at the proposed site are generally similar to those in the region, although wind conditions are locally affected by the nearby Chocolate Mountains. Wind data from the existing Mesquite Mine are shown in Figure 3-26, and indicate that the wind frequently blows from the north-northeast, west and south. This distribution is based on one year of data, extending from April 1, 1991 through March 31, 1992, and measured at the meteorological station shown in Figure 3-27. Wind data monitored during 1989 were used to verify that the distribution in Figure 3-26 is representative for the site.

The westerly flow is the "normal" flow over the entire region, especially during afternoons when the wind is well developed by daily heating. The southerly flow is associated with the summer monsoon. The monsoon flow is caused by the large, thermal-low-pressure area that typically forms over the desert southwest. Air drawn into the low-pressure zone includes the southeast flow from the Gulf of California. The prevalent north-northeasterly wind direction at the site is caused by Santa Ana winds coming down from the north, where a high-pressure area typically develops over the deserts in winter. Local topographic conditions steer this wind around the eastern side and southern end of the Chocolate Mountains and the western side of Quartz Peak, through a pass about five miles to the northeast of the site.

An important air quality parameter in the site vicinity is PM_{10}, because of recreational uses of the desert, nearby gravel excavation activities, and the Mesquite Mine operation. PM_{10} is measured at four locations surrounding the mine, as shown in Figure 3-27. Appendix F provides an analysis of the 1991 and 1992 results for these stations. The monitoring results indicate that the 24-hour state standard (CAAQS) of 50 micrograms per cubic meter ($\mu g/m^3$) was exceeded during 18 of the 243 readings for the four stations, although the federal standard (NAAQS) was never exceeded.

Analysis of wind directions and speeds for each of those monitoring days shows only four readings where the mine could possibly have contributed to the exceedance. The measured exceedances generally appear to be caused by naturally blowing desert dust, although nearby gravel excavation probably affected the closest monitor, labeled as the Old Highway 78 monitor in Figure 3-27. Overall, the annual geometric mean of each station is less than the CAAQS Annual Geometric Mean Standard of 30 $\mu g/m^3$. The annual arithmetic and geometric means for the nine-year[(g)] period 1985 through 1993[(g)] <--
were 28.0[(g)] and 21.1[(g)] $\mu g/m^3$, respectively. <--
These means are used in the impact analysis as background concentrations and include the impact of the existing Mesquite Mine operation.

During one year from May 21, 1992 through May 31, 1993, O_3 was continuously monitored at the nearby Mesquite Mine well field located south of the mine. O_3 concentration exceeded the 90 ppbv one-hour CAAQS twice, reaching 100 ppbv at 4:00 p.m. on April 28, 1993 with wind from the northwest and 94 ppbv at 9:00 a.m. on August 15, 1992 with wind from the southwest. The O_3 concentration equaled the 90 ppbv standard at 9:00 a.m. on July 17, 1992, when the wind was blowing from the southwest.



AVERAGING TIME: 1 HOUR
MESQUITE, CALIFORNIA
WIND ROSE ANALYSIS
FOR 4/1/91 TO 3/31/92

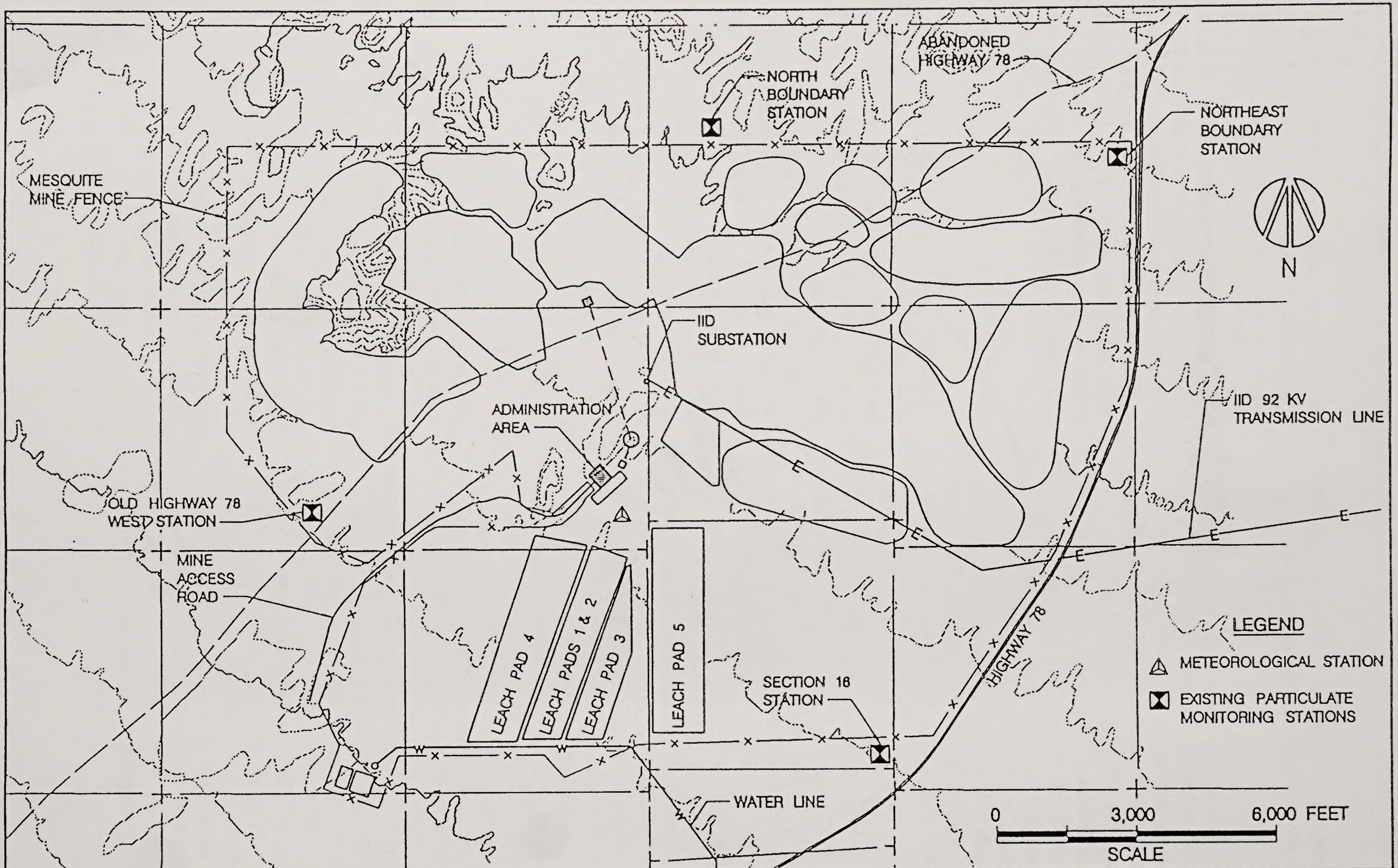
SOURCE: Environmental Solutions, Inc. 1992.

Proposed Mesquite Regional Landfill

Annual Wind Rose for Mesquite Mine

FIGURE **3-26**

91-296 EISAQ-01 REV. 7/29/93



SOURCE: Gold Fields Mining Co., 1992.

Proposed Mesquite Regional Landfill

Mesquite Mine
PM_{10} Monitoring Station Locations

FIGURE 3–27

The NO_2 concentrations during this same monitoring year were low, as expected for a relatively undeveloped remote area. The mean and maximum concentrations were 3 ppbv and 39 ppbv, which are both well below the 250 ppbv one-hour CAAQS.

The Mesquite Mine is the only significant source of emissions at or near the proposed site. During the three-year period of 1990 through 1992, the actual emissions (in pounds per day [lbs/day]) of criteria pollutants were
--> approximately 4,800[h] of NO_x, 330[h] of
--> ROG, 2,010[h] of PM_{10}, 60 of SO_x, and
--> 1,040[h] of CO. The ICAPCD inventory contains different values, including 3,300 lbs/day of NO_x because that inventory is based on earlier fuel consumption data for a base year of 1987.

PM_{10} emissions associated with the mining operation are below permitted levels and are expected to decline further as a result of a decrease in the amount of overburden rock being excavated to expose new ore. In 10 to 15 years, all mining activities are expected to be completed. During the remaining years of operation, emissions of other pollutants (e.g., NO_x and ROG), primarily from mining-related mobile equipment, will also diminish and then stop entirely when mining is completed. Because the mine has been operating continuously since 1985, its emissions are part of the existing environment.

<u>Rail Haul Route</u>

Table 3-16 summarizes the appropriate characteristics of SOCAB and the Salton Trough where air quality would be potentially affected by trains hauling the MSW residue to the proposed regional landfill. The following paragraphs summarize key aspects of each of these geographical areas. The relationship of these areas to regional topographic conditions is shown in Figure 3-24.

General characteristics of the SOCAB, Coachella Valley, and Imperial County areas are that:

- NO_x and ROG emissions are roughly proportional to population in the three areas. Nine times as much of these O_3 precursors are emitted in SOCAB as in the desert areas.

- Much of the land in Imperial County is undeveloped desert. This open space, coupled with many unpaved roads, agricultural burning, and numerous sources around Mexicali, results in PM_{10} emissions of more than twice those in SOCAB.

- Average annual rainfall in the SOCAB is approximately six times that in Imperial County. This would result in some increase in rainfall infiltration and related LFG generation rates for landfills in SOCAB.

Air pollutant dispersion characteristics show that:

- Wind speeds are highest in the desert areas, with large amounts of agricultural land and desert land that has been disturbed. These conditions create the potential for high amounts of dust to be generated, as discussed with regard to PM_{10} air quality conditions below.

- Mixing and dispersion is very good in the Salton Trough, particularly in the summer. Ground-based inversions that may occur during winter nights disperse in early morning thermal mixing.

- The perimeters of Imperial County are topographically open so that emissions that occur at night are primarily blown away prior to being exposed to each day's sunlight. Open perimeters and very good mixing and dispersion, combined with the relatively low emissions in these areas, limit the amount of O_3 that can be produced from locally emitted NO_x and ROG.

TABLE 3-16

Summary of Air Basin Characteristics
Proposed Mesquite Regional Landfill

GENERAL CHARACTERISTICS

GEOGRAPHIC AREA	SIZE (sq. miles)	POPULATION (1987)	1987 BASELINE EMISSIONS (10^6 lbs/day)			CLIMATE	
			NO_x	ROG	PM_{10}	Average Temperature (° F)	Average Annual Rainfall (inches)
SOCAB	6,600	13.7 million	2.3	2.5	1.6	64[1]	15[1]
Salton Trough							
Imperial County	4,600	120,000	0.06	0.06	3.7	73	2.5[2]
Coachella Valley	3,200	400,000	0.1	0.3	0.5	72	5[1,2]

AIR POLLUTANT DISPERSION CHARACTERISTICS

GEOGRAPHIC AREA	CONTROLLING FACTORS					GENERAL SUMMERTIME DISPERSION CHARACTERISTICS
	Average Wind Speed (mph)	Predominant Direction From Which Wind Originates	Approximate Summer Inversion Layer Heights (feet)		Topographic Constraints	
			Morning	Afternoon		
SOCAB	5	West	1,500[2,3] - 2,200[4]	2,500[3] - 3,400[4]	Mountains north and east. Inversion zone blocked most of day by elevation of Banning Pass at El. 2,200 ft.	• Poor mixing conditions. • Nighttime NO_x and ROG emissions trapped.
Salton Trough	7 to 9	Northwest except southeast for July and August	8,000[5]	16,000[5]	Wind flow channeled by mountains to northeast and southwest.	• Very good mixing conditions. • Nighttime NO_x and ROG emissions dispersed.

NONATTAINMENT POLLUTANTS AND PRIMARY SOURCES[d]

GEOGRAPHIC AREA	NONATTAINMENT POLLUTANTS							
	O_3		PM_{10}		NO_2		CO	
	Status	Primary Source	Status	Primary Source	Status	Primary Source	Status	Primary Source
SOCAB	Extreme nonattainment	SOCAB	Nonattainment	Industrial and vehicular emissions atmospheric reactions	Nonattainment	Vehicular emissions	Nonattainment of NAAQS. Nonattainment of CAAQS in Los Angeles County	Vehicular emissions
Salton Trough								
Imperial Valley	Nonattainment	Transport from Mexicali, SOCAB, and San Diego	Nonattainment	Desert roads and agriculture; land and unpaved roads, and industry in Mexico	Attainment	--	Unclassified/ Attainment	--
Coachella Valley	Severe nonattainment	Transport from SOCAB	Nonattainment	Dirt roads and construction	Attainment	--	Unclassified/ Attainment	--
Precursor Emissions	NO_x, ROG		PM_{10}, NO_x, ROG, SO_x		NO_x		CO	

91-296 (5/18/95/dk)

(1) SCAQMD, 1980.
(2) Gale Research Company, 1978.
(3) Holzworth, George C., 1972.
(4) Taylor and Marsh, 1991.
(5) National Climatic Data Center, 1992.

Source: Environmental Solutions, Inc., 1994.

- Mixing conditions are relatively poor in the SOCAB and transport of pollutants out of the basin is restricted by the surrounding mountains and an inversion level that commonly occurs below the elevation of the Banning Pass. As a result, nighttime and early morning emissions are "trapped" within the basin, and are mostly available for the photochemistry that transforms them into O_3 the following morning.

- Predominantly westerly wind conditions in SOCAB result in the transport of O_3, its precursors, and other pollutants through the Banning Pass and into Coachella Valley. Often in late afternoon, the sea breeze reaches its maximum daily strength and causes a substantially higher rate of transport to occur for up to several hours.

The bottom portion of Table 3-16 summarizes air quality conditions within these geographical areas, which are a result of the general and dispersion characteristics described above. The following discussion of these air quality conditions is also supported by the following tables and figures:

- Figure 3-28 shows the number of days O_3, PM_{10}, NO_2, and CO standards were exceeded in SOCAB during 1990.

- Figure 3-29 shows trends of pollutant exceedances in SOCAB for the 1975 to 1990 period.

- Table 3-17 shows O_3 and PM_{10} exceedance data for Banning, Palm Springs, and Indio.

- Figure 3-30 shows example daily O_3 concentration cycles for Banning, Palm Springs, and Indio.

The SOCAB is nonattainment for each of the key pollutants, although the geographical extent and frequency of NO_2 exceedances is small. The biggest problem is O_3, which had exceedances in the eastern San Bernardino and Riverside portions of SOCAB on 125 days in 1990 (Figure 3-29). This high concentration condition, resulting from NO_x and ROG emissions throughout the basin, is the primary source of O_3 transport from SOCAB into the Coachella Valley at Banning Pass. Figure 3-29 shows that O_3 has been the most resistant to reduction by past controls. Ozone is the primary target of current SCAQMD planning.

The Coachella Valley is classified as state and federal nonattainment for PM_{10} and O_3. The PM_{10} concentrations are relatively high, due to local sources associated primarily with windblown dust (50 percent), construction (30 percent), paved roads (3 percent), and unpaved roads (3 percent) (SCAQMD, 1990a).

Ozone exceedances in the Coachella Valley are a direct result of the transport of that pollutant from SOCAB through Banning Pass. This condition is illustrated in Figure 3-30 showing O_3 concentrations at Banning, Palm Springs, and Indio on August 15, 1992 (SCAQMD, 1992b). The Banning plot illustrates how O_3 created in the SOCAB during the midday period was transported eastward and arrived at the Pass around 5:00 p.m. That same peak was then transported into the Palm Springs area about two hours later, corresponding to a wind speed between Banning Pass and Palm Springs of about 10 mph. That same peak continued to travel through the Coachella Valley and arrived at Indio one hour later at 8:00 p.m. Because the distance between Palm Springs and Indio is also 20 miles, the average wind speed appears to have increased to 20 miles per hour. The peak probably continued to travel down the Salton Trough to Imperial County.

Existing air quality conditions in Imperial County were discussed above, in relation to conditions in the vicinity of the proposed regional landfill site.

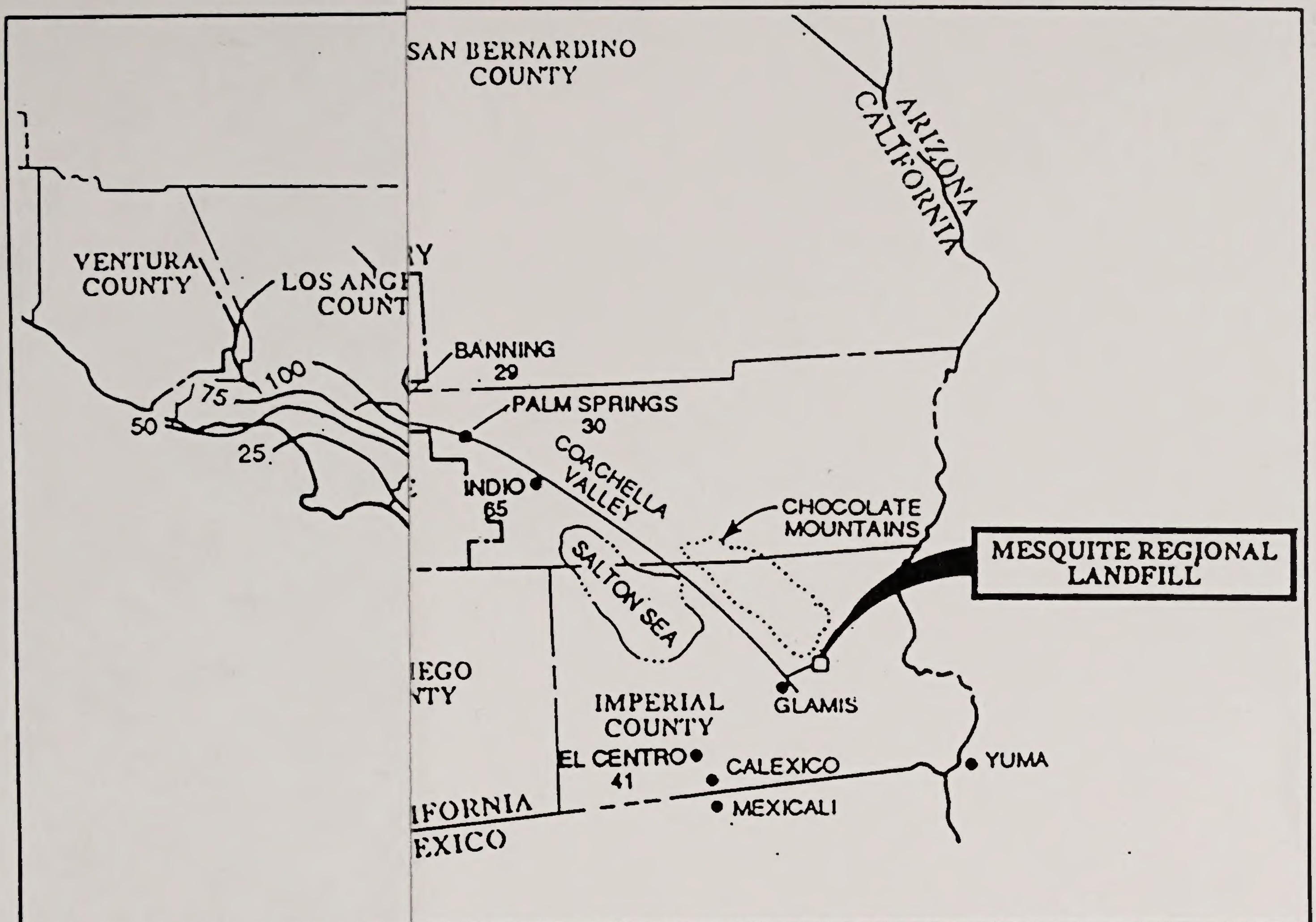
3.1.8.3 Existing Odor Conditions

Although odor is not monitored in Imperial County, nor in other areas of the project analysis, noticeable odors are sometimes evident as a result of livestock operations (e.g., feed lots), agricultural fertilizers, pesticides, and various industrial facilities, such as waste-to-energy facilities, food processing facilities, and geothermal operations. At the proposed site, no substantial odors have been noticed by mine personnel over the period 1984 to present.

Odors are not reported to be a significant existing issue in the Coachella Valley. Odors are sometimes noticeable in areas close to agricultural uses of fertilizers and at some cattle operations. Odors in SOCAB are much more variable than for the desert areas, because of the land use distribution and increased population. Hydrocarbon odors are sometimes noticeable in the vicinity of oil refining and storage facilities and major highways. Agricultural odors associated with fertilizer application and livestock sometimes occur in undeveloped portions of the basin. Other types of odors may occur locally depending on specific industrial activities.

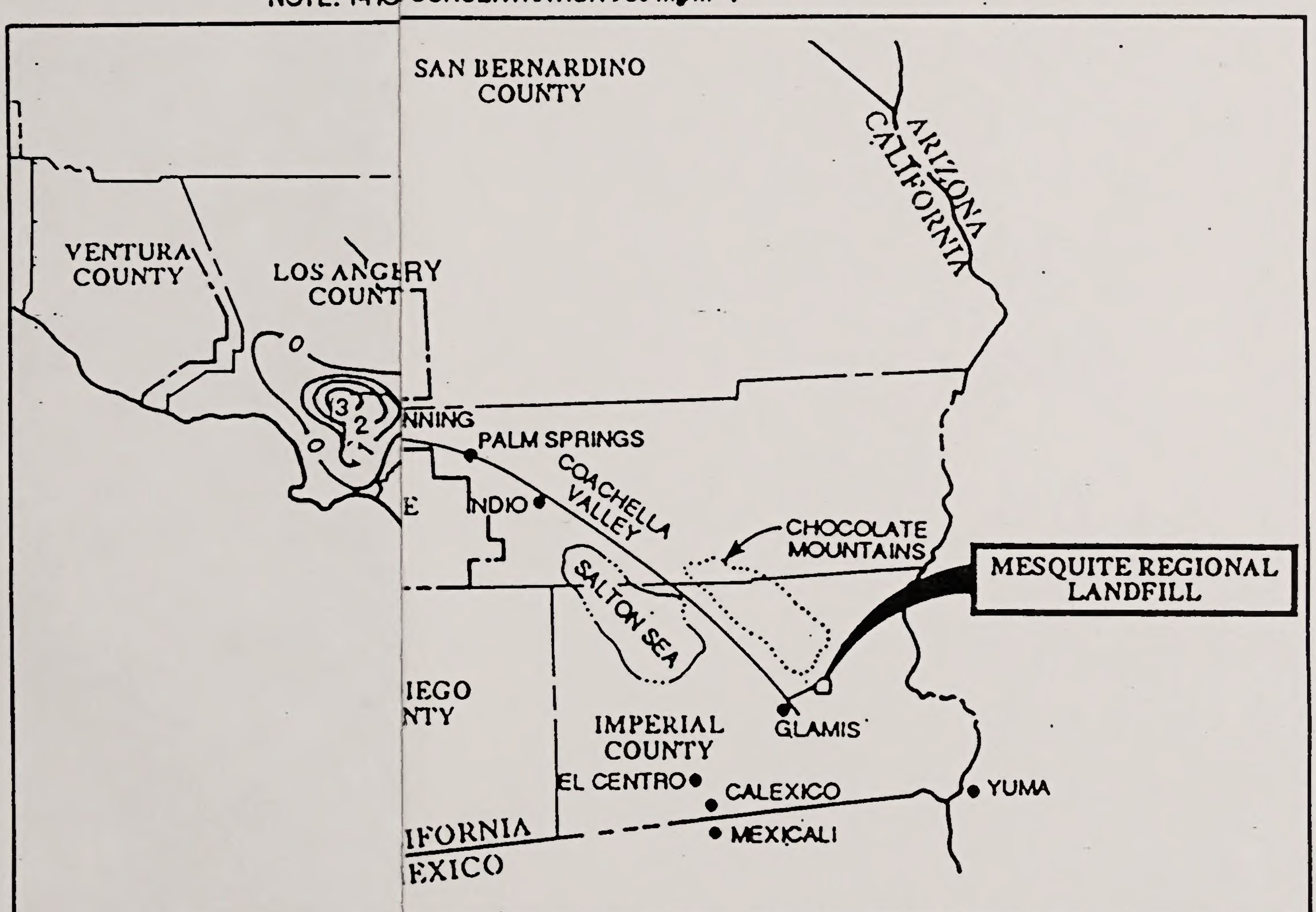
3.1.8.4 Offered Exchange Parcels

The properties proposed for exchange between the applicants and the BLM are located in SEDAB, and have similar weather, climate, air quality, and attainment status to Imperial County and Coachella Valley. The main difference is that parcels in the SRMNSA are mountainous, experience more precipitation, and probably have lower PM_{10} concentrations.



O_3 NURAGE CONCENTRATION 1990

NOTE: 1-HO CONCENTRATION >30 mg/m 3.



NO_2 NUCEEDING STATE STANDARD 1990

NOTE: 1-HO >9.00 ppm.

MILES

Proposed Mesquite Regional Landfill

Number of Exceedance Days in SOCAB 1990

SOURCE: South Coast Air Quality Management District, 1991.

FIGURE
3-28

3.1.8.3 Existing Odor Conditions

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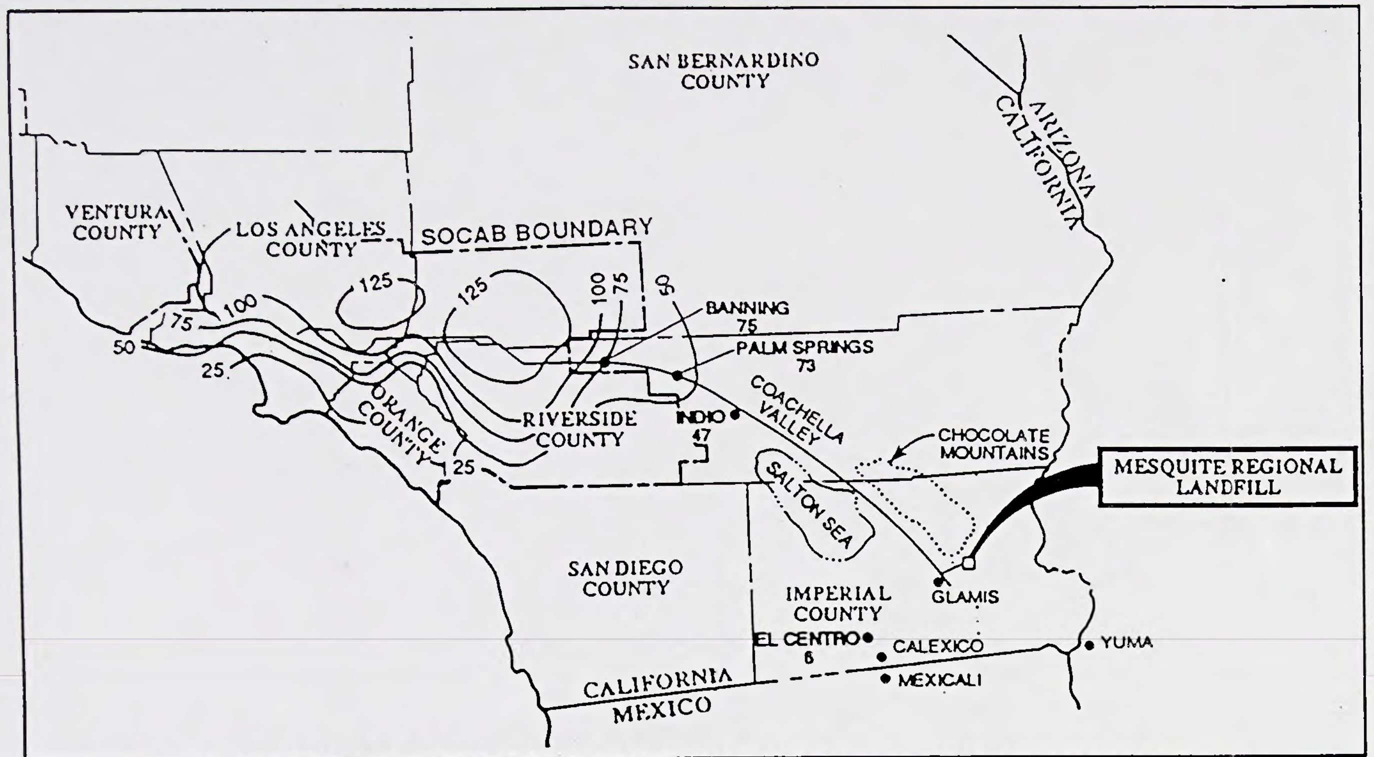
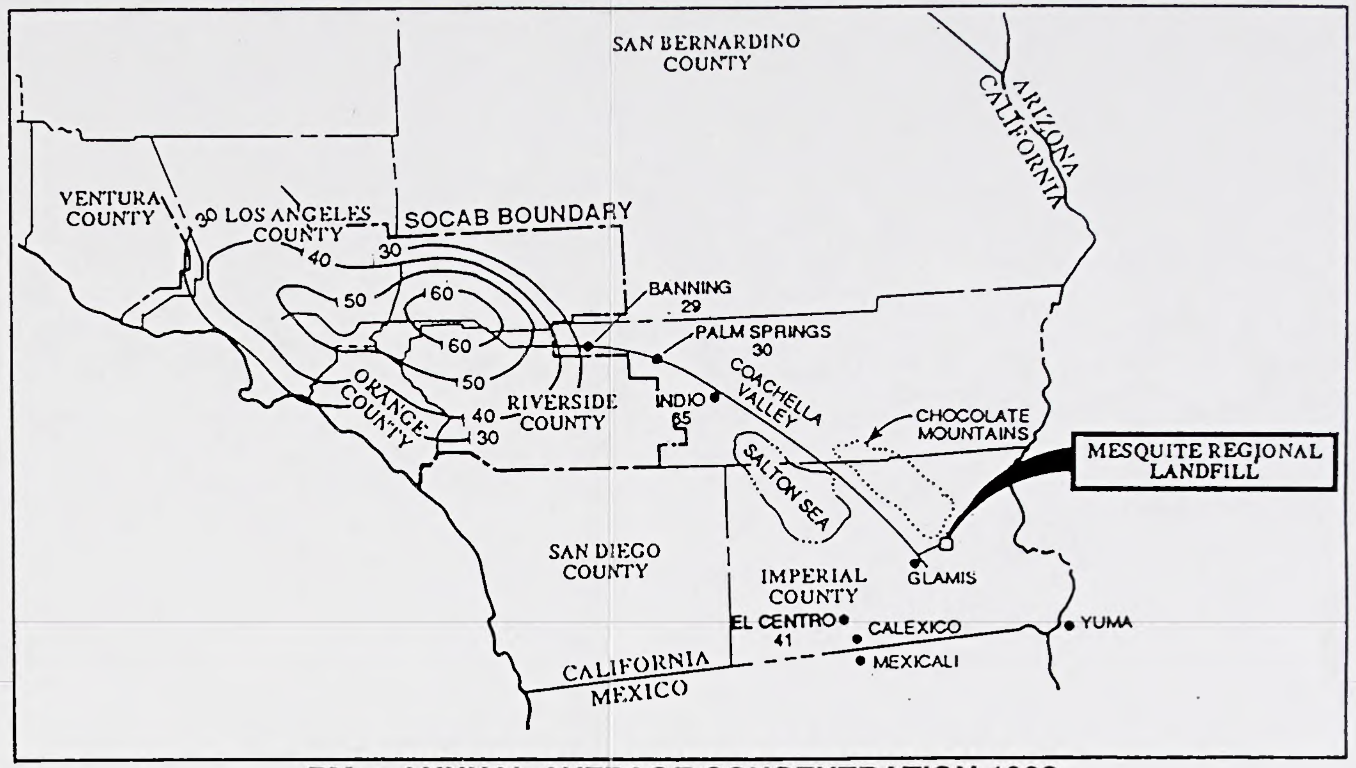


O_3 NUMBER OF DAYS EXCEEDING STATE STANDARD 1990

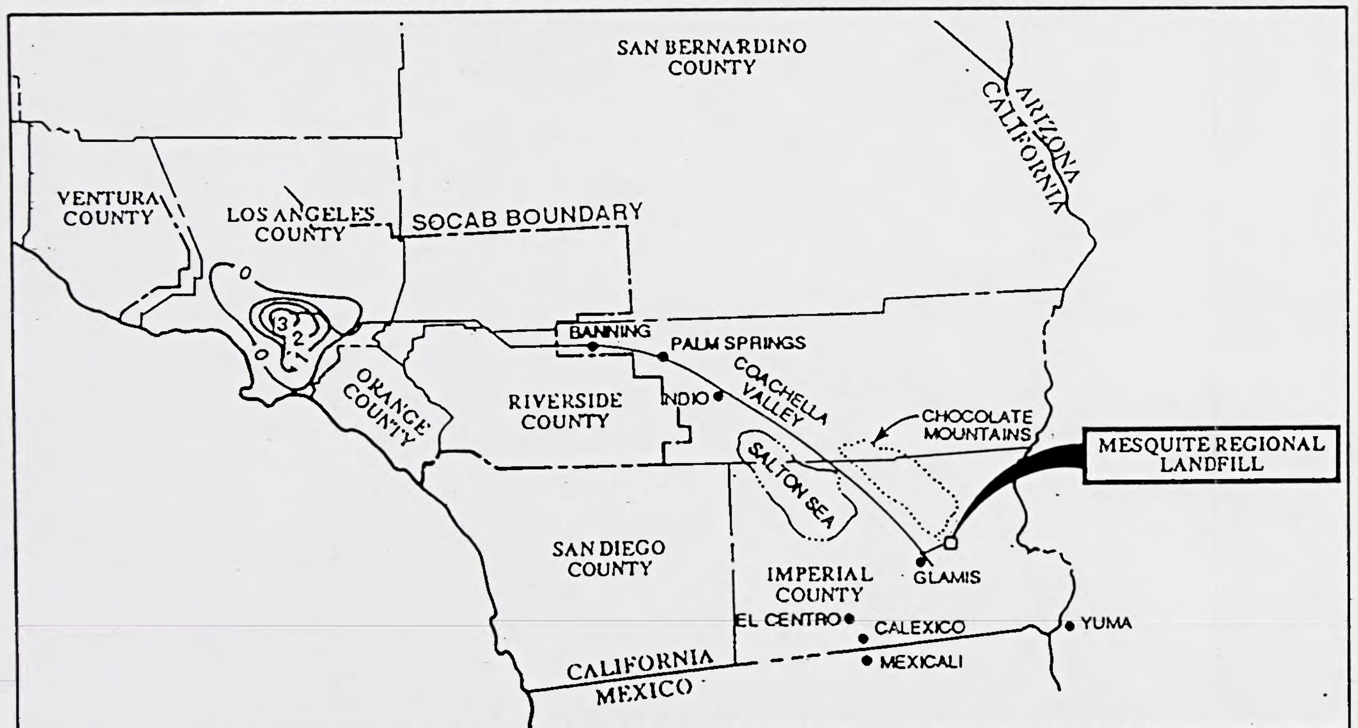
NOTE: 1-HOUR AVERAGE CONCENTRATION >0.09 ppm.



PM_{10} ANNUAL AVERAGE CONCENTRATION 1990

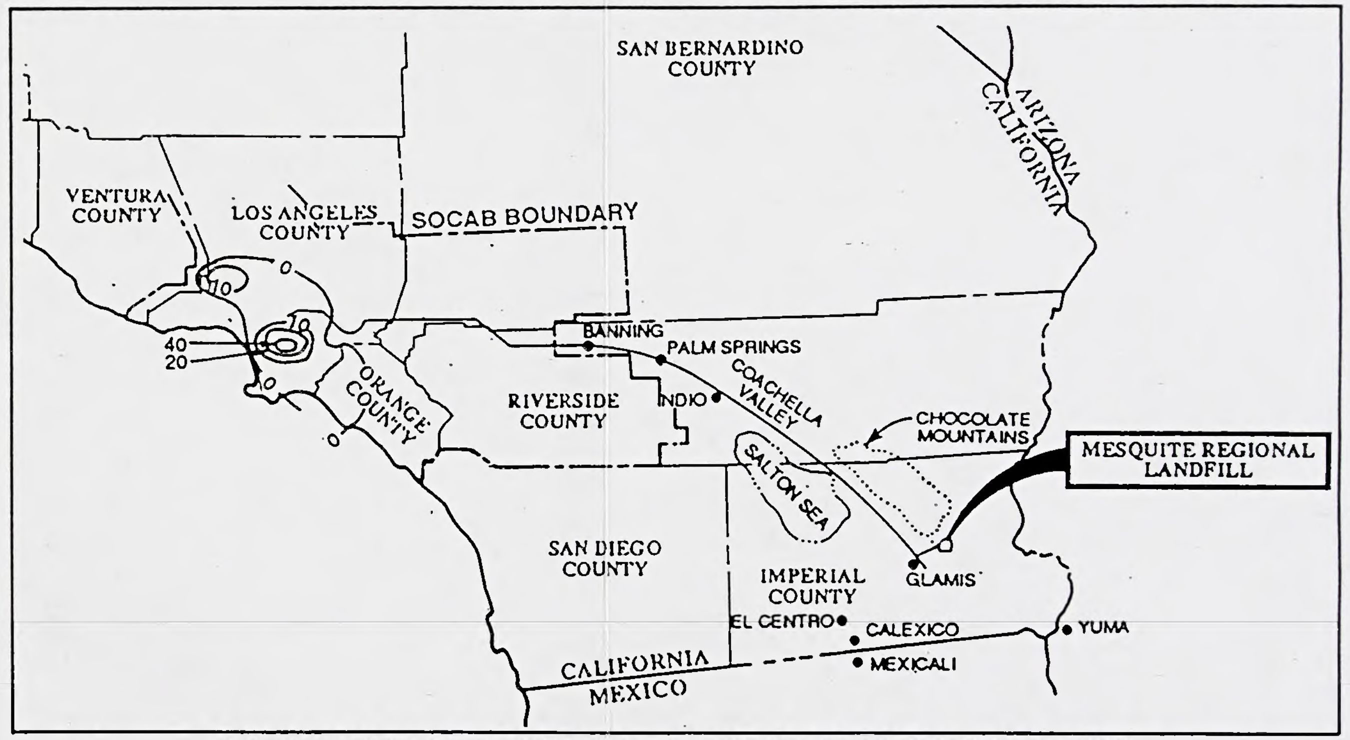
NOTE: ANNUAL GEOMETRIC MEAN CONCENTRATION >30 mg/m 3.

N



NO_2 NUMBER OF DAYS EXCEEDING STATE STANDARD 1990

NOTE: 1-HOUR AVERAGE CONCENTRATION >0.25 ppm.



CO NUMBER OF DAYS EXCEEDING STATE STANDARD 1990

NOTE: 8-HOUR AVERAGE CONCENTRATION >9.00 ppm.

LEGEND

125 — DAYS OF EXCEEDANCE IN SOCAB

EL CENTRO 6 — DAYS OF EXCEEDANCE AT INDIVIDUAL STATIONS

0 50 100 MILES

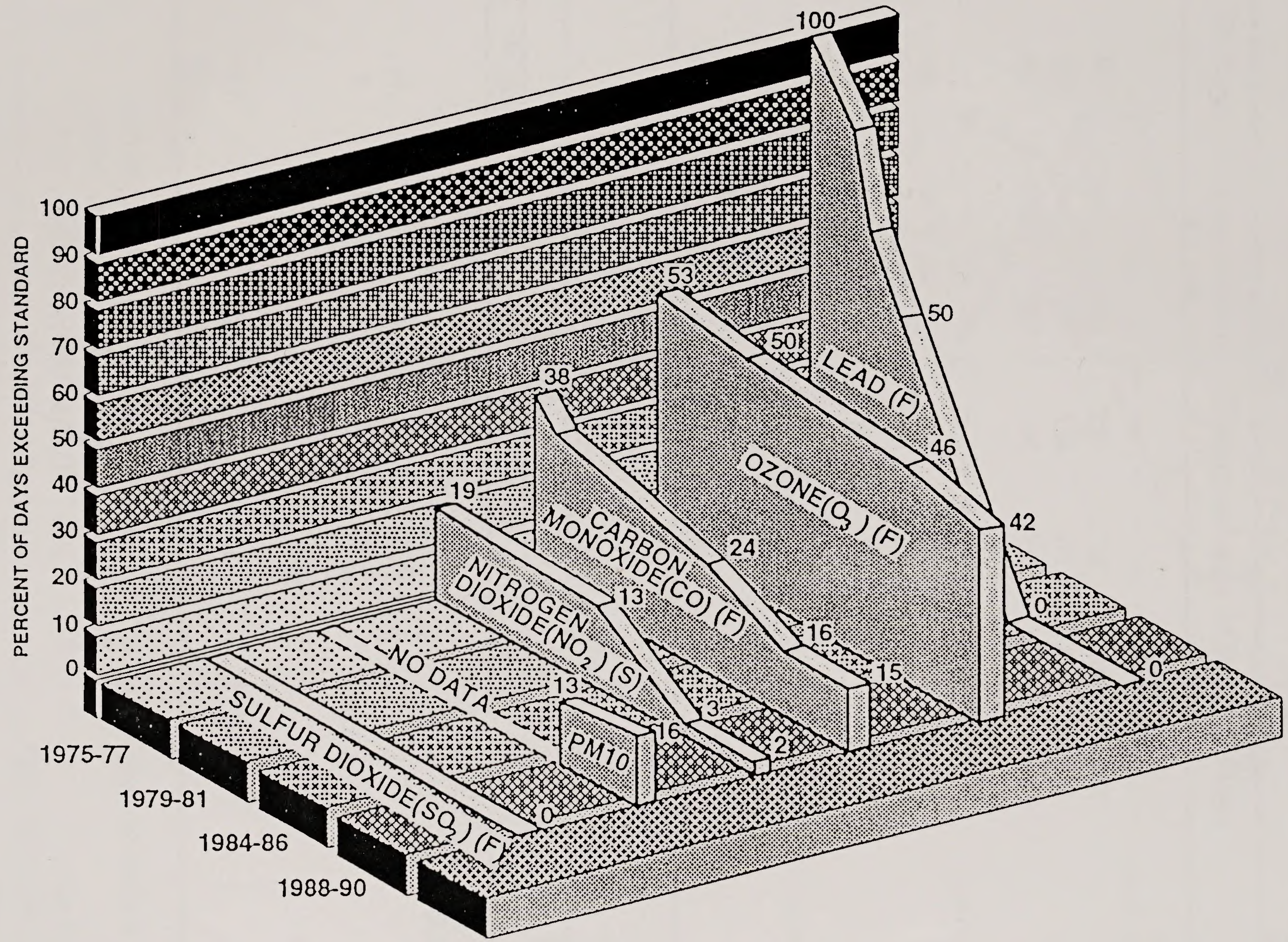
SCALE

Proposed Mesquite Regional Landfill

Number of Exceedance Days in SOCAB 1990

SOURCE: South Coast Air Quality Management District, 1991.

FIGURE 3-28



NOTE:

(F) = FEDERAL
(S) = STATE

SOURCE:
South Coast Air Quality Management District, 1991.

Proposed Mesquite Regional Landfill

Percent of Days Exceeding Levels of Federal or State Standard 1975 - 1990

FIGURE
3-29

TABLE 3-17

O_3 and PM_{10} Exceedances in the Coachella Valley
Proposed Mesquite Regional Landfill

O_3 Exceedances[1]

VARIABLE	YEAR							
	1986[2,3]	1987[3,4]	1988[5,6]	1989[5,7]	1990[5,8]	1991[5,9]	1992[5, 10]	1993 (5,14)(f) <--
Number of Exceedance Hours								
Banning	376	409	527	525	358	276	178	99
Palm Springs	363	303	378	485	341	341	285	319
Indio	-- (12)	250	(5)	361	166	213	144	61
Number of Exceedance Days								
Banning	80	96	118	112	75	64	66	38
Palm Springs	80	74	99	108	73	72	69	79
Indio	–	41	(5)	76	47	48	45	25
Highest Concentration (ppbv)								
Banning	220	210	260	230	220	200	160	160
Palm Springs	180	170	200	190	170	180	150	170
Indio	80	160	50	160	160	180	170[i]	160

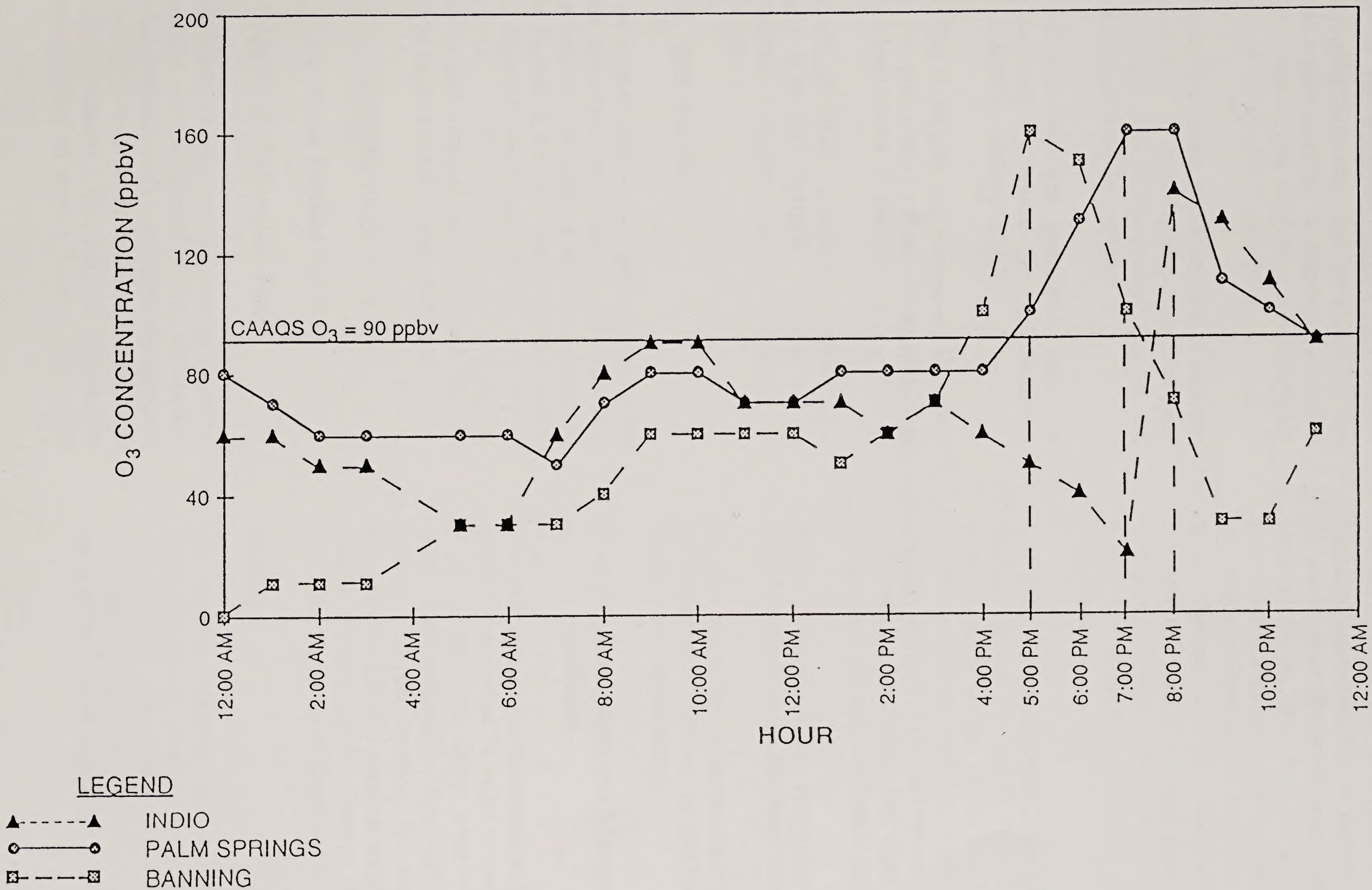
PM_{10} Exceedances[11]

VARIABLE	YEAR							
	1986[2]	1987[4]	1988[6]	1989[7]	1990[8]	1991[9]	1992[10]	1993[14](f) <--
Number of Exceedance Days								
Indio	25	25	25	39	41	37	18	25
Palm Springs	–	5	8	17	9	14	4	1
Highest Concentration ($\mu g/m^3$)[j] <--								
Indio	111	115	115	712	520	340	117	125
Palm Springs	–	121	77	292	83	197	175	58

Notes:

(1) O_3 "Season" = March through October.
(2) CARB, 1987.
(3) CAAQS = 100 ppbv.
(4) CARB, 1988; SCAQMD, 1988.
(5) CAAQS = 90 ppbv.
(6) CARB, 1989b; SCAQMD, 1989.
(7) CARB, 1990; SCAQMD; 1990b.
(8) CARB, 1991c; SCAQMD, 1991b.
(9) CARB, 1992a; SCAQMD, 1992a.
(10) CARB, 1993c; SCAQMD, 1993.
(11) CAAQS = 50 µg/m3.
(12) -- = Insufficient data.
(13) NA = Not Available.
(14) CARB, 1994b; SCAQMD, 1994c.

Source: Environmental Solutions, Inc., 1993.



SOURCE:
South Coast Air Quality
Management District, 1993.

Proposed Mesquite Regional Landfill

Daily O_3 Concentration Cycle for Exceedances at Indio, Palm Springs and Banning on August 15, 1992

FIGURE 3-30

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4.1.8 AIR QUALITY

Detailed evaluations of air quality and odor impacts of the Proposed Action and related transportation activities are provided in the technical report included in Appendix F of this EIS/EIR. This section provides a comprehensive summary of the results of that study.

The reader will notice that a number of changes have been made to the air quality emissions data. These changes are predominantly due to the following assumption corrections:

1. The landfill gas generation rate was erroneously based on an incorrect cellulose calculation; and

2. The American Association of Railroads has proposed to reduce locomotive NOx emissions by 55 percent.

For more detailed information, please see appendix I of this EIS/EIR. Neither set of assumptions changes the determination of significance.

4.1.8.1 Introduction

This air quality section is organized to present first the underlying assumptions and guidelines for the analysis. A detailed analysis is provided for the Proposed Action, which includes a flare station in early years, and energy recovery in later years. Differences in the analysis of emissions and impacts are described for the following approaches to energy recovery:

- Turbine/Boiler Based Power Plant
- Compressed Methane Gas Plant
- Liquefied Methane Gas Plant

The different impacts of the energy recovery approaches are compared. The air quality analysis concludes with a program of mitigation measures, and the level of significance after these mitigation measures. The analysis begins with the identification of project features that would be sources of air pollutants. Project-related mobile sources (e.g., MSW residue trains) remain the same for the different energy recovery approaches, but the stationary sources differ. Emission characteristics or factors are found in the literature or developed specifically to suit the circumstances for the Proposed Action. Emissions are estimated from emission factors and characteristics of the emission device (e.g., height, diameter, and gas velocity) to create input information needed for the Industrial Source Complex (ISC 2) dispersion model, which is then used to compute ambient air quality concentrations.

One year of meteorological data (April 1, 1991 through March 31, 1992) from the Mesquite Mine, is used in the dispersion model. The model computes ambient concentrations at specific receptor points for criteria and toxic air pollutants. The latter are used to compute carcinogenic, chronic, and acute health risks.

Project alternatives are also analyzed for their impacts relative to the Proposed Action.

Finally, mitigation measures capable of reducing project-related impacts to below a level of significance are identified.

4.1.8.2 Assumptions and Assessment Guidelines

The assumptions and assessment guidelines are explicitly described in order to make clear what is being analyzed, under what conditions and what would constitute a significant impact to air quality. For convenience, the assumptions are classified as follows: general, stationary sources, mobile sources, fugitive sources, transportation, odor, and measures of significance of impacts.

<u>General</u>

Air quality impacts are analyzed for the Proposed Action, which is scheduled to operate for 100 years. Emissions can most reliably be predicted for the early years of operation when air quality control technology can be accurately

TABLE 4-6

Schedule for Amount of MSW Residue To Be Shipped

Proposed Mesquite Regional Landfill

Proposed Action and Alternative III			Alternative I		Alternative II		Alternative IV	
MSW Residue Disposal Rate (tpd)	First Year Number	Last Year Number	First Year Number	Last Year Number	First Year Number	Last Year Number	First Year Number	Last Year Number
4,000	1	1	1	1	1	1	1	1
8,000	2	2	2	2	2	2	2	2
12,000	3	6	3	6	3	165	3	6
16,000	7	7	7	7	NA	NA	7	7
20,000	8	100	8	85	NA	NA	8	13
24,000	NA	NA	NA	NA	NA	NA	14	17
30,000	NA	NA	NA	NA	NA	NA	18	95(a)

<--

NA = Not Applicable

Source: Environmental Solutions, Inc., 1994.

predicted. Longer-term projections (e.g., more than 10 years) become more speculative because air pollution control technology advances are occurring rapidly and cannot be predicted. To be conservative, assumptions for the longer-term control technologies are based only on currently foreseeable changes in technology and regulatory requirements. The amount of MSW residue is anticipated to increase in steps according to the schedule shown in Table 4-6. Because each successive disposal rate requires an increase in transportation and landfill activity, the emissions that would be caused by each have been calculated. For each alternative, impacts are calculated for the year of highest emissions, which would be the last year of landfilling.

In addition, the 16th year of the Proposed Action is chosen as an important case for analysis because: (1) the Mesquite Mine would have closed, (2) it is just after an attainment target year in the South Coast Air Quality Management District (SCAQMD) Air Quality Management Plan (AQMP), and (3) the landfill would be operating at full capacity. The "worst-case" analysis of air quality impacts of the LFG emissions and related stationary sources are evaluated for the last year because LFG generation within the landfill would be greatest, as would its collection and destruction. To be conservative, the Alternative I footprint and project boundary are used for the analysis of the Proposed Action because the closer proximity of the Alternative I property boundary to the landfill footprint creates a maximum likelihood impact scenario.

Analysis of the environmental impacts associated with the proposed landfill are put in the context of comparison with the No Action Alternative. Unlike many industrial projects, which add emissions to an existing inventory, the Proposed Action would handle MSW residue differently than would otherwise occur. In the No Action Alternative, trucks would transport all of the MSW residue to new landfills in remote portions of the South Coast Air Basin (SOCAB) because current landfills that are closer to the most heavily populated areas would be already filled and closed. Alternatively, MSW residue would be hauled to other regional landfills.

Landfill and transportation impacts on air quality are analyzed separately because they are controlled by different owners and regulatory authorities. The Applicant for the Proposed Action would control emissions from the landfill in accordance with appropriate permits obtained from Imperial County Air Pollution Control District (ICAPCD). Transportation emissions from trains, highway trucks, and private vehicles would be determined by equipment manufacturers and suppliers of diesel fuel, in accordance with existing and future federal and state regulations, and technological advances.

Stationary Sources

It is assumed that the overall efficiency of the LFG collection system would be 80 percent. This assumption is conservative compared to the 95 percent collection efficiency assumed by the Sanitation Districts of Los Angeles County for Puente Hills Waste Management Facilities (SDLAC, 1992). The remaining 20 percent would migrate towards the surface of the proposed landfill. An impermeable liner would prevent this LFG from migrating into the soil underlying the proposed landfill. LFG migrating towards the landfill surface would be subject to aerobic decomposition, which would convert some methane and other organic constituents (i.e., ROG) to harmless water vapor and carbon dioxide. Puente Hills surface emission data is used to calculate the LFG that would escape into the atmosphere. The composition of the MSW residue is assumed to include the effect of AB 939 on materials recovery.

Estimates of emissions from the destruction or recovery of collected LFG are based on the four energy recovery approaches, which are included as anticipated project elements. To be conservative, it is assumed that a flare station would be used for the first 16 years. During this period, flare station oxides of nitrogen (NO_X) emissions would be less than 1,200 pounds per day, which is 88 percent of the 250 tons per year limit that would trigger a Prevention of Significant Deterioration (PSD) review. The 1,200 pounds per day maximum emission would allow the Proposed Action to qualify for a U.S. EPA tentative determination of PSD nonapplicability. Nitrogen dioxide (NO_2) is the attainment criteria pollutant potentially subject to PSD protection because flares emit less of other criteria pollutants and their precursors. NO_x, therefore, is subject to analysis both for PSD nonapplicability relative to NO_2 and for its role as a precursor to emissions of ozone (O_3), a nonattainment criteria pollutant.

LFG contains a variety of organic compounds, depending on the exact composition of the MSW residue and the anaerobic decomposition reaction products. Source tests are used to measure the destruction efficiency of flares. Usually, the concentration of only a few selected compounds are measured before and after a flare to calculate the destruction efficiencies. Pease et al. (1989) published the destruction efficiencies for six of the most common and most important compounds at the four Southern California landfills shown in Table 4-7. The arithmetic mean destruction efficiencies were calculated from source test data and usually exceeded 99 percent, except for benzene at Puente Hills and Spadra, and carbon tetrachloride at Puente Hills. Flares are assumed to destroy 99 percent of the toxic substances in LFG in this analysis. This efficiency of destruction would be achieved through the use of combustion temperature higher than 1400°F and a retention time greater than 0.6 seconds.

Once it becomes economically feasible and permitted, the energy in LFG methane would be recovered. Energy recovery would be a combination of the following options:

- A gas turbine, boiler, or combined cycle plant to generate electricity for on-site use and sale through the grid system which presently provides power for the Mesquite Mine.
- A methane gas plant to develop commercial quality methane for shipment by pipeline to an existing Southern California Gas Company natural gas pipeline in Niland.
- A plant to liquefy the methane, similar to liquefied natural gas (LNG), for transportation and sale off-site, or use with on-site equipment or locomotives delivering the MSW residue to the site.

The specific combinations of energy recovery utilized would be chosen to suit technology changes and future economic conditions. For analysis purposes only, the generation of electricity by a boiler burning LFG from "as received" MSW residue is assumed to be the energy recovery approach in order to calculate maximum-likelihood emissions for Year 100. Also, use of this technology would allow the proposed landfill to operate without exceeding PSD limits. This is a worst case air emission analysis as compared to the operation of a methane gas plant or a process plant to convert LFG to liquefied methane gas. For the LFG enhancement program analysis, energy recovery includes both a boiler/generator and a liquefied methane gas plant. The emissions and impacts of the assumed energy recovery facilities are presented after the air quality analysis of the Proposed Action.

Mobile Sources

Mobile sources are those sources which are not fixed in place. On-site mobile sources would consist primarily of off-road heavy-construction equipment. Off-road heavy-construction equipment would include dozers, compactors, tippers, end-dump trucks, water trucks, graders, loaders, fork lifts, container truck tractors, and miscellaneous medium/heavy-duty tow and maintenance trucks. Trains, highway MSW trucks (including MSW, agricultural residue, and delivery/pick-up) and employee vehicles are discussed separately below in the subsection titled "Transportation" because these mobile sources would be used primarily off-site.

The emission factors for each of these vehicle types is provided by the U.S. EPA (1985) and

TABLE 4-7

Flare Thermal Destruction Efficiency

Proposed Mesquite Regional Landfill

Flared Landfill Gas Nonmethane Organic Compounds	BKK Flare Destruction (percent)	Puente Hills Flare Destruction (percent)	Scholl Canyon Flare Destruction (percent)	Spadra Flare Destruction (percent)	Arithmetic Mean Flare Destruction (percent)	CAS No.	Synonyms
Benzene	99.66	76.88	99.3	98.47	93.58	71-43-2	--
Carbon Tetrachloride	99.97	96.92	99.9	99.2	99.00	56-23-6	Tetrachloromethane
Tetrachloroethene (PCE)	99.84	99.96	99.9	99.31	99.75	127-18-4	Perchloroethylene
Toluene	99.47	99.77	99.9	99.54	99.67	108-88-3	--
Trichloroethylene (TCE)	99.87	99.96	99.9	99.74	99.87	79-01-6	Trichloroethene
Vinyl Chloride	99.98	99.35	99.9	99.35	99.65	75-01-4	--
Arithmetic Mean Destruction Efficiency (%)	99.80	95.47	99.80	99.27	--	--	--

Source: Pease, Robert R., M. Nazemi, R. Millican, and S. Ebiner, 1989. Control options for landfill gas, Paper 89-155.005 presented at the Air and Waste Management Association Annual Meeting, Anaheim, California, June 26-30, 1989.

California Air Resources Board (CARB) (1992b). In addition, CARB will impose more stringent NO_x and carbon monoxide (CO) emission factors for off-road heavy-construction equipment in 1996, and in 2000. Because this equipment would be used so intensively, replacements would be procured every few years. New equipment would have improved emissions control and lower emissions as required by the U.S. EPA and CARB. It is assumed that all project-related equipment would be inspected and maintained regularly.

At the proposed landfill, the fleet of container and service trucks are assumed to be represented by the "Heavy-Duty Diesel Truck" category used by CARB to predict future average emission factors for vehicles in service in California.

CARB provides these emission factors for each year up through 2010 and makes them available in a model called E7EPSCF2 (CARB, 1992b).

Fugitive Sources

Fugitive sources consist primarily of LFG emissions from the surface of the landfill, and fugitive dust emissions. The important sources of fugitive dust emissions would include traffic on unpaved and paved roads, heavy-construction equipment moving soil, and wind erosion of exposed soil. Additional fugitive emissions would come from the evaporation of fuel from storage tanks and from the fueling process, which would produce a small source of reactive organic gases (ROG).

It is assumed that Best Available Control Technology (BACT) would be used on each source of fugitive emissions. This evolving technology would include watering unpaved roads, water flushing and sweeping of paved roads, using dust suppressants on disturbed areas that would not be used regularly, and controlling speeds.

Transportation

Transportation would include three types of mobile sources: trains, highway trucks and employee vehicles. Each type is subject to different regulations and technology advances.

Trains

Transportation emissions would be primarily associated with common carrier trains hauling MSW residue to the proposed landfill. The distances and route for this analysis are based on the railroad intermodal facility being at the LATC near downtown Los Angeles, and using the SP Main Line that travels east to Indio and southeast to the proposed landfill (see Figure 3-23).

As with all emission sources in the SOCAB, there presently is considerable regulatory discussion regarding approaches to reduce train emissions. For example, SCAQMD has set a goal that 90 percent of locomotives in the basin would be electrified by 2010 (SCAQMD, 1991a). Locomotive manufacturers are conducting research and development regarding electrification and other technologies to reduce emissions. Through these efforts, prototype locomotives fueled by LNG are expected to be available for testing soon (General Electric, 1992). Based on these types of efforts, it is anticipated that train locomotive emissions will be reduced substantially during the operating life of the proposed regional landfill. To be conservative, the air quality analysis assumes that:

- The current fleet of SP diesel locomotives would be used at the beginning of the Proposed Action.

- The locomotives used to haul MSW residue by Year 10[k] would still be <--
mostly diesel-powered, except that NO_x emissions would be reduced 55[k] percent by improved technology <--
that will be implemented to comply with SCAQMD Air Quality Management Plan Measure ARB-16. U.S. EPA's Proposed Rulemaking regarding "Approval and Promulgation of State and Federal Implementation Plans; California-Sacramento and Ventura Ozone; South

Coast Ozone and Carbon Monoxide; Sacramento Ozone Area Reclassification (U.S. EPA, 1994b, c); and the Association of American Railroads' proposal (U.S. EPA, 1994d).

--> At the LATC intermodal facility, the containers of MSW residue would be unloaded from the trucks by cranes and loaded on the train. A train would have two[(1)] diesel locomotives pulling 16 articulated rail cars, five sections to each car, and two containers held by a section. A train would carry 160 containers, and a container would hold 25 tons of MSW residue. The 16 rail cars would be kept together during the haul to and from the landfill. At the LATC, the train would be separated into two 8-car segments by line haul locomotives. Switching engines would not normally be used for these waste haul trains.

Additional train-related emission assumptions in the analysis include the following:

- A train would weigh about 3,000 tons with empty containers, but without MSW residue, and 7,000 tons with the addition of 4,000 tons of MSW residue in 160 containers.

- --> A train would be pulled by two[(1)] diesel locomotives, each rated at about --> 4,400[(1)] horsepower.

- Diesel fuel used in these locomotives would have less than 0.05 percent sulfur, the same limit set by the Clean Air Act (CAA) on diesel fuel for trucks and cars after October 1, 1993 (SP, 1992).

Special emission estimates are not provided for switching activities at the LATC intermodal facility because substantial amounts of rail car movements are not expected.

Emissions are not analyzed for the longer-term possibilities that locomotives would be electrified or powered by LNG. In those instances, emissions would be greatly reduced from those used for this analysis.

Highway Trucks

The collection trucks (also called packer trucks) that take MSW from homes and businesses (the generators) to transfer stations/MRFs are exactly the same for the Proposed Action and No Action Alternative. Consequently, because the packer trucks would continue to collect MSW from the generators and transport it to a transfer station/MRF, this activity is not part of the Proposed Action and is, therefore, not analyzed. Differences arise after MSW is delivered by the packer trucks to the transfer stations/MRFs. Truck haul from the transfer stations/MRFs to the LATC is analyzed.

Emissions are also estimated for 25 transfer trucks that would haul approximately 500 tons per day of Imperial County MSW residue if local communities decide to use the regional landfill. These estimates are also based on 20-ton transfer trucks, because in-county transfer stations may not include compactors. The number of transfer trucks required to haul all of the MSW residue generated in Imperial County is estimated to be approximately 30 for the next few years before full implementation of source reduction and recycling. This worst case estimate is not used for analysis of air quality impacts because it is very unlikely that Imperial County would close all of its public and private landfills by the year 2000 and send all of the county's MSW residue to the proposed Mesquite Regional Landfill. 25 trucks was chosen as a conservative maximum likelihood estimate for analysis purposes.

Delivery trucks would bring fuel and other supplies to the landfill each day. It is assumed that 16 trucks each day would drive 90 miles round trip from various cities in the area to deliver supplies.

Agricultural residue required to be diverted from burning to obtain offsets could be transported by truck to the landfill beginning sometime between the fifth and eighth years. Each of these trucks is assumed to carry approximately 20 tons and would drive 90 miles round trip from the crop fields in Imperial Valley. The number of trucks increases to approximately eight per day as the collection rate of LFG increases in subsequent years.

Private Vehicles

The landfill would directly employ about 268 people, at its maximum disposal rate of 20,000 tpd. These employees would commute to the site from communities such as Brawley, El Centro, Holtville, Imperial, Westmoreland, Calipatria, Calexico, Yuma, Palo Verde, and Blythe at an assumed average speed of 55 miles per hour the maximum speed limit on SR 78.

Air pollutant emissions associated with these employees and up to 16 daily truck deliveries/ pickups to the proposed regional landfill are estimated and included as on-site mobile emissions. The potential air quality effects of idling vehicles due to additional at-grade railroad crossing delays have been evaluated to determine if this factor could be potentially significant with regard to either air quality conditions at an intersection or as a contribution to overall emissions, especially in the SOCAB. These emissions are included with MSW transportation-related emissions.

Odor

At the landfill, the most important odor considerations are those associated with the exposed operating face and the container washdown facility. For the rail-haul route, odor considerations are those which could occur during normal MSW residue transport and extreme conditions, which potentially could occur if trains were delayed. A maximum likelihood train delay would be 24 hours in the hot desert.

Measures of Significance of Impacts

Significance is defined in order to reach conclusions about calculated ambient air quality concentrations that would be caused by the Proposed Action. Different significance measures apply for criteria pollutants, toxic emissions and odor and hence, are discussed separately.

Criteria Air Pollutants

Criteria pollutant air quality impacts resulting from the Proposed Action would be considered significant if the following might occur:

- Violation of California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS), whichever is strictest.
- Substantial contribution to an existing or projected violation of CAAQS or NAAQS.
- Proposed emission units would cause or make worse the violation of an ambient air quality standard.
- Contribution to a delay in attainment of a CAAQS or NAAQS according to a CARB-approved Air Quality Attainment Plan (AQAP).
- Determination that the Proposed Action is inconsistent with a CARB-approved AQAP (including visibility protection).

Toxics

Toxic compounds can potentially cause three types of health risk: carcinogenic, chronic and acute. Both carcinogenic and chronic risks are long-term and are based on annual average ambient air quality concentrations, while acute risk is short-term, and based on one-hour average concentrations.

A carcinogenic health risk is assumed significant if the probability of toxics causing excess cancer over a lifetime at a receptor site where people reside exceeds one in one hundred thousand. A chronic or acute risk is assumed significant if the hazard index for either type risk exceeds 1.0 at a receptor site where people reside.

The context for health risk in this analysis is the population available for potential health effects and the guidance provided in U.S. EPA (1992), California Air Pollution Control Officers Association (CAPCOA) (1992), and SCAQMD (1992b). In this remote project location, the three following situations were assumed to represent potential population exposure:

- Long-term exposure to a population of about 10 at Glamis, approximately five miles from the center of the landfill (3.1 miles from the southwest corner of the landfill). This situation represents a worst-case exposure of recreational populations around the sand dunes near Glamis (i.e., the recreationalists would not be subject to long-term continuous exposure).
- Individuals traveling on SR 78 exposed for 12 minutes (6 minutes each direction), five days per week for a 40-year period.
- Thirty days exposure to campers consisting of four individuals located adjacent to the landfill property boundary. (Camping in one location is allowed for only 14 consecutive days; therefore, this is a worst case assumption.)

Odor

Odor impacts would be considered potentially significant if effects of the Proposed Action were to noticeably change existing conditions at locations where odor could be noticed, including residential, commercial or recreational facilities.

4.1.8.3 Emission Sources

Criteria Pollutants

Landfill Site

Figures 4-3 and 4-4 show the approximate locations where point and fugitive LFG emissions and emissions of particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (Microns) (PM_{10}) would occur in Year 85 for the more constraining Alternative I facility configuration, respectively.

Table 4-8 summarizes the individual emission sources that were included with each major source category analyzed in Section 4.1.8.4, Impacts of the Proposed Action. This table also shows the types of controls that would be provided to satisfy:

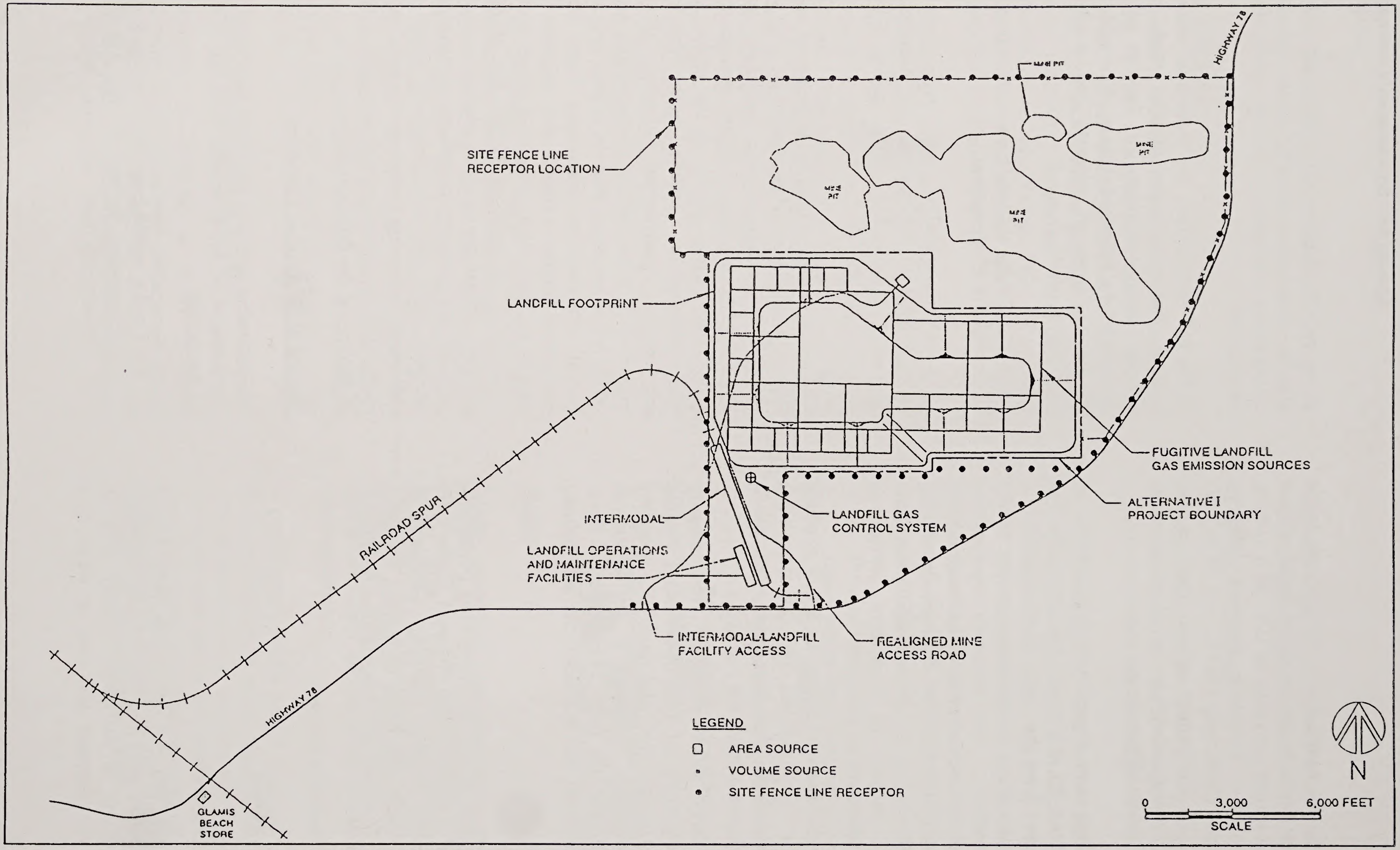
- BACT for stationary sources, required by ICAPCD regulations.
- Commercially available mobile equipment which would be manufactured to satisfy U.S. EPA and/or CARB requirements.

Initial construction would be a short-term source of emissions that precedes operation. For some projects, initial construction emissions are so large that the resulting ambient concentrations exceed the regular impact of the project after initial construction. Landfills, on the other hand, are ongoing construction projects. For the Proposed Action, initial construction would create fewer emissions than the normal operation. Initial construction emissions from heavy equipment engine exhaust and fugitive dust would be less than emissions from landfill activities at an input of 12,000 tpd of MSW residue. Initial construction emissions are not modeled for property boundary concentrations because they do not represent worst-case conditions. Ongoing construction emissions are included in the emissions estimates and analysis of impacts of the Proposed Action.

Related MSW Residue Transport

The following activities would be associated with the transport of MSW residue from the SOCAB to the landfill:

- Trucks would haul the containers to an intermodal facility at the LATC in downtown Los Angeles, where 160



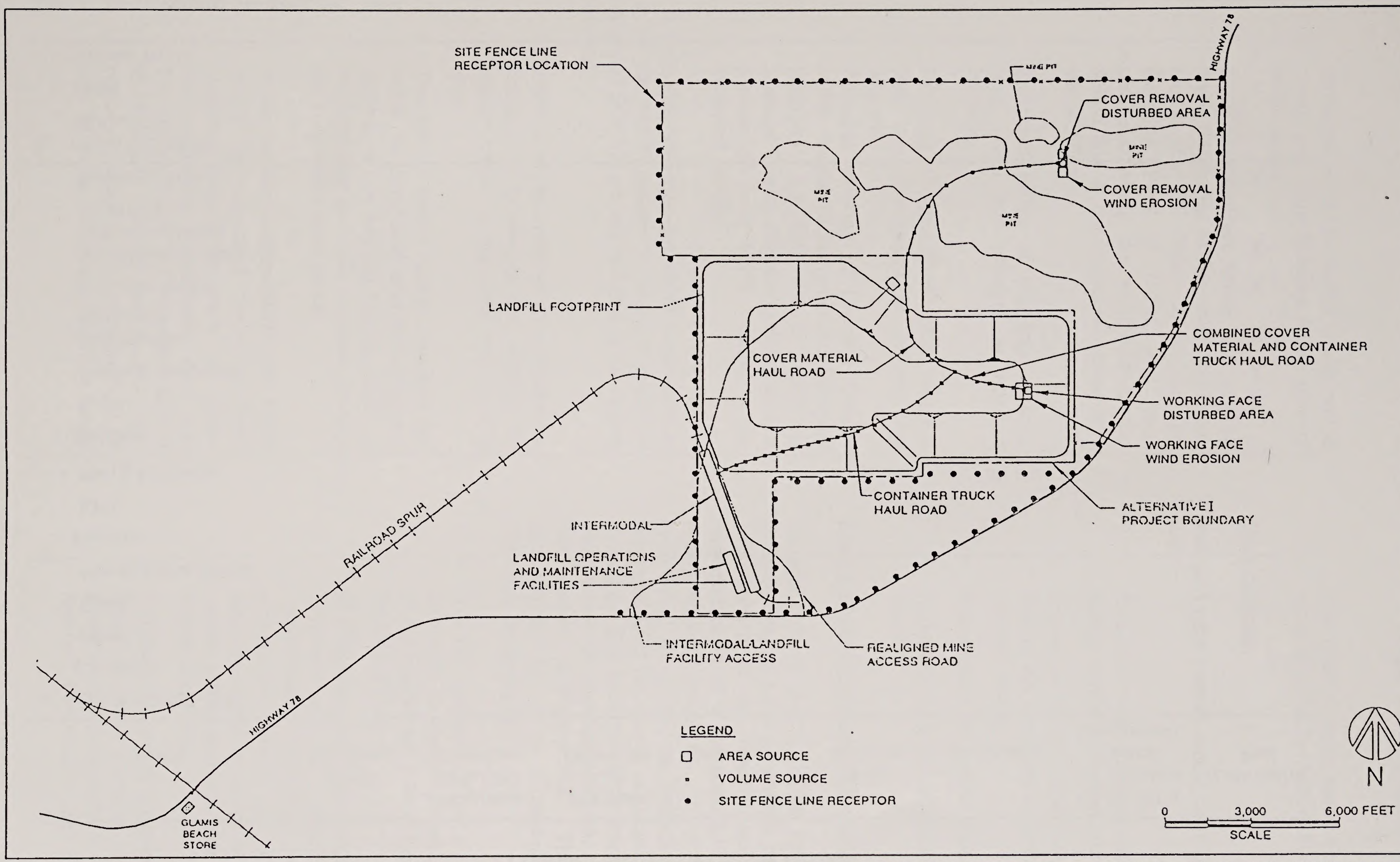
SOURCE: Environmental Solutions, Inc., 1992.

Proposed Mesquite Regional Landfill

Alternative I - Year 85/100 Point and Fugitive Landfill Gas Emission Source Locations

FIGURE

4-3



SOURCE: Environmental Solutions, Inc., 1992.

Proposed Mesquite Regional Landfill

Alternative I - Year 85/100 Fugitive PM_{10} Emission Source Locations

FIGURE 4-4

TABLE 4-8

Summary of Emission Sources and Control Assumptions
Proposed Mesquite Regional Landfill

Source	BACT Equipment	Minimum 80% LFG Collection	99% Trace Gas Destruction	Paved Roads	Water Spraying	Surfactants	CARB /EPA Air Pollution Control Assumptions	Low Sulfur Fuel
A. AT LANDFILL SITE								
• Stationary								
- Flare	X		X					
- Boiler	X		X					
- Miscellaneous Stacks	X							
• Fugitive								
- LFG		X						
- PM_{10} Emissions				X	X	X		
• Mobile								
- Cranes							X	X
- Disposal Equipment							X	X
- Construction Equipment							X	X
- Container Trucks							X	X
- Miscellaneous Site Vehicles including Supply Trucks							X	X
- Employee Trips							X	X
B. RELATED MSW TRANSPORT								
• Trains							X	X
• Transfer Trucks							X	X

Source: Environmental Solutions, Inc., 1994.

containers would be loaded on rail cars to create one train holding 4,000 tons of MSW residue.

--> • Two[1] locomotives would haul each of these trains (up to five each day) east along the SP Main Line through Banning Pass to Indio, and then southeast along the east side of the Salton Sea to the Proposed Action site, east of Glamis.

- Increased idling of highway vehicles (e.g., cars and trucks) at railroad crossing.
- Trucking of agricultural plant material (see the discussions of offsets that follows).
- Potential trucking of Imperial County MSW residue to the proposed Mesquite Regional Landfill would occur if Imperial County chooses to divert all or a portion of local MSW residue to the proposed landfill.

The following activities that would occur whether or not the MSW residue is disposed inside or outside of SOCAB are not included in the impact analysis:

- MSW would be collected from residences, commercial businesses and industry by packer trucks in the same way as it is now.
- The packer trucks would transport the MSW to combined transfer/compactor stations in Los Angeles County, much as happens now and will continue through the Proposed Action period.
- At the transfer stations/MRFs, the MSW would be separated into recyclable material categories such as glass, aluminum cans, green waste, tires, etc. The nonrecyclable MSW residue such as food waste would be loaded into containers, each of which would hold 25 tons of waste. The recycling that would take place at these stations would be the same as in the No Action Alternative.

Odor Sources

Potential odor sources would be those associated with:

- Emissions from MSW residue containers during normal train transport.
- Emissions from containers temporarily held in hot desert areas during infrequent railroad delays.
- Emissions at the landfill face.
- Emissions from the container washdown facility.

Energy Recovery Options Emission Sources

Chapter 2.0 of this EIS/EIR introduced the concept that, as LFG generation rates increase with growth of the landfill and/or through implementation of a full-scale LFG generation enhancement program, it may become economical to utilize the methane fraction of recovered LFG for on-site or commercial energy recovery. The location of the energy recovery plant would be approximately the same as the flare station in Figure 4-2. This could be accomplished by one or a combination of the following technologies:

- A LFG turbine or boiler to generate electricity to support power requirements of the landfill and related facilities and/or for sale off-site.
- A compressed methane plant to develop commercial or pipeline-quality compressed methane, similar to compressed natural gas (CNG). The methane would be piped to an existing natural gas transmission line located near Niland, California.
- A system to convert gaseous methane to liquid methane (similar to LNG). A portion could potentially be used for on-site fuel requirements, and the remainder

would be transported off-site by truck or rail car.

The specific combinations of energy recovery would be chosen to suit technology changes and future economic conditions. For analysis purposes only, the generation of electricity by a boiler burning LFG from "as received" MSW residue is assumed to be the energy recovery approach in order to calculate maximum likely emissions for Year 100, and not exceed PSD limits. For the analysis of MSW residue conditioned to increase LFG production, energy recovery is assumed to include a boiler/generator and a liquefied methane plant. The separate emissions of the proposed energy recovery facilities are presented in a separate section after the analysis of the Proposed Action. The following sources would be associated with each energy recovery system.

<u>LFG Turbine or Boiler</u>. Figures 2-23 and 2-24 show a schematic diagram for an energy recovery system based on use of a gas turbine and a boiler and generator to burn LFG and produce electricity. As noted above, boiler emissions have been calculated for this EIR/EIS analyses. Contaminants would be generated by the combustion of LFG and emitted from a stack adjacent to the boiler. Boilers and their accompanying air pollution control systems have been well developed over the last century, so that boilers have much lower emission factors than flares for ROG, PM_{10}, and CO, and half as much for NO_x.

<u>Compressed Methane Gas Plant</u>. Figure 2-25 shows a schematic diagram for a pipeline-quality compressed methane gas plant. The operation of this plant is described in Section 2.1.6.2. of this EIS/EIR. Contaminants may be emitted to the atmosphere by the following sources:

- Volatile organic compound (VOC) Incinerator: The VOC incinerator shown in Figure 2-25 would typically consist of three separate incinerators which are assumed for analysis of potential exhaust emissions. The following is a general description of emission sources from these incinerators.

- VOC Incinerator No. 1: This device would control the emission of VOCs stripped from condensate which has been separated from the LFG entering the compressed methane plant. This incinerator would be started with natural gas or propane, and fired with some of the compressed methane produced by the plant.

- VOC Incinerator No. 2: This device would control the emission of VOCs stripped from the cleansing solvent used to remove impurities from the LFG. This incinerator would also be fired with some of the compressed methane produced by the plant.

- VOC Incinerator No. 3: This device would control the emission of VOCs from the CO_2 adsorber and flash drums, which strip CO_2 and small quantities of VOCs from the cleansing solvent used to remove impurities from the LFG. This incinerator would also be fired with some of the compressed methane produced by the plant.

- Condensate Tank Vent: The condensate tank shown in Figure 2-25 would store condensate that has been separated from the LFG entering the compressed methane plant. VOCs vaporized from the condensate would be released uncontrolled to the atmosphere through the tank vent.

- Compressor Seals: The two-stage compression and cooling activities shown in Figure 2-25 would produce fugitive VOCs that would be released to the atmosphere from compressor seals.

- Miscellaneous Valves, Flanges, and Fittings: Fugitive VOCs from these devices would be emitted to the atmosphere.

Liquefied Methane Gas Plant - Figure 2-26 shows a schematic diagram for a liquefied methane gas plant. The operation of this plant is described in Section 2.1.6.2 of this EIS/EIR. The liquefied methane gas plant is fed with compressed methane gas which has been purified as described above for the compressed methane gas plant. The liquefied methane gas plant then compresses the gas further prior to production of liquefied methane gas. Therefore, each of the air contaminant emission sources listed above for the compressed methane gas plant also would be included at a liquefied methane gas plant. In addition, air contaminants would be emitted from the following source:

- CO_2 Vent; Small quantities of CO_2 and VOCs would be released uncontrolled to the atmosphere by the CO_2 separator.

4.1.8.4 Impacts of Proposed Action

Appendix F provides detailed calculations performed to evaluate air quality and odor impacts which would occur due to, or be related to the Proposed Action. These impact estimates are summarized in the following sections:

- Criteria pollutants:
  - Proposed landfill site
  - Transportation-related impacts
  - Consistency with air quality attainment plans
- Toxics
  - Landfill site
  - Transportation-related impacts
  - Consistency with air quality attainment plans
- Odor impacts
  - Landfill site
  - Transportation-related impacts
  - Consistency with air quality attainment plans

The emissions of the No Action Alternative are compared with emissions from the Proposed Action to evaluate: (1) the importance of potential project-related impacts, and (2) the manner in which compliance with attainment plans would be accomplished.

Criteria Pollutants

Proposed Landfill Site

Estimated Emissions

Table 4-9 summarizes estimated project emissions at Years 16 and 100, based on the LFG generation rates associated with "as received" MSW residue. Flares are assumed to destroy LFG in Year 16, while a boiler generator is assumed to reduce emissions in Year 100. Table 4-10 summarizes estimated project emissions at Years 16 and 100, with conditioning of the MSW residue for LFG augmentation. The emissions shown are for a boiler/generator in Year 16 and a boiler/generator together with a liquefied methane gas plant in Year 100. The waste characteristics, natural moisture content and rainfall assumptions used to predict LFG generation rates are provided in Appendix F. Because none of the stationary source emission rates in Tables 4-9 and 4-10 exceed 250 tons per year (1,370 pounds per day), PSD review and impact analysis is not required (U.S. EPA, 1994).

Boundary Concentrations

Table 4-11 summarizes the maximum off-site ground-level concentrations determined for NO_2, PM_{10}, sulfur dioxide (SO_2), and CO, where the property boundary (on-site Alternative I configuration) is closest to the landfill. These concentrations were calculated using U.S. EPA's ISCST2 model for the Year 16 with a flare station, and Year 100 with a boiler/generator. The use of a flare station for Year 16 would produce maximum emissions of NO_x, PM_{10} and CO because flare emission factors are higher than boiler emission factors as shown in Table 4-12.

The results show that ambient air quality standards would be met for Years 16 and 100. The estimated maximum concentrations of the

TABLE 4-9

Estimated Project Site Emissions At Year 16 and Year 100 With "As Received" MSW Residue

Proposed Mesquite Regional Landfill

I. YEAR 16 USING A FLARE

Source	Emissions (lbs/day)					
	NO_x	ROG	PM_{10}	SO_x	CO	
Stationary Sources	650	105[m]	260	130	105[m]	<--
Fugitive Sources	0	140[n]	115[o]	0	0	<--
Mobile Sources	1,580[p]	290	50	40	1,330[p]	<--
TOTAL	2,230[p]	535[m]	425[o]	170	1,435[p]	<--

II. YEAR 100 USING A BOILER/GENERATOR

Source	Emissions (lbs/day)					
	NO_x	ROG	PM_{10}	SO_x	CO	
Stationary Source (Boiler/Generator)	635[m]	30	10	360	5[m]	<--
Fugitive Sources	0	250	160	0	0	
Mobile Sources	1,605[p]	290	50	50	1,350[p]	<--
TOTAL	2,240[p]	570	220[o]	410	1,355[p]	<--

Note: Please see Table 4-8 for a listing of the various project components included as stationary, fugitive, and mobile sources.

Source: Environmental Solutions, Inc., 1994.

TABLE 4-10

**Estimated Project Site Emissions at Year 16 and Year 100
With MSW Residue Conditioning**

Proposed Mesquite Regional Landfill

I. YEAR 16 USING A BOILER/GENERATOR

Source	Emissions (lbs/day)					
	NO_x	ROG	PM_{10}	SO_x	CO	
Stationary Sources	695[n]	35[m]	10	400	5[m]	<--
Fugitive Sources	0	270	115[o]	0	0	<--
Mobile Sources	1,580[p]	290	50	40	1,330[p]	<--
TOTAL	2,275[p]	595[m]	175[o]	440	1,335[p]	<--

II. YEAR 100 USING A BOILER/GENERATOR AND A LIQUEFIED METHANE PLANT

Source	Emissions (lbs/day)					
	NO_x	ROG	PM_{10}	SO_x	CO	
Stationary Sources						
Boiler/Generator	340	20	5[m]	200	5[m]	<--
Liquefied Methane	120	120	5[m]	0	25[m]	<--
Total Stationary Sources	460	140	10[m]	200	30	<--
Fugitive Sources	0	460	160[n]	0	0	<--
Mobile Sources	1,605[p]	290	50	40	1,350[p]	<--
TOTAL	2,065[p]	890	220[m]	240	1,380[p]	<--

Source: Environmental Solutions, Inc., 1994.

TABLE 4-11

Estimated Maximum Off-Site, Ground-Level Air Pollutant Concentrations With Conditioned MSW Residue

Proposed Mesquite Regional Landfill

Pollutant	Averaging Period	Background Concentration (μg/m³)	Maximum Project Concentration (μg/m³)		Total Concentration (μg/m³)		California Ambient Air Quality Standards (μg/m³)	National Ambient Air Quality Standards (μg/m³)	
			Year 16	Year 100	Year 16	Year 100			
NO_2	1-hour	73.3 (1)	6.8(q)	2.6(w)	80.1	75.9	470	--	<--
	Annual Arithmetic Mean	5.6 (2)	0.09(r)	0.02(x)	5.7	5.6	--	100	<--
SO_2	1-hour	Negligible	3.9(s)	1.5(y)	3.9	1.5	655	--	<--
	3-hour	Negligible	3.5 (3)(s)	1.4 (3)(y)	3.5	1.4	--	1,300	<--
	24-hour	Negligible	0.7(t)	0.25(z)	0.7	0.25	131	365	<--
	Annual Arithmetic Mean	Negligible	0.05	0.01(aa)	0.05	0.01	--	80	<--
CO	1-hour	Negligible	0.04(u)	0.01(bb)	0.04	0.01	23,000	40,000	<--
	8-hour	Negligible	0.03 (4)(u)	0.01(4)(bb)	0.03	0.01	10,000	10,000	<--
PM_{10}	Annual Arithmetic Mean	28.0 (6)	2.8(v)	4.5(cc)	30.7	32.4	--	50	<--
	Annual Geometric Mean	21.1 (6)	2.8(v)	4.5(cc)	23.8	25.5	30	--	<--
	24-hour	21.1 (5) (6)	27.6(v)	22.4(cc)	48.7	43.5	50	150	<--

Notes:

(1) Highest 1-hour concentration measured at Mesquite Mine well field during a sampling program conducted from May, 1992 through May, 1993 occurred on October 6, 1993.
(2) Annual arithmetic mean measured at Mesquite Mine well field during the period May, 1992 through May, 1993.
(3) Estimated as 90 percent of the 1-hour mean SO_2 concentration computed with ISC2, where 0.9 scaling factor approved by CARB and U.S. EPA (CAPCOA, 1987).
(4) Estimated as 70 percent of the 1-hour mean CO concentration computed with ISC2, where 0.7 is scaling factor approved by CARB and U.S. EPA (CAPCOA, 1987)
(5) Annual geometric mean is the appropriate background concentration to add to 24-hour maximum project concentration because the latter occurs under low wind speeds of 0.4 to 2.4 miles per hour., while high 24-hour background levels occur only under high wind speeds.
(6) Based on Mesquite Mine monitoring from 1985 through 1993.
-- = None

Source: Environmental Solutions, Inc., 1994.

TABLE 4-12

Emissions Factors for Landfill Gas Thermal Destruction Devices

Proposed Mesquite Regional Landfill

	Emission Factor (Lb/Million BTU)				
Device	NO_x	ROG	PM_{10}	SO_x	CO
Flare(1)	0.062	0.01	0.025	0.012	0.01
Boiler(2)	0.035	0.0017	0.0006	0.02	0.0002

Notes:

(1) Carnot. Emissions tests on the Puente Hills Energy Recovery from Landfill Gas (PERG) Facility - Unit 400, report prepared for County Sanitation Districts of Los Angeles County, September 1991.

(2) Carnot. SCAQMD Performance Tests on the SPADRA Energy Recovery from Landfill Gas (SPERG) Facility, October 1991.

Source: Environmental Solutions, Inc., 1994.

gaseous criteria pollutants (NO_2, SO_2, and CO) are almost negligible compared to AAQS. The maximum project concentrations combined with the indicated background concentrations do not cause the total concentrations of these pollutants to exceed AAQS. Even the emissions shown in the bottom half of Table 4-10 for MSW residue conditioning at Year 100 would not cause exceedances of the AAQS. The expected effects of MSW conditioning can be seen by comparing the bottom halves of Tables 4-9 and 4-10. MSW residue conditioning with a boiler/generator and liquefied methane gas plant would cause a total emissions decrease for NO_x (9%), and oxides of sulfur (SO_x) (40%), and emission increases for ROG (58%), PM_{10} (2.8%), and CO (2%). Applying the increases to the maximum project concentrations in Table 4-11 causes the total concentrations shown in Table 4-11, which do not exceed AAQS. The NO_2 and SO_2 estimates are based on the conservative assumption that all of the emitted NO_x and SO_x is in the form of these specific criteria pollutants.

The PM_{10} emissions would be below standards because of the planned application of BACT to fugitive emissions. Unpaved roads would be watered or treated with dust suppressants, similar to the watering/use of dust suppressants proven at the Mesquite Mine. Each day, paved roads would be water-flushed clean of dust deposits. Exposed areas would be watered or treated with dust suppressants, if needed. The following tiered fugitive dust monitoring and control program would be implemented by the Applicant to assure that PM_{10} concentrations would not exceed the model estimates.

- Tier I - Meteorological and Particulate Monitoring Program: The Mesquite Mine continuous recording meteorological station, which measures wind speed and direction, would continue to be operated after the mine is closed. When wind speeds exceed 25 miles per hour, landfill operators would be instructed to curtail dust generating activities such as site clearing; stability berm and other dust generating construction; unnecessary vehicle trips; and excavation, hauling (unless covered), and placement of cover material. It may not be feasible to curtail activities associated with placement of daily cover because of permit requirements, but activities associated with intermediate cover would be curtailed until winds subside.

  Ambient particulate monitoring devices would continue to be operated at their current or new locations approved by ICAPCD. Particulate and meteorological monitoring data would be reviewed periodically, as required by ICAPCD permits, to determine whether landfill activities were responsible for causing PM_{10} concentrations higher than model estimates. The PM_{10} concentration increase that would trigger Tier II measures would be determined in consultation with ICAPCD.

- Tier II - Additional Watering or Use of Dust Suppressants: Watering would be increased to the maximum practical extent that would not cause mud or slippery conditions. If a specific increase in PM_{10} concentration above model estimates (based on consultation with ICAPCD) were to be attributable to the landfill, use of chemical dust suppressants on unpaved roads would be implemented if such suppressants are required by the ICAPCD.

- Tier III - Enhanced Dust Control Measures: If Tier II control measures were not sufficient to prevent the specified increases in PM_{10} above model estimates, the Applicant would evaluate for implementation one or more of the following potential dust control technologies:

  - Application of dust suppressants, gravel, or placement of geotextile fabrics on wind eroding areas.

  - Installation of temporary and permanent wind breaks along paved roads and around the active face working areas.

- Alternate methods for application of daily cover material to the active working face.

Tier III controls would be implemented individually on a case-by-case basis, as required by ICAPCD.

Transportation-Related Impacts

MSW Residue Transportation-Related Impacts

Table 4-13 summarizes estimated emissions associated with transport of MSW residue to the proposed landfill site for maximum disposal rate of 20,000 tpd, which is assumed to be reached in about eight years. Truck emissions from the transfer of MSW residue to the intermodal facility would enter only the SOCAB atmosphere, while the trains' emissions would occur along the entire route.

Additional transport-related emissions, which have also been estimated, are associated with idling of highway vehicles due to delays at rail grade crossings. Using the total magnitude of these delays estimated by Southern California Association of Governments (SCAG) (1988) and CARB (1988) EMFAC idle emission factors, the emissions associated with this total delay would amount to six pounds per day of NO_x, seven pounds per day of ROG, and 68 pounds per day of CO. These emissions are inconsequential in comparison to the total emissions at the rail crossings caused by highway vehicle traffic each day.

To summarize project-related MSW residue transport emissions in the SOCAB, Table 4-14 shows total emissions in the SOCAB of the five criteria pollutants of concern, emissions from all trains in the SOCAB, emissions from the five project-related trains, and total project-related transport emissions in the SOCAB (trains, container trucks and LATC activities). Although small, compared to total emissions in SOCAB, the Proposed Action would decrease the emissions of all five criteria pollutants compared to the emissions associated with a No Action Alternative that continued to landfill in SOCAB. If the MSW residue were instead hauled to a different regional landfill outside of the SOCAB, air quality benefits similar to those associated with the Proposed Action would occur.

The analysis of the impacts of transportation-related emissions begins with a review of the regional aspects of the existing environment. SOCAB is classified as extreme nonattainment for O_3, which is the primary pollutant targeted for improvement in the 1991 SCAQMD AQMP. The Coachella Valley and Imperial County areas are both classified as state nonattainment for O_3. Exceedances of the standard are mostly due to transport of ozone from outside of the area. In Coachella Valley, this transport appears to be entirely from the SOCAB. In Imperial County, the transport origin appears to be a combination of Mexicali, Mexico; the SOCAB; and possibly San Diego, while local emissions also contribute to the nonattainment.

Figure 4-5 illustrates how the reduction in NO_x and ROG emissions in the SOCAB would result in ozone improvements in each area. Part A of this figure illustrates why NO_x and ROG emissions in SOCAB are much more important than the same emissions in the Coachella Valley and Imperial County. The low inversion layer elevation in SOCAB (generally below the elevation of Banning Pass) traps these ozone precursor emissions during the night and early morning. The thin mixing layer increases the concentrations of NO_x, ROG, and other molecules that photochemically form O_3 during sunlight hours. O_3 levels in the two desert areas are much less because precursor emissions (NO_x and ROG) and O_3 are mixed through the deep desert mixing layer, and some of the nighttime emissions of O_3 precursors are dispersed before daytime O_3 creation occurs.

Part B of Figure 4-5 illustrates the number of days O_3 state standards are exceeded. The most frequent exceedances occur in the basin portions of San Bernardino and Riverside counties, as the

TABLE 4-13

**Estimated MSW Residue Transport-Related Emissions
At 20,000 Tons Per Day (lb/day)
For Year 100**

Proposed Mesquite Regional Landfill

Location/Source	NO_x	ROG	PM_{10}	SO_x	CO	
SOCAB						
Trucks	540	110	60	15[m]	415[m]	<--
Trains	1,480[k][l]	60[l]	30[l]	50[l]	270[l]	<--
LATC	330	30	30	5[l]	135[m]	<--
Total SOCAB	2,350[k][l]	200[l]	120[l]	70[l]	820[l]	<--
Coachella Valley (trains)	880[k][l]	30[l]	20[l]	30[l]	160[l]	<--
Imperial County (trains)	680[k][l]	30[l]	20[l]	20[l]	125[l]	<--
TOTAL	3,910[k][l]	260[l]	160[l]	120[l]	1,105[l]	<--

Note: Does not include at-grade railroad crossing vehicle delay emissions.

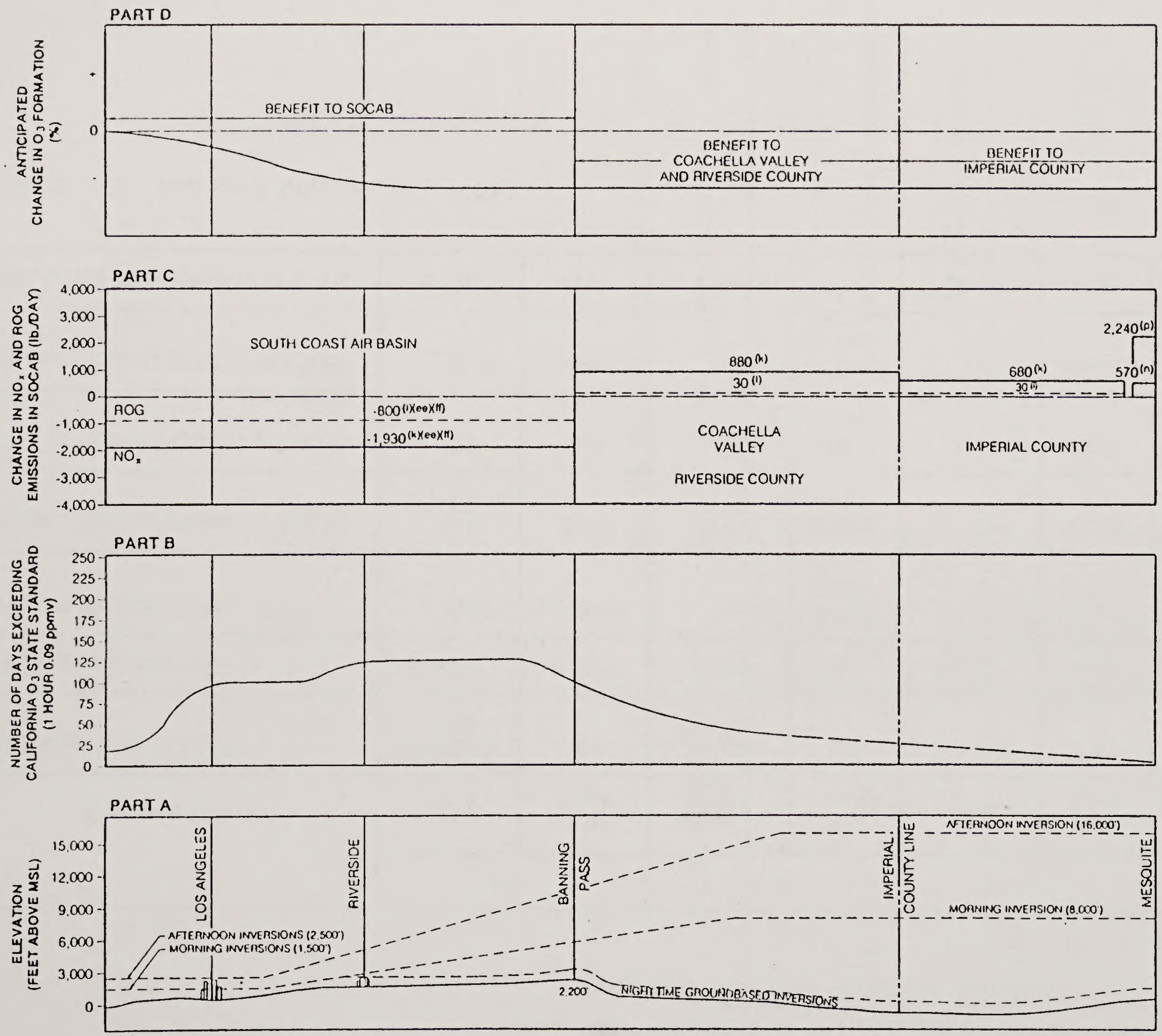
Source: Environmental Solutions, Inc., 1994.

TABLE 4-14

Project-Related
MSW Residue Transport Emissions in
Years 100 Compared to SOCAB Emissions in 1987
Proposed Mesquite Regional Landfill

Emission Source	NO_x		ROG		PM_{10}		SO_x		CO		
	Lb/Day	% of Total	Lb/Day	% of Total	Lb/Day	% of Total	Lb/Day	% of Total	Lb/Day	% of Total	
All Sources in SOCAB	2,600,000 (dd)	100	3,200,000 (n)(dd)	100	2,200,000	100	250,000 (dd)	100	13,500,000 (dd)	100	<--
All Trains in SOCAB	63,000	2.4[ee]	3,000	0.1	1,400	0.06	4,400	1.8[ee]	9,400	0.07[ee]	<--
Project-Related Trains	1,480[k]	0.06[k][dd]	60[l]	0.002 (l)(dd)	30[l]	0.001[l]	50[l]	0.02[n] (l)(dd)(ee)	270[l]	0.002[l]	<--
Project-Related Container Trucks	540	0.02	110	0.003 (dd)	60	0.003	15[m]	0.006 (ee)	415[m]	0.003[m]	<--
Project-Related Activity at LATC	330	0.01	30	0.0009 (ee)	30	0.001	5[m]	0.002 (ee)	135[m]	0.001	<--
Project-Related Total in SOCAB	2,350[k]	0.09[ee][k]	200[l]	0.006 (l)(dd)	120[l]	0.005[l]	70[l][m]	0.03[ee]	820[l]	0:006[l]	<--
No Action Alternative in SOCAB	4,280[ff]	0.17	1,000[ff]	0.03	455[m]	0.02	575	0.21	2,810[ff]	0.03	<--

Source: Environmental Solutions, Inc., 1994.



EMISSIONS IN SOCAB FOR YEAR 100 WITH BOILER/GENERATOR MESQUITE REGIONAL LANDFILL (pounds/day)

ACTIVITY	PROPOSED ACTION EMISSIONS IN SOCAB		
	NO_x	ROG	BOTH
CONTAINER TRUCKS AND LATC	870	140	1,010
TRAINS	1,480[k]	60[l]	1,540[ee]
LANDFILL BOILER AND FUGITIVES	0	0	0
LANDFILL EQUIPMENT EXHAUST AND FUGITIVES	0	0	0
TOTAL	2,350[k]	200[l]	2,550[ee]

ACTIVITY	NO ACTION EMISSIONS IN SOCAB		
	NO_x	ROG	BOTH
CONTAINER TRUCKS	1,910	370	2,280
TRAINS	0	0	0
LANDFILL BOILER AND FUGITIVES	830	360	1,190
LANDFILL EQUIPMENT EXHAUST AND FUGITIVES	1,540[m]	270[m]	1,810[m]
TOTAL	4,280[m]	1,000[m]	5,280[m]

SOURCE: Environmental Solutions, Inc. 1995.

Proposed Mesquite Regional Landfill

Emissions and Effect on Ozone of Landfill vs. No Action Alternative

FIGURE 4-5

pollutants are blown eastward by ocean breezes and become trapped below the inversion layer before Banning Pass. The exceedances of ozone east of the pass are primarily the result of leakage that occurs from SOCAB. The exceedances decrease with distance due to dilution and destruction of ozone molecules.

Part C of Figure 4-5 shows the changes in NO_x and ROG that would occur as a result of the Proposed Action in the 100th year. The most important changes are the decreases that would occur in the SOCAB.

The added O_3 concentration that would occur in the Coachella Valley due to the NO_x and ROG emissions along the rail line in that area was estimated with a model, and the results are shown in Table 4-15. These estimates indicate that the average O_3 concentration increase due to the maximum added train activity would be on the order of 0.08[ee] part per billion by volume (ppbv). This concentration is much lower than background and below the detection limit of most O_3 monitoring instruments, and hence, would not noticeably contribute to exceedances caused by SOCAB transport that frequently reach concentrations of 180 ppbv. Also, when conditions in SOCAB are improved so that transport no longer causes exceedances, the additionally derived train emissions in Coachella Valley would not cause local exceedances.

A similar analysis for train-related emissions in Imperial County shows comparable or lower O_3 concentrations because the dominant west winds (discussed in Chapter 3.1.8) effectively widen the box and transport the lower concentration of O_3 to the eastern low population area.

Finally, Part D illustrates how the changes in NO_x and ROG emissions would tend to reduce O_3 concentrations along the entire rail-haul route. The relative improvement would gradually increase toward the east side of the SOCAB and then would remain essentially constant within the areas of transport. The dilution effect with distance would affect the magnitude of the transported O_3 problem and its reduction equally.

Table 4-16 shows that there would be substantial reductions in each of the other criteria pollutants in the SOCAB as a result of the Proposed Action's replacement of existing or new landfills in the basin. This would result in direct improvements for each of the other nonattainment pollutants: NO_2, PM_{10}, and CO. Based on these comparisons and the above O_3 evaluation, it is concluded that air quality effects in the SOCAB would be positive (i.e., no significant adverse impacts would occur as a result of the Proposed Action).

Table 4-16 also shows that there would be increases of the emission rate for each of the criteria pollutants in the Coachella Valley as a result of the common carrier trains that would transport MSW residue to the regional landfill. The increases associated with the NO_x[hh], ROG, PM_{10}, SO_x and CO would be 0.7[k], 0.01[l][hh], 0.004[l][jj], 0.2[l] and 0.02[l][hh] percent, respectively, of the 1987 total emissions of these pollutants in that area. The small increase in NO_x emissions would cause an ambient concentration of about 0.035[ee] µg/m^3 of NO_2, (Table 4-15) which is much lower than the NO_2 CAAQS of 470 µg/m^3 and background concentration of 39 µg/m^3. The small increases in NO_x and ROG emissions from trains would not cause the production of significant O_3, as discussed above. The O_3 concentrations that could cause exceedances might actually decrease, despite these small project-related emissions, because the decreases in NO_x and ROG emissions in SOCAB would decrease the O_3 generated in the SOCAB and transported into Coachella Valley.

The PM_{10} increase of about 0.0008[ee] µg/m^3 (see Table 4-15) would not substantially affect the time required to reach attainment for that pollutant in Coachella Valley where the annual geometric mean concentration was 37 µg/m^3 in Palm Springs (SCAQMD, 1992). The 0.0013[ee] µg/m^3 increase of SO_x and 0.007[ee] µg/m^3 of CO concentrations would be far below the 105[b] and 10,000[n] µg/m^3 CAAQS for these attainment pollutants. Based upon these

TABLE 4-15

Train Emissions and Ambient Air Quality Impacts in Coachella Valley

Proposed Mesquite Regional Landfill

Air Pollutant	Emissions per Train (1)(gg) (lb)		Resulting Increase in Ambient Concentration (micrograms per cubic meter [$\mu g/m^3$])	Background Concentration(2) ($\mu g/m^3$)	CAAQS Concentration and Averaging Time ($\mu g/m^3$)	<--
	Eastbound	Westbound				
NO_x	127(k)	185(k)	0.035(ee) (0.02 ppbv)	39(3)	470 (1 hour, as NO_2)	<--
ROG	5(l)	7(l)	0.0014(ee)	No Data	NA	<--
PM_{10}	3(l)	4(l)	0.0008(ee)	37(4)	50 (24 hours)	<--
SO_x	5(l)	6(l)	0.0013(ee)	No Data	105(b) (24 hours, as SO_2)	<--
CO	25(l)	33(l)	0.0066(ee)	No Data	10,000(n) (8 hour)	<--
O_3	NA(n)	NA(n)	(0.08 ppbv)(ee)	80(5)	180 (1 hour) (= 90 ppbv)	<--

Notes:

(1) Eastbound and westbound trains haul different loads through different combinations of uphill and downhill segments.
(2) Annual Mean Concentrations.
(3) Annual Arithmetic Mean NO_2 in 1991 for Palm Springs = 20.8 ppbv (SCAQMD, 1992a)
(4) Palm Springs Annual Geometric Mean (SCAQMD, 1992a).
(5) Annual Arithmetic Mean O_3 in 1991 for Palm Springs (CARB, 1992a).
NA = Not Applicable.

Source: Environmental Solutions, Inc., 1994.

TABLE 4-16

Comparison[(1)] of Proposed Action and "No Action" Alternative Maximum Anticipated Emissions For Year 100 With Boiler/Generator (lb/day)

Proposed Mesquite Regional Landfill

I. SOCAB	NO_x	ROG	PM_{10}	SO_x	CO	
Proposed Action	2,350[(k)]	200[(l)]	120[(l)]	70[(l)]	820[(l)]	<--
No Action Alternative	4,280[(ff)]	1,000[(ff)]	455[(m)(ff)]	575[(m)]	2,810[(ff)]	<--
All Sources in SOCAB[(2)] (1987)	2,600,000[(dd)]	3,200,000[(dd)]	2,200,000[(m)]	250,000[(dd)]	13,500,000[(dd)]	<--
II. COACHELLA VALLEY	NO_x	ROG	PM_{10}	SO_x	CO	
Proposed Action	880[(k)]	30[(l)]	20[(l)]	30[(l)]	160[(l)]	<--
No Action Alternative	0	0	0	0	0	<--
All Sources in Coachella Valley (1987)	123,000[(3)(hh)]	314,000[(3)(hh)]	522,000[(3a)(c)(jj)]	17,000[(3)]	900,000[(3)(hh)]	<--
III. IMPERIAL COUNTY	NO_x	ROG	PM_{10}	SO_x	CO	
Proposed Action						
Site	2,240[(p)]	570	220[(o)]	410	1,355[(p)]	<--
Miscellaneous [(5)]	160[(ll)]	20[(ll)]	10[(ll)]	5[(ll)]	170[(ll)]	<--
Trains	680[(k)]	30[(l)]	20[(l)]	20[(l)]	125[(l)]	<--
Total	3,080[(k)(ee)]	620[(l)(ee)]	250[(ee)]	435[(ee)]	1,650[(ee)]	<--
No Action Alternative	0	0	0	0	0	
All Sources in Imperial County (1987)[(4)]	61,600	57,000	1,900,000[(ii)]	3,600	250,000	<--

Note: A "No Action" Alternative that rail hauls MSW to landfills ourside of the SOCAB would have effects similar to those described for the Proposed Action.

"No Action" Alternative information is for a "No Action" Alternative that continues to dispose of SOCAB MSW in landfills located in the SOCAB.

(1) Emissions between MSW generators and transfer/compactor stations are identical for Proposed Action and No Action alternatives. After the trucks leave these stations, the emissions are summed to provide the values in this table.
(2) SCAQMD Air Quality Management Plan, 1994a.
(3) SCAQMD, 1991a.
(3a) SCAQMD, 1994b.
(4) Imperial County Air Quality Attainment Plan, 1992.
(5) Miscellaneous sources of emissions includes employee vehicles, delivery vehicles, transfer trucks hauling Imperial County MSW residue, and trucks hauling agricultural plant material diverted from burning.

Source: Environmental Solutions, Inc., 1994.

relatively small increases and the anticipated improvement in O_3 transport, the Proposed Action would not result in significant adverse air quality impacts in the Coachella Valley.

A similar analysis of the transportation (train) emissions in Imperial County shows them to be --> 1.1[k], 0.05[l], 0.001, 0.6[l], and 0.05[l] percent of the 1987 baseline inventory of NO_x, ROG, PM_{10}, SO_x, and CO, respectively. These train emissions would be a small contribution to the --> baseline inventory, except for the 1.1[k] percent NO_x increase. These increases would cause ambient concentrations similar to those for the Coachella Valley, which would be small compared to CAAQS. In addition, the railroad line is located 10 to 30 miles northeast of the communities in Imperial County, and the prevailing wind is from the west. Therefore, NO_x emitted by trains would not noticeably contribute to existing O_3 exceedances in the populated portion of Imperial County.

The final rail transportation-related air quality impact evaluation is to determine if idling highway vehicles at railroad crossings could cause ambient concentrations that exceed CAAQS. The intersection at Ramona Avenue was selected for this analysis because of the large volume of road traffic and relatively slow train speeds at that location. Idling emissions of delayed vehicles at this intersection would cause a maximum of 188 and 1,600 µg/m^3 of NO_2 and CO, respectively, which are well below the one-hour standards of 470 and 23,000 µg/m^3. As a result, this effect would not be significant.

Should Imperial County truck MSW residue to the proposed landfill, additional transportation-related air quality impacts would occur in --> Imperial County. The addition of up to 25[n] MSW residue transfer trucks would produce incremental impacts that would not change the conclusion that with proposed offsets and emission controls, air quality impacts would be below a level of significance.

<u>Commuting and Delivery Emissions</u>

Employee transportation impact is based on about 268 people commuting from local communities about 90 miles each day. The emissions from their personal vehicles are highest in Year 8 when the landfill first reaches its maximum input rate and when their vehicles have the highest emission factors. Project-related non-MSW residue deliveries and pickups by up to 16 trips per day would also occur. Round trip distances are assumed to average 90[kk] miles, based on the assumption that goods <-- and services come from the same cities as the employees. Up to 500 tons per day of Imperial County MSW residue may be transported by 20-ton transfer trucks from local cities to the proposed landfill. If agricultural burning is diverted to provide offsets, then 149 tons per day of plant residue may be transported by truck from Imperial Valley agricultural fields to the landfill. The exhaust emissions from these four types of vehicles would be 5.5[ll], 3.2[ll], 4.0[ll], <-- 1.1[ll], and 10.4[ll] percent of the NO_x, ROG, <-- PM_{10}, SO_x, and CO emissions from both the project site and project-related transport emissions in Imperial County. These emissions would occur over rural roads with almost no residences or commerce located between their home communities and the site. Therefore, the impact of these vehicles would be negligible, and would decrease beyond Year 8 because of lower emitting vehicles joining the car/light truck population.

<u>Proposed Offsets</u>

The APCD New and Modified Stationary Source Review rule, approved in September 1993, requires that emissions of nonattainment pollutants and precursors be "offset" by equal or greater reductions of each emitted pollutant such that no net increase occurs. Up to 137 lbs/day of a nonattainment pollutant or precursor may be emitted without triggering the offset requirement.

Nonattainment emissions above this threshold would provide the necessary offsets, which amount to 1.2 times the emission rate. For the Proposed Action, this threshold would be exceeded beginning in the fifth year of operations. Therefore, the Proposed Action would have an emission offset program, in which nearby sources would reduce emissions of nonattainment pollutants to offset project-related stationary source emissions. These pollutants include PM_{10} and its precursors, and ozone and its precursors. Other offset sources could be identified in the future by Imperial County or the Applicant and utilized subject to permits issued by the Imperial County Air Pollution Control District. The proposed program is discussed below.

The Mesquite Mine will continue to operate at its current level until 1997. Current plans are to start reducing mining operations in 1997, which would reduce fugitive PM10 and mobile emission but not a significant amount of stationary source emissions. It is only the reduction of stationary source emissions that could provide offsets for the stationary source emissions from the Proposed Action. The diversion of burning agricultural plant material in Imperial County is a source of offsets for the Proposed Action. The offset would result from gathering the agricultural plant material that would otherwise be burned in the fields. The plant material is assumed to be hauled to the landfill where it would be used as a cover amendment or landfilled, hauled to a permitted composting facility, retilled into the soil, or otherwise diverted from burning.

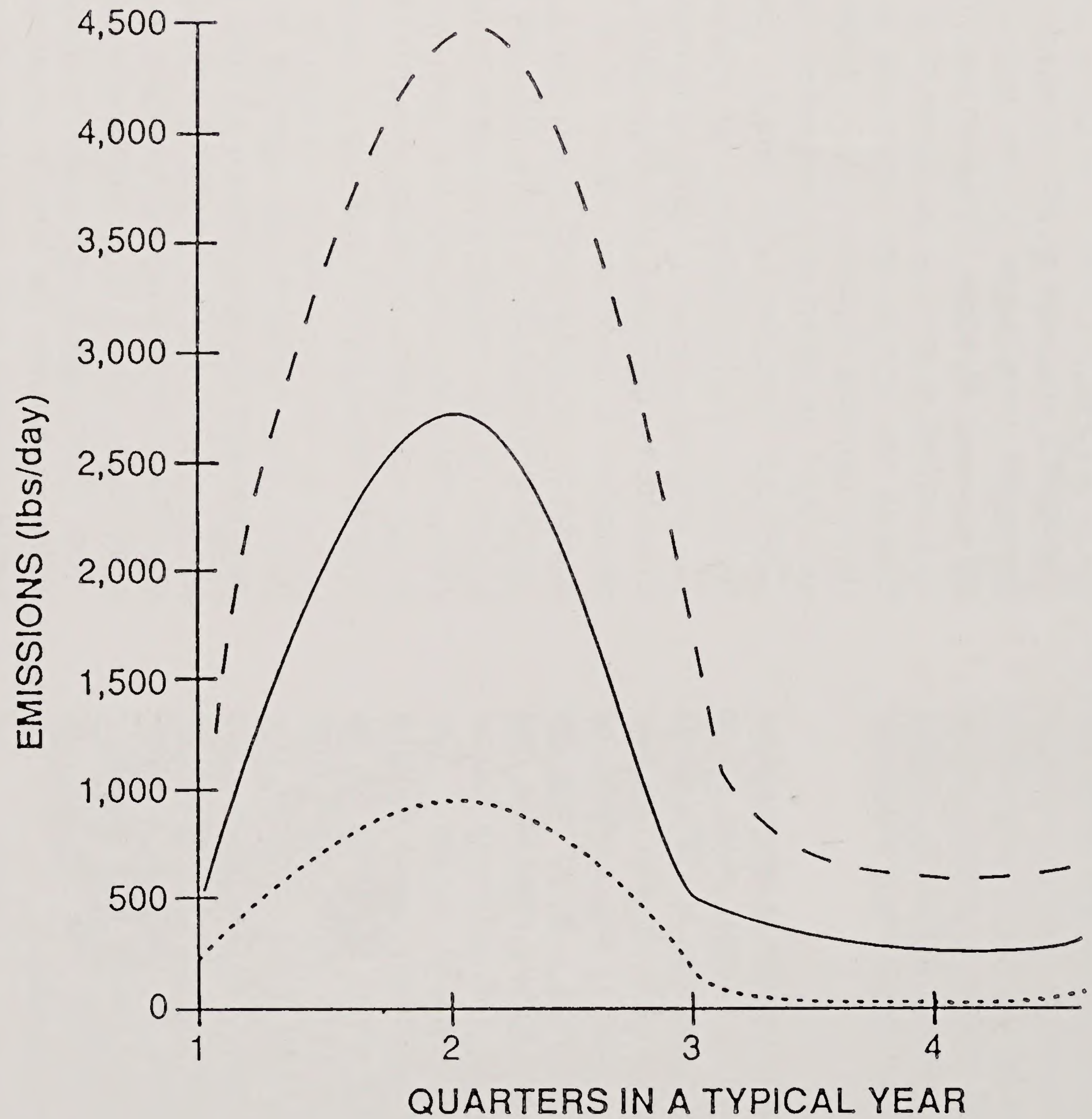
Agricultural burning in Imperial County is primarily a source of PM_{10}, ROG, NO_x and CO. SO_x is also emitted by date palm frond burning. Records of acres and tons of waste burned in Imperial County are kept by ICAPD. The recorded amount of these wastes burned each quarter from 1985 to 1992 is presented in Appendix F, Air Quality Technical Report, of this EIS/EIR.

The arithmetic mean, maximum, and minimum emissions of NO_x, ROG, ozone precursors (NO_x + ROG), and PM_{10} for the burning of agricultural plant material during each calendar quarter from the period 1985 to 1992 are shown in Figures 4-6 through 4-9 as the annually cyclic curves. The diversion of agricultural plant material from burning would provide a sufficient reduction in emissions to offset the landfill stationary source emissions.

The landfill emissions would continue to increase during the same period of time emissions from the adjoining Mesquite Mine decrease. The mine is permitted to move a maximum of 40 million tons of ore, protore and overburden in a year (Environmental Solutions, Inc., 1989). The associated permitted total suspended particulate (TSP) emissions are 1,630 tons per year. The fugitive particulate emissions are approximately 22 percent PM_{10} (TRC Environmental Consultants, 1987; and U.S. EPA, 1985) and the particulate in the diesel exhaust of the mobile equipment is considered to be PM_{10}. Other criteria pollutants (NO_x, ROG, SO_x, and CO) are emitted by the mobile equipment at permitted rates consistent with the fuel use needed for heavy equipment to move the maximum 40 million tons of material a year.

Actual mine emissions are expected to remain constant over the time interval of 1991 through 1997. After 1997, the mine emissions are expected to decrease and hence begin to provide a source of offsets for project emissions. The offset in any given year would be equal to the difference between the historic actual stationary source emissions at the mine during the previous three years and the actual stationary source emissions for the given year.

The reduction in total mine emissions is shown along with the projected increase in landfill emissions of NO_x, ROG, PM_{10}, SO_x, and CO from start of the Proposed Action through closure in Figures 4-10 through 4-14. Almost all of these emissions are fugitive PM_{10} and mobile source exhaust emissions from heavy-



LEGEND
- – – – Maximum NO_x Emissions from Agricultural Burning (1)
- ——— Mean NO_x Emissions from Agricultural Burning (1)
- ········ Minimum NO_x Emissions from Agricultural Burning (1)

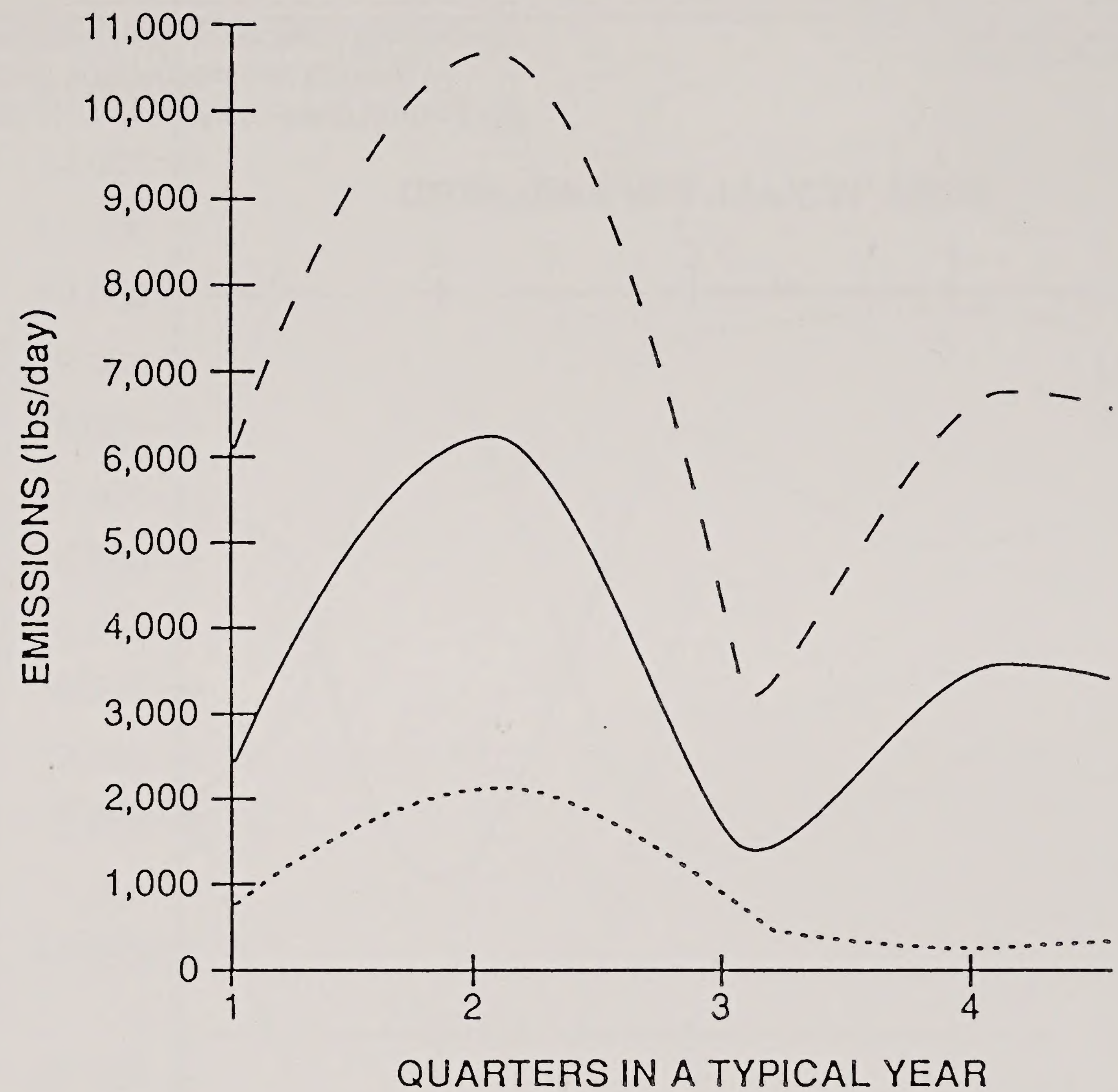
(1) Emissions estimated from records of agricultural burning in Imperial County during period 1985-1992.

SOURCE: ICAPCD, 1993.

Proposed Mesquite Regional Landfill

Potential NO_X Emissions Offset Available from Agricultural Burning

FIGURE **4-6**



LEGEND

- - - Maximum ROG Emissions from Agricultural Burning (1)
—— Mean ROG Emissions from Agricultural Burning (1)
······· Minimum ROG Emissions from Agricultural Burning (1)

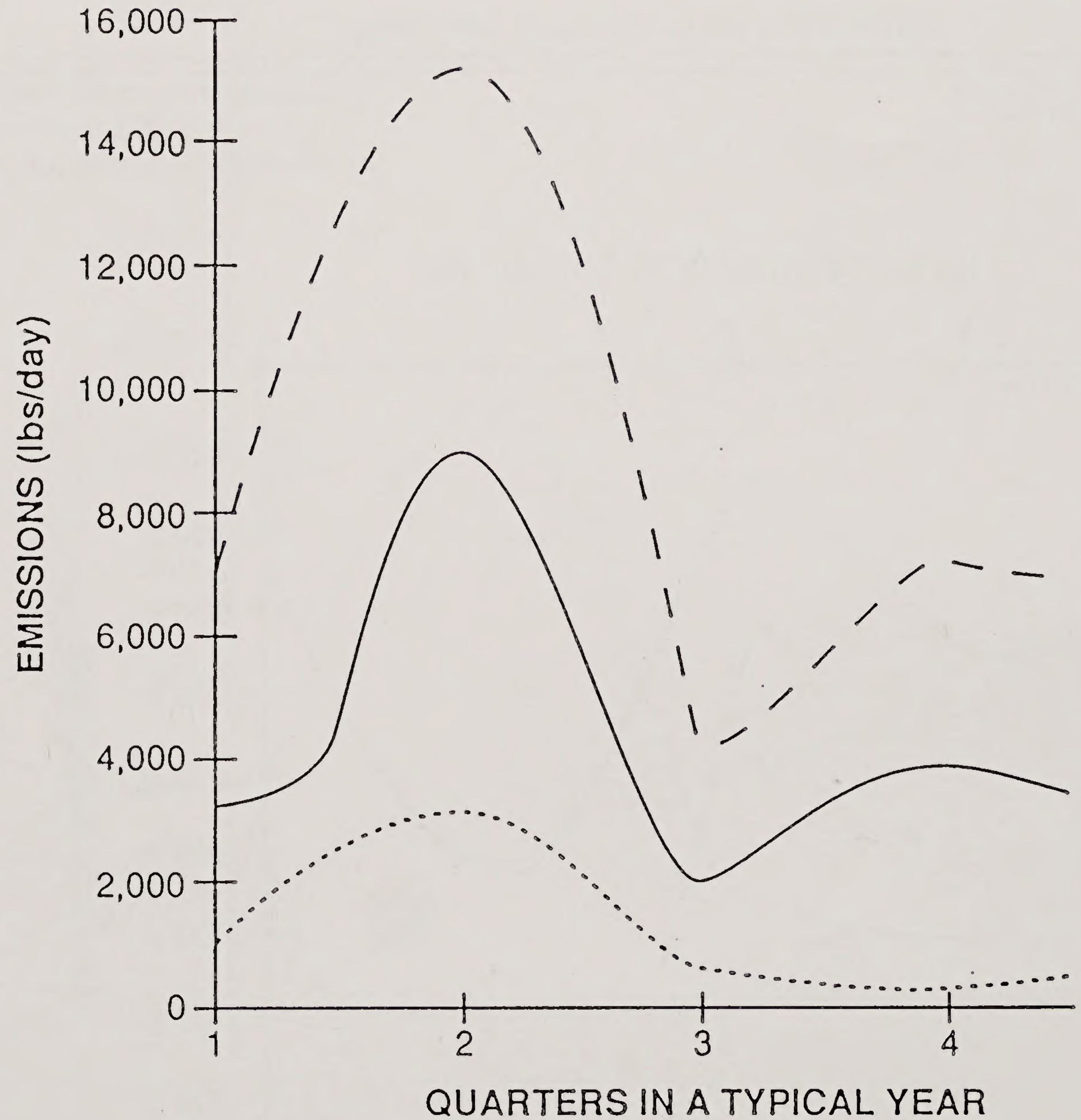
(1) Emissions estimated from records of agricultural burning in Imperial County during period 1985-1992.

SOURCE: ICAPCD, 1993.

Proposed Mesquite Regional Landfill

Potential Reactive Organic Gas (ROG) Emissions Offset Available from Agricultural Burning

FIGURE **4-7**



LEGEND

- — — — Maximum Ozone Precursor Emissions from Agricultural Burning (1)
- ——— Mean Ozone Precursor Emissions from Agricultural Burning (1)
- .... Minimum Ozone Precursor Emissions from Agricultural Burning (1)

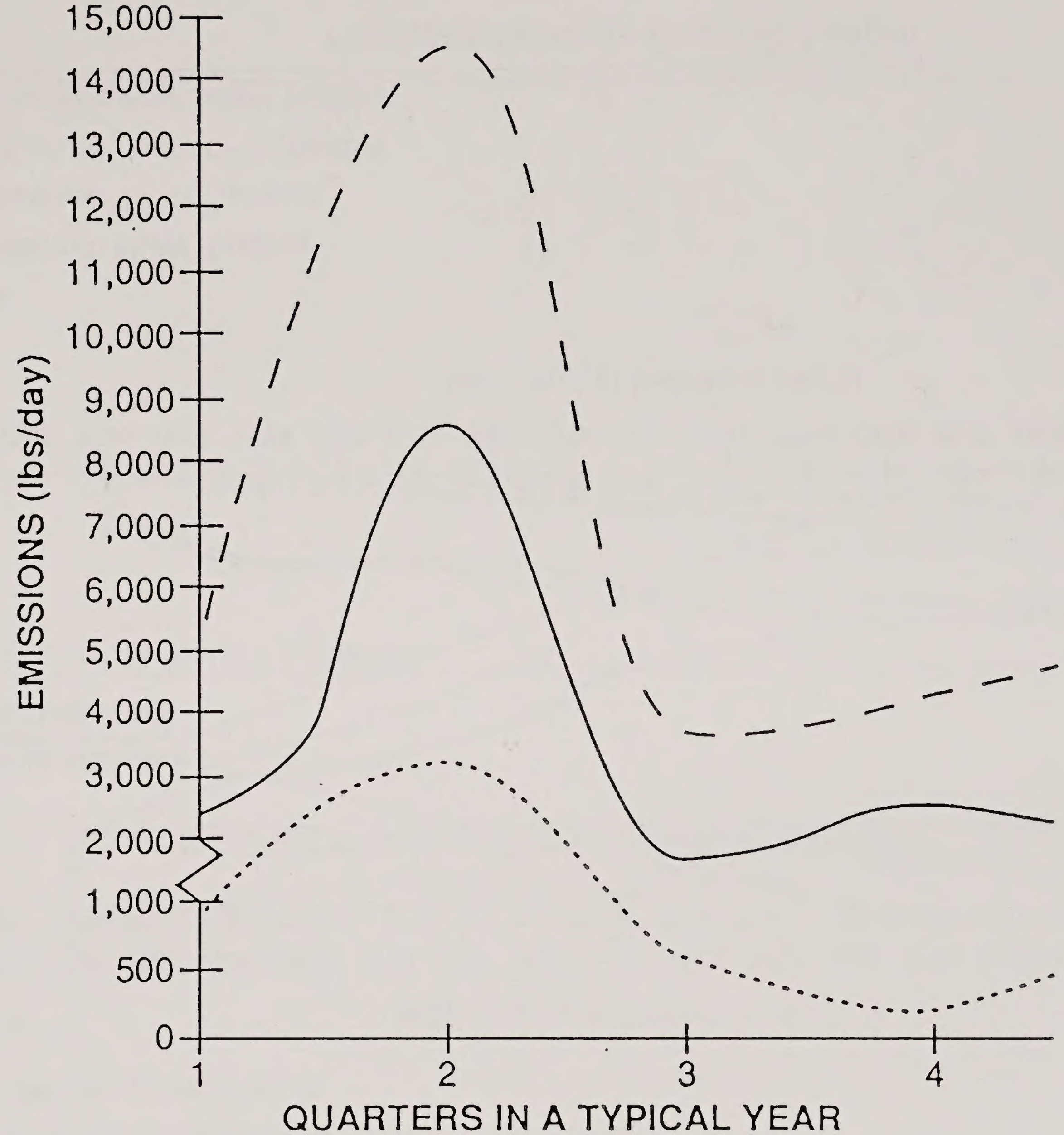
(1) Emissions estimated from records of agricultural burning in Imperial County during period 1985-1992.

SOURCE: ICAPCD, 1993.

Proposed Mesquite Regional Landfill

Potential Ozone Precursor Emissions Offset Available from Agricultural Burning

FIGURE **4-8**



LEGEND

- – – – Maximum PM_{10} Emissions from Agricultural Burning (1)(2)
- ——— Mean PM_{10} Emissions from Agricultural Burning (1)(2)
- .... Minimum PM_{10} Emissions from Agricultural Burning (1)(2)

(1) Emissions estimated from records of agricultural burning in Imperial County during period 1985-1992.
(2) SO_x emissions from agricultural burning are negligible.

SOURCE: ICAPCD, 1993.

Proposed Mesquite Regional Landfill

Potential PM_{10} + PM_{10} Precursor Emissions Offset Available from Agricultural Burning

FIGURE **4-9**

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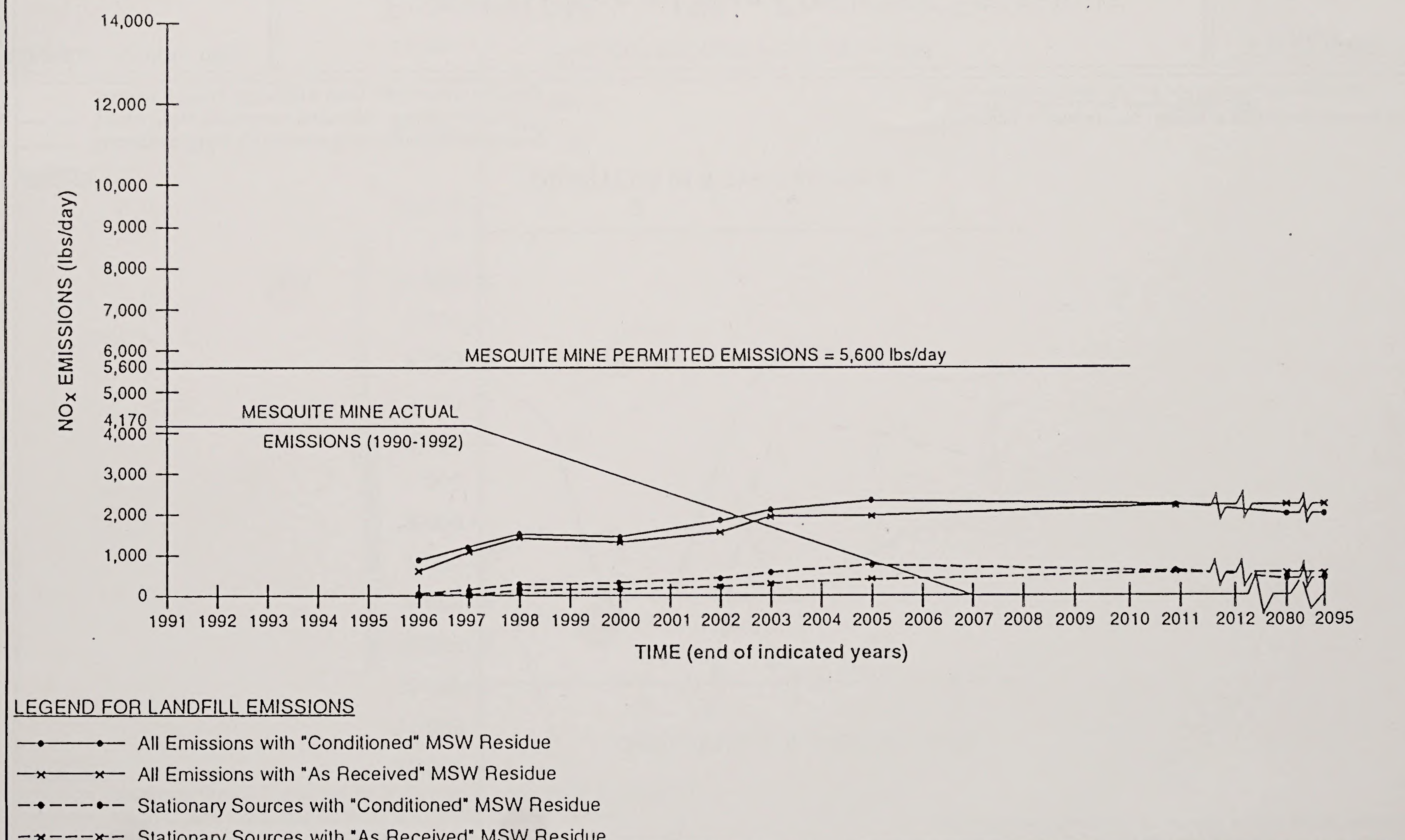


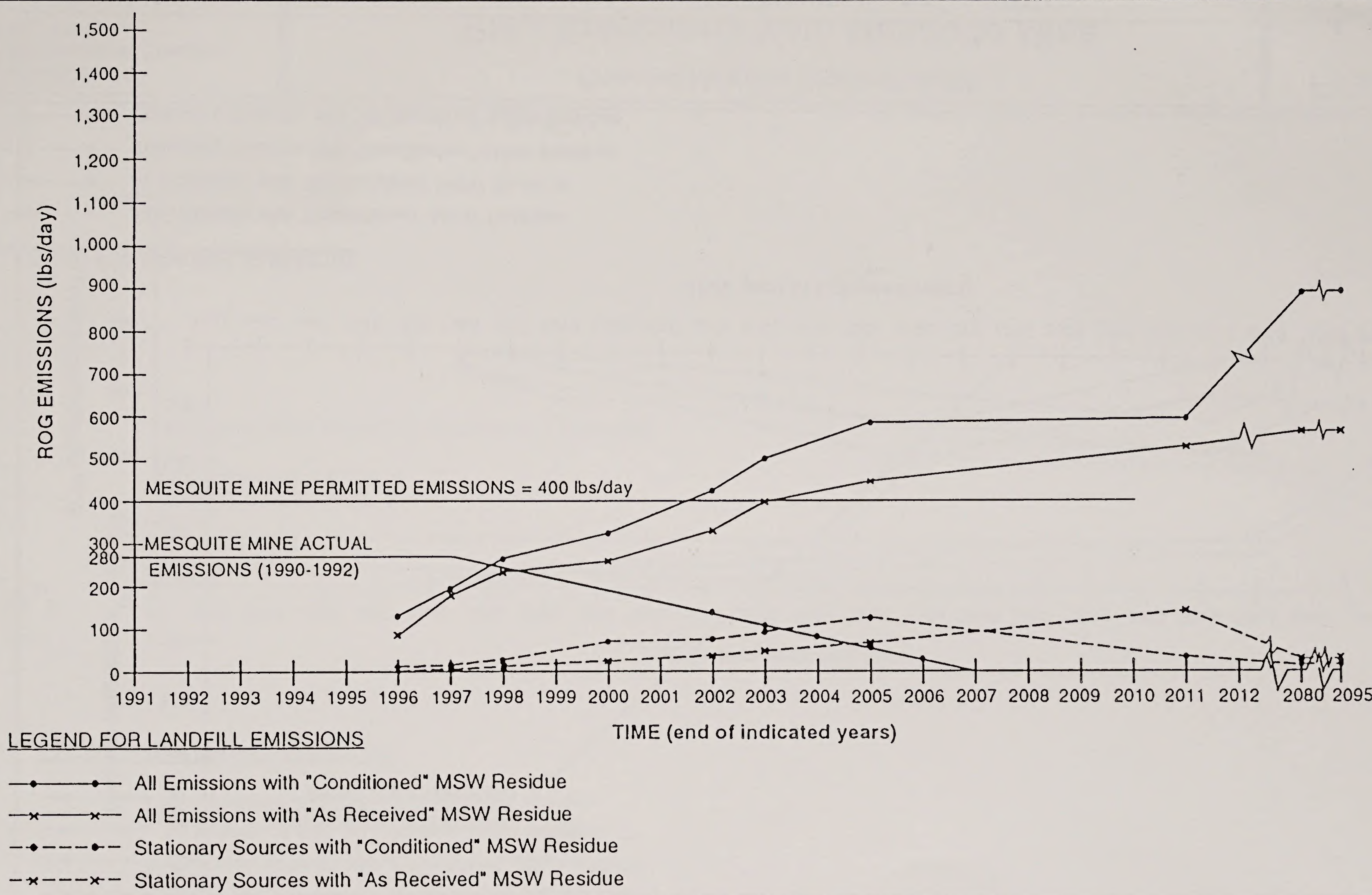
SOURCE:
Environmental Solutions,
Inc., 1992.

Proposed Mesquite Regional Landfill

NO_X Emissions from Mesquite Mine and Mesquite Regional Landfill

FIGURE 4-10

91-296EIS-100 REV.01/31/94

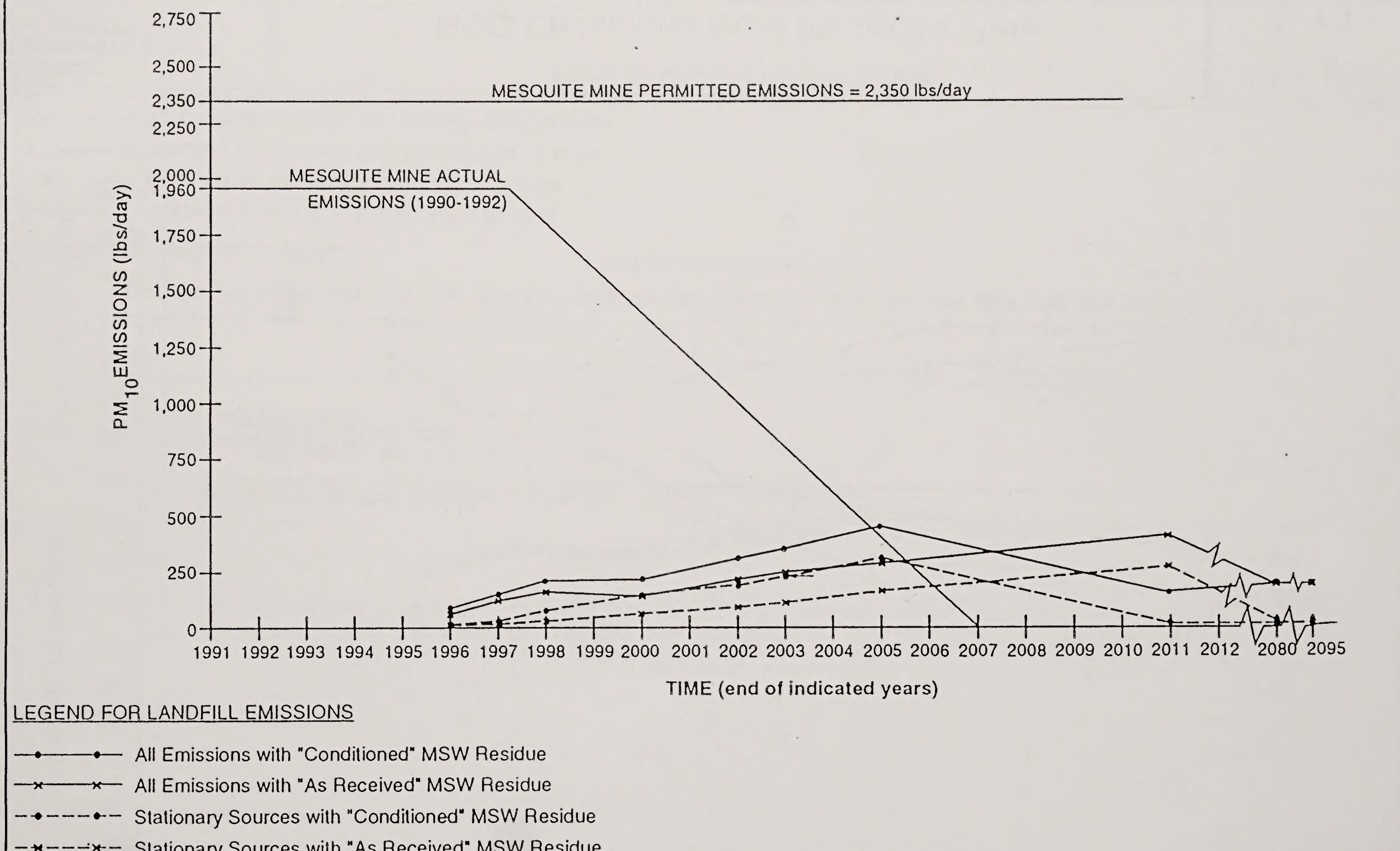


SOURCE:
Environmental Solutions, Inc., 1992.

Proposed Mesquite Regional Landfill

ROG Emissions from Mesquite Mine and Mesquite Regional Landfill

FIGURE 4-11

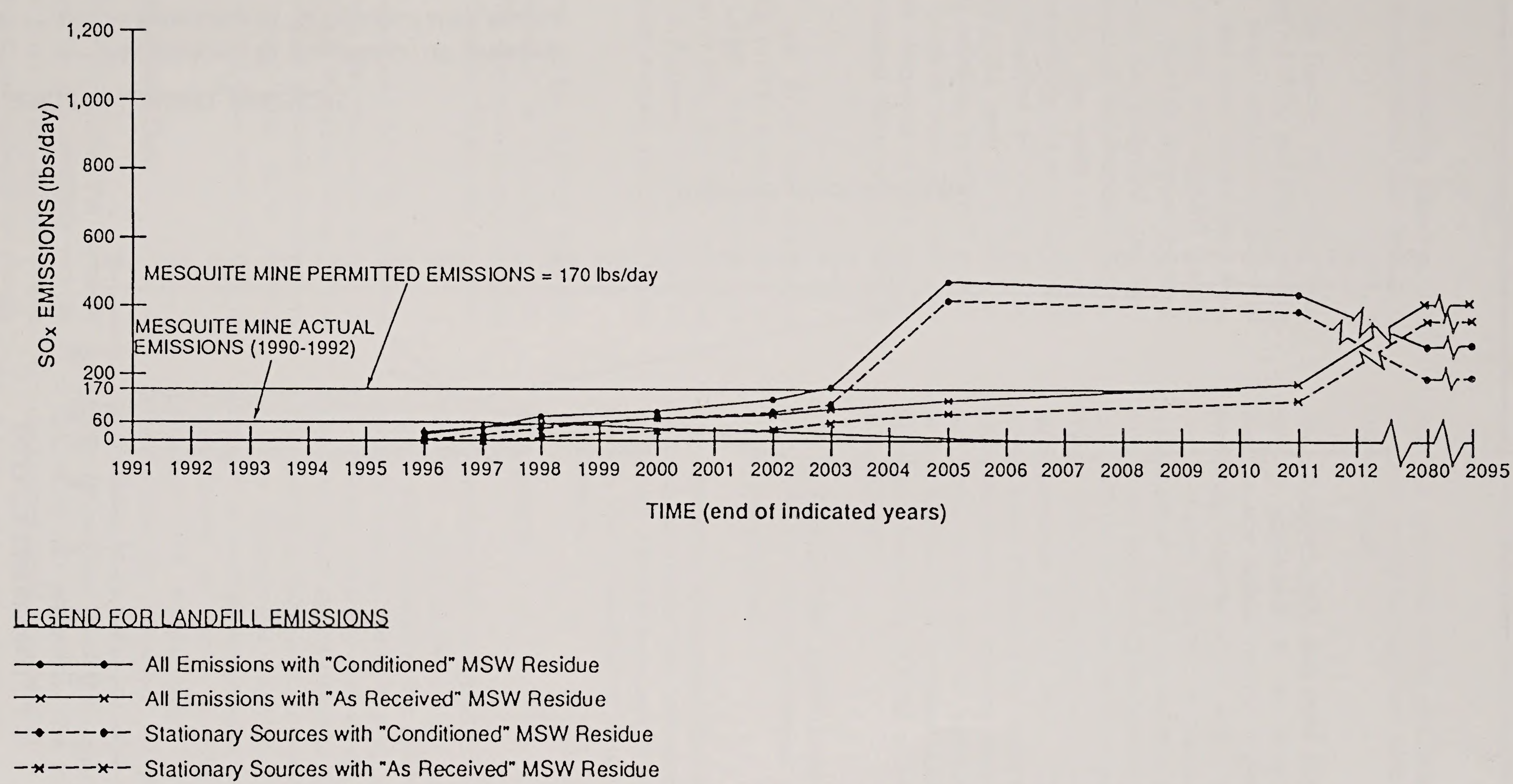


SOURCE:
Environmental Solutions, Inc., 1992.

Proposed Mesquite Regional Landfill

PM_{10} Emissions from Mesquite Mine and Mesquite Regional Landfill

FIGURE
4-12

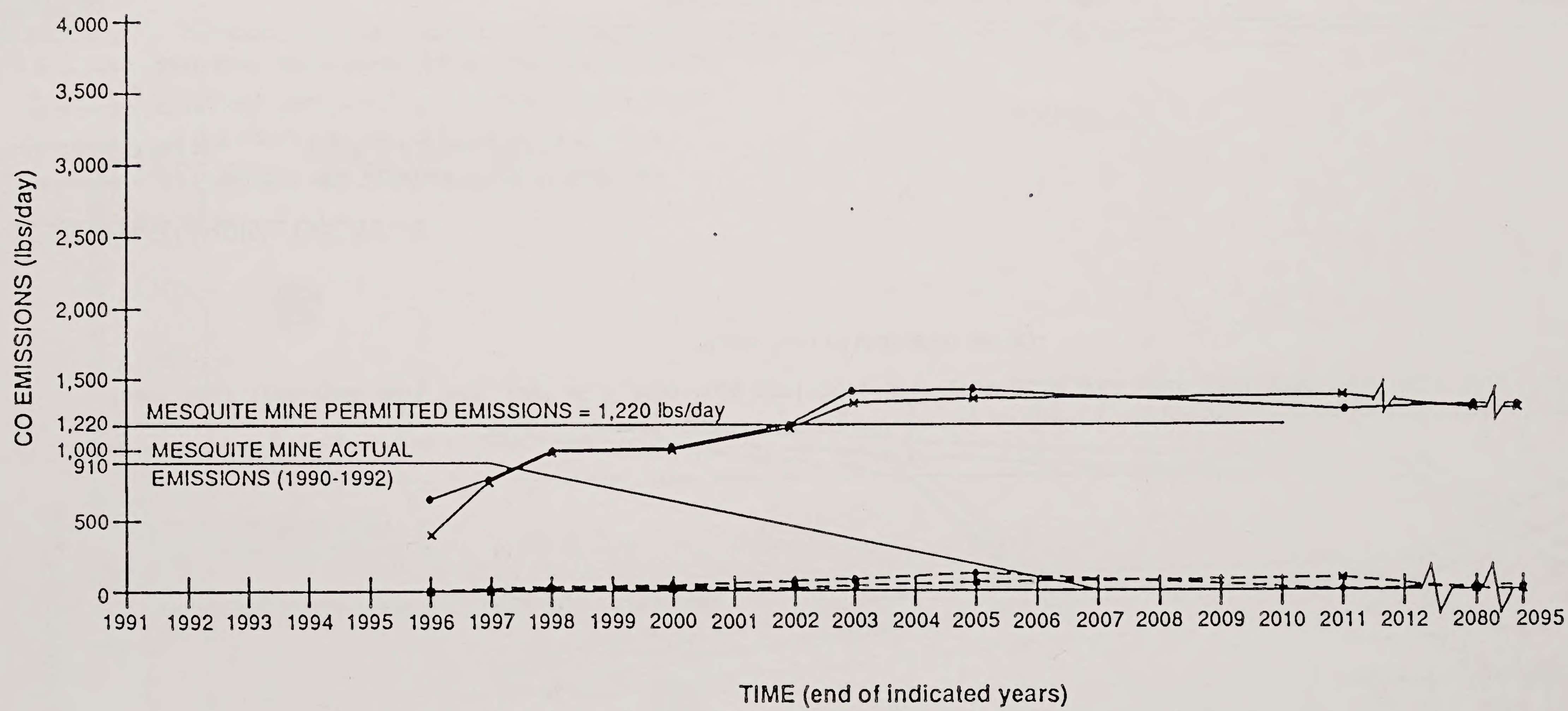


SOURCE: Environmental Solutions, Inc., 1992.

Proposed Mesquite Regional Landfill

SO_x Emissions from Mesquite Mine and Mesquite Regional Landfill

FIGURE 4-13



LEGEND FOR LANDFILL EMISSIONS

- All Emissions with "Conditioned" MSW Residue
- All Emissions with "As Received" MSW Residue
- Stationary Sources with "Conditioned" MSW Residue
- Stationary Sources with "As Received" MSW Residue

SOURCE:
Environmental Solutions, Inc., 1992.

Proposed Mesquite Regional Landfill

CO Emissions from Mesquite Mine and Mesquite Regional Landfill

FIGURE 4-14

duty equipment. For estimating purposes, it is assumed that the decrease would occur linearly to zero in 2007.

As illustrated in the figures, the overall mine emission decreases of NO_x and PM_{10} will be larger than the same emissions from the Proposed Action, and even larger than those from projected stationary sources (LFG thermal destruction facility). For CO, the mine decreases will be larger than the projected stationary source CO emissions of the Proposed Action. For ROG and SO_x, the stationary source increases will eventually exceed the mine decreases. The cessation of mining at the proposed site during the next 10 to 15 years
--> would reduce NO_x emissions by 4,800[h] pounds per day, which is more than 2.2 times the project-related site emissions of NO_x and 1.6 times all project-related emissions of NO_x in Imperial County.

Because NO_x and ROG are companion precursors, CARB (1993) combines them in producing O_3 (CARB, 1993a). Figure 4-15 shows that the sum of NO_x and ROG emissions associated with the Proposed Action would be less than the emission decrease available from the mine closure.

Offset requirements of the ICAPCD Rule 207 would be administered in accordance with ICAPCD Rule 207.1 (Emission Reduction Credit Banking) by the Imperial County Air Pollution Control Officer.

The on-site air emissions from the Proposed Action would be less than the current on-site air emissions from the Mesquite Mine. The difference between these emissions are shown on Table 4-17. Even with MSW residue conditioning, the net emissions would decrease as shown in Table 4-18.

Consistency with Attainment Plans

CEQA and NEPA require that the Proposed Action be analyzed for its consistency with air quality attainment plans. The proposed project would be constructed and operated to comply with all applicable rules and regulations and therefore, would be consistent with the Imperial County AQAP.

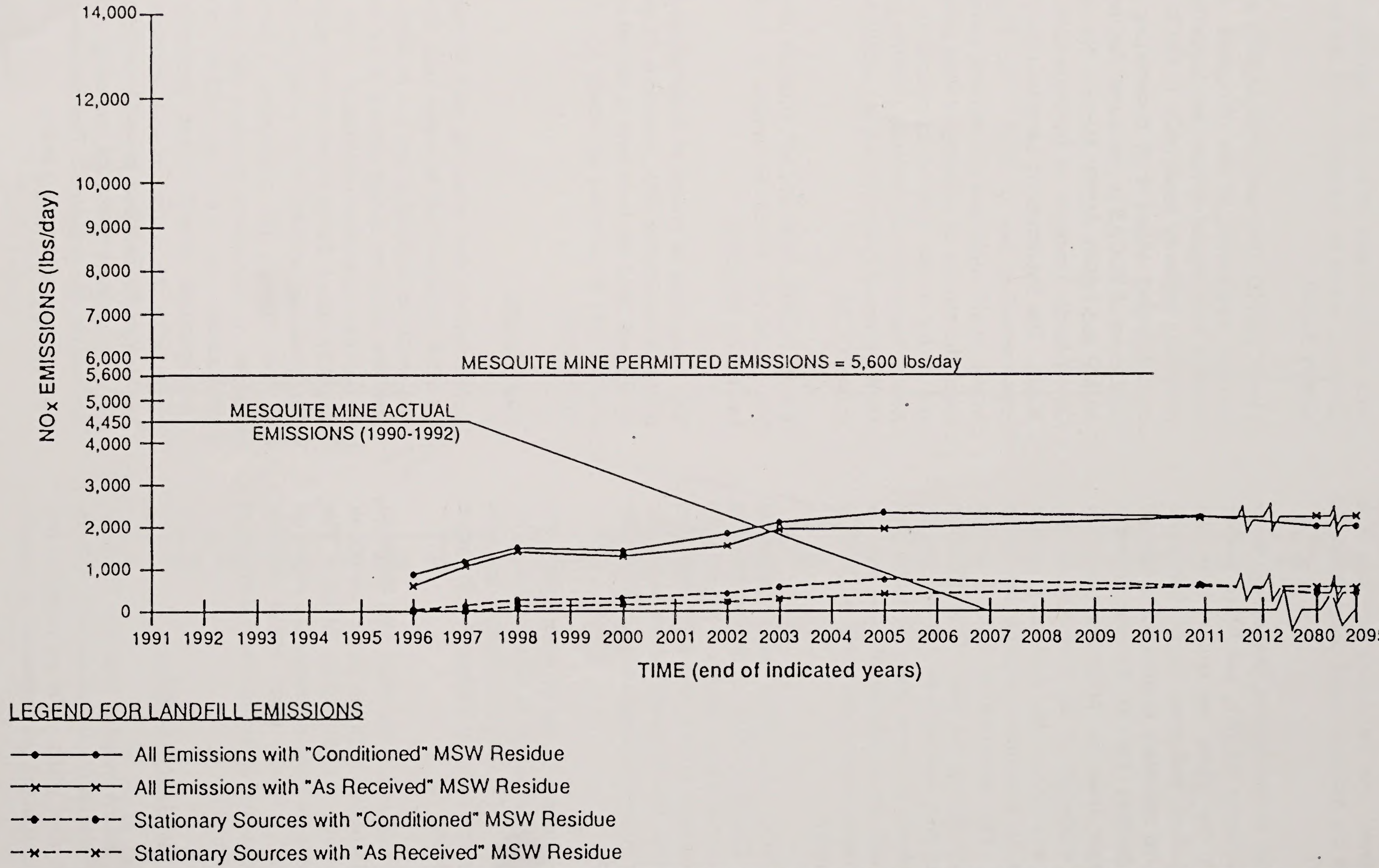
The SCAQMD 1991 and 1994 AQMPs are not directly applicable to the Proposed Action because new source review responsibility and permitting authority reside with ICAPCD. The overall project objective of transporting MSW residue out of SOCAB is consistent with the 1991 AQMP and fulfills AQMP Measure No. A-D-1, Out-of-Basin Transport of Biodegradable Solid Waste. The implementing agencies proposed an implementation date of 1997. The Proposed Action would implement this measure earlier and begin the process of reducing criteria pollutants and toxics in the SOCAB compared to a No Action Alternative of continued landfilling of all MSW generated in the SOCAB at landfills located in the SOCAB.

The SCAQMD 1994 AQMP contains Measure No. TCM-19, which is aimed at reducing locomotive emissions.

The Association of American Railroads proposal to reduce locomotive NO_x emissions 55 percent by the year 2005 has been used in this air quality analysis and is assumed to satisfy the AQMP requirement.

Odor Impacts

Each container that would be used to transport the MSW residue would be water tight, though a vent would be included at one end to allow air to enter the container during tipping at the landfill to facilitate container unloading. This vent would be closed during transit to the landfill so that substantial amounts of air would not be able to flow through the containers. However, changes in atmospheric pressure and container temperature as well as MSW residue decomposition would either pressurize or depressurize the containers. A pressure vent would also be included on each container to allow the pressure inside the container to mirror the outside air pressure. The following five mechanisms would cause venting:



SOURCE:
Environmental Solutions, Inc., 1992.

Proposed Mesquite Regional Landfill

O_3 Precursor (NO_x + ROG) Emissions from Mesquite Mine and Mesquite Regional Landfill

FIGURE **4-15**

TABLE 4-17

Site Emission Changes [1]
Proposed Action Using a Boiler Generator
With "As Received" MSW Residue

Proposed Mesquite Regional Landfill

Change/ Benefit	Emissions (lbs/day)					
	NO_x	ROG	PM_{10}	SO_x	CO	
Mesquite Mine Decrease from 1990-1992 Actual to No Emissions after 2007	4,800[h]	330[h]	2,010[h]	70[h]	1,040[h]	<--
Mesquite Regional Landfill Maximum Increase at Site	2,240[p]	570	220[o]	410	1,355[p]	<--
Net Difference [2]	2,560[ee]	-240[ee]	1,790[ee]	-340[ee]	-315[ee]	<--
O_3 and PM_{10} Benefits (including Precursors)	2,320[ee]		1,450[ee]		--	<--

Note: (1) This table compares emissions at different times. The mine emissions will decrease until the year 2007.

(2) A positive number indicates a net decrease.

Source: Environmental Solutions, Inc., 1994.

TABLE 4-18

Site Emission Changes [1]
Proposed Action Using a Boiler Generator and a Liquefied Methane Gas Plant With MSW Residue Conditioning

Proposed Mesquite Regional Landfill

Change/ Benefit	Emissions (lbs/day)					
	NO_x	ROG	PM_{10}	SO_x	CO	
Mesquite Mine Decrease from 1990-1992 Actual to No Emissions after 2007	4,800[h]	330[h]	2,010[h]	70[h]	1,040[h]	<--
Mesquite Regional Landfill Maximum Increase at Site	2,065[p]	890	220[m]	240	1,380[p]	<--
Net Difference [2]	2,735[ee]	-560[ee]	1,790[ee]	-170[ee]	-340[ee]	<--
O_3 and PM_{10} Benefit [2] (including Precursors)	2,175[ee]		1,620[ee]		--	<--

Note: (1) This table compares emissions at different times. The mine emissions will decrease during the period 1997-2007.

(2) A positive number indicates a net decrease.

-- = Not Applicable

Source: Environmental Solutions, Inc., 1994.

- Increases in temperature in the container would cause the air to expand.
- Decreases in the container internal pressure caused by decreases in external pressure when the train gains elevation
- Diffusion of air from inside the container to the atmosphere.
- Gas generation caused by aerobic decomposition.
- Gas generation caused by anaerobic decomposition.

Each of these mechanisms was analyzed to quantify the relative order of magnitude of the emissions. The potential use of containers with removable tops (see Figure 2-30) does not change this analysis. A container with a removable top (not a tarpaulin) would be constructed to control odor and LFG with substantially the same level of performance as the permanent top containers (May Fabricating Company, 1993).

Applying the Ideal Gas Law to the container air volume as the temperature increases from 64° F to 120° F results in an increased volume of about 200 actual cubic feet (acf), or about 11 percent of the total void air volume of approximately 1800 acf. This volume increase would escape through the louvered vent during the ten-hour trip, and carry with it 11 percent of the LFG amount calculated below.

Some components of MSW residue would begin to decompose prior to collection. MSW residue would continue to decompose during the ten-hour trip. During this early period, decomposition would proceed mostly by aerobic processes that produce carbon dioxide and water vapor, rather than by anaerobic processes that produce carbon dioxide, methane, and odorous VOCs. For the worst-case assumption that the decomposition is anaerobic, the volume of LFG generated in one container in ten hours would be about 7.5 acf. This volume would be mixed in the total void air volume as the 200 acf expansion volume is escaping during the trip. Therefore, the concentration of LFG in the escaping air would be a maximum of approximately 0.4 percent, but probably much lower.

Although several odorous organic compounds exist in LFG, rotten-egg smelling hydrogen sulfide (H_2S) is assumed to be the dominant compound. H_2S is detected by humans at a concentration of about 700 ppbv (Montgomery, 1985). Assuming the concentration of H_2S in the LFG in the container is the same 10 ppmv maximum concentration measured at a Southern California landfill, the concentration of the H_2S in the air escaping through the container vent would be about 37 ppbv.

While in motion, the train would displace approximately 15 million acf of air per hour while leaking out about 3,200 acf of expanded air and LFG per hour, which would dilute the leaked H_2S concentration by a factor of about 4,650. The resulting H_2S concentration behind the train would be about 8 parts per trillion by volume (pptv).

The concentration would dilute further before the wake air disperses off the railroad ROW to neighboring property. If this lateral dispersion is assumed to dilute the H_2S by a factor of 10, then the concentration of H_2S at the railroad boundary would be about 0.8[(n)] pptv, which is <--
approximately 900,000 times less than the human detection odor threshold for H_2S.

The train would climb from near sea level pressure at the LATC to about 2,200 feet at Banning Pass causing the void space gas volume to increase by about four percent or about 85 acf. If this pressure drop effect were added to the expansion caused by increasing temperature, the final H_2S concentration at the railroad boundary would decrease slightly, making it more difficult to detect H_2S odor.

If a train were delayed for 24 hours in a hot desert environment (due to derailment or other delays), the MSW residue could potentially generate a maximum of about 18 acf of LFG in each container. The concentration of LFG in the air escaping through the vent would increase from 0.4 to about 0.9 percent, and the concentration of H_2S would be potentially 90 ppbv at the vent. This concentration is almost 8 times less than the 700 ppbv human odor threshold for H_2S. Dispersion would reduce the concentration further as distance from the pressure vent increased. As an extra precaution, the Applicant would store a sufficient number of carbon filter covers at the proposed landfill or West Colton rail yard to cover the pressure vents for two train loads of containers. If a delay was expected to exceed 48 hours, then these filters would be transported by truck to the site of the delayed train and placed over the container pressure vents. The filters would remove the odorous VOCs and still allow pressure venting to occur. The most likely case would be that CO_2 and H_2O would be released instead of the odorous LFG.

The maximum delay for containers to sit after arrival at the landfill intermodal and prior to transportation to the landfill working face for emptying would be approximately 12 hours. During this time, the MSW residue could potentially generate a maximum of about 9 cubic feet of LFG in each container, assuming the train has been delayed 24 hours in the desert. The resulting H2S concentration that could leak out of the pressure vent would be approximately 50 ppbv. This is about 14 times less than the odor threshold. The actual concentration at SR 78 would be lower because of atmospheric dispersion along the path from the intermodal. If any noticeable odor did occur, the carbon filter covers stored at the landfill would be immediately placed over the container pressure vents to control odors.

Odors at the landfill face would be controlled by compacting the MSW residue within minutes of it being emptied from the containers and covering the material as soon as practicable and not less than once each day. Also, LFG would be collected and destroyed or used for energy recovery. Because of these operating procedures and the remote location, odors at the landfill face are not expected to be noticeable to the public.

The containers would be washed at a washdown facility on the project site. High-pressure water spray would clean residual MSW off the inside walls and carry this material out to grated drains along the length of the floor. The water would flow through the grates and into a holding tank, for subsequent treatment and reuse. The residual MSW retained on the grate would be placed in a covered dumpster, and periodically taken to the active face of the landfill for disposal. This material would be heavily soaked, and hence, would not emit appreciable odor before it is placed in the covered dumpster.

Toxics

Health risk estimates associated with operation of the proposed landfill were calculated for the toxic air contaminant emissions at the 16th and 100th years with: (1) "as received" MSW residue and conditioned MSW residue, (2) 80 percent collection of generated LFG, and (3) a flare or boiler with 99 percent trace gas destruction. The 20 percent of LFG not collected is assumed to migrate towards the landfill surface. Some of this migrating LFG is aerobically decomposed, while the remainder escapes into the air and its effect is included in this health risk assessment. The extreme case of living 70 years on the property boundary is not considered to be reasonable because of the remoteness and federal ownership of the land bordering the proposed site. Instead, the following three exposure conditions were analyzed as more reasonable cases:

- Long-term (70-year) exposure to a population of about 10 residing at Glamis, approximately five miles from the center of the landfill (3.1 miles from the southwest landfill corner). This situation also covers recreation populations around the sand dunes near Glamis.
- Fourteen days exposure to campers consisting of four individuals located

adjacent to the landfill property boundary. An OHV event might lead to people camping near the proposed landfill for several days.

- Individuals traveling on SR 78 exposed for 12 minutes (6 minutes each direction), 5 days per week for a 40-year period.

Table 4-19 summarizes the health risk and indicates that:

- The maximum carcinogenic risk estimate --> of 1×10^{-6}[oo] is less than the 10^{-5}[n] limit suggested by SCAQMD (1993), when Toxics-BACT is used, as would be the case in the proposed use of flares and --> a boiler. This risk of less than 10^{-5}[n] means that if the exposed persons were to breathe this air, the probability that they would get cancer is less than 10 in 1 million. For comparison, the risk of death from all cancers is approximately 10^{-3} or one in one thousand. (NTS Engineering, 1986).
- Both the maximum acute and chronic --> health risk hazard indices (0.03[oo] and --> 0.004,[oo] respectively) are less than 1.0, the limit suggested by U.S. EPA (1992) at which no adverse health effect is expected. Acute health effects are short-term noncancer effects, and hence, the calculation is based on one hour mean concentrations. Chronic health effects are long-term noncancer effects, and hence, the calculation is based on annual mean concentrations.

If the MSW residue were conditioned, the LFG fugitives from the landfill surface would increase --> by a factor of about 1.9[ee] in the 16th year and --> 1.9[ee] in 100th year as seen by comparing Tables 4-10 and 4-9, and the risks shown in the bottom half of Table 4-19 would increase a like amount. The resulting health risks would not be significant.

4.1.8.5 Emissions and Impacts of Energy Recovery Options

<u>LFG Boiler/Generator</u>

The top of Table 4-20 lists the estimated air contaminant emissions from a LFG boiler and electrical generator with LFG collected from landfilling "as received" MSW residue. The bottom portion of Table 4-20 provides similar information if LFG generation was augmented. For comparison, the top portion of Table 4-9 shows project emissions using a flare only.

As has been demonstrated throughout the air quality analysis, implementation of the boiler/ generator would reduce emissions of NO_x, ROG, PM_{10} and CO as compared to a flare. The higher SO_x emissions estimates are not due to actual sulfur that would be available in the LFG from the Proposed Action, but instead, are due to differences in the emission factors that were developed from other landfills with site-specific differences.

<u>Compressed Methane Gas Plant</u>

Table 4-21 lists the air contaminant emissions from the compressed methane gas plant with the LFG collected from landfilling "as received" MSW residue. Emissions associated with the Proposed Action are shown at the bottom of the table for comparison. Table 4-22 provides similar information if LFG generation was augmented. For comparison, the top portion of Table 4-9 shows project emissions using a flare only.

Implementation of the compressed methane option for energy recovery would result in the following:

- NO_x and SO_x impacts associated with the compressed methane gas plant option would be lower than the boiler/generator impacts. Downwind impact of CO, PM_{10}, and ROG and ozone precursors associated with this option would be less than the boiler/generator impacts.

TABLE 4-19

Summary of Health Risk[(1)]

Proposed Mesquite Regional Landfill

Based on Year 16 Emissions

Exposure Conditions	Carcinogenic Risk	Acute Risk Hazard Index	Chronic Risk Hazard Index	
Long-Term (70-year) Exposure at Glamis Beach Store	9×10^{-7}(oo)	0.03(nn)	0.004(oo)	<--
14-Day Exposure at Property Boundary	1×10^{-8}(oo)	0.00008(oo)	0.00004(oo)	<--
12-Minute Daily SR 78 Exposure for 40 Years	1×10^{-8}(oo)	0.0002(oo)	0.00006(oo)	<--
Acceptable Limit	10^{-5}	1.0	1.0	<--

Based on Year 100 Emissions

Exposure Conditions	Carcinogenic Risk	Acute Risk Hazard Index	Chronic Risk Hazard Index	
Long-Term (70-year) Exposure at Glamis Beach Store	1×10^{-6}(oo)	0.03(oo)	0.005(oo)	<--
14-Day Exposure at Property Boundary	7×10^{-9}(oo)	0.00007(oo)	0.00003(oo)	<--
12-Minute Daily SR 78 Exposure for 40 Years	3×10^{-8}(oo)	0.0003(oo)	0.0001(oo)	<--
Acceptable Limit	10^{-5}	1.0	1.0	

Note:

(1) Risk estimated for exposure by inhalation pathway. See Table 4-9 for list of primary contaminants analyzed. Full analysis is contained in the Air Quality Technical Report contained in Appendix F. Units are dimensionless.

Source: Environmental Solutions, Inc., 1994.

TABLE 4-20

A. Estimated Boiler/Generator Emissions at Year 100 with "As Received" MSW Residue

Proposed Mesquite Regional Landfill

EMISSIONS (lbs/day)				
NO_x	ROG	PM_{10}	SO_x	CO
630	30	10	360	10

B. Estimated Boiler/Generator and Liquefied Methane Emissions at Year 100 with MSW Conditioning to Enhance LFG Generation[(1)]

Proposed Mesquite Regional Landfill

EMISSIONS (lbs/day)				
NO_x	ROG	PM10	SO_x	CO
460	140	10	200	30

(1) As shown in Table 4-10, this facility would likely be combined with a liquefied methane plant. The emissions shown are based on this assumption. Otherwise, they would be no different than for Part A above.

Source: Environmental Systems, Inc., 1994.

TABLE 4-21[n] <--

Estimated Compressed Methane Gas Plant Emissions at Year 100 with "As Received" MSW Residue

Proposed Mesquite Regional Landfill

Source	Emissions (lbs/day)				
	NO_x	ROG	PM_{10}	SO_x	CO
Compressed Methane Plant					
• VOC Incinerator No. 1	1.2	0	0	0	0.26
• VOC Incinerator No. 2	54	32	2.7	0.31	11
• VOC Incinerator No. 3	32	3	1.5	0.21	6.4
• Condensate Tank Vent	0	11	0	0	0
• Compressor Seals	0	0.6	0	0	0
• Valves, Flanges and Fittings	0	22	0	0	0
TOTAL	87	69	4	0.5	18

Source: Environmental Solutions, Inc., 1994.

TABLE 4-22[n] <--

Estimated Compressed Methane Gas Plant Emissions at Year 100 with "Conditioned" MSW Residue

Proposed Mesquite Regional Landfill

Source	Emissions (lbs/day)				
	NO_x	ROG	PM_{10}	SO_x	CO
Compressed Methane Plant					
• VOC Incinerator No. 1	2.3	0.13	0.12	0.01	0.49
• VOC Incinerator No. 2	102	61	5.1	0.59	21
• VOC Incinerator No. 3	60	5.8	2.9	0.39	12
• Condensate Tank Vent	0	20	0	0	0
• Compressor Seals	0	1.2	0	0	0
• Valves, Flanges and Fittings	0	40	0	0	0
TOTAL	164	128	8	1	33

Source: Environmental Solutions, Inc., 1994.

Emission of ozone precursors would be considerably lower for the compressed methane option.

- Health risk impacts associated with the compressed methane gas plant option are expected to be similar to the boiler/generator option impacts.

Liquefied Methane Gas Plant

Table 4-23 lists the air contaminant emissions from the liquefied methane gas plant for "as received" MSW residue, and Table 4-24 lists the emissions with augmented LFG generation. For comparison, the top portion of Figure 4-9 shows project emissions using the flare only. Implementation of the liquefied methane gas plant option for energy recovery would result in the following:

- NO_x and SO_x impacts associated with the liquefied methane gas plant option would be lower than the boiler/generator impacts. Downwind impact of CO, PM_{10}, ROG, and ozone precursors associated with this option would be similar to the boiler/generator impacts.

- Health risk impacts associated with the liquefied methane gas plant would be similar to the boiler/generator and compressed methane gas option impacts.

4.1.8.6 Mitigation Measures

The Applicant shall incorporate the following air quality and odor mitigation measures into the landfill design, construction and operation.

- Stationary Sources
  - Provide emission controls indicated in Table 4-8.
  - Obtain offsets described previously or other offsets acceptable to the ICAPCD. Offsets shall be consistent with the Imperial County AQAP.
  - Construct fuel storage tanks with submerged fill pipes to control formation of vapors during filling.
- Fugitive LFG
  - The LFG collection system shall be designed and operated to collect at least 80 percent of the generated LFG at locations where the waste is deep enough (i.e., 20 feet over collector) to avoid excess air infiltration.
  - Energy recovery facilities or other technologies capable of reducing air emissions from the destruction/use of landfill gas shall be implemented before air emissions from the flare reach 1,200 pounds per day (88 percent of the 250 tons per year Prevention of Significant Deterioration Threshold). Further environmental review may be required depending on the recovery facility pursued by the Applicant.
- Mobile Sources
  - Maintain on-site vehicles routinely.
  - All project-related vehicles shall use fuel approved for use in the State of California by CARB.
  - New equipment shall have emission characteristics required by U.S. EPA and CARB.
  - Have available carbon filters for two train loads of containers for covering vents within 12 hours during any prolonged rail delay.
  - Periodically wash empty containers with high-pressure water hoses to remove residual MSW and thereby reduce odor. The wash water shall be treated to remove organics before reuse on-site. Solid material that remains on the grate shall be transferred to a covered dumpster and periodically taken to a landfill face for disposal.

TABLE 4-23(n) <--

Estimated Liquefied Methane Gas Plant Emissions at Year 100 with "As Received" MSW Residue

Proposed Mesquite Regional Landfill

Source	Emissions (lbs/day)				
	NO_x	ROG	PM_{10}	SO_x	CO
Liquefied Methane Gas Plant					
• Compressed Methane Plant Sources	87	69	4	0.5	18
• CO_2 Vent	0	22	0	0	0
TOTAL	87	91	4	0.5	18

Source: Environmental Solutions, Inc., 1993.

TABLE 4-24(n) <--

Estimated Liquefied Methane Gas Plant Emissions at Year 100 with "Conditioned" MSW Residue

Proposed Mesquite Regional Landfill

Source	Emissions (lbs/day)				
	NO_x	ROG	PM_{10}	SO_x	CO
Liquefied Methane Gas Plant					
• Compressed Methane Plant Sources	164	128	8	1	33
• CO_2 Vent	0	40	0	0	0
TOTAL	164	169	8	1	33

Source: Environmental Solutions, Inc., 1993.

- Provide emission controls as described previously in Table 4-8.

- Fugitive Dust

    - Install and operate PM_{10} monitoring stations and an on-site meteorological station as agreed upon with the ICAPCD.

    - Implement Fugitive Dust Control Program as follows: The three tiered fugitive dust control plan described earlier in this section shall be implemented. Fugitive dust emissions from paved roads shall be controlled by constructing two-lane roads with wide paved shoulders, and constructing an apron at the transition between the paved and unpaved roads.

      In addition to the design features presented above, a street cleaning program shall be implemented consisting of flushing the paved road with water once or twice a week. The water shall be applied either by truck or by a roadside sprinkler system. The frequency of flushing shall depend on ambient conditions. During particularly windy periods, or when an excessive amount of dust is accumulating on the road, the frequency shall be increased.

      The apron, which is considered part of the paved road, shall be cleaned more frequently. The apron shall be flushed with water approximately one time per day or more frequently during periods when excessive trackout is observed. The apron shall also be swept or vacuumed between water flushing should this prove to be a feasible method for reducing dust loading associated with trackout. According to U.S. EPA (1985), a water flushing program such as the one described above should provide an overall dust emission control efficiency of 50 percent. Higher efficiency of 75 to 80 percent would be achieved with higher flushing frequencies.

      Fugitive dust emissions from unpaved roads shall be controlled using separate strategies. As with the paved roads, the design features of the semipermanent unpaved segment shall assist in reducing emissions. Dust-suppressing stabilizers such as resins shall be used during the construction of the road. Roads constructed in such a manner have essentially all the qualities of a paved road. Therefore, as with the paved road, the best alternatives to further reduce emissions are alternatives that reduce the surface loading of dust. Weekly water flushing shall be used with periodic reapplication of resin material to achieve an overall control efficiency of 75 percent when the emissions rate is estimated based on paved road emissions. If the selected road base material is not resistant to water flushing, the road shall be maintained according to the manufacturer's recommendations. As an alternative to weekly water flushing, periodic watering of the road (once or twice per day) or more frequent reapplication of road base material may be used.

      For the impermanent segment of the road, the selected control strategy shall be watering of the road for the low-speed segment, and use of dust suppressant on the high-speed portion. Additional treatment shall include the resin-type stabilizers or other dust-suppressing treatments such as lignin sulfonate.

      The road watering program shall entail frequent application throughout the day, with the exact frequency dependent on specific conditions such as previous weather, temperature, humidity, etc. This type of control program provides a dust control efficiency of 90 percent (U.S. EPA, 1985). The additional treatment of the high speed segment is meant to achieve an overall control efficiency of 95 percent.

- Control Working Face and Cover Storage Area Emissions: Fugitive dust emissions from the operations areas of the working face and the cover borrow areas shall be controlled using a combined strategy of limiting the area of operations and by using traditional dust-suppression techniques such as area watering.

4.1.8.7 Level of Significance After Mitigation Measures

Based upon the changes in MSW residue disposal locations that would result from the Proposed Action, regulatory requirements that must be satisfied (including offsets to be provided for site stationary emission sources), and measures that would be incorporated into the project design, the net effects of the Proposed Action would be mitigated so that no significant adverse air quality or odor impacts would occur (Table 4-25), considering each of the measures of significance. Air quality in SOCAB would improve because of decreased emissions. The Proposed Action would not cause significant adverse air quality impacts in Coachella Valley and might reduce the potential for O_3 exceedances to occur in the Coachella Valley and Imperial County. The diversion of agricultural plant material that is currently burned and the transition in economic activity at the site from mining to landfilling would locally reduce both emissions and ambient concentrations, thereby preventing the occurrence of significant adverse air quality impacts.

TABLE 4-25

Summary of Significance of Potential Air Quality Impacts

Proposed Mesquite Regional Landfill

Pollution Type	Measure of Significance	Level of Significance After Mitigation
Criteria Air Pollutants	Violation of NAAQS.	None
	Violation of CAAQS including visibility-reducing particles.	None
	Substantial contribution to existing or projected violation of AAQS.	No
	Proposed emission units would cause or make worse the violation of AAQS.	Cumulative (PM_{10})
	Substantial contribution to a delay in attaining an AAQS.	No
Toxic Air Pollutants	Carcinogenic health risk.	Less than 10^{-6}
	Chronic health risk.	Chronic risk hazard index <1.0.
	Acute health risk.	Acute risk hazard index <1.0.
Odor	Noticeable at residential/commercial facilities.	No
All	Determination that Proposed Action is inconsistent with a CARB-approved AQAP, including visibility protection.	No

Source: The Butler Roach Group, 1994.

TABLE 4-32

Estimated Project Site Emissions
Alternative II and Alternative IV
Proposed Mesquite Regional Landfill

ALTERNATIVE II - DECREASED DISPOSAL RATE AT YEAR 16 WITH A FLARE

Source	Emissions (lbs/day)					
	NO_x	ROG	PM_{10}	SO_x	CO	
Stationary Sources	450[n]	70[n]	180[n]	90[n]	70[n]	<--
Fugitive Sources	0	100[n]	70[mm]	0	0	<--
Mobile Sources	945[n]	170[n]	30[m]	30	800[n]	<--
TOTAL	1,395[n]	340[n]	280[n]	115[n]	870[n]	<--

ALTERNATIVE IV - LARGER PROJECT AT YEAR 95[a] WITH A BOILER/GENERATOR AND LNG PLANT

Source	Emissions (lbs/day)					
	NO_x	ROG	PM_{10}	SO_x	CO	
Stationary Sources	950[n]	45[n]	20	540[n]	5[m]	<--
Fugitive Sources	0	370[n]	240[o]	0	0	<--
Mobile Sources	2,460[nn]	450[nn]	90[m]	70	2,120[nn]	<--
TOTAL	3,410[n]	865[n]	350[m]	615[n]	2,125[n]	<--

Source: Environmental Solutions, Inc., 1993.

4.6.8 AIR QUALITY

The expected air emissions in Year 95 associated with Alternative IV are shown in Table 4-32. The primary air quality impact differences between the larger project alternative and the Proposed Action include:

- On-site MSW residue handling and disposal activities would increase by 50 percent. This would result in a proportional increase in potential pollutant emissions due to on-site fuels and construction activities, unless additional controls were to be implemented.

- Train traffic on the SP Main Line and transfer truck container deliveries to the LATC intermodal would increase by 50 percent.

LFG emission generation rates for this alternative would also increase. Application of the model described in Appendix F for this case indicates a maximum potential LFG generation rate 50 percent higher than for the Proposed Action.

Table 4-11 summarizes the boundary pollutant concentrations estimated for the Proposed Action and compares them to the NAAQS and CAAQS. However, because this alternative would be similar to the Proposed Action, the boundary pollutant concentrations shown in Table 4-11 would be similar for this alternative. As shown, it is not anticipated that standards would be exceeded. Similar to the Proposed Action, PM_{10} monitoring stations would be provided at locations selected by the ICAPCD to assure that planned control measures (e.g., water spraying of unpaved roads and paving of permanent roads) are maintaining PM_{10} emission concentrations below standards. Additional controls would be implemented if the results of the monitoring are such that the PM_{10} standards are being exceeded.

The 50 percent increase in LFG generation would increase the following three sources of airborne toxics by 50 percent: fugitive LFG, LFG destruction device exhaust, and heavy-duty equipment exhaust. These would increase the health risks in Table 4-19 by 50 percent. The resulting carcinogenic risk, acute risk hazard index, and chronic risk hazard index would increase to no more than 1.5 x 10^{-6}[ee], <--
0.045[ee], and 0.006[ee], which would be below <--
acceptable limits. Therefore, impacts would not be significant.

Offsets required for this alternative would be greater than those required for the Proposed Action. Offsets likely would be obtained from the Mesquite Mine and by diverting agricultural plant material from burning.

The larger landfill footprint would extend closer to the SR 78. However, there would be no increased health risk to travelers using this highway. In addition, a larger landfill project could, for the life of the project, reduce the amount of MSW residue landfilling required in the SOCAB, with resulting improvements to air quality in the SOCAB. These improvements would also assist in reducing O_3 exceedances in the SOCAB, which would in turn reduce O_3 transport-related exceedances in Coachella Valley. The reduced transport from the SOCAB would also reduce the O_3 background in Imperial County, and may reduce O_3 exceedances in Imperial County, depending on the degree that transport in that portion of the Salton Trough is from Mexicali, SOCAB and San Diego.

Local emissions that would be caused by Alternative IV-related train traffic in the Salton Trough areas would increase by 50 percent on average and by 60 percent on the alternate days as compared to the train emission of the Proposed Action. These days would result in
0.7[k], 0.03[l], 0.0006[l], 0.3[l], and 0.03[l] <--
percent increases, respectively, of NO_x, ROG, PM_{10}, SO_x and CO emissions in Imperial
County, and 0.4[k], 0.006[l], 0.002[l], 0.1[l], and <--
0.01[l] percent increases Coachella Valley. The <--
small increase in NO_x would not cause exceedances of NO_2 CAAQS. The increases in

NO_x and ROG could potentially increase background O_3 concentrations in the Coachella
--> Valley by about 0.08[ee] ppb (see Section 4.1.8). These concentrations would not noticeably contribute to exceedances caused by SOCAB transport, which frequently reach concentrations of 180 ppb. Emissions would
--> begin to decline after 95[a] years. With implementation of the mitigation measures identified in Section 4.1.8, impacts not be significant.

TABLE 4-38

Rail Haul Transport Emissions [1] for the Proposed Action and Cumulative Regional Landfills for Year 16 (2009) (lb/day)

Proposed Mesquite Regional Landfill

I. SOCAB

PROJECTS	NO_X	ROG	PM_{10}	SO_X	CO	
Proposed Action Trains	2,350[k]	200[l]	120[l]	70[l]	820[l]	<--
3 Regional Landfill Trains - 60,000 tpd[b]	7,050[k]	600[l]	360[l][m]	210[l][m]	2,460[l][m]	<--

II. COACHELLA VALLEY

PROJECTS	NO_X	ROG	PM_{10}	SO_X	CO	
Proposed Action Trains	880[k]	30[l]	20[l]	30[l]	160[l]	<--
3 Regional Landfill Trains- 60,000 tpd[b]	2,640[k][m]	90[l][m]	60[l][m]	90[l][m]	480[l][m]	<--

III. IMPERIAL COUNTY

PROJECTS	NO_X	ROG	PM_{10}	SO_X	CO	
Proposed Action Trains	680[k]	30[l]	15	20[l]	120[l]	<--
2 Regional Landfill Trains - 60,000 tpd	1,080[k]	40[l]	24[l]	40[l]	200[l]	<--

Notes:

(1) Emissions between MSW generators and transfer/compactor stations are identical for project and "No Project" alternatives. After the trucks leave these stations, the emissions are summed to provide the values in this table.

(2) Emission rates are triple those of Proposed Action.

Source: Environmental Solutions, 1994.

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ENDNOTES

(a) 95 years is the correct lifetime to reach 800 million ton capacity at 30,000 tpd.

(b) CARB publishes CAAQS and NAAQS in its Annual Air Quality Data reports. Between the annual reports for 1990 and 1991, CARB changed the published 24-hour average SO_2 concentration from 50 ppbv to 40 ppbv (equivalent to changing 131 $\mu g/m^3$ to 105 $\mu g/m^3$).

(c) Consolidation over recent years has reduced the number of APCDs to 34.

(d) Table corrected and clarified by designations in recently amended designations for state ambient air quality standards (CARB, 1994a).

(e) Statement clarified after Figure 3-25, which was in error in the Draft EIS/EIR, was replaced with correct figure.

(f) Table was updated with 1993 monitoring data added after publication of Annual Air Quality Data Summaries (CARB, 1994b).

(g) Based on public comments, these "new" arithmetic and geometric mean PM_{10} concentrations were calculated from nine years of Mesquite Mine monitoring data to provide a more complete range of environmental conditions than the previous use of the 2-year time period of 1991 and 1992.

(h) These emission rates were recalculated as requested by the Imperial County APCD to agree with the emissions factors used for the Mesquite Mine.

(i) 170 ppbv was the correct highest concentration of O_3 measured at the SCAQMD monitoring station in Indio during 1992, while 140 ppbv was the second highest concentration measured at that station in 1992 and incorrectly placed in this table for the Draft EIS/EIR.

(j) $\mu g/m^3$ are the correct units of concentration for PM_{10} because ppbv units are not meaningful for particulate matter. The ppbv units in the Draft EIS/EIR were incorrectly copied from the upper part of Table 3-17 on O_3 exceedances.

(k) Based on the AAR proposal to EPA, trains will reduce NO_x emissions by 55 percent rather than the 30 percent previously estimated from studies by Booz•Allen & Hamilton, Inc. (1991) and EFEE (1992), and the reduction will be accomplished by 2005 (Year 10) rather than 2003 (Year 8) as estimated for the Draft EIS/EIR.

(l) Southern Pacific Transportation Company selected two larger (4,400 hp) diesel locomotives rather than four smaller (3,600 hp) locomotives in their use of the AAR Train-Energy Model to provide the Lead Agencies with more accurate calculations of rail haul route emissions. The AAR Train-Energy Model computes fuel use and exhaust emissions as a function of train weight, throttle position (notch), and track grade (inclination angle).

(m) Slight revision of number to obtain accurate summation in tables containing rounded numbers.

(n) The Draft EIS/EIR number was inadvertently copied incorrectly from the calculation in Appendix F.

(o) Corrections made to reconcile fugitive emissions calculations with assumptions about emission factors for construction equipment (e.g., length of treated road segments near active face and amount of cover material).

(p) Correction to distance traveled by medium/heavy-duty service trucks.

(q) The NO_2 maximum hourly concentration was reduced from 8.8 to 6.8 $\mu g/m^3$ in Year 16 to account for newly published CARB emission factor reductions effective Year 2000, and corrections made to haul road and medium/heavy-duty service truck travel distance assumptions.

(r) The NO_2 maximum annual concentration was reduced from 0.1 to 0.09 $\mu g/m^3$ in Year 16 for the same reasons as the hourly concentration. The reduction is not proportional, however, because the annual concentration depends on the entire year's meteorology, including hours when modeled sources do not affect a specific receptor. This contrasts with the hourly concentration calculation which deliberately selects the hour when the greatest impact to a receptor would occur.

(s) The SO_2 maximum hourly concentration was reduced from 4.2 to 3.9 $\mu g/m^3$ in Year 16 to account for EPA requirement that diesel fuel have less than 0.05 percent sulfur, and corrections made to haul road and medium/heavy-duty service truck travel distance assumptions.

(t) The SO_2 maximum 24-hour concentration was reduced from 0.8 to 0.7 $\mu g/m^3$ in Year 16 for the same reasons as the hourly concentration. The reduction may not be proportional because the 24-hour concentration depends on hourly wind directions which may not always transport emissions to a specific receptor.

(u) The CO maximum hourly concentration was reduced from 1.3 to 0.04 $\mu g/m^3$ in Year 16 to account for corrections made to CO emission factors, haul road distance, and medium/heavy-duty service truck travel distance assumptions.

(v) The PM_{10} maximum annual arithmetic mean, annual geometric mean and 24-hour concentrations increased in Year 16 for reasons stated in endnotes (o), (ff) and (ll).

(w) The NO_2 maximum hourly concentration was reduced from 11.4 to 2.6 $\mu g/m^3$ in Year 100 to account for modeling input corrections of LFG flow rate, haul road distance, and the medium/heavy-duty service trucks travel distance assumptions, as well as newly published CARB emission factor reductions effective Year 2000.

(x) The NO_2 maximum annual concentration was reduced from 0.2 to 0.02 $\mu g/m^3$ in Year 100 for the same reasons as the hourly concentration. The reduction is not proportional because the annual concentration depends on the entire year's meteorology, including many hours when the modeled sources do not affect a specific receptor.

(y) The SO_2 maximum hourly concentration was reduced from 6.4 to 1.5 $\mu g/m^3$ in Year 100 to account for modeling input corrections to LFG flow rate, haul road distance, newly published CARB emission factor reductions effective Year 2000 and medium/heavy-duty service truck travel distance assumptions.

(z) The SO_2 maximum 24-hour concentration was reduced from 1.5 to 0.25 $\mu g/m^3$ in Year 100 for the same reasons as the hourly concentration. The reduction may not be proportional because the 24-hour concentration depends on hourly wind directions which may not always transport emissions to a specific receptor.

(aa) The SO_2 maximum annual concentration was reduced from 0.08 to 0.01 $\mu g/m^3$ in Year 100 for the same reasons as the hourly concentration. The reduction is not proportional because the annual concentration depends on the entire year's meteorology, including hours when modeled sources do not affect a specific receptor.

(bb) The CO maximum hourly concentration was reduced from 0.06 to 0.01 $\mu g/m^3$ in Year 100 to account for modeling input corrections to assumptions for haul road distance, newly published CARB emission factor reductions effective Year 2000, and medium/heavy-duty service trucks travel distance assumptions.

(cc) The PM_{10} maximum annual arithmetic mean, annual geometric mean and 24-hour concentrations decreased in Year 100 because the stationary point source (boiler) emission rate was corrected from the erroneously high value used in the Draft EIS/EIR.

(dd) The Draft EIS/EIR uses updated SOCAB emission rates taken from 1994 AQMP.

(ee) This change required by arithmetic consistency with correction to the table explained by previous footnotes.

(ff) The Draft EIS/EIR inventory for No Action Alternative underestimated emissions of commuting employees, delivery trucks, graders, and loaders.

(gg) Table modified based on more detailed analysis of eastbound and westbound train emissions.

(hh) Based on following improved reference document: SCAQMD. *Final Technical Report III-B, Emissions Inventory for the Coachella Valley Study Area, Final Air Quality Management Plan,* 1991 Revision, July 1991.

(ii) The Draft EIS/EIR mistakenly contained emission rate for total suspended particulate (TSP) instead of PM_{10}.

(jj) Updated information from SCAQMD (1994b) replaced the older reference from 1991.

(kk) Corrected to more accurately characterize round-trip distances between proposed site and several major cities (90 miles) that would supply employees, goals, and services.

(ll) The Draft EIS/EIR has been clarified to expressly present line items for trucks hauling agricultural plant material and transfer trucks hauling Imperial County MSW residue.

(mm) Corrected to reconcile modeling inputs with active face road segments and cover haulage assumptions.

(nn) Transcription error between this table and the applicable emissions inventory for water trucks and delivery trucks.

(oo) Health risk corrected for modeling computation error.