4.0 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 Introduction

This chapter provides an assessment of potential environmental impacts associated with the LADWP's Electrical Generation Stations Modifications Project. Both project construction and project operational impacts to the affected environment of each resource discussed in Chapter 3 are analyzed in this chapter. Pursuant to CEQA, this chapter focuses on those impacts which are considered potentially significant. An impact has been considered significant if it leads to a "substantial or potentially substantial, adverse change in the environment." The CEQA Guidelines require environmental documents to identify significant environmental effects that may result from a proposed project (CEQA Guidelines §15126(a)). Direct and indirect significant effects of a project on the environment should be identified and described, with consideration given to both short- and long-term impacts. The discussion of environmental impacts may include, but is not limited, to the resources involved; physical changes; alterations of ecological systems; health and safety problems caused by physical changes; and other aspects of the resource base, including water, scenic quality, and public services. If significant environmental impacts are identified, the CEQA Guidelines require a discussion of measures that could either avoid or substantially reduce any adverse environmental impacts to the greatest extent feasible (CEQA Guidelines §15126.4.

CEQA (Public Resources Code, §21000 et seq.) and the CEQA Guidelines as promulgated by the State of California Secretary of Resources establish the categories of environmental impacts to be analyzed in a CEQA document. Under the CEQA Guidelines, there are approximately 17 environmental categories in which potential adverse impacts from a project are evaluated. Projects are evaluated against the environmental categories in an environmental checklist and those environmental categories that may be adversely affected by the project (e.g., have potentially significant impacts) are further analyzed in the appropriate CEQA document.

Pursuant to CEQA, an Initial Study (IS), including an environmental checklist, was prepared for the LADWP's Electrical Generating Stations Modifications Project (see Appendix A). The IS was released on October 3, 2000. Of the 17 environmental categories reviewed in the IS, nine (air quality, biological resources, energy, geology/soils, hazards and hazardous materials, hydrology/water quality, noise, solid/hazardous waste, and transportation/traffic) were identified as having potentially significant impacts resulting from the implementation of the proposed project. Additionally, as a result of comments received on IS, it was further determined that cultural resources impacts should also be further assessed.

The following environmental analysis first proceeds by identifying the potentially significantly impacted environmental topic areas. Next, the analysis comprehensively analyzes and estimates the impacts associated with a particular environmental topic from the implementation of the proposed project[1]. Once the impact from a particular environmental topic is estimated, the analysis compares the estimated impact to the SCAQMD's significance thresholds. If an impact is significant, feasible mitigation measures are proposed to minimize the effect of the project on the environment or reduce the effect to a level where it is no longer significant.

4.2 Air Quality

Emissions that can adversely affect air quality originate from various activities. A project generates emissions both during the period of its construction and through ongoing daily operations. Project-related air quality impacts calculated in this environmental analysis will be considered significant if any of the applicable significance thresholds in Table 4.2-1 are exceeded. This table includes both emissions and concentration related significance thresholds. Construction and non-RECLAIM source emissions (i.e., indirect source emissions) are compared to pollutant specific emissions thresholds to determine if the impact is significant.

Additionally, operational NO_x or SO_x emissions from stationary sources regulated under the RECLAIM program (Regulation XX) will be considered significant if they exceed a facility-specific RECLAIM threshold. It should be noted, however, since electric utilities are exempt from the SO_x RECLAIM program (ref: Rule 2001(i)(2)(A)), this criteria will only apply to NO_x emissions from this project. This RECLAIM threshold is calculated based on the project's Initial 1994 RECLAIM Allocation plus nontradeable credits (NTCs), as listed in the RECLAIM Facility Permit, plus the maximum daily operation NO_x emissions significance thresholds of 55 pounds per day. A project is considered significant if the project's operational emissions, plus the facility's Annual Allocation for the year the project becomes operational, including purchased RECLAIM trading credits (RTCs) for that year, are greater than this RECLAIM significance threshold. Since the NO_x emissions significance threshold in Table 4.2-1 is expressed in pounds per day, the facility's Initial 1994 RECLAIM Allocation plus NTCs and the facility's Annual Allocation for the year the project becomes operational, including purchased RTCs, have been converted to pounds per day by dividing by 365 days per year.

As discussed in Section 3.1 of Chapter 3, the Basin is currently designated by USEPA as a nonattainment area for both CO and PM_{10}. As a result, localized impacts for CO and PM_{10} will be considered significant if they exceed the localized significance thresholds listed in Table 4.2-1. The localized significance thresholds for these nonattainment pollutants are based on the significant change in air quality concentration levels in Rule 1303, Table A-2.

[1] It should be noted that for the ten environmental impact areas that were identified as potentially significant and are further evaluated in detail in this Final EIR, the environmental impacts analysis for each environmental topic incorporates a worst-case approach. This entails maximizing the simultaneous peak daily construction- and operational-related activities for all three project sites.

Although the Basin is currently in attainment for both the CAAQS and NAAQS for NO_2, NO_2 is a precursor pollutant to both ozone and PM_{10}. For this reason, localized NO_2 air quality impacts will be significant if the project's RECLAIM NOx emissions exceed the significant change in air quality concentration level identified in SCAQMD Rule 2005, Table A-2, which is also listed in Table 4.2-1.

Because the Basin has been designated attainment for both the CAAQS and NAAQS for SO_2 since the early 1980s, no significant change in air quality concentration has ever been identified for this pollutant for the purposes of permitting new or modified equipment. Therefore, consistent with the SCAQMD's CEQA Air Quality Handbook (1993), localized SO_2 air quality impacts will be considered significant if the incremental increase in SO_2 emissions from the project, when added to existing background air quality concentrations, cause or contribute to an exceedance of any ambient air quality standard for SO2 at any sensitive receptor location.

Table 4.2-1
Air Quality Significance Thresholds

Criteria Pollutants Mass Daily Thresholds			
Pollutant	**Construction**	**Operation**	**RECLAIM Sources**
NO_x	100 lbs/day	55 lbs/day	HGS: 299 lbs/day VGS: 1,542 lbs/day
VOC	75 lbs/day	55 lbs/day	
PM_{10}	150 lbs/day	150 lbs/day	
SO_x	150 lbs/day	150 lbs/day	Exempt
CO	550 lbs/day	550 lbs/day	
Lead	3 lbs/day	3 lbs/day	
TAC, AHM, and Odor Thresholds			
Toxic Air Contaminants (TACs)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Hazard Index ≥ 1.0 (project increment) Hazard Index ≥ 3.0 (facility-wide)		
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402		
Ambient Air Quality for Criteria Pollutants			

Table 4.2-1
Air Quality Significance Thresholds

NO_2 1-hour average NO_2 annual average	20 µg/m^3 (= 1.0 pphm)[a] 1 µg/m^3 (= 0.05 pphm)[b]
PM_{10} 24-hour PM_{10} annual geometric mean	2.5 µg/m^3 1.0 µg/m^3
Sulfate 24-hour average	1 µg/m^3
CO 1-hour average CO 8-hour average	1.1 mg/m^3 (= 1.0 ppm) 0.50 mg/m^3 (= 0.45 ppm)

µg/m^3 = microgram per cubic meter; pphm = parts per hundred million; mg/m^3 = milligram per cubic meter; ppm = parts per million; TAC = toxic air contaminant; AHM = Acutely Hazardous Material

[a] California 1-hour ambient air quality standard, includes project impact plus background

[b] PSD Annual Class II increment for NO_2

4.2.1 Construction Emissions and Impacts

Construction-related emissions can be distinguished as either onsite or offsite. Onsite emissions generated during construction principally consist of exhaust emissions (NO_X, SO_X, CO, VOC, and PM_{10}) from heavy-duty diesel and gasoline powered construction equipment operation, fugitive dust (PM_{10}) from disturbed soil, and evaporative VOC emissions from storage tank degassing prior to demolition, asphaltic paving, and equipment touch-up painting. Offsite emissions during the construction phase normally consist of exhaust emissions and entrained paved road dust (PM_{10}) from worker commute trips, material delivery trips, and haul truck material removal trips to and from the construction site.

Normally, construction activities are typically divided into three distinct phases: (1) demolition and land clearing; (2) site preparation; and (3) general construction. However, for this proposed project construction-related activities at the three project sites are anticipated to include the following distinct major components:

- Demolition of four storage tanks at HGS
- Demolition of four cooling towers and a storage tank at VGS
- Demolition of a concrete pad at SGS
- Backfilling at HGS to bring the site to road grade
- Grading at all three sites
- Trenching along road sides at HGS
- Jacking (e.g., boring) of utilities under roads at HGS
- Construction of CT pads and equipment foundations at HGS and VGS
- Construction of tank pads at SGS
- Equipment installation of CTs, SCRs, auxiliary equipment and tanks at the three project sites
- Paving of access roads and equipment maintenance areas at the three project sites

Emissions from these activities were estimated using anticipated construction equipment/worker requirements along with the following emission estimating techniques:

- SCAQMD CEQA Air Quality Handbook, November 1993;
- USEPA Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition;
- USEPA Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, 1992;
- California Air Resources Board EMFAC7G on-road motor vehicle emission factor model;
- California Air Resources Board Emission Inventory Methodology 7.9, Entrained Paved Road Dust, 1997; and
- "Open Fugitive Dust PM_{10} Control Strategies Study," Midwest Research Institute, October 12, 1990.

The reader is referred to Appendix C for the details of the emission calculation methodologies used to estimate construction-related air quality impacts from the proposed project.

To estimate the peak daily emissions associated with construction-related activities for the three project sites, the anticipated construction schedule, the types of construction equipment, and number of construction equipment were estimated. Additionally, estimates were made of the number of peak daily worker commuting trips and material delivery and removal trips for each of the construction activities.

The construction at each site was broken down into discrete phases for estimating construction requirements. For concrete demolition, site preparation, and concrete and asphalt work, standard construction estimation methods were used to develop the manpower and equipment requirements, specifically, *Building Construction Cost Data*, RS Means, 12th edition, Western Edition, 1999 (Means). Demolition of the existing tanks at the HGS and VGS sites requires specific expertise. Accordingly, estimates of manpower and equipment requirements for the tank demolition activities were taken from industry sources. Estimates of manpower and equipment for the installation of the CTs and ammonia tanks are based on LADWP and equipment supplier experience on similar installations. Additional details of the methods and assumptions used are discussed in Appendix C.

Tables 4.2-2 through 4.2-4 list the anticipated construction schedule, peak daily construction equipment requirements, peak daily construction worker trips, peak daily material delivery truck trips, and peak daily haul truck trips for construction activities at each project site. Construction is anticipated to occur seven days per week for up to 24 hours per day. Allowing time for shift changes and work breaks, construction equipment is assumed to operate for 16 hours per day.

Table 4.2-2
Construction Schedule, Equipment Requirements, and Motor Vehicle Trips
Harbor Generating Station

Start and End Construction Days	Type of Equipment (Onsite)	Number of Equipment	Number of Construction Workers (Offsite)	Daily Material Delivery Trips (Offsite)	Daily Haul Truck Trips (Offsite)
Demolition					
1-10	D6 Bulldozer	1	16	0	26
	Front End Loader	1			
	Excavator	2			
	Light Plant	20			
	Crane	2			
Backfill					
11-20	D8 Bulldozer	2	10	50	0
	Grader	2			
	Compactor	2			
	Light Plant	20			
Grading					
18-20	Grader	1	3	0	0
	Light Plant	20			
Construction of Foundations					
21-28	Concrete Vibrator	10	250	33	0
	Concrete Pump	10			
	Light Plant	20			
Asphalt Paving					
21-28	Paver	1	6	14	0
	Light Plant	20			
Equipment Installation					
29-150	Forklift	6	400	10	1
	Backhoe	2			
	Compressor	2			
	Light Plant	20			
	Trencher	1			
	Plate Compactor	1			
	Crane	4			

Table 4.2-3
Construction Schedule, Equipment Requirements, and Motor Vehicle Trips
Scattergood Generating Station

Start and End Construction Days	Type of Equipment (Onsite)	Number of Equipment	Number of Construction Workers (Offsite)	Daily Material Delivery Trips (Offsite)	Daily Haul Truck Trips (Offsite)
		Demolition			
1-10	Front End Loader	1	10	0	16
	Backhoe	1			
	Light Plant	5			
	Jackhammer	1			
		Grading			
18-20	Grader	1	3	0	0
	Light Plant	5			
		Construction of Foundations			
21-28	Concrete Vibrator	1	13	8	0
	Concrete Pump	1			
	Light Plant	5			
		Asphalt Paving			
21-28	Paver	1	3	6	0
	Light Plant	5			
		Equipment Installation			
29-150	Forklift	2	100	10	1
	Compressor	2			
	Light Plant	5			
	Welder	6			
	Crane	1			

Table 4.2-4
Construction Schedule, Equipment Requirements, and Motor Vehicle Trips
Valley Generating Station

Start and End Construction Days	Type of Equipment (Onsite)	Number of Equipment	Number of Construction Workers (Offsite)	Daily Material Delivery Trips (Offsite)	Daily Haul Truck Trips (Offsite)
Demolition					
1-10	Front End Loader	2	12	0	10
	Excavator	1			
	Backhoe	1			
	Light Plant	5			
	Jackhammer	1			
	Crane	1			
Grading					
11-15	Grader	1	3	0	0
	Light Plant	5			
Construction of Foundations					
16-22	Concrete Vibrator	2	50	25	0
	Concrete Pump	2			
	Light Plant	5			
Asphalt Paving					
21-25	Paver	1	3	8	0
	Light Plant	5			
Equipment Installation					
29-150	Forklift	2	105	10	1
	Backhoe	1			
	Compressor	2			
	Light Plant	5			
	Welder	2			
	Trencher	1			
	Plate Compactor	1			
	Crane	1			

The information in Tables 4.2-2 through 4.2-4 was used to calculate onsite emissions from construction equipment exhaust and from some fugitive dust PM_{10} sources (bulldozing, grading and vehicle travel on unpaved surfaces). Estimates of fugitive dust emissions assume that construction activities will comply with SCAQMD Rule 403 - Fugitive Dust, by watering active sites two times per day, which reduces fugitive dust emissions approximately 50 percent. PM_{10} emissions from storage pile wind erosion were calculated from estimated storage pile surface areas of 0.023 acres during grading and backfilling at HGS, 0.052 acres during grading at SGS, and 0.023 acres during grading at VGS. These storage pile areas were estimated from the site configurations (see Figures 2.3-5 – 2.3-7 in Chapter 2). PM_{10} emissions from material handling were calculated from estimates of 468 and 900 cubic yards of material handled daily during storage tank demolition and backfilling, respectively, at HGS.

VOC emissions from degassing of storage tanks prior to demolition at HGS and VGS were based on the current tank contents and the tank sizes. Tanks to be demolished at HGS include one 100,000-barrel[2] and two 80,000-barrel tanks containing light cycle oil and one 50,000-gallon tank containing cutting stock. The one 80,000-barrel tank to be demolished at VGS contains No. 6 fuel oil.

VOC emissions from paving activities were based on estimated areas to be paved each day, which include 0.99 acres (43,200 ft^2) at HGS, 0.03 acres (1,125 ft^2) at SGS, and 0.20 acres (8,640 ft^2) at VGS (see Figures 2.3-5 – 2.3-7 in Chapter 2). VOC emissions from architectural coating were based on an estimated maximum daily use of 10 gallons of paint for touch-up during equipment installation. All equipment shipped to the project sites will be pre-painted to manufacturer specifications.

The maximum number of daily motor vehicle trips (e.g., worker commuting, material delivery, and haul trips) anticipated during each construction activity as show in Tables 4.2-2 through 4.2-4 above were used in conjunction with the information in Table 4.2-5 below to estimate peak daily emissions from both onsite and offsite motor vehicles from all three project sites.

[2] One barrel equal approximately 42 gallons.

Table 4.2-5
Motor Vehicle Classes, Speeds and Daily VMT, for Construction Activities

Vehicle Type	Vehicle Class	Speed (mph)	VMT (mile/vehicle-day)
Onsite pickup truck	Medium duty truck, catalyst	15	1
Onsite Watering truck	Medium heavy-duty truck, diesel	15	1
Onsite Dump truck, 3-axle	Heavy heavy-duty truck, diesel	15	1
Onsite Material removal haul truck	Heavy heavy-duty truck, diesel	5	0.5
Onsite Delivery vehicle	Heavy heavy-duty truck, diesel	5	1
Offsite Street sweeper	Medium heavy-duty truck, diesel	15	30
Construction commuter	Light-duty truck, catalyst	35	20
Offsite Material removal haul truck	Heavy heavy-duty truck, diesel	25	60
Offsite Delivery vehicle	Heavy heavy-duty truck, diesel	25	60

Table 4.2-6 lists estimated peak daily unmitigated onsite and offsite emissions associated with each construction phase for each project site. The emissions associated with a particular source (e.g., construction equipment exhaust, bulldozing, grading, worker commuting, material delivery trips, tank degassing, etc.) for a specific construction activity are shown in the attached spreadsheets to Appendix C.

Table 4.2-6
Peak Daily Construction Emissions by Project Site for Each Construction Phase (Pre-Mitigation)

Activity	Location	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM_{10} (lb/day)	Fugitive PM_{10}[a] (lb/day)	Total PM_{10} (lb/day)
HGS Tank Demolition	Onsite	131.8	292.9	238.0	20.3	13.9	16.0	29.9
	Offsite	30.6	4.5	22.3	0.0	1.4	103.1	104.5
HGS Backfill	Onsite	151.9	32.6	302.9	27.3	14.7	93.2	107.9
	Offsite	48.8	7.3	41.5	0.0	2.6	197.3	199.9
HGS Grading	Onsite	52.0	10.4	78.8	6.9	4.5	2.7	7.2
	Offsite	1.5	0.2	0.2	0.0	0.0	0.1	0.1
HGS Foundations	Onsite	254.5	23.1	131.6	10.7	8.0	40.0	48.0
	Offsite	150.0	20.2	44.4	0.0	1.7	89.4	91.1
HGS Paving	Onsite	47.7	9.7	68.8	5.8	3.9	5.2	9.1
	Offsite	21.4	3.2	17.5	0.0	1.1	49.3	50.4
HGS Equipment Installation	Onsite	180.0	76.0	341.5	27.3	19.5	18.8	38.3
	Offsite	202.4	26.6	36.1	0.0	0.5	43.2	43.7
SGS Slab Demolition	Onsite	40.6	7.4	54.9	4.9	2.7	5.8	8.5

Table 4.2-6
Peak Daily Construction Emissions by Project Site for Each Construction Phase (Pre-Mitigation)

Activity	Location	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM_{10} (lb/day)	Fugitive PM_{10}[a] (lb/day)	Total PM_{10} (lb/day)
	Offsite	16.5	2.4	13.4	0.0	0.8	63.2	64.1
SGS Grading	Onsite	22.0	5.9	42.4	3.9	2.2	3.7	5.9
	Offsite	1.5	0.2	0.2	0.0	0.0	0.1	0.1
SGS Foundations	Onsite	31.6	3.2	20.6	1.7	1.3	5.4	6.7
	Offsite	13.3	1.9	7.4	0.0	0.4	19.3	19.7
SGS Paving	Onsite	16.8	2.5	32.1	2.7	1.6	2.7	4.4
	Offsite	6.7	1.0	5.1	0.0	0.3	14.2	14.5
SGS Equipment Installation	Onsite	64.1	48.9	119.9	10.4	6.7	7.3	14.0
	Offsite	58.1	7.8	16.0	0.0	0.6	31.1	31.7
VGS Demolition	Onsite	84.0	16.4	143.2	12.6	7.9	4.9	12.8
	Offsite	17.0	2.4	9.3	0.0	0.5	40.2	40.7
VGS Grading	Onsite	21.7	5.8	42.4	3.9	2.2	2.7	4.9
	Offsite	1.5	0.2	0.2	0.0	0.0	0.1	0.1
VGS Foundations	Onsite	54.1	5.0	29.3	2.3	1.8	9.4	11.2
	Offsite	46.2	6.5	23.9	0.0	1.3	60.8	62.1
VGS Paving	Onsite	17.1	3.0	32.2	2.7	1.6	3.3	5.0
	Offsite	8.5	1.3	6.7	0.0	0.4	18.8	19.2
VGS Equipment Installation	Onsite	74.5	22.6	130.7	11.0	7.4	7.9	15.3
	Offsite	59.6	8.0	15.5	0.0	0.5	28.5	29.1

[a] It is assumed that construction activities will comply with SCAQMD Rule 403 - Fugitive Dust, by watering active sites two times per day, reducing fugitive dust by 50 percent.

Because these activities are not anticipated to all take place at the same time, the overall peak daily construction emissions will not be equal to the sum of the peak daily emissions from all of the construction activities. Therefore, the anticipated overlap of activities was evaluated to determine overall peak daily emissions. First, it was conservatively assumed as a "worst-case" that the peak daily emissions from each overlapping activity would occur at the same time. Next, the activities that are anticipated to occur simultaneously were identified for each day of the entire construction period. The peak daily emissions from the construction activities taking place each day were then added together to estimate the total peak daily emissions during each week. Finally, the day with the highest overall peak daily emissions was identified.

Because different activities tend to lead to higher emissions of one pollutant than another, the activities that lead to the highest overall peak daily emissions are not the same for every pollutant. The overall peak daily CO emissions are anticipated to occur during foundation construction and paving at all three sites. The overall peak daily VOC emissions are anticipated to occur during simultaneous demolition activities at all three project sites. Overall peak daily NO_X and SO_X emissions are anticipated to occur during simultaneous equipment installation at all three project sites. The overall peak daily PM_{10} emissions are anticipated to occur during simultaneous backfilling and grading at HGS, grading at SGS, and foundation construction at VGS.

Table 4.2-7 lists the overall peak daily construction emissions by type of source and compares the emissions with the SCAQMD's CEQA construction emissions significance thresholds to determine whether construction-related air quality impacts are significant. As seen, the significance thresholds are anticipated to be exceeded for CO, VOC, NO_X, and PM_{10} construction-related emissions.

Table 4.2-7
Overall Peak Daily Emissions During Construction (Pre-Mitigation)

Source	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM_{10} (lb/day)	Fugitive PM_{10}[a] (lb/day)	Total PM_{10} (lb/day)
Onsite Construction Equipment Exhaust	408.3	46.2	590.5	48.6	23.1	--	23.1
Onsite Motor Vehicles	13.5	0.8	1.6	0.0	0.1	--	0.1
Onsite Fugitive PM10	--	--	--	--	--	108.9	108.9
Onsite Tank Degassing	--	269.6	--	--	--	--	--
Total Onsite	**421.8**	**316.7**	**592.1**	**48.6**	**23.2**	**108.9**	**132.1**
Offsite Haul Truck Soil Loss	--	--	--	--	--	80.1	80.1
Offsite Motor Vehicles	246.2	9.3	67.6	0.0	3.9	178.3	182.2
Total Offsite	**246.2**	**9.3**	**67.6**	**0.0**	**3.9**	**258.4**	**262.3**
TOTAL	**668.0**	**326.0**	**659.8**	**48.6**	**27.1**	**367.4**	**394.4**
CEQA Significance Level	*550*	*75*	*100*	*150*	--	--	*150*
Significant? (Yes/No)	**Yes**	**Yes**	**Yes**	No	--	--	**Yes**
Note: Totals may not match sum of individual values because of rounding							

4.2.2 Operational Emissions

4.2.2.1 Direct Operational Emissions

This section addresses the direct air quality impacts from the operation of the new and modified equipment associated with the proposed project. Air quality impacts from indirect sources during operational-related activities (e.g., aqueous ammonia tanker truck deliveries) are discussed in Subsection 4.2.2.2.

The sources of potential emissions resulting from new equipment installations and modifications to existing units for the proposed project are discussed below.

Harbor Generating Station

At this project site, the installation of the following equipment installations would result in criteria pollutant and toxic air contaminant emissions:

- Five 47-MW, dual fuel (natural gas and No. 2 diesel fuel) fired, simple-cycle peaking CTs. The CTs will be provided with built-in controls (e.g., water injection) that will preliminarily reduce NO_X emissions prior to venting the exhaust to the SCR systems. The CTs will be provided with SCR systems that will use ammonia and contain a CO catalyst to further reduce NO_X and CO emissions from the CTs[3];
- Five cooling towers, each cooling tower provided with two cells with each cell having a 4,100 gallon per minute circulation rate; and
- One black-start 565-kW diesel generator[4].

Scattergood Generating Station

LADWP is proposing to install three SCR systems on its three existing utility boilers (Units #1, #2, and #3) at the SGS site. The three new SCR systems, which would exhaust through two existing stacks, would be potential sources of ammonia emissions.[5] The project site will also include the installation of three 30,000-gallon (aqueous ammonia) aboveground storage tanks on the SGS site. However, no ammonia emissions are expected, because these tanks would be pressurized tanks and provided with pressure relief valves. In addition, vapor return lines would be used during filling of the ammonia tanks.

Valley Generating Station

At this project site, the installation of the following equipment installations would result in criteria pollutant and toxic air contaminant emissions:

- One 47-MW, dual fuel (natural gas and No. 2 diesel fuel) fired, simple-cycle peaking CT. The CT will be provided with built-in control (e.g., water injection) that will preliminarily

[3] It should be noted that, although an SCR system predominately reduces NO_X emissions from combustion processes, the use of ammonia as a reductant causes a slight increase in PM_{10} precursor emissions. This is due to the fact that not all of the ammonia reacts with the NO_X emissions in the exhaust in the presence of the catalyst. This unreacted ammonia, known as ammonia slippage, is emitted out the exhaust stack. The incremental increase in ammonia emissions from ammonia slippage associated with SCR operation is analyzed in this Final EIR. Also, PM_{10} emissions are generated in the SCRs' reaction chambers when SO_2 in the exhaust stream is converted to SO_3 in the presence of the SCR catalyst. This PM_{10} source is also analyzed in this Final EIR.

[4] A diesel-fueled generator is necessary to provide emergency power during the time period where line power is unavailable and the CTs are coming online from a cold start up.

[5] It should be noted that the NO_X emissions from Units #1 and #2 are currently controlled by urea injection. The current SCAQMD-permit limit for ammonia slippage from these units (combined stack No. 1) is 20 ppm. For this project site, the urea injection systems for Units #1 and #2 will be replaced by in-duct SCR systems. The new permit limit for ammonia slippage from Units #1 and #2 as well as Unit # 3 will be reduced to 10 ppm.

reduce NO_X emissions prior to venting the exhaust to the SCR system. The CT will be provided with an SCR system that will use ammonia and contain a CO catalyst to further reduce NO_X and CO emissions from the CT[6];

- One cooling tower provided with two cells, with each cell having a 4,100 gallon per minute circulation rate; and
- One black start 565-kW diesel generator[7].

This project site will also include the installation of one 30,000-gallon (aqueous ammonia) aboveground storage tank on the VGS project site. However, no ammonia emissions are expected, because the tank would be pressurized and provided with a pressure relief valve. In addition, vapor return lines would be used during filling of the tank.

The new equipment at the three project sites will operate in various modes that lead to different emission rates. The new CTs at HGS and VGS will operate in three modes: (1) normal startup; (2) normal operation; and (3) diesel readiness testing. The new SCRs at SGS will only operate in a normal operating mode. Additionally, the black start diesel generators will undergo periodic testing at the HGS and VGS sites. Criteria pollutant and toxic air contaminant emissions associated with each of these operating modes were estimated. The combinations of these operating modes that lead to peak daily criteria pollutant emissions were identified for comparison with the daily mass emissions significance criteria listed in Table 4.2-1. Additionally, the combinations of the operating modes that lead to peak hourly and daily criteria and toxic air contaminant emissions were identified for use in air quality dispersion modeling for comparison with the ambient air quality and human health risk significance criteria in Table 4.2-1.

This subsection presents emissions during each of the operating modes. The reader is referred to Appendix C for the details of the emission calculation methodologies used to estimate operational-related air quality impacts from the proposed project. "Worst-case" daily emissions are discussed in Subsection 4.2.3.1.

Emissions associated with each operating mode were estimated as follows.

Normal CT Startup

During normal startup of the CTs at the HGS and VGS sites, all five CTs at HGS and the one CT at VGS would be started simultaneously. During this startup, the CTs would be operated in the following two phases: (1) operate the CTs on natural gas without any controls for a maximum of five minutes (natural gas consumed during this phase would be 10,000 standard cubic feet (scf)); and (2) operate the CTs on natural gas for another 55 minutes with only water-injection control (natural gas consumed during this phase would be 226,600 scf).

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[6] See footnote 3.
[7] See footnote 4.

PM_{10} and SO_2 emissions for both phases of normal startup were estimated using USEPA's AP-42 emission factors. NO_X emissions for phase 1 were estimated using USEPA's AP-42 emission factor. For phase 2, NO_X emissions were estimated from the CT manufacturer-supplied emission factor. The VOC emissions for both phases were estimated by using SCAQMD's VOC permit emission limits for these type of sources (see Table 4.2-8 for the SCAQMD approved emission limits).[8] The toxic air contaminant emissions estimates were derived from CARB-approved emission factors. Tables 4.2-9 and 4.2-10 present the estimated criteria pollutant and toxic air contaminant emissions from the CTs, respectively, during normal startup.

[8] The SCAQMD VOC emission limit is higher than the USEPA's AP-42 emission factor.

Table 4.2-8
SCAQMD Permitting Emission Limits for HGS, SGS, and VGS Project Sites

Pollutant	Current Emission Limit			SCAQMD Permitting Emission Limit (2000)		
	HGS (ppm)	SGS (ppm)	VGS (ppm)	HGS (ppm)	SGS (ppm)	VGS (ppm)
NH_3	NA	20 (Units #1 and #2) No limit for Unit #3	NA	5	10	5
CO	NA	--	NA	6	--	6
NO_X	NA	No current limit Urea injection on Units #1 and #2 No add-on control on Unit #3	NA	5	7	5
VOC	NA	--	NA	2	--	2

NA = not applicable (new equipment)

Table 4.2-9
Criteria Pollutant Maximum Hourly and Annual Emissions for HGS and VGS Project Sites - Normal Startup of New CTs

Pollutant	HGS		VGS	
	Maximum Hourly[a] (lb/hr)	Annual[b] (ton/yr)	Maximum Hourly[c] (lb/hr)	Annual[d] (ton/yr)
CO	49.10	8.96	9.82	1.79
NO_x	127.05	23.19	25.41	4.64
PM_{10}	9.75	1.78	1.95	0.36
SO_2	1.75	0.32	0.35	0.064
VOC	3.25	0.59	0.65	0.12

[a] For five CTs and five cooling towers
[b] Based on 365 normal startups for five CTs
[c] For one CT and one cooling tower
[d] Based on 365 normal startups for one CT

Table 4.2-10
Toxic Air Contaminant[a] Annual Emissions Estimates for HGS and VGS Project Sites - Normal Startup of New CTs

Toxic Air Contaminant	Annual Emissions (lb/yr)

	HGS[b]	VGS[c]
1,3-Butadiene	5.50E-02	1.10E-02
Acetaldehyde	5.93E+01	1.19E+01
Acrolein	8.17E+00	1.63E+00
Ammonia	3.14E+03	6.27E+02
Benz(a)anthracene	1.00E-02	2.00E-03
Benzene	5.75E+00	1.15E+00
Benzo(a)pyrene	6.00E-03	1.20E-03
Benzo(b)fluoranthene	5.00E-03	1.00E-03
Benzo(k)fluoranthene	5.00E-03	1.00E-03
Chrysene	1.10E-02	2.20E-03
Dibenz(a,h)anthracene	1.00E-02	2.00E-03
Ethylbenzene	7.74E+00	1.55E+00
Formaldehyde	3.97E+02	7.93E+01
Hexane	1.12E+02	2.24E+01
Indeno(1,2,3-cd)pyrene	1.00E-02	2.00E-03
Naphthalene	7.18E-01	1.44E-01
Propylene	3.33E+02	6.67E+01
Propylene Oxide	2.07E+01	4.13E+00
Toluene	3.07E+01	6.14E+00
Xylene (Total)	1.13E+01	2.26E+00

[a] SCAQMD Rule 1401 (Amended August 18, 2000) Toxic Air Contaminants
[b] Based on 365 normal startups for five CTs
[c] Based on 365 normal startups for one CT

<u>Normal Operating Mode</u>

The normal operating mode for the new CTs at HGS and VGS is defined as the operation of the CTs with all add-on controls after the completion of the normal startup phase. The emissions of PM_{10} and SO_2, were estimated using USEPA's AP-42 emission factors. The emissions of CO, NO_X, and ammonia from the five CTs were estimated using the SCAQMD's Best Available Control Technology (BACT) permitting limits, which are five ppm for NO_x, six ppm for CO, and five ppm for ammonia slippage (see Table 4.2-8). The VOC emissions were estimated using the SCAQMD's VOC permitting limit.[9] The toxic air contaminant (except ammonia) emissions from the CTs during this operating mode were estimated using CARB-approved emission factors. The increased PM_{10} emissions from the installation of SCR technology were estimated using the SCAQMD Energy Team, Application Processing and Calculations for the installation of a SCR system.[10] The criteria pollutant and toxic air contaminant emissions, including ammonia

[9] See footnote 8

[10] There are two sources of PM_{10} associated with the operation of the CTs and SCRs. There are PM_{10} emissions from the combustion process associated with operation of the CTs. Also, PM_{10} emissions are generated in the SCRs'

emissions estimates, for the CTs during this operating mode are presented in Tables 4.2-11 and 4.2-12, respectively.

During the normal operation of the SGS site, the installation of the three new SCRs would result in a substantial decrease in NO_X emissions from current levels. The SCAQMD permitting emission limit for NO_X emissions after the installation of the SCR systems would be seven ppm (see Table 4.2-8). This substantial decrease in NO_X from the SGS site will aid LADWP in complying with the SCAQMD's RECLAIM program.

Table 4.2-11
Criteria Pollutant Maximum Hourly and Annual Emissions for HGS and VGS Project Sites - Normal Operation of New CTs

	HGS		VGS	
Pollutant	**Maximum Hourly[a] (lb/hr)**	**Annual[b] (ton/yr)**	**Maximum Hourly[c] (lb/hr)**	**Annual[d] (ton/yr)**
CO	29.45	128.99	5.89	25.78
NO_x	40.15	175.86	8.03	35.18
PM_{10}[e]	16.00	70.08	3.20	14.02
SO_2	3.05	13.25	0.61	2.65
VOC	5.60	24.53	1.12	4.90

[a] Based on fuel consumption for full load of CT operation for five CTs and five cooling towers
[b] Based on fuel consumption for five CTs, 8,760 hours of operation (each CT and each cooling tower)
[c] Based on fuel consumption for full load of CT operation (one CT) and one cooling tower
[d] Based on fuel consumption for one CT and one operating cooling tower, 8,760 hours of operation
[e] This includes the PM_{10} emissions from natural gas combustion and the incremental increase in PM_{10} emissions from the conversion of SO_2 to SO_3 in the presence of the SCR catalyst. Assumed five percent of the SO_2 converts to SO_3 and all SO_3 converts to ammonium sulfate.

Table 4.2-12
Toxic Air Contaminant[a] Annual Emissions Estimates for HGS and VGS Project Sites - Normal Operation of New CTs

	Annual Emissions (lb/yr)	
Toxic Air Contaminant	**HGS[b]**	**VGS[c]**
1,3-Butadiene	2.28E+00	4.55E-01
Acetaldehyde	2.45E+03	4.91E+02

reaction chambers when SO_2 in the exhaust stream is converted to SO_3 in the presence of the SCR catalyst. Both of these PM_{10} sources are analyzed in this Final EIR.

Acrolein	3.39E+02	6.77E+01
Ammonia	1.30E+05	2.60E+04
Benz(a)anthracene	4.05E-01	8.10E-02
Benzene	2.38E+02	4.77E+01
Benzo(a)pyrene	2.49E-01	4.98E-02
Benzo(b)fluoranthene	2.03E-01	4.05E-02
Benzo(k)fluoranthene	1.97E-01	3.94E-02
Chrysene	4.52E-01	9.03E-02
Dibenz(a,h)anthracene	4.21E-01	8.42E-02
Ethylbenzene	3.21E+02	6.41E+01
Formaldehyde	1.64E+04	3.29E+03
Hexane	4.64E+03	9.28E+02
Indeno(1,2,3-cd)pyrene	4.21E-01	8.42E-02
Naphthalene	2.97E+01	5.95E+00
Propylene	1.38E+04	2.76E+03
Propylene Oxide	8.56E+02	1.71E+02
Toluene	1.27E+03	2.54E+02
Xylene (Total)	4.68E+02	9.35E+01

[a] SCAQMD Rule 1401 (Amended August 18, 2000) Toxic Air Contaminants

[b] Based on fuel consumption for full load of CT operation for five CTs, 8,760 hours of operation (each CT)

[c] Based on fuel consumption for full load of CT operation, 8,760 hours of operation

At SGS, the other criteria pollutant (e.g., CO, VOC, and SO_X) emissions are expected to remain the same as current operations. However, since some ammonia used in the SCR systems will not react and slip out the exhaust stack, PM_{10} emission could slightly increase. Additionally, SO_2 in the exhaust gas could form SO_3 in the presence of the SCR catalyst. Table 4.2-13 presents the post-modification ammonia and increased PM_{10} emission estimates for SGS.

Table 4.2-14 presents estimated NO_X emissions from Units #1, #2, and #3 after the installation of the SCR systems at the SGS site. Table 4.2-14 also presents the actual annual average NO_X emissions during the past two years (September 1998 through August 2000). The emission estimates presented in Table 4.2-14 show that there would be a reduction in NO_X emissions of about 600 tons per year after the installation of the SCR systems at the SGS site.

Table 4.2-13
Maximum Hourly and Annual Ammonia and Particulate Matter Emissions Estimates for SGS Project Site - Normal Operation of New SCR Systems

Pollutant	Maximum Hourly [a] (lb/hr)	Annual [b] (ton/yr)
PM_{10} [c]	1.15	5.04
Ammonia[e]	36.28[d]	158.9[d]

[a] Emissions from all three boiler units

[b] Based on operation of all three boiler units throughout the year (8,760 hours of operation)

[c] PM_{10} associated with ammonia slippage and the conversion of five percent of the SO_2 to SO_3 and all of the SO_3 converting to ammonium sulfate.

[d] Total ammonia emissions after the installation of the three SCR systems

[e] Pre-SCR installations annual average ammonia emission rate is 60 ton/yr from the current use of urea injection of Units #1 and #2.

Table 4.2-14
Annual NO_X Emissions Estimates for the SGS Project Site

Pollutant	Annual Average Pre-SCR Installations[a] (ton/yr)	Annual - Post-SCR Installations[b] (ton/yr)[a]
NO_x	891	297

[a] Based on continuous emission monitoring data from Sept. 1, 1998 through Aug. 31, 2000

[b] Based on continuous operation of all three boiler units throughout the year (8,760 hours of operation)

<u>CTs Diesel Fuel Readiness Testing</u>

The CTs at the HGS and VGS project sites will be tested for diesel fuel (sulfur content of 0.05 percent by weight) readiness once per month for 30 minutes according to the following two phases: (1) operate one CT without any controls for a maximum of five minutes; and (2) operate the same CT for another 25 minutes with only water injection. It should be noted that the CT at the VGS project site will only be tested during the daytime (between 10 a.m. and 4 p.m.).

The emissions of PM_{10}, SO_2, and VOC were estimated using USEPA's AP-42 emission factors. The phase 1 NO_X emissions were estimated using USEPA's AP-42 NO_X emission factor, while a manufacturer-supplied emission factor was used to estimate NO_X emissions during phase 2. Toxic air contaminant emission estimates for this operating mode were derived from CARB-approved emission factors. The criteria pollutant and toxic air contaminant emission estimates are presented in Tables 4.2-15 and 4.2-16, respectively, for both the HGS and VGS project sites.

Table 4.2-15
Criteria Pollutant Maximum Hourly and Annual Emissions
for HGS and VGS Project Sites - Diesel Fuel Readiness Testing of New CTs

Pollutant	HGS		VGS	
	Maximum Hourly[a] (lb/hr)	Annual[b] (ton/yr)	Maximum Hourly[c] (lb/hr)	Annual[d] (ton/yr)
CO	11.27	0.34	11.27	0.068
NO_x	24.68	0.74	24.68	0.15
PM_{10}	1.74	0.052	1.74	0.010
SO_2	6.05	0.18	6.05	0.036
VOC	0.96	0.029	0.96	0.006

[a, c] Maximum hourly emissions for one CT and one cooling tower
[b] Annual emissions for five CTs and five cooling towers
[d] Annual emissions for one CT and one cooling tower

<u>Black Start Diesel-Fueled Generator Testing</u>

The black start generator at both HGS and VGS will be tested every month for a duration of thirty minutes. However, it should be noted that the black start generator and the CT will not be tested simultaneously at the VGS project site.

PM_{10}, SO_2, and VOC emissions were estimated using USEPA's AP-42 emission factors for diesel-fueled industrial engines. The NO_X emissions were estimated using generator manufacturer-supplied emission factors. Toxic air contaminant emissions estimates were determined using CARB-approved emission factors. The criteria pollutant and toxic air contaminant emission estimates are presented in Tables 4.2-17 and 4.2-18, respectively, for both the HGS and VGS project sites.

Table 4.2-16
Toxic Air Contaminant[a] Annual Emissions Estimates for HGS and VGS Project Sites - Black Start Diesel-Fueled Generator Testing

Toxic Air Contaminant	Annual Emissions (lb/yr)	
	HGS[b]	VGS[c]
Arsenic	1.04E-02	2.07E-03
Benz(a)anthracene	4.37E-03	8.74E-04
Benzene	5.79E-01	1.16E-01
Benzo(a)pyrene	4.27E-03	8.54E-04
Benzo(b)fluoranthene	6.76E-03	1.35E-03
Benzo(k)fluoranthene	6.66E-03	1.33E-03
Beryllium	2.78E-03	5.56E-04
Cadmium	1.67E-02	3.33E-03
Chrysene	5.28E-03	1.06E-03
Chromium (Hex)	5.53E-04	1.11E-04
Chromium (total)	2.17E-02	4.35E-03
Copper	5.11E-02	1.02E-02
Dibenz(a,h)anthracene	4.23E-03	8.45E-04
Dioxin: 4D Total	1.92E-07	3.83E-08
Dioxin: 5D Total	3.67E-07	7.33E-08
Dioxin: 6D Total	4.61E-07	9.22E-08
Dioxin: 7D Total	8.61E-07	1.72E-07
Dioxin: 8D	5.48E-06	1.10E-06
Formaldehyde	3.61E+00	7.22E-01
Furan: 4F Total	1.71E-06	3.42E-07
Furan: 5F Total	2.39E-06	4.79E-07
Furan: 6F Total	1.24E-06	2.47E-07
Furan: 7F Total	8.56E-07	1.71E-07
Furan: 8F	4.41E-07	8.82E-08
HCL	4.15E+00	8.29E-01
Indeno(1,2,3-cd)pyrene	4.23E-03	8.46E-04
Lead	3.12E-02	6.23E-03
Manganese	5.28E-01	1.06E-01
Mercury	1.39E-04	2.78E-05
Naphthalene	5.53E-01	1.11E-01
Nickel	2.50E+00	5.00E-01
Selenium	4.30E-04	8.60E-05
Zinc	2.76E+00	5.51E-01

[a] SCAQMD Rule 1401 (Amended August 18, 2000) Toxic Air Contaminants
[b] Emissions for five CTs
[c] Emissions for one CT

Table 4.2-17
Criteria Pollutant Maximum Hourly and Annual Emissions for HGS and VGS Project Sites - Black Start Diesel Fueled Generator Readiness Testing

Pollutant	HGS		VGS	
	Maximum Hourly (lb/hr)	Annual (ton/yr)	Maximum Hourly (lb/hr)	Annual (ton/yr)
CO	2.91	0.017	2.91	0.017
NO_x	6.73	0.04	6.73	0.04
PM_{10}	0.95	0.006	0.95	0.006
SO_2	0.16	0.001	0.16	0.001
VOC	1.07	0.006	1.07	0.006

Table 4.2-18
Toxic Air Contaminant[a] Annual Emissions Estimates for HGS and VGS Project Sites - Black Start Diesel-Fueled Generator Testing

Toxic Air Contaminant	Annual Emissions (lb/yr)	
	HGS[b]	VGS[c]
1,3-Butadiene	1.43E-03	1.43E-03
Acrolein	3.43E-03	3.43E-03
Benz(a)anthracene	6.18E-05	6.18E-05
Benzene	3.22E-02	3.22E-02
Benzo(a)pyrene	4.78E-06	4.78E-06
Benzo(b)fluoranthene	2.29E-05	2.29E-05
Benzo(k)fluoranthene	8.66E-06	8.66E-06
Chrysene (PAH)	1.40E-05	1.40E-05
Dibenz(a,h)anthracene	1.45E-05	1.45E-05
Formaldehyde	3.06E-02	3.06E-02
Indeno(1,2,3-cd)pyrene	1.22E-05	1.22E-05
Naphthalene	1.44E-02	1.44E-02
Propylene	9.45E-02	9.45E-02
Toluene	1.45E-02	1.45E-02
Xylene, Total	9.48E-03	9.48E-03

[a] SCAQMD Rule 1401 (Amended August 18, 2000) Toxic Air Contaminant

4.2.2.2 Indirect (Offsite) Mobile Source Operational Emissions

Indirect offsite operational emissions will be generated by additional trips from tanker trucks delivering aqueous ammonia to the project sites. However, operation of the various equipment associated with the three project sites will not require any additional employees, so there will not be any indirect operational emissions from additional employee commuting trips.

Based on operational requirements for aqueous ammonia, it was estimated that one additional aqueous ammonia delivery trip will be made to HGS[11] each week, two additional delivery trips will be made to SGS each week, and one additional delivery trip will be made to VGS each month. Since the incremental two weekly deliveries to the SGS site are unlikely to occur on the same day, the peak daily emissions from these trips would occur when one trip is made to each project site on the same day. In other words, three aqueous ammonia delivery trips occurring at the same time and on the same day.

The round-trip travel distance for the aqueous ammonia delivery trips was estimated by measuring the distance from a potential supplier of the aqueous ammonia (Orange County locations were selected to ensure the emissions are not underestimated) to each of the project sites. Probable truck routings for each project site were obtained from http://www.mapquest.com. The Mapquest round-trip distance measurements are as follows:

- HGS: 42 miles roundtrip
- SGS: 52 miles roundtrip
- VGS: 72 miles roundtrip

For the details of the calculation methodology used to estimate the emissions from these aqueous ammonia delivery truck trips, the reader is referred to Appendix C. Table 4.2-19 presents the estimated peak daily indirect operational emissions associated with the proposed project's incremental aqueous ammonia delivery truck trips.

[11] Currently, the HGS has 240-MW of combined cycle gas turbine electrical power that uses aqueous ammonia in the associated SCRs as NO_x control. The weekly trip for the five new CTs would be in addition to the trips associated with the existing combined cycle gas turbines.

Table 4.2-19
Overall Peak Daily Mobile Source Emissions
from Aqueous Ammonia Delivery Trips (Pre-Mitigation)

Source	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM_{10} (lb/day)	Fugitive PM_{10}[a] (lb/day)	Total PM_{10} (lb/day)
Offsite Aqueous Ammonia Delivery Trips	3.7	0.6	3.4	0.0	0.2	9.7	9.9

4.2.2.3 Air Quality Dispersion Modeling

Atmospheric dispersion modeling was conducted to analyze potential localized ambient air quality impacts associated with the proposed Project at each project site. The atmospheric dispersion modeling methodology used for each project sites is based on generally accepted modeling practices and modeling guidelines of both the USEPA and the SCAQMD. All dispersion modeling was performed using the Industrial Source Complex Short Term 3 (ISCST3) dispersion model (Version 00101) (USEPA 1999). As discussed in the next subsection, the outputs of the ISCST3 dispersion model were used as inputs to conduct a risk assessment for toxic air contaminants using the ACE2588 (Assessment of Chemical Exposure for AB2588) risk assessment model (Version 93288) (CAPCOA 1993).

The following subsections provide details of how the modeling was performed and presents the results of the modeling. Output listings of model runs are available for public inspection by contacting the SCAQMD's CEQA section.

Model Selection

As mentioned above, the dispersion modeling methodology used follows both USEPA and SCAQMD guidelines. The ISCST3 model (Version 00101) is an USEPA model used for simulating the transport and dispersion of emissions in areas of simple, complex, and intermediate terrain. Simple terrain, for air quality modeling purposes, is defined as a region where the heights of release for all emission sources are above the elevation of the surrounding terrain. Complex terrain is defined as those areas where nearby terrain elevations exceed the release heights of emissions from one or more sources. Intermediate terrain is that which falls between simple and complex terrain. Terrain areas of all three types exist in the vicinity of the SGS project site. However, only simple terrain areas exist in the vicinity of the HGS and VGS project sites.

Modeling Options

The options used in the ISCST3 dispersion modeling are summarized in Table 4.2-20. USEPA regulatory default modeling options were selected, except for the calm processing option. Since the meteorological data sets developed by the SCAQMD are based on hourly average wind measurements, rather than airport observations that represent averages of just a few minutes, the SCAQMD's modeling guidance requires that the calm processing modeling option not be used.

Meteorological Data

The SCAQMD has compiled a standard set of meteorological data files for use in air quality dispersion modeling in the Basin. For the vicinities of the HGS, SGS, and VGS project sites, Long Beach, Lennox, and Burbank 1981 meteorological data files were used.

In the Long Beach data set, the surface wind speeds and directions were collected at the SCAQMD's Long Beach monitoring station (Surface Station No. 53101), while the upper air sounding data used to estimate hourly mixing heights were gathered at Los Angeles International Airport (LAX) (Upper Air Station No. 91919). Temperatures and sky observation (used for stability classification) were taken from Long Beach Airport data.

In the Lennox data set, the surface wind speeds and directions were collected at the SCAQMD's Lennox monitoring station (Surface Station No. 52118), while the upper air sounding data used to estimate hourly mixing heights were gathered at LAX (Upper Air Station No. 91919). Temperatures and sky observation (used for stability classification) were taken from Lennox and LAX data.

In the Burbank data set, the surface wind speeds and directions were collected at the SCAQMD's Burbank (Surface Station No. 51100), while the upper air sounding data used to estimate hourly mixing heights were gathered at Ontario International Airport (Upper Air Station No. 99999). Temperatures and sky observation (used for stability classification) were taken from Burbank and Ontario Airport data.

Table 4.2-20
Dispersion Modeling Options for ISCST3

Feature	Option Selected
Terrain processing selected	Yes
Meteorological data input method	Card Image
Rural-urban option	Urban
Wind profile exponents values	Defaults
Vertical potential temperature gradient values	Defaults
Program calculates final plume rise only	Yes
Program adjusts all stack heights for downwash	Yes
Concentrations during calm period set = 0	No
Aboveground (flagpole) receptors used	No
Buoyancy-induced dispersion used	Yes
Year of surface data	1981
Year of upper air data	1981

Receptors

Appropriate model receptors[12] must be selected to determine the "worst-case" dispersion modeling impacts. For this modeling, two sets of receptor grids were used for determining the peak impacts for the criteria pollutants and for the HRA (e.g., toxic air contaminants). A "coarse" grid was run for each pollutant and averaging time of interest to determine the general area of peak concentration. The coarse grid consisted of two parts: (1) receptors along the perimeter of the facility with a spacing of 100 meters or less; and (2) receptors spaced 1,000 meters apart extending from the property line to approximately five to ten kilometers from the property line. No receptors were placed within the HGS, SGS, and VGS property lines.

Once the location of peak concentration for each criteria pollutant and averaging time was identified from the coarse grid simulation, a fine grid of receptors was created centered on the coarse grid peak location. The fine receptor grid covered a three-by-three kilometer area with receptors at 100 meter spacing. The ISCST3 model was then rerun using this grid spacing to determine the peak concentration for a given pollutant and averaging time. Figures 4.2-1 through

[12] A receptor is generally considered an offsite land use such as residential, hospital, convalescent home, nursing home, child care centers, preschool, elementary/intermediate/high school, etc.

4.2-3 show the boundary line and receptor locations used in the modeling for the three project sites. As seen in the figures, several fine grids were used to evaluate the peak concentrations for different pollutants and averaging times.

Terrain heights for all receptors were determined from commercially available digital terrain elevations developed by the U.S. Geological Survey by using its Digital Elevation Model (DEM). The DEM data provide terrain elevations with one-meter vertical resolution and 30 meters horizontal resolution based on a Universal Transverse Mercator (UTM) coordinate system. For each receptor location at each project site, the terrain elevation was set to the elevation for the closest DEM grid point.

The USEPA's guidance was followed to address the potential influence on the ambient air concentrations of structures located near point emission sources at each project site. The latest building downwash program (Version 3.15) developed by Lakes Environmental was used to identify the structures required to be included in the ISCST3 model to address building downwash effects. The building downwash program was also used to estimate the direction-specific building dimensions, which are required as inputs by the ISCST3 model, to address the influence of nearby structures on the ambient air concentrations.

<u>Source Parameters</u>

In order to estimate the "worst-case" ambient concentrations for various averaging periods from the operation of the CTs at the HGS site, the emissions from the four operating scenarios were combined as described in Table 4.2-21.

For the SGS site, it was assumed that all three boiler units with the new SCR systems would operate throughout the year (8,760 hours per year each boiler unit).

In order to estimate the "worst-case" ambient concentrations for various averaging periods from the operation of the CT at the VGS site, the emissions from the four operating scenarios were combined as described in Table 4.2-22.

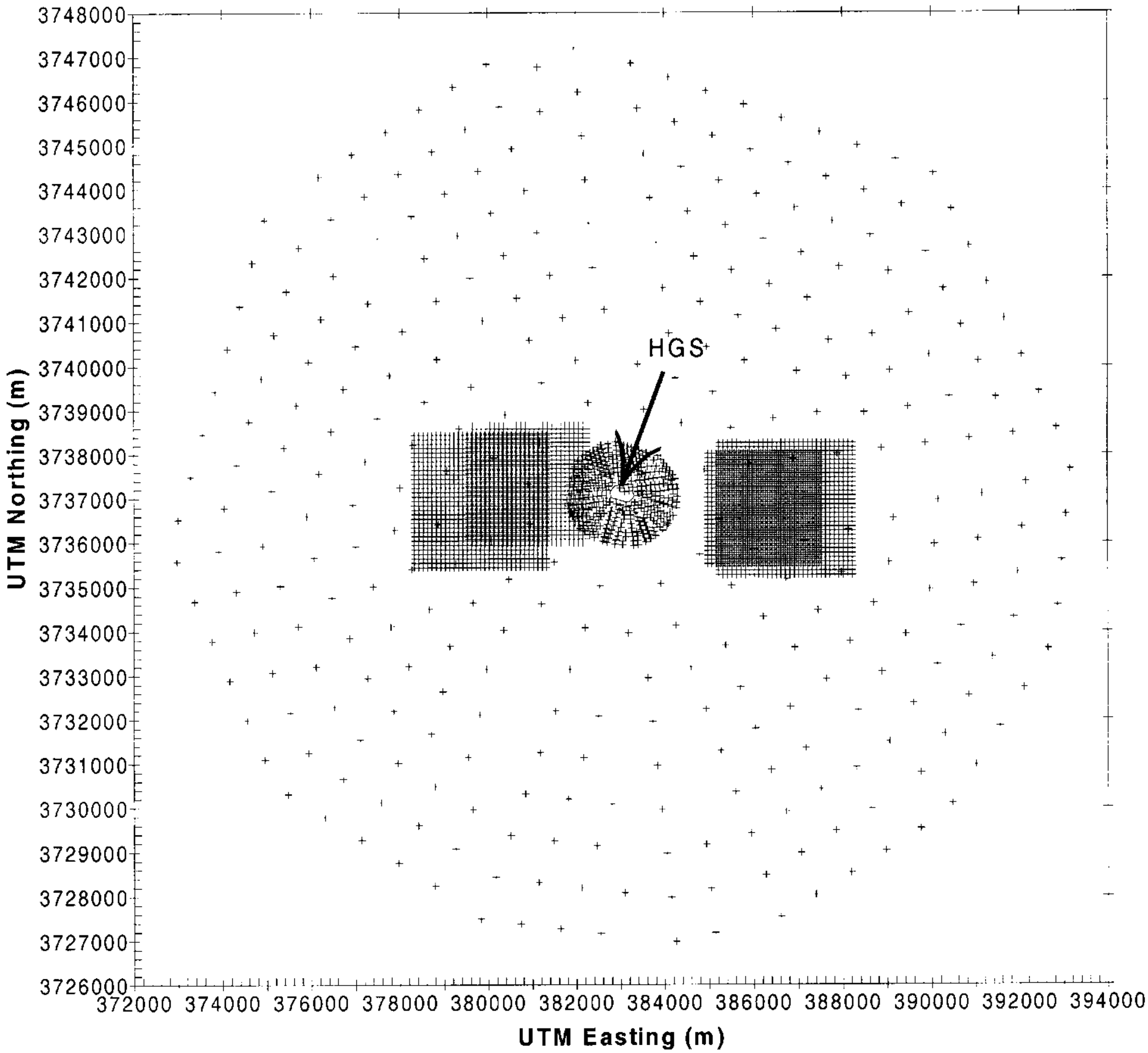

Figure 4.2-1 HGS Site Boundary and Grid Receptor Locations

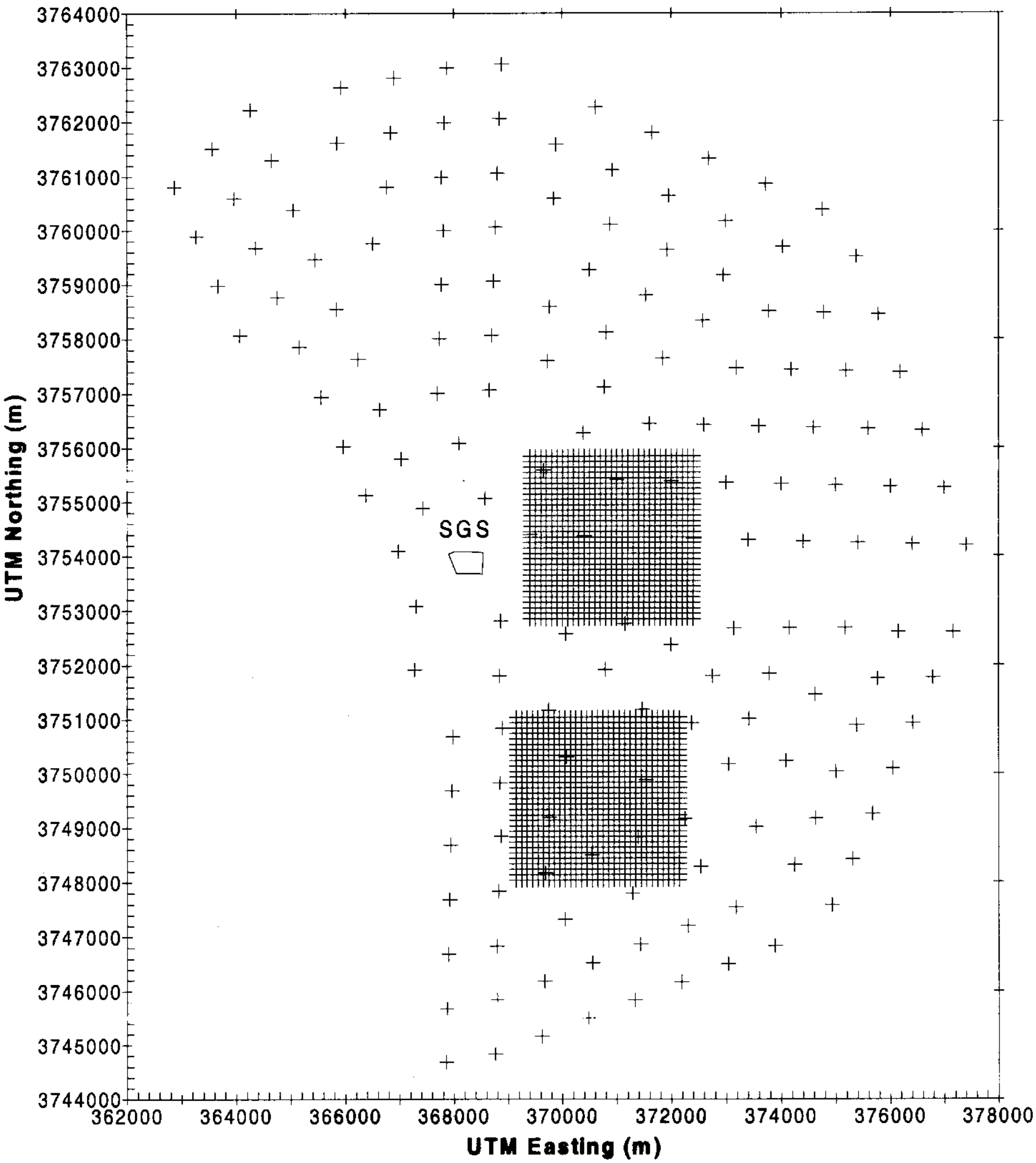

Figure 4.2-2 SGS Site Boundary and Grid Receptor Locations

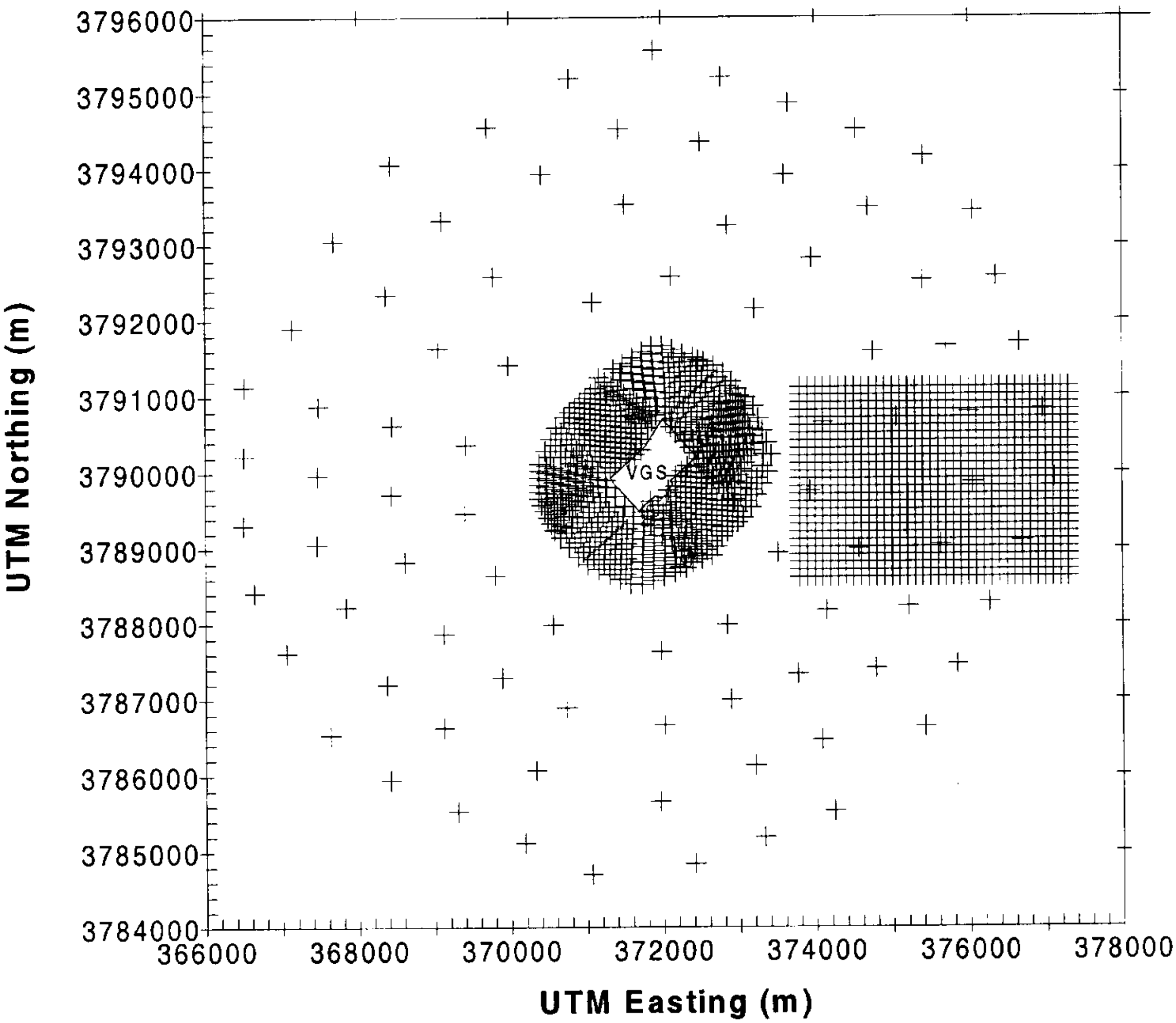

Figure 4.2-3 VGS Site Boundary and Grid Receptor Locations

Table 4.2-21
Grouping of Operating Scenarios for Air Dispersion Modeling for the HGS Site

Pollutant	Averaging Period	Emission Sources Considered for Dispersion Modeling	Operating Conditions Considered for Dispersion Modeling
NO_X	1-hour (hr)	Five CTs	Normal start up of all five CTs simultaneously (1-hr duration for each CT)
NO_X	Annual	Five CTs and 1 black start generator	For each CT 1-hr of normal start up and 23-hours of normal operation every day throughout the year. Readiness testing for the CTs and the black start generator (12 months x 5 CTs x 30 minutes/month for the CTs and 12 months x 30 minutes/month for the generator readiness tests).
CO	1-hr	5 CTs	Normal start up of all five CTs simultaneously (1-hr duration for each CT)
CO	8-hr	5 CTs	Normal start up of all five CTs simultaneously (emission rate same as 1-hr emissions)
SO_2	1-hr	5 CTs and 1 black start generator	4 CTs under normal operation, full load (1-hr duration for each CT); 1 CT and 1 black start generator under readiness testing (30-minutes duration for each readiness test).
SO_2	3-hr	5 CTs and 1 black start generator	4 CTs under normal operation, full load, 1 CT and 1 black start generator under readiness testing (emission rate same as 1-hr emissions)
SO_2	24-hr	5 CTs and 1 black start generator	5 CTs under normal operation, full load (24-hr duration for each CT); 1 CT and 1 black start generator under readiness testing (30-minutes duration for each readiness test).
SO_2	Annual	5 CTs and 1 black start generator	5 CTs under normal operation, full load (8,760 hours per year of operation for each CT); 5 CT and 1 black start generator under readiness testing (12 months x 5 CTs x 30 minutes/month for the CTs and 12 months x 30 minutes/month for the generator readiness tests).

Table 4.2-21
Grouping of Operating Scenarios for Air Dispersion Modeling for the HGS Site

PM_{10}	24-hr	5 CTs, 5 cooling towers, and 1 black start generator	5 CTs and 5 cooling towers under normal operation, full load (24-hours of operation for each CT and cooling tower); 1 CT and 1 black start generator under readiness testing (30-minutes/month duration for each readiness test).
PM_{10}	Annual	5 CTs, 5 cooling towers, and 1 black start generator	5 CTs and 5 cooling towers under normal operation, full load (8,760 hours per year of operation for each CT and cooling tower; 5 CTs and 1 black start generator under readiness testing (12 months x 5 CTs x 30 minutes/month for the CTs and 12 month x 30 minutes/month for the generator readiness tests).

Table 4.2-22
Grouping of Operating Scenarios for Air Dispersion Modeling for VGS

Pollutant	Averaging Period	Emission Sources Considered for Dispersion Modeling	Operating Conditions Considered for Dispersion Modeling
NO_X	1-hr	1 CT and 1 black start generator	Normal start up of the CT (1-hr duration) and readiness test of the generator (30-minutes duration).
NO_X	Annual	1 CT and 1 black start generator	For the CT 1-hr of normal start up and 23-hours of normal operation every day throughout the year. Readiness testing for the CT and the black start generator (12 months x 30 minutes/month for the CT and the generator readiness tests).
CO	1-hr	1 CT and 1 black start generator	Normal start up of the CT (1-hour duration) and readiness test of the generator (30-minutes duration).
CO	8-hr	1 CT and 1 black start generator	Normal start up of the CT and readiness test of the generator (30-minutes/month duration) (emission rate same as 1-hr emissions)
SO_2	1-hr	1 CT and 1 black start generator	1 CT and 1 black start generator under readiness testing (30-minutes/month duration each).
SO_2	3-hr	1 CT and 1 black start generator	1 CT and 1 black start generator under readiness testing (emission rate same as 1-hr emissions)

Table 4.2-22
Grouping of Operating Scenarios for Air Dispersion Modeling for VGS

Pollutant	Averaging Period	Emission Sources Considered for Dispersion Modeling	Operating Conditions Considered for Dispersion Modeling
SO_2	24-hr	1 CT and 1 black start generator	1 CT under normal operation, full load (24-hr duration); 1 CT and 1 black start generator under readiness testing (30-minutes/month duration for each readiness test).
SO_2	Annual	1 CT and 1 black start generator	1 CT under normal operation, full load (8,760 hours of operation); 1 CT and 1 black start generator under readiness testing (12 month x 30 minutes/month of readiness test for the CT and the generator).
PM_{10}	24-hr	1 CT, 1 cooling tower, and 1 black start generator	1 CT and 1 cooling tower under normal operation, full load; 1 CT and 1 black start generator under readiness testing (30-minutes/month duration for each readiness test).
PM_{10}	Annual	1 CT, 1 cooling tower, and 1 black start generator	1 CT and 1 cooling tower under normal operation, full load (8,760 hours per year of operation for the CT and cooling tower); 1 CT and 1 black start generator under readiness testing (12 months x 30 minutes/month of readiness test for the CT and the generator).

Table 4.2-23 summarizes the source parameter inputs to the dispersion model for all three project sites. Each source parameter presented in the table is based upon the proposed equipment installations and modifications at the project sites. The modeling was performed by using only direct emissions from new or modified stationary sources associated with the proposed project. All the sources of emissions were modeled as point sources. Tables 4.2-24 through 4.2-26 present the criteria pollutant emission rates modeled for the three project sites.

Table 4.2-23
Dispersion Modeling Source Location and Stack Parameters Used for the Proposed Project

Source ID	Easting (m)	Northing (m)	Elevation (m)	Release Height (m)	Temp[a] (K)a	Stack Vel[b] (m/s)	Stack Dia (m)
HGS CT1	383114	3736966	6.1	33.5	722.6	34.86	3.05
HGS CT2	383110	3737004	6.1	33.5	722.6	34.86	3.05
HGS CT3	383106	3737042	6.1	33.5	722.6	34.86	3.05
HGS CT4	383102	3737080	6.1	33.5	722.6	34.86	3.05
HGS CT5	383098	3737118	6.1	33.5	722.6	34.86	3.05
HGS COOL1	383109	3736937	6.1	8.2	310.9	13.05	3.7
HGS COOL2	383108	3737060	6.1	8.2	310.9	13.05	3.7
HGS COOL3	383117	3737060	6.1	8.2	310.9	13.05	3.7
HGS COOL4	383104	3737097	6.1	8.2	310.9	13.05	3.7
HGS COOL5	383113	3737097	6.1	8.2	310.9	13.05	3.7
HGS BS1	383117	3737125	6.1	33.5	758.7	72.9	0.2
SGS ST1	368062	3753954	10.6	91.4	415.7	16.87	6.1
SGS ST2	368083	3753845	1.30	100.9	405.9	13.52	7.16
VGS CT	371900	3790068	278.9	33.5	713.2	35.76	3.05
VGS COOL	371891	3790086	278.9	8.2	310.9	13.05	3.7
VGS BS1	371918	3790037	278.9	33.5	758.7	72.9	0.2

[a] Parameters are for normal operations.

CT = combustion turbine

COOL = cooling tower

BS = black start generator

ST = Stack

Table 4.2-24
Emission Rates Modeled for Criteria Pollutant Analysis at the HGS Project Site

Source	CO (g/sec)	PM_{10} (g/sec)	NO_X (g/sec)	SO_2 (g/sec)
All Combustion Turbine Stacks	1-hr = 6.2 8-hr = 6.2	24-hr = 1.81 Annual = 1.81	1-hr = 16.0 Annual = 5.52	1-hr = 1.08 3-hr = 1.08 24-hr = 0.432 Annual = 0.405
Black Start Generator Stack	Not Applicable	24-hr = 0.005 Annual = 0.00016	Annual = 0.0012	1-hr = 0.02 3-hr = 0.02 24-hr = 0.00084 Annual = 2.98E-05
All Cooling Towers	Not Applicable	24-hr = 0.195 Annual = 0.195	Not Applicable	Not Applicable

Table 4.2-25
Emission Rates Modeled for Criteria Pollutant Analysis at the SGS Project Site

Source	PM_{10} (g/sec)
All Boiler Stacks	24-hr = 0.145 Annual = 0.145

Table 4.2-26
Emission Rates Modeled For Criteria Pollutant Analysis at the VGS Project Site

Source	CO	PM_{10}	NO_x	SO_2
Combustion Turbine Stack	1-hr & 8-hr = 1.24	24-hr = 0.36 Annual = 0.36	1-hr = 3.2 Annual = 1.10	1-hr & 3-hr = 0.76 24-hr = 0.11 Annual = 0.081
Black Start Generator Stack	1-hr & 8-hr = 0.37	24-hr = 0.005 Annual = 0.00016	1-hr = 0.85 Annual = 0.0012	1-hr & 3-hr = 0.02 24-hr = 0.00084 Annual = 2.8E-05
Cooling Tower	Not Applicable	24-hr & Annual = 0.039	Not Applicable	Not Applicable

4.2.2.4 Toxic Air Contaminant Health Risk Assessment

The impact of toxic air contaminants from the project sites was determined by performing a health risk assessment (HRA). The impacts that are addressed in the HRA include carcinogenic, chronic noncarcinogenic and acute noncarcinogenic health risks. The reader is referred to Appendix G for the details of the HRA.

<u>Harbor Generating Station</u>

In order to estimate the "worst-case" carcinogenic and noncarcinogenic risks from the operation of the equipment at the HGS site, the emissions from the four operating modes (normal operating, normal startup, CT diesel-readiness testing and diesel-fueled black start generator testing) discussed previously in Subsection 4.2.2.1 were combined as described below. These combinations were selected as the reasonably foreseeable combination of operations that would result in the highest TAC emissions on an hourly basis, to evaluate acute health risks, and on an annual basis, to evaluate potential chronic health risks.

- For estimating the "worst-case" acute hazard index (noncarcinogenic health impact), it was assumed that all five CTs would be operating normally at full load (one hour of operation for each CT), and the black start generator would be tested for readiness (30 minutes in duration).
- For estimating the "worst-case" chronic hazard index (noncarcinogenic health impact) and the carcinogenic health risk, it was assumed that all the five CTs would operate at full load throughout the year (8,760 hours for each CT), and the five CTs and the black start generator would also be tested throughout the year (12 months x five CTs/month x 30 minutes/month for the CTs and 12 months x 30 minutes/months for the generator readiness tests).

<u>Scattergood Generating Station</u>

For the SGS site, it was assumed that all three boiler units would operate continuously at full load throughout the year (8,760 hours of operation for each boiler unit).

<u>Valley Generating Station</u>

For the VGS site, the emissions from the four operating were combined as described below. As in the case of HGS, these combinations were selected as the reasonably foreseeable combination of operations that would result in the highest TAC emissions on an hourly basis, to evaluate acute health risks, and on an annual basis, to evaluate potential chronic health risks.

- For estimating the "worst-case" acute hazard index (noncarcinogenic health impact), it was assumed that the CT and the black start generator would be tested for readiness.

- For estimating the worst-case chronic hazard index (noncarcinogenic health impact) and the carcinogenic health risk, it was assumed that the CT would operate throughout the year (8,760 hours), and that the CT and the black start generator would also be tested throughout the year (12 months x 30 minutes/month for the CT and generator readiness tests).

Methodology

The ACE2588 (Assessment of Chemical Exposure for AB2588) Risk Assessment Model (Version 93288) was used to evaluate the potential health risks from TACs potentially emitted at each project site. The ACE2588 model, which is accepted by the California Air Pollution Control Officers Association (CAPCOA), has been widely used for required health risk assessments under the CARB AB2588 Program. The model provides conservative algorithms to predict relative health risks from exposure to carcinogenic, chronic noncarcinogenic, and acute noncarcinogenic pollutants. This multipathway model was used to evaluate the following routes of exposure: inhalation, soil ingestion, dermal absorption, mother's milk ingestion, and plant product (only home grown vegetable gardens) ingestion. Exposure routes from animal product ingestion and water ingestion were not included for this analysis.

The toxicity data in the 93288 version of ACE2588 was revised to include the current data as recommended by the SCAQMD and California Office of Environmental Health Hazard Assessment (OEHHA) (SCAQMD, 2000; OEHHA, 1999 and 2000). The HRA results obtained based on the CAPCOA HRA guidance are considered to be consistent with those which would be obtained following SCAQMD's Risk Assessment Procedures for Rule 1401 (SCAQMD, 2000).

Hazard Identification

Only TACs identified in the SCAQMD Rule 1401 (Amended August 18, 2000) with potency values or reference exposure levels were included in the HRA. The toxicity values for the identified Rule 1401 TACs emitted from the proposed equipment at the three project sites are included in the ACE2588 output files in Attachment G-1 to Appendix G.

Dose-Response Assessment

The dose-response data, used in the HRA, was extracted from the SCAQMD 2000 and OEHHA 1999 and 2000 Guidelines.

Exposure Assessment

Following the CAPCOA guidance, the inhalation, dermal absorption, soil ingestion, and mother's milk pathways were included in a multipathway analysis. Pathways not included in the analysis are water ingestion, fish, crops (except home grown vegetable gardens), and animal and dairy products, which were not identified as a potential concern for the proposed project.

Inhalation pathway exposure conditions were characterized by the use of the ISCST3 dispersion model as previously discussed.

Residential exposure assumptions (including a 70-year lifetime continuous exposure for the maximum exposed individual (MEI) was included in this analysis. A complete listing of all exposure and pathway assumptions and output files are available for public inspection by contacting the SCAQMD's CEQA Section.

4.2.3 Significance of Project Operational Emissions

4.2.3.1 Daily Mass Emissions

Because all of the new equipment operating modes are not anticipated to take place at the same time, the overall maximum daily operational emissions will not be equal to the sum of the maximum daily emissions from all of the operating modes. For the HGS project site, it was assumed that five CTs would be under normal operation for 23 hours. For the 24th hour, each CT would be under either normal startup or a diesel fuel readiness testing, whichever resulted in the highest emissions. The black start generator was also assumed to be tested on the same day. For the VGS project site, it was assumed that the CT was in normal operation for 23 hours. For the 24th hour the CT would be under startup or diesel fuel readiness testing, whichever resulted in the highest emissions. The black start generator was also assumed to be tested on the same day. For the SGS project site, it was assumed that the SCRs on all three existing units were operative, which results in maximum reductions in NO_X emissions and maximum incremental increases in ammonia slippage and PM_{10} emissions.

A summary of the resulting "worst-case" operational-related non-RECLAIM daily mass emissions associated with each project site is shown in Tables 4.2-27. The table also compares the daily mass operational emissions to the SCAQMD criteria pollutant significance thresholds listed in Table 4.2-1. Based on this comparison, the proposed projects may result in significant CO, PM_{10}, and VOC operational emissions.

Table 4.2-27
Overall Peak Daily Operational Non-RECLAIM Daily Mass Emissions

Source	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	PM_{10} (lb/day)
HGS CTs[a]	748.43	136.40	0.00	101.93	340.90
HGS Cooling Towers	0.00	0.00	0.00	0.00	36.90
HGS Black Start Diesel-Fueled Generator	2.91	1.07	0.00	0.16	0.95
Total HGS	**751.34**	**137.47**	**0.00**	**102.09**	**378.75**
VGS CT[a]	149.69	27.28	0.00	20.39	68.14
VGS Cooling Tower	0.00	0.00	0.00	0.00	7.38
VGS Black Start Diesel-Fueled Generator	2.91	1.07	0.00	0.16	0.95
Total VGS	**152.60**	**28.35**	**0.00**	**20.55**	**76.47**
SGS SCRs[b]	**0.00**	**0.00**	**0.00**	**0.00**	**27.60**
Total Direct	**903.94**	**165.82**	**0.00**	**122.64**	**482.82**
Indirect Emissions (Aqueous Ammonia Delivery Trucks)	**3.70**	**0.60**	**0.40**	**0.00**	**9.90**
Total Project	**907.64**	**166.42**	**0.40**	**122.64**	**492.72**
Significance Threshold	*550*	*55*	*55*	*150*	*150*
Significant? (Yes/No)	**Yes**	**Yes**	No	No	**Yes**

[a] CO, VOC and SO_X: all CTs firing natural gas for 23-1/2 hrs and all CTs one-half hour diesel fuel readiness test; PM_{10}: all CTs firing natural gas for 23 hrs and all CTs one-hour normal startup emissions.
[b] All three SCRs under operation.

A summary of operational RECLAIM pollutant (NO_X) emissions is shown in Table 4.2-28. As discussed previously at the beginning of Subsection 4.2, the significance determination is based on whether direct NO_X emissions, when added to each project site's Annual Allocation (2001) including purchased RTCs are greater than the project site's Initial 1994 RECLAIM Allocation plus NTCs plus the maximum daily operation NO_X significance thresholds of 55 pounds per day. Based on this comparison, the direct NO_X emissions from the installation of CTs at the HGS site may create significant NO_X emissions, while operation of the new CT at the VGS site is not anticipated to lead to significant NO_X emissions.

Although the installation of the three SCR systems at the VGS site will significantly reduce NO_X emissions from the facility, these NO_X emission reductions are not used to offset the NO_X emission increases at the HGS and VGS project sites. The SCR systems installation at the SGS site are being undertaken to comply with an existing SCAQMD rule and therefore cannot be used to offset emission increases from new emission sources at the HGS and VGS project sites.

Table 4.2-28
Project RECLAIM NO_X Peak Daily Emissions

Emissions	Project Site	
	HGS	VGS
RECLAIM NO_X Emissions (lb/day)[a]	1,057	217
2001 RECLAIM NO_X Allocation (lb/day)[b]	179	285
Total (lb/day)	1,236	502
Significance Threshold	299	1,542
Significant? (Yes/No)	**Yes**	No

[a] The emissions were determined as follows: all CTs firing natural gas for 23 hrs, all CTs one-hour emission rate from normal start-up, one black start generator test.

[b] The 2001 facility Allocation for NO_X includes purchased RTCs and is converted to pounds per day by dividing by 365 days per year. This value was taken from the Facility Permit to Operate for each site. The value from the column headed NO_X RTC Holding was selected.

4.2.3.2 Localized Ambient Air Quality Impacts

The following subsections discuss the dispersion modeling results for each project site and whether CO, PM_{10}, NO_X, and SO_X emissions from each project site exceed the significance criteria presented in Table 4.2-1.

Harbor Generating Station

Nitrogen Dioxide, Carbon Monoxide and Particulate Matter

The dispersion modeling results for the NO_2, CO and PM_{10} analysis are provided in Table 4.2-29. Figure 4.2-1 presents the locations of the receptor grids used to determine the maximum air quality impacts. The dispersion modeling results indicate that the expected "worst-case" emissions from the proposed project would not exceed the allowable concentration changes listed in Table 4.2-1 for CO or PM_{10}. Therefore, significant CO and PM_{10} localized air quality impacts are not expected at the HGS project site from the operation of the CTs, cooling towers, black start generator, and increased PM_{10} emissions from the installation of SCR technology. However, the predicted maximum one-hour average NO_2 concentration of 86.7 $\mu g/m^3$ exceeds the 20 $\mu g/m^3$ significance criterion. It should be noted that the NO_2 impacts (one-hour as well as annual impacts) are based on the conservative assumption of 100 percent conversion of the project NO_X to NO_2. Furthermore, the dispersion modeling results presented in Table 4.2-29 show that the annual average NO_2 concentration would be less than 1.0 $\mu g/m^3$.

Table 4.2-29
Summary of Air Quality Impacts for Pollutants at the HGS Project Site

Pollutant	Averaging Period	Significant Change Threshold (μg/m³)	Predicted Maximum Ground Level Impact (μg/m³)	Significant? (Yes/No)	Location of Maximum Ground Level Concentration	
					UTM E (m)	UTM N (m)
PM_{10}	24-hr Annual	2.5 1	2.0 0.36	No No	24-hr = 383137 Annual = 384373	24-hr = 3737157 Annual = 3737015
CO	1-hr 8-hr	1,100 500	33.6 16.7	No No	1-hr = 380832 8-hr = 380932	1-hr = 3737542 8-hr = 3737242
NO_2	1-hr Annual	20 1.0	86.7 0.65	**Yes** No	1-hr = 380832 Annual = 385773	1-hr = 3737542 Annual = 3737017

<u>Sulfur Dioxide</u>

The HGS project site is located within the SCAQMD's South Coastal Los Angeles (LA) County monitoring area. Recent background air quality data for SO_2 from the South Coastal LA County monitoring station and estimated SO_2 air quality impacts from the project site are included in Table 4.2-30. SO_2 incremental impacts were added to the appropriate South Coastal LA County background concentrations and the total concentrations compared to the most stringent of the CAAQS or NAAQS.

As shown in Table and 4.2-30, the modeled results indicate that SO_X emissions from operational related activities at the HGS site will not exceed the SO_2 standards. Therefore, significant SO_2 localized air quality impacts are not expected at the HGS project site from the operation of the CTs, cooling towers, and black start generator.

Table 4.2-30
Sulfur Dioxide Impacts at the HGS Project Site And Estimated Background Air Quality Concentrations for SCAQMD South Coastal Los Angeles County Monitoring Station

Averaging Period	Maximum Predicted Impacts	Estimated Background Concentration[a]	Total Concentration (μg/m³)	State Standard (μg/m³)	National Standard[b] (μg/m³)	Significant? (Yes/No)

	(μg/m^3)	**(μg/m^3)**				
1-hour	10.5 [b]	210	221	655	---	No
3-hour	8.8 [c]	210	219	---	1,300	No
24-hour	0.28 [d]	34.1	34.4	105	365	No
Annual	0.04 [e]	7.1	7.14	---	80	No

[a] Maximum concentration for three-year period, 1997-1999 at South Coastal LA County monitoring site (072)
[b] Located at UTM coordinate 383388 Easting & 3737150 Northing
[c] Located at UTM coordinate 383300 Easting & 3737099 Northing
[d] Located at UTM coordinate 380452 Easting & 3737379 Northing
[e] Located at UTM coordinate 385773 Easting & 3737017 Northing

Scattergood Generating Station

Particulate Matter

The dispersion modeling results for the PM_{10} analysis are provided in Table 4.2-31. Figure 4.2-2 presents the locations of the receptor grids used to determine the maximum air quality impacts. Since there would be no increase in the emissions of other criteria pollutants at the SGS, air dispersion modeling for other criteria pollutants (NO_2, CO and SO_X) was not performed.

The dispersion modeling results indicate that the expected “worst-case” PM_{10} emissions from the proposed project would not exceed the significance criterion for localized impacts listed in Table 4.2-1. Therefore, significant PM_{10} localized air quality impacts are not expected at the SGS project site from the increased PM_{10} emissions from the installation of SCR technology.

Table 4.2-31
Summary of Air Quality Impacts for PM_{10} at the SGS Project Site

Pollutant	Averaging Period	Significant Change Threshold ($\mu g/m^3$)	Predicted Maximum Ground Level Impact ($\mu g/m^3$)	Significant? (Yes/No)	Location of Maximum Ground Level Concentration	
					UTM E (m)	UTM N (m)
PM_{10}	24-hr Annual	2.5 1	0.036 0.010	No No	24-hr = 370901 Annual = 370001	24-hr = 3754248 Annual = 3753948

Valley Generating Station

Nitrogen Dioxide, Carbon Monoxide and Particulate Matter

The dispersion modeling results for the NO_2, CO and PM_{10} analysis are provided in Table 4.2-32. Figure 4.2-3 presents the locations of the receptor grids used to determine the maximum air quality impacts. The dispersion modeling results indicate that the expected "worst-case" emissions from the proposed project would not exceed the allowable concentration changes listed in Table 4.2-1 for CO or PM_{10}. Therefore, significant CO and PM_{10} localized air quality impacts are not expected at the VGS project site from the operation of the CTs, cooling towers, black start generator, and increased PM_{10} emissions from the installation of SCR technology. However, the predicted maximum one-hour average NO_2 concentration of 67.8 $\mu g/m^3$ exceeds the 20 $\mu g/m^3$ significance criterion. It should be noted that the NO_2 impacts (1-hr as well as annual impacts) are based on the conservative assumption of 100 percent conversion of the project NO_X to NO_2. Furthermore, the dispersion modeling results presented in Table 4.2-32 show that the annual average NO_2 concentration would be less than 1.0 $\mu g/m^3$.

Sulfur Dioxide

The VGS project site is located within the SCAQMD's East San Fernando Valley monitoring area. Recent background air quality data for SO_2 for the East San Fernando Valley monitoring station and estimated SO_2 air quality impacts from the project site are included in Table 4.2-33. The SO_2 incremental impacts were added to appropriate East San Fernando Valley background concentrations and the total concentrations compared to the most stringent of the CAAQS or NAAQS. As shown in Table 4.2-33, the modeled results indicate that SO_X emissions from operational related activities at the VGS site will not exceed the SO_2 standards.

Table 4.2-32
Summary of Air Quality Impacts for Pollutants at the VGS Project Site

Pollutant	Averaging Period	Significant Change Threshold ($\mu g/m^3$)	Predicted Maximum Ground Level Impact ($\mu g/m^3$)	Significant? (Yes/No)	Location of Maximum Ground Level Concentration	
					UTM E (m)	UTM N (m)
PM_{10}	24-hr Annual	2.5 1	0.66 0.09	No No	24-hr = 372106 Annual = 371253	24-hr = 3790581 Annual = 3790547
CO	1-hr 8-hr	1,100 500	29.5 13.8	No No	1-hr = 372216 8-hr = 372445	1-hr = 3790427 8-hr = 3790204
NO_2	1-hr Annual	20 1.0	67.8 0.17	**Yes** No	1-hr = 372216 Annual = 375492	1-hr = 3790427 Annual = 3789518

Table 4.2-33
Sulfur Dioxide Impacts at the VGS Project Site And Estimated Background Air Quality Concentrations for SCAQMD East San Fernando Valley Monitoring Station

Averaging Period	Maximum Predicted Impacts ($\mu g/m^3$)	Estimated Background Concentration[a] ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	State Standard ($\mu g/m^3$)	National Standard[b] ($\mu g/m^3$)	Significant? (Yes/No)
1-hour	38.3[b]	26	64	655	---	No
3-hour	24.1[c]	26	50	---	1,300	No
24-hour	0.22[d]	23.6	23.8	105	365	No
Annual	0.012[e]	0.5	0.51	---	80	No

[a] Maximum concentration for three year-period, 1997-1999 at East San Fernando Valley monitoring site (069)
[b] Located at UTM coordinate 372106 easting & 3790581 northing
[c] Located at UTM coordinate 372106 Easting & 3790581 Northing
[d] Located at UTM coordinate 372106 Easting & 3790581 Northing
[e] Located at UTM coordiante 374591 Easting & 3784718 Northing

4.2.3.3 Health Risks

Harbor Generating Station

The results of the ACE2588 analysis indicate a MEI cancer risk of 0.19 in one million at a distance of about 2.5 km, east of the HGS project site. The pathway contribution to the total carcinogenic risk is shown in Table 4.2-34.

A maximum chronic hazard index of 0.01 was calculated for the respiratory endpoint at a receptor approximately 2.5 kilometers from the HGS project site. The two pollutants contributing most to the chronic hazard index for the MEI were formaldehyde (82 percent) and ammonia (10 percent).

The MEI for the acute analysis is located at a receptor approximately two kilometers west of the HGS project site. A maximum acute hazard index of 0.08 was calculated for the respiratory and eye endpoints, primarily from acrolein (89 percent).

The HRA results show that toxic impacts from the HGS project site are below the TAC significance criteria in Table 4.2-1.

Scattergood Generating Station

Because the existing carcinogenic air contaminants emitted from the existing units will not increase as a result of the installation of the SCR systems, only a noncarcinogenic HRA was conducted for the SGS project site. The results of the ACE2588 analysis indicate a maximum chronic hazard index of 0.0017 for the respiratory endpoint at a receptor, 1.5 kilometers east of the SGS project site.The MEI for the acute analysis is located at a receptor approximately five kilometers southeast of the SGS project site. A maximum acute hazard index of 0.002 was calculated for the respiratory endpoint.

The HRA results show the toxic impacts from the SGS project site are below the TAC significance criteria in Table 4.2-1.

Table 4.2-34
70-Year Cancer Risk per Million from the HGS Project Site for the Maximum Exposed Individual

POLLUTANT	INHALE	DERMAL	SOIL	PLANTS	SUM
As	2.13E-10	5.33E-12	2.52E-10	1.05E-10	5.75E-10
BUTAD	5.70E-10	0.00E+00	0.00E+00	0.00E+00	5.70E-10
ACETA	9.74E-09	0.00E+00	0.00E+00	0.00E+00	9.74E-09
BENZA	6.87E-11	6.53E-11	1.03E-10	7.48E-10	9.85E-10
BENZE	1.03E-08	0.00E+00	0.00E+00	0.00E+00	1.03E-08
BENZO	4.32E-10	4.10E-10	6.46E-10	4.70E-09	6.19E-09
BENZF	3.74E-11	3.55E-11	5.60E-11	4.07E-10	5.36E-10
BENZK	3.64E-11	3.46E-11	5.45E-11	3.96E-10	5.22E-10
Be	4.15E-11	0.00E+00	0.00E+00	0.00E+00	4.15E-11
Cd	4.35E-10	0.00E+00	0.00E+00	0.00E+00	4.35E-10
Cr	5.16E-10	7.96E-13	3.76E-12	1.51E-12	5.22E-10
CHRYS	7.66E-12	7.28E-12	1.15E-11	8.34E-11	1.10E-10
DIBEN	7.72E-10	2.30E-10	3.62E-10	2.63E-09	4.00E-09
4DPD	4.53E-11	0.00E+00	0.00E+00	0.00E+00	4.53E-11
5DPDT	4.32E-11	0.00E+00	0.00E+00	0.00E+00	4.32E-11
6DPDT	1.09E-11	0.00E+00	0.00E+00	0.00E+00	1.09E-11
7DPDT	2.04E-12	0.00E+00	0.00E+00	0.00E+00	2.04E-12
8DPD	1.30E-12	0.00E+00	0.00E+00	0.00E+00	1.30E-12
HCHO	1.45E-07	0.00E+00	0.00E+00	0.00E+00	1.45E-07
4DBFT	4.05E-11	0.00E+00	0.00E+00	0.00E+00	4.05E-11
5DBFT	2.83E-10	0.00E+00	0.00E+00	0.00E+00	2.83E-10
6DBFT	2.92E-11	0.00E+00	0.00E+00	0.00E+00	2.92E-11
7DBFT	2.02E-12	0.00E+00	0.00E+00	0.00E+00	2.02E-12
8DBF	1.04E-13	0.00E+00	0.00E+00	0.00E+00	1.04E-13
INDEN	7.08E-11	6.73E-11	1.06E-10	7.71E-10	1.02E-09
Pb	2.33E-12	9.08E-14	4.29E-12	1.80E-12	8.51E-12
Ni	4.05E-09	0.00E+00	0.00E+00	0.00E+00	4.05E-09
PROX	4.66E-09	0.00E+00	0.00E+00	0.00E+00	4.66E-09
Total Risk	**1.77E-07**	**8.57E-10**	**1.60E-09**	**9.85E-09**	**1.90E-07**

Valley Generating Station

The results of the ACE2588 analysis indicate a MEI cancer risk of 0.05 in one million at a distance of about three kilometers east of the VGS project site. The pathway contribution to the total carcinogenic risk is shown in Table 4.2-35.

A maximum chronic hazard index of 0.003 was calculated for the respiratory endpoint at a receptor three kilometers east of the VGS project site. The two pollutants contributing most to the chronic hazard index for the MEI were formaldehyde (84 percent) and ammonia (10 percent).

The MEI for the acute analysis is located at a receptor along the northeast property line of the VGS project site. A maximum acute hazard index of 0.05 was calculated for the respiratory endpoint. The three pollutants contributing most to the chronic hazard index for the MEI were nickel (82 percent), acrolein (10 percent), and formaldehyde (eight percent).

The HRA results show the toxic impacts from the VGS project site are below the TAC significance criteria in Table 4.2-1.

4.2.4 Carbon Monoxide Impacts Analysis

Increases in traffic from a project might lead to impacts of CO emissions on sensitive receptors if the traffic increase worsens congestion on roadways or at intersections. An analysis of these impacts is required if:

1. The project is anticipated to reduce the level of service (LOS) of an intersection rated at C or worse by one full level; or
2. The project is anticipated to increase the volume-to-capacity ratio of an intersection rated D or worse by 0.02.

As indicated in the transportation/traffic analysis (Section 4.11), the volume-to-capacity at the Alameda and Sepulveda intersection, which is currently rated D+, may increase by 0.02 from construction workers leaving HGS at the end of the work day. This increase is a result of increased traffic in the northbound direction on Alameda. This is the only intersection that meets either of the above criteria during either construction or operations.

Table 4.2-35
70-Year Cancer Risk per Million from the VGS Project Site for the Maximum Exposed Individual

POLLUTANT	INHALE	DERMAL	SOIL	PLANTS	SUM
As	1.63E-11	4.08E-13	1.93E-11	8.03E-12	4.40E-11
BUTAD	1.64E-10	0.00E+00	0.00E+00	0.00E+00	1.64E-10
ACETA	2.81E-09	0.00E+00	0.00E+00	0.00E+00	2.81E-09
BENZA	1.92E-11	1.82E-11	2.87E-11	2.09E-10	2.75E-10
BENZE	2.93E-09	0.00E+00	0.00E+00	0.00E+00	2.93E-09
BENZO	1.18E-10	1.12E-10	1.77E-10	1.29E-09	1.69E-09
BENZF	9.79E-12	9.31E-12	1.47E-11	1.07E-10	1.40E-10
BENZK	9.52E-12	9.05E-12	1.43E-11	1.04E-10	1.37E-10
Be	3.18E-12	0.00E+00	0.00E+00	0.00E+00	3.18E-12
Cd	3.33E-11	0.00E+00	0.00E+00	0.00E+00	3.33E-11
Cr	3.95E-11	6.09E-14	2.88E-13	1.16E-13	4.00E-11
CHRYS	2.13E-12	2.03E-12	3.19E-12	2.32E-11	3.05E-11
DIBEN	2.16E-10	6.43E-11	1.01E-10	7.36E-10	1.12E-09
4DPD	3.47E-12	0.00E+00	0.00E+00	0.00E+00	3.47E-12
5DPDT	3.30E-12	0.00E+00	0.00E+00	0.00E+00	3.30E-12
6DPDT	8.37E-13	0.00E+00	0.00E+00	0.00E+00	8.37E-13
7DPDT	1.56E-13	0.00E+00	0.00E+00	0.00E+00	1.56E-13
8DPD	9.94E-14	0.00E+00	0.00E+00	0.00E+00	9.94E-14
HCHO	4.17E-08	0.00E+00	0.00E+00	0.00E+00	4.17E-08
4DBFT	3.10E-12	0.00E+00	0.00E+00	0.00E+00	3.10E-12
5DBFT	2.17E-11	0.00E+00	0.00E+00	0.00E+00	2.17E-11
6DBFT	2.23E-12	0.00E+00	0.00E+00	0.00E+00	2.23E-12
7DBFT	1.55E-13	0.00E+00	0.00E+00	0.00E+00	1.55E-13
8DBF	7.99E-15	0.00E+00	0.00E+00	0.00E+00	7.99E-15
INDEN	1.98E-11	1.88E-11	2.96E-11	2.16E-10	2.84E-10
Pb	1.78E-13	6.95E-15	3.28E-13	1.38E-13	6.51E-13
Ni	3.10E-10	0.00E+00	0.00E+00	0.00E+00	3.10E-10
PROX	1.34E-09	0.00E+00	0.00E+00	0.00E+00	1.34E-09
Total Risk	**4.98E-08**	**2.35E-10**	**3.89E-10**	**2.69E-09**	**5.31E-08**

Figure 5.1 of the SCAQMD CEQA Handbook (1993) lists sensitive receptors as:

- Long-term health care facilities
- Rehabilitation centers
- Convalescent centers
- Retirement homes
- Residences
- Schools
- Playgrounds
- Child care centers
- Athletic facilities

The area in the vicinity of the intersection is heavy manufacturing that precludes the presence of sensitive receptors. Therefore, the potential increase in congestion at this intersection during the short-term construction period is not anticipated to lead to adverse CO impacts on sensitive receptors.

4.2.5 Potential Health Risks from Diesel Exhaust Particulate Matter

The project will lead to increased emissions of diesel exhaust particulate matter from onsite construction equipment and diesel-fueled truck exhaust and from offsite diesel-fueled truck exhaust during construction. In 1998, the CARB listed particulate matter in the exhaust from diesel-fueled engines (diesel particulate matter) as a toxic air contaminant and concluded that it is probably carcinogenic to humans. An Advisory Committee was formed to advise the CARB staff in its preparation of an assessment of the need to further control toxic air pollutants from diesel-fueled engines. The Risk Management Subcommittee was formed to identify the: (1) operating parameters; (2) emission factors; and (3) modeling methodologies recommended for estimating human health risks from diesel-fueled engines. This information will be used by the Subcommittee to develop the scenarios to evaluate the risks associated with exposure to diesel particulate emissions. The SCAQMD is waiting for this guidance before initiating a quantitative risk analysis for diesel particulate emissions.

Significant impacts associated with exposure to diesel particulate emissions are not expected during either construction- or operational activities. As listed in Table 4.2-7 above, construction-related onsite and offsite diesel exhaust particulate matter emissions are estimated to be 9 and 4 pounds per day, respectively. However, these emissions are temporary and are expected to cease within six months. Therefore, long-term exposure to construction-related diesel exhaust particulate matter that could result in significant human health affects to nearby project site sensitive receptors is not expected.

Additionally, as shown in Table 4.2-8 above, operational-related diesel exhaust particulate matter emissions are estimated to be 0.2 pound per day. However, since these emissions are transitory in nature, long-term exposure to operational-related diesel exhaust particulate matter that could result in significant human health affects to nearby project site sensitive receptors is not expected.

4.2.6 Mitigation Measures

4.2.6.1 Construction Mitigation Measures

As indicated in Table 4.2-7 above, construction-related activities associated with the proposed project may have significant unmitigated air quality impacts for CO, VOC, NO_X, and PM_{10}.

The emissions from construction-related activities are primarily from four main sources: 1) onsite fugitive dust, 2) onsite storage tank degassing, 3) onsite construction equipment, and 4) offsite motor vehicles. The mitigation measures listed below are intended to minimize the emissions (e.g., air quality impacts) associated with these sources.

Table 4.2-36 lists mitigation measures for each emission source and identifies the estimated control efficiency of each mitigation measure. As shown in the table, no feasible mitigation have been identified for the emissions from on-road (offsite) vehicle trips. Additionally, no other feasible mitigation measures have been identified to further reduce emissions from this source or the sources for which mitigation measures have been identified[13].

[13] CEQA Guidelines §15364 defines feasible as ". . . capable of being accomplished in a successful manner within a reasonable period if time, taking into account economic, environmental, legal, social, and technological factors."

Table 4.2-36
Construction-Related Mitigation Measures and Control Efficiency

Mitigation Measure	Mitigation	Source	Pollutant	Control Efficiency (%)
AQ-1	Increase watering of active sites by one additional time per day[a]	Onsite Fugitive Dust PM_{10}	PM_{10}	16[a]
AQ-2	Proper equipment maintenance	Construction Equipment Exhaust	VOC NO_x SO_x PM_{10} CO	5 5 5 5 0
AQ-3	Control VOC emissions during storage tank degassing	Storage Tank Degassing	VOC	90
AQ-4	Cover haul trucks with full tarp	Haul Truck Soil Loss	PM_{10}	90
	No feasible measures identified[b]	On-Road Motor Vehicles	VOC NO_x PM_{10} CO	N/A N/A N/A N/A

[a] It is assumed that construction activities will comply with SCAQMD Rule 403 – Fugitive Dust, by watering active sites two times per day, reducing fugitive dust by 50 percent. This mitigation measure assumes an incremental increase in the number of times per day active sites are watered (i.e., from two to three times per day).

[b] Health and Safety Code §40929 prohibits the air districts and other public agencies from requiring an employee trip reduction program making such mitigation infeasible. No feasible measures have been identified to reduce emissions from this source.

Table 4.2-37 lists estimated peak daily mitigated emissions by construction activity and project site. Table 4.2-38 summarizes the overall peak daily mitigated construction-related emissions.

Table 4.2-37
Peak Daily Construction Emissions by Project Site for Each Construction Phase (Mitigated)

Activity	Location	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM_{10} (lb/day)	Fugitive PM_{10}[a] (lb/day)	Total PM_{10} (lb/day)
HGS Tank Demolition	Onsite	131.8	49.8	226.2	19.3	13.2	13.4	26.6
	Offsite	30.6	4.5	22.3	0.0	1.4	69.8	71.2
HGS Backfill	Onsite	151.9	31.0	287.8	25.9	14.0	78.3	92.2
	Offsite	48.8	7.3	41.5	0.0	2.6	133.2	135.8
HGS Grading	Onsite	52.0	9.9	74.9	6.6	4.3	2.3	6.5
	Offsite	1.5	0.2	0.2	0.0	0.0	0.1	0.1
HGS Foundations	Onsite	254.5	22.0	125.1	10.2	7.6	33.6	41.2
	Offsite	150.0	20.2	44.4	0.0	1.7	89.4	91.1
HGS Paving	Onsite	47.7	9.3	65.4	5.5	3.7	4.3	8.0
	Offsite	21.4	3.2	17.5	0.0	1.1	49.3	50.4
HGS Equipment Installation	Onsite	180.0	73.9	324.5	25.9	18.6	15.8	34.3
	Offsite	202.4	26.6	36.1	0.0	0.5	43.2	43.7
SGS Slab Demolition	Onsite	40.6	7.0	52.2	4.7	2.6	4.8	7.5
	Offsite	16.5	2.4	13.4	0.0	0.8	42.7	43.6
SGS Grading	Onsite	22.0	5.6	40.3	3.7	2.1	3.1	5.2
	Offsite	1.5	0.2	0.2	0.0	0.0	0.1	0.1
SGS Foundations	Onsite	31.6	3.1	19.6	1.6	1.2	4.6	5.7
	Offsite	13.3	1.9	7.4	0.0	0.4	19.3	19.7
SGS Paving	Onsite	16.8	2.4	30.5	2.6	1.5	2.3	3.8
	Offsite	6.7	1.0	5.1	0.0	0.3	14.2	14.5
SGS Equipment Installation	Onsite	64.1	48.2	114.0	9.8	6.4	6.1	12.5
	Offsite	58.1	7.8	16.0	0.0	0.6	30.7	31.3
VGS Demolition	Onsite	84.0	15.5	136.1	12.0	7.6	4.1	11.6
	Offsite	17.0	2.4	9.3	0.0	0.5	27.4	27.9
VGS Grading	Onsite	21.7	5.6	40.3	3.7	2.1	2.3	4.4
	Offsite	1.5	0.2	0.2	0.0	0.0	0.1	0.1
VGS Foundations	Onsite	54.1	4.8	27.9	2.2	1.7	7.9	9.5
	Offsite	46.2	6.5	23.9	0.0	1.3	60.8	62.1
VGS Paving	Onsite	17.1	2.9	30.6	2.6	1.5	2.8	4.3
	Offsite	8.5	1.3	6.7	0.0	0.4	18.8	19.2
VGS Equipment Installation	Onsite	74.5	21.8	124.2	10.4	7.0	6.6	13.6
	Offsite	59.6	8.0	15.5	0.0	0.5	28.5	29.1

[a] It is assumed that construction activities will comply with SCAQMD Rule 403 - Fugitive Dust, by watering active sites two times per day, reducing fugitive dust by 50 percent.

Table 4.2-38
Overall Peak Daily Emissions During Construction (Mitigated)

Source	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM_{10} (lb/day)	Fugitive PM_{10}[a] (lb/day)	Total PM_{10} (lb/day)
Onsite Construction Equipment Exhaust	408.3	69.1	590.5	48.6	18.1	--	18.1
Mitigation Reduction (%)	0%	5%	5%	5%	5%	--	0.0
Mitigation Reduction (lb/day)	0.0	-3.5	-29.5	-2.4	-0.9	--	-0.9
Remaining Emissions	**408.3**	**65.6**	**561.0**	**46.2**	**17.2**	**--**	**17.2**
Onsite Motor Vehicles	13.5	1.3	1.6	0.0	0.1	--	0.1
Mitigation Reduction (%)	0%	0%	0%	0%	0%	--	--
Mitigation Reduction (lb/day)	0.0	0.0	0.0	0.0	0.0	--	0.0
Remaining Emissions	**13.5**	**1.3**	**1.6**	**0.0**	**0.1**	**--**	**0.1**
Onsite Fugitive PM10	--	--	--	--	--	66.0	66.0
Mitigation Reduction (%)	--	--	--	--	--	16%	--
Mitigation Reduction (lb/day)	--	--	--	--	--	-10.6	-10.6
Remaining Emissions	**--**	**--**	**--**	**--**	**--**	**55.5**	**55.5**
Architectural Coating	--	77.0	--	--	--	--	--
Mitigation Reduction (%)	--	0%	--	--	--	--	--
Mitigation Reduction (lb/day)	--	0.0	--	--	--	--	--
Remaining Emissions	**--**	**77.0**	**--**	**--**	**--**	**--**	**--**
Total Onsite	**421.8**	**143.9**	**562.6**	**46.2**	**17.3**	**55.5**	**72.7**
Offsite Motor Vehicles	246.2	42.4	67.6	0.0	5.3	251.8	257.1
Mitigation Reduction (%)	0%	0%	0%	0%	0%	0%	--
Mitigation Reduction (lb/day)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Emissions	**246.2**	**42.4**	**67.6**	**0.0**	**5.3**	**251.8**	**257.1**
Total Offsite	**246.2**	**42.4**	**67.6**	**0.0**	**5.3**	**251.8**	**257.1**
TOTAL	**668.0**	**186.3**	**630.2**	**46.2**	**22.6**	**307.3**	**329.8**
CEQA Significance Level	*550*	*75*	*100*	*150*	--	--	*150*
Significant? (Yes/No)	**Yes**	**Yes**	**Yes**	No	--	--	**Yes**

Note: Totals may not match sum of individual values because of rounding

The overall peak daily mitigated construction-related CO, VOC, NO_X, and SO_X emissions are anticipated to occur during simultaneous equipment installation at all three project sites, while the overall peak daily mitigated construction-related PM_{10} emissions are anticipated to occur during simultaneous foundation construction and paving at all three project sites. Table 4.2-38 includes the emissions associated with each source and an estimate of the reductions associated with the proposed mitigation measure(s). The implementation of mitigation measures, while reducing emissions, does not reduce the construction-related CO, VOC, NO_X, or PM_{10} impacts below significance.

4.2.6.2 Operational Mitigation Measures

As indicated in Subsections 4.2.3.1 and 4.2.3.2 above, operation-related activities associated with the proposed project may have significant unmitigated air quality impacts for CO, VOC, NO_X, and PM_{10}. Offsets for these emissions will be acquired prior to construction of the proposed project. However, offsets cannot be used to mitigate significant CO, NO_X or PM_{10} impacts. VOC is an ozone precursor and is considered to be a regional pollutant. Therefore, offsets can be used to mitigate significant VOC impacts.

For CO, NO_X, and PM_{10} emissions associated with the proposed project, no feasible mitigation measures have been identified to reduce significant impacts to insignificance. However, the proposed project utilizes state-of-the-art emission controls for these pollutants. Furthermore, although not considered mitigation, LADWP will be required, as part of the SCAQMD permitting process, to provide offsets for these emissions. Lastly, for NO_X in particular, the SCR installations at SGS will aid LADWP in substantially reducing NO_X emissions at that site as well as lowering overall NO_X emissions in the Basin.

4.2.7 AQMP Consistency

CEQA requires an EIR to discuss any inconsistencies between the proposed project and applicable regional and local plans (CEQA Guidelines § 151265(d)). The 1997 AQMP and the 1999 amendments to the AQMP demonstrate that the standards can be achieved within the required timeframes. The proposed project is being undertaken for several reasons, but the relevant reason with regards to the Air Quality Management Plan (AQMP) is to comply with Regulation XX - RECLAIM. Accordingly, projects to comply with SCAQMD rules and regulations are considered consistent with the AQMP.

4.3 Biological Resources

Impacts to biological resources will be considered significant if any of the following criteria are met:

- The proposed project will result in a loss of plant communities or animal habitat considered to be rare, threatened, or endangered by federal, state, or local agencies.
- Aquatic communities are adversely affected by construction or operation of the proposed project.
- The proposed project interferes substantially with the movement of any resident or migratory fish or wildlife species.

4.3.1 Construction Impacts

4.3.1.1 Scattergood Generating Station

The SGS site is highly disturbed with few open spaces that could support native vegetation. At the time of the survey (October 28, 2000), the majority of that area was covered by iceplant. The area where the aqueous ammonia tanks are expected to be installed is small and surrounded by concrete. There are exposed dune areas outside the main SGS complex. However, most of these are adjacent to roads and are also highly disturbed. The El Segundo Dunes on the west side of Vista Del Mar are a part of the Dockweiler State Beach and that area has also been highly disturbed.

The CNDDB (June 15, 2000) identified the two plant species and five animals which had been sighted near the SGS or occurred generally within the region. The plant species included the beach spectaclepod (*Dithyrea maritima*), a State Threatened and Federal Species of Concern, and the coastal dunes milk-vetch (*Astragalus tener var titi*), a State and Federally Endangered species. The animal species, which were all identified as Federal Species of Concern, included the El Segundo blue butterfly (*Euphilotes battoides allyni*), Lange's El Segundo dune weevil (*Onychobaris langei*), Dorothy's El Segundo dune weevil (*Trigonoscuta dorothea dorothea*), Belkin's dune tabanid fly (*Brennania belkini*), and Henne's eucosman moth (*Eucosma hennei*). None of these plant and animal species nor habitats suitable for the proliferation of these species were observed at SGS, although it should be noted that the survey was not conducted during the spring.

In addition to those species identified by the CNDDB, several animal species were identified as potentially occurring in the vicinity of the SGS. These animal species included the sandy beach tiger beetle (*Cicindela hirticollis gravida*), which is found in areas adjacent to non-brackish water along the coast, and the tiger beetle (*Cicindela senislis frosti*), which is found in a salt marsh environment. Sandy beach tiger beetle and tiger beetle habitats were not found at the SGS at the time of the survey. In addition, the globose dune beetle (*Coelus globosus*), which is found in coastal sand dunes and burrows beneath dune vegetation, was identified as occurring the area of the SGS. However, the presence of the globose dune beetle is highly unlikely, as the construction area at the SGS is surrounded by concrete and covered in iceplant.

Based on the considerations described above, construction-related activities at the SGS project site are not expected to result in significant impacts to biological resources.

4.3.1.2 Harbor and Valley Generating Stations

As discussed in the Biological Resources section of Chapter 3 – Existing Setting, no special status plants, animals, or natural habitats are found on or in close proximity to the HGS or VGS sites. Based on these considerations, construction-related activities at HGS and VGS project sites are not expected to result in significant impacts to biological resources.

4.3.2 Operational Impacts

Based upon the nature of the operational activities anticipated at each project site and the fact that there are no biologically sensitive habitats on the project sites, no significant impacts to biological resources are expected.

4.3.3 Mitigation

No significant impacts to biological resources sources are expected to result during construction- or operational-related activities at any of the project sites. Therefore, no mitigation is necessary or proposed.

4.4 Cultural Sources

Adverse impacts to cultural sources will be considered significant if any of the following conditions are met:

- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group.
- Unique paleontological resources are present that could be disturbed by construction of the proposed project.

4.4.1 Construction Impacts

In order to evaluate potential impacts to archaeological resources from construction-related activities associated with the proposed project, an archaeological survey was conducted. The Phase I cultural resources investigation consisted of record searches at the South Central Coastal Information Center (SCCIC) and of the Native American Heritage Commission's (NAHC) sacred lands files. Archaeological surveys were conducted at the VGS and SGS projects. The surveys focused on those portions of the project sites were construction-related activities would result in a disturbance to the ground surface. As the HGS site is built on fill and is not considered an archaeologically sensitive area, an archaeological survey was not conducted at this location.

As stated in Conejo Archaeological Consultants' *Phase I Archaeological Investigation of Limited Areas within the Los Angeles Department of Water and Power's Harbor, Scattergood, and Valley Generating Stations, Los Angeles, California*, dated October 26, 2000, the SCCIC did not identify prehistoric or historic archaeological sites within a one-quarter mile radius of the three project sites and the NAHC's sacred lands records did not identify cultural resources within or adjacent to the three project sites. In addition, the Phase I archaeological surveys of the VGS and SGS project sites did not identify archaeological prehistoric or historic resources. The October 2000 Conejo Archaeological Consultants report is provided as Appendix F.

No historically significant properties were identified by the California State Inventory list within the confines of the project sites. However, four redwood cooling towers, which were reportedly just under 50 years of age, were identified at the VGS site. Because of their age these towers could be considered unique archaeological resources. However, upon further examination, the towers do not meet the definition for unique archaeological resources in PRC §21083.2(g), which states:

> "As used in this section, 'unique archaeological resource' means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:
>
> 1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
> 2. It has a special and particular quality such as being the oldest of its type or the best available example of its type.
> 3. Is directly associated with a scientifically recognized important prehistoric or historic event."

Based upon the above considerations, the towers would be classified as nonunique archaeological resources. Pursuant to PRC §21083.2(h), "'nonunique archaeological resource' means an archaeological artifact, object, or site which does not meet the criteria in subdivision (g). A nonunique archaeological resource need be given no further consideration, other than the simple recording of its existence by the lead agency if it so elects."

Therefore, no significant environmental impacts to cultural resources are expected from the proposal project.

4.4.2 Operation Impacts

Once the new equipment and existing modifications at the three project sites are completed, no further demolition activities will occur to existing structures. Therefore, no significant impacts to cultural sources will occur as a result of project operations.

4.4.3 Mitigation

As no construction- or operational-related impacts to archaeological resources were identified at the LADWP sites, no mitigation is necessary or proposed. However, in the event that archaeological resources or human remains are unearthed during project construction, all earth disturbing work within the vicinity of the find will be temporarily suspended or redirected until an archaeologist and/or County Coroner has evaluated the nature and significance of the find. Work in the area of the find will be resumed only after the find has been appropriately mitigated. A Gabrielino/Tongva representative will monitor any work associated with prehistoric cultural material. If remains are determined to be of Native American origin, the Native American Heritage Commission will be notified within 24 hours of the determination.

4.5 Energy Resources

The potential adverse impacts to energy resources will be considered significant if any of the following criteria are met:

- The project results in the use of fuel or energy in a wasteful manner
- The project results in substantial depletion of existing energy resource supplies.
- The project results in the use of large amounts of fuel or energy resources.

4.5.1 Construction Impacts

Project construction will result in the expenditure of non-renewable energy sources, primarily gasoline and diesel fuel. Approximately 154,259 gallons of gasoline and 182,140 gallons of diesel fuel will be used by onsite construction equipment, construction workers' vehicles, and material delivery trucks traveling to and from the project sites. Gasoline and diesel fuel usage calculations and associated assumptions are provided in Appendix C.

Gasoline and diesel fuel usage for transportation activities in the Los Angeles region in 2000 were projected by the CEC to be 6.5 billion gallons per year and 1.1 billion gallons per year, respectively (CEC, 1999). As shown in Table 4.5-1, assuming construction-related activities in the future years would yield similar results, the gasoline and diesel fuel required by the proposed project would represent 0.002 and 0.02 percent, respectively, of the projected demand. This demand is one time only and represents a small incremental increase in demand for fuels in the Los Angeles region.

Table 4.5-1
Total Projected Fuel Usage For Construction-Related Activities

Construction Activity	Total Fuel Usage (gallons/yr)	
	Diesel	Gasoline
Total Fuel Usage[a]	30,009	17,672
Threshold (Fuel Supply)	$1,086 \times 10^6$	$6,469 \times 10^6$
% Of Fuel Supply	0.003%	0.0003%
Significant (Yes/No)	No	No

[a] For onsite construction equipment operation, the SCAQMD assumed that diesel would be used in all heavy-duty construction equipment and gasoline would be used in all small portable equipment. For offsite mobile sources, the SCAQMD assumed that diesel would be used in all haul trucks and gasoline would be used in all construction worker vehicles.

According to the CEC 1999 Fuels Report, California's crude oil demand will be met by in-state, Alaska and foreign supplies for all forecasted years. Accordingly, these supplies will be sufficient to meet California's fuel demands for all forecasted years (CEC, 1999).

Based on the available supply of gasoline and diesel fuel, and the small percentage of the total demand that the project is expected to consume, the project will not result in the use of fuel in a wasteful manner nor will it result in a significant impact to fuel supplies.

4.5.2 Operational Impacts

The LADWP is installing state-of-the-art electrical power generating equipment (e.g., CTs) as well as associated emissions control equipment (SCRs). The electrical energy generated by the new equipment is specifically intended to alleviate power shortages experienced during summer peak hours in California. Accordingly, any additional electricity needed to run various ancillary equipment (e.g., pumps, fans, motors, instrumentation, etc.) associated with the CTs and SCRs will be generated by LADWP.

Additionally, incremental fuel (e.g., natural gas) consumed in the CTs or various ancillary equipment (e.g., pumps, fans, motors, instrumentation, etc) would be for the purpose of providing electricity to the Cal-ISO or aiding LADWP in complying with the SCAQMD Rules and Regulations (e.g., RECLAIM, Reg. XIII, etc.). The consumption of fuel to comply with air quality regulations is not considered a wasteful use of energy. Therefore, fuel consumed by the three project sites would not be considered a significant adverse energy impact. Although, the project will result in a net increase in the amount of natural gas consumed due to the operation of the CTs to generate electricity, LADWP already holds large portions of firm capacity rights on interstate gas pipelines (California Gas Reporter, CEC 1998) and the infrastructure and natural gas supply is ample to supply this increased demand. Therefore, the small amount of additional fuel consumed in the CTs to generate electricity and ancillary equipment would be negligible compared to existing supplies and, thus, would not substantially deplete existing energy resources.

It should be noted that the amount of diesel fuel consumed by tanker trucks for the purpose of delivering aqueous ammonia to the project sites, will be negligible and will not substantially deplete existing diesel supplies. As no additional workers will be required for the proposed project's operational activities no gasoline or diesel fuel will be consumed from worker commute trips to and from the project sites.

4.5.3 Mitigation

Since no significant impacts to energy sources are expected to result from construction- or operational-related activities at the project sites, no mitigation is necessary or proposed.

4.6 Geology and Soils

Geologic and seismic conditions will be considered significant if any of the following conditions are met:

- Earthquake induced ground motion capable of inducing catastrophic structural failure of the major components of the proposed project.

- Secondary seismic effects occur, (i.e., earthquake-induced ground failure or liquefaction-related failure).
- Topographic alterations result in significant changes that could include such as visual degradation, soil erosion, and drainage alteration.
- Disturbance of large volumes of soil impacted by petroleum hydrocarbons or other hazardous constituents.

4.6.1 Construction Impacts

Construction will require some minor grading and excavation at all three of the project generating stations. Grading and excavation activities have the potential to cause topographic alterations and secondary seismic effects.

4.6.1.1 Expansive Soil

In general, the uppermost four to 10 feet of soil materials at the three project sites are comprised of granular alluvial materials and sandy, silty artificial fills, none of which tend to show significant soil expansion. Accordingly, these soil types do not typically create soil expansion problems. Therefore, construction-related activities at the three project sites, are not expected to create significant soil expansion impacts.

4.6.1.2 Erosion

Erosion from wind or water could occur during construction activities (e.g., grading, excavating backfilling, trenching, storage piling, etc.) at the three project sites as soils will be exposed to the elements. Standard construction grading practices and retention features will contain runoff. Further, routine dust abatement measures including watering of the excavations for dust control will minimize wind erosion. The combination of these factors will combine to keep erosional impacts to an insignificant level.

4.6.1.3 Soil Contamination

Although soil sampling conducted by LADWP for specific areas within the project sites indicates that contaminated soils are not present, it still is possible that some contaminated soils will be disturbed during certain construction-related activities (e.g., excavation and grading). Please see Section 4.8 for a discussion of LADWP's plans to manage and mitigate the presence of contaminated soils if encountered at any of the project sites.

4.6.2 Operational Impacts

4.6.2.1 Seismicity - Ground Rupture

There are some areas in southern California noted for earthquake-induced ground rupture. These areas are identified as part of the Alquist-Priolo Special Study Act. Although located nearby, the project sites are not included within the earthquake fault zones delineated. Therefore, the risk to any of the three project sites due to earthquake-induced ground rupture is considered insignificant.

4.6.2.2 Seismicity - Ground Shaking

The use of standard engineering practices for building within any seismically active area such as the areas which encompass the three project sites requires that the project design and construction practices adhere to appropriate earthquake safety codes. LADWP will adhere to the current Uniform Building Code and, even though the potential for ground shaking impacts exists, with implementation of the proper design and construction practices, no seismic (e.g., ground shaking) significant impacts are expected from the proposed project.

4.6.2.3 Seismicity - Liquefaction

Liquefaction is a mechanism of ground failure whereby earthquake-induced ground motion transforms loose, water-saturated granular material to a liquid state. Of the three project sites, only the HGS site has been identified by the CDMG as an area that has the potential for permanent ground displacements due to liquefaction. Previous geotechnical investigations at the HGS demonstrate that the site is underlain by unconsolidated sands and silts, with a shallow groundwater table (less than 15 feet deep). These subsurface conditions, combined with the regional active seismicity, support probability of liquefaction occurring at the HGS site. Therefore, appropriate measures will be necessary to mitigate the potential liquefaction hazard at the HGS site (see Subsection 4.6.3).

4.6.2.4 Seismicity - Slope Stability

The potential for slope instability at a manmade embankment at the SGS site is the only area of the three project sites that has been identified by the CDMG as an area that has the potential for permanent ground displacements due to earthquake induced landslides. From the CDMG Guidelines, this means that regional information suggests that the probability of a seismic hazard requiring mitigation is great enough to warrant further action. Therefore, appropriate measures will be necessary to mitigate the potential landslide hazard at the SGS site (see Subsection 4.6.3).

4.6.2.5 Subsidence

While subsidence had historically been a problem in the Long Beach area, which encompasses the area of the HGS site, it has not been a significant problem since approximately 1958, when the practice of pumping saltwater into the oil reservoirs to replace the withdrawn oil and gas was initiated. Since subsidence is being mitigated by the ongoing regional replacement injection of saltwater into depleted oil reservoirs; no significant impact from subsidence is expected from the proposed project.

4.6.3 Mitigation Measures

The following mitigation measure has been identified to address the potential for liquefaction at the HGS site, the potential at all three project sites for significant earthquake-induced ground motion, and the potential for seismically induced slope instability at the SGS:

- GS-1: All project components will employ project design and construction practices that adhere to appropriate earthquake safety codes and current Uniform Building Code.

With proper design and construction, it is expected that the potential hazard due to liquefaction, ground motion, and slope instability can be mitigated to insignificance.

4.7 Hazards and Hazardous Materials

This section addresses potential hazards and risk of upset scenarios associated with the proposed project (e.g., activities at the three project sites). This section analyzes and documents the incremental potential adverse impact that the proposed project may have on the community or environment if an upset were to occur. As explained in Chapter 3 – Existing Setting, the SCAQMD has determined that the major potential significant hazards associated with the proposed project are accidental releases related to the delivery, handling, and storage of aqueous ammonia at the three project sites. Appendix D provides the hazard modeling technical attachment.

The potential for a risk of upset being deemed significant for the proposed project would be dependent on the likelihood of any of the following conditions being met:

- Noncompliance with any applicable design code or regulation;
- Nonconformance to National Fire Protection Association standards;
- Nonconformance to regulations or generally accepted industry practices related to operating policies and procedures concerning the design, construction, security, leak detection, spill containment, or fire protection;
- Increased risk of offsite fatality or serious injury;
- Substantial human exposure to a hazardous chemical;
- Significant exceedance of the USEPA risk management exposure endpoints offsite.

The first three criteria above are related to design codes, fire standards, and generally accepted industry practices. The proposed project will be designed to meet all applicable standards to reduce the risk of an accidental release, operated in a manner to comply with safety standards and practices, and maintained to provide a safe workplace for LADWP personnel and to prevent significant adverse offsite impacts to the public at large. Furthermore, LADWP in constructing and operating power generation equipment incorporates the following: modern industrial technology and design standards; regulatory health and safety codes and guidelines; and training, operating, inspection, and maintenance procedures that will minimize the risk and severity of potential upset conditions.

Examples of safety regulations and standards governing equipment design that LADWP will conform to in installing and modifying equipment at the project sites include:

- California Code of Regulations, Title 8 - contains minimum requirements for equipment design
- Industry Standards and Practices - codes for design of various equipment
  - ANSI - American National Standards Institute
  - API - American Petroleum Institute
  - ASME - American Society of Mechanical Engineers
  - NFPA - National Fire and Protection Association

The standards noted above and other applicable design standards will govern the design of mechanical equipment such as the CTS, SCR systems, aqueous ammonia tanks, pumps, and piping. Accordingly, since LADWP is expected to comply with these standards, no further hazard analysis related to equipment design is required. Furthermore, since each of the three project sites is located within the City of Los Angeles, adherence to applicable safety design codes will be verified by the appropriate City of Los Angeles inspector for all equipment installations and modifications prior to the project sites becoming operational.

Since compliance with applicable safety design codes, guidelines, and procedures is expected, the following hazard analyses concentrate on potential upset scenarios (e.g., accidental aqueous ammonia releases) that may result in risk of serious injury or substantial chemical exposure. The analyses present the estimated likelihood of occurrence and the potential consequences associated with each scenario. The primary focus is on potential impacts to the environment or the community outside of each project site. The range of the impact beyond the fence line to offsite sensitive receptors is estimated for each scenario.

The selection of scenarios was based on previous experience in process engineering, process safety management, and risk analysis. The likelihood of occurrence for the scenarios was based on reliability data available from the American Institute of Chemical Engineers and other published data (e.g., see references in Table 4.7-1).

For the project sites where existing equipment was being modified, the risk of upset analysis evaluated the incremental risk over the current baseline (e.g., the existing risk associated with the project site). For the project sites where completely new equipment or operations were being installed, the risk of upset analysis estimated the new risk over a zero baseline (e.g., no current risk).

4.7.1 Applicable Hazards Regulations

The following discussion describes laws and regulations affecting the proposed project and the management of risk associated with process upsets.

A variety of safety laws and regulations have been in existence for many years to reduce the risk of accidental releases of chemicals at industrial facilities. Initially, the federal government passed legislation to enhance emergency planning efforts in Title III of the Superfund Amendments and Reauthorization Act (SARA). Next, the USEPA developed Emergency Preparedness and Community Right-to-Know regulations.

The Department of Labor Occupational Safety and Health Administration (OSHA) passed a rule in 1992, known as Process Safety Management of Highly Hazardous Chemicals (29 CFR 1910.119), which addresses the prevention of catastrophic accidents. The rule requires companies handling hazardous substances in excess of specific threshold amounts to develop and implement process safety management (PSM) systems. The requirements of the PSM rule are directed primarily at protecting workers within the facility. For aqueous ammonia, the threshold is more than 20,000 pounds of 44 percent concentration. LADWP proposes to use 29.5 percent ammonia for this project at the three project sites. Accordingly, the OSHA PSM regulations described above do not apply.

In 1986, California Assembly Bill 3777 first required facilities handling Acutely Hazardous Materials (AHMs) to establish Risk Management Prevention Programs (RMPPs). The objective of these regulations was to identify facilities that handle AHMs above certain threshold limits and to require these facilities to develop RMPPs to address the potential hazards involved. The RMPPs were intended to identify hazards involving AHMs, evaluate potential consequences of releases, and identify recommended changes in equipment, training, operating, and maintenance procedures, mitigation systems, and emergency response plans to minimize both the potential for these releases and their effects should they occur. The California Office of Emergency Services published guidelines for preparing RMPPs in November of 1989 (OES, 1989). In some cases, administering agencies (usually cities or counties responsible for emergency response and preparedness) have issued additional guidance. The RMPP program has been replaced with the California Accidental Release Program (CalARP) discussed below.

The USEPA established a federal Risk Management Program (RMP) under the Clean Air Act Amendments (CAAA), which were promulgated in November 1990. The CAAA mandated that USEPA create regulations to require facilities possessing listed chemicals above specified threshold amounts to develop and implement Risk Management Plans. A Risk Management Plan contains a hazard assessment of potential worst-credible accidents, an accident prevention program, and an emergency-response program. Federal RMP regulations were promulgated for in June 1996. The Federal RMP was provisionally accepted by California in January 1997 to replace the California RMPP and California regulations. The CalARP was finalized by June 1997, as California's version of the RMP. RMP/CalARP regulations require that risk management programs be completed for affected processes by the time a listed substance exceeds the threshold quantity in process for the first time. The threshold for the federal program is 20,000 pounds of aqueous ammonia that exceeds 20 percent concentration or over 500 pounds of ammonia content in the ammonia solution for the CalARP. As mentioned above, the proposed project will use 29.5 percent ammonia at all three project sites. Accordingly, the proposed project is subject to the CalARP and USEPA RMP reporting requirements.

4.7.2 Overview of Approach

The hazard analysis addresses only processes that are being added or modified to the three project sites as a result of the proposed project. The analysis has been conducted in the five following steps:

1. Review Potential Hazards;
2. Categorize Risk;
3. Select Specific Scenarios;
4. Estimate Likelihood of Accidents; and
5. Assess Consequences

Each step is described in detail in the subsequent subsections.

4.7.3 Hazardous Chemicals Associated with the Project

As mentioned previously, the primary hazardous chemical identified with the proposed project is aqueous ammonia. Ammonia is regulated under the federal RMP and the CalARP. This hazard analysis focuses on the potential increase of risk associated with the use of aqueous ammonia for NO_x emissions control at the three project sites.

For new operations, such as shipping aqueous ammonia to a new location (e.g., SGS and VGS) that did not previously receive aqueous ammonia, the risk of the transfer and storage was estimated. For transfer of aqueous ammonia by pipeline that did not previously exist (e.g., HGS), the risk of transfer was estimated. Similarly, the risk of transfer of aqueous ammonia by trucks to new locations (e.g., SGS and VGS) was estimated. For transfer of ammonia to locations that currently use ammonia (e.g., HGS), the incremental risk of increased ammonia deliveries was estimated. For the truck accident scenarios, two cases were considered. These included a major spill that ruptures the tank truck releasing the entire 5,000-gallon contents and an improper hook-up during delivery that allows 200 gallons to spill. A truck accident could occur anywhere along the delivery route. Major truck accidents are not likely and it is very unlikely that a chemical truck would lose its entire contents in an accident. If there is a chemical spill during a truck accident, the most common release is the diesel fuel and not the load. For a road accident, the roads are usually graded and a spill would be channeled to a low spot or drainage system, which would limit the surface area of the spill and the subsequent toxic emissions. The roadside surfaces may not be paved and may absorb some of the spill. To estimate the risk associated with the aforementioned scenarios, the following quantities of aqueous ammonia and operations involving aqueous ammonia at various locations were reviewed to define scenarios for estimating incremental impacts.

To be conservative, the worst-case truck accident was assumed to occur at the facility, on an impervious flat surface and to spread to a thickness of one centimeter (USEPA worst-case assumption). A 5,000 gallon spill under these conditions would cover a surface of about 1,890 square meters (about 20,380 square feet) and evaporate most of its ammonia content in about 15 minutes. The vapors were assumed to disperse under rural conditions (low dispersion) until a concentration of 200 ppm is attained. (This is the USEPA risk management limit). This is a highly unlikely worst-case scenario.

For the connect/disconnect accident, 200 gallons were assumed to spill at the facility on a flat impervious surface and spread to a thickness of one centimeter. A spill of this type would cover an area of about 76 square meters (about 815 square feet) and also evaporate most of the ammonia in about 15 minutes. This is a more likely accident but the assumptions about the surface and evaporation rate are very conservative.

4.7.3.1 Harbor Generating Station

For the HGS site, primary consideration was given to the new hazards associated with project units, related systems, and piping. Risk analysis scenarios for each component are described as follows:

- Construction of a new ammonia pipeline to transfer aqueous ammonia from existing storage tanks at the facility to the new SCR systems for the five new 47-MW CTs. The risk of a pipeline failure was estimated relative to a zero baseline.
- Incremental delivery of aqueous ammonia at HGS. One additional 5,000-gallon ammonia tanker truck delivery per week will be made to the HGS site to supply the SCR systems associated with the five new CTs. The potential severity (consequence) of the impact of an accidental tanker truck release will not increase above the existing impact associated with current aqueous ammonia deliveries. However, the potential frequency of an accidental release will increase due to increase in deliveries to the HGS site. This incremental risk was estimated.
- Delivery of natural gas with a new gas pipeline from the main line to the five new CTs. The potential impact of the failure of the new natural gas pipeline from the existing main was estimated.

4.7.3.2 Scattergood Generating Station

For the SGS site, primary consideration was given to the new hazards associated the installation of SCR systems on the three existing generating units (Units #1, #2, and #3),. Risk analysis scenarios associated with the SCR systems are described as follows:

- Installation of three, new aboveground 30,000-gallon aqueous ammonia storage tanks. The risk associated with the rupture of an ammonia storage tank resulting in spilling its entire contents of 30,000 gallons into a 120 percent containment dike was estimated relative to a zero baseline.
- Delivery of aqueous ammonia to supply three new SCRs at the SGS site. Two 5,000-gallon tanker truck deliveries per week will be made to SGS. The impact of an accidental tanker truck release was estimated. A total release and partial release were modeled relative to a zero baseline

4.7.3.3 Valley Generating Station

For the VGS site, primary consideration was given to the new hazards associated with the installation of one SCR unit on a new 47-MW CT, the SCR-related systems, and piping. Risk analysis scenarios for each component are described as follows:

- Installation of one new above ground 20,000-gallon aqueous ammonia storage tank. The risk associated with the rupture of the ammonia storage tank resulting in spilling its entire contents of 20,000 gallons into a 120 percent containment dike was estimated relative to a zero baseline.
- Delivery of aqueous ammonia to supply one new SCR at VGS. Approximately one 5,000-gallon tanker truck delivery per month will be made to VGS. The impact of an accidental tanker truck release was estimated. A total release and partial release were modeled relative to a zero baseline.
- A natural gas pipeline will be installed to supply the new generating unit. The risk associated with the rupture of this pipeline was estimated.

4.7.4 Review of Potential Hazards

Most industrial accidents may be classified within one of several broad categories that have been developed by the American Institute of Chemical Engineers (AIChE, 1989 and AIChE 1993). These broad categories and their applicability to the proposed project are described in the following subsections.

4.7.4.1 Toxic Gas Release

Toxic gas releases are usually a concern in evaluating potential accidents at facilities utilizing ammonia. Toxic gas releases are evaluated in terms of possible acute exposures, taking into account the potential for the gas to be transported offsite by the wind. The consequences of such potential releases depend on the specific gas released, the rate of release, the duration of the release, and the atmospheric dispersion and transport conditions. For the proposed project, no direct gaseous acutely hazardous material release scenarios were defined since most ammonia vapor will be indirectly released from the surface of spilled liquid. Emissions from liquid spills are discussed below.

4.7.4.2 Toxic Liquids Release

Toxic liquid can be released in two forms, as a liquid spill or as aerosol droplets. Liquid spills at a facility are typically contained within berms, or dikes, or similar containment system designed to prevent runoff. Potential offsite hazards could result when spilled products pool, evaporate, and then are transported offsite as a gas. Consequences of such a spill would depend upon several factors, such as the location of the spill within the property, the surface area of the spill, the surface on which the spill occurs, the concentration of the liquid, and atmospheric conditions such as wind and temperature. Aqueous ammonia stored at the project sites will contain a concentration of 29.5 percent ammonia. In this concentration, a release of ammonia at a project site could result in human health effects to nearby residents. Similarly, offsite spills due to tanker truck accidents are also of concern. Tanker truck spills are generally unconfined and can spread over larger areas, depending on the surface and the contour of the spill area.

4.7.4.3 Toxic Solids Release

A spill of toxic solids would have little potential impact to the public outside the project site as there are few reasonable transport mechanisms for solids. A potential for offsite hazard could occur if the spilled materials were to catch fire, be introduced to the stormwater system, or be carried by wind. Catalysts used in the SCR systems to enhance emission reductions are toxic but are not a form that would be carried offsite by the above described transport mechanisms. As discussed in Section 4.10 below, SCR spent catalysts will be recycled or properly disposed of. Therefore, no toxic solid hazard impacts are anticipated from the proposed project and will not be further analyzed.

4.7.4.4 Natural Gas Fire

Natural gas will be used as a fuel source for the new CTs at HGS and VGS. In case of a gas pipeline rupture, potential fires and explosions could have an offsite impact. Currently, all project sites are using natural gas as a fuel source for existing power generating equipment.

In the context of the proposed project, the HGS site will require a new gas connector pipeline to be laid under Fries Street (see Figure 2.2-4) to bring gas from the main line to the five new CTs. A possible rupture with resulting explosion was modeled as an accident scenario for this new pipeline connector. Since a fire has a smaller impact distance than an explosion, this scenario was not modeled.

At the VGS site, the new CT gas hook-up is comparable to the existing systems. An unconfined explosion may occur if a large mass of combustible material is released prior to ignition. This type of explosion is discussed below in Section 4.7.4.8.

At the SGS site, no additional natural gas usage is anticipated since LADWP is installing SCRs on existing power generating equipment. Accordingly, a natural gas explosion scenario was not modeled for this project site.

4.7.4.5 Liquid Pool Fire

Combustible, liquid-phase materials (e.g., gasoline) will not be used in the new units of this project and consequently liquid fires were not modeled.

4.7.4.6 Solids Fire

The potential for fire involving combustible solids is much lower than for liquids and gases, as solids combustion occurs only within a relatively narrow range of conditions. In the event of a solids fire, consequences are also typically less severe than a gas or liquids fire due to the smaller volumes of combustible materials involved. Accordingly, no solids fires were considered in this analysis, because the proposed project does not include the use of new or increased use of flammable solids.

4.7.4.7 Confined Explosion

A confined explosion would involve the presence of explosive conditions internal to the process equipment, pipelines, or tanks. Such an explosion would require air to mix with a fuel source, such as natural gas inside pipeline, come into contact with an ignition source and explode. This is not a realistic scenario for a natural gas pipeline. Since the gas in the pipe is at a pressure higher than atmospheric pressure, high pressure gas will leak out of a pipe and mix with air causing an unconfined explosion. Under pressure, air cannot leak into the pipe and mix with the gas. Confined explosions were not modeled. An unconfined explosion is more likely and is discussed below.

4.7.4.8 Unconfined Explosion

An unconfined explosion may occur if a large mass of combustible material is released prior to ignition. These types of explosions occur following the release of flammable gases or mixtures of gases and liquid droplets, which subsequently evaporate. Unconfined explosions occur in ambient air when a release under proper conditions comes in contact with an ignition source. If the ignition occurs shortly after the release, the explosive effects are lessened and the result is a smaller explosion followed by a gas fire. If ignition is delayed, the resulting explosion can be much larger. Explosive effects include both thermal radiation effects (described also under fires) and blast effects. Depending on the severity of the explosion and proximity to the source, offsite effects can range from a loud noise, broken windows, or possible structural damage. Persons within or near a building suffering such damage are at risk of injury.

In the context of this proposed project, all project site locations are currently using natural gas for fueling power generating equipment. The new gas connector pipelines that will carry natural gas from the main pipeline to the new CTs at the HGS and VGS sites were modeled under an explosion scenario. The equipment installation and modifications at the SGS are for pollution control and do not involve gas systems. Therefore, a natural gas explosion scenario was not modeled for this site.

4.7.4.9 Dust Explosion

Combustible solids may also lead to explosions if a sufficient mass of fine particles are dispersed in the air and exposed to an ignition source. For the same reasons as discussed in Subsection 4.7.4.6 above, no dust explosion potential is expected for the proposed project and was not further analyzed.

4.7.4.10 Boiling Liquid Expanding Vapor Explosion

A boiling liquid expanding vapor explosion (BLEVE) is a potentially catastrophic event usually associated with sudden, massive failure of a pressurized storage vessel. The resulting explosion may generate a blast overpressure wave with fragments of the vessel being projected long distances. No BLEVE cases were considered for the proposed project because no new flammable liquids will be added and aqueous ammonia will not be stored at the project sites in pressurized vessels.

4.7.5 Categorize the Risk

Risk is judged by identifying both the severity of the potential consequences and the likelihood of occurrence. Criteria for each of these components of risk are discussed in more detail in the following subsections.

4.7.5.1 Severity

Severity criteria must be defined separately for each type of consequence due to the physical differences in the effect of each event. The type of accidents considered in this evaluation included toxic releases and explosions. Use was made of the USEPA RMP Offsite Consequence Analysis Guidance to determine the endpoint of explosions and for estimating the toxic impact of potential aqueous ammonia releases.

The distance that has to be traversed away from the center of the upset event to reach the endpoint was calculated for each accident scenario. This distance represents the maximum separation distance required to reach the edge of the critical zone of the impact. The edge of the critical zone is the outer limit of potentially serious injuries.

4.7.5.2 Toxic Exposure Endpoint

Toxic exposures become a concern when a process containing an acutely hazardous material releases the material or when an upset causes the formation and subsequent release of a toxic material. For toxic compounds, the USEPA has selected the Emergency Response Planning Guidelines (ERPG) (AIHA/ORC, 1988) Level II as its significance criterion. The ERPG II level is defined as follows:

> “The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.”

Toxic exposures were estimated for various aqueous ammonia release scenarios. The ERPG II for ammonia is 200 ppm.

4.7.5.3 Blast Evaluation Endpoint

Blast impacts are of concern wherever flammable materials and ignition sources are present, or where processes operate under high temperatures and pressures. Blast impacts are described in terms of overpressure (i.e., shock waves) and are presented in the American Institute for Chemical Engineering Guidelines for Hazard Evaluation Procedures (AIChE, 1993) and V.J. Clancey's Diagnostic Features of Explosion Damage (Clancey, 1972). The endpoint selected by the USEPA as a significance criterion is an overpressure of one pound per square inch (psi). An overpressure of one psi may cause partial demolition of houses, which can result in serious injuries to people and shattering of glass windows, which may cause skin laceration from flying glass.

4.7.5.4 Likelihood

The likelihood of an occurrence can be expressed as "Frequent," "Periodic," "Occasional," "Improbable," and "Remote." In qualitative terms, a "Frequent" likelihood is an event that would occur more than once a year. A "Periodic" likelihood is one that occurs once per decade. An "Occasional" likelihood is defined as an event that is likely to occur during the lifetime of the project, assuming normal operation, inspection, and maintenance programs (once in 10 to 100 years). An "Improbable" likelihood is considered to occur every 100 to 10,000 years (a major earthquake capable of rupturing pipelines and storage tanks would fall into this category). A "Remote" likelihood represents an event that is not likely to occur at all. Estimates of likelihood for specific scenarios are discussed in Section 4.7.7. The likelihood would be considered significant if the likelihood of occurrence were less than once in 100 years.

4.7.6 Select Specific Scenarios

The parameters for each upset scenario were selected based on previous experience with similar projects and using design information provided by LADWP. The parameters included temperature, composition, flow rates, piping and equipment sizes, size, and description of containment, including location within the LADWP facility. If information was missing for specific parameters (e.g., the area of containment dikes for storage tanks that have not yet been designed or constructed), assumptions were made based on typical industry practice.

4.7.7 Estimate Likelihood of Accidents

Table 4.7-1 lists qualitative likelihood estimates for the events that can contribute to the selected hazard scenarios. The table also lists published data when available. The likelihood estimates were developed based on experience with similar projects. The likelihoods are categorized as Frequent, Periodic, Occasional, Improbable, and Remote as defined in Section 4.7.5.4.

Table 4.7-1
Qualitative and Quantitative Estimates of Failures that may Contribute to Hazardous Releases

Scenario	Likelihood (Qualitative)	Frequency
Tank failure from earthquake	Improbable	The frequency of a maximum probable (6.3 Richter) Newport-Inglewood earthquake is about one per 100 years.[1] Approximately one in ten spherical vessels fail for lateral accelerations >0.2g which can be generated in such an earthquake[2] (bullets/tanks are less vulnerable and would fail less frequently). The expected tank failure rate in an earthquake would be approximate one per 1,000 years.
Tank failure (catastrophic)	Improbable	The catastrophic tank failure rate[4] is approximately one per 100 years. Failures are primarily due to cracks.
Pipe failure from earthquake	Improbable	The event frequency is approximately once per 100 years but the pipe may not rupture[1]. Assume the pipe failure rate in a maximum probable earthquake is one in ten as for tanks. The number of pipe failures that result in unconfined explosions is estimated to be one in ten (by relating failures and failures plus explosions) for a combined estimate of one per 10,000 years[3,4]. Fires would be of higher probability but less than one per rupture. (The combined fire and pipe failure rate is approximately one per 1,000 years to one per 10,000 years).
Pipe failure (catastrophic)	Improbable	The catastrophic pipe failure rate[4] is approximately one per 1,000 years. The number of explosions for pipeline failures is estimated to be an average of one per ten failures (by relating failures with failures plus explosions) for a combined one per 10,000 years[3,4].
Truck accident	Improbable/ Remote	Truck accident rates are approximately one per 8.7-million miles[5]. Assuming a total of 168 truck deliveries of aqueous ammonia for all new sites per year of an estimated total of 4,250 miles, the expected number of truck accidents will be about one per 2,000 years. The likelihood of release is one in ten and of a major release one in 40[7]. The expected major release frequency is approximately one per 80,000 years.
Truck Connect/ Disconnect Accident	Periodic/ Improbable	Human error rate[6] is about one per 2,000 operations. For 168 tankers per year there are 336 connect/disconnects per year. A bad connect/disconnect would be expected about every 6.5 years. Assume the same release rate as for truck accidents. The likelihood of any connection release (small spill) is one in ten and of a larger (200 gallons) release is one in 40[7]. The approximate larger release rate for connections is about one per 240 years.

Table 4.7-1 (Continued)
Qualitative and Quantitative Estimates of Failures that may Contribute to Hazardous Releases

Frequent -	More than once per year (0 to 1 years)
Periodic -	Once per decade (1 to 10 years)
Occasional-	During the facility lifetime (10 to 100 years)
Improbable -	100 to 10,000 years
Remote -	Not likely to occur at all
1	SCAQMD, 1993
2	AIChE "Chemical Process Quantitative Risk Analysis"
3	F. Lees, "Loss Prevention in Process Industries," Vol. 1, 1992
4	AIChE "Process Equipment Reliability Data," 1989
5	ENSR 1994 in "Risk of Upset Evaluation, Unocal San Francisco Refinery, Reformulated Gasoline Project
6	T. Kletz, "An Engineers View of Human Error," 1985
7	ENSR 1994
8	USDOT, Federal Railroad Administration, Accident/Incident Bulletin No. 164, CY 1995, Aug. 1996

4.7.8 Assess Consequences

Consequence modeling was performed for the scenarios identified below. The purpose of the modeling was to estimate the offsite consequences of releases of toxic and flammable materials from units that are proposed for installation or modification associated with the proposed project.

The modeling was based on USEPA's RMP Guidance for toxic releases and explosions. The RMPComp model was used to calculate size of the impact zones for explosions and toxic releases. The concentration of aqueous ammonia used at the project sites is expected to be 29.5 percent. However, to calculate ammonia emissions for modeling purposes, USEPA's data for aqueous ammonia with a 30 percent concentration was used since 29.5 percent concentration data were not available. This is a slightly more conservative assumption. Appendix D provides a more detailed discussion of the modeling approach and shows the results of the RMPComp model and the Screen3 model. For all toxic releases, the surrounding terrain was assumed to be "rural." This reduces the dispersion of the modeled compound with distance and is a more conservative assumption than assuming "urban" dispersion.

The upset scenarios modeled for the project are detailed below. The following accident scenarios were considered in the analysis of offsite impacts. The results of the model runs are summarized in Table 4-7-2. Figure 4.7-1 shows the impact range for cases evaluated for the HGS site[14]. Figures 4.7-2 and 4.7-3 show similar impacts for the SGS and VGS sites[15], respectively.

[14] For the tanker truck spill scenarios, it is assumed that the spills occur at the location of the storage tank.
[15] Id.

Table 4.7-2
Distance in Meters to Endpoint from Center of Upset

Case	Event	Natural Gas Explosion	Ammonia Release
1	Ruptured Ammonia Pipeline (60 minute release) Unconfined at HGS	NA	200 (default minimum)
2	Ammonia Truck Spill Unconfined (5,000 gallons) at HGS	NA	2,300
3	Bad Connect/Disconnect Unconfined (200 gallons) at HGS	NA	500
4	Ruptured Pipeline Natural Gas at HGS (10 Minute Cloud Plus Explosion)	600	600
5	Aqueous Ammonia Tank Failure to Diked Containment (30,000 gallons) at SGS	NA	600
6	Ammonia Truck Spill Unconfined (5,000 gallons) at SGS	NA	2,300
7	Bad Connect/Disconnect Unconfined (200 gallons) at SGS	NA	500
8	Aqueous Ammonia Tank Failure to Diked Containment (20,000 gallons) at VGS	NA	500
9	Ammonia Truck Spill Unconfined (5,000 gallons) at VGS	NA	2,300
10	Bad Connect/Disconnect Unconfined (200 gallons) at VGS	NA	500
11	Ruptured Pipeline Natural Gas at VGS (10 Minute Cloud Plus Explosion)	NA	300
12	Alternate – Aqueous Ammonia Tank Failure to Diked Containment (20,000 gallons) at HGS	NA	500

- Case 1: is concerned with the potential toxic impact associated with a new ammonia pipeline at the HGS site. The pipeline will be used to convey 29.5 percent aqueous ammonia from existing ammonia storage tanks to the location of five new CTs and their associated SCR systems. The flow rate of the pipeline is low (28 gallons per hour). The assumption was made that the pipe was ruptured in a digging accident or earthquake and allowed to spread ammonia on the surface for an hour before shutdown. The 28 gallons spread in all directions in an unconfined manner to a depth of one centimeter on an impervious surface (USEPA worst-case assumptions). The distance to the 200-ppm endpoint was calculated to be 200 meters.

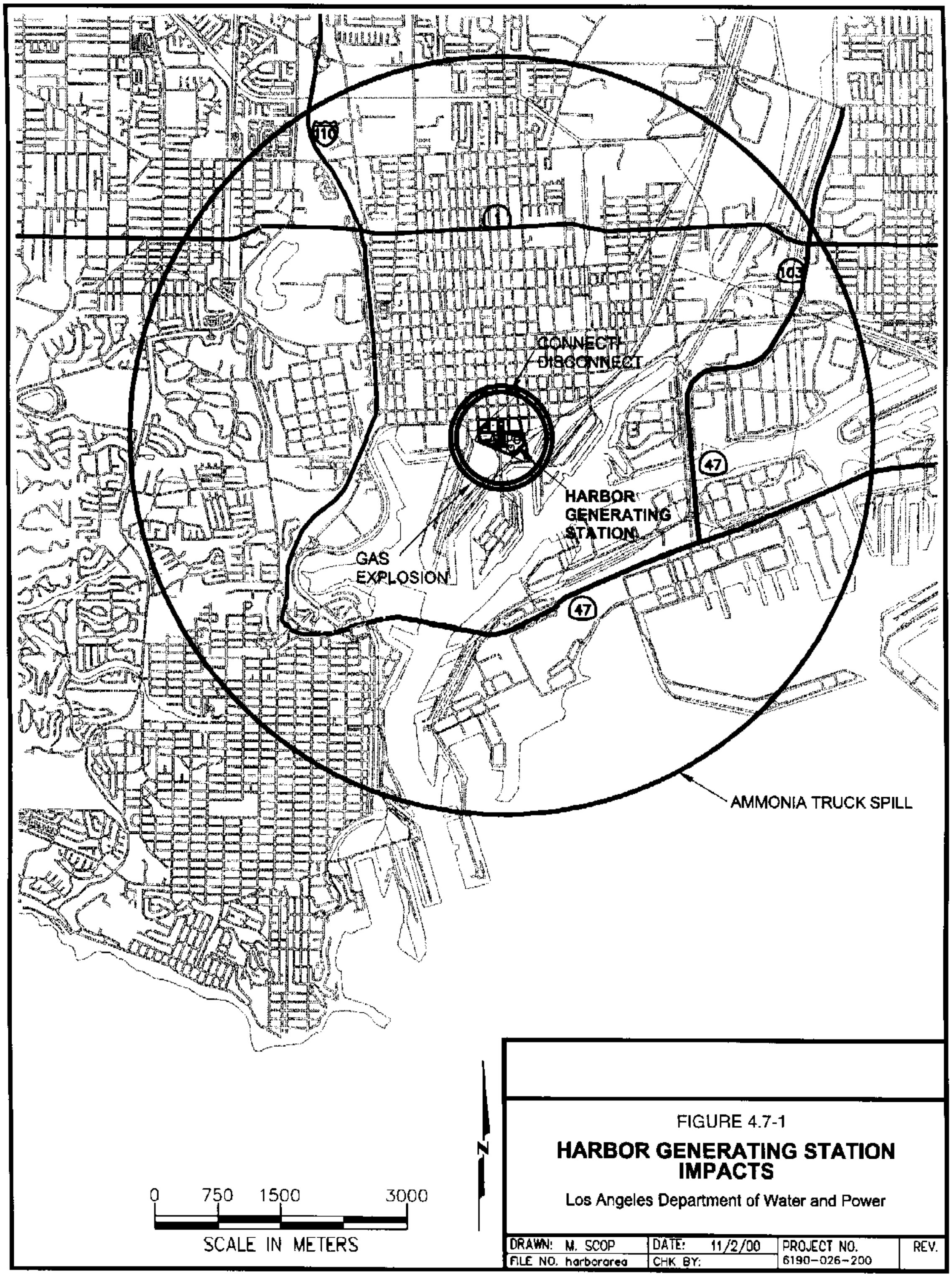

FIGURE 4.7-1
HARBOR GENERATING STATION IMPACTS
Los Angeles Department of Water and Power

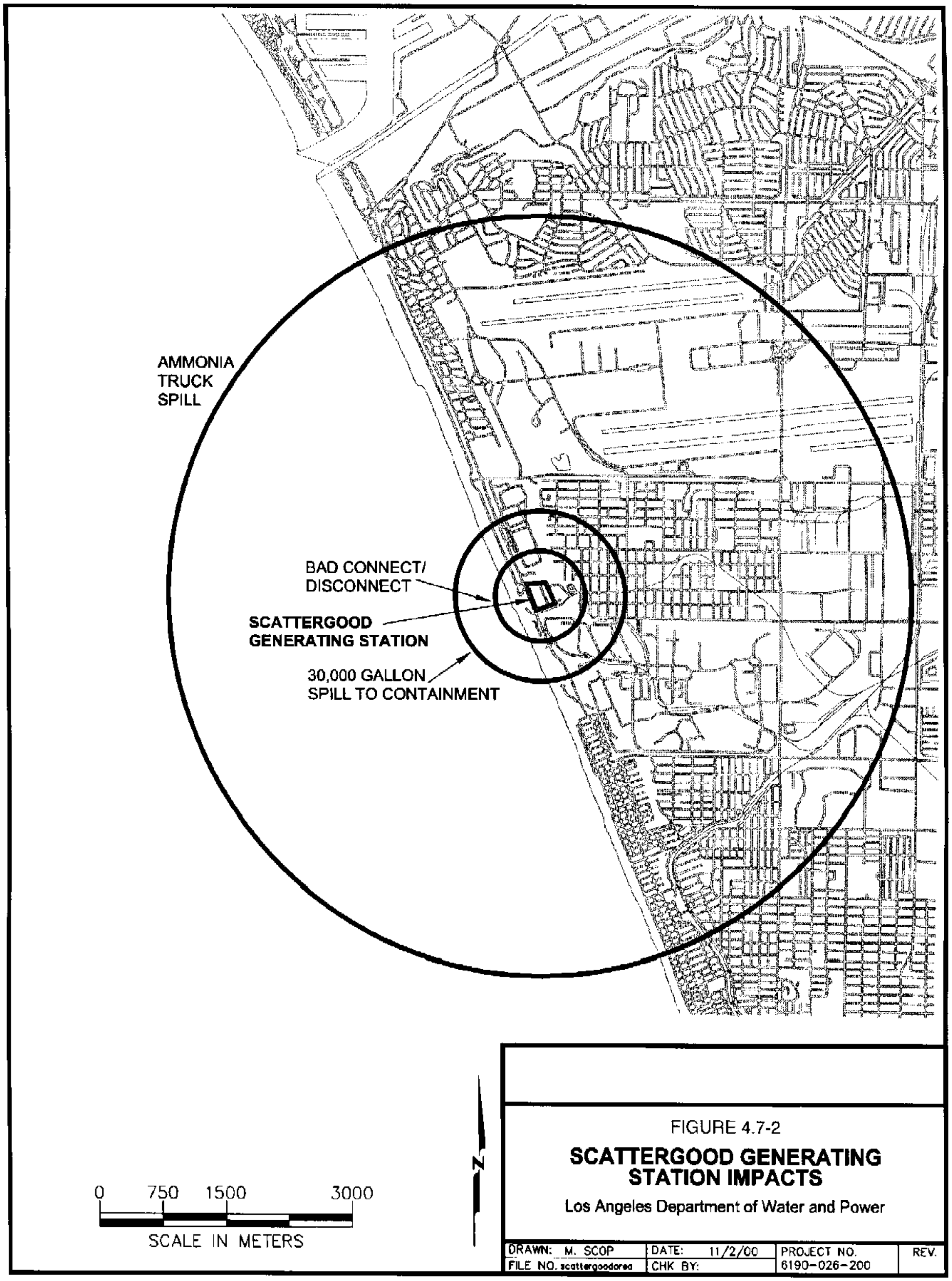

FIGURE 4.7-2
SCATTERGOOD GENERATING STATION IMPACTS

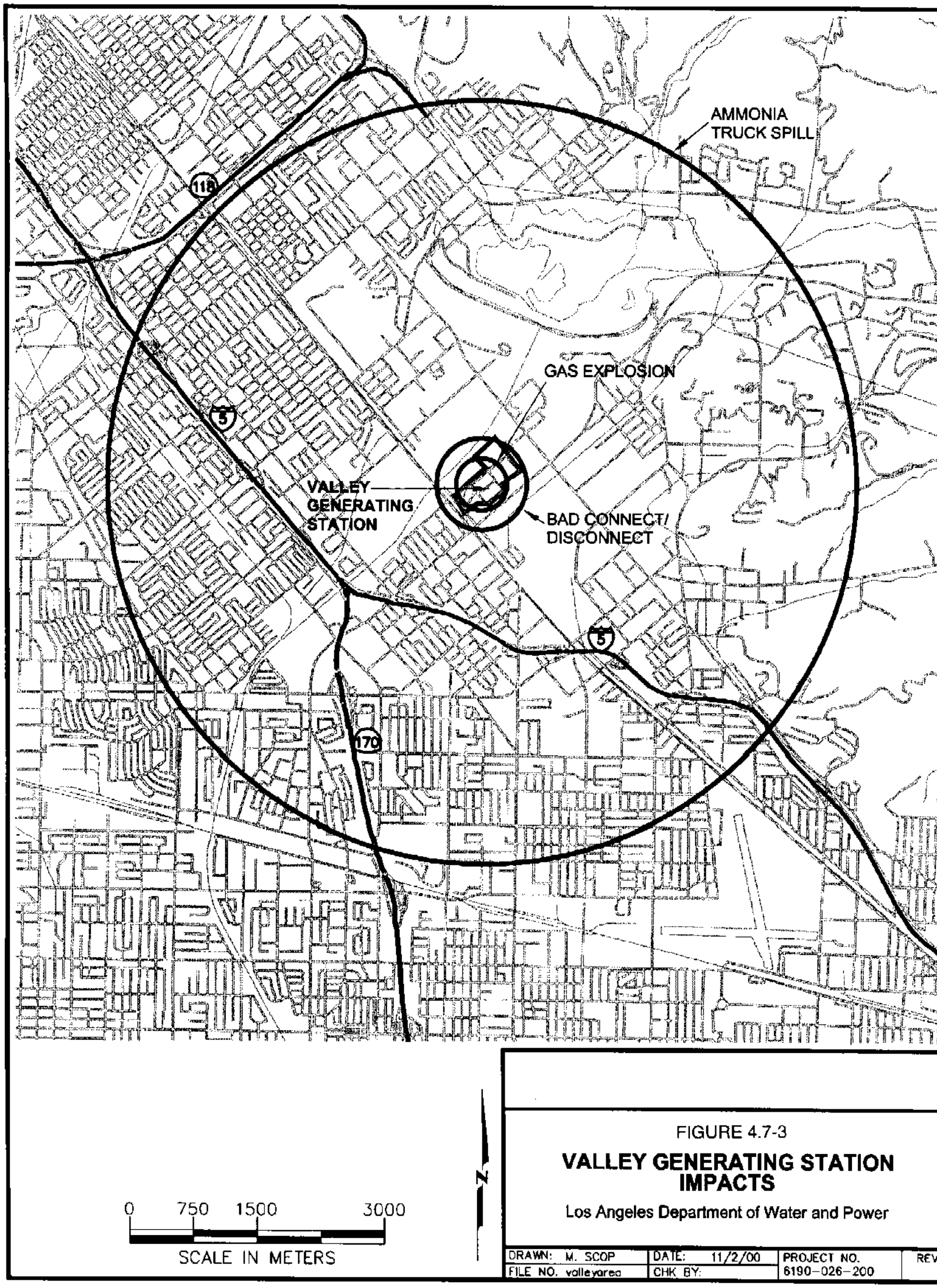

FIGURE 4.7-3

VALLEY GENERATING STATION IMPACTS

Los Angeles Department of Water and Power

DRAWN: M. SCOP	DATE: 11/2/00	PROJECT NO. 6190-026-200	REV.
FILE NO. valleyarea	CHK BY:		

- Case 2: estimates for the HGS site the impact of the unconfined release of 5,000 gallons of aqueous ammonia in a tanker truck accident in an open area (minimum dispersion with distance). The 5,000 gallons spreads in all directions in an unconfined manner to a depth of one centimeter on an impervious surface (USEPA worst-case assumptions). Based on these extremely conservative assumptions, the toxic impact distance from the spill was estimated to be 2,300 meters. The HGS site already has ammonia truck deliveries. The impact distance of a spill due to this project is comparable to the current impact distances. The expected accident frequency will increase because there is one extra ammonia delivery per week. However, the truck accident rate is approximately one per 8.7 million miles traveled and a major release in an accident is about one in forty. One additional delivery per week of about 21 miles estimated distance would not introduce a significant incremental risk over the current situation. The frequency would change from about one per 300,000 years for a major 5,000-gallon release to one per 150,000 years.
- Case 3: estimates the impact of a partial spill of aqueous ammonia due to a bad hose connection or hose rupture during loading or unloading from a tanker truck to an existing storage tank at the HGS site. Approximately 200 gallons was assumed to be released in an unconfined manner and then to disperse in all directions. The impact distance was calculated to be approximately 500 meters. The HGS site already has ammonia truck deliveries. The impact distance of a spill due to this project is comparable to the current impact distances. The expected small accident frequency will increase from about one per 20 years to one per ten years because there is one extra delivery per week. For a major accident, which releases 200 gallons from a bad hook-up, the expected frequency would change from about one per 800 years to one per 400 years. One additional delivery per week would not introduce a significant incremental risk over the current situation.
- Case 4: assumes that the new natural gas connector pipeline installed at HGS from the main gas line to the five new CTs is ruptured and releases a cloud of gas for ten minutes which then explodes. The impact was estimated with RMPComp to extend for 600 meters in any direction surrounding the breach. This scenario considers the impact due to increased natural gas usage at HGS. The odds of a short pipeline failure with a major release are about one per 1000 years (related to major earthquake frequencies and major failures).
- Case 5: calculated the toxic impact at the SGS site from the spill of 30,000 gallons of 30 percent aqueous ammonia into a containment dike sized to hold the tank contents plus an additional 20 percent. Table 4.7-2 shows that with aqueous ammonia, the size of the impact zone for a confined release is about 600 meters until the 200-ppm endpoint is reached. For the SGS site, the installation of three 30,000-gallon

aqueous ammonia tanks is proposed. The new tanks will be located within a dike. The most likely failure would be caused by an external event such as an earthquake.

- Case 6: estimates for the SGS site the impact of the unconfined release of 5,000 gallons of aqueous ammonia in a tanker truck accident in an open area (minimum dispersion with distance). The 5,000 gallons spreads in all directions in an unconfined manner to a depth of one centimeter on an impervious surface (USEPA worst-case assumptions). Based on these extremely conservative assumptions, the toxic impact distance from the spill was estimated to be 2,300 meters. The expected accident frequency will be based on one ammonia delivery per week. The truck accident rate is approximately one per 8.7 million miles traveled and a major release in an accident is about one in 40. One delivery per week of about 30 miles distance would not introduce a significant risk. Expected frequency of release is about one per 100,000 years
- Case 7: estimates the impact of a partial spill of aqueous ammonia due to a bad hose connection or hose rupture during loading or unloading from a tank truck to the storage tank at the SGS site. About 200 gallons was assumed to be released in an unconfined manner and then to disperse. The impact distance was calculated to be approximately 500 meters. The expected accident frequency will be based on two connects and disconnects per week. A minor spill can be expected about once per ten years and a larger (200-gallon spill) about once per 100 years.
- Case 8: calculated the toxic impact from the spill of 20,000 gallons of 29.5 percent aqueous ammonia into a containment dike sized to hold the tank contents plus an additional 20 percent at the VGS site. Table 4.7-2 shows that with aqueous ammonia, the size of the impact zone for a confined release is about 500meters until the 200-ppm endpoint is reached. For the VGS site, one 20,000-gallon aqueous ammonia tank will be added. The most likely failure would be caused by an external event such as an earthquake. The expected frequency is about one per 1,000 years as shown in Table 4.7-1).
- Case 9: estimates for the VGS site the impact of the unconfined release of 5,000 gallons of aqueous ammonia in a tanker truck accident in an open area (minimum dispersion with distance). The 5,000 gallons spreads in all directions in an unconfined manner to a depth of one centimeter on an impervious surface (USEPA worst-case assumptions). Based on these extremely conservative assumptions and using the endpoint, the toxic impact distance from the spill was estimated to be 2,300 meters. The expected accident frequency will be based on one delivery per month. The truck accident rate is approximately one per 8.7 million miles traveled and a major release in an accident is about one in 40. One delivery per month of about 36

miles distance would not introduce a significant risk. The expected frequency of a release is about one per 800,000 years.

- Case 10: estimates the impact of a partial spill of aqueous ammonia due to a bad hose connection or hose rupture during loading or unloading from a tanker truck to the new storage tank at the VGS site. About 200 gallons were assumed to be released in an unconfined manner in all directions and then to disperse. The impact distance was calculated to be approximately 500 meters. The expected accident frequency is based on one connect and disconnect per month. A minor spill can be expected about once per 80 years and a larger (200-gallon spill) about once per 800 years.
- Case 11: assumes that a new natural gas pipeline at VGS from the main line to one new unit is ruptured and releases a cloud of gas for 10 minutes which then explodes. The impact was estimated to extend for 300 meters in any direction surrounding the breach. This scenario considers the impact due to new natural gas at VGS. The odds of failure with a major release for pipelines a few 100 meters in length are about one per 1,000 years (related to major earthquake frequencies and major failures).
- Case 12: estimates the alternative of installing a new 20,000-gallon ammonia storage tank at the HGS Site. The impacts would be the same as those estimated for the VGS ammonia tank release scenarios.

It should be noted that the upsets that were modeled are not likely to occur and were very conservatively based on USEPA RMP worst-case case assumptions. However, the SCAQMD does not consider the likelihood of an incident when determining significance. Only the consequences are considered. In the unlikely event that an upset would occur close to the release at all three project sites, the truck accident has the highest potential impact and is considered significant for this hazards analysis. The consequences also do not take credit for mitigation measures that LADWP has in place or will have in place when the project is completed. Mitigation measures are discussed in Subsection 4.7.10 below.

4.7.9 Potential Risks from Transportation Accidents

The potential for increased risk due to transportation accidents associated with the project was evaluated for truck traffic, which is discussed in Section 4.11. It is anticipated that there will be an increase in truck traffic due to this project for transport of aqueous ammonia from the supplier to each facility.

The entire project will require the use of approximately 168 tanker truck deliveries of aqueous ammonia per year. The average distance traveled by ammonia trucks per year was estimated from all trip is approximately 4,250 miles per year. The estimated annual accidental release rate for all truck delivery (assuming 4,250 miles per year) is one major release per 80,000 years.

Therefore, the likelihood of a major release would be considered to be remote, as 320,439,000 miles per day are driven by vehicles in the Basin (CARB, Daily Emissions, MVE176G Model, 1998).

The pipeline accident rate was estimated to vary from once per 1,000 years for major failures to once per 10,000 years for major failures with explosions. Both of these likelihoods would be considered improbable (see Table 4.7-1).

4.7.10 Preparation Program and Mitigation Measures

The potential incremental increase in risk that will result from the proposed project does not substantially change the expected risk from LADWP's current operations or other industries located in densely populated urban areas. This determination is based on the low probability of the occurrence of a catastrophic event, the very conservative assumptions used to estimate the worst-case hazards scenarios, the implementation of LADWP inspection programs, the use of safety systems, and mitigation measures to reduce risks. However, the potential does exist to exceed the USEPA risk management exposure endpoints offsite when aqueous ammonia is stored, transported, and used in association with project activities. Therefore, the proposed project may result in significant hazards impacts.

The primary area that creates the largest increase of risk from the proposed project is related to the new aqueous ammonia storage and new ammonia deliveries. The following mitigation measures will be implemented to further reduce the risks associated with the proposed project.

HH-1 As part of the proposed project, LADWP will be required to update its Risk Management Plan. The Risk Management Plan requirements are covered under California Health and Safety Code §25534 and 40 CFR Part 68, §112(r).

HH-2 As part of risk management and the California Accidental Release Program, a hazards plan to prevent or minimize the consequences of a release involving a toxic and explosive chemicals. The primary components of the hazards review for proposed project include the following:

- Compilation of written process safety information to enable LADWP and their employees operating the processes involving toxic and explosive chemicals to identify and understand the hazards posed by the process.
- Performance of a process safety analysis to determine and evaluate the hazards of the processes using toxic and explosive chemicals.
- Development of operating procedures that provide clear instructions on how to safely operate the processed using toxic and explosive chemicals identified in the hazards analysis.
- Training in the overview of the processes and in the operating procedures of processes using toxic and explosive chemicals for both LADWP personnel and

contractors. The training will also emphasize the specific safety and health hazards, procedures, and safe practices.

- A pre-start up safety review for new facilities and for modified facilities where a change is made in the process safety information.

HH-3 LADWP will perform a pre-start up safety review for those additions and modifications proposed under the project where the change is significant enough to require a change in the safety information and/or where an acutely hazardous and/or flammable material would be used. The review will be performed by LADWP personnel with expertise in process operations and engineering. The review will verify the following:

- Construction, equipment installations, and equipment modifications are in accordance with design specifications and applicable codes.
- Safety, operating, maintenance, and emergency procedures are in place and are adequate to address various risk of upset scenarios.
- Process hazard analysis recommendations as identified from the review discussed above have been addressed and actions necessary for start-up have been completed.
- Training of each LADWP operating employee and maintenance worker has been completed.

HH-4 Manual shutdown of liquid into or out of the tank, which will minimize the quantity of an ammonia release.

HH-5 Containment dikes with 20 percent over capacity for all tanks

HH-6 Ammonia detectors

Although the above mentioned mitigation measures will significantly reduce the likelihood of significant impacts, the proposed project will still present the potential for significant hazards impacts because the SCAQMD's significance determination for hazards is based on consequence only.

4.8 Hydrology/Water Quality (Water Resources)

Water is an essential resource in southern California. Due to low average annual rainfall in the region, over half of the water supply in the Basin is imported, making water supply and water quality important issues. Water resources can be affected by either increased water use or disposal, or degradation of water quality. Each of these potential impacts is considered below.

Water quality and supply impacts will be considered significant if any of the following conditions are met:

- The project will cause degradation or depletion of ground water resources and surface water substantially affecting current or future uses.

- The project will result in a violation of NPDES permit requirements.
- The project creates a substantial increase in mass inflow to public wastewater treatment facilities.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use a substantial amount of potable water (i.e., greater than five million gallons per day).
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.

4.8.1 Water Supply Effects

4.8.1.1 Construction Impacts

Potential hydrology and water supply impacts caused by construction-related activities at the project sites are expected to be minimal. For example, small quantities of water may be required during the construction phase (e.g., excavation, grading, trenching, stock piling, etc.) for dust control. Watering for dust control purposes would be required pursuant to SCAQMD Rule 403 and/or local government permitting requirements (Brenk, 1993).

It is estimated as a worst-case that approximately 137,500 square yards of soil would be disturbed in any one day. As most of the grading activities will take place at the HGS, the HGS was used as worst-case and it was assumed that all grading activities would take place on one day. Using the assumption that it takes 0.2 gallons per square yard per hour for adequate dust suppression, the worst-case water demand can be estimated by the following equation, (USEPA, 1992).

$$\text{Daily Water Usage} = 0.2\ (\text{gal/yd}^2\text{-hr}) \times 137{,}500\text{yd}^2 \times 16\ \text{hrs/day} = 440{,}000\ \text{gal/site-day}$$

Thus, on a worst-case basis, dust suppression activities would require 440,000 gallons of water per day per site. Accordingly, water supply impacts from the proposed project are not significant since the total daily estimated construction-related water demand does not exceed the SCAQMD's significance criteria of 5,000,000 gallons per day. Therefore, the water use will be minor and will cease following the construction phase.

4.8.1.2 Operational Impacts

The LADWP provides the raw water supply to each of the three project sites. Over the past several years, the LADWP has seen a reduction in water demand, and expects demand to drop further. This reduction is the result of more efficient use of water through replacement of water-inefficient processes, and increased use of reclaimed water. To date, two water recycling projects have been completed by the LADWP and provide an estimated 3,000 acre-feet of water per year to the Basin.

Harbor Generating Station

The HGS site currently uses water from two sources: treated municipal (raw) water and seawater obtained form the Los Angeles Harbor. However, activities at this project site associated with the proposed project are expected to increase the raw water demand. Seawater use will not be impacted by the proposed project as the water needed cooling tower operations will be provided by the municipal water system.

The current raw water use at the HGS site is approximately 429,550 gallons per day. Approximately 432,000 gallons per day of additional municipal water will be required for the project, specifically for the five CTs water injection systems, SCR units and cooling tower operations. This additional water will be provided by LADWP, although reclaimed water will be used when the reclaimed water pipeline to the Harbor is completed. Connections to the water mains and backflow prevention devices will not change as a result of the proposed project.

As LADWP is capable of providing the additional raw water supply and this incremental water demand does not exceed the SCAQMD's significance threshold of 5,000,000 gallons per day, the water supply impacts are not considered significant at the HGS site.

Scattergood Generating Station

The SGS site currently uses water from two sources: treated municipal (raw) water and sea water obtained form the Santa Monica Bay. However, activities at this project site associated with the proposed project are expected to increase the municipal water demand. The sea water use will not be impacted as a result of the proposed project as the water needed cooling tower operations will be provided by the municipal water system.

The current raw water use at the SGS is approximately 617,000 gallons per day. Approximately 57,600 gallons per day of additional raw water will be required for the project site, specifically for the three SCR systems and digester gas scrubber system. This additional water will be provided by the LADWP. Connections to the water mains and backflow prevention devices will not change as a result of the proposed project.

As LADWP is capable of providing the additional raw water supply and this incremental water demand does not exceed the SCAQMD's significance threshold of 5,000,000 gallons per day, the water quality impacts are not considered significant at the SGS site.

Valley Generating Station

The LADWP provides the water used at the VGS site. Approximately 86,400 gallons per day of municipal (raw) water will be required for the project site, specifically for the new cooling tower and SCR system. However, as the proposed project includes the decommissioning of four existing cooling towers, raw water demand will decrease. Connections to the water mains and backflow prevention devices will not change as a result of the proposed project.

As LADWP is capable of providing the additional raw water supply and this incremental water demand does not exceed the SCAQMD's significance threshold of 5,000,000 gallons per day, the water supply impacts are not considered significant at the VGS site.

The cumulative increase in water demand for all three project sites is estimated to be 576,000 gallons per day. As LADWP is capable of providing the additional raw water supply for all three project sites and this incremental water demand does not exceed the SCAQMD's significance threshold of 5,000,000 gallons per day, the water supply impacts are not considered significant.

4.8.2 Water Quality Effects

4.8.2.1 Construction Impacts

Generally for all three project sites, wastewater created from the pressure-testing of vessels and pipelines to ensure integrity may include minor amounts of oil, scale, and rust. Wastewater resulting from this hydrotesting process will be routed to the existing process wastewater treatment systems and recycled, or discharged after treatment along with the process wastewater.

Grading during construction is not expected to disrupt soils at depths sufficient to require dewatering. However, if dewatering is required, the wastewater will be treated, if necessary, and discharged under a general NPDES permit for construction dewatering. These construction activities would not affect ground water resources in the project area. Wastewater generated from these construction activities will be minimal (approximately 2,710 gallons/day); therefore, no significant impacts are anticipated.

Sanitary wastes at staging areas, such as construction parking areas, will be collected in portable chemical toilets. These wastes will be removed by a private contractor and disposed of offsite. Construction workers will be required to use portable sanitary facilities maintained by the contractor. Effluents from those facilities are discharged to the municipal sewer. Sanitary wastes will be minimal (less than 200 gallons per day) and would not create a significant impact to existing sanitary sewer systems.

Harbor Generating Station

The proposed construction area at the HGS site encompasses approximately eight acres onsite and four acres offsite. The offsite areas include equipment laydown areas and contractor parking (see Figure 2.1-5). A NPDES General Permit for Stormwater Discharges Associated with Construction Activity (Stormwater Construction Permit) will be obtained prior to commencing ground-disturbing activities. A Stormwater Pollution Prevention Plan for construction activities that includes best management practices (BMPs) addressing sediment control and other construction-related pollutants will be developed and implemented. Appropriate selection and implementation of the BMPs, including sediment and erosion control, and would reduce potential water quality impacts to a level of insignificance.

Scattergood Generating Station

The proposed construction area at the SGS site encompasses approximately 2,500 square feet. Based upon the area disturbed, no Stormwater Construction Permit will be required. Nevertheless, BMPs will be implemented for sediment and erosion control to minimize potential impacts. Rainfall runoff from the construction areas will be collected in existing stormwater and wastewater systems. As discharges are expected to be approximately the same as current discharges, no significant impacts are expected from the stormwater discharges during construction at SGS.

<u>Valley Generating Station</u>

The proposed construction area at the VGS site encompasses approximately ten acres. A Stormwater Construction Permit will be obtained. A Stormwater Pollution Prevention Plan for construction activities that includes BMPs will be developed and implemented. Rainfall runoff from the construction areas will be collected in existing stormwater and wastewater systems. As discharges are expected to be approximately the same as current discharges, no significant impacts are expected from the stormwater discharges during construction at VGS.

4.8.3 Operational Impacts

4.8.3.1 Process Wastewater Discharges

This subsection will discuss impacts on water resources due to changes in wastewater discharges associated with the proposed project.

<u>Harbor Generating Station</u>

The HGS site currently discharges wastewater to the municipal sanitary sewer system and to the West Basin of the Los Angeles Harbor. Additional wastewater will be discharged to the sanitary sewer system as a result of the proposed project. However, there will be no change in the design or discharge from the once-through cooling system that discharges to the Harbor.

Currently, approximately 3,150 gallons per day of wastewater are discharged to the municipal sanitary sewer system. As a result of the activities associated with the proposed project, minimal additional wastewater will be discharged to the municipal sewer. The additional wastewater will consist primarily of occasional blowdown from the cooling towers and residual water from the SCR systems (most of the water will be vaporized).

<u>Scattergood Generating Station</u>

The SGS site currently discharges industrial wastewater to the Santa Monica Bay. Minimal additional wastewater will be generated, as most of the water used by the SCR system will be vaporized. Therefore, there will be no change in the design or discharge from the once-through cooling system that discharges to the Bay.

<u>Valley Generating Station</u>

The VGS site currently operates on an intermittent basis, when there is high demand for electricity during the months of July to October. When operating, approximately 30,860 gallons per day of wastewater is discharged to the municipal sanitary sewer system. As a result of the activities at the HGS site associated with the proposed project, only minimal quantities of additional wastewater will be discharged. The additional wastewater will consist primarily of non-contact cooling water and residual water from the SCR system.

Due to the fact that minimal wastewater will be generated from the three project sites as a result of the proposed project, no significant impacts from wastewater discharge are expected to occur.

4.8.3.2 Stormwater Quality

Stormwater runoff from the three project sites will not be adversely affected as a result of the proposed project. Each project site has an existing Stormwater Pollution Prevention Plan (SWPPP) in place and any stormwater discharges at the projects sites due to the proposed project will be in compliance with these existing permit conditions. The existing SWPPPs will be updated to reflect the operational modifications to each station and include additional BMPs, if required. Accordingly, since stormwater discharge of or runoff to local stormwater systems is not expected to change significantly in either volume or water quality, no significant stormwater quality impacts are expected to result from the operation of the proposed project.

Though the probability of an ammonia release during transport is extremely small, in the unlikely event that aqueous ammonia enters a storm drain system, it is anticipated that the solution would be further diluted and broken down into nitrogen and water prior to reaching the storm drain outfall. In the event that a release of hazardous materials enters a storm drain, the standard practice is to contact a response contractor who specializes in containment of such releases. The contractor would then neutralize/collect the released ammonia and dispose of it properly. Therefore, no significant impacts to stormwater quality from ammonia transport are expected.

LADWP proposes to store aqueous ammonia in aboveground storage tanks at the SGS and VGS sites. The new tanks at SGS and VGS will be constructed under a roof with partial sidewalls and within secondary containment. The tanks will be periodically refilled from tanker trucks. An accidental release of aqueous ammonia may occur during the delivery or storage of ammonia. However, the spilled material would be contained in the containment area designed to hold the entire contents of the tank plus 20 percent. Therefore, significant stormwater quality impacts are not expected from the release of ammonia at the SGS and VGS sites.

4.8.3.3 Groundwater Quality

In the context of the proposed project, accidental spills of aqueous ammonia could occur from operational activities such as the operation of the SCR system, piping transferring ammonia from storage tanks to vaporizers, tanker truck unloading operations, or during tanker truck transport. Potential water quality impacts would occur if the ammonia were washed into the storm drains, or if the ammonia percolated into the soil. As part of the proposed project, ammonia vapor detectors will be installed in the vicinity of the SCR system. Thus, any leak from the SCR systems or tanks would be quickly detected. In response to an ammonia vapor alarm, the operators would shut down the ammonia feed supply, thus minimizing the quantity of ammonia spilled.

The aboveground storage tanks at the SGS and VGS sites will be installed to comply with the ammonia design, construction, and monitoring standards. Measures that will be in place to prevent and minimize the groundwater quality impacts from accidental ammonia spills include:

- Ammonia vapor detectors in the vicinity of the SCR systems and storage tanks;
- Secondary containment designed to hold the entire contents of a storage tank plus 20 percent; and
- Formal spill response procedures, such as training requirements and spill containment kits.

In the very unlikely event that a leak from an ammonia storage tank does occur and aqueous ammonia is released to the soil, it is possible that the groundwater would be impacted if ammonia were released in sufficiently large quantity. In such a situation, vegetation in the vicinity of the leak would first absorb some of the ammonia, as the ammonia would serve as a nutrient. Excessive ammonia would then be oxidized by autotrophic nitrifying bacteria to form nitrites, which in turn would be oxidized to form nitrates (Sawyer and McCarty, 1978). The nitrates would disperse very rapidly, as they are water-soluble. Therefore, long-term impacts to groundwater resources are considered insignificant.

4.8.4 Mitigation Measures

No significant adverse impacts to water quality and supply are expected as a result of the activities at the project sites associated with the proposed project. The existing water supply and disposal systems are adequate to meet the demand of the project. No changes to water quality or discharge permits are expected to be required. Stormwater will be controlled, and neither surface water nor groundwater resources will be adversely affected. Therefore, no specific mitigation measures are required. LADWP will continue to use water conservation measures to reduce the use of fresh water and increase the reuse of wastewater. The measures may include reuse and the use of reclaimed water. LADWP will also update and modify the SWPPPs and Monitoring Plan, NPDES permits, and industrial wastewater permits, as necessary, prior to project startup.

4.9 Noise Resources

Noise impacts will be considered significant if any of the following conditions are met:

- The project increases the ambient noise levels at the nearest receptors above the “normally acceptable” CNEL or maximum allowable noise level based on the land use classification

- The project increases the ambient noise levels more than three dBA at the nearest sensitive receptors
- The project results in exceedance of noise standards of the local jurisdictions.
- The noise levels exceed the standards designed to address issues related to worker safety.

Table 4.9-1 presents the guidelines for noise compatible land use from the noise element of the general plan of the City of Los Angeles.

Table 4.9-1
Guidelines for Noise Compatible Land Use

Land Use Category	**Day-Night Average Exterior Sound Level (CNEL dB)**						
	50	55	60	65	70	75	80
Residential single-family, duplex, mobile home	A	A	C	C	N	U	U
Residential multifamily	A	A	C	C	N	U	U
Transient lodging, motel, hotel	A	A	C	C	N	U	U
School, library, church, hospital, nursing home	A	A	C	C	N	N	U
Auditorium, concert hall, amphitheater	C	C	C	C/N	U	U	U
Sports arena, outdoor spectator sports	C	C	C	C	C/U	U	U
Playground, neighborhood park	A	A	A	A/N	N	N/U	U
Golf course, riding stable, water recreation, cemetery	A	A	A	A	N	A/N	U
Office building, business, commercial, professional	A	A	A	A/C	C	C/N	N
Agriculture, industrial, manufacturing, utilities	A	A	A	A	A/C	C/N	N

A = Normally acceptable. Specified land use is satisfactory, based upon assumption buildings involved are conventional construction, without any special noise insulation.

C = Conditionally acceptable. New construction or development only after a detailed analysis of noise mitigation is made and needed noise insulation features are included in project design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning normally will suffice.

N = Normally unacceptable. New construction or development generally should be discouraged. A detailed analysis of noise reduction requirements must be made and noise insulation features included in the design of a project.

U = Clearly unacceptable. New construction or development generally should not be undertaken.

Based on the Governor's Office of Planning and Research, "General Plan Guidelines," 1990. To help guide determination of appropriate land use and mitigation measures vis-à-vis or anticipated ambient noise levels).

Source: Noise element of the General Plan of the City of Los Angeles

4.9.1 Construction Impacts

Sources expected to generate noise during the construction phase could include earth-moving equipment (backhoes, excavators, etc.), concrete trucks, cranes, welding operations, construction support vehicles, construction work crew vehicular traffic, and material truck delivery trips to the project site. Table 4.9-2 presents ranges of noise level for various types of construction-related machinery that could potentially be used during the construction phase at the three project sites. Because of the nature of this activity, the types, numbers, periods of operation, and loudness of equipment will vary throughout the construction phase.

Table 4.9-2
Typical Site Construction Equipment Noise Levels (dBA)

Equipment Type	Equipment Sound Pressure Level (dBA)			
	@ 50 feet	@ 300 feet	@ 500 feet	@ 1,400 feet
Cherry-picker	85	69	65	52
Backhoe	85	69	65	52
Forklift	80	64	60	47
Crane, 80-ton hydraulic	85	69	65	52
Welder	76	60	56	43
Air Compressor	81	65	61	48
Service Truck	77	62	57	44
Pick-up Truck	65	49	45	32
Sources: Beranek & Ver, 1977, Edison Electric Institute, 1978; Irwin & Graf, Prentice Hall, 1979.				

Construction at the project sites is scheduled to begin early in 2001 and be completed in summer 2001 at HGS and VGS and summer 2002 at SGS. Construction activities are planned to occur in either two 10-hour shifts per day or on a 24-hour basis throughout the period of construction. Allowing for startup, some downtime, and breaks, the analysis assumes that equipment would be operating and potentially generating noise approximately 16 hours per day. During construction of this project, the HGS, SGS, and VGS sites will continue their normal power generating operations. For the purpose of this evaluation, it is assumed that current sources of noise within each facility will continue throughout the construction period. Noise from local street traffic and nearby industrial land uses will also continue during the construction phase of the proposed project.

Approximately 350 truck trips (250 to HGS, 50 to SGS, and 50 to VGS) for delivery of construction materials and hauling debris offsite will be required during the period of construction. In addition, daily construction worker vehicle trips throughout the construction period will occur. The expected number of truck deliveries and worker trips over the period of construction will not contribute significantly to the overall noise levels resulting from existing traffic on local roads and industrial/commercial uses of the surrounding properties. The amount of trips (delivery trucks and worker trips) to each facility during the temporary construction period is estimated to be small compared to the amount of vehicles operating on roadways in the vicinity of each facility. As existing vehicular traffic and nearby industrial sources are major contributors to the existing ambient noise environment at each of the facilities, the addition of a comparatively small amount of additional trips, for a limited period of time, would not result in significant increases in the existing noise environment.

Construction noise levels at the nearest noise receptors were estimated from the equipment specified for the particular project site and it was assumed that approximately half of the equipment would be in operation at any one time. This is a conservative assumption because the construction activities consist of three phases. Equipment sound levels were extrapolated to receptor distances using standard free-field hemispheric sound propagation (six dBA of reduction per doubling of distance) using the following calculations:

dBA Reduction = 20 log D/50 for distances < 1,000 feet

and

dBA Reduction = 20 log D/50 + [(D-1000)/1000] for distances >1,000 feet)

where D is the distance from the source to the sensitive receptor.

The results of these estimates are presented in the following subsections as the predicted maximum noise levels due to construction-related activities.

Moderate construction-related noise level increases during daylight hours are generally considered acceptable in surrounding communities. However, night and/or weekend shifts may be required to maintain the construction schedule. Temporary construction activities are exempt from the City of Los Angeles Noise Ordinance between the hours of 7:00 AM and 10:00 PM. Construction activities at SGS, HGS, and VGS are proposed on a 24-hour schedule for seven days per week. According to the City of Los Angeles Municipal Code, construction projects which constitute an emergency or where undue hardship or unreasonable delay would result from the interruption of construction can be exempted with written permission of the Board of Police Commissioners. LADWP would be required to obtain such a permit for nighttime construction activities at all three locations.

4.9.1.1 Harbor Generating Station

At this project site, the proposed project includes the installation of five new 47-MW CTs, each with SCR systems to reduce NO_x emissions. The proposed project also will require the construction of a pipeline to transport the ammonia from an existing onsite tank to the new SCR systems. Onsite project-generated construction noise would be short-term and occur primarily during construction of new buildings to house the CTs and SCR systems and installation of the ammonia pipeline.

Based on a worst-case maximum noise level generated at the source during construction activities, the maximum worst-case noise level expected at the nearest residential receptors located approximately 1,320 feet from the project site is 62 dBA. This noise level is predicted to comply with the normally acceptable residential land use class of 60 to 65 dBA. The maximum worst-case noise level expected at the nearest commercial/industrial receptors to the project site is 71 dBA. This predicted noise level complies with the normally acceptable to "conditionally acceptable" land use class of 65 to 75 dBA for commercial/industrial uses. Table 4.9-2 contains a summary of the estimated noise levels at the sensitive receptors. Due to the short-term nature of the construction-related activities, no long-term increase is predicted in existing ambient noise levels. Since construction noise at the HGS site will be within acceptable limits and will not cause a significant increase in existing sound levels, construction-related activities at the HGS project are predicted to have no significant noise impacts.

4.9.1.2 Scattergood Generating Station

For this project site, the proposed project includes the installation of SCR systems on three existing power generating units. As there is currently no ammonia storage capacity at SGS, the project also includes the installation of three 30,000-gallon aqueous ammonia storage tanks. Onsite project-generated construction noise would be short-term and occur primarily during preparation of foundations for and installation of the ammonia storage tanks and SCR systems.

Based on a worst-case maximum noise level generated at the source during construction-related activities, the maximum worst-case noise levels expected at the recreational beach located approximately 300 feet west of the project and the maximum worst-case noise level expected at the residential receptors located approximately 1,400 feet east of the project are 71 dBA and 58 dBA, respectively. The maximum “worst-case” noise levels expected at the nearest commercial/industrial receptor to the site is 67 dBA. Table 4.9-3 contains a summary of the estimated noise levels at these sensitive receptors.

Table 4.9-3
Estimated Construction Noise Levels

Facility	Nearest Receptors	Distance to Nearest Receptor (feet)	Estimated Maximum Noise Level at Nearest Receptor (dBA)[1]
HGS	Residential	1,320	62
	Commercial/Industrial	500	71
SGS	Residential	1,400	58
	Recreational	300	71
	Commercial/Industrial	500	67
VGS	Residential	2,640	52
	Hospital	1,100	60
	Commercial/Industrial	500	67

[1] Noise levels presented represent worst-case maximum noise levels based on distance attenuation only. No reduction in noise levels were assumed for intervening topography, structures, or elevation differences between noise source and receptor.

This is considered a worst-case analysis as noise attenuation provided by intervening topographic features, structures, and the difference in elevation between the source and receptor was not included in the calculation. Topographic elevation differences, berms, and other structures provide significant additional noise level reduction. In addition, it is unlikely that construction equipment used onsite will be operated on the same schedule at maximum power levels resulting in the maximum noise levels presented above. Based on these assumptions, noise levels as a result of construction at the recreational beach to the west, the residential community to the east, and the nearest commercial/industrial receptor are expected to be much lower than the worst-case estimates of 71 dBA, 58 dBA, and 67 dBA, respectively.

Maximum construction noise at the nearest residential receptor is predicted to be 58 dBA. This predicted noise level complies with the normally acceptable residential land use class of 60 to 65 dBA for residential uses. Predicted noise levels do not exceed the City of El Segundo standard of 60 dBA for residential properties or increase the ambient noise levels at the residential property line by greater than five dBA. Maximum construction noise at the nearest commercial/industrial receptor is predicted to be 67 dBA. This predicted noise level complies with the normally acceptable to conditionally acceptable land use class of 65 to 75 dBA for commercial/industrial uses. Maximum construction noise at the beach recreational area is predicted to be 71 dBA. Although this exceeds noise levels considered normally acceptable for recreational areas, intervening structures and topographic features are predicted to reduce noise levels to within the normally acceptable range of 60 to 65 dBA. As maximum construction noise at the SGS site may exceed acceptable limits at the recreational beach area to the west of SGS, construction-related activities at the SGS project site are predicted to have a potentially significant noise impact.

4.9.1.3 Valley Generating Station

For this project site, the proposed project includes the installation of one new 47-MW CT with a SCR system to reduce NO_X emissions. As there is currently no ammonia stored at the project site, the proposed project also includes the installation of one 20,000-gallon aqueous ammonia storage tank.

Based on a worst-case maximum noise level generated at the source during construction activities, the maximum worst-case noise level expected at the nearest residential receptors located approximately one-half mile from the project site is 52 dBA. This noise level is predicted to comply with the normally acceptable residential land use class of 60 to 65 dBA. The maximum worst-case noise level expected at the receptors (hospital, emergency care clinic, and motels) located along San Fernando Road approximately 1,100 feet southwest of the proposed construction area is 60 dBA. This noise level is predicted to comply with the conditionally acceptable range for hospitals, nursing homes, schools, and libraries of 60 to 65 dBA. The maximum worst-case noise level expected at the nearest commercial/industrial receptors to the project site is 67 dBA. This predicted noise level complies with the normally acceptable to conditionally acceptable land use class of 65 to 75 dBA for commercial/industrial uses. Table 4.9-2 contains a summary of the estimated noise levels at the sensitive receptors. Due to the short-term nature of the construction-related activities, no increase is predicted in existing ambient noise levels due to construction activity. Since construction noise at the VGS site will be within ordinance limits and will not cause a significant increase in existing sound levels, construction-related activities at the VGS project site are predicted to have no significant noise impacts.

4.9.2 Operational Impacts

Stationary noise sources for the project include, five new CTs with SCR systems at HGS, the three new SCR systems at SGS and one new CT with a SCR system at VGS.

4.9.2.1 Harbor Generating Station

The modifications at the HGS site include the installation of five CTs and SCR systems on each. The CTs are expected to be similar in design and operational characteristics to the General Electric's LM6000 gas turbine generator set.

Each CT will include a weatherproof, acoustic (e.g., sound dampening) enclosure with separate compartments for turbine and generator. Each compartment will be ventilated with redundant fans. The enclosure, turbine, generator, piping wiring, controls, fans, motors, and pumps are packaged at the factory and the unit is delivered to the site.

According to the S&S Energy Products Product Specification Manual for the General Electric LM6000 gas turbine generator set, near field noise expected from the LM6000 equipped with the S&S Energy Products enclosure and air inlet silencer package is predicted to be 90 dBA at three feet from the enclosure. Far field noise levels will be determined by the design of the customer furnished heat recovery system or exhaust silencer. Steady state noise levels emanating from one standard LM6000 gas turbine generator package will be approximately 59 dBA at a reference distance of 400 feet. LADWP has specified that each CT generates noise levels no greater than 85 dBA at a reference distance of three feet from each unit. The five CTs and SCR units will be contained within a manufacturer-supplied weatherproof, acoustic enclosure, and LADWP will install noise suppression equipment (barriers, enclosures, silencers) on any exterior equipment (air inlets and exhaust stacks) related to the CTs.

Based on LADWP specifications, one CT unit equipped with an enclosure and air inlet silencer will generate no greater than 85 dBA at a reference distance of three feet. Five CT units operating at maximum capacity would generate a maximum noise level of 92 dBA at three feet from the source. Based on the manufacturer's specifications, the operation of five CTs would result in a noise level of 66 dBA at a distance of 400 feet from the units. The nearest residential receptors are located approximately 1,320 feet to the north of the site. Maximum “worst-case” noise levels expected at the residential receptors from operation of the five CT units is predicted to be 63 dBA. The nearest commercial/industrial receptors are located a minimum of 500 feet from the proposed location of the CTs and associated equipment. Based on distance, maximum noise levels of 72 dBA are predicted at the industrial/commercial receptors located nearest to the site. The maximum “worst-case” noise level expected at the nearest commercial/industrial receptors to the project site is 72 dBA. This predicted noise level complies with the normally acceptable to conditionally acceptable land use class of 65 to 75 dBA for commercial/industrial uses. After completion of the HGS site upgrade, additional truck traffic (ammonia deliveries) will be negligible (approximately two per week) and is expected to result in no measurable increase in traffic noise. Table 4.9-3 contains a summary of maximum predicted noise levels for HGS project operations.

Based on a “worst-case” maximum noise level generated at the source by operation of the five CTs and associated equipment, the maximum worst-case noise level expected at the nearest residential receptors is 63 dBA. This noise level is predicted to comply with the normally acceptable residential land use class of 60 to 65 dBA. Based on this information, noise levels generated by operation of the five CT units and associated equipment at HGS site will be within acceptable limits and are not expected to result in a significant noise impacts.

4.9.2.2 Scattergood Generating Station

Proposed modifications to the existing operational equipment are not expected to cause noise increases expected to be audible over the existing noise at the SGS site. Stationary noise sources for the project site include three new SCR systems. Ammonia from three aboveground storage tanks will be conveyed under low pressure through piping to the three SCR systems. Blowers will then be used to inject the ammonia into the exhaust stream of the boilers. The three SCR systems and associated blowers are scheduled to be installed within the existing building housing the boilers. Although operation of the SCR systems and associated blowers will result in a small increase in the noise levels within the buildings housing the boilers, these buildings will serve as a noise suppression enclosure, resulting in no perceptible increase of noise levels at the exterior areas of the project site. After completion of the SGS site upgrade, additional truck traffic (ammonia deliveries) will be negligible (approximately one per week) and is expected to result in no measurable increase in traffic noise. Consequently, the proposed project is not considered a significant new noise source when viewed within the context of the existing noise environment at the SGS. Noise levels generated by the SGS modifications will not result in a significant noise impacts.

4.9.2.3 Valley Generating Station

The modifications at VGS site include the installation of one CT and associated SCR system. The CT specified is expected to be similar in design and operational characteristics to the General Electric LM6000 gas turbine generator set described in the HGS section above.

Based on LADWP specifications, the CT unit will be equipped with an enclosure and air inlet silencer will generate no greater than 85 dBA at a reference distance of three feet. The CT unit operating at maximum capacity would generate a maximum noise level of 85 dBA at three feet from the source. Based on the manufacturer's specifications, the operation of the CT would result in a noise level of 59 dBA at a distance of 400 feet from the unit. The nearest residential receptors are located approximately 2,640 feet to the north of the site. The maximum worst-case noise level expected at the residential receptors from operation of the CT unit is predicted to be 51 dBA. A hospital, emergency care clinic, and two motels are located approximately 1,100 feet from the subject site along San Fernando Boulevard. The maximum noise level at these receptors is predicted to be 58 dBA. The nearest commercial/industrial receptors are located a minimum of 1,000 feet from the proposed location of the CTs and associated equipment. Based on distance, maximum noise levels of 65 dBA are predicted at the industrial/commercial receptors located nearest to the site. Table 4.9-4 contains a summary of maximum predicted noise levels for VGS project site operations.

After completion of the VGS upgrade, additional truck traffic (ammonia deliveries) will be negligible (approximately one truck delivery every month) and is expected to result in no measurable increase in traffic noise.

Based on a "worst-case" maximum noise level generated at the source by operation of the CT and associated equipment, the maximum "worst-case" noise level expected at the nearest residential receptors is 51 dBA. This noise level is predicted to comply with the normally acceptable residential land use class of 60 to 65 dBA. The maximum "worst-case" noise level expected at the hospital and emergency care clinic is 58 dBA. This predicted noise level complies with the normally acceptable land use class of 55 to 60 dBA for hospitals and nursing homes. The maximum "worst-case" noise levels expected at the nearest commercial/industrial receptors to the project site is 65 dBA. This predicted noise level complies with the normally acceptable to conditionally acceptable land use class of 65 to 75 dBA for commercial/industrial uses. Based on this information, noise levels generated by operation of the CT unit and associated equipment at VGS site will be within acceptable limits and are not expected to result in a significant noise impacts.

Table 4.9-4
Estimated Operational Noise Levels

Facility	Nearest Receptors	Distance to Nearest Receptor (feet)	Estimated Maximum Noise Level at Nearest Receptor (dBA)[1]
HGS	Residential	1,320	63
	Commercial/Industrial	500	72
SGS	Residential	1,400	No perceptible noise increase predicted
	Recreational	300	
	Commercial/Industrial	500	
VGS	Residential	1,320	51
	Hospital	1,100	58
	Commercial/Industrial	500	65

[1] Noise levels presented represent worst-case maximum noise levels based on distance attenuation only. No reduction in noise levels were assumed for intervening topography, structures, or elevation differences between noise source and receptor.

Compliance with California Occupational Safety and Health Association (Cal-OSHA) regulations will ensure that facility operations personnel are adequately protected from potential noise hazards. The noise exposure level to protect hearing of workers is regulated at 90 dBA over an 8-hour work shift. Areas above 85 dBA will be posted as high-level noise areas and hearing protection will be required. LADWP will implement a hearing conservation program for applicable employees and/or contractors as required by Cal-OSHA regulations.

4.9.3 Mitigation Measures

This section includes mitigation measures for potential noise impacts.

4.9.3.1 Construction Activities

No significant noise impacts from construction-related activities are anticipated as a result of the proposed project at the HGS and VGS facilities. Significant noise impacts may result at the recreational beach adjacent to the west of SGS due to short-term construction noise. Guidelines are available (Bies and Hansen, 1988) for minimizing construction noise impacts, including consideration of the best available equipment during the construction stage. Table 4.9-5 presents mitigation measures, that if employed, will reduce noise impacts at SGS as a result of construction activities to below a level of significance.

4.9.3.2 Operational Activities

The existing and future noise environment for land uses around the HGS, SGS, and VGS sites are considered normally acceptable for their respective residential and nonresidential uses. It is estimated that no measurable increase in noise above existing noise levels or above applicable local ordinances will be generated from the operation of the project, and no significant impacts from noise is anticipated.

However, to prevent further degradation of the sound environment, the new and modified equipment will be specified and purchased with an equipment noise limit of 85 dBA measured at three feet from the equipment to the extent possible. Exceptions may be evaluated on a case-by-case basis to ensure no degradation of the sound environment.

Table 4.9-5
Noise Mitigation Measures for Construction

Mitigation No.	Measure	Noise Reduction Efficiency
N-1	Specify quiet equipment, including functioning muffler devices, be used.	Up to 6 dBA
N-2	Specify that all mufflers be properly maintained throughout the construction period.	NQ[1]
N-3	Use rubber-tired equipment rather than track equipment where feasible.	NQ
N-4	Keep loading and staging areas away from noise-sensitive land uses to the extent feasible.	Six dBA per doubling of distance to receptor
N-5	Minimize truck traffic on streets adjacent to residential uses, to the extent possible.	NQ
N-6	Prohibit routing of truck traffic through residential areas.	NQ

[1]NQ = Not Quantified

4.10 Solid/Hazardous Waste

The project will be considered to have significant adverse solid/hazardous waste impacts if the following criteria are met by the project:

The generation and disposal of nonhazardous or hazardous waste that exceeds the capacity of designated landfills.

4.10.1 Nonhazardous Waste

4.10.1.1 Construction Impacts

Harbor Generating Station

Based upon data from similar projects (SQAQMD, 1997), it is estimated that 1,500 pounds of nonhazardous waste will be generated on a weekly basis over the six-month construction period. Approximately two-thirds of this will include wood, metal, plastic, and cardboard that will be recycled.

Prior to construction activities, four existing aboveground storage tanks that are currently empty will be decommissioned. Upon being decommissioned, the empty storage tanks will be demolished and the metal from the tanks will be recycled, as it has commercial value.

Scattergood Generating Station

Based upon data from similar projects (SCAQMD, 1997), it is expected that an additional 300 pounds of nonhazardous waste will be generated on a weekly basis for the six-month construction period and approximately two-thirds of this quantity will include materials that will be recycled (wood, metal, plastic, and cardboard).

Valley Generating Station

Based upon data from similar projects (SCAQMD, 1997), it is expected that 300 pounds of nonhazardous waste will be generated on a weekly basis for the six-month construction period and approximately two-thirds of this quantity will include materials that will be recycled (wood, metal, plastic, and cardboard).

The existing four redwood cooling towers will be demolished. The wood will be sampled and analyzed for contamination and managed and disposed of in accordance with all applicable local, stated and federal rules and regulations. Most likely, the wood will be disposed as construction debris in a Class III landfill.

As the increases in solid waste disposal related to construction/demolition activities would be small and temporary and the capacity of the three landfills in Los Angeles County (Puente Hills, Scholl, and Calabassas) is sufficient to handle project-related wastes, the solid waste impacts related to construction activities are expected to be less than significant.

4.10.1.2 Operational Impacts

Project operations are not expected to generate significant incremental quantities of nonhazardous wastes above current project site levels.

4.10.2 Hazardous Waste

Small amounts of hazardous wastes may be generated as a result of project construction- and operational-related activities. The potential impacts associated with hazardous wastes are discussed below.

4.10.2.1 Construction Impacts

Project construction-related activities at the three project sites are expected to generate small quantities of hazardous wastes, including paint wastes and some contaminated soil resulting from past operations. Specific impacts are described below.

Harbor Generating Station

Because construction activity will take place in a former petroleum fuel tank farm, the potential exists for hydrocarbon-impacted (e.g., contaminated) soils to be encountered. However, analytical testing of the soil in this area conducted by LADWP indicates minimal impacts to the soil and groundwater from past operations. A Phase II soil investigation was conducted by Tetra Tech, Inc on September 28 and 29, 2000. Sample locations were selected to address potential impacts associated with the existing storage tanks to be demolished and removed. Soil samples were collected from depths of one foot, four feet, and eight feet below ground surface (bgs). In addition to soil samples, groundwater samples were also collected from each boring. Twenty-nine soils samples were analyzed for total petroleum hydrocarbons (TPH) using USEPA Method 8015 Modified. The soil samples with TPH concentrations exceeding 1,000 mg/kg were further analyzed for PAHs. One shallow and one deep sample from each boring were analyzed for Title 22 Metals using USEPA Method series 6010/7000. California Waste Extraction Tests (WET) were performed on samples with total metal concentrations exceeding 10 times the Soluble Threshold Limit Concentration (STLC) screening criteria. Groundwater samples were analyzed for TPH and one sample from each boring was analyzed for VOCs.

The TPH concentrations in the soil samples were significantly less than the current 1,000 milligram per kilogram (mg/kg) criterion used by LARWQCB for site cleanup. Therefore, no PAH analysis was conducted. As no sampling was conducted directly beneath the tanks, the potential exists for contaminated soil to exist at these localized sites. As conditions beneath the existing tanks are unknown, it is estimated as a worst-case that approximately 2,000 cubic yards of TPH-impacted soil may require excavation. In the event that contaminated soils are encountered during project activities, the soils will be treated/disposed in accordance with applicable local, state, and federal rules and regulations.

Concentrations of heavy metals in soil were below the California thresholds for hazardous waste, with the exception of one sample. The concentration of soluble arsenic at one location was 11.7 milligram per liter (mg/l), which exceeds the STLC for arsenic. Prior to the start of construction activities, the potential for soil disturbance at this location will be evaluated. If excavation is required due to foundation or footing installation, the soil at this location will be removed and managed as hazardous waste. It is estimated that approximately 15 cubic yards of soil would require excavation and disposal (Tetra Tech 2000) at a Class I landfill.

Concentrations of TPH in groundwater ranged from non-detect to 11 mg/l. The VOCs identified in the groundwater samples were in concentrations of less than five microgram per liter (µg/l), and most likely laboratory contaminants (methylene chloride and carbon disulfide) (Tetra Tech 2000).

<u>Scattergood Generating Station</u>

The construction activities required to retrofit existing power generating equipment with SCR systems at the SGS site will take place in two small areas where asbestos containing materials (ACM) may be present. A certified asbestos abatement contractor will complete any work involving ACM. It is estimated that up to 20 cubic yards of waste ACM may be generated. The waste ACM will be disposed at a facility permitted to accept this hazardous material.

<u>Valley Generating Station</u>

Prior to construction-related activities, four redwood cooling towers will be decommissioned. Because this activity will take place in a former process area, the potential exists for soils to be encountered that have been impacted (e.g., contaminated). However, analytical testing of the soil in this area by LADWP indicates minimal impacts to the soil and groundwater from past operations. A Phase II soil investigation was conducted by Tetra Tech, Inc. on October 4 and 5, 2000. Sample locations were selected to address the cooling towers, the concrete overflow ditches, the open areas between the cooling towers, and the overflow basin. Soil samples were collected from depths of one foot, five feet, and 10 feet bgs. Forty-seven soils samples were analyzed for total recoverable petroleum hydrocarbons (TRPH) using USEPA Method 418.1. The soil samples with TRPH concentrations exceeding 1,000 mg/kg would be further analyzed for TPH and PAHs. The one-foot and five-foot samples from each boring were analyzed for Title 22 Metals. California WET was performed on samples with total metal concentrations exceeding 10 times the STLC criteria. Although site personnel stated that sulfuric and phosphoric acids had traditionally been used for cooling tower pH control, hexavalent chromium analysis (USEPA Method 7199) was conducted on the soil sample containing the highest total chromium concentration, as well as the one-foot samples collected from the overflow basin. The one-foot samples were also analyzed for pH to determine if the acid used for cooling tower operations had impacted the surrounding soils. Selected one-foot samples were also analyzed for the presence of PCBs and pesticides/herbicides.

The TRPH concentrations in the soil samples were significantly less than the LARWQCB criterion. Pesticides, herbicides, and PCBs were not detected. The soil pH ranged from 6.79 to 8.76, which is within the normal range for soils.

Concentrations of heavy metals in soil were also below the California thresholds for hazardous waste and the 1999 USEPA Region 9 Preliminary Remediation Goals for both residential and industrial sites. However, in the event that contaminated soils are encountered during project site construction-related activities, the soils will be treated/disposed in accordance with all applicable local, state, and federal rules and regulations.

As no sampling was conducted in the tank farm where an aqueous ammonia storage tank will be constructed, the potential exists for soil to have been contaminated by past operations. It is estimated as a worst-case that approximately 1,000 cubic yards of TPH-impacted soil may require excavation and offsite disposal.

The small quantities of hazardous wastes generated by construction activities are not expected to have a significant impact on Class I landfill capacity, as there is sufficient capacity at the three Class I landfills located in California. Accordingly, significant hazardous waste impacts are not expected.

4.10.2.2 Operational Impacts

Project operations will generate small quantities of hazardous wastes, including cleaning solvent and spent CO and SCR catalyst. The solvents are used in small quantities for equipment cleaning and the spent solvents are managed per the requirements of Title 22 §§ 66260 et seq., which includes storing the material in closed containers within secondary containment. The CO and SCR catalysts normally have a life of three to five years before replacement is necessary. Spent CO catalyst will be returned to the manufacturer for reclamation and the SCR catalyst will be recycled.

The small quantities of hazardous waste that will be generated by project operations will not have a significant impact on the capacity of the three Class I landfills in California.

4.10.3 Mitigation Measures

Project construction- and operational-related hazardous and nonhazardous waste disposal is not expected to significantly adversely affect the capacity of the landfills where the waste will be disposed. Therefore, no mitigation is required for the proposed project's solid/hazardous waste impacts.

4.11 Transportation/Traffic

4.11.1 Construction Traffic

This section describes the potential transportation/traffic impacts associated with the proposed project upon the surrounding roadway network. The analysis focuses primarily on construction-related impacts, as operational increases in traffic are expected to be minimal. The anticipated construction traffic at SGS and VGS will be minimal and no impacts to transportation are expected. This analysis focuses on potential impacts from construction-related traffic impacts at HGS. Traffic generated by the construction phase of the proposed project was added to the existing volumes presented in Chapter 3 – Existing Setting, Section 3.9, and the resulting impacts to the seven intersections were assessed.

Impacts to transportation and circulation will be considered significant if the following criteria are met:

- A major roadway or railroad is closed to all through traffic and no alternate route is available.
- Peak period levels on major arterials within the vicinity of the project sites are disrupted to a point where intersections with a LOS of C or worse are reduced one full level as a result of the project for more than four weeks.
- The project will increase traffic to and/or from any one facility or site by more than 350 truck trips per day.
- The project will increase customer traffic to a facility by more than 700 trips per day.

- The volume to capacity ratio increases by two percent for intersections with a LOS rating of E or F for more than four weeks.

4.11.1.1 Trip Generation

Construction-related activities for the proposed project modifications are scheduled to begin early 2001 and be completed in the summer of 2001 at HGS and VGS and summer 2002 at SGS. Construction is anticipated to take place seven days per week using two work shifts; 6:00 AM to 4:30 PM and 4:00 PM to 2:30 AM.

Table 4.11-1 summarizes the anticipated peak construction vehicles at each project site based on a worst-case vehicle occupancy of 1.0 person per vehicle.

Table 4.11-1
Construction Traffic Summary

Location	Number of Workers	Number of Work Shifts	Workers Per Shift	Estimated Construction Length (in months)
HGS	400	2	200	5
SGS	100	2	50	17 (intermittent)
VGS	100	2	50	5

Table 4.11-1 indicates that the addition of construction workers will be relatively small at the SGS and VGS sites. However, at the HGS site, the construction effort is anticipated to require a peak of 400 daily vehicles or 800 vehicle trips per day during the construction period. These 400 daily vehicles are split between the two workshifts resulting in 200 daily vehicles per shift. Material deliveries were not included in this assessment as they typically do not occur during the peak hour and by assuming the peak work force is onsite everyday and no ridesharing occurs, the analysis is already considered worst-case.

The AM peak hour of the adjacent street system near a project site occurs during the AM peak period of 7:00 AM to 9:00 AM as indicated in the CMP Guidelines. Because the first workshift for the project sites are scheduled to begin at 6:00 AM, traffic attributable to the first construction workshift will arrive at the site before the AM peak period would begin and will not affect the AM peak hour ICU values.

As indicated in the CMP Guidelines, the PM peak hour of the street system in the vicinity of HGS site occurs 4:00 PM to 5:00 PM. The first construction workshift commute trips will leave the work site at the beginning of the PM peak period and may affect the PM peak hour ICU values. The second construction workshift commute trips will arrive at the work site before the PM peak period would begin and will leave before the AM peak period would begin and would not affect the AM or

PM peak hour ICU values. Therefore, the following analysis examines impacts from traffic attributable to the proposed project only for the first construction workshift and only during the PM peak hour.

4.11.1.2 Trip Distribution

Distribution of project generated traffic was derived from observation of existing travel patterns in the vicinity of the project sites. An increase in vehicular movements will occur at the various project sites during the construction period. The anticipated construction traffic at the SGS and VGS locations is considered less than significant, averaging 50 vehicle trips during the PM peak period, during the temporary construction period.

However, construction traffic at the HGS location is forecast to peak at 400 vehicles, with the addition of 50 workers in early 2001 for a regularly scheduled HGS maintenance. Hence, this transportation/traffic analysis is focused on impacts at locations surrounding the HGS project site. To provide a worst-case analysis, it is assumed that most of the construction personnel required for the HGS site would commute to and from the site in private automobiles even though LADWP would encourage construction contractor's employees to organize carpools.

Materials required to support the construction effort would be delivered to the HGS project site by truck. Peak truck usage would correspond to the peak manpower periods. Construction materials, heavy construction equipment, piping, and new equipment would be delivered throughout the construction period. All truck deliveries would be made at the main entrance from Harry Bridges Boulevard.

To estimate the project-related traffic volumes at various points on the transportation system adjacent to the HGS site and thereby establish the magnitude and extent of traffic impacts, a three-step process was utilized. First, the amount of traffic, which would be generated during construction was determined. Second, the construction traffic was geographically distributed to appropriate residential, commercial, and industrial areas. Finally, the trips were assigned to specific roadways and the traffic increases were evaluated on a route-by-route basis.

The average daily truck traffic to and from the HGS site during construction would be approximately 70 trucks per day. Since these trips would primarily consist of soil and material deliveries, the trips would be spread throughout the work day with few deliveries occurring during the peak hour traffic. Therefore, their contribution to overall traffic impacts would be negligible. As a conservative or worst-case analysis, the maximum expected employees at the construction site was assumed to occur daily and no ridesharing is expected to occur.

4.11.1.3 2000/Existing Plus Project Traffic Impacts

The equipment installations and modification at the HGS site would generate short-term impacts on traffic and circulation in the project vicinity during the construction period. The project would temporarily affect the present pattern of circulation of the labor force as well as truck traffic associated with the construction and operation phases of the project.

Project traffic was distributed to the surrounding roadways with thirty percent directed toward the Alameda/I-405 interchange, fifty percent directed toward the Figueroa/I-110 interchange, and the remaining twenty percent to the local surrounding area (traffic analysis is included in Appendix E).

To assess the impacts on the surrounding roadways, an ICU analysis was conducted for the seven intersections which would be most directly impacted by construction-related traffic at the HGS site.

Analysis year-plus-project intersection volumes for the HGS project site were generated by adding the project intersection volumes to the existing Year 2000 background intersection volumes. PM peak hour 2000-plus-project turn volumes are illustrated in Figure 4.11-1, and corresponding ICUs based on existing lane configurations are summarized in the Table 4.11-2. An examination of this table reveals that construction-related traffic at the HGS site does not have a significant impact on the forecast PM peak hour level of service at study area locations as the intersection with a greater than two percent change, currently and during project construction, will operate at a LOS greater than E.

Table 4.11-2
Project Level of Service Summary

Intersection	2000 Existing PM	Existing + Project PM	% Change
1. Figueroa & I-110 Freeway	.40	.46	.06
2. Figueroa & Harry S. Bridges	.41	.42	.01
3. Alameda & I-405 Northbound	.52	.52	No Change
4. Alameda & 223rd/Wardlow Access	.52	.55	.03
5. Alameda & Sepulveda	.83	.85	.02
6. I-405 Southbound On/Offramp & 223rd/Wardlow	.50	.52	.02
7. 223rd & Alameda/Wardlow Access	.81	.82	.01
Level of Services Ranges: .00 - .60 A; .61 - .70 B; .71 - .80 C; .81 - .90 D; .91 – 1.0 E; Above 1.0 F			

4.11.1.4 Onsite Circulation and Parking

Sufficient onsite parking is available to accommodate the increased parking demand from construction workers at the three project sites. The physical site of HGS, VGS, and SGS provide parking capacity beyond the current operational requirements. On any given day, approximately 25 percent of the employees are not on the premises because of rotating shifts, vacations, and sick leave. The total number of parking spaces exceeds the maximum number of construction workers to allow for fluctuations in manpower and to provide ample maneuvering space for heavy trucks.

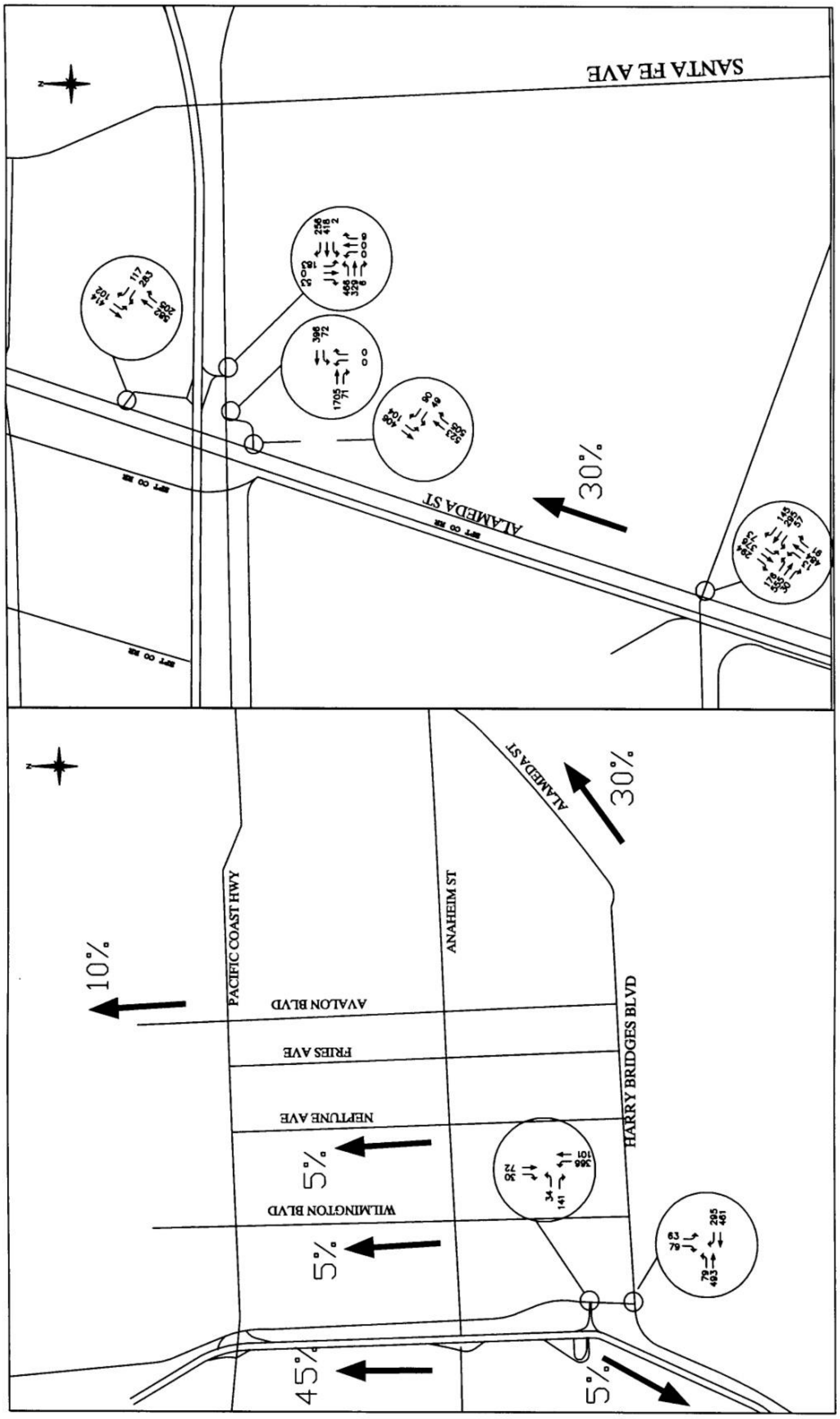

Figure 4.11-1
EXISTING+PROJECT PM
PEAK HOUR TURN VOLUMES (HGS)

4.11.2 Operational Traffic

Significant operational traffic impacts are not expected from the implementation of the proposed project, as the only increases in traffic are associated with the delivery of aqueous ammonia via tanker truck. The delivery of aqueous ammonia is expected to include one additional truck trip per week at HGS, two additional trips a week at SGS, and one additional trip per month at VGS.

4.11.3 Mitigation Measures

Project construction- and operational-related traffic is not expected create significant impacts at the study locations surrounding the HGS site. Furthermore, since construction- and operational-related traffic at the SGS and VGS sites will be less than the HGS site, surrounding traffic patterns are not expected to be significantly impacted. Therefore, no mitigation is required for project-related transportation/traffic impacts

4.12 Environmental Impacts Found Not To Be Significant

As previously mentioned, a NOP/IS (see Appendix A) was prepared for the proposed project, which described the anticipated environmental impacts that may result from its implementation. However, it was concluded in the NOP/IS that the proposed project would not cause significant adverse impacts to the environmental areas identified below. Accordingly, these environmental areas were not further analyzed in this Final EIR. A brief discussion of why the proposed project will not result in significant adverse impacts in these environmental areas is provided in the attached NOP/IS (see Appendix A).

- Aesthetics
- Agriculture Resources
- Land Use Planning
- Mineral Resources
- Population/Housing
- Public Services
- Recreation

4.13 Other CEQA Topics

Pursuant to CEQA requirements, the following subsections consider the proposed project's potential for irreversible environmental changes and growth inducement.

4.13.1 Irreversible Environmental Changes

CEQA Guidelines §15126.2(c) requires an environmental analysis to consider "significant irreversible environmental changes which would be involved in the proposed project should it be implemented." The NOP/IS and comments received on the NOP/IS identified air quality, biological resources, cultural resources, energy, geology/soils, hazards and hazardous materials, hydrology/water quality, noise, solid/hazardous waste, and transportation/traffic as environmental areas potentially adversely affected by the proposed project.

The air quality impacts associated with construction-related activities were determined to be significant. However, these impacts would be temporary in nature.

Potential hazard impacts associated with the storage, transport, and handling of aqueous ammonia were determined to be insignificant. Even though the potential hazards associated with an ammonia spill from a tanker truck were found to be significant, the likelihood of such an incident is remote.

While small insignificant quantities of energy resources would be used, the project would not result in the long-term significant impacts. In fact, the project will generate additional electricity capacity for the Los Angeles Basin.

It should be noted that the project is being constructed at existing facilities so no new land is required. In addition, the infrastructure necessary to implement the project already exists.

Accordingly, as can be seen by the information presented in this Final EIR, the proposed project would not result in irreversible environmental changes or significant irretrievable commitment of resources.

4.13.2 Growth-Inducing Impacts

CEQA defines growth-inducing impacts as those impacts of a proposed project that "could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this definition are projects which would remove obstacles to population growth" (CEQA Guidelines §15126.2(d)).

The proposed project, which will aid LADWP in complying with RECLAIM, provide more reliable in-basin power, and provide excess power to the Cal-ISO, is not expected to significantly contribute to population growth in the areas around the project sites, nor will additional infrastructure or housing be required. The proposed project involves the installation of new equipment and modification of existing power generating equipment at existing industrial facilities. These equipment installations and modifications will not require the hiring of additional LADWP personnel to operate the equipment. Therefore, no new workers, new services, infrastructure, or housing is required.

No significant growth-inducing impacts are foreseen, and no mitigation measures are proposed.