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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 Installation of a Combined Cycle Generating Facility at the Valley Generating Station. 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 §15126.2(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; health and safety problems caused by physical changes; and other aspects of the resource base, including noise, traffic, and water. 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 IS, including an environmental checklist, was prepared for the LADWP's Installation of a Combined Cycle Generating Facility at the VGS (Appendix A). The IS was released on May 4, 2001. Of the 17 environmental categories reviewed in the IS, six (air quality, geology/soils, hazards and hazardous materials, hydrology/water quality, noise, and transportation/traffic) were identified as having potentially significant impacts resulting from the implementation of the proposed project.

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

[1] It should be noted that for the six environmental impact areas that were identified as potentially significant and are further evaluated in detail in this ~~Draft~~Final EIR, the environmental impacts analysis for each environmental topic

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 estimated in this environmental analysis will be considered significant if any of the applicable significance thresholds presented 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.

Table 4.2-1
Air Quality Significance Thresholds

Criteria Pollutants Mass Daily Thresholds			
Pollutant	**Construction**	**Operation**	**RECLAIM[c] Sources**
NO_x	100 lbs/day	55 lbs/day	1,542 lbs/day
VOC	75 lbs/day	55 lbs/day	
PM10	150 lbs/day	150 lbs/day	
SO_x	150 lbs/day	150 lbs/day	
CO	550 lbs/day	550 lbs/day	
Lead	3 lbs/day	3 lbs/day	

TAC, Acutely Hazardous Material (AHM), and Odor Thresholds	
Toxic Air Contaminants	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

incorporates a "worst-case" approach. This entails maximizing the peak daily construction- and operation-related activities.

Table 4.2-1 (Concluded)
Air Quality Significance Thresholds

Ambient Air Quality for Criteria Pollutants	
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]
PM10 24-hour PM10 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 c = 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.	

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 facility'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 threshold 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.

As discussed in Section 3.2 of Chapter 3, the Basin is currently designated by U.S. EPA as a nonattainment area for both CO and PM10. As a result, localized impacts for CO and PM10 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 as they appear in Rule 1303, Table A-2.

Although the Basin is currently in attainment for both the CAAQS and NAAQS for NO_2, NO_2 emissions can contribute to significant adverse localized NO_2 impacts and is a precursor pollutant to both ozone and PM10. As a result, localized NO_2 air quality impacts will be considered significant if the project's NO_x emissions cause or contribute to an exceedance of any ambient air quality standard at the nearest sensitive receptor.

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, similar to the approach taken to determine localized NO_2 air quality impacts, 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 SO_2 at any sensitive receptor location.

4.2.1 Construction Emissions and Impacts

Construction-related emissions can be designated as either onsite or offsite. Onsite emissions generated during construction principally consist of exhaust emissions (NO_X, SO_X, CO, VOC, and PM10) from heavy-duty diesel and gasoline powered construction equipment operation, fugitive dust (PM10) from disturbed soil, and evaporative VOC emissions from asphaltic paving and equipment touch-up painting. Offsite emissions during the construction phase normally consist of exhaust emissions and entrained paved road dust (PM10) from worker commute trips, material delivery trips, and haul truck material removal trips to and from the construction site.

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

- Grading;
- Construction of equipment pads and foundations and paving of access roads and equipment maintenance areas; and
- Equipment installation of combined cycle combustion turbines, HRSGs with associated SCR systems, a STG, a cooling tower, ammonia storage tanks, and associated auxiliary equipment.

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

- SCAQMD CEQA Air Quality Handbook, November 1993;
- U.S. EPA Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition (AP-42);
- U.S. EPA Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, 1992;

[2] A fourth phase, commissioning, involving the initial start-up and tuning of the CTGs was evaluated for peak daily emissions. Based on the emission estimates, commissioning activities do not lead to the maximum peak daily non-operational emissions. A discussion of CTG commissioning, along with emission estimates are presented in Appendix C.

- California Air Resources Board EMFAC2000 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 PM10 Control Strategies Study," Midwest Research Institute, October 12, 1990.

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

To estimate the "worst-case" peak daily emissions associated with the construction activities, the anticipated schedule, and the types 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. Estimates that were made previously of the construction equipment and manpower requirements for installing five 47-MW combustion turbines (CTs) and associated SCR at LADWP's Harbor Generating Station (HGS) and one 47-MW peaking CT and associated SCR at VGS (Los Angeles Department of Water and Power's Electrical Generation Stations Modifications Project; SCAQMD, 2001) were extrapolated to the increased amount of equipment to be installed for this proposed project. The specific assumptions for each phase of construction are as follows:

- Grading: Based on the size of the area to be graded, it was estimated that peak construction equipment and manpower required for the grading phase of construction would be the same as for grading for installation of the five CTs at HGS.
- Foundations and Paving: Based on the requirements for equipment pads and foundations, it was estimated that peak construction equipment and manpower required for construction of foundations and pads would be the same as for construction of foundations and pads for installation of the five CTs at HGS. Based on the area to be paved, it was estimated that the requirements for paving would be the same as for installation of the peaking CT at VGS.
- Equipment Installation: Based on the amount of equipment to be installed, it was estimated that peak construction equipment and manpower requirements for equipment installation would be 50 percent greater than for installation of the equipment at HGS.

The anticipated 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 are listed in Table 4.2-2. Construction-related activities are anticipated to occur six days per week, Monday through Saturday, between from 6:00 am to 5:00 pm. Allowing time for shift changes and work breaks, all construction equipment is assumed to operate 10 hours per day except light plants, which are assumed to operate two hours per day.

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

Start and End Construction Month	Type of Equipment (Onsite)	Number of Equipment	Number of Construction Workers (Offsite)	Daily Material Delivery Trips (Offsite)	Daily Haul Truck Trips (Offsite)
Grading					
1-1	Grader	1	3	0	0
	Light Plant	20			
Construction of Foundations and Asphalt Paving					
2-12	Concrete	10	253	33	0
	Vibrator	10			
	Concrete Pump	25			
	Light Plant	1			
	Paver				
Equipment Installation					
11-26	Forklift	9	600	15	3
	Backhoe	3			
	Compressor	2			
	Light Plant	30			
	Welder	15			
	Trencher	2			
	Plate Compactor	2			
	Crane	6			

The information in Table 4.2-2 was used to calculate onsite emissions from construction equipment exhaust and from some fugitive dust PM10 sources (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. PM10 emissions from storage pile wind erosion were calculated from estimated storage pile surface areas of 3,000 square feet (0.069 acres) during grading. These storage pile areas were estimated from the site configurations.

VOC emissions from asphaltic paving activities were based on an estimated maximum area of 0.59 acres to be paved each day (see Figures 2.3-1 and 2.3-2 in Chapter 2). VOC emissions from architectural coating were based on an estimated maximum daily use of six gallons of paint for touch-up during equipment installation. Equipment shipped to the project site 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 Table 4.2-2 above were used in conjunction with the information provided in Table 4.2-3 below to estimate peak daily emissions from both onsite and offsite motor vehicles from the project site.

Table 4.2-3
Motor Vehicle Classes, Speeds and Daily VMT During Construction

Vehicle Type	Vehicle Class	Speed (mph)	VMT (mi/vehicle-day)
Onsite pickup truck	Medium duty truck, catalyst	15	2-10
Watering truck	Medium heavy-duty truck, diesel	15	1
Material removal haul truck, onsite	Heavy heavy-duty truck, diesel	5	1
Delivery vehicle, onsite	Heavy heavy-duty truck, diesel	5	1
Construction commuter	Light-duty truck, catalyst	35	40
Material removal haul truck, offsite	Heavy heavy-duty truck, diesel	25	40
Delivery vehicle, offsite	Heavy heavy-duty truck, diesel	25	40

Estimated peak daily unmitigated onsite and offsite emissions associated with each construction phase are listed in Table 4.2-4. The emissions associated with a particular source (e.g., construction equipment exhaust, grading, worker commuting, material delivery trips, etc.) for a specific construction activity are shown in Appendix C.

Table 4.2-4
Peak Daily Construction Emissions for
Each Construction Phase (Pre-Mitigation)

Activity	Location	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM10 (lb/day)	Fugitive PM10[a] (lb/day)	Total PM10 (lb/day)
Grading	Onsite	14.0	3.7	27.0	2.5	1.4	3.7	5.1
	Offsite	4.5	0.3	0.3	0.0	0.0	0.1	0.2
	Total	**18.5**	**4.0**	**27.3**	**2.5**	**1.4**	**3.9**	**5.3**
Foundations and Paving	Onsite	151.1	15.0	76.8	6.1	4.4	45.7	50.2
	Offsite	404.3	28.9	83.4	0.0	2.9	108.2	111.1
	Total	**555.4**	**43.8**	**160.2**	**6.1**	**7.3**	**154.0**	**161.3**
Equipment Installation	Onsite	172.2	60.9	332.1	27.6	18.8	0.0	18.8
	Offsite	915.1	60.3	74.9	0.0	1.7	64.8	66.5
Total		**1,087.3**	**121.2**	**407.1**	**27.6**	**20.5**	**64.8**	**85.3**

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 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 month of the entire construction period. The peak daily emissions from the construction activities taking place each month were then added together to estimate the total peak daily emissions during each month. Finally, the month(s) with the highest overall peak daily emissions was identified.

The overall peak daily construction-related emissions are anticipated to occur during simultaneous construction of foundations, paving and equipment installation. The overall “worst-case” peak daily emissions by type of source and a comparison of these emissions to the SCAQMD’s CEQA significance thresholds are presented in Table 4.2-5 to determine whether construction-related air quality impacts are significant. As shown in the table, the significance thresholds are anticipated to be exceeded for CO, VOC, NO_X, and PM10 construction-related emissions.

Table 4.2-5
Overall Peak Daily Emissions During Construction (Pre-Mitigation)

Source	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM10 (lb/day)	Fugitive PM10[a] (lb/day)	Total PM10 (lb/day)
Onsite Construction Equipment Exhaust	306.5	50.4	403.8	33.7	23.0	--	23.0
Onsite Motor Vehicles	16.8	2.9	5.1	0.0	0.2	--	0.2
Onsite Fugitive PM10	--	--	--	--	--	45.7	45.7
Asphaltic Paving	--	1.6	--	--	--	--	--
Architectural Coating	--	21.0	--	--	--	--	--
Total Onsite	**323.3**	**75.9**	**408.9**	**33.7**	**23.2**	**45.7**	**69.0**
Offsite Motor Vehicles	1,319.4	89.1	158.4	0.0	4.5	173.0	177.6
Total Offsite	**1,319.4**	**89.1**	**158.4**	**0.0**	**4.5**	**173.0**	**177.6**
TOTAL	**1,642.7**	**165.0**	**567.3**	**33.7**	**27.8**	**218.8**	**246.6**
CEQA Significance Level	*550*	*75*	*100*	*150*	--	--	*150*
Significant? (Yes/No)	**Yes**	**Yes**	**Yes**	No	--	--	**Yes**
a = Totals may not match sum of individual values because of rounding							

4.2.2 Operational Emissions

This section addresses the direct and indirect air quality impacts from the operation of the new and modified equipment associated with the proposed project. Atmospheric dispersion modeling to analyze the impacts of the proposed project and the results of the HRA are also discussed.

4.2.2.1 Direct Operational Emissions

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

The installation of the following equipment will result in criteria pollutant and toxic air contaminant emissions:

- Two dual fuel (natural gas and distillate) fired 171.7 MW CTGs with duct burners, two HRSGs with associated SCR, and a steam turbine generator. The CTGs will be provided with controls (e.g., water injection when firing diesel oil or a low NO_X combustor when firing natural gas) that will preliminarily reduce NO_X emissions prior to venting the exhaust to the SCR systems. The CTGs 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 CTGs[3]; and

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 PM10 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

- One cooling tower provided with 10 cells, with each cell having a 10,560 gallon per minute circulation rate.

The proposed project will also include the installation of two 20,000-gallon ASTs for aqueous ammonia storage and the conversion of one fuel oil tank to distillate service. However, no ammonia emissions are expected from the two new tanks because the tanks will be pressurized and each tank will be provided with a pressure relief valve. In addition, vapor return lines will be used during filling of the tanks.

The new CTGs and HRSGs will operate in various modes that lead to different emission rates. The three operating modes evaluated for impacts in this ~~Draft~~Final EIR are: (1) normal startup; (2) normal operation; and (3) diesel fuel readiness testing. The SCR will only operate in a normal operating mode. 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 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.

The following subsections present emissions data during each of the operating modes. The reader is referred to Appendix C for the details of the emission calculation methodologies used to estimate operation-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 discussed in the following subsections.

Normal CTG Startup

During start-up, the CTGs will operate for a period of time without NO_X or CO control. Once stable operating conditions are reached, dry low NO_X combustor operations will begin. Finally, when the SCR/CO catalyst system reaches the appropriate temperature for the catalyst to be effective, ammonia injection will commence and the SCR/CO catalyst systems will become operational. Normal startup will last for four hours (one-half hour of normal operation with all controls). Emission rates for CO, NO_X, and VOC during startup were based on an engineering analysis of available data, which included source test data from startups of the GE gas turbines and summarized in the Application for Certification (AFC) for the Mountainview Power Plant (CEC, 2000). PM10 and SO_X emissions were based on AP-42 emission factors and fuel consumption during the start-up period provided by the combustion turbine manufacturer. Gas turbine exhaust parameters for the minimum operating load point (50 percent) were used to characterize gas turbine exhaust during startup. The toxic air contaminant (except ammonia) emissions during the start-up mode were estimated using CARB-approved emission factors. The estimated criteria

this EIR. Also, PM10 emissions are generated in the SCR reaction chambers when SO_2 in the exhaust stream is converted to SO_3 in the presence of the SCR catalyst. This PM10 source is also analyzed in this EIR.

pollutant and toxic air contaminant emissions from one CTG during normal startup are presented in Tables 4.2-6 and 4.2-7, respectively.

Table 4.2-6
Criteria Pollutant Maximum Hourly and Annual Emissions for One CTG Normal Startup

Pollutant	Maximum Hourly (lb/hr)	Total Emissions During One Start-up (lb per 4-hr start-up)	Annual[a] (lb/yr)
CO	100	326.2	3,914
NO_X	20	78.0	936
PM10	14.7	25.8	310
SO_2	2.49	4.84	58
VOC	4.12	14.6	175
a = Based on 12 normal startups per year for one CTG, each startup lasting four hours			

Table 4.2-7
Toxic Air Contaminant[a] Emission Estimates for One CTG Normal Startup

Toxic Air Contaminant	Maximum Hourly (lb/hr)	Total Annual[b] (lb/yr)
1,3-Butadiene	2.14E-04	4.99E-03
Acetaldehyde	2.31E-01	5.39E+00
Acrolein	3.19E-02	7.44E-01
Ammonia	1.33E+01	1.59E+02
Benz(a)anthracene	3.81E-05	8.88E-04
Benzene	2.24E-02	5.23E-01
Benzo(a)pyrene	2.34E-05	5.46E-04
Benzo(b)fluoranthene	1.90E-05	4.44E-04
Benzo(k)fluoranthene	1.85E-05	4.32E-04
Chrysene	4.25E-05	9.90E-04

Table 4.2-7 (Concluded)
Toxic Air Contaminant[a] Emission Estimates for One CTG Normal Startup

Toxic Air Contaminant	Maximum Hourly (lb/hr)	Total Annual (lb/yr)
Dibenz(a,h)anthracene	3.96E-05	9.24E-04
Ethylbenzene	3.02E-02	7.04E-01
Formaldehyde	1.55E+00	3.61E+01
Hexane	4.36E-01	1.02E+01
Indeno(1,2,3-cd)pyrene	3.96E-05	9.24E-04
Naphthalene	2.80E-03	6.53E-02
Propylene	1.30E+00	3.03E+01
Propylene Oxide	8.06E-02	1.88E+00
Toluene	1.20E-01	2.80E+00
Xylene (Total)	4.40E-02	1.03E+00

a = SCAQMD Rule 1401 Toxic Air Contaminants
b = Based on 12 normal startups per year for one CTG, each startup lasting four hours

<u>Normal Operating Mode</u>

The normal operating mode is defined as the operation of the CTGs with add-on controls after the completion of the normal startup phase. The emissions of PM10 and SO_2, were estimated using AP-42 emission factors. The emissions of NO_X, CO, VOC, and ammonia were estimated using the SCAQMD's BACT permitting limits, which are 2.5 ppmv for NO_X, six ppmv for CO, two ppmv for VOC, and five ppmv for ammonia slippage (at 15 percent O_2). The toxic air contaminant (except ammonia) emissions during this operating mode were estimated using CARB-approved emission factors. The increased PM10 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[4]. The estimated criteria pollutant and toxic air contaminant emissions during normal operation of one CTG are presented in Tables 4.2-8 and 4.2-9, respectively.

[4] There are two sources of PM10 associated with the operation of the CTGs and SCRs. PM10 emissions are generated from the combustion process associated with operation of the CTG. Also, PM10 emissions are generated in the SCR reaction chambers when SO_2 in the exhaust stream is converted to SO_3 in the presence of the SCR catalyst. Both of these PM10 sources are analyzed in this EIR.

Table 4.2-8
Criteria Pollutant Maximum Hourly, Daily and Annual Emissions during Normal Operation of One CTG

Pollutant	Maximum Hourly (lb/hr)	Maximum Daily[a] (lb/day)	Annual[b] (lb/yr)
CO	28.16	675.84	246,600
NO_X	19.32	463.68	169,200
PM10[c]	16.32	391.68	143,000
SO_2	2.13	51.12	18,600
VOC	5.34	128.16	46,800

a = Based on 24 hours of normal operation.
b = Based on operation of 8760 hours per year.
c = Includes PM10 emissions from the conversion of SO_2 to SO_3 in the presence of the SCR catalyst. Assumed 65 percent of the SO_2 converts to SO_3 and all SO_3 converts to ammonium sulfate.

Table 4.2-9
Toxic Air Contaminant[a] Emissions Estimates during Normal Operation of One CTG

Toxic Air Contaminant	Maximum Hourly (lb/hr)	Total Annual[b] (lb/yr)
1,3-Butadiene	2.49E-04	2.18E+00
Acetaldehyde	2.68E-01	2.35E+03
Acrolein	3.70E-02	3.24E+02
Ammonia	1.42E+01	1.24E+05
Arsenic	1.05E-04	9.17E+01
Benz(a)anthracene	4.42E-05	3.87E-01
Benzene	2.60E-02	2.28E+02
Benzo(a)pyrene	2.72E-05	2.38E-01
Benzo(b)fluoranthene	2.21E-05	1.94E-01
Benzo(k)fluoranthene	2.15E-05	1.89E-01
Chloroform	2.44E-02	2.13E+02
Chrysene	4.93E-05	4.32E-01
Dibenz(a,h)anthracene	4.60E-05	4.03E-01
Ethylbenzene	3.50E-02	3.07E+02
Formaldehyde	1.79E+00	1.57E+04
Hexane	5.07E-01	4.44E+03
Indeno(1,2,3-cd)pyrene	4.60E-05	4.03E-01
Naphthalene	3.25E-03	2.85E+01
Propylene	1.51E+00	1.32E+04
Propylene Oxide	9.35E-02	8.19E+02
Toluene	1.40E-01	1.23E+03
Xylene (Total)	5.11E-02	4.47E+02

a = SCAQMD Rule 1401 Toxic Air Contaminants
b = Based on operation of 8760 hours per year.

Diesel Fuel Readiness Testing

The CTGs will be tested individually for diesel fuel readiness once per month for 60 minutes. Testing involves operating the CTG while hot (after normal operation) with CO catalyst and water injection controls. The SCR and dry low NO_X combustors will not be operated when the CTG is fueled by diesel fuel.

The emissions of PM10, SO_2, and VOC are estimated using AP-42 emission factors. NO_X emissions were provided by the project proponent. Toxic air contaminant emission estimates for this operating mode were derived from CARB-approved emission factors. The estimated criteria pollutant and toxic air contaminant emissions from one CTG during the diesel fuel readiness testing are presented in Tables 4.2-10 and 4.2-11, respectively.

Table 4.2-10
Criteria Pollutant Maximum Hourly, Daily and Annual Emissions for One CTG Diesel Fuel Readiness Testing

Pollutant	Maximum Hourly (lb/hr)	Maximum Daily[a] (lb/day)	Annual[b] (lb/yr)
CO	26.30	26.30	315.6
NO_X	313	313	3,756.0
PM10	23.22	23.22	278.6
SO_2	98.57	98.57	1,182.8
VOC	5.20	5.20	62.4

a = Based on one 1-hr test per day.
b = Based on 12 diesel fuel readiness tests per year for one CTG

Table 4.2-11
Toxic Air Contaminant[a] Emissions Estimates for One CTG
Diesel Fuel Readiness Testing

Toxic Air Contaminant	Maximum Hourly (lb/hr)	Total Annual[b] (lb/yr)
Arsenic	2.81E-03	3.37E-02
Benz(a)anthracene (PAH)	1.19E-03	1.42E-02
Benzene	1.57E-01	1.89E+00
Benzo(a)pyrene (PAH)	1.16E-03	1.39E-02
Benzo(b)fluoranthene (PAH)	1.84E-03	2.20E-02
Benzo(k)fluoranthene (PAH)	1.81E-03	2.17E-02
Beryllium	7.55E-04	9.06E-03
Cadmium	4.52E-03	5.42E-02
Chrysene (PAH)	1.43E-03	1.72E-02
Chromium (Hex)	1.50E-04	1.80E-03
Chromium (total)	5.89E-03	7.07E-02
Copper	1.39E-02	1.66E-01
Dibenz(a,h)anthracene (PAH)	1.15E-03	1.38E-02
Dioxin: 4D Total	5.20E-08	6.24E-07
Dioxin: 5D Total	9.94E-08	1.19E-06
Dioxin: 6D Total	1.25E-07	1.50E-06
Dioxin: 7D Total	2.34E-07	2.80E-06
Dioxin: 8D	1.49E-06	1.78E-05
Formaldehyde	9.80E-01	1.18E+01
Furan: 4F Total	4.64E-07	5.57E-06
Furan: 5F Total	6.49E-07	7.79E-06
Furan: 6F Total	3.35E-07	4.02E-06
Furan: 7F Total	2.32E-07	2.79E-06
Furan: 8F	1.20E-07	1.44E-06
HCL	1.12E+00	1.35E+01
Indeno(1,2,3-cd)pyrene (PAH)	1.15E-03	1.38E-02
Lead	8.45E-03	1.01E-01
Manganese	1.43E-01	1.72E+00
Mercury	3.77E-05	4.52E-04
Naphthalene (PAH)	1.50E-01	1.80E+00
Nickel	6.78E-01	8.14E+00
Selenium	1.17E-04	1.40E-03
Zinc	7.48E-01	8.97E+00

a = SCAQMD Rule 1401 Toxic Air Contaminants
b = Based on 12 diesel fuel readiness tests per year for one CTG

Cooling Tower Normal Operation

The cooling tower has only one mode of operation. PM10 will be the only criteria pollutant emitted during the normal operation of the cooling tower. PM10 and TAC emissions for this operating mode were estimated using the methodology provided in AP-42. The estimated criteria pollutant and toxic air contaminant emissions from the cooling tower are presented in Tables 4.2-12 and 4.2-13.

Table 4.2-12
Criteria Pollutant Maximum Hourly and Annual Emissions for the Cooling Tower

Pollutant	Maximum Hourly (lb/hr)	Maximum Daily (lb/day)	Annual[a] (lb/yr)
PM10	2.95	70.8	25,842
a = Based on continuous operation of 8760 hours per year			

Table 4.2-13
Toxic Air Contaminant[a] Emissions Estimates for the Cooling Tower

Toxic Air Contaminant	Maximum Hourly (lb/hr)	Total Annual[b] (lb/yr)
Chloroform	0.0244	214
Toluene	0.0009	8
Arsenic	0.0001	1
a = SCAQMD Rule 1401 Toxic Air Contaminants b = Based on continuous operation of 8760 hours per year		

4.2.2.2 Indirect (Offsite) Mobile Source Operational Emissions

Indirect peak daily offsite operational emissions will not increase from additional trips by tanker trucks delivering aqueous ammonia to the project site. Based on operational requirements for aqueous ammonia, it was estimated that two to three additional aqueous ammonia delivery trips will be made to the VGS each month. The 47-MW peaking CTG that is currently being installed at VGS is anticipated to require one aqueous ammonia delivery trip each month. Since it is unlikely that these additional delivery trips will occur on the same days as the delivery trips that will be required for operation of the 47-MW peaking CTG, the peak daily number of delivery trips and the associated emissions are not anticipated to increase.

Operation of the new equipment will not require additional employees, so there will not be an increase in indirect operational emissions due to additional employee commuting trips.

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. The air emissions from the proposed project were modeled with no adjustment made for the emission reductions associated with the removal of the existing equipment at the facility. This allows for prediction of the "worst case" impact to ambient air quality at any receptor.

The atmospheric dispersion modeling methodology used is based on generally accepted modeling practices and modeling guidelines of both the U.S. EPA and the SCAQMD. Industrial Source Complex Short Term 3 (ISCST3) dispersion model (Version 00101) (U.S. EPA 1999) was used to model SO_2, CO, and NO_X emission impacts. The EPA approved CTSCREEN model (version number 94111) was used to perform refined PM10 impact analysis in the complex terrain located northeast of the project site.

The results of the preliminary modeling analysis using the ISCST3 model indicated that emissions of SO_2, CO, and NO_X would not result in ambient concentrations exceeding the allowable limits. However, PM10 concentrations were predicted to exceed the allowable limit. The maximum PM10 concentration location was predicted to occur in the complex terrain region northeast of the VGS site. The COMPLEX I model, which is part of the ISCST3 model is automatically used for predicting the concentrations in the complex terrain (see Model Selection section below for additional information on simple and complex terrain). Since the COMPLEX I model tends to over-predict the concentrations in complex terrain, a refined modeling analysis was performed for PM10 emissions using CTSCREEN model (see Model Selection section for additional information on CTSCREEN model).

As discussed in the next subsection (4.2.2.4), the outputs of the ISCST3 dispersion model were used as inputs to conduct a risk assessment for toxic air contaminants using the Assessment of Chemical Exposure for ACE2588 (AB2588) risk assessment model (Version 93288) (California Air Pollution Control Officers Association [CAPCOA] 1993).

Details of how the modeling was performed and the results of the modeling are provided in the following subsections. Output listings of model runs are available for public inspection by contacting the SCAQMD's Public Information Center at (909) 396-2039.

<u>Model Selection</u>

The ISCST3 model (Version 00101) is a U.S. EPA 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 both simple and complex type exist in the vicinity of the VGS site. It should be noted that the dispersion model used for estimating the concentrations in the complex terrain is a screening model and provides conservative estimates (higher concentrations) of modeled pollutants.

The CTSCREEN model (Version 94111) is the screening mode of CTDMPLUS model, which is a refined point-source Gaussian air quality model developed for use in all stability conditions for complex terrain applications. As stated in the CTDMPLUS users guide, "CTSCREEN and the refined model, CTDMPLUS are the same basic model. The primary difference in their make-up is in the way in which CTSCREEN obtains the meteorological conditions. CTSCREEN yields maximum concentration estimates that are near to, yet on the conservative side of, those that would result from the use of the CTDMPLUS with a full year of on-site meteorological data for the same source-terrain configuration." The CTSCREEN model accounts for the three dimensional nature of the plume and terrain interaction; thus, it requires digitized terrain of the nearby topographical features. The digitization of terrain features was accomplished by using the terrain preprocessors, FITCON and HCRIT. The wind direction used in CTSCREEN is based on the source-terrain geometry, resulting in computation of the highest impacts likely to occur. Other meteorological variables are chosen from possible combinations of a set of predetermined values. CTSCREEN provides maximum concentration estimates that are similar to, but are on the conservative side of, those that would be calculated from the CTDMPLUS model, which employs on-site meteorological data.

<u>Modeling Options</u>

The options used in the ISCST3 dispersion modeling are summarized in Table 4.2-14. U.S. EPA 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.

The options used in the CTSCREEN dispersion modeling are summarized in Table 4.2-15.

Table 4.2-14
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

Table 4.2-15
Dispersion Modeling Options for CTSCREEN

Feature	Option Selected
Priority Mixing Height	Observed
Set Minimum Wind Speed = 1.0 m/s	Yes
Assume σ_θ or σ_V	σ_V
Scale Wind Speed with Height	Yes
Output Concentration	µg/m^3
Set Conc=0.0 if receptor below stack tip	No
Model Mode	Screening , all hours
Automated Wind Directions	Model Determined
User specified range of wind directions	No
User specified discrete wind directions	No

Meteorological Data for ISCST3

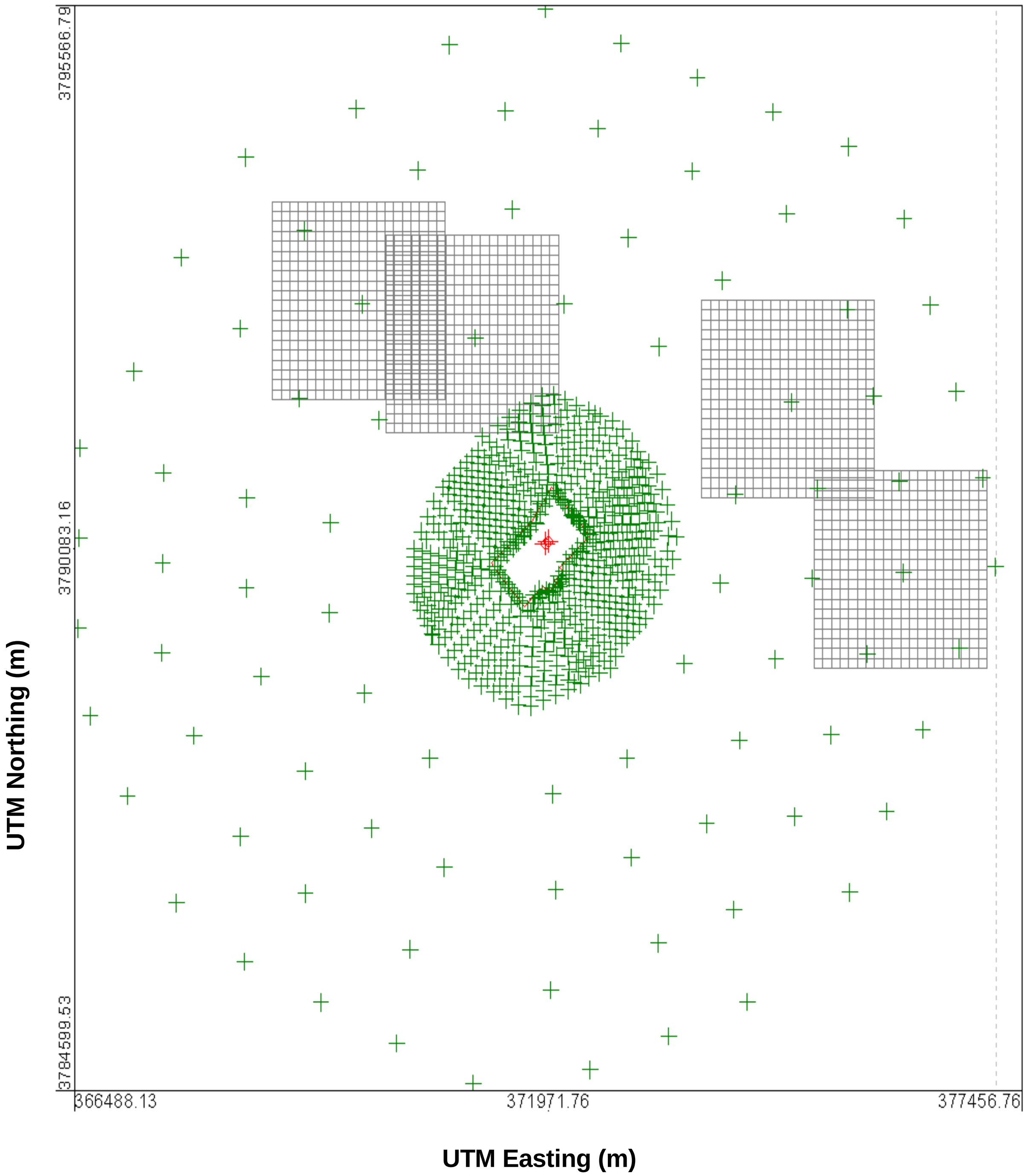
The SCAQMD has compiled a standard set of meteorological data files for use in air quality dispersion modeling in the Basin. Meteorological data file from the Burbank monitoring station (1981) was used for performing the dispersion modeling. In this dataset, the surface wind speeds and directions were collected at the SCAQMD's Burbank monitoring station (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.

Receptors for ISCST3

Appropriate model receptors must be selected to determine the worst-case modeling impacts. For this modeling, two sets of receptor grids were used for determining the peak impacts for the HRA. A "coarse" grid was used to determine the general area of peak concentration. The coarse grid consisted of three parts: (1) receptors along the perimeter of the facility with a spacing of approximately 100 meters or less; (2) receptors spaced 250 meters apart extending from the property line to approximately 2.5 kilometers from the property line; and (3) receptors spaced 500 meters apart extending from the prior grids to another 2.5 kilometers. No receptors were placed within the VGS site property line.

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 two-kilometers by two-kilometers 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. The boundary lines and receptor locations used in the modeling are shown in Figure 4.2-1. As seen in the figure, 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, the terrain elevation was set to the elevation for the closest DEM grid point.



UTM Easting (m)

Figure 4.2-1 VGS Site Boundary and ISCST3 Grid Receptor Locations

The U.S. EPA's guidance was followed to address the potential influence on the ambient air concentrations of structures located near point emission sources. 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.

Receptors for CTSCREEN

Receptors were generated using the program RECGEN, which places receptors along the terrain contours generated with the FITCON and HCRIT terrain preprocessors. The terrain data was created by digitizing the contours. A sufficient number of points were selected to define the basic shape of each contour. All digitized points were input to the preprocessor programs, FITCON and HCRIT, and a terrain file was generated for use in the CTSCREEN model. RECGEN then used these contours and generated receptors.

Receptors were specified for distances of 500 meters along the terrain contours. Once the location of maximum concentration was determined, a one-km by one-km fine receptor grid with 100 meters spacing was created manually using a text editing program. Terrain elevations were obtained from the same source as for the ISCST3 modeling. The receptor locations used are shown in Figure 4.2-2.

Source Parameters

In order to estimate the "worst-case" ambient concentrations for various averaging periods from the operation of the CTGs and HRSGs, the emissions from the three operating scenarios were combined as presented in Table 4.2-16.

The source parameter inputs and criteria pollutant emissions during normal startup, normal operation, and diesel fuel readiness testing used in the dispersion model are summarized in Tables 4.2-17 through 4.2-19. All sources of emissions were modeled as point sources.

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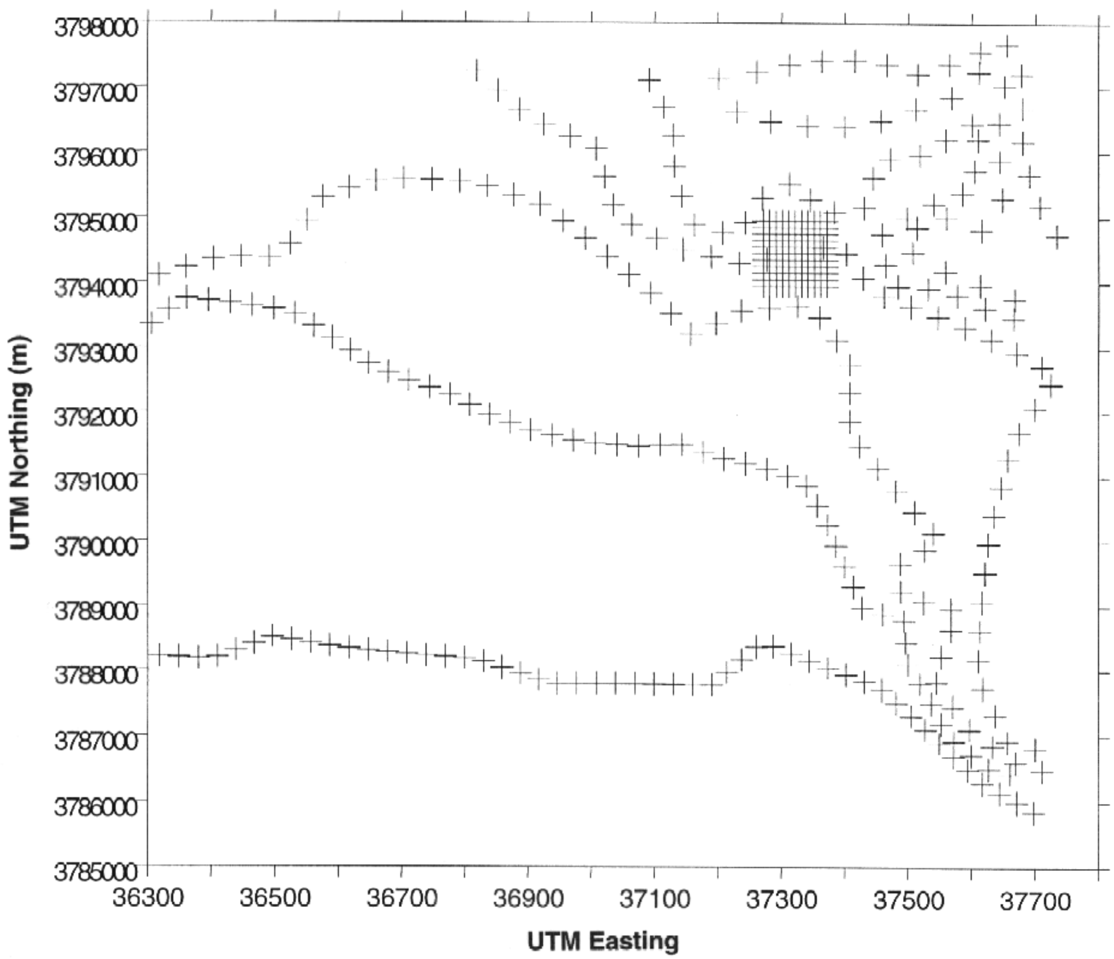

Figure 4.2-2 Coarse and Fine Grid Receptor Locations for CTSCREEN Modeling

Table 4.2-16
Grouping of Operating Scenarios for Air Dispersion Modeling

Pollutant	Averaging Period	Emission Sources Considered for Dispersion Modeling	Operating Conditions Considered for Dispersion Modeling
NO_X	1-hour (hr)	Two CTGs	CTG01 in Diesel Testing, CTG02 in Normal Operation
NO_X	Annual	Two CTGs	Both CTGs in Normal Operating + 12 Diesel Tests
CO	1-hr	Two CTGs	CTG01 in Normal Startup, CTG02 in Normal Operation
CO	8-hr	Two CTGs	CTG01 in Normal Startup, CTG02 in Normal Operation
SO_2	1-hr	Two CTGs	CTG01 in Diesel Testing, CTG02 in Normal Operation
SO_2	3-hr	Two CTGs	CTG01 in Diesel Testing, CTG02 in Normal Operation
SO_2	24-hr	Two CTGs	CTG01 in Diesel Testing, CTG02 in Normal Operation
SO_2	Annual	Two CTGs	Both CTGs in Normal Operation + 12 Diesel Tests
PM10	24-hr	Two CTGs and Cooling Tower	Both CTGs in Normal Operation (23 hours each)+ Cooling Tower in Operation + both CTGs Diesel Tested (1 hour duration)
PM10	Annual	Two CTGs and Cooling Tower	Both CTGs in Normal Operation + Cooling Tower in Operation + 12 Diesel Tests

Table 4.2-17
Dispersion Modeling Source Location and Stack Parameters
During Normal Operation

Source ID	Easting (m)	Northing (m)	Elevation (m)	Release Height (m)	Temp (K)	Stack Vel (m/s)	Stack Dia (m)	Emission (g/s)			
								NO_X	SO_2	CO	PM10
CTG01	371935	3790125	282	41.15	358	18.85	6.1	2.436	0.269	3.551	2.058
CTG02	371965	3790150	282	41.15	358	18.85	6.1	2.436	0.269	3.551	2.058
COOLT	372095	3790180	282	16.76	311	7.80	11.0	N/A	N/A	N/A	0.373

m = meters
^oK = Kelvin
m/s = meters/second
g/s = grams/second

Table 4.2-18
Dispersion Modeling Source Location and Stack Parameters
During Normal Startup

Source ID	Easting (m)	Northing (m)	Elevation (m)	Release Height (m)	Temp (K)	Stack Vel (m/s)	Stack Dia (m)	Emission (g/s)			
								NO_X	SO_2	CO	PM10
CTG01	371935	3790125	282	41.15	355	10.19	6.1	2.5	0.1	12.6	1.26
CTG02	371965	3790150	282	41.15	355	10.19	6.1	2.5	0.1	12.6	1.26
Note - Although two turbines are shown in the table, only one turbine will be in normal startup at any time.											

Table 4.2-19
Dispersion Modeling Source Location and Stack Parameters
During Diesel Fuel Readiness Testing

Source ID	Easting (m)	Northing (m)	Elevation (m)	Release Height (m)	Temp (K)	Stack Vel (m/s)	Stack Dia (m)	Emission (g/s) [a]			
								NO_X	SO_2	CO	PM10
CTG01	371935	3790125	282	41.15	415	20.0	6.1	39.47	12.43	3.32	2.93
CTG02	371965	3790150	282	41.15	415	20.0	6.1	39.47	12.43	3.32	2.93
Note - Although two turbines are shown in the table, only one turbine will be in diesel fuel readiness testing at any time. [a] = Based on maximum hourly emissions.											

4.2.2.4 Toxic Air Contaminant Health Risk Assessment

The impact of toxic air contaminants was determined by performing a HRA. The impacts that are addressed in the HRA include carcinogenic, chronic noncarcinogenic, and acute noncarcinogenic health risks. Additional details of the HRA are found in Appendix F.

In order to estimate the "worst-case" carcinogenic and noncarcinogenic risks from the operation of the equipment at the VGS, the emissions from the three operating modes (normal operating, normal startup, and diesel readiness 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. As with the criteria pollutants, discussed above, the air emissions from the proposed project were modeled with no adjustment made for the emission reductions associated with the removal of the existing equipment at the facility. This allows for prediction of the "worst case" impact to ambient air quality at any receptor.

- For estimating the "worst-case" acute hazard index (noncarcinogenic health impact), it was assumed that both CTGs would be operating normally at full load.
- For estimating the "worst-case" chronic hazard index (noncarcinogenic health impact) and the carcinogenic health risk, it was assumed that both CTGs would operate at full load throughout the year (8,760 hours for each CTG), and both CTGs would be tested for diesel fuel readiness during the year (12 tests/year, one test/month, and one hr/test for each CTG).

It may be mentioned that the preliminary estimates of the acute hazard index for the three operating modes described above indicated that the worst-case scenario would be when both the CCTs would be operating in normal mode. Acrolein was identified as the largest contributor to the acute hazard index. Since acrolein will not be emitted during diesel readiness testing, this operational mode was not expected to yield the maximum acute hazard index. In addition, during startup mode the quantity of fuel used and thus the emission rates of air toxics would be less than the normal operation mode and the stack exit parameters would be similar to normal operation. Thus, acute hazard index is expected to be lower during the startup mode in comparison to normal operation mode. A summary of maximum hourly and annual average TAC emission rates is presented in Table F-2.

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 the VGS site. The ACE2588 model, which is accepted by the CAPCOA, has been widely used for health risk assessments required 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 OEHHA (SCAQMD, 2001; 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 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 VGS site are included in Appendix F.

Dose-Response Assessment

The dose-response data, used in the HRA, were extracted from the SCAQMD 2000 and 2001 and the 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), were included in this analysis. A complete listing of exposure and pathway assumptions and output files are available for public inspection by contacting the SCAQMD's Public Information Center at (909) 396-2039.

4.2.3 Significance of Project Operational Emissions

4.2.3.1 Daily Mass Emissions

The operating scenario that results in the maximum daily mass emissions varies by pollutant. The maximum daily mass emissions, by pollutant, are based on the following operating scenarios:

CO	4-hr start-up plus 20-hours of normal operation for two CTGs.
NO_x	1-hr diesel readiness test plus 23-hours of normal operation for one CTG; 24-hours normal operation for one CTG.
PM10	1-hr diesel readiness test plus 23-hours of normal operation for one CTG; 24 hours normal operation for one CTG; 24-hours normal operation for the cooling tower.
SO_2	1-hr diesel readiness test plus 23-hours of normal operation for one CTG; 24-hours normal operation for one CTG.
VOC	24-hours of normal operation for two CTGs.

Because the existing electrical generating equipment at VGS will be decommissioned when the proposed project is implemented, the emission reductions associated with the existing equipment (see Table 3.2-5) will be subtracted from the project-related emissions. This will represent a "worst case" emissions increase because the average daily historical emissions are subtracted from the maximum peak-daily project emissions.

A summary of the resulting maximum peak-daily operation-related non-RECLAIM mass emissions associated with the project site is shown in Table 4.2-20. A comparison of the daily mass operational emissions to the SCAQMD criteria pollutant significance thresholds is also presented in Table 4.2-20. As shown in Table 4.2-20, operation-related emissions of CO, VOC, SO_x and PM10 exceed the significance criteria identified in Table 4.2-1.

A summary of operational RECLAIM pollutant (NO_X) emissions is shown in Table 4.2-21. As discussed previously at the beginning of Subsection 4.2, the significance determination is based on whether direct NO_X emissions, when added to the annual allocation (2002) including purchased RTCs are greater than the Initial 1994 RECLAIM allocation plus NTCs plus the maximum daily operation NO_X significance threshold of 55 pounds per day. Based on this comparison, the direct NO_X emissions from the installation of CTGs are not expected to result in significant impacts.

Table 4.2-20
Overall Peak Daily Operational Non-RECLAIM Daily Mass Emissions (Pre-Mitigation)

Source	CO (lb/day)	VOC (lb/day)	SO_X (lb/day)	PM10 (lb/day)
Combustion Turbines (CTG)[a]	1,778.8	256.3	198.7	790.3
Cooling Tower				71
Total	**1,778.8**	**256.3**	**198.7**	**861.3**
Indirect Emissions (Aqueous Ammonia Delivery Trucks)	0.0	0.0	0.0	0.0
Total Project	**1,778.8**	**256.3**	**198.7**	**861.3**
Average Daily Historical Emissions	(97.8)	(57.6)	(7.7)	(16.3)
Net Emissions Increase	1,681	199	191	845
Significance Threshold	*550*	*55*	*150*	*150*
Significant? (Yes/No)	Yes	Yes	Yes	Yes

[a] Emissions for two CTGs.

Table 4.2-21
Project RECLAIM NO_X Peak Daily Emissions

Criteria	Emissions
CTG NO_X Emissions (lb/day)	1,221
Average Daily Historical Emissions	(526)
Net Emissions Increase	695

2002 RECLAIM NO_X allocation (lb/day)[a]	271
Total (lb/day)	**966**
Significance Threshold	1,542
Significant? (Yes/No)	**No**
[a] The 2002 facility allocation for NO_X includes purchased RTCs and is converted to pounds per day. This value was taken from the Facility Permit to Operate. The value from the column headed NO_X RTC Holding was selected.	

4.2.3.2 Localized Ambient Air Quality Impacts

The dispersion modeling results and a determination of whether CO, PM10, NO_X, and SO_X emissions from the project exceed the significance criteria presented in Table 4.2-1 are discussed in the following subsections.

<u>Carbon Monoxide and Particulate Matter</u>

The dispersion modeling results for the CO and PM10 analyses are provided in Table 4.2-22. Figure 4.2-1 presents the locations of the receptor grids used to determine the maximum CO impacts. Figure 4.2-2 presents the locations of the receptor grids used to determine the maximum PM10 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 PM10. Therefore, significant adverse CO or PM10 localized air quality impacts are not expected from the operation of the CTGs, HRSGs, STG, SCR, or cooling tower.

Table 4.2-22
Summary of CO and PM10 Impacts

Pollutant	Averaging Period	Significant Change Threshold ($\mu g/m^3$)	Predicted [a] Maximum Ground Level Impact ($\mu g/m^3$)	Significant? (Yes/No)	Location of Maximum Ground Level Concentration	
					UTM E (m)	UTM N (m)
PM10	24-hr Annual	2.5 1	2.43 0.49	N N	373,220 373,220	3,794,445 3,794,445
CO	1-hr 8-hr	1,100 500	94.1 62.8	N N	371,083 370,583	3,792,143 3,791,843

a = Based on operating scenarios listed in Table 4.2-16

<u>Nitrogen Dioxide and Sulfur Dioxide</u>

The project site is located within the SCAQMD's East San Fernando Valley monitoring area. Recent background air quality data for NO_X and SO_2 for the East San Fernando Valley monitoring station and estimated NO_X and SO_2 air quality impacts from the project site are presented in Table 4.2-23. The 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.

The dispersion modeling results indicate that NO_X and SO_X emissions from operation-related activities at the VGS do not exceed the NO_X and SO_2 standards. Therefore, significant NO_X or SO_2 localized air quality impacts are not expected from the operation of the CTGs, HRSGs, STG, SCR, and cooling tower.

Table 4.2-23
Summary of NO_X and SO_2 Impacts

Averaging Period	Maximum[a] Predicted Impacts (μg/m^3)	Estimated Background Concentration[b] (μg/m^3)	Total Concentration (μg/m^3)	State Standard (μg/m^3)	National Standard (μg/m^3)	Significant? (Yes/No)
SO_2						
1-hour	35.7	26	61.7	650	--	N
3-hour	30.8	26	56.8	--	1300	N
24-hour	10.1	23.6	33.7	109	365	N
Annual	0.1	0.5	0.6	--	80	N
NO_X						
1-hour	113.6	338.4	452.0	470	--	N
Annual	0.74	85.7	86.4	--	100	N

a = Based on operating scenarios listed in Table 4.2-16.
b = Maximum concentration for three-year period, 1999-2001 at East San Fernando Valley monitoring site (069)

4.2.3.3 Health Risks

The results of the ACE2588 analysis indicate a MEI cancer risk of 0.69 in one million (0.69 x 10^{-6}) at a distance of approximately 2.3 km northwest of the project site. The pathway contribution to the total carcinogenic risk is shown in Table 4.2-24.

A maximum chronic hazard index of 0.06 was calculated for the respiratory endpoint at a receptor approximately 2.3 km northwest from the project site. The two pollutants contributing most to the chronic hazard index for the MEI were acrolein (46 percent) and ammonia (45 percent).

The MEI for the acute analysis is located at a receptor approximately 2.3 km north-northwest of the VGS site. A maximum acute hazard index of 0.23 was calculated for the respiratory and eye endpoints, primarily from acrolein (89 percent).

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

Table 4.2-24
70-Year Cancer Risk per Million for the Maximum Exposed Individual

Pollutant	Inhale	Dermal	Soil	Plants	Sum
Acetaldehyde	3.33E-08	0.00E+00	0.00E+00	0.00E+00	3.33E-08
Arsenic	1.60E-08	4.00E-10	1.89E-08	7.88E-09	4.32E-08
Benzene	3.49E-08	0.00E+00	0.00E+00	0.00E+00	3.49E-08
Beryllium	8.17E-11	0.00E+00	0.00E+00	0.00E+00	8.17E-11
Butadiene-1,3	1.95E-09	0.00E+00	0.00E+00	0.00E+00	1.95E-09
Cadmium	8.58E-10	0.00E+00	0.00E+00	0.00E+00	8.58E-10
Chloroform	5.81E-09	0.00E+00	0.00E+00	0.00E+00	5.81E-09
Chromium (hex.)	1.02E-09	1.57E-12	7.41E-12	2.98E-12	1.03E-09
Formaldehyde	4.94E-07	0.00E+00	0.00E+00	0.00E+00	4.94E-07
Lead	4.56E-12	1.78E-13	8.40E-12	3.53E-12	1.67E-11
Nickel	7.97E-09	0.00E+00	0.00E+00	0.00E+00	7.97E-09
Propylene oxide	1.59E-08	0.00E+00	0.00E+00	0.00E+00	1.59E-08
benz[a]anthracene	2.29E-10	2.18E-10	3.43E-10	2.50E-09	3.29E-09
Benzo[a]pyrene	1.43E-09	1.36E-09	2.15E-09	1.56E-08	2.05E-08
Benzo[b]fluoranthrene	1.21E-10	1.15E-10	1.81E-10	1.32E-09	1.73E-09
Benzo[k]fluroanthrene	1.18E-10	1.12E-10	1.76E-10	1.28E-09	1.69E-09
Chrysene	2.56E-11	2.44E-11	3.84E-11	2.79E-10	3.68E-10
Dibenz[a,h]anthracene	2.60E-09	7.74E-10	1.22E-09	8.86E-09	1.35E-08
Indeno[1,2,3-cd]pyre	8.66E-10	2.27E-10	3.57E-10	2.59E-09	4.04E-09
Tetra-p-dioxin	8.94E-11	0.00E+00	0.00E+00	0.00E+00	8.94E-11
1,2,3,4,6,7,8-Hepdio	4.01E-12	0.00E+00	0.00E+00	0.00E+00	4.01E-12
1,2,3,4,6,7,8-Octa	2.55E-12	0.00E+00	0.00E+00	0.00E+00	2.55E-12
1,2,3,4,5,6,7,8-Octf	2.06E-13	0.00E+00	0.00E+00	0.00E+00	2.06E-13
Pentachlor-p-dioxin	8.51E-11	0.00E+00	0.00E+00	0.00E+00	8.51E-11
Hexachlor-p-dioxin	2.15E-11	0.00E+00	0.00E+00	0.00E+00	2.15E-11
Tetrachlor-furan	7.97E-11	0.00E+00	0.00E+00	0.00E+00	7.97E-11
Pentachlor-furan	5.57E-10	0.00E+00	0.00E+00	0.00E+00	5.57E-10
Hexachlor-furan	5.75E-11	0.00E+00	0.00E+00	0.00E+00	5.75E-11
Heptachlor-furan	3.99E-12	0.00E+00	0.00E+00	0.00E+00	3.99E-12
Total Risk	**6.18E-07**	**3.23E-09**	**2.34E-08**	**4.03E-08**	**6.85E-07**
Based on both turbines in normal operating mode 8760 hours/year per turbine, cooling tower emissions, and 12 diesel readiness tests per year per turbine.					

4.2.4 Carbon Monoxide Impacts Analysis

Increases in traffic from a project may 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:

- The project is anticipated to reduce the level of service (LOS) of an intersection rated at C or worse by one full level; or
- 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 4.7), the volume-to-capacity at the San Fernando Road and Sheldon Street intersection, which is currently rated D+, may increase by more than 0.02 from construction workers leaving the VGS site at the end of the work day. This is the only intersection that meets either of the above criteria during either construction or operations.

Sensitive receptors are identified in Figure 5.1 of the SCAQMD CEQA Handbook (1993) 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 significant adverse CO impacts on sensitive receptors.

These emissions are temporary and are expected to cease within six months. Therefore, long-term exposure to construction-related CO that could result in significant adverse human health affects to nearby project site sensitive receptors is not expected.

4.2.5 AQMP Consistency

CEQA requires that any inconsistencies between the proposed project and applicable regional and local plans (CEQA Guidelines § 151265(d)) be addressed in the EIR. The 1997 AQMP and the 1999 amendments to the AQMP demonstrate that the state and national ambient air quality standards can be achieved within the required timeframes. The District has lead responsibility for the development of the AQMP. The Southern California Association of Governments (SCAG) develops strategies for the implementation of the AQMP and facilitates the implementation of the strategies. The proposed project is being undertaken for several reasons, but the relevant reason with regards to the AQMP is to comply with Regulation XX - RECLAIM. Accordingly, projects that comply with SCAQMD rules and regulations are considered consistent with the AQMP and other regional plans.

4.2.6 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 4.2-5, construction-related onsite and offsite diesel exhaust particulate matter emissions are estimated to be approximately 23 and five 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 adverse human health affects to nearby project site sensitive receptors is not expected.

Additionally, as shown in discussed in subsection 4.2.2.2 above, peak daily operation-related diesel exhaust particulate matter emissions are not anticipated to increase.

4.2.7 Mitigation Measures

4.2.7.1 Construction Mitigation Measures

As indicated in Table 4.2-5, construction-related activities associated with the proposed project may have significant unmitigated air quality impacts for CO, VOC, NO_X, and PM10.

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

Mitigation measures for each emission source and the estimated control efficiency of each mitigation measure are listed in Table 4.2-25. As shown in the table, no feasible[5] mitigation measures 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.

Table 4.2-25
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 PM10	PM10	16[a]
AQ-2	Proper equipment maintenance	Construction Equipment Exhaust	VOC NO_x SO_x PM10 CO	5 5 5 5 0
AQ-3	Prior to use in construction, the project proponent will evaluate the feasibility of retrofitting the large off-road construction equipment that will be operating for significant periods. Retrofit technologies such as selective catalytic reduction, oxidation catalysts, air enhancement technologies, etc. will be evaluated. These technologies will be required if they are commercially available and can feasibly be retrofitted onto construction equipment.	Construction Equipment Exhaust	CO VOC NO_X SO_X PM10	Unknown Unknown Unknown Unknown Unknown

[5] 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 4.2-25 (Concluded)
Construction-Related Mitigation Measures and Control Efficiency

Mitigation Measure	Mitigation	Source	Pollutant	Control Efficiency (%)
AQ-4	Use low sulfur diesel (as defined in SCAQMD Rule 431.2) where feasible.	Construction Equipment	SO_X PM10	Unknown
	No feasible measures identified[b]	On-Road Motor Vehicles	VOC NO_x PM10 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.

Estimated peak daily mitigated emissions by construction activity are listed in Table 4.2-26. The overall peak daily mitigated construction-related emissions are anticipated to occur during simultaneous foundation construction, and paving and equipment installation. The overall peak daily mitigated construction-related emissions are summarized in Table 4.2-27. The implementation of mitigation measures, while reducing emissions, does not reduce the construction-related CO, VOC, NO_X, or PM10 impacts below significance.

Table 4.2-26
Peak Daily Construction Emissions for Each Construction Phase (Mitigated)

Activity	Location	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM10 (lb/day)	Fugitive PM10 (lb/day)	Total PM10 (lb/day)
Grading	Onsite	14.0	3.5	25.7	2.4	1.3	3.1	4.5
	Offsite	4.5	0.3	0.3	0.0	0.0	0.1	0.2
	Total	18.5	3.8	26.0	2.4	1.3	3.3	4.6
Foundations and Paving	Onsite	151.1	14.4	73.1	5.8	4.2	38.4	42.5
	Offsite	404.3	28.9	83.4	0.0	2.9	108.2	111.1
	Total	555.4	43.2	156.6	5.8	7.1	146.7	153.6
Equipment Installation	Onsite	172.2	59.0	315.6	26.2	17.9	0.0	17.8
	Offsite	915.1	60.3	74.9	0.0	1.7	64.8	66.5
	Total	1,087.3	119.3	390.6	26.2	19.5	64.8	84.3

Table 4.2-27
Overall Peak Daily Emissions During Construction (Mitigated)

Source	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	Exhaust PM10 (lb/day)	Fugitive PM10 (lb/day)	Total PM10 (lb/day)
Onsite Construction Equipment Exhaust	306.5	50.4	403.8	33.7	23.0	--	23.0
Mitigation Reduction (%)	0%	5%	5%	5%	5%	--	--
Mitigation Reduction (lb/day)	0.0	-2.5	-20.2	-1.7	-1.1	--	-1.1
Remaining Emissions	**306.5**	**47.9**	**383.6**	**32.0**	**21.8**	--	**21.8**
Onsite Motor Vehicles	16.8	2.9	5.1	0.0	0.2	--	0.2
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	**16.8**	**2.9**	**5.1**	**0.0**	**0.2**	**--**	**0.2**
Onsite Fugitive PM10	--	--	--	--	--	45.7	45.7
Mitigation Reduction (%)	--	--	--	--	--	16%	--
Mitigation Reduction (lb/day)	--	--	--	--	--	-7.3	-7.3
Remaining Emissions	--	--	--	--	--	**38.4**	**38.4**
Asphaltic Paving	--	1.6	--	--	--	--	--
Mitigation Reduction (%)	--	0%	--	--	--	--	--
Mitigation Reduction (lb/day)	--	0.0	--	--	--	--	--
Remaining Emissions	--	**1.6**	--	--	--	--	--
Architectural Coating	--	21.0	--	--	--	--	--
Mitigation Reduction (%)	--	0%	--	--	--	--	--
Mitigation Reduction (lb/day)	--	0.0	--	--	--	--	--
Remaining Emissions	--	**21.0**	--	--	--	--	--
Total Onsite	**321.8**	**72.7**	**386.8**	**32.0**	**21.9**	**38.4**	**60.3**
Offsite Motor Vehicles	1,319.4	89.1	158.4	0.0	4.5	173.0	177.6
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	**1,319.4**	**89.1**	**158.4**	**0.0**	**4.5**	**173.0**	**177.6**
Total Offsite	**1,319.4**	**89.1**	**158.4**	**0.0**	**4.5**	**173.0**	**177.6**
TOTAL	**1,642.7**	**162.5**	**547.1**	**32.0**	**26.6**	**211.5**	**237.8**
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, SO_X and PM10 emissions are anticipated to occur during simultaneous foundation construction, paving and equipment installation at the project site. The emissions associated with each source and an estimate of the reductions associated with the proposed mitigation measure(s) are listed in Table 4.2-27. The implementation of mitigation measures, while reducing emissions, does not reduce the construction-related CO, VOC, NO_X, or PM10 impacts below significance.

4.2.7.2 Operational Mitigation Measures

Operation-related activities associated with the proposed project may have significant unmitigated air quality impacts for CO, SO_x, VOC, and PM10.

Pursuant to Rule 1304(a)(2), LADWP is not required to provide emission offsets when replacing electric utility steam boilers with CTGs unless there is an increase in generating capacity. If there is a net increase in capacity, LADWP would be required to provide offsets only for the increase in capacity. LADWP is decommissioning four electric utility steam boilers with a net capacity of 526 MW as part of the proposed project, and replacing them with CTGs with a net capacity of 532 MW. LADWP will be required to provide offsets for VOC, PM10, CO, and SO_x for only 6 MW of generating capacity to satisfy the requirements of Regulation XIII.

However, VOC is an ozone precursor and is considered to be a regional pollutant. Under CEQA, offsets are a viable mitigation measure for regional pollutants. Offsets provided in this context are provided for CEQA mitigation to reduce the significant impacts to levels of insignificance and are independent of the Rule 1304 exemption described above, which applies to the permitting action.

Unmitigated SO_x emissions exceed the significance criteria. The emissions associated with the one-hour diesel fuel readiness testing contribute almost 50 percent of the total for peak daily SO_x emissions. The use of low sulfur diesel fuel during readiness testing will reduce the significant impact of SO_x emissions to insignificance. Due to the use of natural gas as the primary fuel, SO_x emissions during normal operation of the CTGs would not be significant.

For CO and PM10 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.

The feasible mitigation measures for operating emissions are presented in Table 4.2-28.

Table 4.2-28
Operation-Related Mitigation Measures and Control Efficiency

Mitigation Measure	Mitigation	Source	Pollutant	Control Efficiency (%)
AQ-5	Use low sulfur diesel (as defined in SCAQMD Rule 431.2).[a]	Diesel readiness testing	SO_x	97%
AQ-6	Provide VOC Offsets	Combustion contaminant	VOC	N/A
	No feasible measures identified	Fuel combustion in CTGs	PM10 CO	N/A N/A
a - Pursuant to Rule 431.2, low sulfur diesel will be required for use in stationary sources by June 2004. The project is expected to be operational prior to that date. The use of low sulfur diesel is therefore an appropriate mitigation measure for the project.				

The overall peak daily mitigated operation-related emissions are summarized in Table 4.2-29. The implementation of mitigation measures, while reducing emissions, does not reduce the operation-related CO or PM10 impacts below significance.

Table 4.2-29
Overall Peak Daily Operational Non-RECLAIM Daily Mass Emissions (Mitigated)

Source	CO (lb/day)	VOC (lb/day)	SO_X (lb/day)	PM10 (lb/day)
Combustion Turbines (CTG)[a]	1,778.8	256.3	198.7	790.3
Cooling Tower				71
Total	**1,778.8**	**256.3**	**198.7**	**861.3**
Indirect Emissions (Aqueous Ammonia Delivery Trucks)	0.0	0.0	0.0	0.0
Total Project	**1,778.8**	**256.3**	**198.7**	**861.3**
Average Daily Historical Emissions	(97.8)	(57.6)	(7.7)	(16.3)
Net Emissions Increase (Pre-Mitigation)	1,681	199	191	845
Emission Reduction Due to Mitigation	0	199	(95.6)	0
Net Emissions with Mitigation	**1,681**	**0**	**95**	**845**
Significance Threshold	*550*	*55*	*150*	*150*
Significant? (Yes/No)	Yes	No	No	Yes
a - Emissions for two CTGs.				

4.2.8 Remaining Impacts

4.2.8.1 Construction

Although the above mentioned mitigation measures will reduce emissions, construction-related CO, VOC, NO_X, and PM10 impacts will not be reduced to levels of insignificance.

4.2.8.2 Operation

Low-sulfur diesel fuel will be used during diesel fuel readiness testing to reduce peak daily SO_x emissions to levels of insignificance. VOC is an ozone precursor and is considered to be a regional pollutant. Therefore, offsets can be used to mitigate significant VOC impacts to levels of insignificance.

No feasible mitigation measures have been identified to reduce CO or PM10 emissions from operations to insignificant levels, and offsets cannot be used to mitigate significant CO or PM10 impacts. Therefore, impacts from CO and PM10 emissions will not be reduced to insignificant levels.

4.3 Geology and Soils

Geologic, soil and seismic impacts 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 or slope failure, slope failure, or liquefaction-related failure); or
- Topographic alterations result in significant changes that affect soil erosion and/or drainage.

4.3.1 Construction Impacts

Construction will require some minor grading and excavation at the project site. Grading and excavation activities are not expected to cause significant topographic alterations or secondary seismic effects.

4.3.1.1 Expansive Soil

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

4.3.1.2 Erosion

Erosion from wind or water could occur during construction activities (e.g., grading, excavating backfilling, trenching, storage piling, etc.) at the site as soils will be exposed to the elements.

Standard construction grading practices and retention features will control runoff. Further, routine dust abatement measures including watering of the exposed soil for dust control will minimize wind erosion. The combination of these factors will combine to keep erosional impacts to an insignificant level.

4.3.1.3 Soil Contamination

Although soil sampling conducted by LADWP for specific areas within the project site 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).

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. The TRPH concentrations in the soil samples were significantly less than the Los Angeles Regional Water Quality Control Board 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 U.S. EPA Region 9 Preliminary Remediation Goals for both residential and industrial sites. Based on the reviewed data, the potential for encountering soil contamination is considered low. However, in the event that contaminated soils are encountered during project site construction-related activities, the soils will be treated/disposed in accordance with applicable local, state, and federal rules and regulations. Appropriately trained individuals will be used consistent with OSHA requirements in the unlikely event contaminated soils are encountered during construction. The potential for soil contamination would not be considered significant.

4.3.2 Operation Impacts

4.3.2.1 Seismicity - Ground Rupture

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

4.3.2.2 Seismicity - Ground Shaking

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

4.3.2.3 Seismicity - Liquefaction

Liquefaction is a mechanism of ground failure whereby earthquake-induced ground motion transforms loose, water-saturated granular material to a liquid state. Based on boreholes drilled at the site, groundwater is deeper than 50 feet, therefore, the potential for liquefaction is not considered significant.

4.3.2.4 Seismicity - Slope Stability

The potential for slope instability adjacent to the pond wall 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 exists at the gravel pit. Therefore, appropriate measures will be necessary to mitigate the potential landslide hazard at the VGS site (Subsection 4.3.3).

4.3.2.5 Subsidence

Due to the dense, granular nature of the subsurface materials, subsidence is not expected to be significant at the site.

4.3.3 Mitigation Measures

The mitigation measures are presented below in Table 4.3-1 to address the potential for seismically induced slope instability at the site:

Table 4.3-1
Geology/Soils Mitigation Measures

Mitigation Measures	Mitigation	Source
GS-1	Foundation elements will be set back a minimum of 200 feet from the pit walls.	Seismically induced slope instability

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

4.3.4 Remaining Impacts

The above mentioned mitigation for seismically induced slope instability will reduce the potential significant impacts related to geology and soils to insignificant levels. There will be no remaining significant impacts.

4.4 Hazards and Hazardous Materials

This section addresses potential hazards and risk of upset scenarios associated with the proposed VGS project. 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. 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;
- Increased use of natural gas;
- 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; or
- Significant exceedance of the U.S. EPA 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 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, during construction and operation of the proposed project, LADWP will incorporate the following: modern industrial technology and design standards; regulatory health and safety codes and guidelines; and training, operating, inspection, and maintenance procedures to 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 site 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 power generating equipment, 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 the project site 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 start of operations.

Since compliance with applicable safety design codes, guidelines, and procedures is expected, the following hazard analysis concentrates on potential upset scenarios (e.g., accidental aqueous ammonia releases) that may result in risk of serious injury or substantial chemical exposure. The analysis presents 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 the 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 Appendix D).

4.4.1 Overview of Approach

The hazard analysis addresses only processes that are being added or modified to the VGS 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[6]
5. Assess Consequences

Each step is described in detail in the subsequent subsections.

4.4.2 Hazardous Chemicals Associated with the Project

For the proposed project, the 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:

- Installation of two new aboveground 20,000-gallon aqueous ammonia storage tanks and a change in service for one existing aboveground storage tank from fuel oil service to distillate service. The risk associated with distillate storage was assumed to be equal to the risk of fuel oil storage, as both are petroleum products with approximately the same composition. Therefore, only the incremental risk associated with the rupture of a single ammonia storage tank resulting in spilling its entire contents of 20,000 gallons into a 120-percent containment dike was estimated.
- Incremental delivery of aqueous ammonia at VGS. It is estimated that two to three additional 5,000-gallon tanker truck deliveries per month will be made to VGS to supply aqueous ammonia to the SCR systems associated with the new HRSGs. 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 an increase in deliveries to the VGS. Two accident scenarios were considered consisting of a tank truck accident releasing the entire 5,000-gallon contents and an improper hook-up during delivery that allows 200 gallons to spill. The incremental risk of releasing the entire contents of a 5,000-gallon tanker truck was modeled and the risk associated with an improper hook-up was compared to a zero baseline.
- A connector to an existing natural gas pipeline will be installed to supply the new CCGF. The risk associated with the rupture of the connector was estimated.

[6] Although hazards analyses prepared by some public agencies include likelihood of accidents, the SCAQMD includes this for informational purposes only. Conclusions regarding significance do not involve using likelihood.

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.

A truck accident could occur anywhere along the delivery route. However, major truck accidents are not likely and it is 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. Even though a truck accident is unlikely, the risk associated with an accident has been evaluated. 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 (U.S. EPA 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 U.S. EPA risk management limit). This is an 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.

4.4.3 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.

4.4.3.1 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 AHM release scenarios were defined, because most ammonia vapor will be indirectly released from the surface of spilled liquid. Emissions from liquid spills are discussed below.

4.4.3.2 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 site will contain a concentration of 29.5 percent ammonia, which does not present the hazards of anhydrous ammonia.

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. This issue will be further assessed.

4.4.3.3 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 in a form that would be carried offsite by the above described transport mechanisms. Spent SCR catalyst will be preferentially recycled or properly disposed. Therefore, no toxic solid hazard impacts are anticipated from the proposed project and will not be further analyzed.

4.4.3.4 Natural Gas Fire

Natural gas will be used as a fuel source for the new CTGs at VGS. In the case of a gas pipeline rupture, potential fires and explosions could have an offsite impact. The VGS is currently using natural gas as a fuel source for existing power generating equipment.

The new gas hook-ups at the VGS will be 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 4.4.3.8.

4.4.3.5 Liquid Pool Fire

Combustible, liquid-phase materials (e.g., gasoline) will not be used in the new units of this project and distillate was assumed to present equal hazards to fuel oil. Therefore, liquid fires were not modeled.

4.4.3.6 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.

4.4.3.7 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 a pipeline, and to 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.

4.4.3.8 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.

The VGS is currently using natural gas for fueling power generating equipment. An explosion scenario was therefore modeled for the new gas connector pipeline that will carry natural gas from the main pipeline to the new equipment.

4.4.3.9 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 4.4.3.6 above, no dust explosion potential is expected for the proposed project and was not further analyzed.

4.4.3.10 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 in pressurized vessels.

4.4.4 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.

<u>Severity</u>

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 U.S. EPA 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.

<u>Toxic Exposure Endpoint</u>

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 U.S. EPA 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.

<u>Blast Evaluation Endpoint</u>

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 U.S. EPA 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.

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 Appendix D. Although the likelihood of a risk of upset event is estimated for the various scenarios analyzed, the SCAQMD does not use likelihood (probability) to determine significance. Only consequence (exposure to hazards) is used to determine hazard impacts.

4.4.5 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.

4.4.6 Assess Consequences

Consequence modeling was performed for the risk scenarios identified below. The purpose of the modeling was to estimate the 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 U.S. EPA'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 site is expected to be 29.5 percent. However, to calculate ammonia emissions for modeling purposes, U.S. EPA's data for aqueous ammonia with a 30 percent concentration was used, as 29.5 percent concentration data were not available. 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 impacts. The results of the model runs are summarized in Table 4-4-1. Figure 4.4-1 shows the appropriate impact range for cases evaluated[7].

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

Table 4.4-1
Distance in Meters to Endpoint from Center of Upset

Case	Event	Natural Gas Explosion	Ammonia Release
1	Aqueous Ammonia Tank Failure to Diked Containment (20,000 gallons)	NA	500
2	Ammonia Truck Spill Unconfined (5,000 gallons)	NA	2,300
3	Bad Connect/Disconnect Unconfined (200 gallons)	NA	500
4	Ruptured Natural Gas Pipeline (10 Minute Cloud Plus Explosion)	300	NA

- Case 1: 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. The simultaneous catastrophic failure of multiple tanks is improbable (approximately one per 1,000 years) therefore only one of the two 20,000-gallon storage tanks was assumed to fail. Table 4.7-1 shows that with aqueous ammonia, the size of the impact zone for a confined release is about 500 meters until the 200-ppm endpoint is reached. The most likely failure would be caused by an external event such as an earthquake. Based on SCAQMD criteria, a spill would result in significant adverse impacts.
- Case 2: estimates 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 (U.S. EPA 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. Therefore, an unconfined release of aqueous ammonia would result in significant impacts. The expected accident frequency will be based on three deliveries 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.

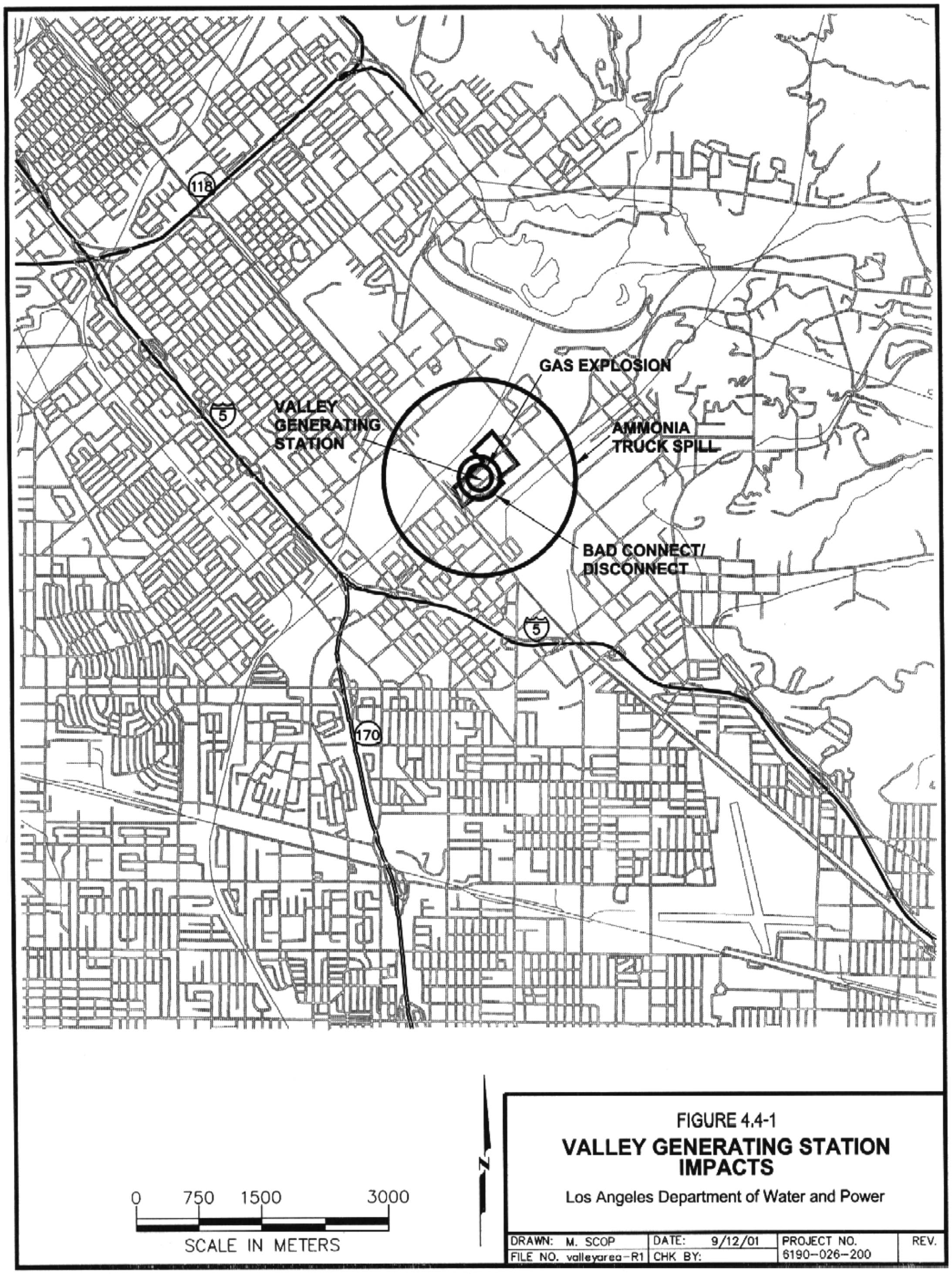

Figure 4.4-1 Valley Generating Station Impacts

- 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 the new storage tank. 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. Therefore, a partial spill of aqueous ammonia would result in significant adverse impacts. The expected accident frequency is based on one connect and disconnect per week. A minor spill can be expected about once per 80 years and a larger (200-gallon spill) about once per 800 years.
- Case 4: assumes that the connecting pipeline from the main line to one new unit is ruptured and releases a cloud of natural gas for 10 minutes which then explodes. The impact was estimated to extend for 300 meters in any direction surrounding the breach. Therefore, the rupture of the natural gas connector would result in significant adverse impacts. 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).

It should be noted that the upsets that were modeled are not likely to occur and were very conservatively based on U.S. EPA 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 occurs, the truck accident has the highest potential impact. The consequences also do not take credit for measures that LADWP has in place or will have in place when the project is completed. Mitigation measures are discussed in Subsection 4.4.8 below.

4.4.7 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 4.7. 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 the VGS facility. The proposed project will require the use of a maximum of approximately 36 tanker truck deliveries of aqueous ammonia per year. The average distance traveled by ammonia trucks per year was estimated from all trips at approximately 1,300 miles per year. See Case 2 in Section 4.4.6 for additional information.

4.4.8 Prevention Program and Mitigation Measures

The potential incremental increase in risk that will result from the 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 U.S. EPA risk management exposure endpoints offsite for the additional use of natural gas and 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. Mitigation measures are identified in Table 4.4-2. These measures will be implemented to further reduce the risks associated with the proposed project.

Table 4.4-2
Hazards and Hazardous Materials Mitigation Measures

Mitigation Measures	Mitigation	Source
HH-1	Manual shutdown of liquid into or out of the tank, which will minimize the quantity of an ammonia release.	Ammonia release from new ASTs
HH-2	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.	

Table 4.4-2 (Concluded)
Hazards and Hazardous Materials Mitigation Measures

Mitigation Measures	Mitigation	Source
HH-2 (continued)	• 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.	

4.4.9 Remaining Impacts

Although the above-mentioned mitigation measures will reduce the likelihood of significant impacts, the proposed project will still present the potential for significant hazards impacts related to ammonia and natural gas use because offsite consequences could still occur.

4.5 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 quality an important issue. 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 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; or
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.

4.5.1 Construction Impacts

Generally, 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 hydrostatic testing process will be routed to the existing process wastewater treatment systems and recycled, or discharged after treatment along with the process wastewater to the industrial sewer.

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 an existing general NPDES permit for construction dewatering.

Project-related construction activities such as hydrostatic testing or dewatering are not expected to affect ground water resources in the project area and wastewater generated from these construction activities will be minimal (approximately 2,710 gallons/day). Therefore, no significant adverse impacts to water quality from construction activities are anticipated.

Sanitary wastes at staging areas, such as the construction parking area, 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 will be discharged to the municipal sewer. Sanitary wastes will be minimal (less than 200 gallons per day) and would not create a significant adverse impact to existing sanitary sewer systems.

The proposed construction area at the VGS site encompasses approximately 13 acres. A Stormwater Construction Permit will be obtained. A Stormwater Pollution Prevention Plan for construction activities that includes Best Management Practices (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 adverse impacts are expected from stormwater discharges during construction at VGS.

4.5.2 Operational Impacts

Potential operational impacts from proposed project activities are discussed below.

4.5.2.1 Process Wastewater Discharges

The VGS site currently operates on an intermittent basis, when there is high demand for electricity during the months of July through October. When operating, approximately 30,860 gallons per day of wastewater may be discharged to the municipal sanitary sewer system. As a result of the activities associated with the proposed project, approximately 1,008,000 gallons per day additional wastewater may be discharged. The additional wastewater will consist primarily of non-contact cooling water and residual water from the SCR system.

Industrial Wastewater Permit IU000025, which expires in February 2003, states that the wastewater flow is 30,860 gallons per day. According to the permit, this is not intended as maximum limits on the discharge; however, LADWP must give notice to the Department of Public Works, Bureau of Sanitation if flows are significantly different. As the proposed discharge is expected to be greater than the existing discharge, LADWP is required to notify the Bureau of

Sanitation of increased discharge. However, there is ample capacity in the City of Los Angeles sewer system for this increased discharge ~~(Los Angeles County Sanitation Districts, 2001)~~. Therefore, no significant impacts from wastewater discharge are expected to occur as a result of the proposed project.

4.5.2.2 Stormwater Quality

Stormwater runoff from the project site will not be adversely affected as a result of the proposed project. An existing Stormwater Pollution Prevention Plan (SWPPP) is in place and stormwater discharges at the site due to the proposed project will be in compliance with the existing permit conditions. The existing SWPPP will be updated to reflect the operational modifications associated with the proposed project and include additional BMPs, if required. Accordingly, since stormwater discharge of, or runoff to, the local stormwater system is not expected to change significantly in either volume or water quality, no significant adverse impacts to stormwater quality 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 two new ASTs, which will be constructed within secondary containment. 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 site.

4.5.2.3 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 groundwater 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, a 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 ASTs 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.

4.5.3 Mitigation Measures

No significant adverse impacts to water quality are expected as a result of proposed project activities at the VGS. The existing wastewater disposal system is adequate to meet the demand of the project. No changes to water quality are expected. Stormwater will be controlled, and neither surface water nor groundwater resources will be adversely affected. A Stormwater Pollution Prevention Plan for construction activities that includes BMPs will be developed and implemented. LADWP will also update and modify the existing SWPPP and Monitoring Plan for operations and the industrial wastewater permit, as necessary, prior to project startup. Therefore, no specific mitigation measures are required.

4.5.4 Remaining Impacts

No significant adverse impacts to water quality are expected as a result of proposed project activities at the VGS. Therefore, there will be no remaining significant adverse impacts.

4.6 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 4.6-1 presents the guidelines for noise compatible land use from the noise element of the General Plan of the City of Los Angeles.

Table 4.6-1
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

Table 4.6-1 (Concluded)
Guidelines for Noise Compatible Land Use

Land Use Category	Day-Night Average Exterior Sound Level (CNEL dB)						
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

4.6.1 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 4.6-2 presents ranges of noise level for various types of construction-related machinery that could potentially be used during the construction phase of the proposed project. Because of the nature of this activity, the types, numbers, periods of operation, and loudness of equipment will vary throughout the construction phase of the proposed project.

Table 4.6-2
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 VGS is scheduled to begin in spring of 2002 and be completed in summer of 2003. Construction activities are planned to occur six days per week, Monday through Saturday, from 6:00 am to 5:00 pm. For the purpose of this evaluation, it is assumed that current sources of noise within the 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 for delivery of construction materials 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 the facility during the temporary construction period is estimated to be small compared to the amount of vehicles operating on roadways in the vicinity of the facility. As existing vehicular traffic and nearby industrial sources are major contributors to the existing ambient noise environment at the facility, 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 proposed project and it was assumed that approximately half of the equipment would be in operation at any one time. 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 paragraphs 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 are anticipated to take place six days per week, Monday through Saturday, from 6:00 am to 5:00 pm. However, night and/or Sunday shifts may be required to ensure that construction activities stay on schedule. 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.

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. 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.

4.6.2 Operational Impacts

Based on LADWP specifications, the new equipment will be equipped with enclosures and air inlet silencers, and will generate no greater than 85 dBA at a reference distance of three feet. The CTGs 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 a CTG would result in a noise level of 70 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 a CTG is predicted to be 54 dBA. A hospital, emergency care clinic, and two motels are located approximately 1,100 feet from the subject site along San Fernando Road. The maximum noise level at these receptors is predicted to be 61 dBA. The nearest commercial/industrial receptors are located a minimum of 1,000 feet from the proposed location of the new equipment. Based on distance, maximum noise levels of 68 dBA are predicted at the industrial/commercial receptors located nearest to the site. Table 4.6-3 contains a summary of maximum predicted noise levels for VGS operations.

Table 4.6-3
Estimated Operation Noise Levels

Facility	Nearest Receptors	Distance to Nearest Receptor (feet)	Estimated Maximum Noise Level at Nearest Receptor (dBA)[a]
VGS	Residential	2,640	54
	Hospital	1,100	61
	Commercial/Industrial	500	68

a. 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.

After completion of the VGS upgrade, additional truck traffic (ammonia deliveries) will be negligible (approximately two to three truck deliveries 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 new power generating equipment, the maximum "worst-case" noise level expected at the nearest residential receptors is 54 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 61 dBA. This predicted noise level complies with the normally acceptable land use class of 60 to 65 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 CTGs and associated equipment at VGS site will be within acceptable limits and are not expected to result in a significant noise impacts.

4.6.2.1 Worker Protection and Safety

Compliance with 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 eight-hour work shift. Areas with noise levels 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.

Increased noise levels resulting from project construction will be temporary, short-term and are expected to be below the Cal-OSHA and the U.S. Occupational Safety and Health Administration (U.S./OSHA) guidelines for worker noise exposure. Increased noise during operation of the substation is also expected to comply with OSHA guidelines. Therefore, no impacts to worker safety from project noise levels generated by construction or operational phases are anticipated.

4.6.3 Mitigation Measures

No significant noise impacts from construction-related activities are anticipated as a result of the proposed project at the VGS, therefore, no mitigation is required or proposed. However, guidelines are available (Bies and Hansen, 1988) for minimizing construction noise impacts, including consideration of the best available equipment during the construction stage. LADWP will implement these measures where appropriate.

The existing and future noise environment for land uses around the 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 operational 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.

4.6.4 Remaining Impacts

No significant adverse impacts related to noise are expected as a result of the construction or operation of the proposed project. Therefore, there will be no remaining significant impacts.

4.7 Transportation/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. Traffic generated by the construction phase of the proposed project was added to the existing traffic volumes presented in Chapter 3 – Existing Setting, Section 3.7, and the resulting impacts to the nineteen intersections were assessed.

Impacts to transportation/traffic will be considered significant if the following criteria are met:

- For project impacts that would last between three and 12 months, ICU ratio increase greater than or equal to 0.04, if LOS is E or worse.
- For project impacts longer than 12 months if ICU ratio increase greater or equal to 0.040 and LOS is C: ICU ratio increase greater than or equal to 0.020 and LOS is D; and ICU ratio increase greater than or equal to 0.010 and LOS is E or F.
- A major roadway or railroad is closed to all through traffic and no alternate route is available.
- The project will increase customer traffic to a facility by more than 700 trips per day.

4.7.1 Trip Generation

Construction-related activities for the proposed project modifications are scheduled to begin in spring of 2002 and be completed in the summer of 2003. Construction is anticipated to take place six days per week from 6:00 am to 5:00 pm.

The construction effort is anticipated to require 600 workers per day during the peak construction period. This peak construction period is anticipated to last for six months. The traffic analysis used a 1.0 vehicle occupancy for the construction workers as a "worst case." Table 4.7-1 summarizes the anticipated peak construction vehicles at the project site. Material deliveries were not included in this assessment as they typically do not occur during the peak hour.

The morning peak traffic hour of the adjacent street system near the project site occurs during the morning peak period of 7:00 am to 9:00 am as indicated in the CMP Guidelines. Construction activities at the VGS will occur six days per week. The workshift is scheduled to begin at 6:00 am and end at 5:00 pm. Traffic attributable to the project construction traffic will arrive at the site before the morning peak period would begin and will not affect the morning peak hour ICU values. The workshift will leave at the beginning of the PM peak period and may affect the afternoon peak hour ICU values. Therefore, the following analysis examines impacts from traffic attributable to the proposed project only during the afternoon peak traffic period.

Table 4.7-1
Construction Worker Summary

Phase	Maximum Number of Workers	Estimated Construction Time (in months)
1. Excavation	3	5
2. Foundation	253	11
3. Equipment Installation[a]	600	
CTGs	--	10
Steam Turbine	--	9
HRSGs	--	10
4. Auxiliary Equipment	10	18

Phase	Maximum Number of Workers	Estimated Construction Time (in months)
a = There will be overlap among phases of equipment installation.		

4.7.2 Trip Distribution

Distribution of project-generated traffic was derived from observation of existing travel patterns in the vicinity of the project site. An increase in vehicular movements will occur at the project site during the construction period. The anticipated construction traffic at the VGS is forecast to peak at 600 vehicles per day.

To provide a “worst-case” analysis, it is assumed that most of the construction personnel required for the proposed project would commute to and from the site in private automobiles even though LADWP would encourage construction contractor's employees to organize carpools.

To estimate the project-related traffic volumes at various points on the transportation system adjacent to the generating station 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 maximum daily truck traffic at the VGS site during construction is estimated to be approximately 70 trucks per day. Since these trips would primarily consist of material deliveries, it is expected that the truck trips would be spread throughout the work day with few deliveries occurring during the peak hour traffic. Therefore, the truck traffic contribution from the proposed project to overall traffic impacts would be negligible. All truck deliveries would be made at the main entrance from Sheldon Street. As a conservative or “worst-case” analysis, the maximum expected employees at the construction site was assumed to occur daily.

4.7.3 2001/Existing Plus Project Traffic Impacts

The equipment installation and modification at the VGS 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 phase of the project.

Project traffic was distributed to the surrounding roadways with 35 percent directed northward along the Golden State Freeway (Interstate 5), 15 percent eastward toward the Foothill Freeway (I-210), 25 percent directed southward via SR-170, and the remaining 25 percent directed south/southeast of the site along Interstate 5. Roadways in the vicinity of the VGS would be impacted by the project’s construction-related traffic. However, project-related construction traffic would contribute less than two percent of the daily traffic volume on these roadways.

To assess the impacts on the surrounding roadways, an ICU analysis was conducted for the 19 intersections that would be most directly impacted by construction-related traffic at the VGS site.

Analysis year-plus-project intersection volumes for the VGS project site were generated by adding the project intersection volumes to the existing Year 2001 background intersection volumes. PM peak hour 2001-plus-project turn volumes are illustrated in Table 4.7-2. An examination of this table reveals that construction-related traffic at the VGS site does have a significant impact on the forecast afternoon peak period level of service with the exception of one intersection. The intersection of San Fernando Road and Sheldon Street, which has a “E” LOS, with the addition of the project related traffic will result in an ICU ratio increase greater than 0.04 for between three to 12 months.

Table 4.7-2
Project Level of Service Summary

Intersection	Existing PM	Existing + Project PM	% Change
1. Glenoaks & Sheldon	0.463	0.463	NC
2. Glenoaks & Tuxford	0.646	0.646	NC
3. Sunland & Glenoaks	0.697	0.697	NC
4. San Fernando & Osborne	0.799	0.799	NC
5. San Fernando & Sheldon	0.800	0.922	.122[a]
6. Arleta & Sheldon	0.754	0.760	.006
7. Coldwater Canyon & Roscoe	1.106	1.106	NC
8. SR-170 SB Ramp & Roscoe	1.206	1.206	NC
9. SR-170 NB Ramp & Roscoe	0.888	0.888	NC
10. SR-170 NB Off & Sheldon	0.509	0.509	NC
11. SR-170 SB Ramp & Arleta	0.749	0.790	.041
12. Sunland & Interstate 5 NB On/Off	0.594	0.594	NC
13. Sunland & Interstate 5 SB On/Off	0.848	0.848	NC
14. Interstate 5 NB On/Rincon & Sheldon	0.575	0.575	NC
15. Laurel Canyon & Interstate 5 NB On/Off	0.656	0.686	.030
16. Laurel Canyon & Interstate 5 NB Off	0.500	0.500	NC
17. Interstate 5 NB On/Off & Osborne	0.704	0.704	NC
18. Interstate 5 SB On/Off & Osborne	0.932	0.932	NC
19. Laurel Canyon & Sheldon	0.765	0.812	.047

a = Significant Impact based on SCAQMD criteria

Level of Services Ranges: .00 - .60 A; .61 - .70 B; .71 - .80 C; .81 - .90 D; .91 – 1.0 E; Above 1.0 F

4.7.4 Onsite Circulation and Parking

Sufficient onsite parking is available to accommodate the increased parking demand from construction workers at the proposed project site. The physical site of the VGS provides 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.

4.7.5 Mitigation Measures

Adequate off-street parking within the generating station is available to accommodate the peak construction and operating labor force after completion of the project. The entry point to the VGS minimizes impacts on traffic and circulation patterns on the street system near the facility, and maintains access for pedestrians, bicyclists, and motor vehicle traffic. If required, truck operations for the delivery of over-size equipment and materials will be conducted to the maximum extent possible during off-peak hours to minimize traffic impacts.

However, project construction traffic does have a potential for significant adverse impacts on the forecast afternoon peak hour level of one of the 19 intersections in the vicinity of the VGS. Level of service at the San Fernando Road and Sheldon Street intersection will increase from 0.8 to 0.922, a change of 0.122 percent.

Several mitigation measures were considered to lessen the impacts to insignificance. However, none of the mitigation measures considered were deemed feasible. Under CEQA Guidelines (§ 15126.4(a)(1)), "an EIR shall describe feasible measures which could minimize significant adverse impacts…" According to § 15364 of the CEQA Guidelines, when determining the feasibility of a mitigation measure, it is acceptable to take into account economic, environmental, legal, social, and technological factors.

Based on these guidelines, the following mitigation measures were considered, but were deemed infeasible due to economic, environmental, legal, social, and technological factors:

- Road improvements to increase the capacity of the impact intersection.

Such construction would require acquisition of additional right-of-way and demolition of any existing buildings along the roadways. Such acquisition and building demolition would cost millions of dollars, would require an environmental review, could not be accomplished in the time frame established for this project, and is not commensurate with the short-term construction impact.

- Shifting the construction start time from 6:00 a.m. to an earlier time or a later time so that the construction end time would occur outside of the evening peak period.

This mitigation is considered infeasible due to economic and technological considerations. Shifting the start of construction earlier or later would require construction workers to work in the dark, making it necessary to provide lighting and other special equipment that would increase the costs of construction the project. Such construction might also cause significant noise impacts since allowable noise levels at night are lower and generators used to power the lights would be additional noise sources.

4.7.6 Remaining Impacts

The mitigation measures identified above were considered, but were deemed infeasible due to economic, environmental, legal, social, and technological factors. Therefore, the proposed project will present the potential for significant transportation and traffic impacts during the relatively short term of the construction phase of the proposed project.

4.8 Summary of Mitigation Measures

The table below provides a summary of the mitigation measures for air quality, geology/soils, and hazards and hazardous materials.

Table 4.7-3
Summary of Mitigation Measures

Air Quality – (AQ-1)	Increase watering of active sites by one additional time per day.
Air Quality – (AQ-2)	Proper equipment maintenance
Air Quality – (AQ-3)	Prior to use in construction, the project proponent will evaluate the feasibility of retrofitting the large off-road construction equipment that will be operating for significant periods. Retrofit technologies such as selective catalytic reduction, oxidation catalysts, air enhancement technologies, etc. will be evaluated. These technologies will be required if they are commercially available and can feasibly be retrofitted onto construction equipment.
Air Quality – (AQ-4)	Use low sulfur diesel (as defined in SCAQMD Rule 431.2) where feasible.
Air Quality – (AQ-5)	Use low sulfur diesel (as defined in SCAQMD Rule 431.2) during diesel readiness testing.
Air Quality – (AQ-6)	Provide VOC emission offsets.
Geology/Soils (GS-1)	Foundation elements will be set back a minimum of 200 feet from the pit walls.
Hazards and Hazardous Materials (HH-1)	Manual shutdown of liquid into or out of the tank, which will minimize the quantity of an ammonia release.

Table 4.7-3 (Concluded)
Summary of Mitigation Measures

Hazards and Hazardous Materials (HH-2)	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.

4.9 Environmental Impacts Found Not To Be Significant

As previously mentioned, a NOP/IS (Appendix A) was prepared for the proposed project, which described the anticipated environmental impacts that may result from its implementation. 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 ~~Draft~~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 (Appendix A).

- Aesthetics
- Agriculture Resources
- Energy
- Land Use Planning
- Mineral Resources
- Population/Housing
- Public Services
- Recreation
- Solid/Hazardous Waste
- Water Supply

4.10 Other CEQA Topics

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

4.10.1 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, geology/soils, hazards and hazardous materials, hydrology/water quality, noise, 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. The air quality impacts associated with maximum peak daily emissions of criteria pollutants from operation of the facility were determined to be significant.

Potential hazard impacts associated with the storage, transport, and handling of aqueous ammonia or release of natural gas were determined to be significant. However, the likelihood of an ammonia spill from a tanker truck or a natural gas release is remote.

Potential transportation and traffic impacts associated with the construction phase of the proposed project were determined to be significant. However, these impacts will be of relatively short duration.

It should be noted that the project is being constructed at an existing facility, 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 ~~Draft~~Final EIR, the proposed project would not result in irreversible environmental changes or significant irretrievable commitment of resources.

4.10.2 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 and provide more reliable in-basin power, is not expected to significantly contribute to population growth in the areas around the project site, 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 an existing industrial facility. The new power generating equipment will replace four existing utility boilers, which will be decommissioned. The new equipment will not require the hiring of additional LADWP personnel to operate the equipment. The construction workers can be hired from the existing labor pool in southern California; therefore, no new workers, new services, infrastructure, or housing is required.

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